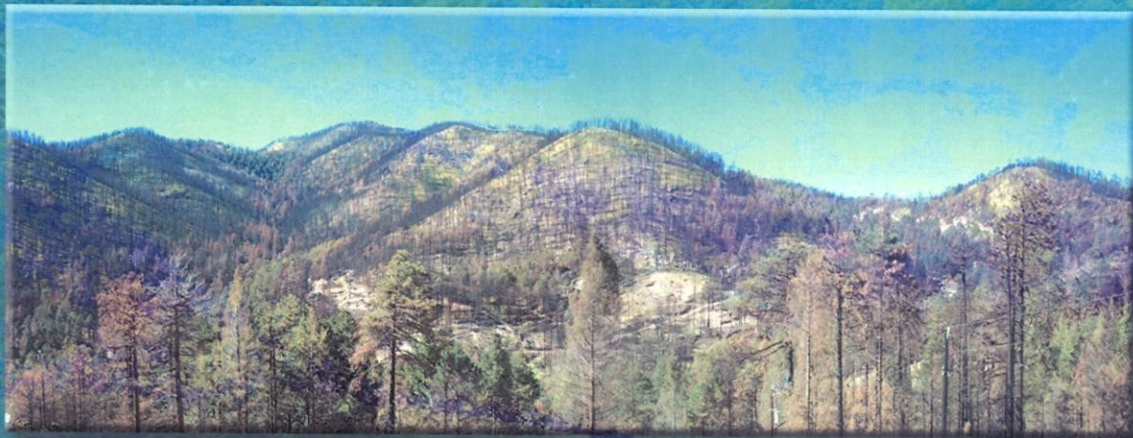


HYDROLOGIC AND
HYDRAULIC STUDY
FOR THE TOWN OF

SUMMERHAVEN



PREPARED BY

URS

PREPARED FOR

PIMA COUNTY DEPARTMENT OF
TRANSPORTATION



DECEMBER 30, 2003

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FINAL REPORT

**PIMA COUNTY, ARIZONA
SUMMERHAVEN
HYDROLOGIC AND HYDRAULIC ANALYSIS**

**Prepared for
PIMA COUNTY DEPARTMENT
OF TRANSPORTATION AND
FLOOD CONTROL DISTRICT**

**URS Job No. 23443361
December 30, 2003**

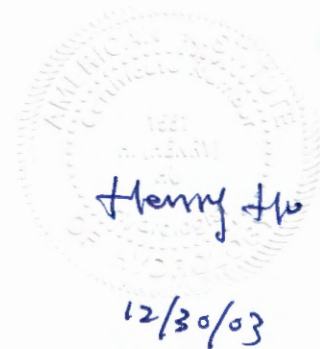


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1.0 INTRODUCTION

1.1 PURPOSE OF STUDY

The Aspen Fire of the summer of 2003 burned 84,750 acres within the Coronado National Forest and destroyed 333 structures. Portions of the Sabino Canyon and Carter Canyon watersheds were severely burned in the Aspen Fire. The purpose of this study is to determine the hydrologic and hydraulic impacts of the fire on the Sabino Canyon and Carter Canyon watersheds, which are in the vicinity of the Town of Summerhaven, located on Mount Lemmon in the Santa Catalina Mountains, Arizona.

This report presents hydrologic and hydraulic study results for the Town of Summerhaven. Tasks performed include data collection and review, site visits, watershed and sub-basin delineation, development of HEC-HMS hydrologic models, development of HEC-RAS hydraulic models, potential erosion hazard mapping, road crossing structures capacity evaluation, and floodplain mapping.

1.2 AUTHORIZATION AND ACKNOWLEDGEMENTS

URS Corporation (URS) was contracted by Pima County Flood Control District (PCFCD) to perform this study under requisition number 70931. The Principal-in-Charge for this study is Dr. Elliot Silverston, P.E. The Project Manager is Mr. Andrew Messer, R.G., with the assistance of Dr. Henry Hu, P.H., CFM. Project Engineers are Mr. Colin McKernan and Mr. Erick Lopez. The PCFCD Project Manager is Mr. Lynn Orchard, CFM.

2.0 DATA COLLECTION AND REVIEW

2.1 FIELD VISITS

An initial field visit was conducted on October 9, 2003, to view the impacts of the Aspen Fire on the watershed. A walk-through field reconnaissance was conducted to determine the size, location, and condition of each of the six publicly owned culverts, and a number of driveway culverts along Sabino Creek and Carter Canyon Wash. The field visit also provided evidence in estimating Manning's "n" values to be used in the hydraulic modeling. A second field visit was conducted on November 5, 2003, to further view the impacts of the Aspen Fire on the watershed. The photos from the initial and second field visits can be found in Appendix A.

2.2 HYDROLOGIC AND HYDRAULIC PARAMETERS

Several data sources were used to compile information to determine the parameters necessary to perform the hydrologic and hydraulic analyses. These data and their sources are tabulated in Table 1.

2.3 SUMMARY OF GAGE DATA

The stream gage was first operated by the U.S. Geologic Survey (USGS) for the period 1951 to 1970. The USGS gage number is 09483300, "Sabino Canyon near Mt. Lemmon, Arizona." Annual peaks were acquired from the USGS for the period 1951 to 1959. A historic peak flow of 380 cubic feet per second (cfs) was recorded for September 13, 1966. No annual peaks were available from 1960 to 1970.

The stream gage was later acquired and operated by the U.S. Forest Service (USFS). Daily maximum, minimum, and mean flows were provided by the USFS Coronado National Forest for the period 1982 to 1992. Daily mean flows also were available for the period 1993 through 1997.

The stream gage is currently being operated and maintained by PCFCD with a new gage name of Marshall Gulch. Stream flows were provided by PCFCD for the period from July to early October 2003.

The Marshall Gulch stream gage has a broken record of annual peaks from 1951 to 2003. Annual peak discharges are missing for many years mainly due to the operational transition between different agencies. In the flood frequency analysis (Section 3.3), the different record segments were analyzed as a continuous record with a total of 21 years of peak flow record, assuming that

there had been no significant changes in the climatic trends and watershed conditions in the study area before the recent Aspen fire. A summary of the available gage data is included in Table 2.

3.0 HYDROLOGY

3.1 OVERVIEW

This section summarizes the hydrologic analyses performed to estimate the peak discharges for Sabino Creek and Carter Canyon Wash. The subtasks include:

- Flood Frequency Analysis
- Development of Pre- and Post-Fire HEC-HMS Models
- Estimated Pre- and Post-Fire Peak Discharges

3.2 WATERSHED DESCRIPTION

The study area consists of approximately 2.5 miles of streams with a drainage area of approximately 1.7 square miles. The watershed consists mainly of high mountainous pine forest and is located near the Town of Summerhaven, Arizona. The project location is shown in Figure 1.

The watershed consists of two major streams: Sabino Creek and Carter Canyon Wash. The study limit is located at approximately 1 mile downstream of the confluence area between the Sabino Creek and Carter Canyon Wash, at the confluence with Marshall Gulch. However, since a streamflow gage is located on Sabino Creek (less than 1 mile downstream of the study limit), the watershed delineation and the HEC-HMS model also include the Marshall Gulch subwatershed. The drainage area to the gage consists of the Sabino Canyon and Carter Canyon watersheds and the Marshall Gulch basins. Marshall Gulch was incorporated into the HEC-HMS model to allow calibration of the HEC-HMS model using the stream gage data.

3.3 FLOOD FREQUENCY ANALYSIS

The discharge probability curve was developed using the USGS PEAKFQ computer program, Version 4.1 (Thomas et al. 1998). The computational methods of PEAKFQ are based on the techniques described in "Guidelines for Determining Flood Flow Frequency, Bulletin # 17B" (Interagency Advisory Committee on Water Data 1982), hereafter referred to as "Bulletin 17B."

The input data required for PEAKFQ include the geographic location of the gage (latitude and longitude) and annual peak flow data. The general skew coefficient of -0.2 was determined in

PEAKFQ from Plate I of Bulletin 17B based on the gage location. The adopted skew coefficient of 0.22 was computed by weighting the general and station skew coefficients.

Table 3 summarizes the 2-, 5-, 10-, 25-, 50-, and 100-year frequency flows at the gage. The PEAKFQ output file is included in Appendix B. For comparison, the peak discharges also were calculated using the USGS regression equations for Arizona Region 5 (USGS 1993). It can be seen that the peak flows from PEAKFQ are much smaller than the regression equation results, ranging from 15.1 to 154.6 percent. The differences of discharges between the flood frequency and regression equation results may be due to the following factors:

- 1) The regression equations were developed based on gaging stations in a large region and represents the “average” condition in the region. The equations may not well represent rainfall responses in the small study area on Mount Lemmon. The Summerhaven watershed is located in a forested area with elevations ranging from 7,000 to 9,000 feet, compared to other areas with low elevations and desert cover.
- 2) The annual peak discharge values have limited records. The PEAKFQ analysis does not include some large floods from 1993 to 1998 because annual peak data are not available. For example, during the 1993 flood, the streamflow gage was not operational. Missing large floods may have some impacts on the peak discharge distribution, especially for low frequency flows.

The flow data, discharge probability curve, and the 5 and 95 percent confidence limits are shown in Figure 2.

3.4 PRE-FIRE HEC-HMS MODEL DEVELOPMENT

A rainfall-runoff model was developed using HEC-HMS, Version 2.2.2 (U.S. Army Corps of Engineers [COE] 2003a). The drainage areas were delineated using automated hydrologic techniques. Using the USGS Digital Elevation Models (DEMs) for Mount Lemmon and Mount Bigelow, the watershed boundary was constructed with Watershed Modeling System (WMS), Version 6.1 (BOSS International 2003). The Sabino Canyon, Carter Canyon, and Marshall Gulch watersheds were further subdivided to account for the varying terrain conditions within the watershed and to create necessary concentration points at the six public culverts. The sub-basin areas are shown in Table 4. The watershed boundary and sub-basins can be seen on Figure 3.

The 24-hour 2-, 5-, 10-, 25-, 50-, and 100-year hypothetical precipitation values were determined for the basin areas by using the National Oceanic Atmospheric Administration (NOAA) Atlas 14 precipitation maps. Table 5 shows these precipitation values.

The loss rates for each sub-basin were calculated using the Soil Conservation Service (SCS) curve number method. The initial SCS curve number was determined based on a combination of soil data and land cover using a series of Geographic Information System (GIS) data processing methods. First, the National Resources Conservation Service (NRCS) State Soil Geographic Database (STATSGO) (U.S. Department of Agriculture 1995) was imported into Arc/Info and trimmed to the watershed boundaries. Second, the hydrologic soil units associated with these soil types were determined by overlaying the land use maps for Pima County.

The final composite curve numbers were determined using the General Soil Map of Pima County, found on page 99 of the Pima County Hydrology Manual (PCFCD 1979). The classification of the soil based on this map is Zone 14, described as “Rock Outcrop – Bakerville – Faraway association: Rock outcrop and very shallow and shallow sub-humid soils of the mountains. Hydrologic soil groups = 40% C and 60% D”. This ratio was applied in place of the STATSGO soil classification of soil Group D because, based on the HEC-HMS model calibration, using the soil classification from the Pima County soil map yields more reasonable runoff results.

The sub-basin lag time was determined using the SCS TR-55 method (U.S. Department of Agriculture 1986) within the WMS model and calculated using the following equation:

$$T_{lag} = 0.6 (T_{sheet} + T_{shallow} + T_{channel})$$

Where T_{sheet} = sum of travel time in sheet flow segments over the watershed land surface; $T_{shallow}$ = sum of travel time in shallow flow segments, down streets in gutters, or in shallow rills and rivulets; and $T_{channel}$ = sum of travel time in channel segments. The results of the lag time calculation can be seen in Table 6.

The Modified Puls channel routing method was used for routing reaches that are covered in the hydraulic models to account for backwater effects from culverts and channel constrictions. The storage-outflow relationship (Table 7) was developed by using the HEC-RAS, Version 3.1.1 (U.S. Army Corps of Engineers [COE] 2003b), models for Sabino Creek and Carter Canyon Wash. Please refer to the hydraulic analysis portion of this report for a description of the hydraulic modeling process. The routing reaches (Figure 3) that are located in the uppermost reaches and were not covered in the hydraulic model were modeled using the Muskingum channel routing technique. Table 8 shows the parameters required in the Muskingum method. The base flow was assumed to be zero.

3.5 POST-FIRE HEC-HMS MODEL DEVELOPMENT

Burn severity data for the Aspen Fire were provided by PCFCD. The severity was classified as the following: high, moderate, low, and unburned. The burn-intensity map was imported into Arc/Info and trimmed to the sub-basin drainage areas (Figure 4). The percentage of severity types for each sub-basin was then determined. The weighted average SCS curve number was determined based on these percentages and the following curve numbers: unburned = 75, low severity = 80, moderate = 85, and high severity = 90 (BAER 2002). The post-fire SCS curve number for each sub-basin can be found in Table 9. The initial abstraction was assumed to be 0.10 inches, which is less than the pre-fire condition value, due to less soil infiltration under burned conditions.

All other parameters in the channel routing were unchanged from the pre-fire conditions.

3.6 MODEL CALIBRATION/VERIFICATION

3.6.1 Pre-Fire Model Calibration

The results of the flood frequency analysis were used to calibrate the HEC-HMS model for the pre-fire condition. Two parameters were determined to be the most sensitive when determining the peak discharge: the SCS curve number and the cumulative initial abstraction (interception) by the basin.

Initial hydrologic analysis results using initial SCS curve numbers were considerably higher than the flood frequency analysis results. Initial SCS curve numbers using the STATSGO data and county land use maps for the sub-basins were between 75 and 78. Based on the calibration results, composite curve number of 45.2 are used for all sub-basins in the calibrated hydrologic model. This value was determined by using the hydrologic soil group ratio of 40% C and 60% D, described in Section 3.4, for Oak-Aspen in good condition as described in Table 2.2d of TR-55 (USDA 1986).

The default value for the initial abstraction is $I = 0.2S$ where S is the potential maximum retention, a measure of the ability of a watershed to abstract and retain storm precipitation. For the curve number value of 45.2, the resulting initial abstraction would be equivalent to 2.42 inches using the equation:

$$S = \frac{(1000 - 10CN)}{CN}$$

This value was considered to be unreasonable given the soil type and watershed location. Based on Table 4.4 (Hydrologic Soil Group D) in the Maricopa County Hydrology Manual (MCFCD 2003) and a hydrologic and hydraulic study performed on the Upper Canada Del Oro Watershed (CMG 2003), a more reasonable value of 0.25 inches was used in all sub-basins to account for the cumulative initial abstraction.

Table 10 shows the peak discharges for the 2-, 5-, 10-, 25-, 50-, and 100-year pre-fire events from the calibrated HEC-HMS model. When compared to the 95% confidence limits of the Marshall Gulch stream gage flood frequency analysis, the calibrated results fall within the range of the upper and lower limits (Figure 5).

For comparison, the peak discharges for Sabino Creek, Carter Canyon Wash, and at the gage location, also were calculated using the USGS regression equations (USGS 1993). Two types of USGS regression equations were used. One is for Arizona Region 5 and the other one is for Southwestern Region 13. It is apparent that these two types of regression equation results are comparable and have the same magnitude of peak flows. However, the regression equations results are significantly higher than flood frequency analysis results and HEC-HMS peak flows. Again, the regression equations were developed based on gage data in a large region and may not be applicable to the study area. Also, the flood frequency analysis was based on a limited record of annual peak discharges. These results can be seen in Table 11.

The SCS Type I rainfall distribution was used in the final model simulation. Other rainfall distributions were attempted. However, the simulated peak flows using these rainfall distributions (other than the SCS Type I) are significantly higher than the flood frequency analysis results or observed flow for the selected calibration event. A sensitivity analysis of the rainfall distribution is discussed in Section 3.7.

3.6.2 Post-Fire Model Verification

A recent summer rainfall event (after the Aspen Fire) was selected to verify the post-fire HEC-HMS model. The rain started on July 24, 2003, at 6:30 pm and ended at 8:45 pm with a total rainfall depth of 0.94 inch. For the same period, stream flow was recorded at the Marshal Gulch gage. The recorded precipitation was applied uniformly to all sub-basins. Figure 6 shows the simulated and observed hydrographs. The simulated hydrograph matches the observed one reasonably well, although the simulated peak is 38 cfs higher than the observed peak of 385 cfs and the timing is slightly shifted. The model verification indicates that the post-fire HEC-HMS model with estimated curve number and initial abstraction is able to reasonably simulate the post-fire rainfall-runoff process.

Table 12 shows the 2-, 5-, 10-, 25-, 50-, and 100-year peak discharges for the post-burn condition. Compared to the pre-burn condition hydrology, the increase in peak flows from the pre-burn condition to the post-burn condition ranges from 141 to 489 percent, as shown in Table 13. Also, when compared to the pre-fire condition, the curve number in the post-fire condition increased by a range of 77 to 99 percent (Figure 7). It is also worth pointing out that the post-fire condition peak discharges for different frequencies are outside of the 90 percent confidence interval of the pre-fire condition flood frequency distribution (Figure 5). This indicates that the increase in discharges due to the Aspen Fire is statistically significant.

3.6.3 Comparison with Army Corps of Engineers' Carter Canyon Study

Recently a hydrologic analysis was performed for Carter Canyon Wash by Army Corps of Engineers (COE 2003c). The Corps used the USGS regression equations for Arizona Region 5 for the pre-fire condition. As stated previously, the results of this analysis using HEC-HMS are lower than the regression equation results. A comparison between the results in this study, the Corps' results, and those determined using the regression equations is found in Table 14.

When comparing the post-fire results to the Corps' hydrologic analysis of Carter Canyon Wash, the post-fire 100-year HEC-HMS peak flow (using SCS Type I) is significantly lower than the Corps'. The post-fire 2-year HEC-HMS peak flow (using SCS Type I) is approximately twice as high as the Corps' modeling result. Also, the post-fire 10-year HEC-HMS results are close to the Corps' peak flows for these events. The differences between the HEC-HMS results (using SCS Type I) and the Corps' values may be due to the Corps assuming a high severity SCS curve number (90) for the entire basin, and the absence of post-fire HEC-1 model calibration.

3.7 RAINFALL DISTRIBUTION SENSITIVITY ANALYSIS

Within HEC-HMS, several types of rainfall models were developed in an attempt to reasonably model the watershed's response to the rainfall. The SCS Type I rainfall distribution was selected due to its similarity to a more front end loaded storm, commonly seen in the monsoon season of lower Arizona as a Gulf of California moisture surge. Gulf of California moisture surges are the major source of low-level moisture for thunderstorms in Arizona.

Several rainfall events were reviewed using the rainfall gage data in the study watershed. The prevailing storm type was found to be a short duration, high intensity, and frontally loaded storm, typical of the Arizona summer monsoon thunderstorm. Several other significant rainfall events in the winter months throughout the rain gage period were also examined. They also tended to have a more frontal distribution as opposed to the centrally distributed storm,

typical of winter storms. Although the SCS Type I rainfall distribution was chosen as mostly accurately reflecting the watersheds response, the SCS Type II and the HEC-HMS frequency storm methods (central distribution) were attempted. Both the SCS Type II and the frequency storm methods provided results much higher than the flood frequency analysis results at the gaging station. As an example, the results of the 2-year and 100-year pre-fire peak flows for each of three rainfall distributions are shown in Table 15.

4.0 HYDRAULICS

4.1 HEC-RAS MODEL DEVELOPMENT

The HEC-RAS model was developed based on the recent 5-foot interval contour map provided by PCFCD. HEC-RAS cross-sections were constructed using BOSS RMS with AutoCAD. All culverts were coded in the model based on the data collected in the field.

Roughness coefficients for low flow and high flow conditions (Manning's "n" values) used in the hydraulic analysis for Sabino Creek and Carter Canyon Wash were based on field reconnaissance. As shown in Table 16, these values ranged from 0.017 to 0.10 for the channel, and from 0.013 to 0.055 for the overbanks. The water surface profiles for the 10- and 100-year floods were computed. Starting water surface elevations were based on computed normal depths at the downstream limit of the hydraulic model.

It should be noted that the hydraulic analysis was based on the existing channel condition. All culverts were assumed to be in place in both the pre-fire and post-fire runs.

4.2 HYDRAULIC RESULTS

Tables 17 and 18 show the results of the 10- and 100-year pre- and post-fire events for Sabino Creek and Carter Canyon Wash, respectively. Figures 8 and 9 show the 100-year water surface profiles. The entire HEC-RAS output is included in Appendix C. It is apparent that with the increase in the peak discharges from the pre- to post-fire conditions, the water surface elevations and flow velocities for the post-fire conditions are generally higher than those for the pre-fire condition. The increase in the water surface elevations ranges from 0.43 to 3.28 feet for the 10-year flow and from 0.63 to 4.48 feet for the 100-year flow.

5.0 EROSION MAPPING

The erosion mapping was primarily based on the field observation during the second site visit. The burn intensity map also was used to determine the area that would be prone to various degrees of erosion. Figure 10 shows the erosion potential map with different zones designated as low, moderate, and high erosion potential and no erosion potential. Generally, the areas that have been rated moderate burn intensity have been mapped as low erosion potential.



Low Erosion Potential

Also, the areas that have been rated high burn intensity are mapped as moderate erosion potential.



Moderate Erosion Potential

The areas designated as high erosion potential were the most severely burned and generally have areas of deeply incised channels, and/or channel impediment due to debris, steep slopes, or improper bank protection.



High Erosion Potential

Based on observed field conditions, areas designated as high erosion potential are in need of appropriate bank protection measures, such as rootwad revetment, gabion baskets, rip-rap placement, boulder revetment, or concrete stakes such as A-Jacks®.

6.0 ROAD CROSSING DESIGN

PCFCD provided a previous report (CMG 1993) with culvert size recommendations for driveway culverts, along Carter Canyon Road, Turkey Run Road, and Sabino Canyon Parkway, within the Town of Summerhaven, and requested that URS evaluate the existing and CMG recommended culvert sizes for the publicly owned structures in the study area.

Note that the sixth publicly owned culvert under Tucson Road has not been included in this analysis due to its upstream drainage area contributing less than 50 cfs, even in the 100-year event.

The criteria developed by PCFCD for roadway culverts within the Town of Summerhaven is that culverts should convey a 10-year event under the road and the 100-year event over the road at a depth of one foot or less and/or the product of the depth and velocity squared should be less than or equal to 18. For this analysis, the post-fire 10- and 100-year hydraulic results were used in the culvert capacity evaluation.

Along Carter Canyon Road, CMG recommends using the same size (64 inch x 43 inch) of corrugated metal arch pipe (CMAP) in place of all existing driveway culverts. This culvert size was recommended to replace the existing 42 inch corrugated metal pipe (CMP) underneath Carter Canyon Road (Culvert #10 in the hydraulic model). The existing 42 inch CMP publicly owned culvert under Carter Canyon Road does not meet the PCFCD established criteria. The results of the hydraulic analysis show that the CMG recommended culvert size would not fulfill the established criteria for conveying the 10-year event under the road and the 100-year event over Carter Canyon Road at a depth of less than or equal to one foot (Table 19).

Along Turkey Run Road, CMG recommends using the same size (71 inch x 47 inch) of CMAP in place of the existing driveway culverts. This culvert size was recommended to replace the existing 36 inch CMP underneath Guthrie Road (Culvert #17 in the hydraulic model). The existing 36 inch CMP publicly owned culvert under Guthrie Road does not meet the PCFCD established criteria. The results of the hydraulic analysis show that the CMG recommended culvert size does not meet either the 10-year event or the 100-year event criteria (Table 19).

Along Sabino Canyon Road, CMG recommends using the same size (71 inch x 47 inch) of CMAP in place of the existing driveway culverts. This culvert size was recommended to replace the existing twin 36 inch x 48 inch elliptical CMP culverts under East Sabino Road (Culvert #2 in the hydraulic model) as well as the twin 30 inch x 48 inch elliptical CMP culverts under

Sabino Canyon Road (Culvert #9 in the hydraulic model) and the single 36 inch CMP underneath Goat Hill Road (Culvert #4 in the hydraulic model). These three locations all do not meet the PCFCD established criteria. The results of the hydraulic analysis show that at neither the 10-year event or the 100-year event criteria is met using the CMG suggested culvert size for the Sabino Canyon Road, Goat Hill Road and East Sabino Road crossings (Table 19).

7.0 FLOODPLAIN MAPPING

The results of the hydraulic analyses were used to map the floodplains for Carter Canyon and Sabino Canyon within the Town of Summerhaven. Water surface elevations calculated by the HEC-RAS models were projected onto the 5-foot contour interval map. The floodplain maps (Figures 11A and 11B) show that the overall width of the floodplain along Carter Canyon and Sabino Canyon has increased due to the increase in the post-fire 10- and 100-year flows from the pre-fire condition. Also included within the floodplain maps is the approximate location of the wastewater treatment plant and the Zimmerman Elementary School. These structures are located near the confluence of Carter Canyon Wash and Sabino Creek.

8.0 SUMMARY AND CONCLUSIONS

Hydrologic and hydraulic analyses have been performed to quantify the impacts of the recent Aspen Fire on Sabino Canyon and Carter Canyon watersheds and structures. Pre-fire HEC-HMS models were developed and calibrated using the flood frequency analysis results at the Marshall Gulch gaging station. The post-fire HEC-HMS models were verified using the observed rainfall and stream flow for a selected event. Model calibration results indicate that the pre-fire HEC-HMS simulated peak flows are within the 95% confidence limits of the flood frequency analysis results. The post-fire HEC-HMS simulated hydrograph matches the observed reasonably well for the selected event. The hydrologic impacts of the Aspen Fire on Sabino Creek and Carter Canyon Wash were determined to increase the peak discharges for the 2-, 5-, 10-, 25-, 50-, and 100-year events by a range of 141 to 489 percent when compared to the pre-fire hydrology.

HEC-RAS hydraulic models for Sabino Creek and Carter Canyon Wash were developed to compute the pre-fire and post-fire 10- and 100-year water surface elevations and flow velocities. The water surface elevations were used to develop the floodplain maps. The hydraulic impacts of the fire were determined to cause a range of 0.63 to 4.5-foot increase in water surface elevations for the 100-year flood event.

URS also performed potential erosion hazard mapping based on field investigations and a road crossing design analysis for five publicly owned culverts. It was determined that all CMG recommended culvert sizes for Sabino Canyon Road, Turkey Run Road, and Carter Canyon Road within the Town of Summerhaven failed to meet PCFCD established criteria of conveying a 10-year event under the road and the 100-year event over the road at a depth of one foot or less and/or the product of the depth and velocity squared should be less than or equal to 18.

It should be pointed out that in this study, the pre-fire HEC-HMS model was calibrated to flood frequency analysis results and the post-fire HEC-HMS was verified using observed streamflow for one post-fire storm. However, because only limited annual peak discharges were used in the flood frequency analysis and only one post-fire storm was selected, the hydrologic results from the HEC-HMS models represent the best estimate that can be made at this time given the available data.

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TABLES

Table 1
Summary of Data Collection

Data Collected	Source	Needed for
USGS Digital Elevation Models (DEMs)	Mount Lemmon - Mount Bigelow obtained from www.geocomm.com	Watershed and subbasin delineation. Parameters for TR-55 subbasin lagtime method
USGS Digital Raster Graphics (DRGs)	Mount Lemmon - Mount Bigelow obtained from www.geocomm.com	Base map
5-foot contour map for the town of Summerhaven	Pima County FCD and Cooper Aerial	Base map and construction of hydraulic model cross sections
Soil type, vegetation cover, and land use type maps	Pima County FCD and USDA - STATSGO	Determine percentage of each type within subbasins. Determine prefire composite SCS curve numbers
SCS Curve Numbers	NRCS TR-55 Manual	Assign curve number based on soil type, vegetation cover, and land use type
Hypothetical precipitation values	NOAA Atlas 14 precipitation maps	Determine the 5-, 10-, 25-, 50-, and 100 year rainfall runoff using the SCS Type I distribution
Stream and rainfall gage data	Pima County FCD, US Forest Service- Coronado National Forest, and USGS - Arizona	Calibrate pre- and post-fire hydrologic models
Burn severity mapping	Pima County FCD	Determine percentage of burn severity and post-fire condition curve numbers within each basin
SCS Curve Numbers for burned areas	BAER Report	Determine post-fire composite curve numbers
Manning's n values	Initial Field Visit	Hydrologic and hydraulic modeling
Culvert sizes and invert elevations	Pima County DOT	Hydraulic modeling and road crossing flow capacity
Recommended culvert sizes	CMG Drainage Report	Road crossing flow capacity analysis

Table 2
Summary of Stream Gage Data

Type of Data	Period of Record		
	USGS	USFS	PCFCD
Annual Peak	1951-1959, 1966	1982-1992	N.A.
Daily Flow	1951-1959	1982-1997	7/17-10/10/2003
Stage Flow	1951-1959, 1966	1982-1997	7/17-10/10/2003
Annual Peaks			
Water Year	Date	Streamflow (cfs)	Notes
1951	Jul. 23, 1951	180	
1952	Jan. 13, 1952	262	
1953	Jul. 16, 1953	219	
1954	Mar. 23, 1954	344	
1955	Aug. 23, 1955	329	
1956	Jul. 20, 1956	68	
1957	Jan. 09, 1957	197	
1958	Mar. 22, 1958	116	
1959	Oct. 05, 1958	73	
1966	Sep. 13, 1966	380	Historic Peak
1982	Aug. 23, 1982	145	
1983	Aug. 03, 1983	148	
1984	Oct. 11, 1983	625	
1985	Dec. 20, 1984	110	
1986	Nov. 25, 1985	107	
1987	Aug. 12, 1987	81	
1988	Aug. 25, 1988	128	
1989	Oct. 20, 1988	76	
1990	Sep. 02, 1990	180	
1991	Aug. 25, 1991	126	
1992	Feb. 17, 1992	167	
<p>Gage Information: Gage Number: USGS 09483300, "Sabino Canyon Near Mt Lemmon" Location: Pima County, Arizona Hydrologic Unit Code: 15050302 Latitude: 32°25'20" Longitude: 110°45'05" Drainage Area: 2.91 square miles based on the watershed delineation in this study</p>			

Table 3
Flow Frequency for the Marshall Gulch Stream Gage

Type of Analysis	Pre-Fire Peak Discharges (cfs) for Recurrence Interval					
	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
PEAKFQ	152	255	344	485	617	779
USGS Regression Equation	175	443	704	1133	1528	1983
Difference (%)	15.1	73.7	104.7	133.6	147.7	154.6

At Marshall Gulch Stream Gage Location - Drainage Area 2.91 square miles

Table 4
Drainage Area Estimates

Basin-ID	Basin Area (mi²)
6B	0.22
8B	0.09
10B	0.35
11B	0.27
12B	0.24
13B	0.06
14B	0.10
15B	0.30
16B	0.08
17B	0.06
19B	0.04
21B	0.17
22B	0.09
42B	0.16
43B	0.24
44B	0.23
63B	0.02
82B	0.19

Table 5
Precipitation Frequency Estimates in Inches

Frequency (yr)	5-min	10-min	15-min	30-min	1-hr	2-hr	3-hr	6-hr	12-hr	24-hr
2	0.36	0.55	0.69	0.92	1.14	1.32	1.45	1.72	2.05	2.28
5	0.51	0.78	0.97	1.3	1.61	1.84	2	2.34	2.77	3.1
10	0.61	0.93	1.15	1.55	1.92	2.2	2.38	2.78	3.27	3.67
25	0.74	1.12	1.39	1.88	2.32	2.68	2.91	3.37	3.97	4.44
50	0.83	1.27	1.57	2.12	2.62	3.05	3.32	3.85	4.5	5.03
100	0.93	1.41	1.75	2.36	2.92	3.43	3.74	4.36	5.07	5.65

**Table 6
Drainage Basin Lag Time Estimates**

Basin-ID	T _{shallow}					T _{shallow}			T _{channel}					Lagtime	
	Manning's n	2yr - 24hr Rainfall	Slope	Length	Travel Time	Slope	Length	Travel Time	Manning's n	Hydraulic Radius	Slope	Length	Travel Time	Lagtime (TR-55 Method)	Lagtime (TR-55 Method)
		(in)	(ft/ft)	(ft)	(hr)						(ft/ft)	(ft)	(hr)		
6B	0.04	2.28	0.178	290.144	0.066	0.298	1500.758	0.047	0.04	0.6	0.187	1749.764	0.043	0.093	5.6
8B	0.04	2.28	0.319	234.993	0.044	0.436	1061.502	0.028	0.04	0.659	0.091	1763.586	0.058	0.078	4.7
10B	0.04	2.28	0.2	288.947	0.063	0.162	2923.999	0.125	0.04	0.849	0.052	3039.883	0.111	0.179	10.8
11B	0.04	2.28	0.185	297.895	0.066	0.134	1922.656	0.090	0.04	0.585	0.167	2649.839	0.069	0.136	8.1
12B	0.04	2.28	0.203	207.492	0.048	0.401	444.898	0.012	0.04	0.308	0.166	3394.035	0.137	0.118	7.1
13B	0.04	2.28	0.443	152.866	0.027	0.527	631.373	0.015	0.04	1.204	0.085	929.948	0.021	0.038	2.3
14B	0.04	2.28	0.448	305.97	0.047	0.336	1304.02	0.039	0.04	0.673	0.089	1724.455	0.064	0.090	5.4
15B	0.04	2.28	0.461	300	0.046	0.379	1013.404	0.028	0.04	0.605	0.089	3805.071	0.134	0.125	7.5
16B	0.04	2.28	0.409	271.295	0.045	0.292	1774.188	0.057	0.04	0.631	0.056	888.787	0.038	0.084	5.0
17B	0.04	2.28	0.319	300	0.053	0.369	909.659	0.026	0.028	0.616	0.068	1199	0.033	0.068	4.1
19B	0.04	2.28	0.212	122.73	0.031	0.262	527.59	0.018	0.04	0.456	0.201	450.42	0.013	0.037	2.2
21B	0.04	2.28	0.388	300	0.049	0.421	800.359	0.021	0.04	0.414	0.195	3467.93	0.106	0.106	6.4
22B	0.04	2.28	0.182	205.774	0.049	0.243	1734.379	0.061	0.04	0.89	0.039	786.493	0.032	0.085	5.1
42B	0.04	2.28	0.467	110.74	0.021	0.307	2530.142	0.079	0.04	0.387	0.128	437.913	0.017	0.070	4.2
43B	0.04	2.28	0.333	118.119	0.025	0.347	1122.053	0.033	0.04	0.475	0.131	2674.866	0.091	0.089	5.4
44B	0.04	2.28	0.481	261.623	0.041	0.405	1301.583	0.035	0.04	0.648	0.079	1913.335	0.068	0.086	5.2
63B	0.04	2.28	0.133	95.699	0.030	0.134	99.026	0.005	0.04	0.353	0.183	705.869	0.025	0.036	2.2
82B	0.04	2.28	0.323	132.977	0.028	0.5	1259.716	0.031	0.04	0.525	0.111	2569.632	0.089	0.088	5.3

Table 7
Modified Puls Channel Routing Estimates

Sabino Creek Discharge Range (cfs)	Volume (acre-ft) 9R	Volume (acre-ft) 10R	Volume (acre-ft) 8R	Volume (acre-ft) 11R	Volume (acre-ft) 6R	Volume (acre-ft) 15R	Carter Canyon Wash Discharge Range (cfs)	Volume (acre-ft) 14R
0	0	0	0	0	0	0	0	0
10	0.13	0.2	0.43	0.36	0.08	0.21	10	0.27
40	0.4	0.53	1.26	1.43	0.24	0.6	40	0.84
70	0.62	0.91	1.72	2.21	0.38	0.93	70	1.3
100	0.77	1.28	2.23	2.46	0.5	1.25	100	1.7
200	1.2	2.41	2.41	3.48	0.89	2.25	200	2.7
400	2	3.99	5.06	5.15	1.45	4.02	300	3.66
600	2.7	4.62	5.95	6.73	1.91	5.87	400	4.47
800	3.4	6.05	6.81	7.75	2.34	7.55	500	5.42
1000	4.06	7.01	7.57	8.69	2.75	9.04	600	6.18
1200	4.68	8.21	8.24	9.51	3.18	10.48	700	7.26
1400	5.23	9.07	8.8	10.31	3.61	11.73	800	8.3
1600	5.74	9.82	9.33	11.05	4.07	12.93	900	9.11
2000	6.8	11.18	10.43	12.5	4.87	15.31	1000	9.84
4000	11.22	17.7	15	19.11	8.21	26.06	2000	16.28
6000	15.52	23.86	18.72	25.38	11.15	35.03	3000	22.04

Table 8
Muskingum Channel Routing Estimates

Reach Name	Stream Length (ft)	Velocity (ft/s)	Muskingum K (hours)	$\Delta t/K$	Muskingum X
5R	4135	4	0.287	0.29	0.2
18R	1047	3	0.097	0.86	0.4
24R	2082	4	0.145	0.58	0.125
25R	2780	3	0.257	0.32	0.125
4R	2672	4	0.186	0.45	0.2
7R	1034	3	0.096	0.87	0.125

Table 9
Post-Fire SCS Curve Number Estimates

Basin-ID	Basin Area (mi ²)	High Severtly %	Moderate Severity %	Low Severity %	Unburned %	Post-Fire CN	Pre-Fire CN	% Change
6B	0.22	5.76	33.93	24.14	36.17	80	45.20	77
8B	0.09	25.49	57.18	17.33	0.00	85	45.20	88
10B	0.35	22.44	31.03	38.78	7.74	83	45.20	84
11B	0.27	9.51	35.62	22.70	32.17	81	45.20	79
12B	0.24	19.78	52.66	15.32	12.25	84	45.20	86
13B	0.06	19.90	0.00	78.74	1.35	82	45.20	81
14B	0.10	31.59	50.17	0.00	18.24	85	45.20	88
15B	0.30	16.29	9.45	34.97	39.29	80	45.20	77
16B	0.08	13.16	23.34	20.64	42.86	80	45.20	77
17B	0.06	48.26	51.74	0.00	0.00	87	45.20	92
19B	0.04	11.37	88.64	0.00	0.00	86	45.20	90
21B	0.17	86.75	13.25	0.00	0.00	89	45.20	97
22B	0.09	46.69	43.73	9.58	0.00	87	45.20	92
42B	0.16	48.86	51.14	0.00	0.00	87	45.20	92
43B	0.24	56.17	26.09	17.74	0.00	87	45.20	92
44B	0.23	12.71	16.78	63.26	7.22	82	45.20	81
63B	0.02	46.19	53.81	0.00	0.00	87	45.20	92
82B	0.19	98.03	1.46	0.51	0.00	90	45.20	99

CN used for various watershed conditions are as follows: unburned = 75, low severity = 80, moderate severity = 85, and high severity = 90

Table 10
Computed Peak Discharges for 2-, 5-, 10-, 25-, 50-, and 100-Year Events (Pre-Fire)

Flooding Sources & Locations	HEC-HMS Location	Drainage Area (mi ²)	Pre-Fire Peak Discharges (cfs)					
			2-year	5-year	10-year	25-year	50-year	100-year
Sabino Creek								
Upstream Limit of Study	9C	0.51	46	83	113	161	201	247
Culvert #17 at Guthrie Road	10C	0.59	49	90	129	183	228	282
Culvert #9 at Sabino Canyon Road	8C	0.69	50	91	127	183	232	297
Culvert #4 at Goat Hill Road	11C	0.81	49	92	147	225	261	299
At Confluence with Carter Canyon Wash	6C	0.90	58	116	165	244	300	366
Culvert #2 at East Sabino Road	15C	1.35	65	119	186	293	382	493
Downstream Limit of Study	4C	1.70	99	183	273	418	540	684
Carter Canyon Wash								
Upstream Limit of Study	14C	0.17	16	32	44	65	82	102
Culvert #10 under Carter Canyon Rd	6C	0.36	39	72	99	142	180	238
Summerhaven								
Total Basin	2C	2.90	141	264	373	564	735	925

Table 11
Discharge Calculations for Pre-Fire Condition Using USGS Regression Equations

Arizona Region 5

Flooding Sources & Locations	Drainage Area (mi ²)	Peak Discharges (cfs)					
		2-year	5-year	10-year	25-year	50-year	100-year
Sabino Creek							
At Confluence with Carter Canyon Wash	0.91	92	244	397	655	897	1,179
At Downstream Limit of Study	1.71	130	337	542	882	1,198	1,563
Carter Canyon Wash							
At Confluence with Sabino Creek	0.36	55	152	252	423	587	779
Summerhaven							
Total Basin	2.91	175	443	704	1,133	1,528	1,983

NFF for Southwestern U.S. Region 13

Peak Discharges (cfs)					
2-year	5-year	10-year	25-year	50-year	100-year
116	279	431	682	897	1,182
168	406	634	1,012	1,344	1,782
66	154	234	364	470	609
227	551	865	1,386	1,850	2,461

Table 12
Computed Peak Discharges for 2-, 5-, 10-, 25-, 50-, and 100-Year Events (Post-Fire)

Flooding Sources & Locations	HEC-HMS Location	Drainage Area (mi ²)	Post-Fire Peak Discharges (cfs)					
			2-year	5-year	10-year	25-year	50-year	100-year
Sabino Creek								
Upstream Limit of Study	9C	0.51	153	249	322	425	507	594
Culvert #17 at Guthrie Road	10C	0.59	174	286	369	489	586	687
Culvert #9 at Sabino Canyon Road	8C	0.69	175	305	395	545	708	787
Culvert #4 at Goat Hill Road	11C	0.81	216	315	398	588	765	883
At Confluence with Carter Canyon Wash	6C	0.90	241	381	490	677	875	1030
Culvert #2 at East Sabino Road	15C	1.35	338	623	808	1025	1210	1446
Downstream Limit of Study	4C	1.70	477	821	1076	1400	1657	1969
Carter Canyon Wash								
Upstream Limit of Study	14C	0.17	96	148	186	237	276	317
Culvert #10 under Carter Canyon Rd	6C	0.36	204	315	393	499	581	666
Summerhaven								
Total Basin	2C	2.90	674	1,136	1,468	1,927	2,296	2,703

Table 13
Percent Change in Peak Discharge Due to Aspen Fire

Flooding Sources & Locations	Peak Discharges (cfs)					
	2-year	5-year	10-year	25-year	50-year	100-year
Sabino Creek						
Upstream Limit of Study	229%	201%	184%	165%	152%	141%
Culvert #17 at Guthrie Road	255%	218%	187%	168%	157%	143%
Culvert #9 at Sabino Canyon Road	250%	236%	210%	199%	206%	165%
Culvert #4 at Goat Hill Road	336%	243%	171%	162%	194%	195%
At Confluence with Carter Canyon Wash	312%	227%	197%	178%	192%	182%
Culvert #2 at East Sabino Road	417%	422%	335%	250%	217%	193%
At Downstream Limit of Study	381%	347%	295%	235%	207%	188%
Carter Canyon Wash						
Upstream Limit of Study	489%	371%	317%	265%	235%	209%
Culvert #10 under Carter Canyon Rd	420%	336%	295%	250%	222%	180%
Summerhaven						
Total Basin	377%	329%	294%	242%	212%	192%

**Table 14
Carter Canyon Wash Peak Discharge Comparison**

Carter Canyon Wash at Confluence with Sabino Creek	Basin Area (mi ²)	Pre-Fire Peak Discharge (cfs)				Post-Fire Peak Discharge (cfs)			
		SCS Type I	Army Corps	USGS Regression Equation	HEC-HMS Frequency Storm (Central Distribution)	SCS Type I	SCS Type II	HEC-HMS Frequency Storm (Central Distribution)	Army Corps
2-year	0.36	39	50	55	71	204	400	366	100
10-year	0.36	99	260	252	236	393	749	841	380
100-year	0.36	238	780	779	528	666	1253	1408	1100

Table 15
Rainfall Distribution Sensitivity

Marshall Gulch Gaging Station	Basin Area (mi²)	Peak Discharge (cfs)			
		SCS Type I	SCS Type II	Frequency Storm	Flood Frequency Analysis
2-Year	2.9	141	271	227	151
100-Year	2.9	925	1763	1980	645

Table 16
Manning's n Values

Location	Photo #	HEC-RAS Cross Section #	Manning's n (Low Flow)			Manning's n (High Flow)		
			Left Overbank	Channel	Right Overbank	Left Overbank	Channel	Right Overbank
Sabino Creek	6	4370	0.055	0.035	0.055	0.055	0.043	0.055
	10	4380	0.055	0.035	0.055	0.055	0.043	0.055
	12	4395-4400	CMP	0.024	Culvert #1	CMP	0.024	Culvert #1
	13	4410	0.055	0.03	0.013	0.055	0.03	0.025
	16-18	4430	0.055	0.055	0.013	0.055	0.1	0.025
	19	4440	0.055	0.035	0.013	0.055	0.038	0.025
	20-23	4490-4450	0.055	0.035	0.013	0.055	0.03	0.025
	30	4500	0.055	0.035	0.013	0.055	0.043	0.02
	31	4510-4520	CMP	0.024	Culvert #2	CMP	0.03	Culvert #2
	32	4530	0.055	0.035	0.013	0.055	0.043	0.02
	34	4560	0.055	0.035	0.055	0.055	0.043	0.055
	41	4590	0.055	0.04	0.013	0.055	0.045	0.02
	42,44	4630-4640	CMP	0.024	Culvert #3	CMP	0.03	Culvert #3
	43	4640	0.055	0.04	0.013	0.055	0.045	0.02
	45,47	4670-4680	CMP	0.024	Culvert #4	CMP	0.03	Culvert #4
	48	4680	0.055	0.04	0.013	0.055	0.045	0.02
	49,51	4701-4710	Clay	0.017	Culvert #5	Clay	0.018	Culvert #5
	54	4701	0.055	0.04	0.013	0.055	0.045	0.02
	55,57	4720-4730	CMP	0.024	Culvert #6	CMP	0.03	Culvert #6
	59	4720	0.055	0.04	0.013	0.055	0.045	0.02
	56,59	4740-4750	CMP	0.024	Culvert #7	CMP	0.03	Culvert #7
	60	4740	0.055	0.04	0.045	0.055	0.045	0.045
	61,63	4770-4780	CMP	0.024	Culvert #8	CMP	0.03	Culvert #8
	64	4770	0.055	0.04	0.013	0.055	0.045	0.02
	65,67,68	4770-4780	CMP	0.024	Culvert #9	CMP	0.03	Culvert #9
	68	4790	0.013	0.04	0.03	0.02	0.045	0.03
	109	4820	0.013	0.04	0.055	0.02	0.04	0.055
	108,110	4820-4830	CMP	0.024	Culvert #20	CMP	0.03	Culvert #20
	105	4850	0.013	0.045	0.055	0.02	0.04	0.055
	104,106	4850-4860	CMP	0.024	Culvert #19	CMP	0.03	Culvert #19
	101	4880	0.013	0.045	0.055	0.013	0.04	0.055
100,102	4880-4890	CMP	0.024	Culvert #18	CMP	0.03	Culvert #18	
97	4920	0.013	0.045	0.055	0.013	0.04	0.055	
96,98	4920-4930	CMP	0.024	Culvert #17	CMP	0.03	Culvert #17	
93	4948	0.013	0.045	0.055	0.013	0.04	0.055	
92,94	4948-4950	CMP	0.024	Culvert #16	CMP	0.03	Culvert #16	
91	5000	0.013	0.045	0.055	0.013	0.04	0.055	
Carter Canyon Wash	69	1800	0.055	0.045	0.055	0.055	0.045	0.055
	70,72	1800-1815	CMP	0.024	Culvert #10	CMP	0.03	Culvert #10
	74,76	1820-1830	CMP	0.024	Culvert #11	CMP	0.03	Culvert #11
	78	1840-1850	CMP	0.024	Culvert #12	CMP	0.03	Culvert #12
	77,79	1860	0.055	0.024	0.013	0.055	0.026	0.02
	80,82	1865-1880	CMP	0.024	Culvert #13	CMP	0.03	Culvert #13
	84,86	1885-1900	CMP	0.024	Culvert #14	CMP	0.03	Culvert #14
	85,87	1905	0.055	0.035	0.035	0.055	0.04	0.04
	88,90	1910-1920	CMP	0.024	Culvert #15	CMP	0.03	Culvert #15
	89	2000	0.055	0.045	0.045	0.055	0.045	0.055

Manning's n values are for the listed cross-section downstream to the next cross-section listed.

Table 17
Water Surface Elevation and Flow Velocity for Sabino Creek

River Station Sabino Canyon	Profile	10-year Water Surface Elevation (ft)	10-year Average Velocity (ft/s)	100-year Water Surface Elevation (ft)	100-year Average Velocity (ft/s)
5000	Pre-Fire	7978.37	6.17	7979.22	7.18
	Post-Fire	7979.58	7.57	7980.67	7.72
4990	Pre-Fire	7956.03	4.71	7956.75	5.13
	Post-Fire	7957.03	5.4	7957.77	6.18
4980	Pre-Fire	7941.23	4.07	7941.93	4.62
	Post-Fire	7942.23	4.85	7943.02	5.51
4970	Pre-Fire	7928.5	4.68	7929.02	5.22
	Post-Fire	7929.23	5.47	7929.84	5.92
4955	Pre-Fire	7921.94	5.82	7922.7	6.75
	Post-Fire	7923.01	7.1	7923.91	7.06
4950	Pre-Fire	7920.69	1.47	7921.38	2.84
	Post-Fire	7921.68	2.18	7922.31	3.03
4949		Culvert #16			
4948	Pre-Fire	7915.7	6.96	7916.8	7.91
	Post-Fire	7917.23	8.3	7918.4	9.36
4940	Pre-Fire	7909.49	6.01	7910.28	7.1
	Post-Fire	7910.62	7.47	7911.56	8.35
4930	Pre-Fire	7891.47	3.49	7893.06	5.11
	Post-Fire	7893.72	5.79	7895.45	7.63
4925		Culvert #17			
4920	Pre-Fire	7887.83	7.96	7889.27	9.74
	Post-Fire	7890.07	9.82	7891.76	10.16
4910	Pre-Fire	7883.11	7.09	7884.25	8.34
	Post-Fire	7884.73	8.8	7886.08	9.91
4900	Pre-Fire	7871.98	7.09	7873.12	7.92
	Post-Fire	7873.58	8.21	7874.76	9.24
4890	Pre-Fire	7864.09	3.2	7867.49	2.94
	Post-Fire	7868.29	3.35	7870.4	4.63
4885		Culvert #18			
4880	Pre-Fire	7861.6	7.82	7863.48	6.02
	Post-Fire	7863.75	6.27	7864.27	7.81
4870	Pre-Fire	7853.98	8.22	7855.49	9.76
	Post-Fire	7856.34	9.69	7857.99	7.4
4860	Pre-Fire	7846.17	3.57	7851.38	2.63
	Post-Fire	7852.24	3.02	7853.29	4.92
4855		Culvert #19			
4850	Pre-Fire	7843.6	8.19	7845.22	9.27
	Post-Fire	7845.96	9.07	7847.46	9.57
4840	Pre-Fire	7828.35	6.11	7829.33	5.97
	Post-Fire	7829.46	6.97	7830.17	8.04
4830	Pre-Fire	7819.37	4.7	7821.5	2.95
	Post-Fire	7822.65	2.39	7824.27	2.68
4825		Culvert #20			

Table 17
Water Surface Elevation and Flow Velocity for Sabino Creek

River Station	Profile	10-year Water Surface Elevation (ft)	10-year Average Velocity (ft/s)	100-year Water Surface Elevation (ft)	100-year Average Velocity (ft/s)
4820	Pre-Fire	7814.52	7.97	7815.41	7.64
	Post-Fire	7815.83	8.06	7816.98	9.21
4810	Pre-Fire	7803.94	6.8	7804.99	7.9
	Post-Fire	7805.41	8.38	7806.64	9.42
4800	Pre-Fire	7786.65	6.22	7787.8	5.46
	Post-Fire	7787.99	6.03	7788.52	7.7
4790	Pre-Fire	7779.62	5.82	7780.5	6.36
	Post-Fire	7780.83	6.53	7781.64	7.33
4780	Pre-Fire	7769.53	3.52	7770.97	3.54
	Post-Fire	7771.48	4	7772.76	5.37
4775		Culvert #9			
4770	Pre-Fire	7764.15	7.06	7765.4	5.42
	Post-Fire	7765.65	5.58	7766.23	6.86
4765	Pre-Fire	7756.84	6.47	7757.87	7.67
	Post-Fire	7758.3	8.12	7759.82	8.21
4760	Pre-Fire	7741.94	6.4	7742.94	7.78
	Post-Fire	7743.38	8.28	7744.71	9.58
4750	Pre-Fire	7734.69	3.43	7737.95	2.8
	Post-Fire	7738.46	3.19	7739.47	4.33
4745		Culvert #8			
4740	Pre-Fire	7732.52	4.57	7732.99	5.71
	Post-Fire	7733.18	6.91	7734.06	8.71
4730	Pre-Fire	7732.65	1.51	7733.21	1.22
	Post-Fire	7733.5	1.45	7734.1	2.34
4725		Culvert #7			
4720	Pre-Fire	7729.87	1.93	7730.9	2.15
	Post-Fire	7731.23	2.53	7731.91	3.79
4710	Pre-Fire	7729.86	1.31	7730.87	1.98
	Post-Fire	7731.2	2.18	7731.86	3.15
4705.5		Culvert #6			
4701	Pre-Fire	7726.09	7.36	7727.39	9.83
	Post-Fire	7728.03	10.79	7729.01	7
4690	Pre-Fire	7722.28	6.25	7723.25	7.37
	Post-Fire	7723.65	7.85	7725.01	7.43
4680	Pre-Fire	7719.28	1.69	7719.68	2.56
	Post-Fire	7719.91	2.89	7720.43	4.54
4675		Culvert #5			
4670	Pre-Fire	7717.32	10.18	7718.43	5.05
	Post-Fire	7718.65	5.15	7719.26	6.13
4640	Pre-Fire	7710.52	1.46	7711.36	2.24
	Post-Fire	7711.74	2.6	7712.89	3.69
4635		Culvert #4			
4630	Pre-Fire	7703.26	4.62	7703.66	5.55

Table 17
Water Surface Elevation and Flow Velocity for Sabino Creek

River Station	Profile	10-year Water Surface Elevation (ft)	10-year Average Velocity (ft/s)	100-year Water Surface Elevation (ft)	100-year Average Velocity (ft/s)
Sabino Canyon					
	Post-Fire	7703.9	5.82	7704.73	6.93
4620	Pre-Fire	7689.34	3.88	7689.62	4.73
	Post-Fire	7689.77	5.1	7690.33	6.22
4610	Pre-Fire	7679.16	2.69	7679.45	3.48
	Post-Fire	7679.62	3.84	7680.18	5.36
4600	Pre-Fire	7677.95	0.49	7678.48	0.83
	Post-Fire	7678.72	1.02	7679.53	1.79
4595		Culvert #3			
4590	Pre-Fire	7673.85	7.5	7674.93	9.49
	Post-Fire	7675.5	10.54	7676.46	3.81
4580	Pre-Fire	7665.91	4.39	7666.26	5.25
	Post-Fire	7666.42	5.84	7667.19	6.91
4570	Pre-Fire	7655.76	4.7	7656.2	5.72
	Post-Fire	7656.55	5.05	7657.07	6.83
4565	Pre-Fire	7645.86	6.2	7646.63	7.14
	Post-Fire	7647.01	7.55	7648.31	8.89
4560	Pre-Fire	7633.23	6.7	7634.26	7.85
	Post-Fire	7634.72	8.32	7636.15	9.81
4550	Pre-Fire	7624	5.99	7624.91	5.63
	Post-Fire	7625.25	5.72	7626.27	6.25
4540	Pre-Fire	7618.86	6.5	7619.84	7.62
	Post-Fire	7620.27	8.14	7621.67	9.27
4530	Pre-Fire	7606.54	7.59	7607.85	8.21
	Post-Fire	7608.35	8.67	7609.95	9.68
4520	Pre-Fire	7597.78	1.97	7599.05	2.83
	Post-Fire	7599.74	3.1	7602.29	3.68
4515		Culvert #2			
4510	Pre-Fire	7594.48	3.74	7597.06	5.02
	Post-Fire	7598.9	5.96	7601.54	7.5
4500	Pre-Fire	7592.5	8.71	7594.73	10.26
	Post-Fire	7596.17	11.26	7598.22	12.64
4495	Pre-Fire	7588.91	6.97	7590.34	8.29
	Post-Fire	7591.34	8.25	7592.75	7.74
4490	Pre-Fire	7585.61	7.28	7587.15	8.8
	Post-Fire	7588.35	7.58	7589.21	9.31
4485	Pre-Fire	7573.35	7.63	7575.04	9.28
	Post-Fire	7576.69	8.1	7577.75	9.6
4480	Pre-Fire	7551.03	7.3	7552.6	8.8
	Post-Fire	7553.6	9.87	7555.15	9.38
4470	Pre-Fire	7539.4	7.4	7540.72	7.45
	Post-Fire	7541.35	8.22	7542.34	9.59
4460	Pre-Fire	7526.39	7.41	7528	8.95
	Post-Fire	7529.09	9.88	7530.97	8.53

Table 17
Water Surface Elevation and Flow Velocity for Sabino Creek

River Station	Profile	10-year Water Surface Elevation (ft)	10-year Average Velocity (ft/s)	100-year Water Surface Elevation (ft)	100-year Average Velocity (ft/s)
4450	Pre-Fire	7514.96	6.65	7516.24	8.09
	Post-Fire	7517.28	7.5	7518.09	9.11
4440	Pre-Fire	7497.38	6.93	7498.79	8.38
	Post-Fire	7499.74	9.25	7501.13	10.39
4430	Pre-Fire	7483.16	6.76	7484.49	8.25
	Post-Fire	7485.39	9.11	7486.72	10.21
4420	Pre-Fire	7470.37	6.51	7471.61	7.95
	Post-Fire	7472.46	8.81	7473.7	9.99
4410	Pre-Fire	7464.73	6.77	7466.08	8.25
	Post-Fire	7466.99	9.15	7468.33	10.25
4400	Pre-Fire	7459.84	3.76	7461.89	5.17
	Post-Fire	7462.91	6.25	7464.29	7.74
4397.5		Culvert #1			
4395	Pre-Fire	7457.1	7.86	7458.86	10.95
	Post-Fire	7459.42	8.73	7460.77	8.66
4390	Pre-Fire	7456.08	7.29	7457.66	8.5
	Post-Fire	7458.78	7.65	7459.97	7.9
4380	Pre-Fire	7444.15	6.13	7445.21	7.59
	Post-Fire	7445.95	8.42	7447.14	9.17
4370	Pre-Fire	7440.99	6.77	7442.3	8.13
	Post-Fire	7443.06	9.19	7444.49	10.01

Table 18
Water Surface Elevation and Flow Velocity for Carter Canyon Wash

River Station	Profile	10-year Water Surface Elevation (ft)	10-year Average Velocity (ft/s)	100-year Water Surface Elevation (ft)	100-year Average Velocity (ft/s)
2000	Pre-Fire	7984.51	6.18	7985.45	7.55
	Post-Fire	7986.22	8.22	7987.26	8.88
1990	Pre-Fire	7946.57	4.42	7947.05	5.78
	Post-Fire	7947.46	6.74	7948.07	7.9
1980	Pre-Fire	7909.26	5.34	7910.07	5.88
	Post-Fire	7910.5	6.81	7911.13	7.81
1970	Pre-Fire	7874.49	6.49	7875.57	7.78
	Post-Fire	7876.38	8.6	7878.03	6.61
1960	Pre-Fire	7829.64	4.53	7830.13	5.75
	Post-Fire	7830.54	6.53	7831.15	7.3
1950	Pre-Fire	7806.57	6.06	7807.51	7.2
	Post-Fire	7808.34	5.55	7808.73	6.77
1940	Pre-Fire	7788.9	6.38	7789.95	7.62
	Post-Fire	7790.74	8.39	7791.76	9.35
1930	Pre-Fire	7776.42	6.19	7777.4	7.32
	Post-Fire	7778.53	5.25	7778.92	6.15
1920	Pre-Fire	7768.9	2.38	7770	1.86
	Post-Fire	7770.6	2.25	7771.4	2.74
1915		Culvert #15			
1910	Pre-Fire	7764.4	6.28	7765.4	8.44
	Post-Fire	7766.24	10.16	7767.01	8.3
1905	Pre-Fire	7758.04	5.43	7758.8	6.44
	Post-Fire	7759.36	7.13	7760.08	7.94
1900	Pre-Fire	7757	1.16	7757.48	1.97
	Post-Fire	7757.8	2.6	7758.17	3.52
1892.5		Culvert #14			
1885	Pre-Fire	7748.65	5.26	7749.35	6.94
	Post-Fire	7749.95	8.23	7750.86	9.81
1880	Pre-Fire	7740.16	1.86	7741.6	2.32
	Post-Fire	7741.75	3.35	7742.23	4.01
1872.5		Culvert #13			
1865	Pre-Fire	7732.64	7.15	7733.92	9.6
	Post-Fire	7734.41	8.87	7735.76	6.37
1860	Pre-Fire	7724.18	5.97	7725.09	7.09
	Post-Fire	7725.78	7.79	7726.92	6.5
1850	Pre-Fire	7717.18	1.14	7717.77	2.06
	Post-Fire	7718.21	2.73	7718.72	3.63
1845		Culvert #12			
1840	Pre-Fire	7712.19	5.86	7713.09	7.14
	Post-Fire	7713.82	7.75	7714.83	7.57
1830	Pre-Fire	7710.05	0.93	7710.67	1.67
	Post-Fire	7711.06	2.35	7711.67	3.21

Table 18
Water Surface Elevation and Flow Velocity for Carter Canyon Wash

River Station	Profile	10-year Water Surface Elevation (ft)	10-year Average Velocity (ft/s)	100-year Water Surface Elevation (ft)	100-year Average Velocity (ft/s)
Carter Canyon					
1825		Culvert #11			
1820	Pre-Fire	7704.74	5.6	7705.52	6.59
	Post-Fire	7706.01	7.56	7706.77	7.47
1815	Pre-Fire	7700.41	3.34	7701.75	4.96
	Post-Fire	7702.23	6.14	7702.88	6.95
1807.5		Culvert #10			
1800	Pre-Fire	7693.62	5.11	7694.32	6.02
	Post-Fire	7694.83	6.67	7695.44	7.69
1795	Pre-Fire	7688.72	5.37	7689.46	6.4
	Post-Fire	7690.01	7.13	7690.7	8.08
1790	Pre-Fire	7683.01	5.45	7683.76	6.46
	Post-Fire	7684.34	7.08	7685.05	7.93
1780	Pre-Fire	7668.85	4.88	7669.45	5.81
	Post-Fire	7669.91	6.39	7670.47	7.25
1770	Pre-Fire	7656.29	3.46	7656.76	4.65
	Post-Fire	7657.14	5.46	7657.65	6.48

**Table 19
Culvert Design Results**

Based on Depth of Flow at or just above roadway elevation

Culvert Location	Culvert #	Overtopping Discharge (cfs)	Velocity (ft/s)	Upstream Depth (ft)	(VD) ²	(VD) ² <= 18?
East Sabino Road	2	200	9.09	5.18	2217	No
Goat Hill Road	4	70	9.84	6.88	4583	No
Sabino Canyon Road	9	100	7.79	3.32	669	No
Carter Canyon Road	10	70	9.06	4.45	1625	No
Guthrie Road	17	70	8.44	4.4	1379	No

Based on post-fire 10- and 100-year discharges

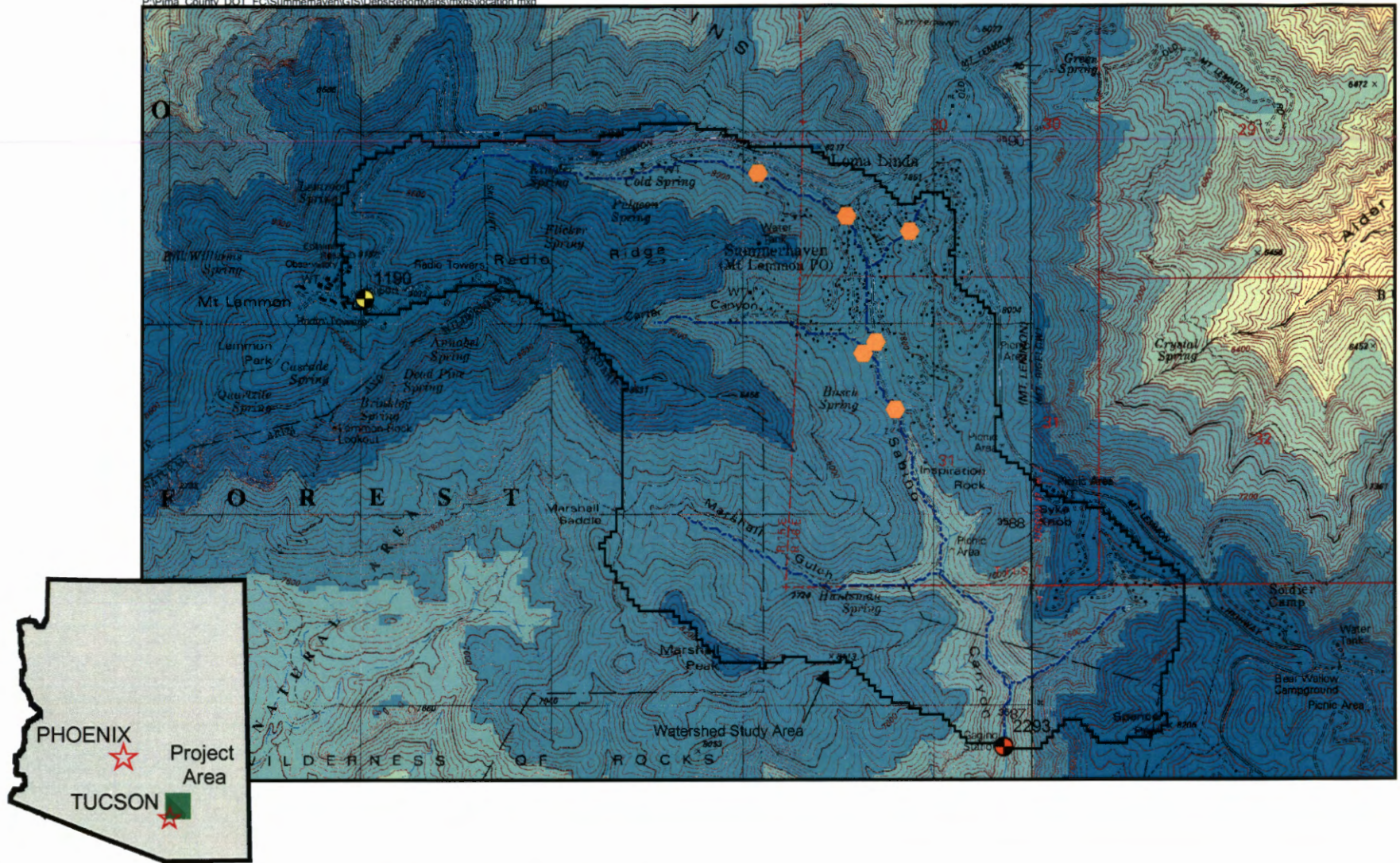
Culvert Location	Culvert #	Discharge (10-Year) cfs	Water Surface (ft)	Overtopping Elevation (ft)	Over/Under Road	Discharge (100-Year) cfs	Water Surface (ft)	Overtopping Elevation (ft)	Depth over Road Less than or equal to 1' ?
East Sabino Road	2	808	7599.75	7597.53	Over	1446	7602.24	7597.53	No
Goat Hill Road	4	398	7711.74	7709.51	Over	883	7712.89	7709.51	No
Sabino Canyon Road	9	395	7771.47	7769.27	Over	787	7772.69	7769.27	No
Carter Canyon Road	10	393	7701.55	7699.62	Over	666	7702.87	7699.62	No
Guthrie Road	17	369	7893.72	7889.9	Over	687	7895.45	7889.9	No

Based on CMG Design

Culvert Location	Culvert #	Discharge (10-Year) cfs	Water Surface (ft)	Overtopping Elevation (ft)	Over/Below Road	Discharge (100-Year) cfs	Water Surface (ft)	Overtopping Elevation (ft)	Depth over Road Less than or equal to 1' ?
East Sabino Road	2	808	7599.72	7597.54	Over	1446	7602.24	7597.54	No
Goat Hill Road	4	398	7709.89	7707.59	Over	883	7711.65	7707.59	No
Sabino Canyon Road	9	395	7772.52	7770.58	Over	787	7773.64	7770.58	No
Carter Canyon Road	10	393	7701.88	7699.62	Over	666	7702.55	7699.62	No
Guthrie Road	17	369	7893.54	7891.27	Over	687	7895.61	7891.27	No

FIGURES

FIGURES



Legend	
Rain Gage	Elevation Range in Meters
Streamflow Gage	Elevation Range 1,820 - 1,954
Public Culverts	Elevation Range 1,954 - 2,081
Stream Flowline	Elevation Range 2,081 - 2,207
Watershed Study Area	Elevation Range 2,207 - 2,353
	Elevation Range 2,353 - 2,604



Location Map			
Not to Scale	Horizontal Datum: NAD83 HPGN	DATE: 12-30-03	CHECKED BY: HH
	Vertical Datum: NAVD88	PROJ. NO: 23443361	PM: AM
			FIGURE NO: 1

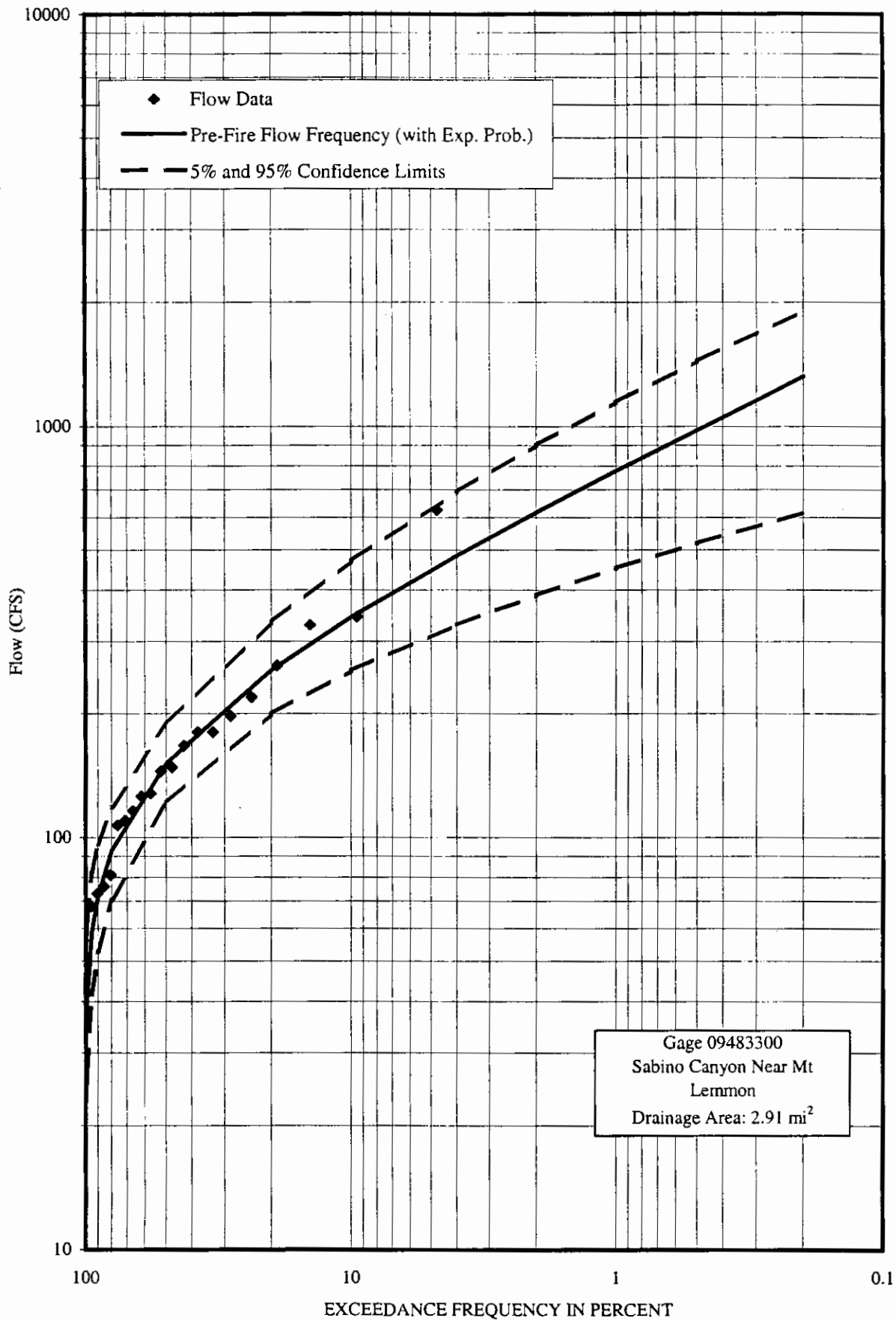
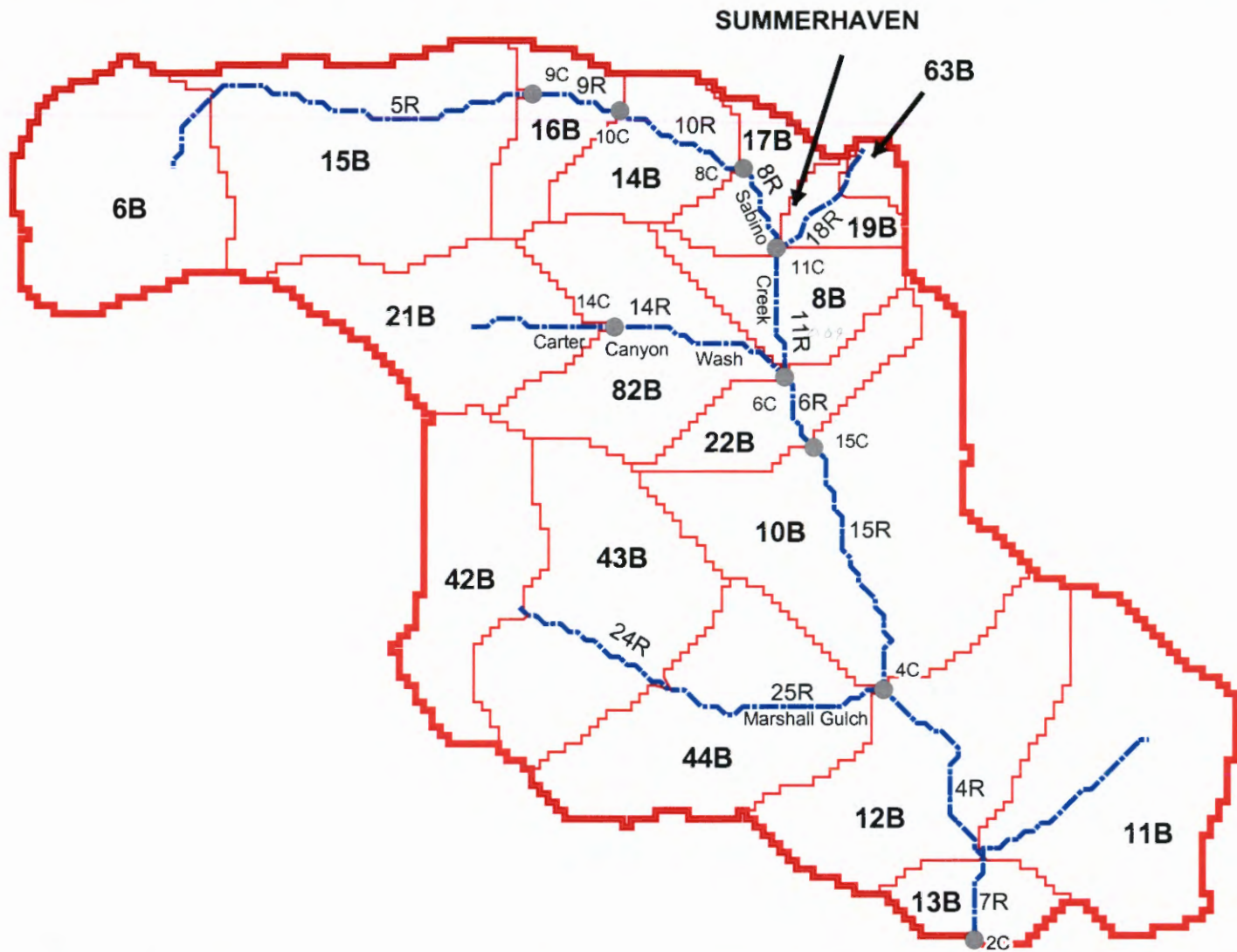






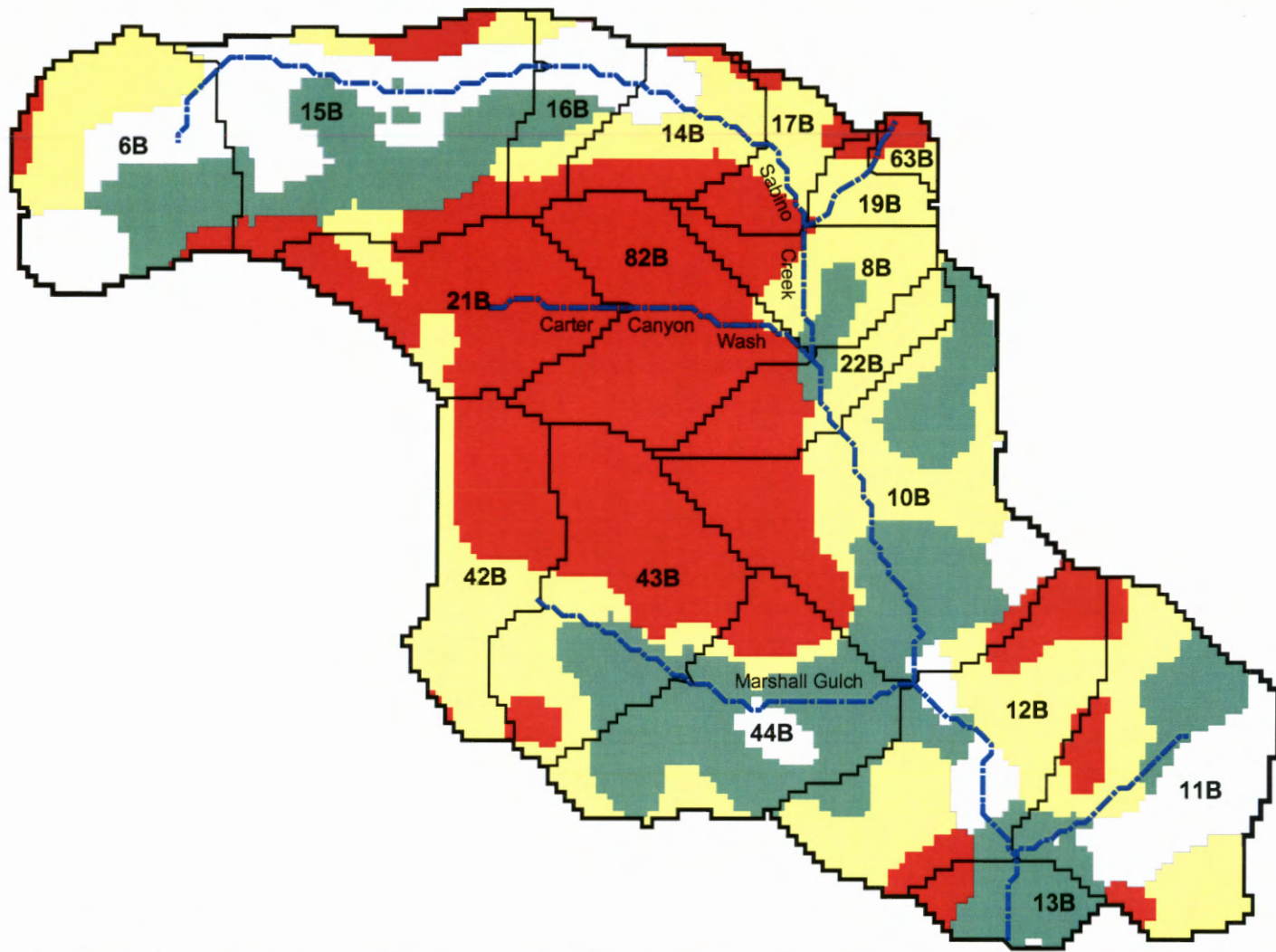








Figure 2 Pre-Fire Condition Discharge Probability Curve



LEGEND			Summerhaven Basin Delineation				
 Stream Flowline	 11C Concentration Point				Horizontal Datum: NAD83 HPGN	DATE: 12-30-03	CHECKED BY: HH
 Watershed Boundary	11B Subbasin Name	Not to Scale			Vertical Datum: NAVD88	PROJ. NO: 23443361	PM: AM
 Subbasin Boundary	11R Reach Name						



LEGEND

 High Burn Severity	 Subbasin Boundary
 Moderate Burn Severity	 Stream Flowline
 Low Burn Severity	6B Subbasin Name
 Unburned	




Subbasin Burn Severity

Not to Scale	Horizontal Datum: NAD83 HPGN	DATE: 12-30-03	CHECKED BY: HH	FIGURE NO:
	Vertical Datum: NAVD88	PROJ. NO: 23443361	PM: AM	4

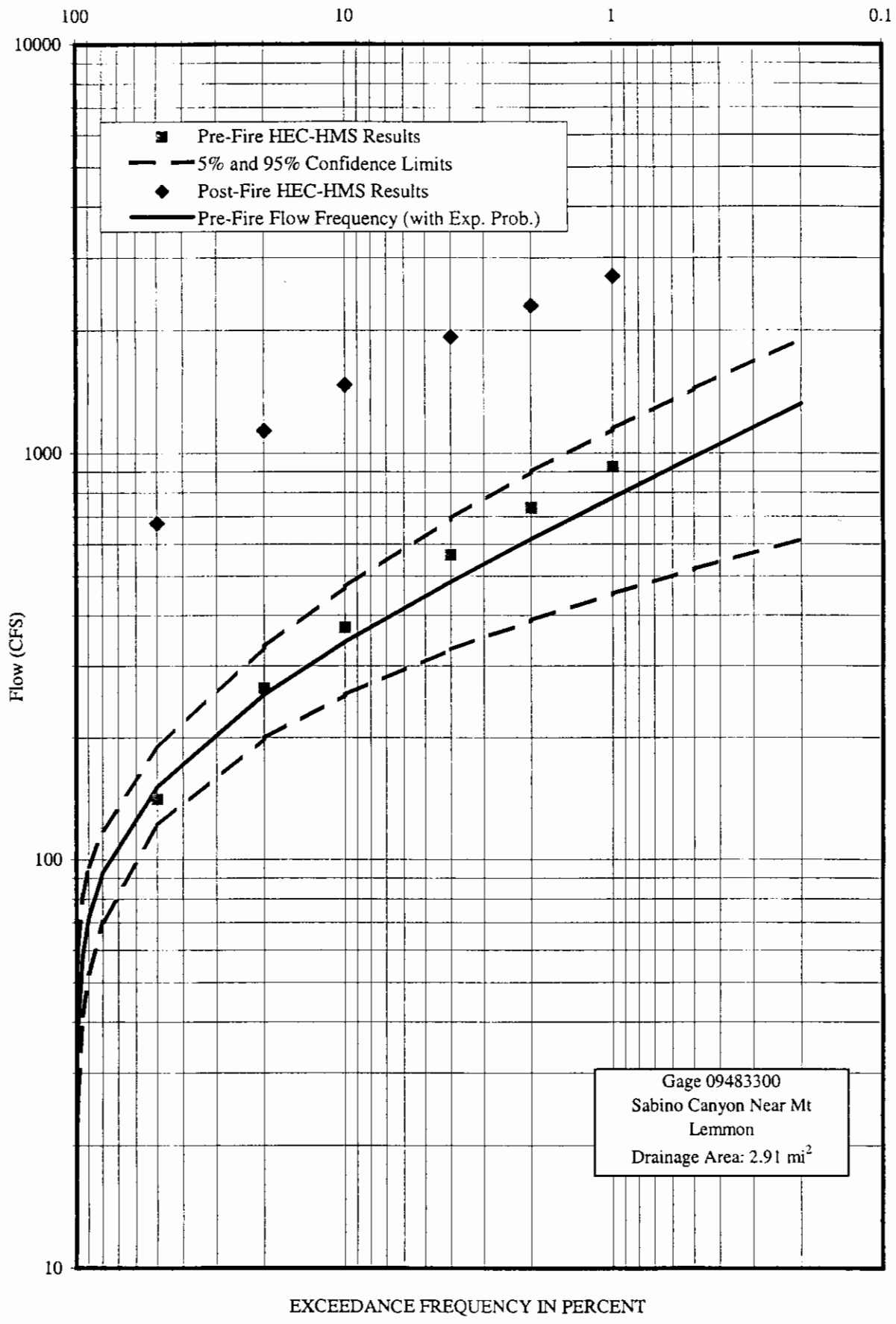
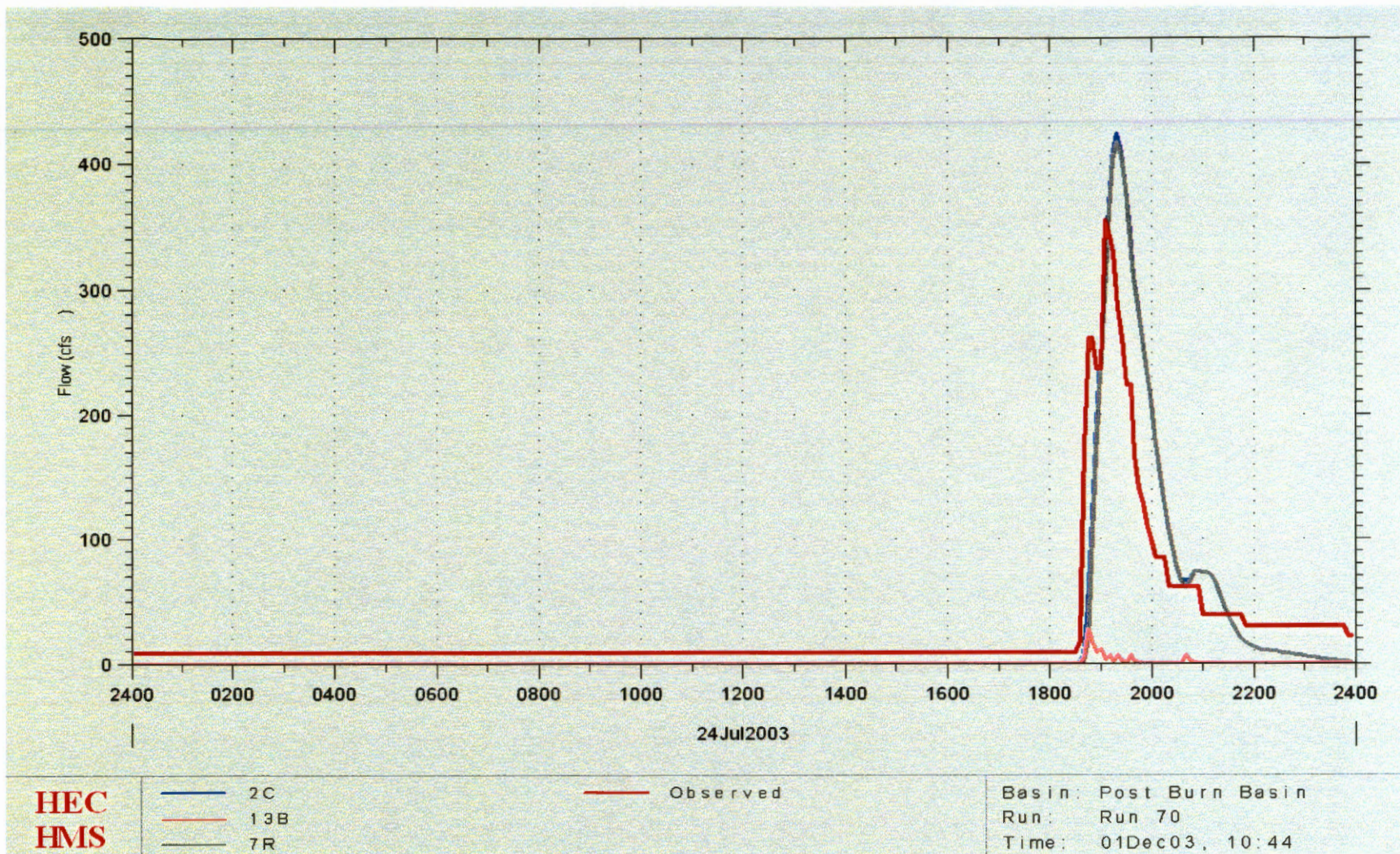
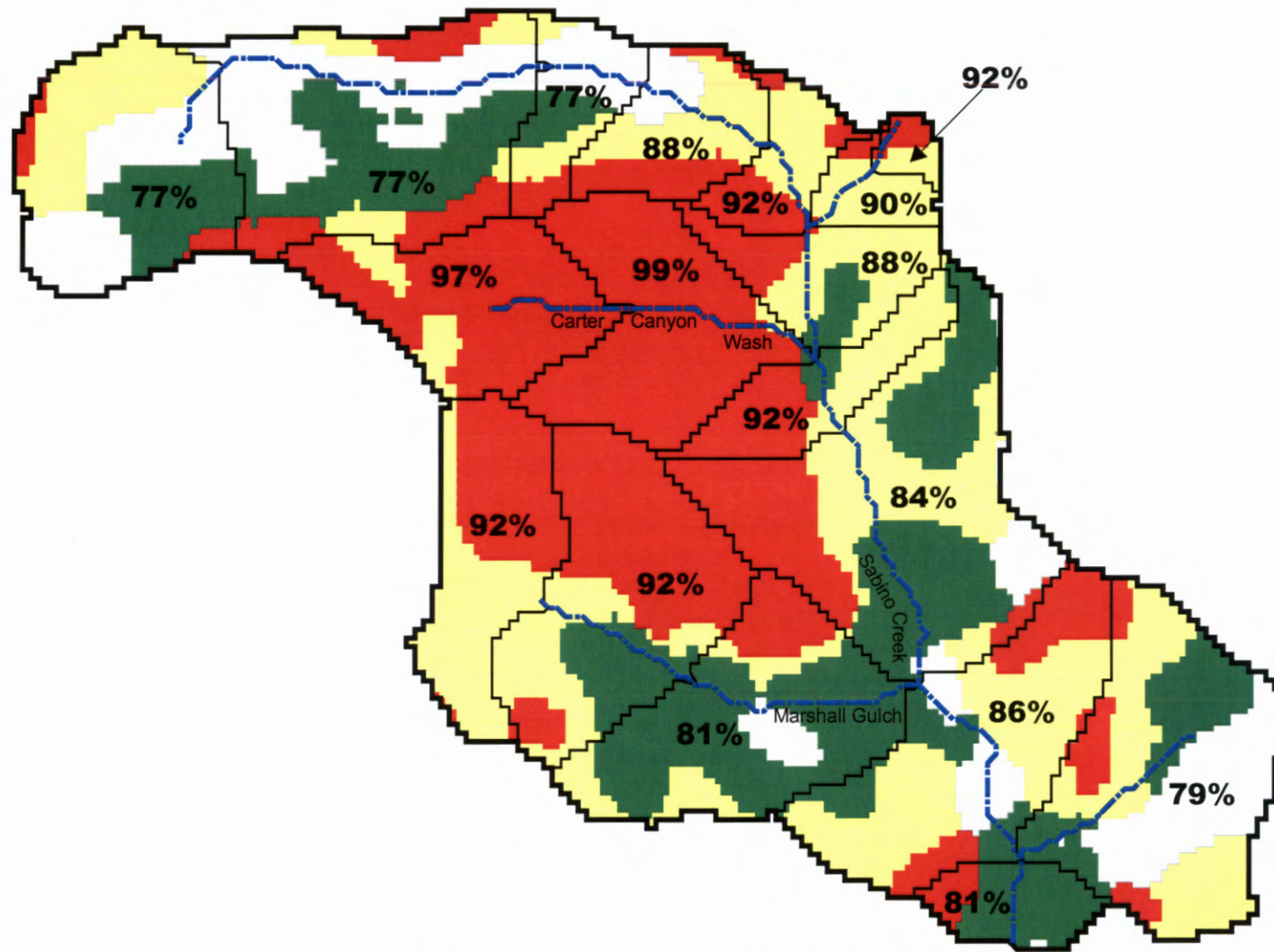


Figure 5 HEC-HMS Discharge Values Compared to Pre-Fire Condition Flood Frequency Analysis Results



LEGEND:
 2C - Blue - Subbasin Junction at Marshall Gulch Stream Gage
 13B - Pink - Subbasin Between Upstream Tributary Confluence and Marshall Gulch Stream Gage Location
 7R - Grey - Reach Between Upstream Tributary Confluence and Marshall Gulch Stream Gage Location
 Observed - Red - Observed Hydrograph at Marshall Gulch Stream Gage on July 24, 2003

Figure 6 Comparison of Simulated and Observed Post-Fire Condition Flow Hydrographs



LEGEND Stream Flowline Watershed Boundary Subbasin Boundary 77% % Increase in CN	High Burn Severity Moderate Burn Severity Low Burn Severity Unburned	 	<h2>Pre-Fire to Post-Fire Curve Number Increase</h2>			
			Not to Scale	Horizontal Datum: NAD83 HPGN Vertical Datum: NAVD88	DATE: 12-30-03 PROJ. NO: 23443361	CHECKED BY: HH PM: AM

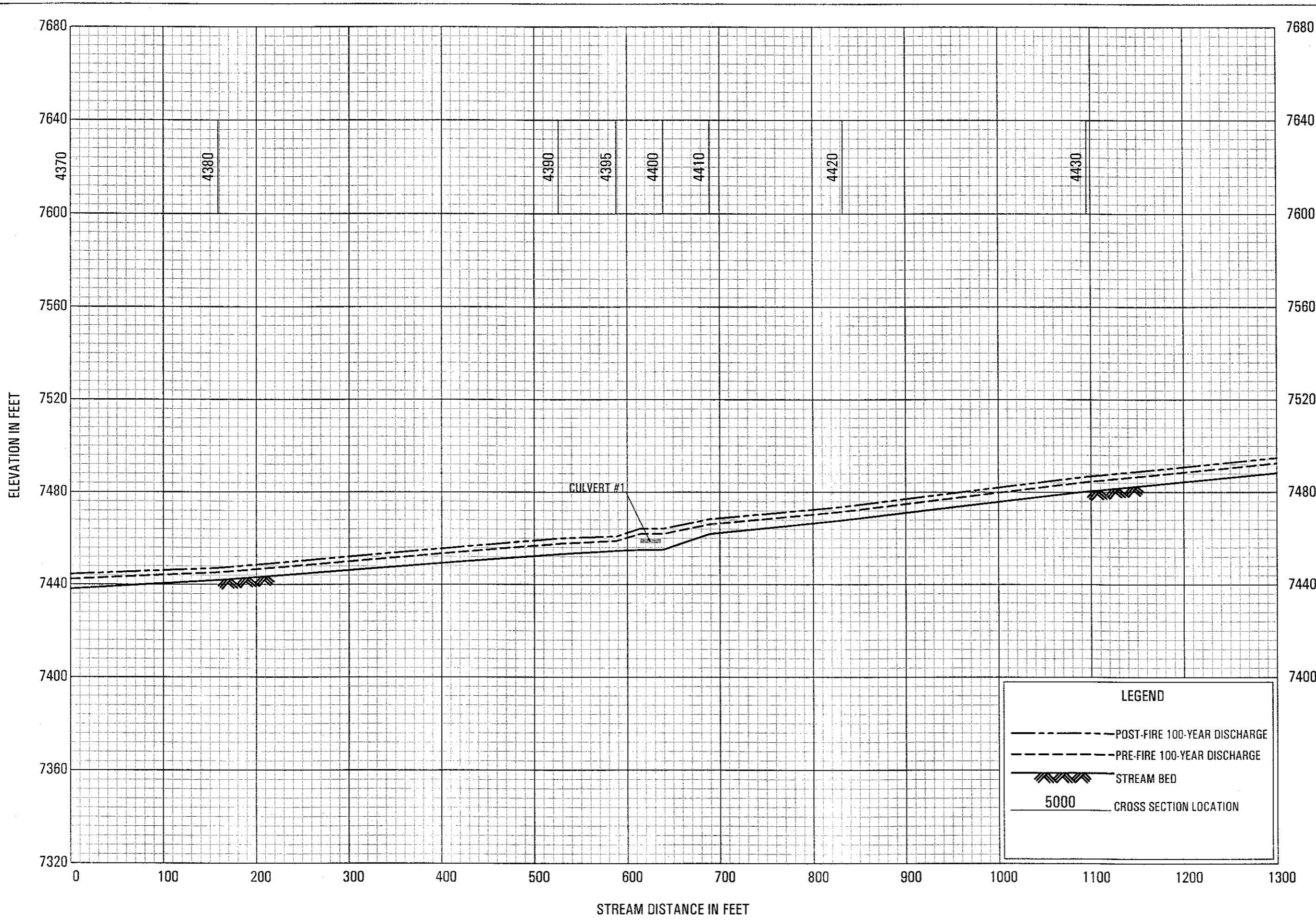


FIGURE 8

100-YEAR FLOOD PROFILE FOR SABINO CREEK

PIMA COUNTY FLOOD CONTROL DISTRICT
 TOWN OF SUMMERHAVEN, AZ
 PIMA COUNTY

ELEVATION IN FEET

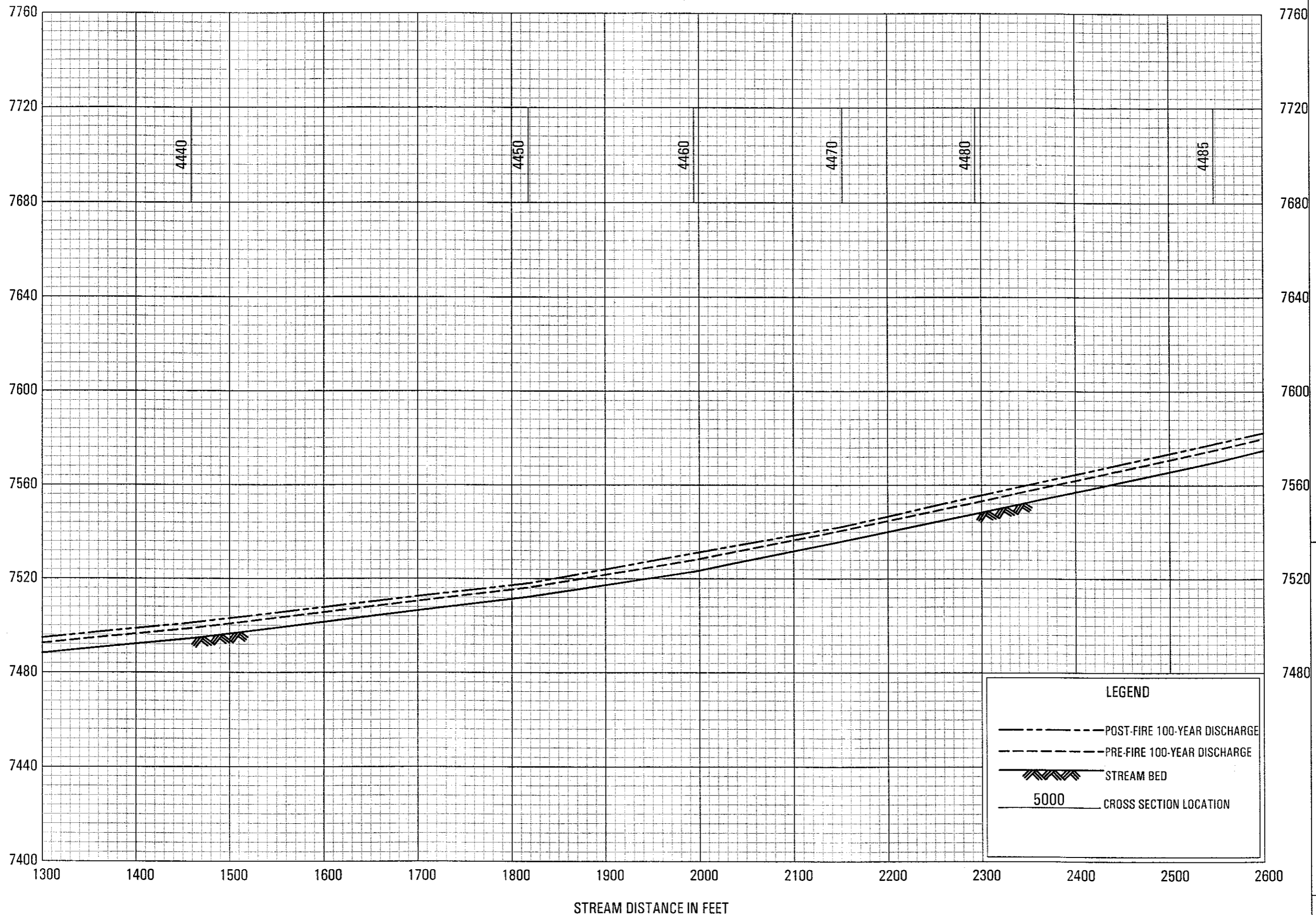


FIGURE 8

100-YEAR FLOOD PROFILES FOR SABINO CREEK

PIMA COUNTY FLOOD CONTROL DISTRICT
TOWN OF SUMMERHAVEN, AZ
PIMA COUNTY

ELEVATION IN FEET

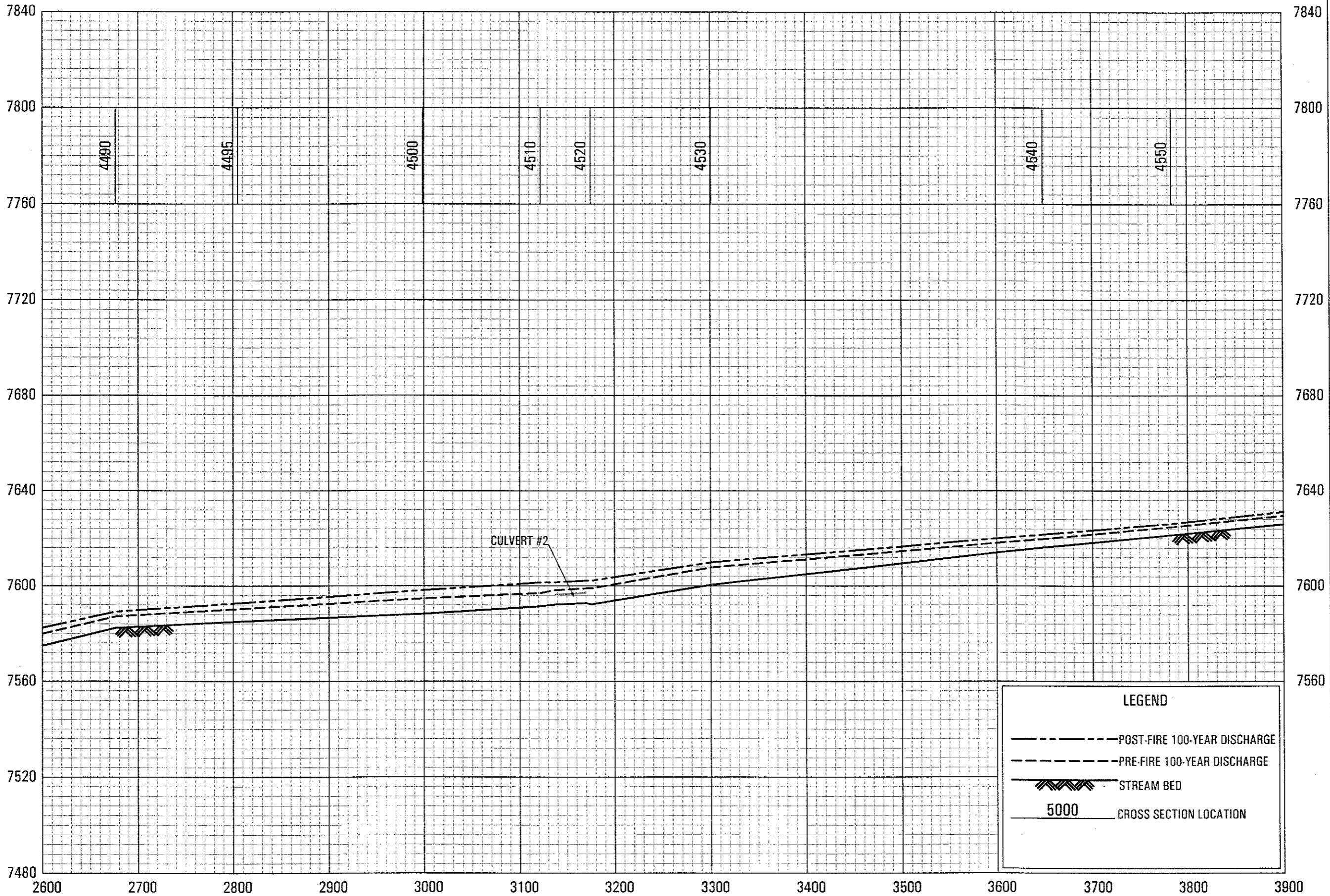


FIGURE 8

100-YEAR FLOOD PROFILES FOR SABINO CREEK

PIMA COUNTY FLOOD CONTROL DISTRICT
TOWN OF SUMMERHAVEN, AZ
PIMA COUNTY

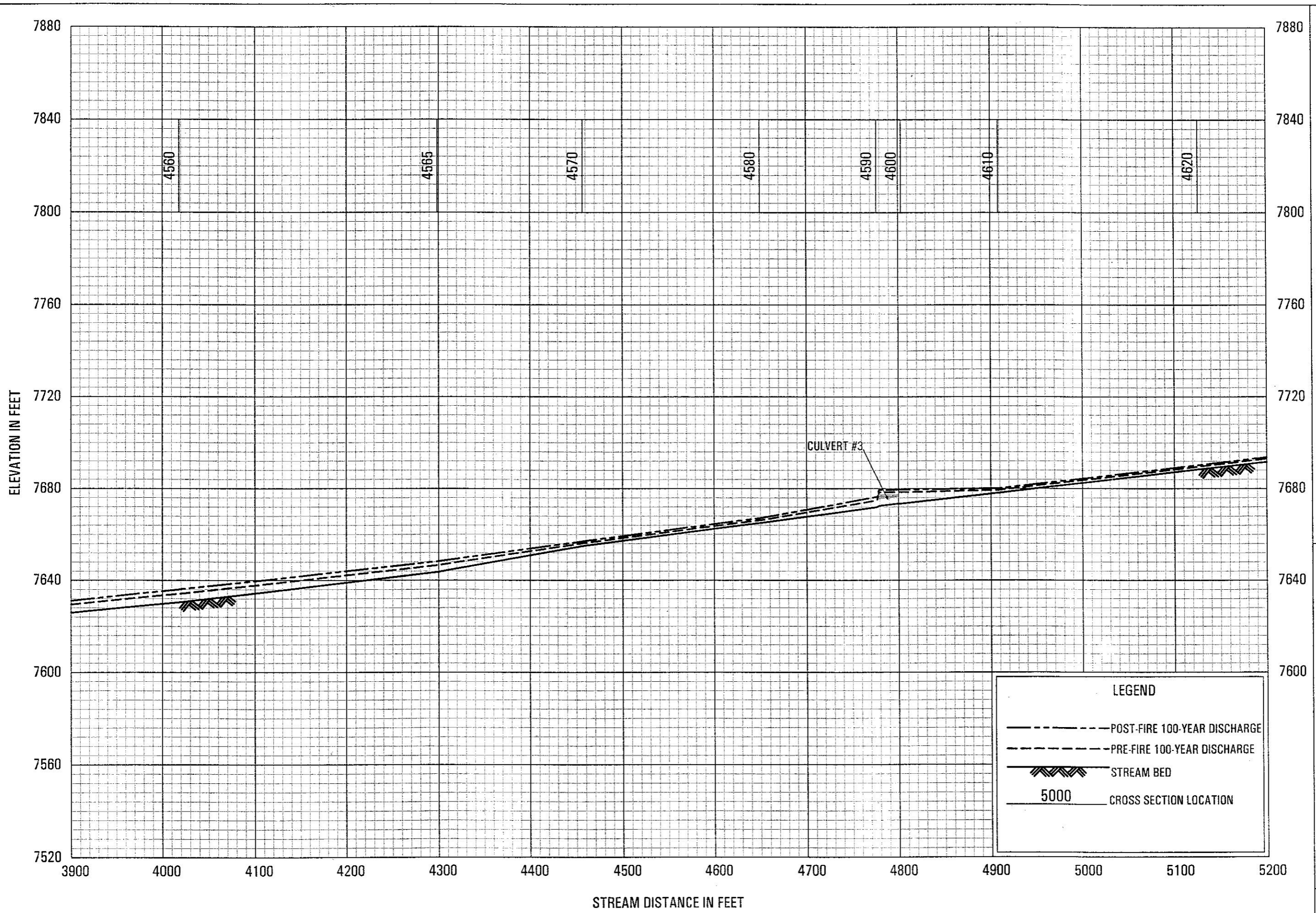
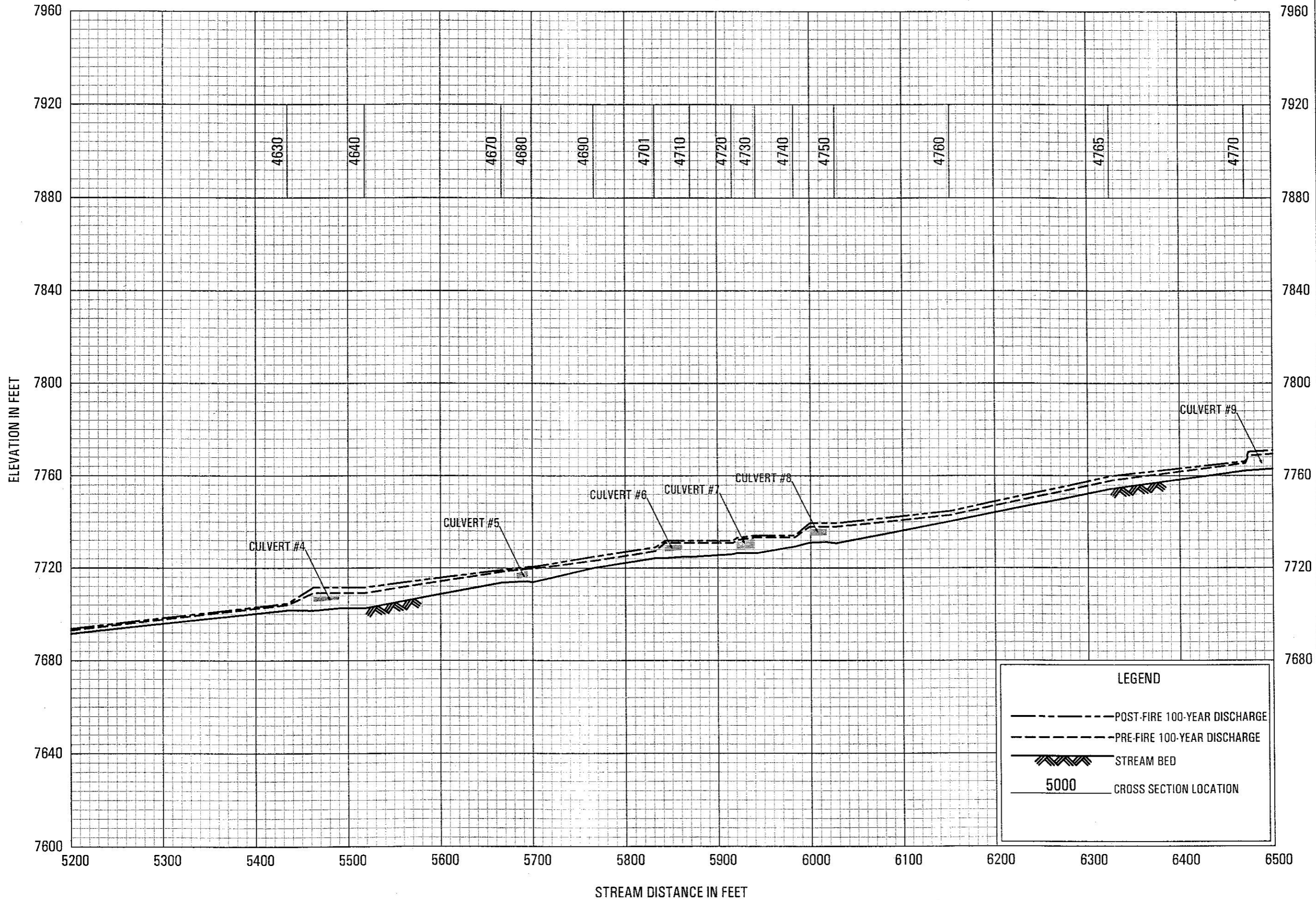


FIGURE 8

100-YEAR FLOOD PROFILES FOR SABINO CREEK

PIMA COUNTY FLOOD CONTROL DISTRICT
 TOWN OF SUMMERHAVEN, AZ
 PIMA COUNTY



FLOOD PROFILES

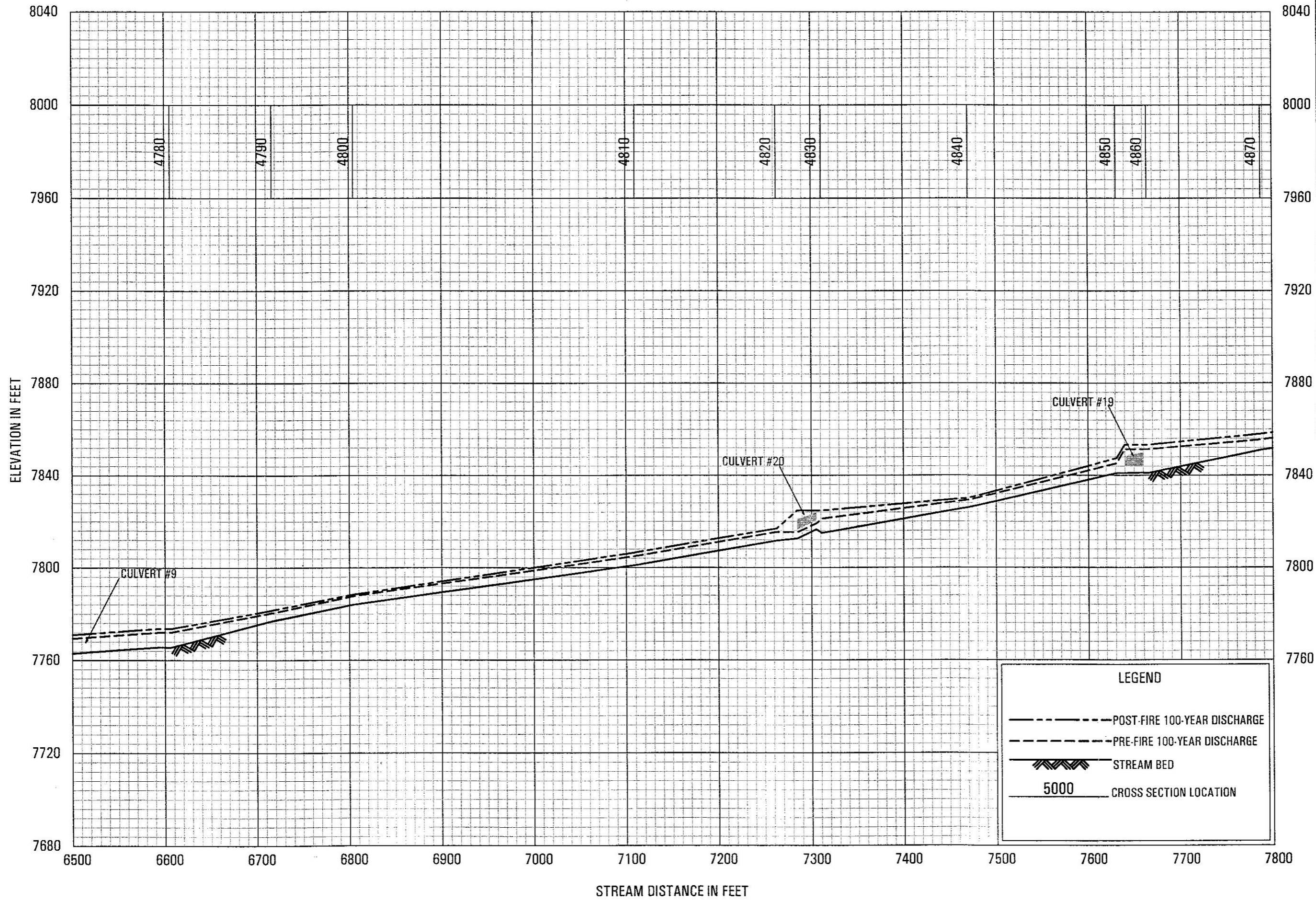
SABINO CANYON

PIMA COUNTY FLOOD CONTROL DISTRICT
TOWN OF SUMMERHAVEN, AZ

PIMA COUNTY

LEGEND

- POST-FIRE 100-YEAR DISCHARGE
- PRE-FIRE 100-YEAR DISCHARGE
- STREAM BED
- CROSS SECTION LOCATION



PIMA COUNTY FLOOD CONTROL DISTRICT
 TOWN OF SUMMERHAVEN, AZ
 PIMA COUNTY

FIGURE 8
 100-YEAR FLOOD PROFILE SABINO CREEK

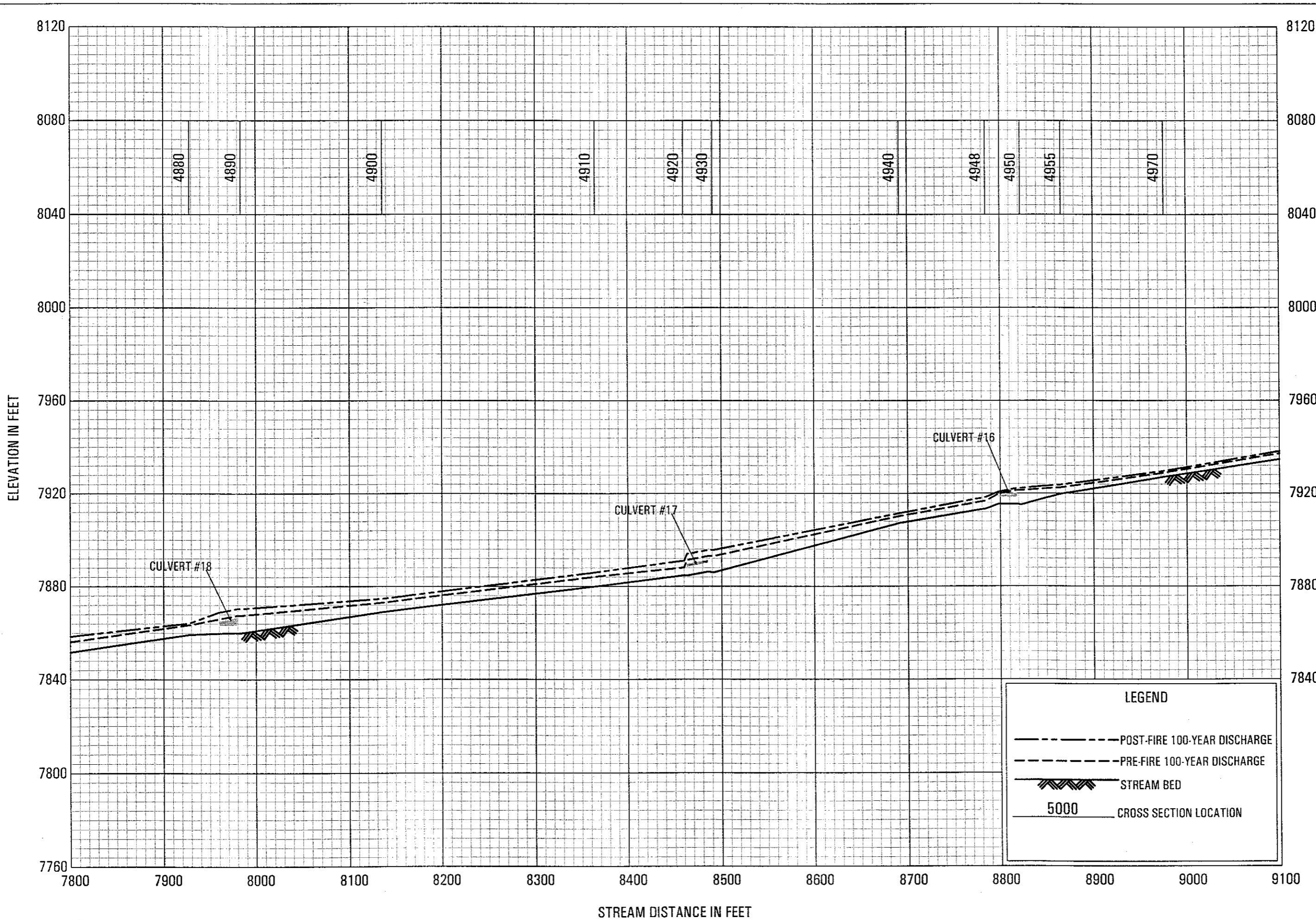


FIGURE 8
100-YEAR FLOOD PROFILES FOR SABINO CREEK

PIMA COUNTY FLOOD CONTROL DISTRICT
TOWN OF SUMMERHAVEN, AZ
PIMA COUNTY

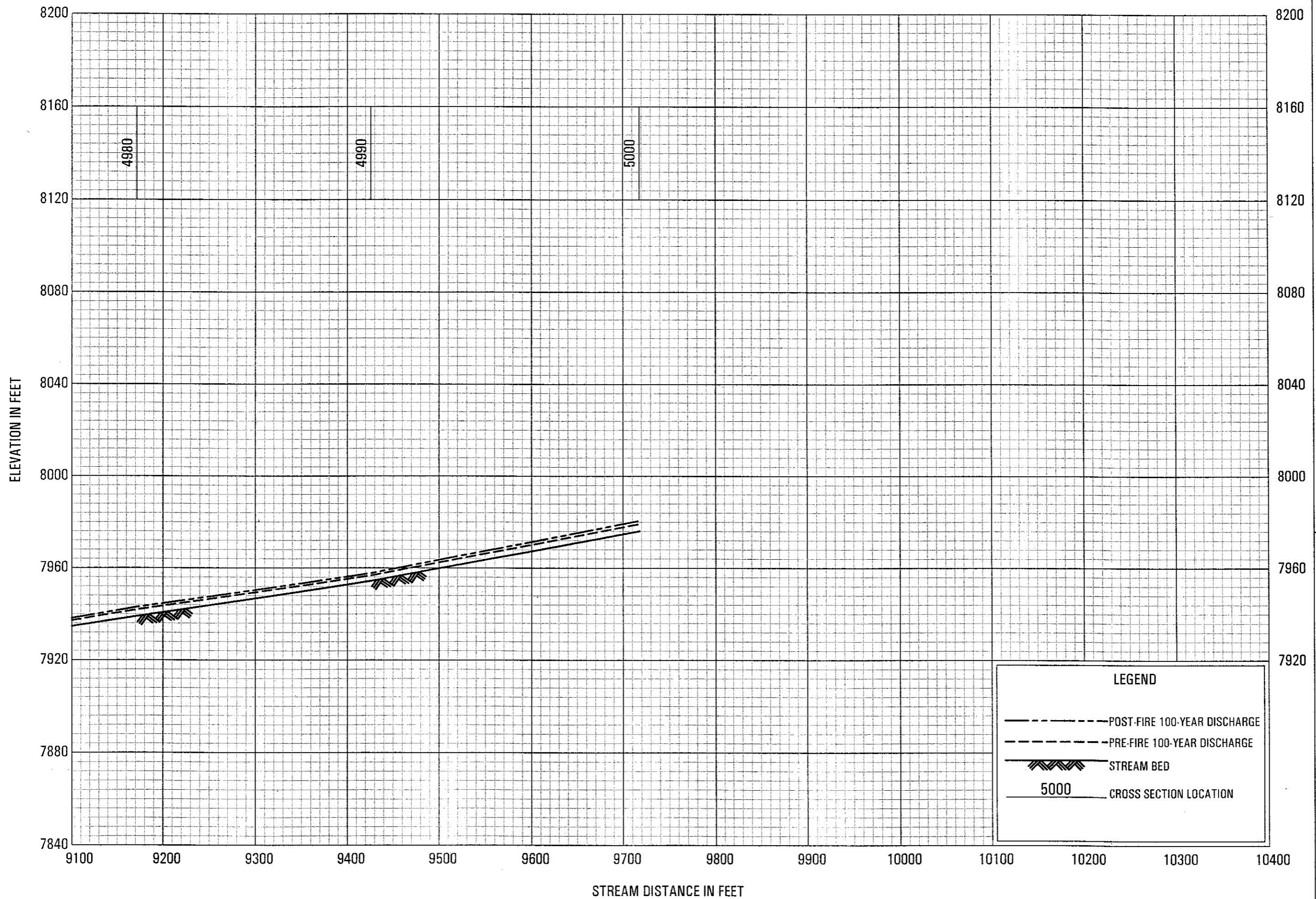


FIGURE 8

100-YEAR FLOOD PROFILES FOR SABINO CREEK

PIMA COUNTY FLOOD CONTROL DISTRICT
 TOWN OF SUMMERHAVEN, AZ
 PIMA COUNTY

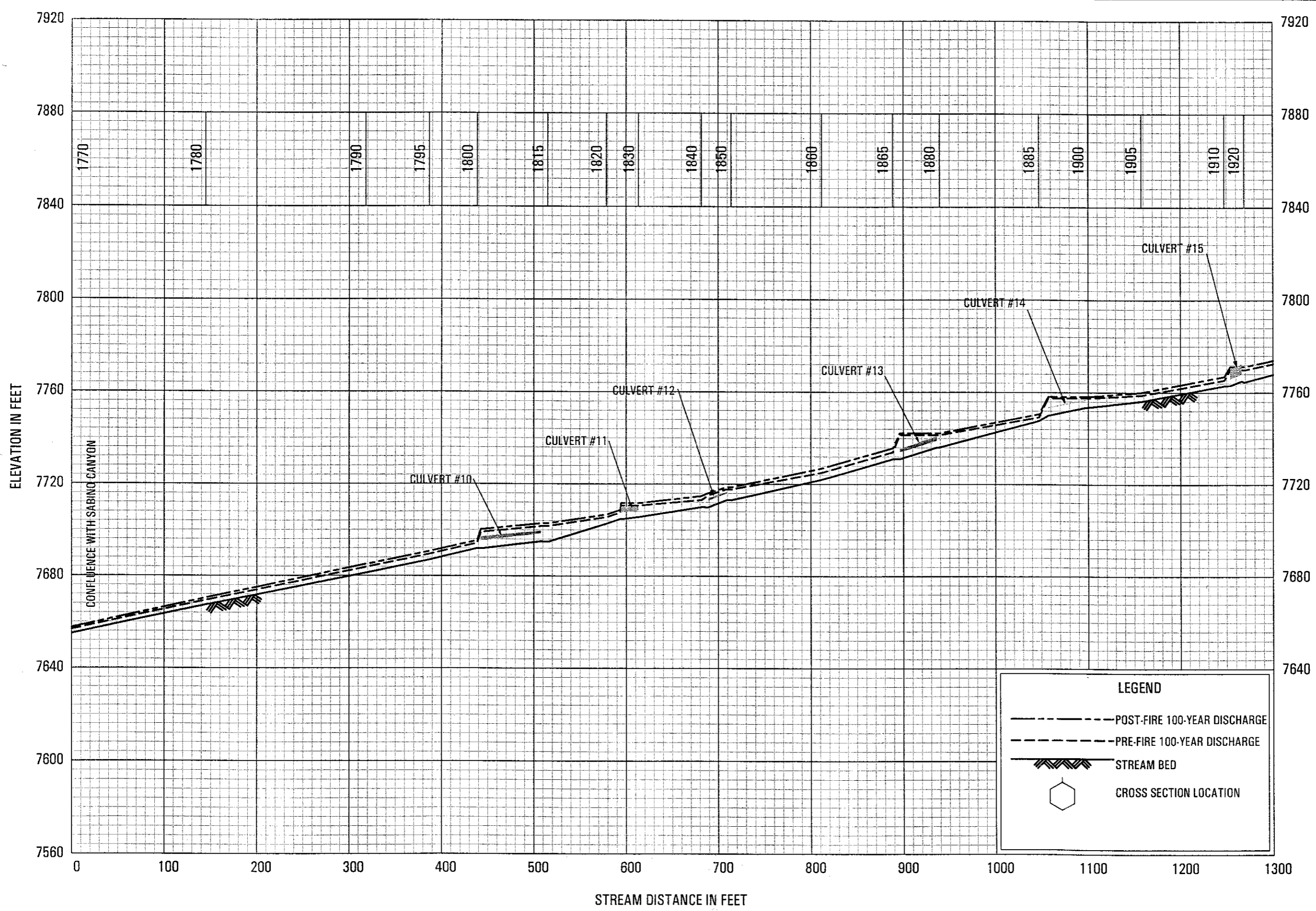


FIGURE 9

100-YEAR FLOOD PROFILES FOR CARTER CANYON WASH

**PIMA COUNTY FLOOD CONTROL DISTRICT
TOWN OF SUMMERHAVEN, AZ
PIMA COUNTY**

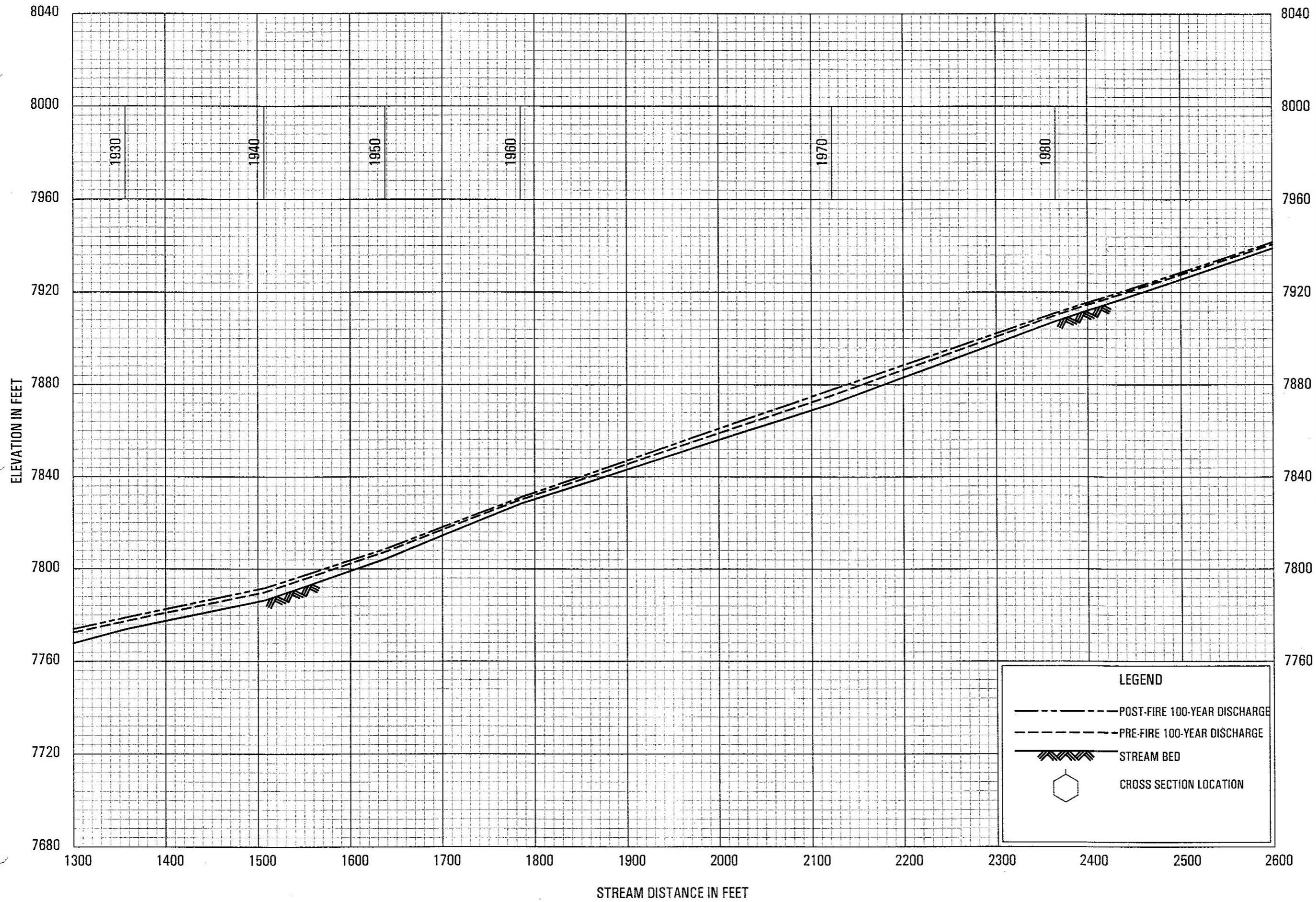


FIGURE 9

100-YEAR FLOOD PROFILES FOR CARTER CANYON WASH

PIMA COUNTY FLOOD CONTROL DISTRICT
 TOWN OF SUMMERHAVEN, AZ
 PIMA COUNTY

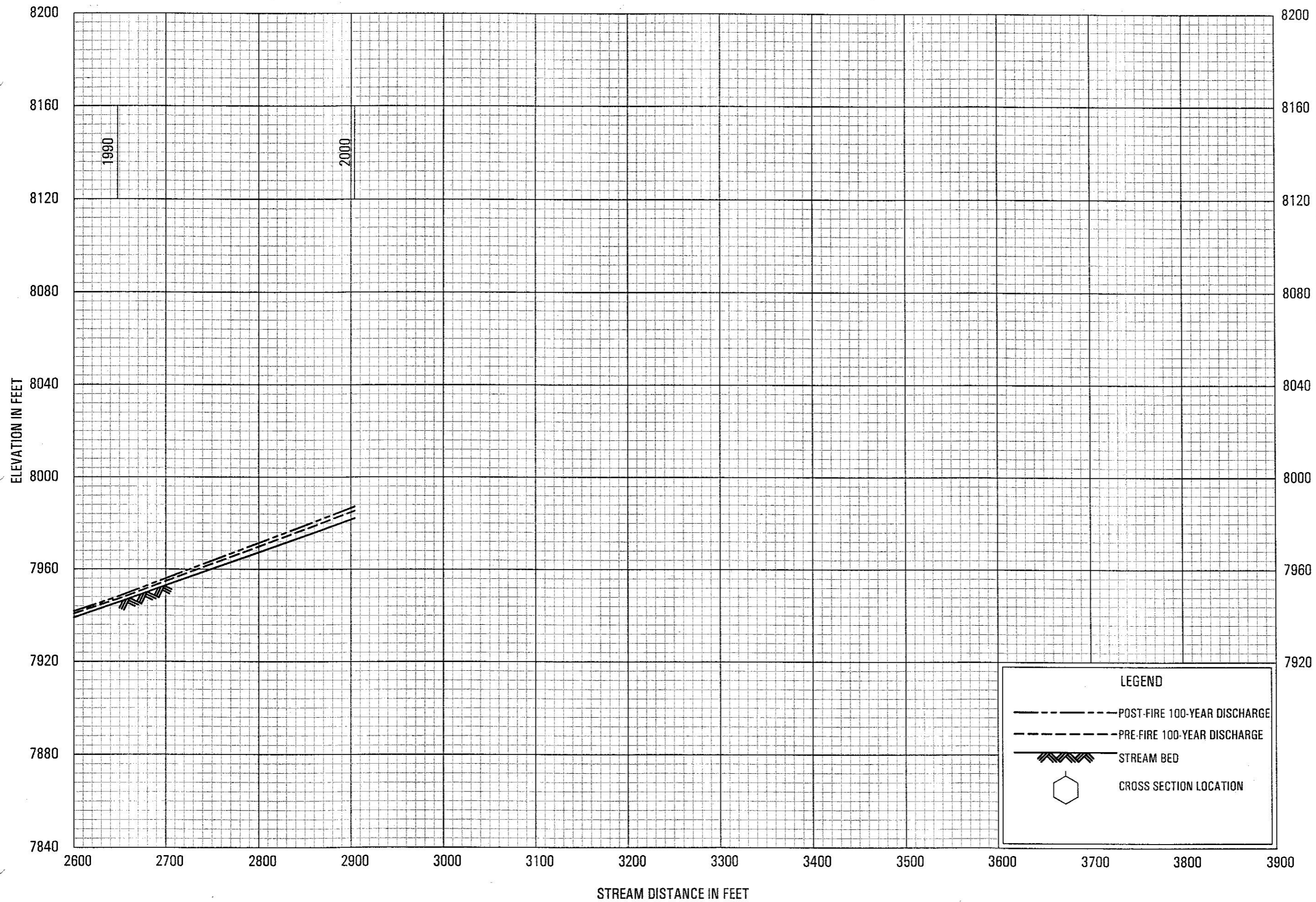
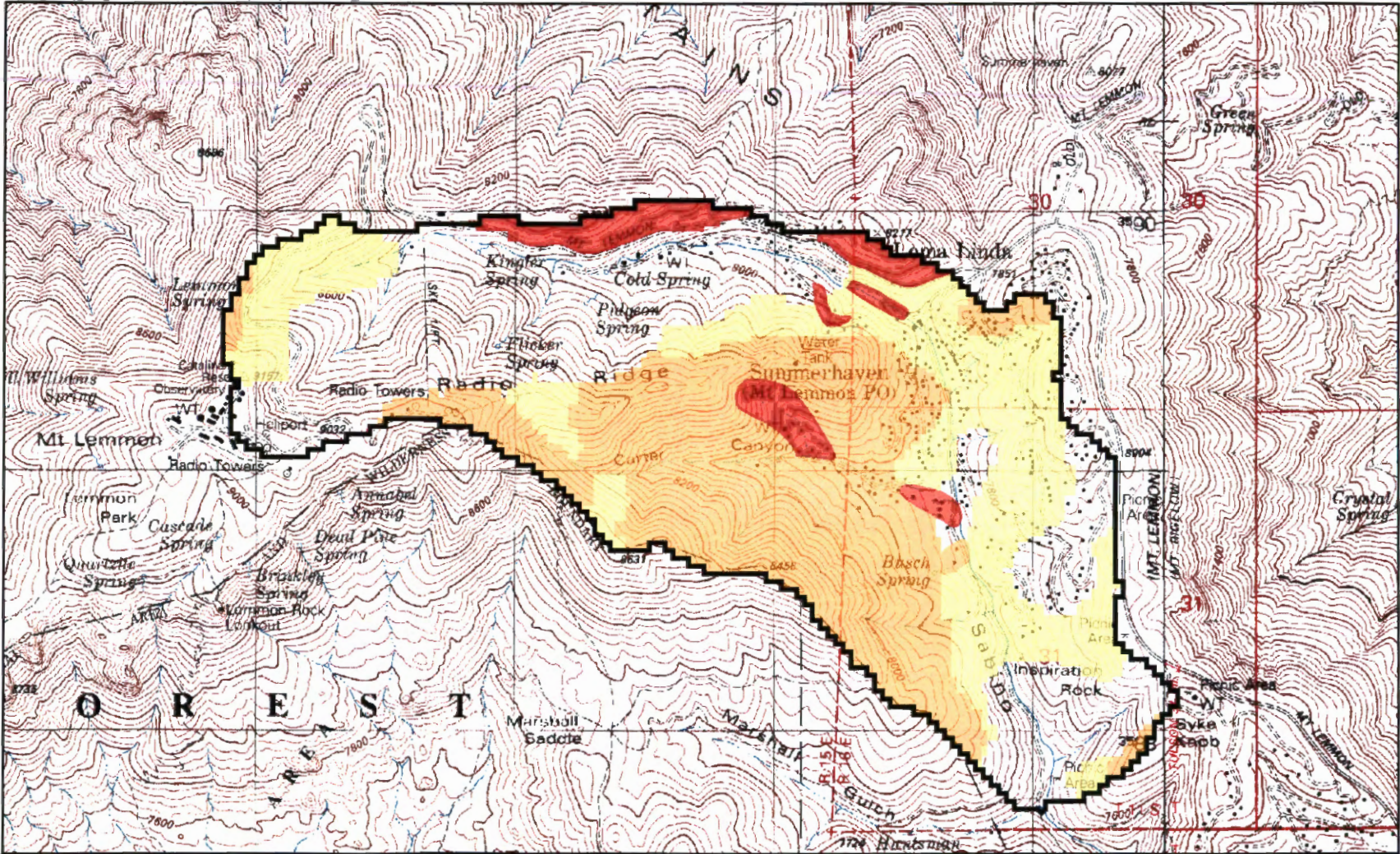


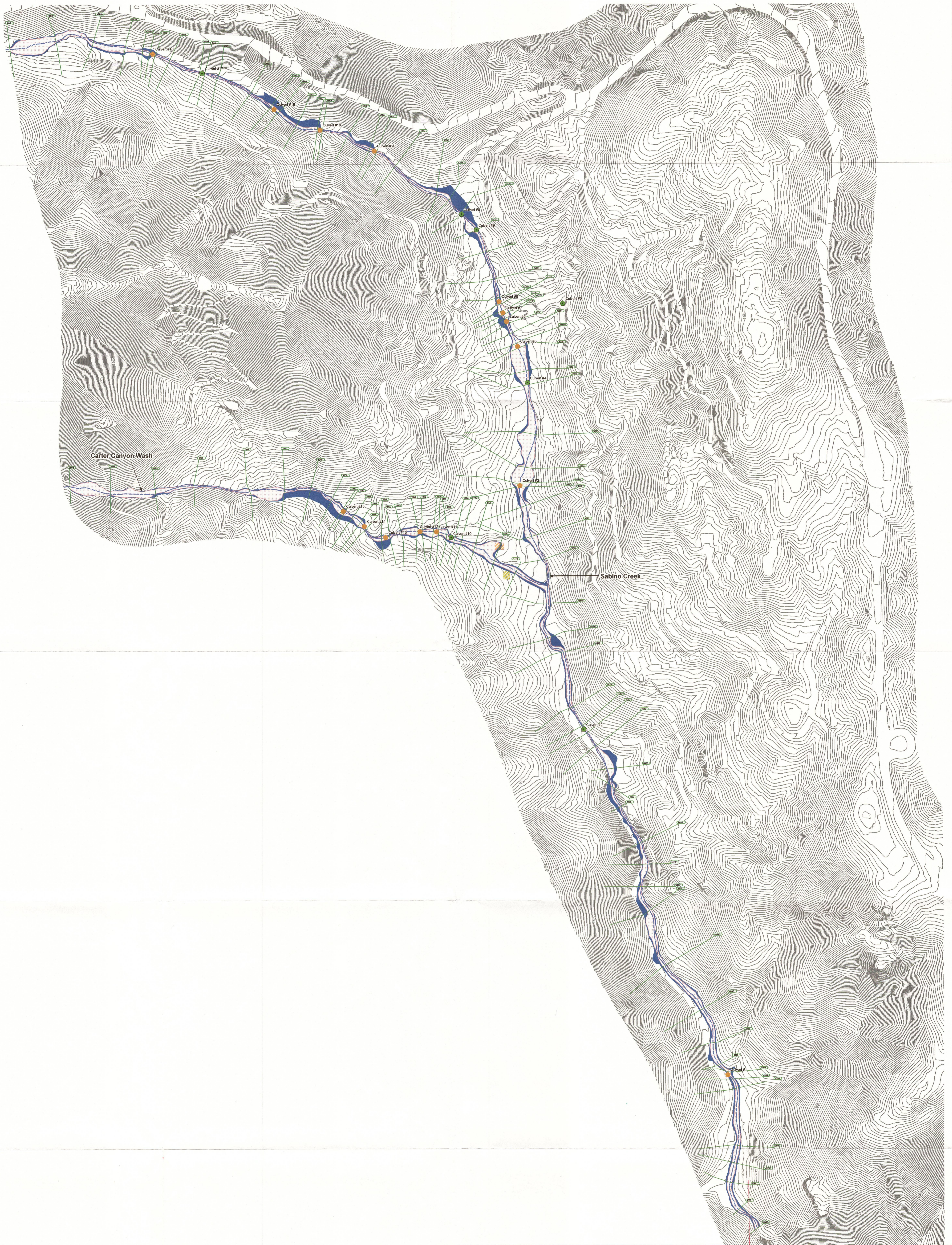
FIGURE 9

100-YEAR FLOOD PROFILES FOR CARTER CANYON WASH

**PIMA COUNTY FLOOD CONTROL DISTRICT
SUMMERHAVEN, AZ
PIMA COUNTY**

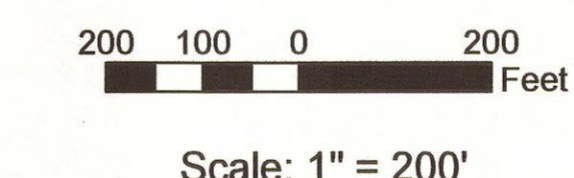


LEGEND High Erosion Potential Moderate Erosion Potential Low Erosion Potential No Erosion Potential			<h2>Erosion Potential</h2>			
			Horizontal Datum: NAD83 HPGN Vertical Datum: NAVD88		DATE: 12-30-03 PROJ. NO: 23443361	CHECKED BY: HH PM: AM



LEGEND

- ◆ Private Culverts
- ◆ Public Culverts
- Mt. Lemmon Waste Treatment Plant
- Zimmerman Elementary School
- Stream Flowline
- HEC-RAS Cross Sections
- Pre-Fire 10-Year Floodplain
- Post-Fire 10-Year Floodplain



Sabino Canyon Watershed 10-Year Floodplain

Horizontal Datum: NAD83 HPGN
Vertical Datum: NAVD88

CHECKED BY: HH
PM: AM

DATE: 12-30-03
PROJ. NO: 23443361

FIGURE NO:
11A



LEGEND	
	Private Culverts
	Public Culverts
	Mt. Lemmon Waste Treatment Plant
	Zimmerman Elementary School
	Stream Flowline
	HEC-RAS Cross Sections
	Pre-Fire 100-Year Floodplain
	Post-Fire 100-Year Floodplain



Sabino Canyon Watershed 100-Year Floodplain



200 100 0 200
 Feet
 Scale: 1" = 200'

Horizontal Datum: NAD83 HPGN
 Vertical Datum: NAVD88

CHECKED BY: HH

DATE: 12-30-03

FIGURE NO:

PM: AM

PROJ. NO: 23443361

11B

APPENDIX A

PHOTO LOG

FIRST SITE VISIT

(OCTOBER 9, 2003)



Picture 1. Downstream LOS looking upstream at rockwall protecting Marshall Gulch right parking lot.



Picture 2. Downstream LOS looking upstream at rockwall and channel.



Picture 3. Downstream LOS looking upstream at rockwall.



Picture 4. Downstream LOS looking upstream at parking lot.



Picture 5. Downstream LOS looking at channel roughness example.



Picture 6. Downstream LOS looking upstream at 10' wide channel.



Picture 7. Right side of channel looking upstream at 24" CMP under Sabino Canyon Road.



Picture 8. Right side of channel looking upstream at 24" CMP under Sabino Canyon Road.



Picture 9. Centerline of channel looking upstream at 24" CMP under Sabino Canyon Road.



Picture 10. Centerline of channel looking downstream at debris in channel.



Picture 11. At the downstream side of parking lot culvert (# 1) looking downstream at channel wall on left side.



Picture 12. Downstream of parking lot entrance looking upstream at twin ellipse CMP culverts (# 1).



Picture 13. Upstream of parking lot culvert looking downstream at grate across culverts (# 1).



Picture 14. At left side of culvert crossing looking right at grate across culverts (1).



Picture 15. At Sabino Canyon Road looking upstream at channel.



Picture 16. At Sabino Canyon Road 300' upstream of parking lot looking upstream at large downed tree in channel 6' high with debris.



Picture 17. At Sabino Canyon Road 300' upstream of parking lot looking upstream at large downed tree in channel.



Picture 18. In channel 350' upstream of parking lot looking downstream at large downed tree in channel.



Picture 19. At Sabino Canyon Road looking downstream at channel constriction area termination.



Picture 20. At Sabino Canyon Road looking upstream at channel constriction.



Picture 21. At Sabino Canyon Road looking upstream at the road.



Picture 22. Centerline of channel (100 downstream of panel point) looking downstream at channel constriction and roughness change.



Picture 23. Centerline of channel (100' downstream of panel point) looking upstream at channel constriction and roughness change.



Picture 24. 5' behind panel point looking upstream at panel point next to Sabino Canyon Road.



Picture 25. At centerline of channel of stream below Busch Spring looking downstream at channel steep drop and debris.



Picture 26. At centerline of small stream influence looking downstream at channel.



Picture 27. At small stream influence looking downstream at left overbank.



Picture 28. At small stream influence looking upstream at channel



Picture 29. At small stream influence looking upstream at small stream.



Picture 30. Downstream of East Sabino Road culvert (# 2) looking downstream at channel.



Picture 31. Downstream of East Sabino Road culvert looking upstream at twin ellipse culverts (# 2).



Picture 32. At East Sabino Road culverts (# 2) looking upstream at channel.



Picture 33. Upstream of East Sabino Road culverts (# 2) looking downstream at culvert openings.



Picture 34. Centerline of channel looking downstream at channel, near school.



Picture 35. Centerline of channel looking upstream at dirt road crossing, near school.



Picture 36. Upstream of dirt road crossing looking upstream at incised channel.



Picture 37. Upstream of dirt road crossing looking upstream at incised channel.



Picture 38. Pima County Waste Water Treatment Facility.



Picture 39. Downstream of driveway crossing looking upstream at 2.5' drop on the downstream side of driveway.



Picture 40. At center of driveway looking downstream at channel.



Picture 41. Downstream of driveway culvert (# 3) looking downstream at channel.



Picture 42. Downstream of driveway culvert looking upstream at elliptical CMP culvert (# 3).



Picture 43. Upstream of driveway culvert (# 3) looking upstream at channel



Picture 44. Upstream of driveway culvert looking downstream at elliptical culvert (# 3).



Picture 45. Downstream of Goat Hill Road culvert looking upstream at 3' diameter CMP culvert (# 4).



Picture 46. Upstream of Goat Hill Road culvert (# 4) looking upstream at channel.



Picture 47. Upstream of Goat Hill Road culvert looking downstream at culvert (# 4).



Picture 48. Top of driveway culvert (# 5) looking downstream at channel



Picture 49. Downstream of driveway culvert at right bank looking upstream at 2-18" clay pipes in concrete (# 5).



Picture 50. Top of driveway culvert (# 5) looking upstream at channel.



Picture 51. Upstream of driveway culvert (# 5) looking downstream at 2-18" pipes with metal grate.



Picture 52. Centerline of channel looking left at small 2.5' wide and 2' deep channel.



Picture 53. On left embankment looking right at small 2.5' wide and 2' deep channel.



Picture 54. Downstream of driveway culvert (# 6) looking downstream at channel.



Picture 55. Centerline of channel looking upstream at 2-36" CMPs (# 6).



Picture 56. Top of driveway (# 6) looking upstream at 2-24" CMPs and 1-36" CMP (# 7).



Picture 57. Top of driveway (# 7) looking downstream at 2-36" CMPs (# 6).



Picture 58. Top of driveway (# 7) looking upstream at centerline of channel.



Picture 59. Upstream of driveway looking downstream at 2-24" and 1-36" CMPs (# 7).



Picture 60. Downstream of coffee house driveway (# 8) looking downstream at centerline of channel.



Picture 61. Downstream of coffee house driveway looking upstream at 2-40" CMPs (# 8).



Picture 62. Centerline of coffee house driveway (# 8) looking upstream at centerline of channel.



Picture 63. Upstream of coffee house driveway looking downstream at 2-40" CMPs (# 8).



Picture 64. Downstream of Sabino Canyon Road elliptical culvert (# 9) looking downstream at centerline of channel.



Picture 65. Downstream of Sabino Canyon Road looking upstream at elliptical culvert (# 9).



Picture 66. At Sabino Canyon Road looking upstream at channel with retaining walls.



Picture 67. Upstream of Sabino Canyon Road looking downstream at elliptical culvert (# 9).



Picture 68. At Sabino Canyon Road looking downstream at culvert (# 9) and Sabino Canyon Road.



Picture 69. Downstream side of Carter Canyon Road looking downstream at centerline of channel.



Picture 70. Downstream of Carter Canyon Road looking upstream at 42" CMP (# 10).



Picture 71. Upstream of Carter Canyon Road culvert looking upstream at centerline of channel.



Picture 72. Upstream of Carter Canyon Road looking downstream at 42" CMP (# 10).



Picture 73. Centerline of driveway culvert looking downstream at centerline of channel.



Picture 74. Downstream of driveway culvert looking upstream at 36" CMP (# 11).



Picture 75. Centerline of driveway culvert (#11) looking upstream at crushed culvert.



Picture 76. Upstream of driveway culvert looking downstream at 36" CMP (# 11).



Picture 77. Centerline of driveway culvert (#12) looking upstream at centerline of channel.



Picture 78. Upstream of driveway culvert looking downstream at 36" CMP (# 12).



Picture 79. Downstream of culvert (# 13) looking downstream at centerline of channel.



Picture 80. Downstream of culvert looking upstream at 2-36" CMPs (# 13).



Picture 81. Upstream of culvert (#13) looking upstream at centerline of channel.



Picture 82. Upstream of culvert looking downstream at 2-36" CMPs (# 13).



Picture 83. Centerline of driveway culvert (# 14) looking downstream at centerline of channel.



Picture 84. Downstream of driveway culvert looking upstream at 36" CMP (# 14).



Picture 85. Centerline of driveway culvert (# 14) looking upstream at centerline of channel.



Picture 86. Upstream of driveway culvert looking downstream at 36" CMP (# 14).



Picture 87. Centerline of driveway culvert (#15) looking downstream at centerline of channel.



Picture 88. Downstream of culvert looking upstream at 2-36" CMPs (# 15).



Picture 89. Centerline of driveway culvert (#15) looking upstream at centerline of channel.



Picture 90. Upstream of driveway culvert looking downstream at 2-36" CMPs (# 15).



Picture 91. From driveway (#16) looking upstream at centerline of channel and Turkey Run Road.



Picture 92. Upstream of driveway culvert looking downstream at 36" CMP and blocked 24" CMP (# 16).



Picture 93. From driveway culvert (#16) looking downstream at channel.



Picture 94. Downstream of driveway looking upstream at 36" CMP and 24" CMP (# 16).



Picture 95. At Guthrie Road (#17) looking upstream at centerline of channel.



Picture 96. Upstream of Guthrie Road looking downstream at 36" CMP (# 17).



Picture 97. At Guthrie Road culvert (#17) looking downstream at channel.



Picture 98. Downstream of Guthrie Road looking upstream at 36" CMP (# 17).



Picture 99. At driveway culvert (#18) looking upstream at centerline of channel.



Picture 100. Upstream of driveway culvert looking downstream at 2-48" CMPs (# 18).



Picture 101. At driveway culvert (# 18) looking downstream at centerline of channel.



Picture 102. Downstream of driveway culvert looking upstream at 2-48" CMPs (# 18).



Picture 103. At driveway culvert (# 19) looking upstream at centerline of channel.



Picture 104. Upstream of driveway culvert looking downstream at 2-36" CMPs (# 19).



Picture 105. At driveway culvert (# 19) looking downstream at centerline of channel.



Picture 106. Downstream of driveway culvert looking upstream at 2-36" CMPs (# 19).



Picture 107. At driveway culvert (#20) looking upstream at centerline of channel.



Picture 108. Upstream of driveway culvert looking downstream at 2- 4' x 6' ellipse CMPs (# 20).



Picture 109. At driveway culvert (# 20) looking downstream at centerline of channel.



Picture 110. Downstream of driveway culvert looking upstream at two ellipse CMPs (# 20).



Picture 111. Coffee Shop.



Picture 112. At Tucson Road (#21) looking upstream at centerline of channel.



Picture 113. Upstream Tucson Road looking downstream at a 36" CMP (# 21).



Picture 114. At Tucson Road (#21) looking downstream at centerline of channel.



Picture 115. Downstream of 36" CMP on Tucson Road looking upstream at CMP (# 21).

SECOND SITE VISIT

(NOVEMBER 5, 2003)



PHOTOGRAPH 116 – Looking upstream at small drainage that flows into Sabino Canyon from the west. This is an example of low erosion potential.



PHOTOGRAPH 117 – Looking at revegetation area that drains into Sabino Canyon from the east. This is an example of low erosion potential.



PHOTOGRAPH 118 – Looking upstream at Busch Spring drainage, which flows into Sabino Canyon. This is an example of moderate erosion potential. Notice the slopes beginning to erode. Also, the flatter area of the channel is developing small “waves” of accumulated sediment.



PHOTOGRAPH 119 – Looking upstream at Busch Spring drainage, which flows into Sabino Canyon. Notice the debris choking the channel.



PHOTOGRAPH 120 – Looking upstream at Busch Spring drainage, which flows into Sabino Canyon. Again, debris is evident and areas of higher channel velocity are apparent.



PHOTOGRAPH 121 – Drainage area south of Carter Canyon and drains into Sabino Canyon. This is an example of moderate erosion. Notice the area is severely burned and seeding has not resulted in suitable ground cover.



PHOTOGRAPH 122 – Looking upstream at downstream area of Carter Canyon. The Zimmerman Elementary School is at the top of the right overbank area. This is an example of high erosion potential. Revegetation efforts have not succeeded, and high velocity flows have eroded the stream banks.



PHOTOGRAPH 123 – Looking downstream from right overbank towards Carter Canyon. Notice the eroded left embankment is six-feet high in this area. The Summerhaven wastewater treatment plant is in the background.



PHOTOGRAPH 124 – Looking downstream at Carter Canyon. Zimmerman Elementary school is in the background. Notice rock placement at streambank to protect school grounds.



PHOTOGRAPH 125 – Looking upstream at drainage area which flows into Carter Canyon. This is an example of high erosion potential. Notice the debris piles used to prevent sediment flow downstream.



PHOTOGRAPH 126 – Carter Canyon looking downstream viewed from Carter Canyon Road. This is an example of high erosion potential.



PHOTOGRAPH 127 – 150 feet downstream of driveway culvert along Turkey Run Road (#20) looking upstream. This is an example of high erosion potential. Notice the steep sloped walls on both sides of the stream.



PHOTOGRAPH 128 – 150 feet downstream of driveway culvert along Turkey Run Road (#20) looking downstream. This is an example of high erosion potential.



PHOTOGRAPH 129 – 350 feet downstream of driveway culvert along Turkey Run Road (#20) looking upstream. Notice the gabion baskets used to prevent erosion of the stream.



PHOTOGRAPH 130 – 350 feet downstream of driveway culvert along Turkey Run Road (#20) looking downstream. Notice the failing embankment along the right side of the stream.

APPENDIX B

PEAKFQ OUTPUT

SABINO

U. S. GEOLOGICAL SURVEY
ANNUAL PEAK FLOW FREQUENCY ANALYSIS
Following Bulletin 17-B Guidelines
Program peakfq
(Version 4.1, February, 2002)

--- PROCESSING DATE/TIME ---

2003 NOV 4 17:05:56

--- PROCESSING OPTIONS ---

Plot option = Graphics & Printer
Basin char output = None
Print option = Yes
Debug print = No
Input peaks listing = Long
Input peaks format = WATSTORE peak file

U. S. GEOLOGICAL SURVEY
ANNUAL PEAK FLOW FREQUENCY ANALYSIS
Following Bulletin 17-B Guidelines
Program peakfq
(Version 4.1, February, 2002)

Station - 09483300 SABINO CANYON NEAR MT LEMMON, ARIZONA
2003 NOV 4 17:05:56

INPUT DATA SUMMARY

Number of peaks in record	=	21
Peaks not used in analysis	=	1
Systematic peaks in analysis	=	20
Historic peaks in analysis	=	0
Years of historic record	=	0
Generalized skew	=	-0.200
Standard error of generalized skew	=	0.550
Skew option	=	WEIGHTED
Gage base discharge	=	0.0
User supplied high outlier threshold	=	--
User supplied low outlier criterion	=	--
Plotting position parameter	=	0.00

***** NOTICE -- Preliminary machine computations. *****
***** User responsible for assessment and interpretation. *****

**WCF109W-PEAKS WITH MINUS-FLAGGED DISCHARGES WERE BYPASSED.		1
**WCF113W-NUMBER OF SYSTEMATIC PEAKS HAS BEEN REDUCED TO NSYS =		20
WCF134I-NO SYSTEMATIC PEAKS WERE BELOW GAGE BASE.		0.0
WCF162I-SYSTEMATIC PEAKS EXCEEDED HIGH-OUTLIER CRITERION.	1	607.9
WCF195I-NO LOW OUTLIERS WERE DETECTED BELOW CRITERION.		39.4
WCF002J-CALCS COMPLETED. RETURN CODE = 2		

SABINO

Station - 09483300 SABINO CANYON NEAR MT LEMMON, ARIZONA
2003 NOV 4 17:05:56

ANNUAL FREQUENCY CURVE PARAMETERS -- LOG-PEARSON TYPE III

	FLOOD BASE		LOGARITHMIC		
	DISCHARGE	EXCEEDANCE PROBABILITY	MEAN	STANDARD DEVIATION	SKEW
SYSTEMATIC RECORD	0.0	1.0000	2.1898	0.2491	0.658
BULL.17B ESTIMATE	0.0	1.0000	2.1898	0.2491	0.224

ANNUAL FREQUENCY CURVE -- DISCHARGES AT SELECTED EXCEEDANCE PROBABILITIES

ANNUAL EXCEEDANCE PROBABILITY	BULL.17B ESTIMATE	SYSTEMATIC RECORD	'EXPECTED PROBABILITY' ESTIMATE	95-PCT CONFIDENCE LIMITS FOR BULL. 17B ESTIMATES	
				LOWER	UPPER
0.9950	39.9	50.2	33.8	23.0	56.2
0.9900	44.8	54.0	39.4	26.8	61.9
0.9500	62.6	67.9	58.7	41.6	82.0
0.9000	75.4	78.2	72.4	52.8	96.4
0.8000	95.0	94.7	93.0	70.6	118.7
0.5000	151.5	145.4	151.5	121.5	188.3
0.2000	249.0	244.1	255.3	199.5	334.3
0.1000	326.8	332.1	343.8	254.7	470.3
0.0400	440.9	475.0	484.9	329.4	693.1
0.0200	537.8	608.5	617.4	389.0	900.2
0.0100	645.3	768.8	779.3	452.3	1146.0
0.0050	764.7	961.5	979.7	519.8	1437.0
0.0020	942.9	1276.0	1324.0	616.5	1903.0
0.6667	119.0	(1.50-year flood)			
0.4292	167.7	(2.33-year flood)			

1

Station - 09483300 SABINO CANYON NEAR MT LEMMON, ARIZONA
2003 NOV 4 17:05:56

INPUT DATA LISTING

WATER YEAR	DISCHARGE	CODES	WATER YEAR	DISCHARGE	CODES
1951	180.0		1983	148.0	
1952	262.0		1984	625.0	
1953	219.0		1985	110.0	
1954	344.0		1986	107.0	
1955	329.0		1987	81.0	
1956	68.0		1988	128.0	
1957	197.0		1989	76.0	
1958	116.0		1990	180.0	
1959	73.0		1991	126.0	
1966	-380.0	H	1992	167.0	
1982	145.0				

SABINO
Explanation of peak discharge qualification codes

PEAKFQ CODE	WATSTORE CODE	DEFINITION
D	3	Dam failure, non-recurrent flow anomaly
G	8	Discharge greater than stated value
X	3+8	Both of the above
L	4	Discharge less than stated value
K	6 OR C	Known effect of regulation or urbanization
H	7	Historic peak

1

Station - 09483300 SABINO CANYON NEAR MT LEMMON, ARIZONA
2003 NOV 4 17:05:56

EMPIRICAL FREQUENCY CURVES -- WEIBULL PLOTTING POSITIONS

WATER YEAR	RANKED DISCHARGE	SYSTEMATIC RECORD	BULL.17B ESTIMATE
1984	625.0	0.0476	0.0476
1954	344.0	0.0952	0.0952
1955	329.0	0.1429	0.1429
1952	262.0	0.1905	0.1905
1953	219.0	0.2381	0.2381
1957	197.0	0.2857	0.2857
1951	180.0	0.3333	0.3333
1990	180.0	0.3810	0.3810
1992	167.0	0.4286	0.4286
1983	148.0	0.4762	0.4762
1982	145.0	0.5238	0.5238
1988	128.0	0.5714	0.5714
1991	126.0	0.6190	0.6190
1958	116.0	0.6667	0.6667
1985	110.0	0.7143	0.7143
1986	107.0	0.7619	0.7619
1987	81.0	0.8095	0.8095
1989	76.0	0.8571	0.8571
1959	73.0	0.9048	0.9048
1956	68.0	0.9524	0.9524
1966	-380.0	--	--

1

U. S. GEOLOGICAL SURVEY
ANNUAL PEAK FLOW FREQUENCY ANALYSIS
Following Bulletin 17-B Guidelines
Program peakfq
(Version 4.1, February, 2002)

End PEAKFQ analysis.
Stations processed : 1
Number of errors : 0

SABINO

Stations skipped : 0
Station years : 21

APPENDIX C

APPENDIX C

HYDRAULIC ANALYSIS RESULTS

HEC-RAS OUTPUT

CARTER CANYON WASH (10-YEAR)

```

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 X
XXXXXXXX XXXX XXX XXXXXX XXXX
X 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: Summerhaven
 Project File : CARTER CANYON CREEK.prj
 Run Date and Time: 12/30/2003 10:18:25 AM

Project in English units

Project Description:
 Carter Canyon

PLAN DATA

Plan Title: 10 year SCS Type I
 Plan File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\CARTER CANYON CREEK.p03

Geometry Title: Edited Geometry
 Geometry File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\CARTER CANYON CREEK.g03

Flow Title : 10 year SCS Type I
 Flow File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\CARTER CANYON CREEK.f03

Plan Summary Information:
 Number of: Cross Sections = 27 Multiple Openings = 0
 Culverts = 6 Inline Structures = 0
 Bridges = 0 Lateral Structures = 0

Computational Information
 Water surface calculation tolerance = 0.01
 Critical depth calculation tolerance = 0.01
 Maximum number of iterations = 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: 10 year SCS Type I
 Flow File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\CARTER CANYON CREEK.f03

Flow Data (cfs)

River	Reach	RS	Pre-Fire	Post-Fire
Reach #2	Carter Canyon	2000	99	393

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Reach #2	Carter Canyon	Pre-Fire		Normal S = 0.02
Reach #2	Carter Canyon	Post-Fire		Normal S = 0.02

GEOMETRY DATA

Geometry Title: Edited Geometry
 Geometry File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\CARTER CANYON CREEK.g03

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 2000

INPUT

Description:

Station Elevation Data		num= 23	
Sta	Elev	Sta	Elev
0	8045	8040	17.54
34.81	8025	8020	50.82
78.85	8000	80.67	7999.26
109.11	7982.19	120.24	7985
187.1	8005	198.86	8010

Manning's n Values

Sta	n Val	Sta	n Val
0	.055	103.5	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	103.5	120.24		254.41	256.17	252.38	.1 .3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1990

INPUT

Description:
 Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	8005	9.41	8000	18.78	7995	28.25	7990	38.26	7985
51.76	7980	59.42	7977.48	66.51	7975	79.6	7970	92.57	7965
105.45	7960	118.09	7955	130.54	7950	139.17	7946.4	175.2	7945.54
182.85	7950	192.56	7955	200.57	7960	207.4	7965	214.12	7970
220.93	7975	227.71	7980	234.64	7985	235.37	7985.55	244.39	7986.76
250.47	7990	260.21	7995	269.88	8000	279.52	8005		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	130.54	.04	182.85	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 130.54 182.85 274.35 282.15 287.47 .1 .3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1980

INPUT

Description:
 Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7950	13.88	7945	27.45	7940	41.07	7935	47.99	7932.49
55.31	7930	70.15	7925	84.95	7920	98.87	7915	113.5	7910
122.37	7907.53	144.15	7910	147.09	7910	150.85	7910	177.55	7915
190.35	7920	201.96	7925	213.55	7930	225.18	7935	237.36	7940
242.14	7942.16	254.74	7945	283.23	7950				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	113.5	.04	144.15	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 113.5 144.15 254.12 242.71 241.57 .1 .3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1970

INPUT

Description:
 Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7905	14.23	7900	28.2	7895	42.06	7890	46.37	7888.38
73	7885	97.67	7880	103.71	7878.15	153.58	7877.26	155.42	7876.517
159.18	7875	167.22	7871.91	173.33	7875	179.21	7877.952	183.29	7880
193.29	7885	203.14	7890	212.66	7895	222.28	7900	232.57	7905
243.1	7910	243.32	7910.13	255.45	7915	266.14	7920	280.97	7925
293.76	7930								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	155.42	.04	179.21	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 153.58 183.29 332.19 337.86 359.72 .1 .3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1960

INPUT

Description:
 Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7880	20.5	7875	41.15	7870	73.23	7865	103.32	7860
120.46	7855	121.39	7854.77	134.5	7851.85	142.72	7850	171.15	7845
175.29	7844.43	185.33	7840	188.61	7838.51	205.88	7835	225.9	7831.8
240.27	7830	250.73	7828.39	280.4	7829.76	281.49	7830	300.68	7835
314.68	7840	323.82	7845	332.94	7850	342	7855	352.2	7860
364.48	7865	375.81	7870	387.38	7875	397.92	7880	409	7885
418.64	7886.93	443.75	7890						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	240.27	.04	281.49	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 240.27 281.49 239.94 147 195.48 .1 .3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1950

INPUT

Description:
 Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7880	15.71	7875	33.18	7870	48.63	7865	63.76	7860
79.75	7855	96.79	7850	112.05	7845	113.19	7844.49	130.94	7843.12
140.18	7840	155.27	7835	168.91	7830	186.94	7825	201.74	7820
208.68	7817.54	217.11	7815	233.65	7810	240.99	7807.93	250.88	7805
253.04	7804.38	255.17	7805	264.76	7807.91	306.8	7807.91	315.53	7810
332.52	7815	349.79	7820	368.41	7825	387.74	7830	401.54	7833.94
413.53	7835	441.27	7837.41	450.81	7840				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 240.99 C 264.76 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 240.99 264.76 171.44 130.77 155 .1 .3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1940

INPUT

Description:
 Station Elevation Data num= 27
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7850 10.51 7845 21.54 7840 32.26 7835 43.29 7830
 58.76 7825 74.61 7820 96.44 7815 110.38 7810 124.71 7805
 138.97 7800 152.44 7795 157.92 7792.58 165.36 7790 176.78 7786.41
 183.31 7790 187.91 7792.43 240.63 7792.26 251.18 7795 270.37 7800
 289.63 7805 310.63 7810 332.01 7815 342.23 7817.33 359.37 7820
 365.09 7821.51 381.02 7820

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 165.36 .04 183.31 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 157.92 187.91 155.48 150.5 128.56 .1 .3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1930

INPUT

Description:
 Station Elevation Data num= 26
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7825 14.77 7820 28.55 7815 42.04 7810 56.78 7805
 71.7 7800 86.85 7795 101.46 7790 107.37 7788.07 123.46 7785
 139.92 7780 147.24 7777.69 155.14 7775 156.83 7773.91 160.02 7775
 169.76 7777.91 230.28 7778.62 235.15 7780 251.77 7785 265.98 7790
 276.41 7795 286.06 7800 295.86 7805 299.9 7807.08 315.17 7810
 338.94 7815

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 147.24 0 169.76 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 147.24 169.76 95.72 87.86 77.51 .3 .5

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1920

INPUT

Description: XSEC Upstream of Culvert # 15
 Station Elevation Data num= 34
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7795 21.78 7790 29.21 7788.07 40.61 7785 58.94 7780
 87.49 7775 133.17 7770 136.3 7768.68 145.34 7765 146.35 7764.59
 148.27 7765 168.77 7769.25 205.05 7769.49 206.52 7770 222.71 7775
 238.8 7780 251.28 7785 259.8 7788.12 275.09 7790 277.81 7790.35
 283.49 7795 289.16 7800 294.96 7805 295.05 7805

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 136.3 0 168.77 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 136.3 168.77 20.28 21.1 23.47 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 140.85 7769 F
 153 295.05 7769 F

CULVERT

RIVER: Reach #2
 REACH: Carter Canyon RS: 1915

INPUT

Description: Culvert #15
 Distance from Upstream XS = 3
 Deck/Roadway Width = 12
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates num= 4
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 140.84 7772.5 153.84 7772.5 153.85 7769
 200 7768.08

Upstream Bridge Cross Section Data
 Station Elevation Data num= 24
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7795 21.78 7790 29.21 7788.07 40.61 7785 58.94 7780
 87.49 7775 133.17 7770 136.3 7768.68 145.34 7765 146.35 7764.59
 148.27 7765 168.77 7769.25 205.05 7769.49 206.52 7770 222.71 7775
 238.8 7780 251.28 7785 259.8 7788.12 275.09 7790 277.81 7790.35
 283.49 7795 289.16 7800 294.96 7805 295.05 7805

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 136.3 0 168.77 0

Bank Sta: Left Right Coeff Contr. Expan.
 136.3 168.77 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 140.85 7769 F
 153 295.05 7769 F

Downstream Deck/Roadway Coordinates
 num= 4
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 148.5 7770.5 161.5 7770.5 161.51 7767
 230 7766.08

Downstream Bridge Cross Section Data
 Station Elevation Data num= 22
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7795 21.7 7790 30.65 7788.07 41.77 7785 59.95 7780
 80.55 7775 85.99 7773.79 134.54 7770 142.79 7766.8 148.27 7765
 151.21 7763.08 153.93 7762.93 160.73 7763.14 166.08 7765 177.49 7766.96
 226.61 7767.89 233.49 7770 247.27 7775 261.91 7780 276.4 7785
 285.77 7790 293.21 7794.27

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 142.79 0 177.49 0

Bank Sta: Left Right Coeff Contr. Expan.
 142.79 177.49 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 150 7767 F
 162.41 293.21 7767 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 =
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 3 12 .024 .024 0 .5 1

Number of Barrels = 2
 Upstream Elevation = 7765
 Centerline Stations
 Sta. Sta.
 145.34 149.34
 Downstream Elevation = 7763.15
 Centerline Stations
 Sta. Sta.
 153.33 157.33

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1910

INPUT

Description: XSEC Downstream of Culvert # 15
 Station Elevation Data num= 22
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7795 21.7 7790 30.65 7788.07 41.77 7785 59.95 7780
 80.55 7775 85.99 7773.79 134.54 7770 142.79 7766.8 148.27 7765
 151.21 7763.08 153.93 7762.93 160.73 7763.14 166.08 7765 177.49 7766.96
 226.61 7767.89 233.49 7770 247.27 7775 261.91 7780 276.4 7785
 285.77 7790 293.21 7794.27

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 142.79 0 177.49 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 142.79 177.49 117.95 89.97 84.42 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 150 7767 F
 162.41 293.21 7767 F

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1905

INPUT

Description:
 Station Elevation Data num= 22
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7780 21.24 7775 40.45 7770 56.16 7765.91 72.37 7765
 116.45 7760 143.29 7756.26 159.35 7760 168.13 7761.98 205.41 7763.75
 210.7 7765 231.16 7770 251.73 7775 265.36 7780 278.59 7785
 279.76 7785.46 320.24 7787.71 328.41 7790 345.1 7795 356.92 7800
 361.63 7802.01 374.44 7805

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 116.45 0 159.35 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 116.45 159.35 56.03 57.39 58.41 .3 .5

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1900

INPUT

Description: Upstream of Culvert #14

Station Elevation Data num= 24											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770.33	1.92	7770	30.46	7765	56.2	7760	58.5	7759.58		
108.51	7756.83	135.03	7755.34	135.92	7753.57	141.06	7753.56	148	7753.54		
152.14	7756.16	166.86	7756.81	182.87	7757.533	202.16	7758.41	210.16	7760		
230.64	7765	236.44	7766.583	248.96	7770	265.28	7775	280.58	7780		
297.92	7785	316.92	7790	332.05	7795	343.72	7800				

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	135.03	0	152.14	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	135.03	152.14		59.12	52.85	39.83	.3	.5
Ineffective Flow num= 2								
Sta L	Sta R	Elev	Permanent					
0	137.39	7756	F					
147.26	343.72	7756	F					

CULVERT

RIVER: Reach #2

REACH: Carter Canyon RS: 1892.5

INPUT

Description: Culvert #14

Distance from Upstream XS =	3								
Deck/Roadway Width =	40								
Weir Coefficient =	3.1								
Upstream Deck/Roadway Coordinates num= 2									
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
108.51	7756.83			166.86	7756.81				

Upstream Bridge Cross Section Data num= 24											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770.33	1.92	7770	30.46	7765	56.2	7760	58.5	7759.58		
108.51	7756.83	135.03	7755.34	135.92	7753.57	141.06	7753.56	148	7753.54		
152.14	7756.16	166.86	7756.81	182.87	7757.533	202.16	7758.41	210.16	7760		
230.64	7765	236.44	7766.583	248.96	7770	265.28	7775	280.58	7780		
297.92	7785	316.92	7790	332.05	7795	343.72	7800				

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	135.03	0	152.14	0

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	135.03	152.14		.3	.5
Ineffective Flow num= 2					
Sta L	Sta R	Elev	Permanent		
0	137.39	7756	F		
147.26	343.72	7756	F		

Downstream Deck/Roadway Coordinates num= 2									
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
183.72	7753.47			230.95	7753.53				

Downstream Bridge Cross Section Data num= 19											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
95.18	7762.83	142	7760	170.52	7755	183.72	7753.47	192.5	7752.43		
197.3	7747.9	207.68	7747.71	219.81	7747.88	230.95	7753.53	264.7	7754.41		
267.47	7755	288.88	7760	305.25	7765	319.31	7770	332.76	7775		
346.39	7780	362.95	7785	380.46	7790	393.63	7795				

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
95.18	0	192.5	0	230.95	0

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	192.5	230.95		.3	.5

- Upstream Embankment side slope = 1 horiz. to 1.0 vertical
- Downstream Embankment side slope = 1 horiz. to 1.0 vertical
- Maximum allowable submergence for weir flow = .95
- Elevation at which weir flow begins =
- 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 # 2 - Corrugated Metal Pipe Culvert						
FHWA Scale # 3 - Pipe projecting from fill						
Solution Criteria = Highest U.S. EG						
Culvert Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
3	40	.024	.024	0	.9	1

Number of Barrels =	2
Upstream Elevation =	7753.56
Centerline Stations	
Sta.	Sta.
139.95	145.69
Downstream Elevation =	7750
Centerline Stations	
Sta.	Sta.
204.51	214.23

CROSS SECTION

RIVER: Reach #2

REACH: Carter Canyon RS: 1885

INPUT

Description: XSEC Downstream of Culvert # 14

Station Elevation Data num= 19											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

95.18	7762.83	142	7760	170.52	7755	183.72	7753.47	192.5	7752.43
197.3	7747.9	207.68	7747.71	219.81	7747.88	230.95	7753.53	264.7	7754.41
267.47	7755	288.88	7760	305.25	7765	319.31	7770	332.76	7775
346.39	7780	362.95	7785	380.46	7790	393.63	7795		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 95.18 0 192.5 0 230.95 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 192.5 230.95 81.97 108.19 160.19 .3 .5

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1880

INPUT
 Description: Upstream of Culvert #13
 Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7760	18.47	7755	24.55	7753.31	71.34	7755	109.86	7755
152.93	7750	176.48	7745	216.81	7740	224.29	7736.14	229.4	7736.19
231.76	7736.13	235.42	7740	237.64	7741.47	300.41	7741.41	304.11	7742.561
311.96	7745	328.42	7750	328.84	7750.12	382.56	7753.02		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 216.81 0 237.64 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 216.81 237.64 46.39 50.55 56.56 .3 .5

CULVERT

RIVER: Reach #2
 REACH: Carter Canyon RS: 1872.5

INPUT
 Description: Culvert #13
 Distance from Upstream XS = 3
 Deck/Roadway Width = 40
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates
 num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
216.81		7740			237.64		7741.47		

Upstream Bridge Cross Section Data
 Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7760	18.47	7755	24.55	7753.31	71.34	7755	109.86	7755
152.93	7750	176.48	7745	216.81	7740	224.29	7736.14	229.4	7736.19
231.76	7736.13	235.42	7740	237.64	7741.47	300.41	7741.41	304.11	7742.561
311.96	7745	328.42	7750	328.84	7750.12	382.56	7753.02		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 216.81 0 237.64 0

Bank Sta: Left Right Coeff Contr. Expan.
 216.81 237.64 .3 .5

Downstream Deck/Roadway Coordinates
 num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
217.02		7735			237.64		7735.53		

Downstream Bridge Cross Section Data
 Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
71	7746.49	135.67	7747.76	165.45	7745.44	169.17	7745	203.36	7740
217.02	7735	223.2	7731.08	228.67	7730.96	231.57	7731.05	236.58	7735
251.48	7735	277.75	7735	315.77	7740	341.7	7745	361.84	7750
378.35	7755	393.64	7759.59	408.03	7759.93	408.35	7760		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 71 0 217.02 0 236.58 0

Bank Sta: Left Right Coeff Contr. Expan.
 217.02 236.58 .3 .5

Ineffective Flow num= 2

Sta	L	Sta	R	Elev	Permanent
71	223.01	7734	F		
231.57	408.35	7734	F		

Upstream Embankment side slope = 1 horiz. to 1.0 vertical
 Downstream Embankment side slope = 1 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .95
 Elevation at which weir flow begins = 7740
 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 1
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall

Solution Criteria = Highest U.S. BD

Culvert	Upstrm	Dist	Length	Top	Bottom	n	Depth	Blocked	Entrance	Loss	Coeff	Exit	Loss	Coeff
			3	40	.024	.024	0			.5		1		

Number of Barrels = 2
 Upstream Elevation = 7736.1
 Centerline Stations

Sta.	Sta.	Sta.
225.97	229.96	

 Downstream Elevation = 7731.09
 Centerline Stations

Sta.	Sta.

225.48 229.86

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1865

INPUT

Description: XSection Downstream of Culvert # 13

Station Elevation Data		num= 19		Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
71	7746.49	135.67	7747.76	165.45	7745.44	169.17	7745	203.36	7740		
217.02	7735	223.2	7731.08	228.67	7730.96	231.57	7731.05	236.58	7735		
251.48	7735	277.75	7735	315.77	7740	341.7	7745	361.84	7750		
378.35	7755	393.64	7759.59	408.03	7759.93	408.35	7760				

Manning's n Values		num= 3		Sta	n Val	Sta	n Val	Sta	n Val
71	0	217.02	0	236.58	0				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	217.02	236.58		73.14	76.92	75.1	.3	.5

Ineffective Flow		num= 2		Sta L	Sta R	Elev	Permanent
71	223.01	7734	F				
231.57	408.35	7734	F				

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1860

INPUT

Description:

Station Elevation Data		num= 23		Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7755	17.84	7750	40.74	7745	72.59	7740	86	7735		
87.92	7734.12	123.13	7730	143.75	7725.99	147.98	7725	158.71	7722.02		
169.16	7725	173.27	7726.19	207.09	7726.7	224.66	7730	249.44	7735		
272.84	7740	291.06	7745	307.57	7750	323.14	7755	338.27	7759.89		
340.05	7760	352.74	7760.86	372.02	7765						

Manning's n Values		num= 3		Sta	n Val	Sta	n Val	Sta	n Val
0	0	143.75	0	173.27	0				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	143.75	173.27		108.23	97.78	82.66	.3	.5

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1850

INPUT

Description: XSection Upstream of Culvert # 12

Station Elevation Data		num= 27		Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7760	4.91	7758.28	25.95	7755	50.68	7750	72.48	7745		
93.37	7740	112.74	7735	130.77	7730	148.47	7725	165.51	7720		
193.76	7715	207.27	7713.01	214.2	7715	221.75	7717.14	252.72	7718.5		
259.35	7720	296.89	7725	312.95	7730	318.7	7735	322.99	7738.73		
326.83	7740	341.83	7745	356.83	7750	370.8	7754.82	371.94	7755		
395.41	7758.13	399.94	7760								

Manning's n Values		num= 3		Sta	n Val	Sta	n Val	Sta	n Val
0	.055	193.76	.035	214.2	.055				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	193.76	221.75		36.39	32.29	38.67	.3	.5

Ineffective Flow		num= 2		Sta L	Sta R	Elev	Permanent
0	200.71	7716.5	F				
213.62	399.94	7716.5	F				

CULVERT

RIVER: Reach #2
REACH: Carter Canyon RS: 1845

INPUT

Description: Culvert #12

Distance from Upstream XS = 5
Deck/Roadway Width = 20
Weir Coefficient = 3.1

Upstream Deck/Roadway Coordinates

num= 3		Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
0	7720.64	207.27	7716.5	225	7716.2		

Upstream Bridge Cross Section Data

Station Elevation Data		num= 27		Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7760	4.91	7758.28	25.95	7755	50.68	7750	72.48	7745		
93.37	7740	112.74	7735	130.77	7730	148.47	7725	165.51	7720		
193.76	7715	207.27	7713.01	214.2	7715	221.75	7717.14	252.72	7718.5		
259.35	7720	296.89	7725	312.95	7730	318.7	7735	322.99	7738.73		
326.83	7740	341.83	7745	356.83	7750	370.8	7754.82	371.94	7755		
395.41	7758.13	399.94	7760								

Manning's n Values		num= 3		Sta	n Val	Sta	n Val	Sta	n Val
0	.055	193.76	.035	214.2	.055				

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	193.76	221.75	.3	.5	

Ineffective Flow		num= 2		Sta L	Sta R	Elev	Permanent
0	200.71	7716.5	F				

213.62 399.94 7716.5 F
 Downstream Deck/Roadway Coordinates
 num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7718.28 207.27 7713.79 225 7713.84

Downstream Bridge Cross Section Data
 Station Elevation Data num= 23
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7760 9.09 7757.41 19.7 7755 42.41 7750 61.41 7745
 75.19 7740 89.54 7735 112.83 7730 153.96 7725 174.74 7720
 189.16 7715 203.8 7709.96 218.79 7713.8 239.91 7715 246.57 7715.37
 309.52 7720 316.82 7725 324.06 7730 331.29 7735 336.79 7738.73
 341.04 7740 358.41 7745 393.61 7750

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 189.16 0 218.79 0

Bank Sta: Left Right Coeff Contr. Expan.
 189.16 218.79 .3 .5

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 =
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 3 - Pipe projecting from fill
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 5 20 .024 .024 0 .9 1
 Upstream Elevation = 7713.01
 Centerline Station = 207.27
 Downstream Elevation = 7709.96
 Centerline Station = 203.8

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1840

INPUT
 Description: XSection Downstream of Culvert # 12
 Station Elevation Data num= 23
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7760 9.09 7757.41 19.7 7755 42.41 7750 61.41 7745
 75.19 7740 89.54 7735 112.83 7730 153.96 7725 174.74 7720
 189.16 7715 203.8 7709.96 218.79 7713.8 239.91 7715 246.57 7715.37
 309.52 7720 316.82 7725 324.06 7730 331.29 7735 336.79 7738.73
 341.04 7740 358.41 7745 393.61 7750

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 189.16 0 218.79 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 189.16 218.79 70.59 68.23 61.25 .3 .5

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1830

INPUT
 Description: XSection Upstream of Culvert # 11
 Station Elevation Data num= 20
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7750 22.07 7745 36.84 7740.93 40.61 7740 66.06 7735
 90.58 7730 115.88 7725 143.42 7720 167.54 7715 186.51 7710
 202.55 7705.6 213.94 7708.11 237.53 7709.18 240.55 7710 268.87 7715
 308.86 7720 320.56 7725 334.2 7730 348.11 7735 376.32 7740

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 186.51 0 213.94 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 186.51 213.94 20 20 20 .3 .5

CULVERT

RIVER: Reach #2
 REACH: Carter Canyon RS: 1825

INPUT
 Description: Culvert #11
 Distance from Upstream XS = 4
 Deck/Roadway Width = 11.5
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates
 num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7716.09 203 7710 243 7708.8

Upstream Bridge Cross Section Data
 Station Elevation Data num= 20
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7750 22.07 7745 36.84 7740.93 40.61 7740 66.06 7735
 90.58 7730 115.88 7725 143.42 7720 167.54 7715 186.51 7710
 202.55 7705.6 213.94 7708.11 237.53 7709.18 240.55 7710 268.87 7715
 308.86 7720 320.56 7725 334.2 7730 348.11 7735 376.32 7740

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 186.51 0 213.94 0

Bank Sta: Left Right Coeff Contr. Expan.
 186.51 213.94 .3 .5

Downstream Deck/Roadway Coordinates
 num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7716.09 201.26 7710 241.26 7708.6

Downstream Bridge Cross Section Data
 Station Elevation Data num= 20
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7752 17.34 7747 34.1 7742 50.53 7737 71.38 7732
 93.31 7727 117.09 7722 142.32 7717 165.88 7712 189.29 7707
 199.87 7704.77 209.74 7707.02 209.75 7707 228.15 7708.14 249.6 7712
 285.04 7717 311.47 7722 335.19 7727 370.44 7732 409.15 7737

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 189.29 0 209.74 0

Bank Sta: Left Right Coeff Contr. Expan.
 189.29 209.74 .3 .5

Upstream Embankment side slope = 1 horiz. to 1.0 vertical
 Downstream Embankment side slope = 1 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .95
 Elevation at which weir flow begins =
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 3 - Pipe projecting from fill
 Solution Criteria = Highest U.S. EC
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 .5 18.5 .024 .024 0 .9 1
 Upstream Elevation = 7705.6
 Centerline Station = 202.55
 Downstream Elevation = 7704.77
 Centerline Station = 199.87

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1821

INPUT
 Description: XSection Downstream of Culvert # 11
 Station Elevation Data num= 20
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7752 17.34 7747 34.1 7742 50.53 7737 71.38 7732
 93.31 7727 117.09 7722 142.32 7717 165.88 7712 189.29 7707
 199.87 7704.77 209.74 7707.02 209.75 7707 228.15 7708.14 249.6 7712
 285.04 7717 311.47 7722 335.19 7727 370.44 7732 409.15 7737

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 189.29 0 209.74 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 189.29 209.74 14.12 14.93 19.04 .3 .5

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1820

INPUT
 Description: XSection Downstream of Culvert # 11
 Station Elevation Data num= 20
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7750 17.34 7745 34.1 7740 50.53 7735 71.38 7730
 93.31 7725 117.09 7720 142.32 7715 165.88 7710 189.29 7705
 199.87 7702.77 209.74 7705.02 209.75 7705 228.15 7706.14 249.6 7710
 285.04 7715 311.47 7720 335.19 7725 370.44 7730 409.15 7735

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 189.29 0 209.74 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 189.29 209.74 86.19 63.36 66.35 .3 .5

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1815

INPUT
 Description: XSection Upstream of Culvert # 10
 Station Elevation Data num= 22
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7750 17.02 7745 31.17 7740 46.82 7735 61.54 7730
 77.31 7725 93.45 7720 112.1 7715 150.36 7710 173.55 7705
 194.33 7700 194.51 7694.89 198.99 7694.84 200.21 7700 204.34 7701.56
 225.4 7702.16 278.01 7705 306.27 7710 331.89 7715 355.86 7720
 388.5 7725 419.36 7730

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 194.33 0 204.34 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

194.33 204.34 71.48 76.69 51.22 .3 .5

CULVERT

RIVER: Reach #2
REACH: Carter Canyon RS: 1807.5

INPUT

Description: Culvert #10
Distance from Upstream XS = 7.63
Deck/Roadway Width = 67
Weir Coefficient = 3.1
Upstream Deck/Roadway Coordinates

num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
194.33 7699.62 204.34 7699.62

Upstream Bridge Cross Section Data

Station Elevation Data num= 22
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7750 17.02 7745 33.17 7740 46.92 7735 61.54 7730
77.31 7725 93.45 7720 112.1 7715 150.36 7710 173.55 7705
194.33 7700 194.51 7694.89 198.99 7694.84 200.21 7700 204.34 7701.56
225.4 7702.16 278.01 7705 306.27 7710 331.89 7715 355.66 7720
388.5 7725 419.36 7730

Manning's n Values

num= 3
Sta n Val Sta n Val Sta n Val
0 0 194.33 0 204.34 0

Bank Sta: Left Right Coeff Contr. Expan.
194.33 204.34 .3 .5

Downstream Deck/Roadway Coordinates

num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
175 7697.07 300 7697.07

Downstream Bridge Cross Section Data

Station Elevation Data num= 19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7720 56.76 7715.16 71.13 7715 88.13 7713 134.29 7710
144.47 7709.38 156.71 7705 173.25 7700 181.91 7698.81 216.75 7698.24
228.677695.657 231.7 7695 249.79 7692 275.8 7695 301.06 7700
320.33 7705 339.01 7710 361.86 7715 408.3 7720

Manning's n Values

num= 3
Sta n Val Sta n Val Sta n Val
0 0 216.75 0 301.06 0

Bank Sta: Left Right Coeff Contr. Expan.
216.75 301.06 .3 .5

Ineffective Flow

num= 2
Sta L Sta R Elev Permanent
0 226 7697 F
278 408.3 7697 F

Upstream Embankment side slope = 1 horiz. to 1.0 vertical
Downstream Embankment side slope = 3 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 7698.49
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 3.5

FHWA Chart # 2 - Corrugated Metal Pipe Culvert

FHWA Scale # 1 - Headwall

Solution Criteria = Highest U.S. EG

Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef

7.63 65 .024 .024 0 .5 1

Upstream Elevation = 7695.03

Centerline Station = 197.13

Downstream Elevation = 7691.94

Centerline Station = 252

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1800

INPUT

Description: XSection Downstream of Culvert #10

Station Elevation Data num= 19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7720 56.76 7715.16 71.13 7715 88.13 7713 134.29 7710
144.47 7709.38 156.71 7705 173.25 7700 181.91 7698.81 216.75 7698.24
228.677695.657 231.7 7695 249.79 7692 275.8 7695 301.06 7700
320.33 7705 339.01 7710 361.86 7715 408.3 7720

Manning's n Values

num= 3
Sta n Val Sta n Val Sta n Val
0 0 216.75 0 301.06 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
216.75 301.06 65.85 52 50.16 .3 .5

Ineffective Flow

num= 2
Sta L Sta R Elev Permanent
0 226 7697 F
278 408.3 7697 F

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1795

INPUT

Description:

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7715	96.45	7710	154.09	7708.76	165.68	7705	175.71	7700
178.06	7698.74	215.72	7698.22	230.02	7695	253.66	7690	271.74	7686.94
289.49	7690	319.56	7695	340.08	7700	357.65	7705	401.45	7710
433.12	7715	457.87	7720						

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	253.66	.045	289.49	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	253.66	289.49		71.79	68.66	66.12	.1	.3

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1790

INPUT
Description:

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7700	155.98	7700	196.65	7697.57	209.43	7695	232.88	7690
257.35	7685	275.88	7681.23	300.64	7685	331.91	7690	361.89	7695
392.25	7700	422.5	7705	451.89	7710	485.19	7714.99	485.37	7715

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	257.35	.045	300.64	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	257.35	300.64		163.71	173.13	165.52	.1	.3

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1780

INPUT
Description:

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7690	14.55	7695	23.27	7680	31.87	7675	39.36	7670.58
140.13	7670.55	145.48	7670	172.45	7667.42	196.61	7670	248.11	7675
282.71	7680	324.52	7685	363.05	7690				

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	140.13	.045	196.61	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	140.13	196.61		150.3	144.77	149.38	.1	.3

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1770

INPUT
Description:

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
52.98	7664.11	70.45	7660	80.94	7657.67	90.2	7655.88	111.25	7655.66
120.57	7654.95	143.45	7657.47	166.51	7660	214.89	7665	254.62	7670
273.01	7670								

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
52.98	.055	80.94	.045	143.45	.055

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	80.94	143.45		.1	.3

SUMMARY OF MANNING'S N VALUES

River: Reach #2

Reach	River Sta.	n1	n2	n3
Carter Canyon	2000	.055	.045	.045
Carter Canyon	1990	.055	.04	.035
Carter Canyon	1980	.055	.04	.035
Carter Canyon	1970	.055	.04	.035
Carter Canyon	1960	.055	.04	.035
Carter Canyon	1950	0	0	0
Carter Canyon	1940	.055	.04	.035
Carter Canyon	1930	0	0	0
Carter Canyon	1920	0	0	0
Carter Canyon	1915	Culvert		
Carter Canyon	1910	0	0	0
Carter Canyon	1905	0	0	0
Carter Canyon	1900	0	0	0
Carter Canyon	1892.5	Culvert		
Carter Canyon	1885	0	0	0
Carter Canyon	1880	0	0	0
Carter Canyon	1872.5	Culvert		
Carter Canyon	1865	0	0	0
Carter Canyon	1860	0	0	0
Carter Canyon	1850	.055	.035	.055
Carter Canyon	1845	Culvert		
Carter Canyon	1840	0	0	0
Carter Canyon	1830	0	0	0
Carter Canyon	1825	Culvert		
Carter Canyon	1821	0	0	0
Carter Canyon	1820	0	0	0
Carter Canyon	1815	0	0	0
Carter Canyon	1807.5	Culvert		
Carter Canyon	1800	0	0	0

Carter Canyon	1795	.055	.045	.055
Carter Canyon	1790	.055	.045	.055
Carter Canyon	1780	.055	.045	.055
Carter Canyon	1770	.055	.045	.055

SUMMARY OF REACH LENGTHS

River: Reach #2

Reach	River Sta.	Left	Channel	Right
Carter Canyon	2000	254.41	256.17	252.38
Carter Canyon	1990	274.35	282.15	287.47
Carter Canyon	1980	254.12	242.71	241.57
Carter Canyon	1970	132.19	137.86	159.72
Carter Canyon	1960	239.94	147	195.48
Carter Canyon	1950	171.44	130.77	155
Carter Canyon	1940	155.48	150.5	128.56
Carter Canyon	1930	95.72	87.86	77.51
Carter Canyon	1920	20.28	21.1	23.47
Carter Canyon	1915	Culvert		
Carter Canyon	1910	117.95	89.97	84.42
Carter Canyon	1905	56.03	57.39	58.41
Carter Canyon	1900	59.12	52.85	39.83
Carter Canyon	1892.5	Culvert		
Carter Canyon	1885	81.97	108.19	160.19
Carter Canyon	1880	46.39	50.55	56.56
Carter Canyon	1872.5	Culvert		
Carter Canyon	1865	73.14	76.92	75.1
Carter Canyon	1860	108.23	97.78	82.66
Carter Canyon	1850	36.39	12.29	38.67
Carter Canyon	1845	Culvert		
Carter Canyon	1840	70.59	68.23	61.25
Carter Canyon	1830	20	20	20
Carter Canyon	1825	Culvert		
Carter Canyon	1821	14.12	14.93	19.04
Carter Canyon	1820	86.19	63.38	66.35
Carter Canyon	1815	71.48	76.69	51.22
Carter Canyon	1807.5	Culvert		
Carter Canyon	1800	65.85	52	50.16
Carter Canyon	1795	71.79	68.66	66.12
Carter Canyon	1790	163.71	173.13	165.52
Carter Canyon	1780	150.3	144.77	149.38
Carter Canyon	1770			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Reach #2

Reach	River Sta.	Contr.	Expan.
Carter Canyon	2000	.1	.3
Carter Canyon	1990	.1	.3
Carter Canyon	1980	.1	.3
Carter Canyon	1970	.1	.3
Carter Canyon	1960	.1	.3
Carter Canyon	1950	.1	.3
Carter Canyon	1940	.1	.3
Carter Canyon	1930	.3	.5
Carter Canyon	1920	.3	.5
Carter Canyon	1915	Culvert	
Carter Canyon	1910	.3	.5
Carter Canyon	1905	.3	.5
Carter Canyon	1900	.3	.5
Carter Canyon	1892.5	Culvert	
Carter Canyon	1885	.3	.5
Carter Canyon	1880	.3	.5
Carter Canyon	1872.5	Culvert	
Carter Canyon	1865	.3	.5
Carter Canyon	1860	.3	.5
Carter Canyon	1850	.3	.5
Carter Canyon	1845	Culvert	
Carter Canyon	1840	.3	.5
Carter Canyon	1830	.3	.5
Carter Canyon	1825	Culvert	
Carter Canyon	1821	.3	.5
Carter Canyon	1820	.3	.5
Carter Canyon	1815	.3	.5
Carter Canyon	1807.5	Culvert	
Carter Canyon	1800	.3	.5
Carter Canyon	1795	.1	.3
Carter Canyon	1790	.1	.3
Carter Canyon	1780	.1	.3
Carter Canyon	1770	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #	Chl
Carter Canyon	2000	Pre-Fire	99.00	7982.19	7984.51	7984.51	7985.10	0.031116	6.18	16.02	13.81	1.01	
Carter Canyon	2000	Post-Fire	393.00	7982.19	7986.22	7986.22	7987.36	0.020780	8.70	47.82	23.25	0.95	
Carter Canyon	1990	Pre-Fire	99.00	7945.54	7946.57	7946.57	7946.87	0.029196	4.42	22.39	38.19	1.02	
Carter Canyon	1990	Post-Fire	393.00	7945.54	7947.46	7947.46	7948.17	0.023066	6.74	58.32	41.88	1.01	
Carter Canyon	1980	Pre-Fire	99.00	7907.53	7909.26	7909.26	7909.70	0.025633	5.34	18.54	21.45	1.01	
Carter Canyon	1980	Post-Fire	393.00	7907.53	7910.50	7910.50	7911.23	0.017605	6.83	57.69	41.51	0.91	
Carter Canyon	1970	Pre-Fire	99.00	7871.91	7874.49	7874.49	7875.15	0.024471	6.49	15.25	11.82	1.01	
Carter Canyon	1970	Post-Fire	393.00	7871.91	7876.38	7876.38	7877.53	0.021846	8.60	45.69	20.33	1.01	
Carter Canyon	1960	Pre-Fire	99.00	7828.39	7829.64	7829.64	7829.96	0.028113	4.53	21.85	35.08	1.01	
Carter Canyon	1960	Post-Fire	393.00	7828.39	7830.54	7830.54	7831.23	0.021688	6.67	60.17	47.65	0.99	
Carter Canyon	1950	Pre-Fire	99.00	7804.38	7806.57	7806.57	7807.14	0.024625	6.06	16.34	14.79	1.02	
Carter Canyon	1950	Post-Fire	393.00	7804.38	7808.34	7808.34	7808.82	0.009453	5.75	70.82	69.04	0.68	

Carter Canyon	1940	Pre-Fire	99.00	7786.41	7788.90	7788.90	7789.53	0.024402	6.38	15.53	12.46	1.01
Carter Canyon	1940	Post-Fire	393.00	7786.41	7790.74	7790.74	7791.83	0.021342	8.38	46.88	21.50	1.00
Carter Canyon	1930	Pre-Fire	99.00	7773.91	7776.42	7776.42	7777.02	0.025035	6.19	15.98	13.83	1.02
Carter Canyon	1930	Post-Fire	393.00	7773.91	7778.53	7778.53	7779.00	0.007941	5.75	74.76	77.91	0.64
Carter Canyon	1920	Pre-Fire	99.00	7764.59	7768.90	7766.76	7768.99	0.000846	2.38	41.61	31.33	0.23
Carter Canyon	1920	Post-Fire	393.00	7764.59	7770.36	7768.69	7770.46	0.000965	2.52	154.90	77.75	0.24
Carter Canyon	1915	Culvert										
Carter Canyon	1910	Pre-Fire	99.00	7762.93	7764.40	7764.40	7765.01	0.016448	6.28	15.78	15.15	0.98
Carter Canyon	1910	Post-Fire	393.00	7762.93	7766.24	7766.24	7767.85	0.014692	10.16	38.66	28.81	1.01
Carter Canyon	1905	Pre-Fire	99.00	7756.26	7758.04	7758.04	7758.50	0.019492	5.43	18.23	20.45	1.01
Carter Canyon	1905	Post-Fire	393.00	7756.26	7759.36	7759.36	7760.15	0.018143	7.14	55.03	35.53	1.01
Carter Canyon	1900	Pre-Fire	99.00	7753.54	7757.08	7755.03	7757.11	0.000277	1.42	90.82	68.95	0.14
Carter Canyon	1900	Post-Fire	393.00	7753.54	7757.83	7756.76	7757.98	0.001402	3.47	153.22	98.87	0.31
Carter Canyon	1892.5	Culvert										
Carter Canyon	1885	Pre-Fire	99.00	7747.71	7748.63	7748.63	7749.03	0.020309	5.09	19.46	24.75	1.01
Carter Canyon	1885	Post-Fire	393.00	7747.71	7749.83	7749.83	7750.74	0.017545	7.65	51.36	28.39	1.00
Carter Canyon	1880	Pre-Fire	99.00	7736.13	7740.03	7737.73	7740.09	0.000662	1.35	50.76	18.91	0.21
Carter Canyon	1880	Post-Fire	393.00	7736.13	7741.72	7739.64	7741.96	0.001980	4.13	114.09	98.48	0.36
Carter Canyon	1872.5	Culvert										
Carter Canyon	1865	Pre-Fire	99.00	7730.96	7732.64	7732.64	7733.43	0.014991	7.15	13.86	12.84	0.99
Carter Canyon	1865	Post-Fire	393.00	7730.96	7734.41	7734.41	7735.63	0.016992	8.87	44.33	17.88	0.99
Carter Canyon	1860	Pre-Fire	99.00	7722.02	7724.18	7724.18	7724.73	0.008839	5.97	16.58	15.35	1.01
Carter Canyon	1860	Post-Fire	393.00	7722.02	7725.78	7725.78	7726.72	0.007821	7.79	50.46	27.22	1.01
Carter Canyon	1850	Pre-Fire	99.00	7713.01	7717.21	7714.92	7717.23	0.000183	1.27	87.79	41.94	0.14
Carter Canyon	1850	Post-Fire	393.00	7713.01	7718.24	7716.51	7718.38	0.000902	3.25	146.06	71.23	0.30
Carter Canyon	1845	Culvert										
Carter Canyon	1840	Pre-Fire	99.00	7709.96	7712.16	7712.16	7712.72	0.008801	6.02	16.46	14.97	1.01
Carter Canyon	1840	Post-Fire	393.00	7709.96	7713.77	7713.77	7714.75	0.007976	7.97	49.29	25.91	1.02
Carter Canyon	1830	Pre-Fire	99.00	7705.60	7710.06	7707.64	7710.08	0.000116	0.67	107.55	54.60	0.07
Carter Canyon	1830	Post-Fire	393.00	7705.60	7711.09	7709.09	7711.22	0.000445	1.63	168.89	64.36	0.15
Carter Canyon	1825	Culvert										
Carter Canyon	1821	Pre-Fire	99.00	7704.77	7706.74	7706.74	7707.23	0.030568	5.62	17.63	17.94	1.00
Carter Canyon	1821	Post-Fire	393.00	7704.77	7708.11	7708.11	7708.85	0.015017	6.78	58.23	43.57	0.80
Carter Canyon	1820	Pre-Fire	99.00	7702.77	7704.73	7704.73	7705.23	0.030894	5.64	17.56	17.91	1.00
Carter Canyon	1820	Post-Fire	393.00	7702.77	7706.11	7706.11	7706.85	0.015017	6.78	58.23	43.57	0.80
Carter Canyon	1815	Pre-Fire	99.00	7694.84	7700.19	7697.27	7700.38	0.005332	3.57	27.82	7.14	0.30
Carter Canyon	1815	Post-Fire	393.00	7694.84	7701.55	7701.55	7702.92	0.033014	9.58	43.90	16.42	0.86
Carter Canyon	1807.5	Culvert										
Carter Canyon	1800	Pre-Fire	99.00	7692.00	7693.62	7693.62	7694.03	0.041205	5.11	19.36	23.86	1.00
Carter Canyon	1800	Post-Fire	393.00	7692.00	7694.83	7694.83	7695.52	0.033346	6.67	58.95	41.63	0.99
Carter Canyon	1795	Pre-Fire	99.00	7686.94	7688.72	7688.72	7689.16	0.031586	5.37	18.44	20.78	1.00
Carter Canyon	1795	Post-Fire	393.00	7686.94	7690.01	7690.01	7690.80	0.026764	7.13	55.12	35.92	1.01
Carter Canyon	1790	Pre-Fire	99.00	7681.23	7683.01	7683.01	7683.47	0.032546	5.45	18.16	20.42	1.02
Carter Canyon	1790	Post-Fire	393.00	7681.23	7684.34	7684.34	7685.12	0.026072	7.08	55.49	35.70	1.00
Carter Canyon	1780	Pre-Fire	99.00	7667.42	7668.85	7668.85	7669.22	0.034392	4.88	20.28	28.35	1.02
Carter Canyon	1780	Post-Fire	393.00	7667.42	7669.91	7669.91	7670.55	0.028110	6.39	61.52	49.38	1.01
Carter Canyon	1770	Pre-Fire	99.00	7654.95	7656.29	7656.16	7656.47	0.020014	3.46	28.58	44.61	0.76
Carter Canyon	1770	Post-Fire	393.00	7654.95	7657.14	7656.99	7657.61	0.020039	5.46	72.02	56.82	0.85

Profile Output Table - Culvert Only

Reach Culv Vel DS (ft/s)	River Sta	Profile	E.G. US. (ft)	W.S. US. (ft)	E.G. IC (ft)	E.G. OC (ft)	Min El Weir (ft)	Flow (cfs)	Q Culv Group (cfs)	Q Weir (cfs)	Delta WS (ft)	Culv Vel US (ft/s)
Carter Canyon 8.55 14.24	1915	CULVERT#1	Pre-Fire	7768.99	7768.90	7768.69	7768.99	7769.01	99.00			4.51
Carter Canyon 10.31 10.31	1915	CULVERT#1	Post-Fire	7770.46	7770.36	7770.50	7770.46	7769.01	145.80	247.20		4.11
Carter Canyon 7.38 13.19	1892.5	CULVERT#1	Pre-Fire	7757.11	7757.08	7756.72	7757.11	7756.82	71.51	27.49		8.46
Carter Canyon 8.51 14.16	1892.5	CULVERT#1	Post-Fire	7757.98	7757.83	7757.71	7757.98	7756.82	98.13	294.87		8.00
Carter Canyon 8.55 16.01	1872.5	CULVERT#1	Pre-Fire	7740.09	7740.03	7739.84	7740.09	7740.01	98.94	0.06		7.40
Carter Canyon 13.99 13.99	1872.5	CULVERT#1	Post-Fire	7741.97	7741.72	7742.05	7741.97	7740.01	197.81	195.19		7.31
Carter Canyon 8.25 15.32	1845	CULVERT#1	Pre-Fire	7717.23	7717.21	7716.77	7717.23	7716.40	46.07	52.93		5.05
Carter Canyon 8.86 8.86	1845	CULVERT#1	Post-Fire	7718.39	7718.24	7718.37	7718.39	7716.40	62.64	330.36		4.47
Carter Canyon 8.59 10.77	1825	CULVERT#1	Pre-Fire	7710.08	7710.06	7709.92	7710.08	7709.06	49.99	49.01		3.32
Carter Canyon 9.22 9.22	1825	CULVERT#1	Post-Fire	7711.22	7711.09	7711.25	7711.22	7709.06	65.17	327.83		2.98
Carter Canyon 8.94 13.35	1807.5	CULVERT#1	Pre-Fire	7700.39	7700.19	7700.39	7700.31	7699.63	85.98	13.02		6.56
Carter Canyon 12.04 14.69	1807.5	CULVERT#1	Post-Fire	7702.85	7701.55	7702.85	7701.89	7699.63	115.80	277.20		6.72

HEC-RAS OUTPUT

CARTER CANYON WASH (100-YEAR)

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X X XXXXX XXXX XXXX XX XXXX
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PROJECT DATA

Project Title: Summerhaven
 Project File: CARTER CANYON CREEK.prj
 Run Date and Time: 12/19/2003 11:18:47 AM

Project in English units

Project Description:
 Carter Canyon

PLAN DATA

Plan Title: 100 year SCS Type I
 Plan File: p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\CARTER CANYON CREEK.p04

Geometry Title: Edited Geometry
 Geometry File: p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\CARTER CANYON CREEK.g03

Flow Title: 100 year SCS Type I
 Flow File: p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\CARTER CANYON CREEK.f04

Plan Summary Information:

Number of: Cross Sections = 27 Multiple Openings = 0
 Culverts = 6 Inline Structures = 0
 Bridges = 0 Lateral Structures = 0

Computational Information

Water surface calculation tolerance = 0.01
 Critical depth calculation tolerance = 0.01
 Maximum number of iterations = 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: 100 year SCS Type I
 Flow File: p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\CARTER CANYON CREEK.f04

Flow Data (cfs)

River	Reach	RS	Pre-Fire	Post-Fire
Reach #2	Carter Canyon	2000	238	666

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Reach #2	Carter Canyon	Pre-Fire		Normal S = 0.02
Reach #2	Carter Canyon	Post-Fire		Normal S = 0.02

GEOMETRY DATA

Geometry Title: Edited Geometry
 Geometry File: p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\CARTER CANYON CREEK.g03

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 2000

INPUT

Description:

Station	Elevation	Date	num=	23
Sta	Elev	Sta	Elev	Sta
0	8045	8.88	8040	17.54
34.81	8025	42.96	8020	50.82
78.85	8000	80.67	7999.26	86.91
109.11	7982.19	120.24	7985	138.54
187.1	8005	198.86	8010	209.89

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	103.5	.045	120.24	.045

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	103.5	120.24		254.41	256.17	252.38		.1	.3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1990

INPUT

Description:

Station Elevation Data		num=		29	
Sta	Elev	Sta	Elev	Sta	Elev
0	8005	9.43	8000	18.78	7995
51.76	7980	59.42	7977.48	66.51	7975
105.45	7960	118.09	7955	130.54	7950
182.85	7950	192.56	7955	200.57	7960
220.93	7975	227.71	7980	234.64	7985
250.47	7990	260.21	7995	269.88	8000

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	130.54	.04	182.85	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	130.54	182.85		279.35	282.15		.1	.3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1980

INPUT

Description:

Station Elevation Data		num=		23	
Sta	Elev	Sta	Elev	Sta	Elev
0	7950	13.88	7945	27.45	7940
55.31	7930	70.15	7925	84.95	7920
122.37	7907.53	144.15	7910	147.09	7910
190.35	7920	201.96	7925	213.55	7930
242.14	7942.16	254.74	7945	283.23	7950

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	113.5	.04	144.15	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	113.5	144.15		254.12	242.71		.1	.3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1970

INPUT

Description:

Station Elevation Data		num=		26	
Sta	Elev	Sta	Elev	Sta	Elev
0	7905	14.23	7900	28.2	7895
73	7885	97.67	7880	103.71	7878.15
159.18	7875	167.22	7871.91	172.33	7875
193.29	7885	203.14	7890	212.66	7895
242.1	7910	243.32	7910.13	255.45	7915
293.76	7930				

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	155.42	.04	179.21	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	153.58	183.29		332.19	337.86		.1	.3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1960

INPUT

Description:

Station Elevation Data		num=		32	
Sta	Elev	Sta	Elev	Sta	Elev
0	7880	20.5	7875	41.15	7870
120.46	7855	121.39	7854.77	134.5	7851.85
175.29	7844.42	185.33	7840	188.61	7838.51
240.27	7830	250.73	7828.39	280.4	7829.76
314.68	7840	323.82	7845	332.94	7850
364.48	7865	375.81	7870	387.38	7875
418.64	7886.92	442.75	7890		

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	240.27	.04	281.49	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	240.27	281.49		239.94	147		.1	.3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1950

INPUT

Description:

Station Elevation Data		num=		33	
Sta	Elev	Sta	Elev	Sta	Elev
0	7880	15.71	7875	32.18	7870
79.75	7855	96.79	7850	112.05	7845
140.18	7840	155.27	7835	168.91	7830
208.68	7817.54	217.11	7815	233.65	7810
253.04	7804.38	255.17	7805	264.76	7807.91
332.52	7815	349.79	7820	368.41	7825
413.53	7835	441.27	7837.41	450.81	7840

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 240.99 0 264.76 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 240.99 264.76 171.44 110.77 155 .1 .3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1940

INPUT

Description: Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7850	10.51	7845	21.54	7840	32.26	7835	43.29	7830
58.76	7825	74.61	7820	96.44	7815	110.38	7810	124.71	7805
138.97	7800	152.44	7795	157.92	7792.58	165.36	7790	176.78	7786.41
183.31	7790	187.91	7792.43	240.63	7792.26	251.18	7795	270.37	7800
289.63	7805	310.63	7810	332.01	7815	342.23	7817.32	359.37	7820
365.09	7821.51	381.02	7820						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 165.36 .04 183.31 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 157.92 187.91 155.48 150.5 128.56 .1 .3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1930

INPUT

Description: Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7825	14.77	7820	28.55	7815	42.04	7810	56.78	7805
71.7	7800	85.85	7795	101.46	7790	107.37	7788.07	123.46	7785
139.92	7780	147.24	7777.69	155.14	7775	156.83	7773.91	160.02	7775
169.76	7777.91	230.28	7778.62	225.15	7780	251.77	7785	265.98	7790
276.41	7795	286.06	7800	295.86	7805	299.9	7807.68	315.17	7810
338.94	7815								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 147.24 0 169.76 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 147.24 169.76 95.72 87.86 77.51 .3 .5

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1920

INPUT

Description: XSEC Upstream of Culvert # 15
 Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7795	21.78	7790	29.21	7788.07	40.61	7785	58.94	7780
87.49	7775	133.17	7770	136.3	7768.68	142.34	7765	146.35	7764.59
148.27	7765	168.77	7769.25	205.05	7769.49	206.52	7770	222.71	7775
238.8	7780	251.28	7785	259.8	7788.12	275.09	7790	277.81	7790.35
283.49	7795	289.16	7800	294.96	7805	295.05	7805		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 136.3 0 168.77 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 136.3 168.77 20.28 21.1 23.47 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 140.85 7769 P
 153 295.05 7769 P

CULVERT

RIVER: Reach #2
 REACH: Carter Canyon RS: 1915

INPUT

Description: Culvert #15
 Distance from Upstream XS = 3
 Deck/Roadway Width = 12
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates
 num= 4

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
140.84	7772.5		153.84	7772.5	153.85	7769			
200	7768.08								

Upstream Bridge Cross Section Data
 Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7795	21.78	7790	29.21	7788.07	40.61	7785	58.94	7780
87.49	7775	133.17	7770	136.3	7768.68	142.34	7765	146.35	7764.59
148.27	7765	168.77	7769.25	205.05	7769.49	206.52	7770	222.71	7775
238.8	7780	251.28	7785	259.8	7788.12	275.09	7790	277.81	7790.35
283.49	7795	289.16	7800	294.96	7805	295.05	7805		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 136.3 0 168.77 0

Bank Sta: Left Right Coeff Contr. Expan.
 136.3 168.77 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 140.85 7769 F
 153 295.05 7769 F

Downstream Deck/Roadway Coordinates
 num= 4
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 148.5 7770.5 161.5 7770.5 161.51 7767
 230 7766.08

Downstream Bridge Cross Section Data
 Station Elevation Data num= 22
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7795 21.7 7790 30.65 7788.07 41.77 7785 59.95 7780
 80.55 7775 85.99 7773.79 134.54 7770 142.79 7766.8 148.27 7765
 151.21 7763.08 153.93 7762.93 160.73 7763.14 166.08 7765 177.49 7766.96
 226.61 7767.89 233.49 7770 247.27 7775 261.91 7780 276.4 7785
 285.77 7790 293.21 7794.27

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 142.79 0 177.49 0

Bank Sta: Left Right Coeff Contr. Expan.
 142.79 177.49 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 150 7767 F
 162.41 293.21 7767 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 =
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria - Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 3 12 .024 .024 0 .5 1

Number of Barrels = 2
 Upstream Elevation = 7765
 Centerline Stations
 Sta. Sta.
 145.34 149.34
 Downstream Elevation = 7763.15
 Centerline Stations
 Sta. Sta.
 153.33 157.33

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1910

INPUT
 Description: XSEC Downstream of Culvert # 15
 Station Elevation Data num= 22
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7795 21.7 7790 30.65 7788.07 41.77 7785 59.95 7780
 80.55 7775 85.99 7773.79 134.54 7770 142.79 7766.8 148.27 7765
 151.21 7763.08 153.93 7762.93 160.73 7763.14 166.08 7765 177.49 7766.96
 226.61 7767.89 233.49 7770 247.27 7775 261.91 7780 276.4 7785
 285.77 7790 293.21 7794.27

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 142.79 0 177.49 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 142.79 177.49 117.95 89.97 84.42 .3 5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 150 7767 F
 162.41 293.21 7767 F

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1905

INPUT
 Description:
 Station Elevation Data num= 22
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7780 21.24 7775 40.45 7770 56.16 7765.91 72.87 7765
 116.45 7760 143.29 7756.26 159.35 7760 168.13 7761.98 205.41 7763.75
 210.7 7765 231.16 7770 251.73 7775 265.36 7780 278.59 7785
 279.76 7785.46 320.24 7787.71 328.41 7790 345.1 7795 356.92 7800
 361.63 7802.01 374.44 7805

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 116.45 0 159.35 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 116.45 159.35 56.01 57.39 58.41 .3 .5

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1900

INPUT

Description: Upstream of Culvert #14
 Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770.33	1.92	7770	30.46	7765	56.2	7760	58.5	7759.58
108.51	7756.83	135.03	7755.34	135.92	7753.57	141.06	7753.56	148	7753.54
152.14	7756.16	166.86	7756.81	182.87	7757.533	202.16	7758.41	210.16	7760
230.64	7765	236.44	7766.583	248.96	7770	265.28	7775	280.58	7780
297.92	7785	316.92	7790	332.05	7795	343.72	7800		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	135.03	0	152.14	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 135.03 152.14 59.12 52.85 39.83 .3 .5
 Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	137.39	7756	F
147.26	343.72	7756	F

CULVERT

RIVER: Reach #2
 REACH: Carter Canyon RS: 1892.5

INPUT

Description: Culvert #14
 Distance from Upstream XS = 3
 Deck/Roadway Width = 40
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates num= 2

Sta	H1	Cord	Lo Cord	Sta	H1	Cord	Lo Cord
108.51	7756.83			166.86	7756.81		

Upstream Bridge Cross Section Data
 Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770.33	1.92	7770	30.46	7765	56.2	7760	58.5	7759.58
108.51	7756.83	135.03	7755.34	135.92	7753.57	141.06	7753.56	148	7753.54
152.14	7756.16	166.86	7756.81	182.87	7757.533	202.16	7758.41	210.16	7760
230.64	7765	236.44	7766.583	248.96	7770	265.28	7775	280.58	7780
297.92	7785	316.92	7790	332.05	7795	343.72	7800		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	135.03	0	152.14	0

Bank Sta: Left Right Coeff Contr. Expan.
 135.03 152.14 .3 .5
 Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	137.39	7756	F
147.26	343.72	7756	F

Downstream Deck/Roadway Coordinates num= 2

Sta	H1	Cord	Lo Cord	Sta	H1	Cord	Lo Cord
183.72	7753.47			230.95	7753.53		

Downstream Bridge Cross Section Data
 Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
95.18	7765.83	142	7760	170.52	7755	183.72	7753.47	192.5	7752.43
197.2	7747.9	207.68	7747.71	219.81	7747.88	230.95	7753.53	264.7	7754.41
267.47	7755	288.88	7760	305.25	7765	319.31	7770	332.76	7775
346.39	7780	362.95	7785	380.46	7790	393.63	7795		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
95.18	0	192.5	0	230.95	0

Bank Sta: Left Right Coeff Contr. Expan.
 192.5 230.95 .3 .5

Upstream Embankment side slope = 1 horiz. to 1.0 vertical
 Downstream Embankment side slope = 1 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .95
 Elevation at which weir flow begins =
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 3 - Pipe projecting from fill
 Solution Criteria = Highest U.S. EG

Culvert Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
3	40	.024	.024	0	.9	1

Number of Barrels = 2
 Upstream Elevation = 7753.56
 Centerline Stations

Sta.	Sta.
139.95	145.69

 Downstream Elevation = 7750
 Centerline Stations

Sta.	Sta.
204.51	214.23

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1885

INPUT

Description: XSEC Downstream of Culvert # 14
 Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-----	------	-----	------	-----	------	-----	------

95.18	7762.83	142	7760	170.52	7755	183.72	7753.47	192.5	7752.43
197.3	7747.9	207.68	7747.71	219.81	7747.88	230.95	7753.53	264.7	7754.41
267.47	7755	288.88	7760	305.25	7765	319.31	7770	332.76	7775
346.39	7780	362.95	7785	380.46	7790	393.63	7795		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 95.18 0 192.5 0 230.95 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 192.5 230.95 81.97 108.19 160.19 .3 .5

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1880

INPUT

Description: Upstream of Culvert #13
 Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7760	18.47	7755	24.55	7753.31	71.34	7755	109.86	7755
152.93	7750	176.48	7745	216.81	7740	224.29	7736.14	229.4	7736.19
231.76	7736.13	235.42	7740	237.64	7741.47	300.41	7741.41	304.11	117742.561
311.96	7745	328.42	7750	328.84	7750.12	382.56	7753.02		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 216.81 0 237.64 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 216.81 237.64 46.39 50.55 56.56 .3 .5

CULVERT

RIVER: Reach #2
 REACH: Carter Canyon RS: 1872.5

INPUT

Description: Culvert #13
 Distance from Upstream XS = 3
 Deck/Roadway Width = 40
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
216.81		7740		237.64	7741.47				

Upstream Bridge Cross Section Data
 Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7760	18.47	7755	24.55	7753.31	71.34	7755	109.86	7755
152.93	7750	176.48	7745	216.81	7740	224.29	7736.14	229.4	7736.19
231.76	7736.13	235.42	7740	237.64	7741.47	300.41	7741.41	304.11	117742.561
311.96	7745	328.42	7750	328.84	7750.12	382.56	7753.02		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 216.81 0 237.64 0

Bank Sta: Left Right Coeff Contr. Expan.
 216.81 237.64 .3 .5

Downstream Deck/Roadway Coordinates num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
217.02		7735		237.64	7735.53				

Downstream Bridge Cross Section Data
 Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
71	7746.49	135.67	7747.76	165.45	7745.44	169.17	7745	203.35	7740
217.02	7735	223.2	7731.08	228.67	7730.96	231.57	7731.05	236.58	7735
251.48	7735	277.75	7735	315.77	7740	341.7	7745	361.84	7750
378.35	7755	393.64	7759.59	408.03	7759.93	408.35	7760		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 71 0 217.02 0 236.58 0

Bank Sta: Left Right Coeff Contr. Expan.
 217.02 236.58 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
71	223.01	7734	F
211.57	408.35	7734	F

Upstream Embankment side slope = 1 horiz. to 1.0 vertical.
 Downstream Embankment side slope = 1 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .95
 Elevation at which weir flow begins = 7740
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG

Culvert Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
3	40	.024	.024	0	.5	1

Number of Barrels = 2
 Upstream Elevation = 7736.1
 Centerline Stations

Sta.	Sta.
225.97	229.96

 Downstream Elevation = 7731.09
 Centerline Stations

Sta.	Sta.
------	------

225.48 229.86

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1865

INPUT

Description: XSection Downstream of Culvert # 13

Station Elevation Data num= 19									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
71	7746.49	135.67	7747.76	165.45	7745.44	169.17	7745	203.36	7740
217.02	7735	223.2	7731.08	228.67	7730.96	231.57	7731.05	236.58	7735
251.48	7735	277.75	7735	315.77	7740	341.7	7745	361.84	7750
378.35	7755	393.64	7759.59	408.03	7759.93	408.35	7760		

Manning's n Values num= 3					
Sta	n	Val	Sta	n	Val
71	0	217.02	0	236.58	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	217.02	236.58		73.14	76.92		.75:1	

Ineffective Flow num= 2				
Sta L	Sta R	Elev	Permanent	
71	223.01	7734	F	
231.57	408.35	7734	F	

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1860

INPUT

Description:

Station Elevation Data num= 23									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7755	17.84	7750	40.74	7745	72.89	7740	86	7735
87.92	7734.12	123.13	7730	143.75	7725.99	147.98	7725	158.71	7722.02
169.16	7725	173.27	7726.19	207.09	7726.7	224.66	7730	249.44	7735
272.84	7740	291.06	7745	307.57	7750	323.14	7755	338.27	7759.89
340.05	7760	352.74	7760.86	372.02	7765				

Manning's n Values num= 3					
Sta	n	Val	Sta	n	Val
0	0	143.75	0	173.27	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	143.75	173.27		108.23	97.78		82.66	.1

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1850

INPUT

Description: XSection Upstream of Culvert # 12

Station Elevation Data num= 27									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7760	4.91	7758.28	25.95	7755	50.68	7750	72.48	7745
93.37	7740	112.74	7735	130.77	7730	148.47	7725	165.51	7720
193.76	7715	207.27	7713.01	214.2	7715	221.75	7717.14	252.72	7718.5
259.35	7720	296.89	7725	312.95	7730	318.7	7735	322.99	7738.73
326.83	7740	341.83	7745	356.83	7750	370.8	7754.82	371.94	7755
395.41	7758.13	399.94	7760						

Manning's n Values num= 3					
Sta	n	Val	Sta	n	Val
0	.055	193.76	.035	214.2	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	193.76	221.75		36.39	32.29		38.67	.3

Ineffective Flow num= 2				
Sta L	Sta R	Elev	Permanent	
0	200.71	7716.5	F	
213.62	399.94	7716.5	F	

CULVERT

RIVER: Reach #2
REACH: Carter Canyon RS: 1845

INPUT

Description: Culvert #12

Distance from Upstream XS = 5
Deck/Roadway Width = 20
Weir Coefficient = 3.1
Upstream Deck/Roadway Coordinates

num= 3					
Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	7720.64		207.27	7716.5	
			225	7716.2	

Upstream Bridge Cross Section Data									
Station Elevation Data num= 27									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7760	4.91	7758.28	25.95	7755	50.68	7750	72.48	7745
93.37	7740	112.74	7735	130.77	7730	148.47	7725	165.51	7720
193.76	7715	207.27	7713.01	214.2	7715	221.75	7717.14	252.72	7718.5
259.35	7720	296.89	7725	312.95	7730	318.7	7735	322.99	7738.73
326.83	7740	341.83	7745	356.83	7750	370.8	7754.82	371.94	7755
395.41	7758.13	399.94	7760						

Manning's n Values num= 3					
Sta	n	Val	Sta	n	Val
0	.055	193.76	.035	214.2	.055

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	193.76	221.75		.3	.5

Ineffective Flow num= 2				
Sta L	Sta R	Elev	Permanent	
0	200.71	7716.5	F	

213.62 399.94 7716.5 F

Downstream Deck/Roadway Coordinates

num= 3
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
0 7718.28 207.27 7713.79 225 7713.84

Downstream Bridge Cross Section Data

Station Elevation Data num= 23
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7760 9.09 7757.41 19.7 7755 42.41 7750 61.41 7745
75.19 7740 89.54 7735 112.83 7730 153.96 7725 174.74 7720
189.16 7715 203.8 7709.96 218.79 7713.8 239.91 7715 246.57 7715.37
309.52 7720 316.82 7725 324.06 7730 331.29 7735 336.79 7738.73
341.04 7740 358.41 7745 393.61 7750

Manning's n Values

num= 3
Sta n Val Sta n Val Sta n Val
0 0 189.16 0 218.79 0

Bank Sta: Left Right

189.16 218.79 .3 .5

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 =
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 # 2 - Corrugated Metal Pipe Culvert

FHWA Scale # 3 - Pipe projecting from fill

Solution Criteria = Highest U.S. EG

Culvert Upstream Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
5 20 .024 0 0 9 1

Upstream Elevation = 7713.01
Centerline Station = 207.27

Downstream Elevation = 7709.96
Centerline Station = 203.8

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1840

INPUT

Description: XSection Downstream of Culvert # 12

Station Elevation Data num= 23
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7760 9.09 7757.41 19.7 7755 42.41 7750 61.41 7745
75.19 7740 89.54 7735 112.83 7730 153.96 7725 174.74 7720
189.16 7715 203.8 7709.96 218.79 7713.8 239.91 7715 246.57 7715.37
309.52 7720 316.82 7725 324.06 7730 331.29 7735 336.79 7738.73
341.04 7740 358.41 7745 393.61 7750

Manning's n Values

num= 3
Sta n Val Sta n Val Sta n Val
0 0 189.16 0 218.79 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
189.16 218.79 70.59 68.23 61.25 .3 5

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1830

INPUT

Description: XSection Upstream of Culvert # 11

Station Elevation Data num= 20
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7750 22.07 7745 36.84 7740.93 40.61 7740 66.06 7735
90.58 7730 115.88 7725 143.42 7720 167.54 7715 186.51 7710
202.55 7705.6 213.94 7708.11 237.53 7709.18 240.55 7710 268.87 7715
308.86 7720 320.56 7725 334.2 7730 348.11 7735 376.32 7740

Manning's n Values

num= 3
Sta n Val Sta n Val Sta n Val
0 0 186.51 0 213.94 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
186.51 213.94 20 20 20 .3 5

CULVERT

RIVER: Reach #2
REACH: Carter Canyon RS: 1825

INPUT

Description: Culvert #11

Distance from Upstream XS = 4

Deck/Roadway Width = 11.5

Weir Coefficient = 3.1

Upstream Deck/Roadway Coordinates

num= 3
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
0 7716.09 203 7710 243 7708.8

Upstream Bridge Cross Section Data

Station Elevation Data num= 20
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7750 22.07 7745 36.84 7740.93 40.61 7740 66.06 7735
90.58 7730 115.88 7725 143.42 7720 167.54 7715 186.51 7710
202.55 7705.6 213.94 7708.11 237.53 7709.18 240.55 7710 268.87 7715
308.86 7720 320.56 7725 334.2 7730 348.11 7735 376.32 7740

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 186.51 0 213.94 0

Bank Sta: Left Right Coeff Contr. Expan.
 186.51 213.94 .3 .5

Downstream Deck/Roadway Coordinates
 num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7716.09 201.26 7710 241.26 7708.8

Downstream Bridge Cross Section Data
 Station Elevation Data num= 20
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7752 17.34 7747 34.1 7742 50.53 7737 71.38 7732
 93.31 7727 117.09 7722 142.32 7717 165.88 7712 189.29 7707
 199.87 7704.77 209.74 7707.02 209.75 7707 228.15 7708.14 249.6 7712
 285.04 7717 311.47 7722 335.19 7727 370.44 7732 409.15 7737

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 189.29 0 209.74 0

Bank Sta: Left Right Coeff Contr. Expan.
 189.29 209.74 .3 .5

Upstream Embankment side slope = 1 horiz. to 1.0 vertical.
 Downstream Embankment side slope = 1 horiz. to 1.0 vertical.
 Maximum allowable submergence for weir flow = .95
 Elevation at which weir flow begins =
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 3 - Pipe projecting from fill
 Solution Criteria = Highest U.S. EG
 Culvert Upstream Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 .5 18.5 .024 .024 0 .9 .9 1
 Upstream Elevation = 7705.6
 Centerline Station = 202.55
 Downstream Elevation = 7704.77
 Centerline Station = 199.87

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1821

INPUT
 Description: XSection Downstream of Culvert # 11
 Station Elevation Data num= 20
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7752 17.34 7747 34.1 7742 50.53 7737 71.38 7732
 93.31 7727 117.09 7722 142.32 7717 165.88 7712 189.29 7707
 199.87 7704.77 209.74 7707.02 209.75 7707 228.15 7708.14 249.6 7712
 285.04 7717 311.47 7722 335.19 7727 370.44 7732 409.15 7737

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 189.29 0 209.74 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 189.29 209.74 14.12 14.93 19.04 .3 .5

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1820

INPUT
 Description: XSection Downstream of Culvert # 11
 Station Elevation Data num= 20
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7750 17.34 7745 34.1 7740 50.53 7735 71.38 7730
 93.31 7725 117.09 7720 142.32 7715 165.88 7710 189.29 7705
 199.87 7702.77 209.74 7705.02 209.75 7705 228.15 7706.14 249.6 7710
 285.04 7715 311.47 7720 335.19 7725 370.44 7730 409.15 7735

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 189.29 0 209.74 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 189.29 209.74 86.19 63.38 66.35 .3 .5

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1815

INPUT
 Description: XSection Upstream of Culvert # 10
 Station Elevation Data num= 22
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7750 17.02 7745 33.17 7740 46.82 7735 61.54 7730
 77.31 7725 93.45 7720 112.1 7715 150.36 7710 173.55 7705
 194.33 7700 194.51 7694.89 198.99 7694.84 200.21 7700 204.34 7701.56
 225.4 7702.16 278.01 7705 306.27 7710 331.89 7715 355.86 7720
 388.5 7725 419.36 7730

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 194.33 0 204.34 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

194.33 204.34 71.48 76.69 51.22 .3 .5

CULVERT

RIVER: Reach #2
REACH: Carter Canyon RS: 1807.5

INPUT

Description: Culvert #10
Distance from Upstream XS = 7.63
Deck/Roadway Width = 67
Weir Coefficient = 3.1
Upstream Deck/Roadway Coordinates
num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
194.33 7699.62 204.34 7699.62

Upstream Bridge Cross Section Data

Station Elevation Data num= 22
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7750 17.02 7745 33.17 7740 46.82 7735 61.54 7730
77.31 7725 93.45 7720 112.1 7715 150.36 7710 173.55 7705
194.33 7700 194.51 7694.89 198.99 7694.84 200.21 7700 204.34 7701.56
225.4 7702.16 278.01 7705 306.27 7710 331.89 7715 355.86 7720
388.5 7725 419.36 7730

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 194.33 0 204.34 0

Bank Sta: Left Right Coeff Contr. Expan.
194.33 204.34 .3 .5

Downstream Deck/Roadway Coordinates

num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
175 7697.07 200 7697.07

Downstream Bridge Cross Section Data

Station Elevation Data num= 19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7720 56.76 7715.16 71.13 7715 88.13 7713 134.29 7710
144.47 7709.38 156.71 7705 173.25 7700 181.91 7698.81 216.75 7698.24
228.677695.657 231.7 7695 249.79 7692 275.8 7695 301.06 7700
320.33 7705 339.01 7710 361.86 7715 408.3 7720

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 216.75 0 301.06 0

Bank Sta: Left Right Coeff Contr. Expan.
216.75 301.06 .3 .5

Ineffective Flow

num= 2
Sta L Sta R Elev Permanent
0 226 7697 F
278 408.3 7697 F

- Upstream Embankment side slope = 1 horiz. to 1.0 vertical
- Downstream Embankment side slope = 3 horiz. to 1.0 vertical
- Maximum allowable submergence for weir flow = .95
- Elevation at which weir flow begins = 7698.49
- 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 3.5
FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 1 - Headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
7.63 65 .024 .024 0 .5 1
Upstream Elevation = 7695.03
Centerline Station = 197.13
Downstream Elevation = 7691.94
Centerline Station = 252

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1800

INPUT

Description: XSection Downstream of Culvert #10
Station Elevation Data num= 19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7720 56.76 7715.16 71.13 7715 88.13 7713 134.29 7710
144.47 7709.38 156.71 7705 173.25 7700 181.91 7698.81 216.75 7698.24
228.677695.657 231.7 7695 249.79 7692 275.8 7695 301.06 7700
320.33 7705 339.01 7710 361.86 7715 408.3 7720

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 216.75 0 301.06 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
216.75 301.06 65.85 52 50.16 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 226 7697 F
278 408.3 7697 F

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1795

INPUT

Description:

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7715	96.45	7710	154.09	7708.76	165.68	7705	175.71	7700
178.06	7698.74	215.72	7698.22	230.02	7695	253.66	7690	271.74	7686.94
285.49	7690	319.56	7695	340.08	7700	357.65	7705	401.45	7710
433.12	7715	457.87	7720						

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	253.66	.045	289.49	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	253.66	289.49		71.79	68.66		.1	.3

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1790

INPUT

Description: Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7700	155.98	7700	196.65	7697.57	209.43	7695	232.88	7690
257.35	7685	275.88	7681.23	300.64	7685	331.91	7690	361.89	7695
392.25	7700	422.5	7705	451.89	7710	485.19	7714.99	485.37	7715

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	257.35	.045	300.64	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	257.35	300.64		163.71	173.13		.1	.3

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1780

INPUT

Description: Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7690	14.55	7685	23.27	7680	31.87	7675	39.36	7670.58
140.13	7670.55	145.48	7670	172.45	7667.42	196.61	7670	248.11	7675
282.71	7680	324.52	7685	363.05	7690				

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	140.13	.045	196.61	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	140.13	196.61		150.3	144.77		.1	.3

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1770

INPUT

Description: Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
52.98	7664.11	70.45	7660	80.94	7657.67	90.2	7655.88	111.25	7655.66
120.57	7654.95	143.45	7657.47	166.51	7660	214.89	7665	254.62	7670
273.01	7670								

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
52.98	.055	80.94	.045	143.45	.055

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	80.94	143.45		.1	.3

SUMMARY OF MANNING'S N VALUES

River: Reach #2

Reach	River Sta.	n1	n2	n3
Carter Canyon	2000	.055	.045	.045
Carter Canyon	1990	.055	.04	.035
Carter Canyon	1980	.055	.04	.035
Carter Canyon	1970	.055	.04	.035
Carter Canyon	1960	.055	.04	.035
Carter Canyon	1950	0	0	0
Carter Canyon	1940	.055	.04	.035
Carter Canyon	1930	0	0	0
Carter Canyon	1920	0	0	0
Carter Canyon	1915	Culvert		
Carter Canyon	1910	0	0	0
Carter Canyon	1905	0	0	0
Carter Canyon	1900	0	0	0
Carter Canyon	1892.5	Culvert		
Carter Canyon	1885	0	0	0
Carter Canyon	1880	0	0	0
Carter Canyon	1872.5	Culvert		
Carter Canyon	1865	0	0	0
Carter Canyon	1860	0	0	0
Carter Canyon	1850	.055	.035	.055
Carter Canyon	1845	Culvert		
Carter Canyon	1840	0	0	0
Carter Canyon	1830	0	0	0
Carter Canyon	1825	Culvert		
Carter Canyon	1821	0	0	0
Carter Canyon	1820	0	0	0
Carter Canyon	1815	0	0	0
Carter Canyon	1807.5	Culvert		
Carter Canyon	1800	0	0	0

Carter Canyon	1795	.055	.045	.055
Carter Canyon	1790	.055	.045	.055
Carter Canyon	1780	.055	.045	.055
Carter Canyon	1770	.055	.045	.055

SUMMARY OF REACH LENGTHS

River: Reach #2

Reach	River Sta.	Left	Channel	Right
Carter Canyon	2000	254.41	256.17	252.36
Carter Canyon	1990	274.35	282.15	287.47
Carter Canyon	1980	254.12	242.71	241.57
Carter Canyon	1970	332.19	337.86	359.72
Carter Canyon	1960	239.94	147	195.48
Carter Canyon	1950	171.44	110.77	155
Carter Canyon	1940	155.48	150.5	128.56
Carter Canyon	1930	95.72	87.86	77.51
Carter Canyon	1920	20.28	21.1	23.47
Carter Canyon	1915	Culvert		
Carter Canyon	1910	117.95	89.97	84.42
Carter Canyon	1905	56.03	57.29	58.41
Carter Canyon	1900	59.12	52.85	39.83
Carter Canyon	1892.5	Culvert		
Carter Canyon	1885	81.97	108.19	180.19
Carter Canyon	1880	46.39	50.55	56.56
Carter Canyon	1872.5	Culvert		
Carter Canyon	1865	73.14	76.52	75.1
Carter Canyon	1860	108.23	97.78	82.66
Carter Canyon	1850	36.39	32.29	38.67
Carter Canyon	1845	Culvert		
Carter Canyon	1840	70.59	68.23	61.25
Carter Canyon	1830	20	20	20
Carter Canyon	1825	Culvert		
Carter Canyon	1821	14.12	14.93	19.04
Carter Canyon	1820	86.19	63.38	66.35
Carter Canyon	1815	71.48	76.69	51.22
Carter Canyon	1807.5	Culvert		
Carter Canyon	1800	65.85	52	50.16
Carter Canyon	1795	71.79	68.66	46.12
Carter Canyon	1790	162.71	173.13	165.52
Carter Canyon	1780	150.3	144.77	149.38
Carter Canyon	1770			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Reach #2

Reach	River Sta.	Contr.	Expan.
Carter Canyon	2000	.1	.3
Carter Canyon	1990	.1	.3
Carter Canyon	1980	.1	.2
Carter Canyon	1970	.1	.3
Carter Canyon	1960	.1	.3
Carter Canyon	1950	.1	.3
Carter Canyon	1940	.1	.3
Carter Canyon	1930	.3	.5
Carter Canyon	1920	.3	.5
Carter Canyon	1915	Culvert	
Carter Canyon	1910	.3	.5
Carter Canyon	1905	.3	.5
Carter Canyon	1900	.3	.5
Carter Canyon	1892.5	Culvert	
Carter Canyon	1885	.3	.5
Carter Canyon	1880	.3	.5
Carter Canyon	1872.5	Culvert	
Carter Canyon	1865	.3	.5
Carter Canyon	1860	.3	.5
Carter Canyon	1850	.3	.5
Carter Canyon	1845	Culvert	
Carter Canyon	1840	.3	.5
Carter Canyon	1830	.3	.5
Carter Canyon	1825	Culvert	
Carter Canyon	1821	.3	.5
Carter Canyon	1820	.3	.5
Carter Canyon	1815	.3	.5
Carter Canyon	1807.5	Culvert	
Carter Canyon	1800	.3	.5
Carter Canyon	1795	.1	.3
Carter Canyon	1790	.1	.3
Carter Canyon	1780	.1	.3
Carter Canyon	1770	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta.	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Frclude #	Chl
Carter Canyon	2000	Pre-Fire	238.00	7982.19	7985.45	7985.45	7986.35	0.025488	7.65	31.54	19.14		0.99
Carter Canyon	2000	Post-Fire	666.00	7982.19	7987.26	7987.26	7988.72	0.017645	10.03	75.04	28.85		0.92
Carter Canyon	1990	Pre-Fire	238.00	7945.54	7947.05	7947.05	7947.56	0.022851	5.78	41.19	40.16		1.01
Carter Canyon	1990	Post-Fire	666.00	7945.54	7948.07	7948.07	7949.04	0.022858	7.90	84.34	44.36		1.01
Carter Canyon	1980	Pre-Fire	238.00	7907.53	7910.07	7910.07	7910.61	0.018184	5.92	40.50	37.93		0.91
Carter Canyon	1980	Post-Fire	666.00	7907.53	7911.13	7911.13	7912.10	0.016657	7.83	85.24	46.67		0.90
Carter Canyon	1970	Pre-Fire	238.00	7871.91	7875.57	7875.57	7876.51	0.022039	7.78	30.59	16.68		1.01
Carter Canyon	1970	Post-Fire	666.00	7871.91	7878.03	7878.03	7878.77	0.009327	7.16	100.79	68.64		0.70
Carter Canyon	1960	Pre-Fire	238.00	7826.39	7830.13	7830.13	7830.64	0.024146	5.76	41.41	42.74		1.01
Carter Canyon	1960	Post-Fire	666.00	7826.39	7831.15	7831.15	7832.05	0.019573	7.71	91.24	54.82		0.96
Carter Canyon	1950	Pre-Fire	238.00	7804.38	7807.51	7807.51	7808.31	0.021787	7.20	33.04	21.01		1.01
Carter Canyon	1950	Post-Fire	666.00	7804.38	7808.73	7808.73	7809.45	0.011668	6.84	98.34	72.05		0.75

Carter Canyon 1940	Pre-Fire	238.00	7786.41	7789.95	7789.95	7790.85	0.021906	7.62	31.24	17.67	1.01
Carter Canyon 1940	Post-Fire	666.00	7786.41	7791.76	7791.76	7793.12	0.021457	9.35	71.25	26.36	1.00
Carter Canyon 1930	Pre-Fire	238.00	7773.93	7777.40	7777.40	7778.22	0.022040	7.32	32.51	19.97	1.01
Carter Canyon 1930	Post-Fire	666.00	7773.93	7778.95	7778.95	7779.54	0.009052	6.52	110.86	88.19	0.67
Carter Canyon 1920	Pre-Fire	238.00	7764.59	7769.81	7767.78	7769.88	0.000818	1.14	114.39	72.36	0.22
Carter Canyon 1920	Post-Fire	666.00	7764.59	7771.04	7769.67	7771.21	0.001274	3.13	211.36	86.27	0.27
Carter Canyon 1915			Culvert								
Carter Canyon 1910	Pre-Fire	238.00	7762.93	7765.40	7765.40	7766.50	0.013749	8.44	28.20	21.34	0.99
Carter Canyon 1910	Post-Fire	666.00	7762.93	7767.01	7767.01	7768.06	0.017254	8.31	60.24	37.74	0.96
Carter Canyon 1905	Pre-Fire	238.00	7756.26	7758.80	7758.80	7759.44	0.017189	6.44	36.93	29.11	1.01
Carter Canyon 1905	Post-Fire	666.00	7756.26	7760.08	7760.08	7761.06	0.019154	7.95	83.83	43.99	1.00
Carter Canyon 1900	Pre-Fire	238.00	7753.54	7757.55	7756.01	7757.63	0.000698	2.47	127.39	87.73	0.23
Carter Canyon 1900	Post-Fire	666.00	7753.54	7758.19	7757.48	7758.46	0.002766	4.81	192.35	113.70	0.41
Carter Canyon 1892.5			Culvert								
Carter Canyon 1885	Pre-Fire	238.00	7747.71	7749.27	7749.27	7749.95	0.017206	6.63	35.90	26.69	1.01
Carter Canyon 1885	Post-Fire	666.00	7747.71	7750.63	7750.63	7751.85	0.018736	8.68	74.98	30.81	1.00
Carter Canyon 1880	Pre-Fire	238.00	7736.13	7741.50	7738.78	7741.63	0.000920	2.88	92.96	96.03	0.26
Carter Canyon 1880	Post-Fire	666.00	7736.13	7742.23	7741.38	7742.54	0.002780	4.92	165.91	104.24	0.41
Carter Canyon 1872.5			Culvert								
Carter Canyon 1865	Pre-Fire	238.00	7730.96	7733.92	7733.92	7735.35	0.012476	9.60	24.80	16.47	0.99
Carter Canyon 1865	Post-Fire	666.00	7730.96	7735.76	7735.76	7736.43	0.007597	7.00	104.52	68.59	0.65
Carter Canyon 1860	Pre-Fire	238.00	7722.02	7725.09	7725.09	7725.87	0.007860	7.10	33.50	21.88	1.01
Carter Canyon 1860	Post-Fire	666.00	7722.02	7726.92	7726.92	7727.71	0.004348	7.37	102.07	69.29	0.77
Carter Canyon 1850	Pre-Fire	238.00	7713.01	7717.79	7715.92	7717.87	0.000502	2.39	117.07	58.51	0.23
Carter Canyon 1850	Post-Fire	666.00	7713.01	7718.75	7717.14	7719.01	0.001664	4.41	186.25	81.30	0.38
Carter Canyon 1845			Culvert								
Carter Canyon 1840	Pre-Fire	238.00	7709.96	7713.08	7713.08	7713.88	0.007874	7.18	33.15	21.25	1.01
Carter Canyon 1840	Post-Fire	666.00	7709.96	7714.80	7714.80	7715.79	0.005826	8.17	86.47	46.60	0.88
Carter Canyon 1830	Pre-Fire	238.00	7705.60	7710.65	7708.58	7710.72	0.000263	1.15	141.28	60.16	0.11
Carter Canyon 1830	Post-Fire	666.00	7705.60	7711.70	7709.62	7711.92	0.000741	2.32	209.72	70.10	0.20
Carter Canyon 1825			Culvert								
Carter Canyon 1821	Pre-Fire	238.00	7704.77	7707.57	7707.57	7708.20	0.018974	6.34	37.88	32.42	0.86
Carter Canyon 1821	Post-Fire	666.00	7704.77	7708.74	7708.74	7709.70	0.013354	7.56	88.10	50.38	0.79
Carter Canyon 1820	Pre-Fire	238.00	7702.77	7705.57	7705.57	7706.20	0.018974	6.34	37.88	32.42	0.86
Carter Canyon 1820	Post-Fire	666.00	7702.77	7706.74	7706.74	7707.70	0.013354	7.56	88.10	50.38	0.79
Carter Canyon 1815	Pre-Fire	238.00	7694.84	7701.66	7699.09	7702.12	0.010875	5.60	45.88	20.36	0.49
Carter Canyon 1815	Post-Fire	666.00	7694.84	7702.87	7702.87	7703.71	0.014652	7.75	95.01	56.08	0.60
Carter Canyon 1807.5			Culvert								
Carter Canyon 1800	Pre-Fire	238.00	7692.00	7694.32	7694.32	7694.88	0.035481	6.02	39.54	34.09	0.99
Carter Canyon 1800	Post-Fire	666.00	7692.00	7695.44	7695.44	7696.36	0.032390	7.69	86.60	48.37	1.01
Carter Canyon 1795	Pre-Fire	238.00	7686.94	7689.46	7689.46	7690.10	0.028151	6.40	37.18	29.51	1.01
Carter Canyon 1795	Post-Fire	666.00	7686.94	7690.70	7690.70	7691.75	0.022042	8.28	82.42	43.32	0.98
Carter Canyon 1790	Pre-Fire	238.00	7681.23	7683.76	7683.76	7684.41	0.028530	6.46	36.83	29.08	1.01
Carter Canyon 1790	Post-Fire	666.00	7681.23	7685.05	7685.05	7686.03	0.024360	7.93	83.96	43.89	1.00
Carter Canyon 1780	Pre-Fire	238.00	7667.42	7669.45	7669.45	7669.98	0.030457	5.81	40.98	40.30	1.01
Carter Canyon 1780	Post-Fire	666.00	7667.42	7670.47	7670.47	7671.29	0.025721	7.31	91.32	60.45	1.01
Carter Canyon 1770	Pre-Fire	238.00	7654.95	7656.76	7656.61	7657.09	0.020016	4.65	51.18	51.33	0.82
Carter Canyon 1770	Post-Fire	666.00	7654.95	7657.65	7657.52	7658.31	0.020006	6.48	102.83	64.09	0.89

Profile Output Table - Culvert Only

Reach Culv Vel DS (ft/s)	River Sta	Profile	E.G. US. (ft)	W.S. US. (ft)	E.G. IC (ft)	E.G. OC (ft)	Min El Weir	Flow (ft)	Q Culv Group (cfs)	Q Weir (cfs)	Delta WG (ft)	Culv Vel US (ft/s)
Carter Canyon 1915		CULVERT#1	Pre-Fire	7769.89	7769.81	7769.89	7769.83		7769.01	126.83	111.17	4.41
8.97	15.48											
Carter Canyon 1915		CULVERT#1	Post-Fire	7771.21	7771.04	7771.25	7771.21		7769.01	173.55	492.45	4.04
12.28	12.28											
Carter Canyon 1892.5		CULVERT#1	Pre-Fire	7757.63	7757.55	7757.27	7757.63		7756.82	87.71	150.29	8.28
8.06	13.81											
Carter Canyon 1892.5		CULVERT#1	Post-Fire	7758.46	7758.19	7758.46	7758.42		7756.82	111.10	554.90	7.57
7.86	14.79											
Carter Canyon 1872.5		CULVERT#1	Pre-Fire	7741.63	7741.50	7741.63	7741.32		7740.01	138.76	99.24	7.59
9.81	17.48											
Carter Canyon 1872.5		CULVERT#1	Post-Fire	7742.54	7742.23	7742.61	7742.54		7740.01	187.37	477.50	6.47
13.25	13.25											
Carter Canyon 1845		CULVERT#1	Pre-Fire	7717.88	7717.79	7717.87	7717.88		7716.40	58.61	183.23	4.71
9.11	7.87											
Carter Canyon 1845		CULVERT#1	Post-Fire	7719.01	7718.75	7719.00	7719.01		7716.40	75.26	590.74	3.96
10.65	10.65											
Carter Canyon 1825		CULVERT#1	Pre-Fire	7710.72	7710.65	7710.72	7710.55		7709.06	56.76	181.24	3.07
8.03	12.32											
Carter Canyon 1825		CULVERT#1	Post-Fire	7711.92	7711.70	7711.92	7711.92		7709.06	65.82	599.10	2.95
9.31	9.31											
Carter Canyon 1807.5		CULVERT#1	Pre-Fire	7702.12	7701.66	7702.12	7701.43		7699.63	107.80	130.20	7.34
11.20	14.33											
Carter Canyon 1807.5		CULVERT#1	Post-Fire	7703.63	7702.87	7703.70	7703.63		7699.63	131.89	534.11	7.42
13.71	13.71											

HEC-RAS OUTPUT

CARTER CANYON WASH

CULVERT ANALYSIS (10-YEAR)

```

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  X  X
XXXXXXXX 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  X  XXXXXX  XXXX  X  X  X  X  XXXXX
  
```

PROJECT DATA

Project Title: Summerhaven
 Project File : CARTER CANYON CREEK.prj
 Run Date and Time: 12/19/2007 11:20:23 AM

Project in English units

Project Description:
 Carter Canyon

PLAN DATA

Plan Title: CMG 10 year
 Plan File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\CARTER CANYON CREEK.p06

Geometry Title: CMG
 Geometry File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\CARTER CANYON CREEK.g02

Flow Title : 10 year SCS Type I
 Flow File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\CARTER CANYON CREEK.f03

Plan Summary Information:

Number of: Cross Sections = 26 Multiple Openings = 0
 Culverts = 6 Inline Structures = 0
 Bridges = 0 Lateral Structures = 0

Computational Information

Water surface calculation tolerance = 0.01
 Critical depth calculation tolerance = 0.01
 Maximum number of iterations = 20
 Maximum difference tolerance = 0.2
 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: 10 year SCS Type I
 Flow File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\CARTER CANYON CREEK.f03

Flow Data (cfs)

River	Reach	RS	Pre-Fire	Post-Fire
Reach #2	Carter Canyon	2000	99	393

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Reach #2	Carter Canyon	Pre-Fire		Normal S = 0.02
Reach #2	Carter Canyon	Post-Fire		Normal S = 0.02

GEOMETRY DATA

Geometry Title: CMG
 Geometry File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\CARTER CANYON CREEK.g02

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 2000

INPUT

Description:

Station	Elevation	Data	num=	23
Sta	Elev	Sta	Elev	Sta
0	8045	8.88	8040	17.54
34.81	8025	42.96	8020	50.82
78.85	8000	80.67	7999.26	86.91
109.11	7982.19	120.24	7985	136.54
187.1	8005	198.86	8010	209.89

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	103.5	.045	120.24	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	103.5	120.24		254.41	252.18	.1	.5

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1990

INPUT

Description:

Station Elevation Data num= 29											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	8005	9.42	8000	18.78	7995	28.25	7990	38.26	7985		
51.76	7980	59.42	7977.48	66.51	7975	79.6	7970	92.57	7965		
105.45	7960	118.09	7955	130.54	7950	139.17	7946.4	175.2	7945.54		
182.85	7950	192.56	7955	200.57	7960	207.4	7965	214.12	7970		
220.93	7975	227.71	7980	234.64	7985	235.37	7985.55	244.39	7986.76		
250.47	7990	260.21	7995	269.88	8000	279.52	8005				

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	130.54	.04	182.85	.035

Bank	Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
	130.54	182.85	274.35	282.15	287.47		.1	.3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1980

INPUT

Description:

Station Elevation Data num= 23											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7950	13.88	7945	27.45	7940	41.07	7935	47.99	7932.49		
55.31	7930	70.15	7925	84.95	7920	98.87	7915	113.5	7910		
122.37	7907.53	144.15	7910	147.09	7910	150.85	7910	177.55	7915		
190.35	7920	201.96	7925	213.55	7930	225.18	7935	237.36	7940		
242.14	7942.16	254.74	7945	283.23	7950						

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	113.5	.04	144.15	.035

Bank	Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
	113.5	144.15	254.12	242.71	241.57		.1	.3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1970

INPUT

Description:

Station Elevation Data num= 26											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7905	14.23	7900	28.2	7895	42.06	7890	46.37	7888.38		
73	7885	97.67	7880	103.71	7878.15	153.58	7877.26	155.42	7876.517		
159.18	7875	167.22	7871.91	173.33	7875	179.21	7877.952	183.29	7880		
193.29	7885	203.14	7890	212.66	7895	222.28	7900	232.57	7905		
243.1	7910	243.32	7910.13	255.45	7915	268.14	7920	280.97	7925		
293.76	7930										

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	155.42	.04	179.21	.035

Bank	Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
	153.58	183.29	332.19	337.86	359.72		.1	.3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1960

INPUT

Description:

Station Elevation Data num= 32											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7880	20.5	7875	41.35	7870	73.23	7865	103.32	7860		
120.46	7855	121.39	7854.77	134.5	7851.85	142.72	7850	171.15	7845		
175.29	7844.43	185.33	7840	188.61	7838.51	205.88	7835	225.9	7831.8		
240.27	7830	250.73	7828.39	280.4	7829.76	281.49	7830	300.68	7835		
314.68	7840	323.82	7845	332.94	7850	342	7855	352.2	7860		
364.48	7865	375.81	7870	387.38	7875	397.92	7880	409	7885		
418.64	7886.93	443.75	7890								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	240.27	.04	281.49	.035

Bank	Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
	240.27	281.49	239.94	147	195.48		.1	.3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1950

INPUT

Description:

Station Elevation Data num= 33											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7880	15.71	7875	33.18	7870	48.63	7865	63.76	7860		
79.75	7855	96.79	7850	112.05	7845	113.19	7844.49	130.94	7842.12		
140.18	7840	155.27	7835	168.91	7830	186.94	7825	201.74	7820		
208.68	7817.54	217.11	7815	233.65	7810	240.99	7807.93	250.88	7805		
253.04	7804.38	255.17	7805	264.76	7807.91	306.8	7807.91	315.53	7810		
332.52	7815	349.79	7820	368.41	7825	387.74	7830	401.54	7833.94		
413.53	7835	441.27	7837.41	450.81	7840						

Manning's n Values num= 2
 Sta n Val Sta n Val Sta n Val
 0 0 240.99 0 264.76 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 240.99 264.76 171.44 130.77 155 .1 .3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1940

INPUT

Description:
 Station Elevation Data num= 27
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7850 10.51 7845 21.54 7840 32.26 7835 43.29 7830
 58.76 7825 74.61 7820 96.44 7815 110.38 7810 124.71 7805
 138.97 7800 152.44 7795 157.92 7792.58 165.36 7790 176.78 7786.41
 183.31 7790 187.91 7792.43 240.63 7792.26 251.18 7795 270.37 7800
 289.63 7805 310.63 7810 332.01 7815 342.23 7817.33 359.37 7820
 365.09 7821.51 381.02 7820

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 165.36 .04 183.31 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 157.92 187.91 155.48 150.5 128.56 .1 .3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1930

INPUT

Description:
 Station Elevation Data num= 26
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7825 14.77 7820 28.55 7815 42.04 7810 56.78 7805
 71.7 7800 86.05 7795 101.46 7790 107.37 7788.07 123.46 7785
 139.92 7780 147.24 7777.69 155.14 7775 156.83 7773.91 160.02 7775
 169.76 7777.91 220.18 7778.61 135.15 7780 251.77 7765 265.98 7790
 276.41 7795 286.06 7800 295.86 7805 299.9 7807.08 315.17 7810
 338.94 7815

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 147.24 .04 169.76 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 147.24 169.76 95.72 87.86 77.51 .1 .3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1920

INPUT

Description: XSEC Upstream of Culvert # 15
 Station Elevation Data num= 24
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7795 21.78 7790 29.21 7788.07 40.61 7785 58.94 7780
 87.49 7775 133.17 7770 136.3 7768.68 145.34 7765 146.35 7764.59
 148.27 7765 168.77 7769.25 205.05 7769.49 206.52 7770 222.71 7775
 238.8 7780 251.28 7785 259.8 7788.12 275.09 7790 277.81 7790.35
 283.49 7795 289.16 7800 294.96 7805 295.05 7805

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 136.3 0 168.77 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 136.3 168.77 20.28 21.1 23.47 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 140.85 7769 F
 153 295.05 7769 F

CULVERT

RIVER: Reach #2
 REACH: Carter Canyon RS: 1915

INPUT

Description: Culvert #15
 Distance from Upstream XS = 2
 Deck/Roadway Width = 12
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates
 num= 5
 Sta Hs Cord Lo Cord Sta Hs Cord Lo Cord Sta Hs Cord Lo Cord
 0 7775.3 140.84 7772.5 153.84 7772.5
 153.85 7769 200 7768.08

Upstream Bridge Cross Section Data
 Station Elevation Data num= 24
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7795 21.78 7790 29.21 7788.07 40.61 7785 58.94 7780
 87.49 7775 133.17 7770 136.3 7768.68 145.34 7765 146.35 7764.59
 148.27 7765 168.77 7769.25 205.05 7769.49 206.52 7770 222.71 7775
 238.8 7780 251.28 7785 259.8 7788.12 275.09 7790 277.81 7790.35
 283.49 7795 289.16 7800 294.96 7805 295.05 7805

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 136.3 0 168.77 0

Bank Sta: Left Right Coeff Contr. Expan.
 136.3 168.77 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 140.85 7769 F
 153 295.05 7769 F

Downstream Deck/Roadway Coordinates
 num= 5
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 134.54 7770 148.5 7770.5 161.5 7770.5
 161.51 7767 230 7766.08

Downstream Bridge Cross Section Data
 Station Elevation Data num= 22
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7795 21.7 7790 30.65 7788.07 41.77 7785 59.95 7780
 80.55 7775 85.99 7773.79 134.54 7770 142.79 7766.8 148.27 7765
 151.21 7763.08 153.93 7762.93 160.73 7763.14 166.08 7765 177.49 7766.96
 226.61 7767.89 233.49 7770 247.27 7775 261.91 7780 276.4 7785
 285.77 7790 293.21 7794.27

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 142.79 0 177.49 0

Bank Sta: Left Right Coeff Contr. Expan.
 142.79 177.49 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 150 7767 F
 162.41 293.21 7767 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 =
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 3 12 .024 .024 0 .5 1

Number of Barrels = 2
 Upstream Elevation = 7765
 Centerline Stations
 Sta Sta
 145.34 149.34
 Downstream Elevation = 7763.15
 Centerline Stations
 Sta Sta
 153.33 157.33

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1910

INPUT
 Description: XSEC Downstream of Culvert # 15
 Station Elevation Data num= 22
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7795 21.7 7790 30.65 7788.07 41.77 7785 59.95 7780
 80.55 7775 85.99 7773.79 134.54 7770 142.79 7766.8 148.27 7765
 151.21 7763.08 153.93 7762.93 160.73 7763.14 166.08 7765 177.49 7766.96
 226.61 7767.89 233.49 7770 247.27 7775 261.91 7780 276.4 7785
 285.77 7790 293.21 7794.27

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 142.79 0 177.49 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 142.79 177.49 117.95 89.97 84.42 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 150 7767 F
 162.41 293.21 7767 F

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1905

INPUT
 Description:
 Station Elevation Data num= 22
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7780 21.24 7775 40.45 7770 56.16 7765.91 72.87 7765
 116.45 7760 143.29 7756.26 159.35 7760 168.13 7761.98 205.41 7763.75
 210.7 7765 231.16 7770 251.73 7775 265.36 7780 278.59 7785
 279.76 7785.46 320.24 7787.71 328.41 7790 345.1 7795 356.92 7800
 361.63 7802.01 374.44 7805

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 116.45 .035 159.35 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 116.45 159.35 56.03 57.39 58.41 .1 3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1900

INPUT

Description: Upstream of Culvert #14
Station Elevation Data num= 24
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7770.33 1.92 7770 30.46 7765 56.2 7760 58.5 7759.58
108.51 7756.83 135.03 7755.34 135.92 7753.57 141.06 7753.56 148 7753.54
152.14 7756.16 166.86 7756.81 182.87757.533 202.16 7758.41 210.16 7760
230.64 7765 236.447766.583 248.96 7770 265.28 7775 280.58 7780
297.92 7785 316.92 7790 332.05 7795 343.72 7800

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 135.03 0 152.14 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
135.03 152.14 59.12 52.85 39.83 .3 .5
Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 137.39 7756 F
147.26 343.72 7756 F

CULVERT

RIVER: Reach #2
REACH: Carter Canyon RS: 1892.5

INPUT

Description: Culvert #14
Distance from Upstream XS = 3
Deck/Roadway Width = 40
Weir Coefficient = 3.1
Upstream Deck/Roadway Coordinates
num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
108.51 7756.83 166.86 7756.81

Upstream Bridge Cross Section Data
Station Elevation Data num= 24
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7770.33 1.92 7770 30.46 7765 56.2 7760 58.5 7759.58
108.51 7756.83 135.03 7755.34 135.92 7753.57 141.06 7753.56 148 7753.54
152.14 7756.16 166.86 7756.81 182.87757.533 202.16 7758.41 210.16 7760
230.64 7765 236.447766.583 248.96 7770 265.28 7775 280.58 7780
297.92 7785 316.92 7790 332.05 7795 343.72 7800

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 135.03 0 152.14 0

Bank Sta: Left Right Coeff Contr. Expan.
135.03 152.14 .3 .5
Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 137.39 7756 F
147.26 343.72 7756 F

Downstream Deck/Roadway Coordinates
num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
183.72 7753.47 230.95 7753.53

Downstream Bridge Cross Section Data
Station Elevation Data num= 19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
95.18 7762.83 142 7760 170.52 7755 183.72 7753.47 192.5 7752.43
197.3 7747.9 207.68 7747.71 219.81 7747.88 230.95 7753.53 264.7 7754.41
267.47 7755 288.88 7760 305.25 7765 319.31 7770 332.76 7775
346.39 7780 362.95 7785 380.46 7790 393.63 7795

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
95.18 .055 192.5 .035 230.95 .035

Bank Sta: Left Right Coeff Contr. Expan.
192.5 230.95 .3 .5
Ineffective Flow num= 2
Sta L Sta R Elev Permanent
95.18 197.3 7752 F
219.48 393.63 7752 F

Upstream Embankment side slope = 1 horiz. to 1.0 vertical
Downstream Embankment side slope = 1 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
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 # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 3 - Pipe projecting from fill
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
3 40 .024 .024 0 .9 1

Number of Barrels = 2
Upstream Elevation = 7753.56
Centerline Stations
Sta Sta
139.95 145.69
Downstream Elevation = 7750
Centerline Stations
Sta Sta
204.51 214.23

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1885

INPUT

Description: XSEC Downstream of Culvert # 14

Station Elevation Data num= 19											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
95.18	7762.83	142	7760	170.52	7755	183.72	7753.47	192.5	7752.43		
197.3	7747.9	207.68	7747.71	219.31	7747.88	230.95	7753.53	264.7	7754.41		
267.47	7755	288.88	7760	305.25	7765	319.31	7770	332.76	7775		
346.39	7780	362.95	7785	380.46	7790	393.63	7795				

Manning's n Values num= 3					
Sta	n	Val	Sta	n	Val
95.18	.055	192.5	.035	230.95	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	192.5	230.95		81.97	108.19	160.19	.3	.5
Ineffective Flow num= 2								
Sta L	Sta R	Elev	Permanent					
95.18	197.3	7752	F					
219.48	393.63	7752	F					

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1860

INPUT

Description: Upstream of Culvert #13

Station Elevation Data num= 19											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7760	18.47	7755	24.55	7753.31	71.34	7755	109.86	7755		
152.93	7750	176.48	7745	216.81	7740	224.29	7736.14	229.4	7736.19		
231.76	7736.13	235.42	7740	237.64	7741.47	300.41	7741.41	304.11	7742.561		
311.96	7745	328.42	7750	328.84	7750.12	382.56	7753.02				

Manning's n Values num= 3					
Sta	n	Val	Sta	n	Val
0	0	216.81	0	237.64	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	216.81	237.64		46.39	50.55	56.56	.3	.5
Ineffective Flow num= 2								
Sta L	Sta R	Elev	Permanent					
0	224.16	7740	F					
231.89	382.56	7740	F					

CULVERT

RIVER: Reach #2
REACH: Carter Canyon RS: 1872.5

INPUT

Description: Culvert #13

Distance from Upstream XS = 3
Deck/Roadway Width = 40
Weir Coefficient = 3.1

Upstream Deck/Roadway Coordinates num= 2									
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
216.81			7740		237.64			7741.47	

Upstream Bridge Cross Section Data Station Elevation Data num= 19											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7760	18.47	7755	24.55	7753.31	71.34	7755	109.86	7755		
152.93	7750	176.48	7745	216.81	7740	224.29	7736.14	229.4	7736.19		
231.76	7736.13	235.42	7740	237.64	7741.47	300.41	7741.41	304.11	7742.561		
311.96	7745	328.42	7750	328.84	7750.12	382.56	7753.02				

Manning's n Values num= 3					
Sta	n	Val	Sta	n	Val
0	0	216.81	0	237.64	0

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	216.81	237.64		.3	.5
Ineffective Flow num= 2					
Sta L	Sta R	Elev	Permanent		
0	224.16	7740	F		
231.89	382.56	7740	F		

Downstream Deck/Roadway Coordinates num= 2									
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
217.02			7735		237.64			7735.53	

Downstream Bridge Cross Section Data Station Elevation Data num= 19											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
71	7746.49	135.67	7747.76	165.45	7745.44	169.17	7745	203.36	7740		
217.02	7735	223.2	7731.08	228.67	7730.96	231.57	7731.05	236.58	7735		
251.48	7735	277.75	7735	315.77	7740	341.7	7745	361.84	7750		
378.35	7755	393.64	7759.59	408.03	7759.93	408.35	7760				

Manning's n Values num= 3					
Sta	n	Val	Sta	n	Val
71	0	217.02	0	236.58	0

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	217.02	236.58		.3	.5
Ineffective Flow num= 2					
Sta L	Sta R	Elev	Permanent		
71	223.01	7734	F		
231.57	408.35	7734	F		

- Upstream Embankment side slope = 1 horiz. to 1.0 vertical
- Downstream Embankment side slope = 1 horiz. to 1.0 vertical
- Maximum allowable submergence for weir flow = .95
- Elevation at which weir flow begins = 7740
- 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 3 - Pipe projecting from fill
 Solution Criteria - Highest U.S. EG
 Culvert Upstream Dist. Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 3 40 .024 .024 0 .9 1

Number of Barrels = 2
 Upstream Elevation = 7736.1
 Centerline Stations
 Sta. Sta.
 225.97 229.96
 Downstream Elevation = 7731.09
 Centerline Stations
 Sta. Sta.
 225.48 229.86

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1865

INPUT

Description: XSection Downstream of Culvert # 13
 Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
71	7746.49	135.67	7747.76	165.45	7745.44	169.17	7745	203.36	7740
217.02	7735	223.2	7731.08	228.67	7730.96	231.57	7731.05	236.58	7735
251.48	7735	277.75	7735	315.77	7740	341.7	7745	361.84	7750
378.35	7755	393.64	7759.59	408.03	7759.93	408.35	7760		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
71	0	217.02	0	236.58	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	217.02	236.58		73.14	76.92	75.1	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
71	223.01	7734	F
231.57	408.35	7734	F

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1860

INPUT

Description: XSection Upstream of Culvert # 12
 Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7755	17.84	7750	40.74	7745	72.89	7740	86	7735
87.92	7734.12	123.13	7730	143.75	7725.99	147.98	7725	158.71	7722.02
169.16	7725	173.27	7726.19	207.09	7726.7	224.66	7730	249.44	7735
272.84	7740	291.06	7745	307.57	7750	323.14	7755	338.27	7759.89
340.05	7760	352.74	7760.86	372.02	7765				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	143.75	.035	173.27	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	143.75	173.27		108.23	97.78	82.66	.1	.3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1850

INPUT

Description: XSection Upstream of Culvert # 11
 Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7760	4.91	7758.28	25.95	7755	50.68	7750	72.48	7745
93.37	7740	112.74	7735	120.77	7730	148.47	7725	165.51	7720
193.76	7715	207.27	7713.01	214.2	7715	221.75	7717.14	252.72	7718.5
259.35	7720	296.89	7725	312.95	7730	318.7	7735	322.99	7738.73
326.83	7740	341.83	7745	356.83	7750	370.8	7754.82	371.94	7755
395.41	7758.13	399.94	7760						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	193.76	.035	214.2	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	193.76	221.75		36.39	32.29	38.47	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	200.71	7716.5	F
213.62	399.94	7716.5	F

CULVERT

RIVER: Reach #2
 REACH: Carter Canyon RS: 1845

INPUT

Description: Culvert #12
 Distance from Upstream XS = 5
 Deck/Roadway Width = 20
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates num= 3

Sta	H1	Cord	Lo	Cord	Sta	H1	Cord	Lo	Cord
0	7720.64				207.27	7716.5			
					225	7716.2			

Upstream Bridge Cross Section Data
 Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

0	7760	4.91	7758.28	25.95	7755	50.68	7750	72.48	7745
93.37	7740	112.74	7735	110.77	7730	148.47	7725	165.51	7720
193.76	7715	207.27	7713.01	214.2	7715	221.75	7717.14	252.72	7718.5
259.35	7720	296.89	7725	312.95	7730	318.7	7735	322.99	7738.73
326.83	7740	341.83	7745	356.83	7750	370.8	7754.82	371.94	7755
395.41	7758.13	399.94	7760						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 193.76 .035 214.2 .055

Bank Sta: Left Right Coeff Contr Expan.
 193.76 221.75 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 200.71 7716.5 F
 213.62 399.94 7716.5 F

Downstream Deck/Roadway Coordinates num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7718.28 207.27 7713.79 225 7713.84

Downstream Bridge Cross Section Data
 Station Elevation Data num= 23
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7760 9.09 7757.41 19.7 7755 42.41 7750 61.41 7745
 75.19 7740 89.54 7735 112.82 7730 153.96 7725 174.74 7720
 189.16 7715 203.8 7709.96 218.79 7713.8 239.91 7715 246.57 7715.37
 309.52 7720 316.82 7725 324.06 7730 331.29 7735 336.79 7738.73
 341.04 7740 358.41 7745 393.61 7750

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 189.16 .045 218.79 .055

Bank Sta: Left Right Coeff Contr. Expan.
 189.16 218.79 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 198.16 7712 F
 207.59 393.61 7712 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 =
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 3 - Pipe projecting from fill
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 5 20 .024 .024 0 .9 1
 Upstream Elevation = 7713.01
 Centerline Station = 207.27
 Downstream Elevation = 7709.96
 Centerline Station = 203.8

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1840

INPUT
 Description: XSection Downstream of Culvert # 12
 Station Elevation Data num= 23
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7760 9.09 7757.41 19.7 7755 42.41 7750 61.41 7745
 75.19 7740 89.54 7735 112.82 7730 153.96 7725 174.74 7720
 189.16 7715 203.8 7709.96 218.79 7713.8 239.91 7715 246.57 7715.37
 309.52 7720 316.82 7725 324.06 7730 331.29 7735 336.79 7738.73
 341.04 7740 358.41 7745 393.61 7750

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 189.16 .045 218.79 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 189.16 218.79 70.59 68.23 61.25 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 198.16 7712 F
 207.59 393.61 7712 F

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1830

INPUT
 Description: XSection Upstream of Culvert # 11
 Station Elevation Data num= 20
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7750 22.07 7745 16.84 7740.93 40.61 7740 66.06 7735
 90.58 7730 115.88 7725 143.42 7720 167.54 7715 186.51 7710
 202.55 7705.6 213.94 7708.11 217.53 7709.18 240.55 7710 268.87 7715
 308.86 7720 320.56 7725 324.2 7730 348.11 7735 376.32 7740

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 186.51 0 213.94 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 186.51 213.94 34.12 34.93 39.04 .3 .5

Ineffective Flow num= 2

Sta L Sta R Elev Permanent
 0 196.05 7710 F
 209.05 376.32 7710 F

CULVERT

RIVER: Reach #2
 REACH: Carter Canyon RS: 1825

INPUT

Description: Culvert #11
 Distance from Upstream XS = 5
 Deck/Roadway Width = 11.5
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates

num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7716.09 203 7710 243 7706.8

Upstream Bridge Cross Section Data

Station Elevation Data num= 20
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7750 22.07 7745 36.84 7740 92 40.61 7740 66.06 7735
 90.58 7730 115.88 7725 143.42 7720 167.54 7715 186.51 7710
 202.55 7705.6 213.94 7700 237.53 7700 240.55 7710 268.87 7715
 308.86 7720 320.56 7725 334.2 7710 348.11 7735 376.32 7740

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 186.51 0 213.94 0

Bank Sta: Left Right Coeff Contr. Expan.
 186.51 213.94 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 196.05 7710 F
 209.05 376.32 7710 F

Downstream Deck/Roadway Coordinates

num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7713.38 201.26 7707.28 241.26 7706.08

Downstream Bridge Cross Section Data

Station Elevation Data num= 20
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7750 17.34 7745 34.1 7740 50.52 7735 71.38 7730
 93.31 7725 117.09 7720 142.32 7715 165.88 7710 189.29 7705
 199.87 7702.77 209.74 7705.02 209.75 7705 228.15 7706.14 249.6 7710
 285.04 7715 311.47 7720 335.19 7725 370.44 7730 409.15 7735

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 189.29 0 209.74 0

Bank Sta: Left Right Coeff Contr. Expan.
 189.29 209.74 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 181.97 7706.52 F
 217.77 409.15 7706.52 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 =
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 2 - Mitered to conform to slope
 Solution Criteria = Highest U.S. EG
 Culvert Upstream Dist Length Top Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 5 18.5 .024 .024 0
 Upstream Elevation = 7705.6
 Centerline Station = 202.55
 Downstream Elevation = 7702.77
 Centerline Station = 199.87

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1820

INPUT

Description: XSection Downstream of Culvert # 11

Station Elevation Data num= 20
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7750 17.34 7745 34.1 7740 50.53 7735 71.38 7730
 93.31 7725 117.09 7720 142.32 7715 165.88 7710 189.29 7705
 199.87 7702.77 209.74 7705.02 209.75 7705 228.15 7706.14 249.6 7710
 285.04 7715 311.47 7720 335.19 7725 370.44 7730 409.15 7735

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 189.29 0 209.74 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 189.29 209.74 86.19 63.58 66.35 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 181.97 7706.52 F
 217.77 409.15 7706.52 F

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1815

INPUT

Description: XSection Upstream of Culvert # 10

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7750	17.02	7745	33.17	7740	46.82	7735	61.54	7730
77.31	7725	93.45	7720	112.1	7715	150.36	7710	173.55	7705
192.76	7700.01	193.77	7694.82	200.09	7694.83	201.29	7700.02	204.34	7701.56
225.4	7702.16	278.01	7705	306.27	7710	331.89	7715	355.86	7720
388.5	7725	419.36	7730						

Manning's n Values					
Sta	n	Val	Sta	n	Val
0	0	192.76	0	204.34	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
192.76 204.34 71.48 76.69 51.22 .3 .5

Ineffective Flow				
Sta L	Sta R	Elev	Permanent	
0	193.39	7700.04	F	
200.61	419.36	7699.99	F	

CULVERT

RIVER: Reach #2
REACH: Carter Canyon RS: 1807.5

INPUT

Description: Culvert #10

Distance from Upstream XS = 7.63
Deck/Roadway Width = 67
Weir Coefficient = 3.1

Upstream Deck/Roadway Coordinates											
num	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	
3	1877700.113					1977699.613					2077700.113

Upstream Bridge Cross Section Data

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7750	17.02	7745	33.17	7740	46.82	7735	61.54	7730
77.31	7725	93.45	7720	112.1	7715	150.36	7710	173.55	7705
192.76	7700.01	193.77	7694.82	200.09	7694.83	201.29	7700.02	204.34	7701.56
225.4	7702.16	278.01	7705	306.27	7710	331.89	7715	355.86	7720
388.5	7725	419.36	7730						

Manning's n Values					
Sta	n	Val	Sta	n	Val
0	0	192.76	0	204.34	0

Bank Sta: Left Right Coeff Contr. Expan.
192.76 204.34 .3 .5

Ineffective Flow				
Sta L	Sta R	Elev	Permanent	
0	193.39	7700.04	F	
200.61	419.36	7699.99	F	

Downstream Deck/Roadway Coordinates

num					
Sta	Hi	Cord	Lo	Cord	
2	175	7697.07	300	7697.07	

Downstream Bridge Cross Section Data

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7720	56.76	7715.16	71.13	7715	88.13	7713	134.29	7710
144.47	7709.38	156.71	7705	173.25	7700	181.91	7698.81	216.75	7698.24
228.67	7695.657	231.7	7695	248.72	7691.98	249.73	7691.98	252.61	7691.98
275.8	7695	301.06	7700	320.33	7705	339.01	7710	361.86	7715
408.3	7720								

Manning's n Values					
Sta	n	Val	Sta	n	Val
0	0	216.75	0	301.06	0

Bank Sta: Left Right Coeff Contr. Expan.
216.75 301.06 .3 .5

Ineffective Flow				
Sta L	Sta R	Elev	Permanent	
0	226	7697	F	
278	408.3	7697	F	

Upstream Embankment side slope = 1 horiz. to 1.0 vertical
Downstream Embankment side slope = 3 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 7698.49
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	Arch	3.583	5.333
FHWA Chart # 41- Arch, Corrugated metal			
FHWA Scale # 1 - 90 Degree headwall			
Solution Criteria = Highest U.S. EG			
Culvert Upstrm Dist	Length	Top n	Bottom n
7.63	65	.024	0
Entrance Loss Coef = .5			
Exit Loss Coef = 1			
Upstream Elevation = 7695.03			
Centerline Station = 197			
Downstream Elevation = 7691.94			
Centerline Station = 250			

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1800

INPUT

Description: XSection Downstream of Culvert #10

Station Elevation Data num= 21									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7720	56.76	7715.16	71.13	7715	88.13	7713	114.29	7710
144.47	7709.38	156.71	7705	173.25	7700	181.91	7698.81	216.75	7698.24
228.67	7695.657	231.7	7695	246.72	7691.98	249.73	7691.98	252.61	7691.98
275.8	7695	301.06	7700	320.33	7705	339.01	7710	361.86	7715
408.3	7720								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	216.75	0	301.06	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	216.75	301.06		85.85	52	50.16	.3	.5

Ineffective Flow num= 2			
Sta L	Sta R	Elev	Permanent
0	226	7697	F
278	408.3	7697	F

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1795

INPUT

Description: Station Elevation Data num= 17									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7715	96.45	7710	154.09	7708.76	165.68	7705	175.71	7700
178.06	7698.74	215.72	7698.22	230.02	7695	253.66	7690	271.74	7686.94
289.49	7690	319.56	7695	340.08	7700	357.65	7705	401.45	7710
433.12	7715	457.87	7720						

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	253.66	.045	289.49	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	253.66	289.49		71.79	68.66	66.12	.1	.3

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1790

INPUT

Description: Station Elevation Data num= 15									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7700	155.98	7700	196.65	7697.57	209.43	7695	232.88	7690
257.25	7685	275.88	7681.23	300.64	7685	331.91	7690	361.89	7695
392.25	7700	422.5	7705	451.89	7710	485.19	7714.99	485.37	7715

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	257.35	.045	300.64	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	257.35	300.64		163.71	173.13	165.52	.1	.3

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1780

INPUT

Description: Station Elevation Data num= 13									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7690	14.55	7685	23.27	7680	31.87	7675	39.26	7670.58
140.13	7670.55	145.48	7670	172.45	7667.42	196.61	7670	248.11	7675
282.71	7680	324.52	7685	363.05	7690				

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	140.13	.045	196.61	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	140.13	196.61		150.3	144.77	149.38	.1	.3

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1770

INPUT

Description: Station Elevation Data num= 11									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
52.98	7664.11	70.45	7660	80.94	7657.67	90.2	7655.88	111.25	7655.66
120.57	7654.95	143.45	7657.47	166.51	7660	214.89	7665	254.62	7670
273.01	7670								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
52.98	.055	80.94	.045	143.45	.055

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	80.94	143.45	.1	.3	.3

SUMMARY OF MANNING'S N VALUES

River: Reach #2	Reach	River Sta.	n1	n2	n3
	Carter Canyon	2000	.055	.045	.045

Carter Canyon	1990	.055	.04	.035
Carter Canyon	1980	.055	.04	.035
Carter Canyon	1970	.055	.04	.035
Carter Canyon	1960	.055	.04	.035
Carter Canyon	1950	0	0	0
Carter Canyon	1940	.055	.04	.035
Carter Canyon	1930	.055	.04	.035
Carter Canyon	1920	0	0	0
Carter Canyon	1915	Culvert		
Carter Canyon	1910	0	0	0
Carter Canyon	1905	.055	.035	.055
Carter Canyon	1900	0	0	0
Carter Canyon	1892.5	Culvert		
Carter Canyon	1885	.055	.035	.035
Carter Canyon	1880	0	0	0
Carter Canyon	1872.5	Culvert		
Carter Canyon	1865	0	0	0
Carter Canyon	1860	.055	.035	.055
Carter Canyon	1850	.055	.035	.055
Carter Canyon	1845	Culvert		
Carter Canyon	1840	.055	.045	.055
Carter Canyon	1830	0	0	0
Carter Canyon	1825	Culvert		
Carter Canyon	1820	0	0	0
Carter Canyon	1815	0	0	0
Carter Canyon	1807.5	Culvert		
Carter Canyon	1800	0	0	0
Carter Canyon	1795	.055	.045	.055
Carter Canyon	1790	.055	.045	.055
Carter Canyon	1780	.055	.045	.055
Carter Canyon	1770	.055	.045	.055

SUMMARY OF REACH LENGTHS

River: Reach #2

Reach	River Sta.	Left	Channel	Right
Carter Canyon	2000	254.41	256.17	252.38
Carter Canyon	1990	274.35	282.15	287.47
Carter Canyon	1980	254.12	242.71	241.57
Carter Canyon	1970	332.19	337.86	359.72
Carter Canyon	1960	239.94	147	195.48
Carter Canyon	1950	171.44	130.77	155
Carter Canyon	1940	155.48	150.5	128.56
Carter Canyon	1930	95.72	87.86	77.51
Carter Canyon	1920	20.28	21.1	23.47
Carter Canyon	1915	Culvert		
Carter Canyon	1910	117.95	89.97	84.42
Carter Canyon	1905	56.03	57.19	58.41
Carter Canyon	1900	59.12	52.85	39.83
Carter Canyon	1892.5	Culvert		
Carter Canyon	1885	81.97	108.19	160.19
Carter Canyon	1880	46.39	50.55	56.56
Carter Canyon	1872.5	Culvert		
Carter Canyon	1865	73.14	76.92	75.1
Carter Canyon	1860	108.22	97.78	82.66
Carter Canyon	1850	36.39	32.29	38.67
Carter Canyon	1845	Culvert		
Carter Canyon	1840	70.59	68.23	61.25
Carter Canyon	1830	34.12	34.93	39.04
Carter Canyon	1825	Culvert		
Carter Canyon	1820	86.19	63.38	66.35
Carter Canyon	1815	71.48	76.69	51.22
Carter Canyon	1807.5	Culvert		
Carter Canyon	1800	65.85	52	50.16
Carter Canyon	1795	71.79	68.66	66.12
Carter Canyon	1790	163.71	173.13	165.52
Carter Canyon	1780	150.3	144.77	149.38
Carter Canyon	1770			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Reach #2

Reach	River Sta.	Contr.	Expan.
Carter Canyon	2000	.1	.3
Carter Canyon	1990	.1	.3
Carter Canyon	1980	.1	.3
Carter Canyon	1970	.1	.3
Carter Canyon	1960	.1	.3
Carter Canyon	1950	.1	.3
Carter Canyon	1940	.1	.3
Carter Canyon	1930	.1	.3
Carter Canyon	1920	.3	.5
Carter Canyon	1915	Culvert	
Carter Canyon	1910	.3	.5
Carter Canyon	1905	.1	.3
Carter Canyon	1900	.3	.5
Carter Canyon	1892.5	Culvert	
Carter Canyon	1885	.3	.5
Carter Canyon	1880	.3	.5
Carter Canyon	1872.5	Culvert	
Carter Canyon	1865	.3	.5
Carter Canyon	1860	.1	.3
Carter Canyon	1850	.3	.5
Carter Canyon	1845	Culvert	
Carter Canyon	1840	.3	.5
Carter Canyon	1830	.3	.5
Carter Canyon	1825	Culvert	
Carter Canyon	1820	.3	.5
Carter Canyon	1815	.3	.5
Carter Canyon	1807.5	Culvert	
Carter Canyon	1800	.3	.5
Carter Canyon	1795	.1	.3
Carter Canyon	1790	.1	.3
Carter Canyon	1780	.1	.3

Carter Canyon 1770 .1 .3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #	Chl
Carter Canyon	2000	Pre-Fire	99.00	7982.19	7984.51	7984.51	7985.10	0.031116	6.18	16.02	13.81	1.01	
Carter Canyon	2000	Post-Fire	393.00	7982.19	7986.22	7986.22	7987.36	0.020780	8.70	47.82	23.25	0.95	
Carter Canyon	1990	Pre-Fire	99.00	7945.54	7946.57	7946.57	7946.87	0.029196	4.42	22.39	38.19	1.02	
Carter Canyon	1990	Post-Fire	393.00	7945.54	7947.46	7947.46	7948.17	0.023066	6.74	58.32	41.88	1.01	
Carter Canyon	1980	Pre-Fire	99.00	7907.53	7909.26	7909.26	7909.70	0.025633	5.34	18.54	21.45	1.01	
Carter Canyon	1980	Post-Fire	393.00	7907.53	7910.50	7910.50	7911.23	0.017605	6.83	57.69	41.51	0.91	
Carter Canyon	1970	Pre-Fire	99.00	7871.91	7874.49	7874.49	7875.15	0.024471	6.49	15.25	11.82	1.01	
Carter Canyon	1970	Post-Fire	393.00	7871.91	7876.38	7876.38	7877.53	0.021846	8.60	45.69	20.33	1.01	
Carter Canyon	1960	Pre-Fire	99.00	7828.39	7829.64	7829.64	7829.96	0.028113	4.53	21.85	35.08	1.01	
Carter Canyon	1960	Post-Fire	393.00	7828.39	7830.54	7830.54	7831.23	0.021688	6.67	60.17	47.65	0.99	
Carter Canyon	1950	Pre-Fire	99.00	7804.38	7806.57	7806.57	7807.14	0.024625	6.06	16.34	14.79	1.02	
Carter Canyon	1950	Post-Fire	393.00	7804.38	7808.34	7808.34	7808.82	0.009453	5.75	70.82	69.04	0.68	
Carter Canyon	1940	Pre-Fire	99.00	7786.41	7788.90	7788.90	7789.53	0.024402	6.38	15.53	12.46	1.01	
Carter Canyon	1940	Post-Fire	393.00	7786.41	7790.74	7790.74	7791.83	0.021368	8.39	46.86	21.50	1.00	
Carter Canyon	1930	Pre-Fire	99.00	7773.91	7776.42	7776.42	7777.02	0.025035	6.19	15.98	13.83	1.02	
Carter Canyon	1930	Post-Fire	393.00	7773.91	7778.53	7778.53	7779.00	0.007932	5.75	74.80	77.96	0.63	
Carter Canyon	1920	Pre-Fire	99.00	7764.59	7768.90	7768.90	7768.99	0.008846	2.38	41.61	31.33	0.23	
Carter Canyon	1920	Post-Fire	393.00	7764.59	7770.60	7768.69	7770.69	0.000658	2.18	174.61	80.82	0.20	
Carter Canyon	1915		Culvert										
Carter Canyon	1910	Pre-Fire	99.00	7762.93	7764.40	7764.40	7765.01	0.016448	6.28	15.78	15.15	0.98	
Carter Canyon	1910	Post-Fire	393.00	7762.93	7766.24	7766.24	7767.85	0.014692	10.16	38.66	28.81	1.01	
Carter Canyon	1905	Pre-Fire	99.00	7756.26	7758.04	7758.04	7758.50	0.019492	5.43	18.23	20.45	1.01	
Carter Canyon	1905	Post-Fire	393.00	7756.26	7759.36	7759.36	7760.15	0.018052	7.13	55.13	35.56	1.01	
Carter Canyon	1900	Pre-Fire	99.00	7753.54	7757.08	7755.03	7757.11	0.000277	1.42	90.82	68.95	0.14	
Carter Canyon	1900	Post-Fire	393.00	7753.54	7757.83	7756.76	7757.98	0.001402	3.47	153.22	98.87	0.31	
Carter Canyon	1892.5		Culvert										
Carter Canyon	1885	Pre-Fire	99.00	7747.71	7748.65	7748.65	7749.08	0.019077	5.26	18.83	24.82	1.01	
Carter Canyon	1885	Post-Fire	393.00	7747.71	7749.95	7749.95	7751.00	0.015224	8.23	47.74	28.77	0.99	
Carter Canyon	1880	Pre-Fire	99.00	7736.13	7740.40	7737.90	7740.44	0.000449	1.71	98.31	22.41	0.17	
Carter Canyon	1880	Post-Fire	393.00	7736.13	7741.91	7740.01	7742.08	0.001400	3.58	132.90	100.61	0.31	
Carter Canyon	1872.5		Culvert										
Carter Canyon	1865	Pre-Fire	99.00	7730.96	7732.64	7732.64	7733.43	0.014992	7.15	13.86	12.84	0.99	
Carter Canyon	1865	Post-Fire	393.00	7730.96	7734.41	7734.41	7735.63	0.016992	8.87	44.32	17.88	0.99	
Carter Canyon	1860	Pre-Fire	99.00	7722.02	7724.18	7724.18	7724.73	0.008839	5.97	16.58	15.35	1.01	
Carter Canyon	1860	Post-Fire	393.00	7722.02	7725.78	7725.78	7726.72	0.007821	7.79	50.46	27.22	1.01	
Carter Canyon	1850	Pre-Fire	99.00	7713.01	7717.21	7714.92	7717.23	0.000183	1.27	87.79	41.94	0.14	
Carter Canyon	1850	Post-Fire	393.00	7713.01	7718.24	7716.51	7718.38	0.000902	3.25	146.08	71.23	0.30	
Carter Canyon	1845		Culvert										
Carter Canyon	1840	Pre-Fire	99.00	7709.96	7712.19	7712.19	7712.72	0.008192	5.86	16.91	15.17	0.98	
Carter Canyon	1840	Post-Fire	393.00	7709.96	7713.82	7713.82	7714.75	0.007369	7.75	50.71	26.54	0.98	
Carter Canyon	1830	Pre-Fire	99.00	7705.60	7710.05	7707.64	7710.07	0.000118	0.67	106.80	54.47	0.07	
Carter Canyon	1830	Post-Fire	393.00	7705.60	7711.06	7709.48	7711.19	0.000460	1.85	167.19	64.11	0.15	
Carter Canyon	1825		Culvert										
Carter Canyon	1820	Pre-Fire	99.00	7702.77	7704.74	7704.74	7705.23	0.030286	5.60	17.69	17.97	0.99	
Carter Canyon	1820	Post-Fire	393.00	7702.77	7706.01	7706.01	7707.00	0.018840	7.37	51.95	41.54	0.89	
Carter Canyon	1815	Pre-Fire	99.00	7694.82	7698.95	7696.74	7699.13	0.003179	3.43	28.83	8.08	0.30	
Carter Canyon	1815	Post-Fire	393.00	7694.82	7701.88	7699.50	7702.49	0.010542	6.41	66.35	30.08	0.51	
Carter Canyon	1807.5		Culvert										
Carter Canyon	1800	Pre-Fire	99.00	7691.98	7693.32	7693.32	7693.73	0.039351	5.14	19.26	22.85	0.99	
Carter Canyon	1800	Post-Fire	393.00	7691.98	7694.56	7694.56	7695.29	0.033223	6.87	57.21	38.50	0.99	
Carter Canyon	1795	Pre-Fire	99.00	7686.94	7688.72	7688.72	7689.16	0.031586	5.37	18.44	20.78	1.00	
Carter Canyon	1795	Post-Fire	393.00	7686.94	7690.01	7690.01	7690.80	0.026764	7.13	55.12	35.92	1.01	
Carter Canyon	1790	Pre-Fire	99.00	7681.23	7683.01	7683.01	7683.47	0.032546	5.45	18.16	20.42	1.02	
Carter Canyon	1790	Post-Fire	393.00	7681.23	7684.34	7684.34	7685.12	0.026072	7.08	55.49	35.70	1.00	
Carter Canyon	1780	Pre-Fire	99.00	7667.42	7668.85	7668.85	7669.22	0.034392	4.88	20.28	28.35	1.02	
Carter Canyon	1780	Post-Fire	393.00	7667.42	7669.91	7669.91	7670.55	0.028110	6.39	61.52	49.38	1.01	
Carter Canyon	1770	Pre-Fire	99.00	7654.95	7656.29	7656.16	7656.47	0.020014	3.46	28.58	44.61	0.76	
Carter Canyon	1770	Post-Fire	393.00	7654.95	7657.14	7656.99	7657.61	0.020039	5.46	72.02	56.82	0.85	

Profile Output Table - Culvert Only

Reach	River Sta	Profile	E.G. US (ft)	W.S. US (ft)	E.G. IC (ft)	E.G. OC (ft)	Min El Weir (ft)	Flow (cfs)	Q Culv Group (cfs)	Q Weir (cfs)	Delta WE (ft)	Culv Vel US (ft/s)
Carter Canyon	1915	CULVERT#1	Pre-Fire	7768.99	7768.90	7768.69	7768.99	7769.01	99.00			4.51
Carter Canyon	1915	CULVERT#1	Post-Fire	7770.69	7770.60	7770.71	7770.69	7769.01	152.23	240.77		4.36
Carter Canyon	1892.5	CULVERT#1	Pre-Fire	7757.11	7757.08	7756.72	7757.11	7756.82	71.53	27.49		8.44

Carter Canyon	1892.5	CULVERT#1	Post-Fire	7757.98	7757.83	7757.71	7757.98	7756.82	98.13	294.87	7.88
8.51	14.16										
Carter Canyon	1872.5	CULVERT#1	Pre-Fire	7740.44	7740.40	7740.07	7740.44	7740.01	95.87	3.13	7.76
8.41	15.89										
Carter Canyon	1872.5	CULVERT#1	Post-Fire	7742.08	7741.91	7742.11	7742.08	7740.01	140.68	252.32	7.50
9.95	9.95										
Carter Canyon	1845	CULVERT#1	Pre-Fire	7717.23	7717.21	7716.77	7717.23	7716.40	46.07	52.93	5.02
8.25	15.32										
Carter Canyon	1845	CULVERT#1	Post-Fire	7718.39	7718.24	7718.37	7718.39	7716.40	62.64	330.36	4.42
8.86	8.86										
Carter Canyon	1825	CULVERT#1	Pre-Fire	7710.06	7710.05	7710.06	7709.68	7709.83	47.21	51.79	5.31
8.35	15.21										
Carter Canyon	1825	CULVERT#1	Post-Fire	7711.19	7711.06	7711.28	7711.19	7709.83	69.80	323.20	5.05
9.87	9.87										
Carter Canyon	1807.5	CULVERT#1	Pre-Fire	7699.14	7698.95	7698.78	7699.14	7699.62	99.00		5.63
9.08	12.63										
Carter Canyon	1807.5	CULVERT#1	Post-Fire	7702.49	7701.88	7702.49	7701.68	7699.62	173.55	219.45	7.32
11.56	15.15										

HEC-RAS OUTPUT
CARTER CANYON WASH
CULVERT ANALYSIS (100-YEAR)

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X X XXXXXX XXXX XXXX XX XXXX
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PROJECT DATA

Project Title: Summerhaven
 Project File : CARTER CANYON CREEK.prj
 Run Date and Time: 12/19/2003 11:21:25 AM

Project in English units

Project Description:
 Carter Canyon

PLAN DATA

Plan Title: CMG 100 year
 Plan File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\CARTER CANYON CREEK.p05

Geometry Title: CMG
 Geometry File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\CARTER CANYON CREEK.g02

Flow Title : 100 year SCS Type I
 Flow File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\CARTER CANYON CREEK.f04

Plan Summary Information:

Number of: Cross Sections = 26 Multiple Openings = 0
 Culverts = 5 Inline Structures = 0
 Bridges = 0 Lateral Structures = 0

Computational Information

Water surface calculation tolerance = 0.01
 Critical depth calculation tolerance = 0.01
 Maximum number of iterations = 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: 100 year SCS Type I
 Flow File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\CARTER CANYON CREEK.f04

Flow Data (cfs)

River	Reach	RS	Pre-Fire	Post-Fire
Reach #2	Carter Canyon	2000	238	666

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Reach #2	Carter Canyon	Pre-Fire		Normal S = 0.02
Reach #2	Carter Canyon	Post-Fire		Normal S = 0.02

GOMETRY DATA

Geometry Title: CMG
 Geometry File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\CARTER CANYON CREEK.g02

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 2000

INPUT

Description:

Station	Elevation	Data	num=	23	Sta	Elev	Sta	Elev	Sta	Elev
0	8045	8.88	8040	17.54	8035	21.79	8032.57	26.16	8030	
34.81	8025	42.96	8020	50.82	8015	58.62	8010	68.82	8005	
78.85	8000	80.67	7999.26	86.91	7995	95.02	7990	103.5	7985	
109.11	7982.19	120.24	7985	138.54	7990	153.58	7995	170.59	8000	
187.1	8005	198.86	8010	209.89	8015					

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	103.5	.045	120.24	.045

Bank	Sta	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	103.5	120.24		254.41	256.17	252.38	.1	.3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1990

INPUT

Description:

Station Elevation Data		num=		29	
Sta	Elev	Sta	Elev	Sta	Elev
0	8005	9.43	8000	18.78	7995
51.76	7980	59.42	7977.48	66.51	7975
105.45	7960	118.09	7955	130.54	7950
182.85	7950	192.56	7955	200.57	7960
220.93	7975	227.71	7980	234.64	7985
250.47	7990	260.21	7995	269.88	8000

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	130.54	.04	182.85	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	130.54	182.85		274.35	282.15	287.47	.1	.3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1980

INPUT

Description:

Station Elevation Data		num=		23	
Sta	Elev	Sta	Elev	Sta	Elev
0	7950	13.88	7945	27.45	7940
55.31	7930	70.15	7925	84.95	7920
122.37	7907.53	144.15	7910	147.09	7910
190.35	7920	201.96	7925	213.55	7930
242.14	7942.16	254.74	7945	283.23	7950

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	113.5	.04	144.15	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	113.5	144.15		254.12	242.71	241.57	.1	.3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1970

INPUT

Description:

Station Elevation Data		num=		26	
Sta	Elev	Sta	Elev	Sta	Elev
0	7905	14.23	7900	28.2	7895
73	7885	97.67	7880	103.71	7878.15
159.18	7875	167.22	7871.91	173.33	7875
193.29	7885	203.14	7890	212.66	7895
243.1	7910	243.32	7910.13	255.45	7915
293.76	7930				

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	155.42	.04	179.21	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	153.58	183.29		332.19	337.86	359.72	.1	.3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1960

INPUT

Description:

Station Elevation Data		num=		32	
Sta	Elev	Sta	Elev	Sta	Elev
0	7880	20.5	7875	41.15	7870
120.46	7855	121.39	7854.77	134.5	7851.85
175.29	7844.43	185.33	7840	188.61	7838.51
240.27	7830	250.73	7828.39	280.4	7829.76
314.68	7840	323.82	7845	332.94	7850
364.48	7865	375.81	7870	387.38	7875
418.64	7896.93	443.75	7890		

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	240.27	.04	281.49	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	240.27	281.49		239.94	147	195.48	.1	.3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1950

INPUT

Description:

Station Elevation Data		num=		33	
Sta	Elev	Sta	Elev	Sta	Elev
0	7880	15.71	7875	33.18	7870
79.75	7855	96.79	7850	112.05	7845
140.18	7840	155.27	7835	168.91	7830
208.68	7817.54	217.11	7815	233.65	7810
253.04	7804.38	255.17	7805	264.76	7807.91
332.82	7815	349.79	7820	368.41	7825
413.53	7835	441.27	7837.41	450.81	7840

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 240.99 0 264.76 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 240.99 264.75 171.44 130.77 155 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Carter Canyon RS: 1940

INPUT

Description: Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7850	10.51	7845	21.54	7840	32.26	7835	43.29	7830
58.76	7825	74.61	7820	86.44	7815	110.38	7810	124.71	7805
138.97	7800	152.44	7795	157.92	7792.58	165.36	7790	176.78	7786.41
183.31	7790	187.91	7792.43	240.63	7792.26	251.18	7795	270.37	7800
289.63	7805	310.63	7810	332.01	7815	342.23	7817.33	359.37	7820
365.09	7821.51	381.02	7820						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 165.36 .04 183.31 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 157.92 187.91 155.48 150.5 128.56 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Carter Canyon RS: 1930

INPUT

Description: Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7825	14.77	7820	28.55	7815	42.04	7810	56.78	7805
71.7	7800	86.85	7795	101.46	7790	107.37	7788.07	123.46	7785
139.92	7780	147.24	7777.69	155.14	7775	156.83	7773.91	160.02	7775
165.76	7777.91	230.28	7778.62	235.15	7780	251.77	7785	265.98	7790
276.41	7795	286.06	7800	295.86	7805	299.9	7807.08	315.17	7810
338.94	7815								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 147.24 .04 169.76 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 147.24 169.76 95.72 87.86 77.51 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Carter Canyon RS: 1920

INPUT

Description: XSEC Upstream of Culvert # 15 Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7795	21.78	7790	29.21	7788.07	40.61	7785	58.94	7780
87.49	7775	133.17	7770	136.3	7768.68	145.34	7765	146.35	7764.59
148.27	7765	168.77	7769.25	205.05	7769.49	206.52	7770	222.71	7775
238.8	7780	251.28	7785	259.8	7788.12	275.09	7790	277.81	7790.35
283.49	7795	289.16	7800	294.96	7805	295.05	7805		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 136.3 0 168.77 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 136.3 168.77 20.28 21.1 23.47 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 140.85 7769 F
 153 295.05 7769 F

CULVERT

RIVER: Reach #1
 REACH: Carter Canyon RS: 1915

INPUT

Description: Culvert #15
 Distance from Upstream XS = 2
 Deck/Roadway Width = 12
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates num= 5

Sta	H1	Cord	Lo	Cord	Sta	H1	Cord	Lo	Cord
0	7775.3				153.84	7772.5			
153.85	7769				200	7768.08			

Upstream Bridge Cross Section Data Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7795	21.78	7790	29.21	7788.07	40.61	7785	58.94	7780
87.49	7775	133.17	7770	136.3	7768.68	145.34	7765	146.35	7764.59
148.27	7765	168.77	7769.25	205.05	7769.49	206.52	7770	222.71	7775
238.8	7780	251.28	7785	259.8	7788.12	275.09	7790	277.81	7790.35
283.49	7795	289.16	7800	294.96	7805	295.05	7805		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 136.3 0 168.77 0

Bank Sta: Left Right Coeff Contr. Expan.
 136.3 168.77 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 140.85 7769 F
 153 295.05 7769 F

Downstream Deck/Roadway Coordinates
 num= 5
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 134.54 7770 148.5 7770.5 161.5 7770.5
 161.51 7767 230 7766.08

Downstream Bridge Cross Section Data
 Station Elevation Data num= 22
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7795 21.7 7790 30.65 7788.07 41.77 7785 59.95 7780
 80.55 7775 85.39 7773.79 134.54 7770 142.79 7766.8 148.27 7765
 151.21 7763.08 153.33 7762.93 160.73 7763.14 166.08 7765 177.49 7766.96
 226.61 7767.89 233.49 7770 247.27 7775 261.91 7780 276.4 7785
 285.77 7790 293.21 7794.27

Manning's n Values num= 1
 Sta n Val Sta n Val Sta n Val
 0 0 142.79 0 177.49 0

Bank Sta: Left Right Coeff Contr Expan.
 142.79 177.49 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 150 7767 F
 162.41 293.21 7767 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 =
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 3 12 .024 .024 0 .5 1

Number of Barrels = 2
 Upstream Elevation = 7765
 Centerline Stations
 Sta. Sta.
 145.34 149.34
 Downstream Elevation = 7763.15
 Centerline Stations
 Sta. Sta.
 153.33 157.33

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1910

INPUT

Description: XSEC Downstream of Culvert # 15
 Station Elevation Data num= 22
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7795 21.7 7790 30.65 7788.07 41.77 7785 59.95 7780
 80.55 7775 85.99 7773.79 134.54 7770 142.79 7766.8 148.27 7765
 151.21 7763.08 153.93 7762.93 160.73 7763.14 166.08 7765 177.49 7766.96
 226.61 7767.89 233.49 7770 247.27 7775 261.91 7780 276.4 7785
 285.77 7790 293.21 7794.27

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 142.79 0 177.49 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 142.79 177.49 117.95 89.97 84.42 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 150 7767 F
 162.41 293.21 7767 F

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1905

INPUT

Description:
 Station Elevation Data num= 22
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7780 21.24 7775 40.45 7770 56.16 7765.91 72.87 7765
 116.45 7760 143.29 7756.26 159.35 7760 168.13 7761.98 205.41 7763.75
 210.7 7765 231.16 7770 251.73 7775 265.36 7780 278.59 7785
 279.76 7785.46 320.24 7787.71 328.41 7790 345.1 7795 356.92 7800
 361.63 7802.01 374.44 7805

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 116.45 .035 159.35 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 116.45 159.35 56.03 57.39 58.41 .1 .3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1900

INPUT

Description: Upstream of Culvert #14
 Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770.33	1.92	7770	30.46	7765	56.2	7760	58.5	7759.58
108.51	7756.83	135.03	7755.34	135.92	7753.57	141.06	7753.56	148	7753.54
152.14	7756.16	166.86	7756.81	182.87	7757.533	202.16	7758.41	210.16	7760
230.64	7765	236.44	7766.583	248.96	7770	265.28	7775	280.56	7780
297.92	7785	316.92	7790	332.05	7795	343.72	7800		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	135.03	0	152.14	0

 Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

Left	Right	Left	Channel	Right	Coeff	Contr.	Expan.
135.03	152.14	59.12	52.85	39.82	.3	.5	

 Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	137.39	7756	F
147.26	343.72	7756	F

CULVERT

RIVER: Reach #2
 REACH: Carter Canyon RS: 1892.5

INPUT

Description: Culvert #14
 Distance from Upstream XS = 3
 Deck/Roadway Width = 40
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
108.51	7756.83		166.86	7756.81					

 Upstream Bridge Cross Section Data
 Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770.33	1.92	7770	30.46	7765	56.2	7760	58.5	7759.58
108.51	7756.83	135.03	7755.34	135.92	7753.57	141.06	7753.56	148	7753.54
152.14	7756.16	166.86	7756.81	182.87	7757.533	202.16	7758.41	210.16	7760
230.64	7765	236.44	7766.583	248.96	7770	265.28	7775	280.56	7780
297.92	7785	316.92	7790	332.05	7795	343.72	7800		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	135.03	0	152.14	0

 Bank Sta: Left Right Coeff Contr. Expan.

Left	Right	Coeff	Contr.	Expan.
135.03	152.14	.3	.5	

 Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	137.39	7756	F
147.26	343.72	7756	F

Downstream Deck/Roadway Coordinates num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
183.72	7753.47		230.95	7753.53					

 Downstream Bridge Cross Section Data
 Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
95.18	7762.83	142	7760	170.52	7755	183.72	7753.47	192.5	7752.43
197.3	7747.9	207.68	7747.71	219.81	7747.88	230.95	7753.53	264.7	7754.41
267.47	7755	288.88	7760	305.25	7765	319.31	7770	332.76	7775
346.39	7780	362.95	7785	380.46	7790	393.63	7795		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
95.18	.055	192.5	.035	230.95	.035

 Bank Sta: Left Right Coeff Contr. Expan.

Left	Right	Coeff	Contr.	Expan.
192.5	230.95	.3	.5	

 Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
95.18	197.3	7752	F
219.48	393.63	7752	F

Upstream Embankment side slope = 1 horiz. to 1.0 vertical
 Downstream Embankment side slope = 1 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .95
 Elevation at which weir flow begins =
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 3 - Pipe projecting from fill
 Solution Criteria = Highest U.S. EG
 Culvert Upstream Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef

3	40	.024	.024	0	.9	1
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 Number of Barrels = 2
 Upstream Elevation = 7753.56
 Centerline Stations

Sta.	Sta.
139.95	145.69

 Downstream Elevation = 7750
 Centerline Stations

Sta.	Sta.
204.51	214.23

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1885

INPUT

Description: XSEC Downstream of Culvert # 14

Station Elevation Data num= 19									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
95.18	7762.93	192	7760	170.52	7755	183.72	7753.47	192.5	7752.43
197.3	7747.9	207.58	7747.71	219.81	7747.88	230.95	7751.53	264.7	7754.41
267.47	7755	288.38	7760	305.25	7765	319.31	7770	332.76	7775
346.39	7780	362.35	7785	380.46	7790	393.63	7795		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
95.18	.055	192.5	.035	230.95	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	192.5	230.95		81.97	108.19	160.19	.3	.5
Ineffective Flow num= 2								
Sta L	Sta R	Elev	Permanent					
95.18	197.3	7752	F					
219.48	330.63	7752	F					

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1880

INPUT

Description: Upstream of Culvert #13

Station Elevation Data num= 19									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7760	18.47	7755	24.55	7753.31	71.34	7755	109.86	7755
152.93	7750	176.48	7745	216.81	7740	224.29	7736.14	229.4	7736.19
231.76	7736.13	235.42	7740	237.64	7741.47	300.41	7741.41	304.11	7742.561
311.96	7745	328.42	7750	328.84	7750.12	382.56	7753.02		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	216.81	0	237.64	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	216.81	237.64		46.39	50.55	56.56	.3	.5
Ineffective Flow num= 2								
Sta L	Sta R	Elev	Permanent					
0	224.16	7740	F					
231.89	382.56	7740	F					

CULVERT

RIVER: Reach #2
REACH: Carter Canyon RS: 1872.5

INPUT

Description: Culvert #13

Distance from Upstream XS	=	3
Deck/Roadway Width	=	40
Weir Coefficient	=	3.1
Upstream Deck/Roadway Coordinates num= 2		
Sta	Hi Cord	Lo Cord
216.81	7740	237.64 7741.47

Upstream Bridge Cross Section Data num= 19									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7760	18.47	7755	24.55	7753.31	71.34	7755	109.86	7755
152.93	7750	176.48	7745	216.81	7740	224.29	7736.14	229.4	7736.19
231.76	7736.13	235.42	7740	237.64	7741.47	300.41	7741.41	304.11	7742.561
311.96	7745	328.42	7750	328.84	7750.12	382.56	7753.02		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	216.81	0	237.64	0

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	216.81	237.64	.3		.5
Ineffective Flow num= 2					
Sta L	Sta R	Elev	Permanent		
0	224.16	7740	F		
231.89	382.56	7740	F		

Downstream Deck/Roadway Coordinates num= 2					
Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
217.02	7735		237.64	7735.53	

Downstream Bridge Cross Section Data num= 19									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
71	7746.49	135.67	7747.76	165.45	7745.44	169.17	7745	203.16	7740
217.02	7735	223.2	7731.08	228.67	7730.96	251.57	7731.05	256.58	7735
251.48	7735	277.75	7735	315.77	7740	341.7	7745	361.84	7750
378.35	7755	393.64	7759.59	408.03	7759.93	408.35	7760		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
71	0	217.02	0	236.58	0

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	217.02	236.58	.3		.5
Ineffective Flow num= 2					
Sta L	Sta R	Elev	Permanent		
71	223.01	7734	F		
231.57	408.35	7734	F		

- Upstream Embankment side slope = 1 horiz. to 1.0 vertical
- Downstream Embankment side slope = 1 horiz. to 1.0 vertical
- Maximum allowable submergence for weir flow = .95
- Elevation at which weir flow begins = 7740
- 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Chart # 3 - Pipe projecting from fill
 Solution Criteria = Highest U.S. BS
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 3 40 .024 .024 0 .9 1
 Number of Barrels = 2
 Upstream Elevation = 7736.1
 Centerline Stations
 Sta. Sta.
 225.97 229.96
 Downstream Elevation = 7731.09
 Centerline Stations
 Sta. Sta.
 225.48 229.86

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1865

INPUT

Description: XSection Downstream of Culvert # 13

Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
71	7746.49	135.67	7747.76	165.45	7745.44	169.17	7745	203.36	7740
217.02	7735	223.2	7731.08	228.67	7730.96	231.57	7731.05	236.58	7735
251.48	7735	277.75	7735	315.77	7740	341.7	7745	361.84	7750
378.35	7755	393.64	7759.59	408.03	7759.93	408.35	7760		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
71	0	217.02	0	236.58	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 217.02 236.58 73.14 76.92 75.1 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
71	223.01	7734	F
231.57	408.35	7734	F

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1860

INPUT

Description:

Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7755	17.84	7750	40.74	7745	72.89	7740	86	7735
87.92	7734.12	123.13	7730	143.75	7725.99	147.98	7725	158.71	7722.02
169.16	7725	173.27	7726.19	207.09	7726.7	224.66	7730	249.44	7735
272.84	7740	291.06	7745	307.57	7750	323.14	7755	338.27	7759.89
340.05	7760	352.74	7760.86	372.02	7765				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	143.75	.035	173.27	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 143.75 173.27 108.23 97.78 82.66 .1 .3

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1850

INPUT

Description: XSection Upstream of Culvert # 12

Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7760	4.91	7758.28	25.95	7755	50.68	7750	72.48	7745
93.37	7740	112.74	7735	130.77	7730	148.47	7725	165.51	7720
193.76	7715	207.27	7713.01	214.2	7715	221.75	7717.14	252.72	7718.5
259.35	7720	296.89	7725	312.95	7730	318.7	7735	322.99	7738.73
326.83	7740	341.83	7745	356.83	7750	370.8	7754.82	371.94	7755
395.41	7758.13	399.94	7760						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	193.76	.035	214.2	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 193.76 221.75 36.39 32.29 38.67 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	200.71	7716.5	F
213.62	399.94	7716.5	F

CULVERT

RIVER: Reach #2
 REACH: Carter Canyon RS: 1845

INPUT

Description: Culvert #12

Distance from Upstream XS = 5
 Deck/Roadway Width = 20
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates num= 3

Sta	H1	Cord	Lo Cord	Sta	H1	Cord	Lo Cord	Sta	H1	Cord	Lo Cord
0	7720.64			207.27	7716.5			225	7716.2		

Upstream Bridge Cross Section Data

Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-----	------	-----	------	-----	------	-----	------	-----	------

0	7760	4.91	7758.28	25.95	7755	50.68	7750	72.48	7745
93.37	7740	112.74	7735	130.77	7730	148.47	7725	165.51	7720
193.76	7715	207.27	7713.01	214.2	7715	221.75	7717.14	252.72	7718.5
259.35	7720	296.89	7725	312.95	7730	318.7	7735	322.99	7738.73
326.83	7740	341.83	7745	356.83	7750	370.8	7754.82	371.94	7755
395.41	7758.12	399.94	7760						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 193.76 .035 214.2 .055

Bank Sta: Left Right Coeff Contr. Expan.
 193.76 221.75 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 200.71 7716.5 F
 213.62 399.94 7716.5 F

Downstream Deck/Roadway Coordinates
 num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7718.28 207.27 7713.79 225 7713.84

Downstream Bridge Cross Section Data
 Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7760	9.09	7757.41	19.7	7755	42.41	7750	61.41	7745
75.19	7740	89.54	7735	112.83	7730	153.96	7725	174.74	7720
189.16	7715	203.8	7709.96	218.79	7713.8	239.91	7715	246.57	7715.37
309.52	7720	316.82	7725	324.06	7730	331.29	7735	336.79	7738.73
341.04	7740	358.41	7745	393.61	7750				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 189.16 .045 218.79 .055

Bank Sta: Left Right Coeff Contr. Expan.
 189.16 218.79 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 198.16 7712 F
 207.59 393.61 7712 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 =
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 3 - Pipe projecting from fill
 Solution Criteria = Highest U.S. BG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 5 20 .024 .024 0 .9 1
 Upstream Elevation = 7713.01
 Centerline Station = 207.27
 Downstream Elevation = 7709.96
 Centerline Station = 203.8

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1840

INPUT

Description: XSection Downstream of Culvert # 12
 Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7760	9.09	7757.41	19.7	7755	42.41	7750	61.41	7745
75.19	7740	89.54	7735	112.83	7730	153.96	7725	174.74	7720
189.16	7715	203.8	7709.96	218.79	7713.8	239.91	7715	246.57	7715.37
309.52	7720	316.82	7725	324.06	7730	331.29	7735	336.79	7738.73
341.04	7740	358.41	7745	393.61	7750				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 189.16 .045 218.79 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 189.16 218.79 70.59 69.23 61.25 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 198.16 7712 F
 207.59 393.61 7712 F

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1830

INPUT

Description: XSection Upstream of Culvert # 11
 Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7750	22.07	7745	36.84	7740.92	40.61	7740	66.06	7735
90.58	7730	115.88	7725	143.42	7720	167.54	7715	186.51	7710
202.55	7705.6	213.94	7708.11	237.53	7709.18	240.55	7710	269.87	7715
308.86	7720	320.56	7725	334.2	7730	348.11	7735	376.32	7740

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 186.51 0 213.94 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 186.51 213.94 14.12 34.33 39.04 .3 .5
 Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	196.05	7710	F
209.05	376.32	7710	F

CULVERT

RIVER: Reach #2
 REACH: Carter Canyon RE: 1825

INPUT

Description: Culvert #11
 Distance from Upstream XS = 5
 Deck/Roadway Width = 11.5
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates

num=	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	
3	0	7716.09				203	7710			243	7708.8

Upstream Bridge Cross Section Data

Station	Elevation	Data	num=	Sta	Elev	Sta	Elev	Sta	Elev
0	7750	22.07	20	7745	36.84	7740.93	40.61	7740	66.06
90.58	7730	115.88		7725	143.42	7720	167.54	7715	186.51
202.55	7705.6	213.94		7708.11	237.53	7709.18	240.55	7710	268.97
308.66	7720	320.56		7725	334.2	7730	348.11	7735	376.32

Manning's n Values

num=	Sta	n Val	Sta	n Val
3	0	186.51	0	213.94

Bank Sta: Left Right Coeff Contr. Expan.
 186.51 213.94 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 196.05 7710 F
 209.05 376.32 7710 F

Downstream Deck/Roadway Coordinates

num=	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	
3	0	7713.38				201.26	7707.28			241.26	7706.08

Downstream Bridge Cross Section Data

Station	Elevation	Data	num=	Sta	Elev	Sta	Elev	Sta	Elev
0	7750	17.34	20	7745	34.1	7740	60.52	7735	71.38
93.31	7725	117.09		7720	142.32	7715	165.88	7710	189.29
199.87	7702.77	209.74		7705.02	209.75	7705	228.15	7706.14	249.6
285.04	7715	311.47		7720	335.19	7725	370.44	7730	409.15

Manning's n Values

num=	Sta	n Val	Sta	n Val
3	0	189.29	0	209.74

Bank Sta: Left Right Coeff Contr. Expan.
 189.29 209.74 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 181.97 7706.52 F
 217.77 409.15 7706.52 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 =
 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	

FMWA Chart # 2 - Corrugated Metal Pipe Culvert
 FMWA Scale # 2 - Mitered to conform to slope
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 5 18.5 .024 .024 0 .7 1

Upstream Elevation = 7705.6
 Centerline Station = 202.55
 Downstream Elevation = 7702.77
 Centerline Station = 199.87

CROSS SECTION

RIVER: Reach #2
 REACH: Carter Canyon RS: 1820

INPUT

Description: XSection Downstream of Culvert # 11

Station	Elevation	Data	num=	Sta	Elev	Sta	Elev	Sta	Elev
0	7750	17.34	20	7745	34.1	7740	60.52	7735	71.38
93.31	7725	117.09		7720	142.32	7715	165.88	7710	189.29
199.87	7702.77	209.74		7705.02	209.75	7705	228.15	7706.14	249.6
285.04	7715	311.47		7720	335.19	7725	370.44	7730	409.15

Manning's n Values

num=	Sta	n Val	Sta	n Val
3	0	189.29	0	209.74

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 189.29 209.74 86.19 63.38 66.35 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 181.97 7706.52 F
 217.77 409.15 7706.52 F

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1815

INPUT

Description: XSection Upstream of Culvert # 10

Station Elevation Data num= 22
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7750 17.02 7745 33.17 7740 46.82 7735 61.54 7730
77.31 7725 93.45 7720 112.1 7715 150.36 7710 173.55 7705
192.76 7700.01 193.77 7694.82 200.09 7694.83 201.29 7700.02 204.34 7701.56
225.4 7702.16 278.01 7705 306.27 7710 331.89 7715 355.86 7720
388.5 7725 419.36 7730

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 192.76 0 204.34 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
192.76 204.34 71.48 76.69 51.22 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 193.39 7700.04 F
200.61 419.36 7699.99 F

CULVERT

RIVER: Reach #2
REACH: Carter Canyon RS: 1807.5

INPUT

Description: Culvert #10

Distance from Upstream XS = 7.63
Deck/Roadway Width = 67
Weir Coefficient = 3.1

Upstream Deck/Roadway Coordinates num= 3
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
1877700.113 1977699.613 2077700.113

Upstream Bridge Cross Section Data num= 22
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7750 17.02 7745 33.17 7740 46.82 7735 61.54 7730
77.31 7725 93.45 7720 112.1 7715 150.36 7710 173.55 7705
192.76 7700.01 193.77 7694.82 200.09 7694.83 201.29 7700.02 204.34 7701.56
225.4 7702.16 278.01 7705 306.27 7710 331.89 7715 355.86 7720
388.5 7725 419.36 7730

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 192.76 0 204.34 0

Bank Sta: Left Right Coeff Contr. Expan.
192.76 204.34 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 193.39 7700.04 F
200.61 419.36 7699.99 F

Downstream Deck/Roadway Coordinates num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
175 7697.07 300 7697.07

Downstream Bridge Cross Section Data num= 21
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7720 56.76 7715.16 71.13 7715 88.13 7713 134.29 7710
144.47 7709.38 156.71 7705 173.25 7700 181.91 7698.81 216.75 7698.24
228.677695.657 231.7 7695 246.72 7691.98 249.73 7691.98 252.61 7691.98
275.8 7695 301.06 7700 320.33 7705 339.01 7710 361.86 7715
408.3 7720

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 216.75 0 301.06 0

Bank Sta: Left Right Coeff Contr. Expan.
216.75 301.06 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 226 7697 F
278 408.3 7697 F

Upstream Embankment side slope = 1 horiz. to 1.0 vertical
Downstream Embankment side slope = 3 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 7698.49
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 Arch 3.583 5.333
FHWA Chart # 41- Arch; Corrugated metal
FHWA Scale # 1 - 90 Degree headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
7.63 65 .024 .024 0 .5 1
Upstream Elevation = 7695.03
Centerline Station = 197
Downstream Elevation = 7691.94
Centerline Station = 250

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1800

INPUT

Description: XSection Downstream of Culvert #10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7720	56.76	7715.16	71.13	7715	88.13	7713	134.29	7710
144.47	7705.38	156.71	7705	173.25	7700	181.91	7698.81	216.75	7698.24
228.67	7695.657	231.7	7695	246.72	7691.98	249.73	7691.98	252.61	7691.98
275.8	7695	301.06	7700	320.33	7705	339.01	7710	361.86	7715
408.3	7720								

Sta	n Val	Sta	n Val	Sta	n Val
0	0	216.75	0	301.06	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	216.75	301.06		65.85	52	50.16	.3	.5

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1795

INPUT

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7715	96.45	7710	154.09	7708.76	165.68	7705	175.71	7700
178.06	7698.74	215.72	7698.22	230.02	7695	253.66	7690	271.74	7686.94
289.49	7690	319.56	7695	340.08	7700	357.65	7705	401.45	7710
433.12	7715	457.87	7720						

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	253.66	.045	289.49	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	253.66	289.49		71.79	68.66	66.12	.1	.3

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1790

INPUT

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7700	155.98	7700	196.45	7697.57	209.43	7695	232.88	7690
257.35	7685	275.88	7681.21	300.64	7685	311.91	7690	361.89	7695
392.25	7700	422.5	7705	451.89	7710	485.19	7714.99	485.37	7715

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	257.35	.045	300.64	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	257.35	300.64		163.71	173.13	165.52	.1	.3

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1780

INPUT

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7690	14.55	7685	23.27	7680	31.87	7675	39.36	7670.58
140.13	7670.55	145.48	7670	172.45	7667.42	196.61	7670	248.11	7675
282.71	7680	324.52	7685	363.05	7690				

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	140.13	.045	196.61	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	140.13	196.61		150.3	144.77	149.38	.1	.3

CROSS SECTION

RIVER: Reach #2
REACH: Carter Canyon RS: 1770

INPUT

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
52.98	7664.11	70.45	7660	80.94	7657.67	90.2	7655.88	111.25	7655.66
120.57	7654.95	143.45	7657.47	166.51	7660	214.89	7665	254.62	7670
273.01	7670								

Sta	n Val	Sta	n Val	Sta	n Val
52.98	.055	80.94	.045	143.45	.055

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	80.94	143.45	.1	.3	

SUMMARY OF MANNING'S N VALUES

River: Reach #2	Reach	River Sta.	n1	n2	n3
	Carter Canyon	2000	.055	.045	.045

Carter Canyon	1990	.055	.04	.035
Carter Canyon	1980	.055	.04	.035
Carter Canyon	1970	.055	.04	.035
Carter Canyon	1960	.055	.04	.035
Carter Canyon	1950	0	0	0
Carter Canyon	1940	.055	.04	.035
Carter Canyon	1930	.055	.04	.035
Carter Canyon	1920	0	0	0
Carter Canyon	1915	Culvert		
Carter Canyon	1910	0	0	0
Carter Canyon	1905	.055	.035	.055
Carter Canyon	1900	0	0	0
Carter Canyon	1892.5	Culvert		
Carter Canyon	1885	.055	.035	.035
Carter Canyon	1880	0	0	0
Carter Canyon	1872.5	Culvert		
Carter Canyon	1865	0	0	0
Carter Canyon	1860	.055	.035	.055
Carter Canyon	1850	.055	.035	.055
Carter Canyon	1845	Culvert		
Carter Canyon	1840	.055	.045	.055
Carter Canyon	1830	0	0	0
Carter Canyon	1825	Culvert		
Carter Canyon	1820	0	0	0
Carter Canyon	1815	0	0	0
Carter Canyon	1807.5	Culvert		
Carter Canyon	1800	0	0	0
Carter Canyon	1795	.055	.045	.055
Carter Canyon	1790	.055	.045	.055
Carter Canyon	1780	.055	.045	.055
Carter Canyon	1770	.055	.045	.055

SUMMARY OF REACH LENGTHS

River: Reach #2

Reach	River Sta.	Left	Channel	Right
Carter Canyon	2000	254.41	256.17	252.38
Carter Canyon	1990	274.35	282.15	287.47
Carter Canyon	1980	254.12	242.71	241.57
Carter Canyon	1970	332.19	337.86	359.72
Carter Canyon	1960	239.94	147	195.48
Carter Canyon	1950	171.44	130.77	155
Carter Canyon	1940	155.48	150.5	128.56
Carter Canyon	1930	95.72	87.86	77.51
Carter Canyon	1920	20.28	21.1	23.47
Carter Canyon	1915	Culvert		
Carter Canyon	1910	117.95	89.97	84.42
Carter Canyon	1905	56.03	57.39	58.41
Carter Canyon	1900	59.12	52.85	39.83
Carter Canyon	1892.5	Culvert		
Carter Canyon	1885	81.97	108.19	160.19
Carter Canyon	1880	46.39	50.55	56.56
Carter Canyon	1872.5	Culvert		
Carter Canyon	1865	73.14	76.92	75.1
Carter Canyon	1860	108.23	97.78	82.66
Carter Canyon	1850	36.39	32.29	38.67
Carter Canyon	1845	Culvert		
Carter Canyon	1840	70.59	68.23	61.25
Carter Canyon	1830	34.12	34.93	39.04
Carter Canyon	1825	Culvert		
Carter Canyon	1820	86.19	63.38	66.35
Carter Canyon	1815	71.48	76.69	51.22
Carter Canyon	1807.5	Culvert		
Carter Canyon	1800	65.85	52	50.16
Carter Canyon	1795	71.79	68.66	66.12
Carter Canyon	1790	163.71	173.13	165.52
Carter Canyon	1780	150.3	144.77	149.38
Carter Canyon	1770			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Reach #2

Reach	River Sta.	Contr.	Expan.
Carter Canyon	2000	.1	.3
Carter Canyon	1990	.1	.3
Carter Canyon	1980	.1	.3
Carter Canyon	1970	.1	.3
Carter Canyon	1960	.1	.3
Carter Canyon	1950	.1	.3
Carter Canyon	1940	.1	.3
Carter Canyon	1930	.1	.3
Carter Canyon	1920	.3	.5
Carter Canyon	1915	Culvert	
Carter Canyon	1910	.3	.5
Carter Canyon	1905	.1	.3
Carter Canyon	1900	.3	.5
Carter Canyon	1892.5	Culvert	
Carter Canyon	1885	.3	.5
Carter Canyon	1880	.3	.5
Carter Canyon	1872.5	Culvert	
Carter Canyon	1865	.3	.5
Carter Canyon	1860	.1	.3
Carter Canyon	1850	.3	.5
Carter Canyon	1845	Culvert	
Carter Canyon	1840	.3	.5
Carter Canyon	1830	.3	.5
Carter Canyon	1825	Culvert	
Carter Canyon	1820	.3	.5
Carter Canyon	1815	.3	.5
Carter Canyon	1807.5	Culvert	
Carter Canyon	1800	.3	.5
Carter Canyon	1795	.1	.3
Carter Canyon	1790	.1	.3
Carter Canyon	1780	.1	.3

Carter Canyon 1770 .1 .3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #	Chl
Carter Canyon	2000	Pre-Fire	238.00	7982.19	7985.45	7985.45	7986.35	0.025488	7.65	31.54	19.14	0.99	
Carter Canyon	2000	Post-Fire	666.00	7982.19	7987.26	7987.26	7988.72	0.017645	10.03	75.04	28.85	0.52	
Carter Canyon	1990	Pre-Fire	238.00	7945.54	7947.05	7947.05	7947.56	0.022851	5.78	41.19	40.16	1.01	
Carter Canyon	1990	Post-Fire	666.00	7945.54	7948.07	7948.07	7949.04	0.022858	7.90	84.34	44.36	1.01	
Carter Canyon	1980	Pre-Fire	238.00	7907.53	7910.07	7910.07	7910.61	0.018184	5.92	40.50	37.93	0.91	
Carter Canyon	1980	Post-Fire	666.00	7907.53	7911.13	7911.13	7912.10	0.016657	7.83	85.24	46.67	0.90	
Carter Canyon	1970	Pre-Fire	238.00	7871.91	7875.57	7875.57	7876.51	0.022039	7.78	30.59	16.68	1.01	
Carter Canyon	1970	Post-Fire	666.00	7871.91	7878.03	7878.03	7878.77	0.009327	7.16	100.79	68.64	0.70	
Carter Canyon	1960	Pre-Fire	238.00	7828.39	7830.13	7830.13	7830.64	0.024146	5.76	41.41	42.74	1.01	
Carter Canyon	1960	Post-Fire	666.00	7828.39	7831.15	7831.15	7832.05	0.019573	7.71	91.24	54.82	0.96	
Carter Canyon	1950	Pre-Fire	238.00	7804.38	7807.51	7807.51	7808.31	0.021787	7.20	33.04	21.01	1.01	
Carter Canyon	1950	Post-Fire	666.00	7804.38	7808.73	7808.73	7809.45	0.016668	6.84	84.34	72.05	0.75	
Carter Canyon	1940	Pre-Fire	238.00	7786.41	7789.95	7789.95	7790.85	0.021906	7.62	31.24	17.67	1.01	
Carter Canyon	1940	Post-Fire	666.00	7786.41	7791.76	7791.76	7793.12	0.021467	9.35	71.24	26.36	1.00	
Carter Canyon	1930	Pre-Fire	238.00	7773.91	7777.40	7777.40	7778.23	0.022040	7.32	32.51	19.77	1.01	
Carter Canyon	1930	Post-Fire	666.00	7773.91	7778.92	7778.92	7779.54	0.005720	6.72	108.28	87.99	0.69	
Carter Canyon	1920	Pre-Fire	238.00	7764.59	7770.00	7767.78	7770.05	0.000573	1.87	127.90	73.34	0.18	
Carter Canyon	1920	Post-Fire	666.00	7764.59	7771.40	7769.67	7771.53	0.000832	2.67	243.16	90.71	0.22	
Carter Canyon	1915		Culvert										
Carter Canyon	1910	Pre-Fire	238.00	7762.93	7765.40	7765.40	7766.50	0.013749	8.44	28.20	21.34	0.99	
Carter Canyon	1910	Post-Fire	666.00	7762.93	7767.01	7767.01	7768.08	0.017254	8.31	80.24	37.74	0.96	
Carter Canyon	1905	Pre-Fire	238.00	7756.26	7758.80	7758.80	7759.44	0.017189	6.44	36.93	29.11	1.01	
Carter Canyon	1905	Post-Fire	666.00	7756.26	7760.08	7760.08	7761.06	0.019122	7.94	83.88	44.00	1.00	
Carter Canyon	1900	Pre-Fire	238.00	7753.54	7757.55	7756.01	7757.63	0.000698	2.47	127.39	87.73	0.23	
Carter Canyon	1900	Post-Fire	666.00	7753.54	7758.19	7757.48	7758.46	0.002766	4.81	192.35	113.70	0.41	
Carter Canyon	1892.5		Culvert										
Carter Canyon	1885	Pre-Fire	238.00	7747.71	7749.35	7749.35	7750.09	0.014974	6.94	34.31	26.93	0.98	
Carter Canyon	1885	Post-Fire	666.00	7747.71	7750.86	7750.86	7752.35	0.015685	9.81	67.90	31.52	0.99	
Carter Canyon	1880	Pre-Fire	238.00	7736.13	7741.56	7739.28	7741.69	0.000817	2.75	100.36	96.89	0.24	
Carter Canyon	1880	Post-Fire	666.00	7736.13	7742.38	7740.88	7742.63	0.002166	4.44	181.72	105.94	0.36	
Carter Canyon	1872.5		Culvert										
Carter Canyon	1865	Pre-Fire	238.00	7730.96	7733.92	7733.92	7735.35	0.012478	9.60	24.80	16.47	0.99	
Carter Canyon	1865	Post-Fire	666.00	7730.96	7735.76	7735.76	7736.43	0.007597	7.00	104.52	68.59	0.65	
Carter Canyon	1860	Pre-Fire	238.00	7722.02	7725.09	7725.09	7725.87	0.007820	7.09	33.57	21.90	1.01	
Carter Canyon	1860	Post-Fire	666.00	7722.02	7726.92	7726.92	7727.71	0.004314	7.34	102.41	69.34	0.77	
Carter Canyon	1850	Pre-Fire	238.00	7713.01	7717.79	7715.92	7717.87	0.000503	2.39	117.07	58.51	0.23	
Carter Canyon	1850	Post-Fire	666.00	7713.01	7718.72	7717.14	7718.98	0.001734	4.48	183.47	80.95	0.39	
Carter Canyon	1845		Culvert										
Carter Canyon	1840	Pre-Fire	238.00	7709.96	7713.09	7711.09	7713.88	0.007756	7.14	33.34	21.31	1.01	
Carter Canyon	1840	Post-Fire	666.00	7709.96	7714.83	7714.83	7715.79	0.005583	8.04	88.01	47.27	0.86	
Carter Canyon	1830	Pre-Fire	238.00	7705.60	7710.67	7708.61	7710.74	0.000255	1.14	142.64	60.38	0.11	
Carter Canyon	1830	Post-Fire	666.00	7705.60	7711.67	7710.01	7711.89	0.000763	2.35	207.67	69.82	0.20	
Carter Canyon	1825		Culvert										
Carter Canyon	1820	Pre-Fire	238.00	7702.77	7705.52	7705.52	7706.21	0.021851	6.65	36.11	31.26	0.92	
Carter Canyon	1820	Post-Fire	666.00	7702.77	7706.77	7706.77	7707.70	0.012855	7.45	89.21	50.60	0.77	
Carter Canyon	1815	Pre-Fire	238.00	7694.82	7701.19	7698.21	7701.52	0.006602	4.69	52.55	15.37	0.39	
Carter Canyon	1815	Post-Fire	666.00	7694.82	7702.55	7702.55	7703.43	0.014133	8.02	93.68	49.55	0.59	
Carter Canyon	1807.5		Culvert										
Carter Canyon	1800	Pre-Fire	238.00	7691.98	7694.01	7694.01	7694.62	0.036086	6.24	38.16	31.63	1.00	
Carter Canyon	1800	Post-Fire	666.00	7691.98	7695.24	7695.24	7696.16	0.031150	7.72	86.27	46.40	1.00	
Carter Canyon	1795	Pre-Fire	238.00	7686.94	7689.46	7689.46	7690.10	0.028151	6.40	37.18	29.51	1.01	
Carter Canyon	1795	Post-Fire	666.00	7686.94	7690.70	7690.70	7691.75	0.022042	8.28	82.42	43.32	0.98	
Carter Canyon	1790	Pre-Fire	238.00	7681.23	7682.76	7683.76	7684.41	0.028530	6.46	36.83	29.08	1.01	
Carter Canyon	1790	Post-Fire	666.00	7681.23	7685.05	7685.05	7686.03	0.024360	7.93	83.96	43.89	1.00	
Carter Canyon	1780	Pre-Fire	238.00	7667.42	7669.45	7669.45	7669.98	0.030457	5.81	40.98	40.30	1.01	
Carter Canyon	1780	Post-Fire	666.00	7667.42	7670.47	7670.47	7671.29	0.025721	7.31	91.92	60.45	1.01	
Carter Canyon	1770	Pre-Fire	238.00	7654.95	7656.76	7656.61	7657.09	0.020016	4.65	51.18	51.33	0.82	
Carter Canyon	1770	Post-Fire	666.00	7654.95	7657.65	7657.52	7658.31	0.020006	6.48	102.83	64.09	0.89	

Profile Output Table - Culvert Only

Reach	River Sta	Profile	E.G. US (ft)	W.S. US (ft)	E.G. IC (ft)	E.G. OC (ft)	Min El Weir (ft)	Flow Q (cfs)	Q Culv Group (cfs)	Q Weir (cfs)	Delta WS (ft)	Culv Vel US (ft/s)
Carter Canyon	1915	CULVERT#1	Pre-Fire	7770.06	7770.06	7770.06	7769.94	7769.01	130.31	107.69	4.60	9.22
Carter Canyon	1915	CULVERT#1	Post-Fire	7771.53	7771.40	7771.60	7771.53	7769.01	180.11	485.89	4.40	12.74
Carter Canyon	1892.5	CULVERT#1	Pre-Fire	7757.63	7757.55	7757.27	7757.63	7756.82	87.71	150.29	8.20	8.06

Carter Canyon	1892.5	CULVERT#1	Post-Fire	7758.46	7758.19	7758.46	7758.42	7756.82	111.10	554.90	7.33
7.86	14.79										
Carter Canyon	1872.5	CULVERT#1	Pre-Fire	7741.69	7741.58	7741.69	7741.66	7740.01	122.61	115.39	7.67
8.67	8.67										
Carter Canyon	1872.5	CULVERT#1	Post-Fire	7742.64	7742.38	7742.68	7742.64	7740.01	153.59	512.41	6.62
10.86	10.86										
Carter Canyon	1845	CULVERT#1	Pre-Fire	7717.88	7717.79	7717.87	7717.88	7716.40	55.61	183.23	4.70
9.11	7.87										
Carter Canyon	1845	CULVERT#1	Post-Fire	7718.98	7718.72	7719.00	7718.98	7716.40	74.74	592.15	3.89
10.57	10.57										
Carter Canyon	1825	CULVERT#1	Pre-Fire	7710.74	7710.67	7710.74	7710.02	7709.83	52.63	185.37	5.15
7.45	16.88										
Carter Canyon	1825	CULVERT#1	Post-Fire	7711.89	7711.67	7711.36	7711.89	7709.83	78.66	587.34	4.90
11.13	11.13										
Carter Canyon	1807.5	CULVERT#1	Pre-Fire	7701.52	7701.19	7701.52	7701.04	7699.62	156.22	81.78	7.17
10.41	14.60										
Carter Canyon	1807.5	CULVERT#1	Post-Fire	7703.37	7702.55	7703.37	7702.24	7699.62	188.11	477.89	7.31
12.53	15.63										

HEC-RAS OUTPUT

SABINO CREEK (10-YEAR)

```

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
XXXXXXXX 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   XXXX
  
```

PROJECT DATA

Project Title: Summerhaven
 Project File : SABINO CANYON CREEK.prj
 Run Date and Time: 12/19/2003 11:23:43 AM

Project in English units

Project Description:
 Sabino Canyon

PLAN DATA

Plan Title: 10 year event SCS Type I
 Plan File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\SABINO CANYON CREEK.p03

Geometry Title: Edited Geometry
 Geometry File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\SABINO CANYON CREEK.g03

Flow Title : 10 year SCS Type I event
 Flow File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\SABINO CANYON CREEK.f03

Plan Summary Information:

Number of: Cross Sections = 68 Multiple Openings = 0
 Culverts = 14 Inline Structures = 0
 Bridges = 0 Lateral Structures = 0

Computational Information

Water surface calculation tolerance = 0.01
 Critical depth calculation tolerance = 0.01
 Maximum number of iterations = 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: 10 year SCS Type I event
 Flow File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\SABINO CANYON CREEK.f03

Flow Data (cfs)

River	Reach	RS	Pre-Fire	Post-Fire
Reach #1	Sabino Canyon	5000	111	322
Reach #1	Sabino Canyon	4930	129	369
Reach #1	Sabino Canyon	4790	127	395
Reach #1	Sabino Canyon	4680	147	398
Reach #1	Sabino Canyon	4560	165	490
Reach #1	Sabino Canyon	4510	186	808
Reach #1	Sabino Canyon	4370	273	1076

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Reach #1	Sabino Canyon	Pre-Fire		Normal S = 0.01565
Reach #1	Sabino Canyon	Post-Fire		Normal S = 0.01565

GEOMETRY DATA

Geometry Title: Edited Geometry
 Geometry File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\SABINO CANYON CREEK.g03

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RE: 5000

INPUT

Description:

Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	8030	10.48	8025	21.09	8020	31.2	8015	40.37	8010
49.49	8005	58.93	8000	68.54	7995	77.96	7990	88.64	7985
96.83	7982.98	142.41	7980	183.47	7976.07	169.59	7980	190.91	7982.51
201.25	7985	206.54	7986.31	221.18	7990	243.82	7995	267.78	8000
280.24	8002.52	288.85	8005	305.86	8010	321.81	8015	337.7	8020

Manning's n Values num= 1

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	142.41	.045	169.59	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 142.41 169.59 280.23 292.32 289.78 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4990

INPUT

Description:
 Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	8010	10.25	8005	20.5	8000	30.67	7995	40.73	7990
50.88	7985	60.93	7980	70.76	7975	80.29	7970	90.03	7965
100.12	7960	102.86	7958.87	120.3	7957.44	147.12	7955	155.89	7954.38
159	7955	168.81	7957.19	183.52	7960	215.73	7965	230.92	7967.47
235.72	7970	259.52	7975	279.34	7980	302.17	7985	307.56	7986.12
332.88	7990	372.22	7995						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	147.12	0	159	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 147.12 159 259.73 254.38 208.78 1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4980

INPUT

Description:
 Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10.99	7990	23.56	7985	36.13	7980	48.9	7975	61.61	7970
74.39	7965	87.3	7960	101.02	7955	114.26	7950	120.99	7947.43
135.21	7945	148.27	7942.85	163.34	7940.24	172.75	7940	175	7939
177.1	7940	202.85	7942.73	210.37	7943.62	214.64	7945	229.73	7950
258.14	7955	261.59	7955.16	270.72	7960	280.11	7965	289.44	7970
299.74	7975	314.19	7980	329.81	7985	333.62	7986.12	358.82	7990

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
10.99	0	172.75	0	177.1	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 172.75 177.1 195.74 195.12 199.47 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4970

INPUT

Description:
 Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7990	8.68	7985	16.46	7980	24.1	7975	31.63	7970
39.22	7965	47.07	7960	57.44	7955	76.43	7950	96.26	7945
112.04	7940	123.18	7935	128.04	7932.69	158.34	7930	169.33	7927.21
195.13	7928.24	229.1	7930	256.36	7930.6	264.61	7935	270.84	7940
276.9	7945	282.9	7950	288.87	7955	295.3	7960	302.24	7965
309.34	7970	322.98	7975	339.39	7980				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	158.34	.045	195.13	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 158.34 195.13 109.28 110.18 116.2 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4955

INPUT

Description:
 Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7965	9.74	7960	20.56	7955	32.86	7950	42.4	7945
52.04	7940	61.69	7935	71.37	7930	81.03	7925	82.88	7924.11
101.18	7925	112.8	7920	113	7919.9	113.74	7920	133.3	7922.79
181.02	7925	184.2	7925.13	195.47	7930	207.28	7935	219.9	7940
233.19	7945	249.07	7950	265	7955	280.49	7960		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	101.18	0	133.3	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 101.18 133.3 48.65 42.54 36.65 .3 .5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4950

INPUT

Description: XSEC Upstream of Culvert # 16
 Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7965	9.02	7960	18.52	7955	27.88	7950	37.05	7945
46.22	7940	55.38	7935	64.38	7930	73.76	7925	81.27	7920.95
104.24	7920.78	105.78	7920	107.63	7915.22	114.55	7915.09	119.62	7915.16

126.13 7920 127.89 7920.63 182.08 7923.25 186.68 7925 199.43 7930
 212.03 7935 224.8 7940 238.83 7945 252.79 7950 266.83 7955
 283.81 7960

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 105.78 .045 126.13 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 105.78 126.13 44.18 37.93 31.14 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 106.1 7921.5 F
 120.6 283.81 7921.5 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4949

INPUT

Description: Culvert #16
 Distance from Upstream XS = 4.5
 Deck/Roadway Width = 20
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates

num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 78.63 7920.4 114 7920.4 150 7920.4

Upstream Bridge Cross Section Data

Station Elevation Data num= 26
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7965 9.02 7960 18.62 7955 27.88 7950 37.05 7945
 46.22 7940 55.38 7935 64.38 7930 73.76 7925 81.27 7920.95
 104.24 7920.78 105.78 7920 107.63 7915.22 114.95 7915.09 119.64 7915.16
 126.13 7920 127.89 7920.63 182.08 7923.25 186.68 7925 199.43 7930
 212.03 7935 224.8 7940 238.83 7945 252.79 7950 266.83 7955
 283.81 7960

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 105.78 .045 126.13 .055

Bank Sta: Left Right Coeff Contr. Expan.
 105.78 126.13 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 106.1 7921.5 F
 120.6 283.81 7921.5 F

Downstream Deck/Roadway Coordinates

num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 83.93 7918.81 131 7918.81 158.35 7918.81

Downstream Bridge Cross Section Data

Station Elevation Data num= 30
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7970 7.83 7965 16.4 7960 25.34 7955 33.74 7950
 42.36 7945 51.07 7940 60.01 7935 68.77 7930 77.22 7925
 85.58 7920 87.95 7918.59 116.77 7918.95 126.78 7915 128.03 7911.55
 130.48 7913.45 133.47 7913.52 134.38 7915 143.93 7919.16 162.55 7920
 187.79 7921.36 195.75 7925 207.84 7930 220.19 7935 234.38 7940
 250.34 7945 267.17 7950 287.05 7955 306.95 7960 326.64 7965

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 116.77 .045 143.93 .055

Bank Sta: Left Right Coeff Contr. Expan.
 116.77 143.93 .3 .5

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 =
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Culverts = 2

Culvert Name Shape Rise Span
 CULVERT#1 Circular 3
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 4.5 20 .024 .024 0 .5 1
 Upstream Elevation = 7915.29
 Centerline Station = 114.1
 Downstream Elevation = 7913.5
 Centerline Station = 128.93

Culvert Name Shape Rise Span
 CULVERT#2 Circular 2
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 4.5 20 .024 .024 0 .5 1
 Upstream Elevation = 7915.42
 Centerline Station = 115.1
 Downstream Elevation = 7913.8
 Centerline Station = 131.93

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4946

INPUT

Description: XSEC Downstream of Culvert # 16

Station Elevation Data num= 30
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7970 7.83 7965 16.4 7960 25.34 7955 33.74 7950
42.36 7945 51.07 7940 60.01 7935 68.77 7930 77.22 7925
85.58 7920 87.95 7918.59 116.77 7918.95 126.78 7915 128.03 7913.55
130.48 7913.45 133.47 7913.52 134.38 7915 143.93 7919.16 162.55 7920
187.79 7921.36 195.75 7925 207.84 7930 220.19 7935 234.38 7940
250.34 7945 267.17 7950 287.05 7955 306.95 7960 326.64 7965

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .013 116.77 .045 143.93 .055

Bank Sta: Left Right Lengths: Left Channel Right Ccoeff Contr. Expan.
116.77 143.93 100.62 93.02 81.56 .3 .5

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4940

INPUT

Description:

Station Elevation Data num= 22
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7990 12.37 7985 19.46 7980 26.13 7975 32.82 7970
39.39 7965 46.02 7960 52.67 7955 59.87 7950 67.67 7945
75.92 7940 84.24 7935 92.56 7930 100.84 7925 109.17 7920
117.47 7915 118.25 7914.55 144.77 7914.55 160.69 7910 169.94 7907.29
181.71 7910 204.89 7915 226.01 7920 242.77 7925 260.28 7930
277.83 7935 293.54 7940 307.26 7945 321.97 7950 341.81 7955
364.39 7960 382.07 7965

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .013 160.69 .045 181.71 .055

Bank Sta: Left Right Lengths: Left Channel Right Ccoeff Contr. Expan.
160.69 181.71 183.11 200.29 206.49 .3 .5

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4930

INPUT

Description: XSEC Upstream of Culvert # 17

Station Elevation Data num= 40
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7990 10.2 7985 19.18 7980 25.92 7975 32.35 7970
38.84 7965 45.32 7960 51.83 7955 58.31 7950 64.86 7945
72.28 7940 79.83 7935 87.33 7930 94.86 7925 102.3 7920
109.63 7915 116.66 7910 125.8 7905 133.96 7900 136.06 7898.73
153.35 7899.17 175.42 7895 178.77 7891.05 180.55 7887.89 184.12 7885.96
187.33 7887.72 188.4 7891.05 190.82 7895 203.47 7898.35 209.94 7900
228.39 7905 246.25 7910 263.87 7915 281.84 7920 300.86 7925
321.17 7930 340.34 7935 349.09 7937.27 367.86 7937.89 378.66 7940

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 175.42 0 190.82 0

Bank Sta: Left Right Lengths: Left Channel Right Ccoeff Contr. Expan.
175.42 190.82 35.99 31.3 37.79 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 178.85 7886.34 F
189.85 378.66 7886.34 F

CULVERT

RIVER: Reach #1
REACH: Sabino Canyon RS: 4925

INPUT

Description: Culvert #17

Distance from Upstream XS = 6
Deck/Roadway Width = 18
Weir Coefficient = 3.1

Upstream Deck/Roadway Coordinates num= 4
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
130 7890.3 140 7898.15 150 7890.12
200 7889.9

Upstream Bridge Cross Section Data

Station Elevation Data num= 40
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7990 10.2 7985 19.18 7980 25.92 7975 32.35 7970
38.84 7965 45.32 7960 51.83 7955 58.31 7950 64.86 7945
72.28 7940 79.83 7935 87.33 7930 94.86 7925 102.3 7920
109.63 7915 116.66 7910 125.8 7905 133.96 7900 136.06 7898.73
153.35 7899.17 175.42 7895 178.77 7891.05 180.55 7887.89 184.12 7885.96
187.33 7887.72 188.4 7891.05 190.82 7895 203.47 7898.35 209.94 7900
228.39 7905 246.25 7910 263.87 7915 281.84 7920 300.86 7925
321.17 7930 340.34 7935 349.09 7937.27 367.86 7937.89 378.66 7940

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 175.42 0 190.82 0

Bank Sta: Left Right Ccoeff Contr. Expan.
175.42 190.82 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 178.85 7886.34 F
189.85 378.66 7886.34 F

Downstream Deck/Roadway Coordinates

num= 4
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 120 7890.3 130 7898.35 160 7890.12
 200 7890.12

Downstream Bridge Cross Section Data
 Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7985	9.17	7980	16.69	7975	24.03	7970	31.43	7965
38.68	7960	45.88	7955	52.8	7950	59.7	7945	68.04	7940
76.34	7935	84.57	7930	92.6	7925	100.29	7920	107.92	7915
115.59	7910	123.35	7905	131.14	7900	137.2	7896.12	155.49	7895.55
158.84	7895	179.13	7889.65	181.27	7887.19	181.27	7886.32	185.55	7884.74
188.4	7886.67	189.12	7889.47	200.69	7895	218.76	7900	237.9	7905
255.89	7910	272.71	7915	288.67	7920	305.6	7925	324.29	7930
344.75	7935	354.74	7937.24	380.58	7937.21	389.75	7940		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	179.13	0	189.12	0

Bank Sta: Left Right Coeff Contr. Expan.
 179.13 189.12 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	171.84	7884.69	F
200	389.75	7884.69	F

Upstream Embankment side slope = 3 horiz. to 1.0 vertical
 Downstream Embankment side slope = 3 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .95
 Elevation at which weir flow begins =
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 2 - Mitered to conform to slope
 Solution Criteria = Highest U.S. EG

Culvert Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
6	22	.024	.024	0	.7	1

Upstream Elevation = 7886.34
 Centerline Station = 184.35
 Downstream Elevation = 7884.69
 Centerline Station = 185.27

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4920

INPUT

Description: XSEC Downstream of Culvert # 17
 Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7985	9.17	7980	16.69	7975	24.03	7970	31.43	7965
38.68	7960	45.88	7955	52.8	7950	59.7	7945	68.04	7940
76.34	7935	84.57	7930	92.6	7925	100.29	7920	107.92	7915
115.59	7910	123.35	7905	131.14	7900	137.2	7896.12	155.49	7895.55
158.84	7895	179.13	7889.65	181.27	7887.19	181.27	7886.32	185.55	7884.74
188.4	7886.67	189.12	7889.47	200.69	7895	218.76	7900	237.9	7905
255.89	7910	272.71	7915	288.67	7920	305.6	7925	324.29	7930
344.75	7935	354.74	7937.24	380.58	7937.21	389.75	7940		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	179.13	0	189.12	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 179.13 189.12 89.2 95.09 39.24 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	171.84	7884.69	F
200	389.75	7884.69	F

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4910

INPUT

Description:
 Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7975	7.07	7970	14.12	7965	21.13	7960	28.12	7955
35.14	7950	44.47	7945	54.08	7940	63.13	7935	71.73	7930
80.21	7925	88.58	7920	96.05	7915	103.86	7910	112.71	7905
121.86	7900	130.79	7895	136.8	7891.8	162.5	7890.92	167.98	7890
191.23	7880	205.48	7890	223.02	7895	241.18	7900	260.68	7905
280.52	7910	300.22	7915	318.22	7920	335.53	7925	352.05	7930
369.3	7935	385.54	7940						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	167.98	0	205.48	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 167.98 205.48 242.99 229.2 209.27 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4900

INPUT

Description:
 Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7945	6.47	7940	17.24	7935	29.38	7930	39.56	7925
47.76	7920	55.06	7915	62.29	7910	70.05	7905	77.87	7900
86.67	7895	95.65	7890	105.03	7885	114.41	7880	119.95	7877.12
171.48	7876.87	179.79	7875	193.15	7871.16	195.33	7869.13	198.51	7869.05
200.13	7871.16	209.78	7875	228.29	7880	247.26	7885	264.39	7890
275.92	7895	287.41	7900	298.92	7905	311.4	7910	323.73	7915
336.22	7920	350.49	7925	364.8	7930	379.29	7935	393.38	7940

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 179.79 0 209.78 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 179.79 209.78 163.32 152.05 152.08 .3 .5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4890

INPUT
 Description: XSEC Upstream of Culvert # 18
 Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7955	8.03	7950	15.42	7945	22.55	7940	28.1	7936.09
29.86	7935	37.6	7930	45.48	7925	53.39	7920	61.34	7915
69.89	7910	80	7905	91.69	7900	103.43	7895	115.24	7890
126.76	7885	131.22	7882.85	139.5	7880	154.12	7875	168.79	7870
176.85	7867.21	208.12	7867.08	218.11	7864.82	222.12	7860.44	225.25	7860
229.26	7860.15	233.27	7865.41	242.92	7870	257.15	7875	272.4	7880
287.28	7885	299.18	7890	310.69	7895	322.19	7900	335.77	7905
349.16	7910	362.25	7915	374.81	7920	386.81	7925	397.22	7930
409.76	7935	422.59	7940						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 208.12 .045 242.92 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 208.12 242.92 65.94 55.62 51.72 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 217.51 7871.51 F
 235.51 422.59 7871.51 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4885

INPUT
 Description: Culvert #18
 Distance from Upstream XS = 5
 Deck/Roadway Width = 17
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates num= 3

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
0 7871.07		228 7866.51		250 7866.07	

Upstream Bridge Cross Section Data
 Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7955	8.03	7950	15.42	7945	22.55	7940	28.1	7936.09
29.86	7935	37.6	7930	45.48	7925	53.39	7920	61.34	7915
69.89	7910	80	7905	91.69	7900	103.43	7895	115.24	7890
126.76	7885	131.22	7882.85	139.5	7880	154.12	7875	168.79	7870
176.85	7867.21	208.12	7867.08	218.11	7864.82	222.12	7860.44	225.25	7860
229.26	7860.15	233.27	7865.41	242.92	7870	257.15	7875	272.4	7880
287.28	7885	299.18	7890	310.69	7895	322.19	7900	335.77	7905
349.16	7910	362.25	7915	374.81	7920	386.81	7925	397.22	7930
409.76	7935	422.59	7940						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 208.12 .045 242.92 .055

Bank Sta: Left Right Coeff Contr. Expan.
 208.12 242.92 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 217.51 7871.51 F
 235.51 422.59 7871.51 F

Downstream Deck/Roadway Coordinates num= 3

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
175.25	7865	228	7865	250	7865

Downstream Bridge Cross Section Data
 Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7955	9.24	7950	18.01	7945	26.61	7940	34.66	7936.16
37.14	7935	47.91	7930	58.28	7925	68.5	7920	78.59	7915
88.77	7910	99.02	7905	109.08	7900	118.97	7895	128.92	7890
138.76	7885	143.11	7882.85	149.4	7880	162	7875	175.25	7870
188.62	7865	193.66	7863.09	222.3	7863.8	235.22	7861.86	237.29	7859.27
243.09	7859.3	243.97	7861.86	248.21	7865	259.41	7870	271.61	7875
283.77	7880	295.55	7885	307.06	7890	318.39	7895	329.64	7900
340.95	7905	353.79	7910	364.74	7915	375.13	7920	385.29	7925
395.01	7930	404.8	7935	417.95	7940				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 222.3 0 248.21 0

Bank Sta: Left Right Coeff Contr. Expan.
 222.3 248.21 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 235.22 7861 F

243.97 417.95 7861 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 =
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 3.5
FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 1 - Headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
5 19 024 .024 0 .5 1
Number of Barrels = 2
Upstream Elevation = 7860
Centerline Stations
Sta. Sta.
223.5 228
Downstream Elevation = 7859.87
Centerline Stations
Sta. Sta.
238 242

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4880

INPUT

Description: XSEC Downstream of Culvert # 18

Station Elevation Data num= 43
Table with 10 columns: Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Rows include station numbers and elevations from 0 to 395.01.

Manning's n Values num= 3
Table with 6 columns: Sta, n, Val, Sta, n, Val, Sta, n, Val. Rows show values for stations 0, 222.3, and 248.21.

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
222.3 248.21 120.36 140.56 143.52 .3 .5

Ineffective Flow num= 2
Table with 6 columns: Sta L, Sta R, Elev, Permanent, Sta, Elev. Rows show flow data for stations 0 and 243.97.

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4870

INPUT

Description:

Station Elevation Data num= 38

Table with 10 columns: Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Rows include station numbers and elevations from 0 to 345.18.

Manning's n Values num= 3
Table with 6 columns: Sta, n, Val, Sta, n, Val, Sta, n, Val. Rows show values for stations 0, 193.66, and 218.55.

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
193.66 218.55 86.06 123.02 129.77 .3 .5

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4860

INPUT

Description: XSEC Upstream of Culvert # 19

Station Elevation Data num= 33
Table with 10 columns: Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Rows include station numbers and elevations from 12.24 to 333.65.

Manning's n Values num= 3
Table with 6 columns: Sta, n, Val, Sta, n, Val, Sta, n, Val. Rows show values for stations 12.24, 183.19, and 206.33.

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
183.19 206.33 29.33 33.29 29.29 .3 .5

Ineffective Flow num= 2
Table with 6 columns: Sta L, Sta R, Elev, Permanent, Sta, Elev. Rows show flow data for stations 12.24 and 207.61.

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4855

INPUT

Description: Culvert #19
 Distance from Upstream XS = 5
 Deck/Roadway Width = 19.5
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates
 num= 2
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 183.19 7849.88 206.33 7850

Upstream Bridge Cross Section Data

Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
12.24	7925	18.7	7920	25.39	7915	33.1	7910	41.04	7905
48.86	7900	56.81	7895	64.57	7890	72.3	7885	75.66	7882.85
81.53	7880	91.68	7875	101.81	7870	111.95	7865	122.09	7860
132.19	7855	144.7	7850.65	176.31	7850	183.19	7849.88	190	7846.11
192	7841	197	7841	200.03	7846.11	206.33	7850	214.52	7855
222.64	7860	232.18	7865	259.4	7869.91	259.51	7870	278.65	7875
337.65	7880	363.57	7885	390.4	7890				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
12.24	0	183.19	0	206.33	0

Bank Sta: Left Right Coeff Contr. Expan.
 183.19 206.33 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
12.24	190.61	7853.67	F
207.61	190.4	7853.67	F

Downstream Deck/Roadway Coordinates
 num= 2
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 154.95 7848.82 188.12 7848.43

Downstream Bridge Cross Section Data

Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7915	7.98	7910	15.95	7905	23.71	7900	31.42	7895
39.08	7890	46.67	7885	49.95	7882.85	56.09	7880	66.94	7875
77.81	7870	88.64	7865	99.23	7860	110.84	7855	122.45	7850
123.67	7849.52	154.95	7848.82	169.66	7845	171.58	7843.52	172.5	7841
177	7841	179.08	7843.52	179.7	7845	188.12	7848.43	194.32	7850
207.99	7855	221.51	7859.84	222.15	7860	241.04	7865	300.86	7870
320.26	7872.94	325.04	7875	337.24	7880	349.74	7885	364.98	7890

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	154.95	0	188.12	0

Bank Sta: Left Right Coeff Contr. Expan.
 154.95 188.12 .3 .5

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 =
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 5 19.5 .024 .024 0 .5 1

Number of Barrels = 2

Upstream Elevation = 7841.2

Centerline Stations
 Sta. Sta.
 193.25 196.75

Downstream Elevation = 7841

Centerline Stations
 Sta. Sta.
 173.52 176.6

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4855

INPUT

Description: XSEC Downstream of Culvert # 19
 Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7915	7.98	7910	15.95	7905	23.71	7900	31.42	7895
39.08	7890	46.67	7885	49.95	7882.85	56.09	7880	66.94	7875
77.81	7870	88.64	7865	99.23	7860	110.84	7855	122.45	7850
123.67	7849.52	154.95	7848.82	169.66	7845	171.58	7843.52	172.5	7841
177	7841	179.08	7843.52	179.7	7845	188.12	7848.43	194.32	7850
207.99	7855	221.51	7859.84	222.15	7860	241.04	7865	300.86	7870
320.26	7872.94	325.04	7875	337.24	7880	349.74	7885	364.98	7890

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	154.95	0	188.12	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 154.95 188.12 173.2 160.5 156.03 .3 .5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4840

INPUT

Description:

Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.53	7925	8.01	7920	15.1	7915	22.33	7910	29.54	7905
36.77	7900	44	7895	51.19	7890	58.4	7885	61.45	7882.85
67.06	7880	76.72	7875	85.89	7870	94.72	7865	103.5	7860
112.21	7855	121.03	7850	130.02	7845	139.05	7840	148.05	7835
156.85	7830	158.04	7829.26	177.05	7828.93	190.97	7826.07	203.71	7830
220.15	7835	234.67	7840	245.73	7845	255.42	7850	264.94	7855
274.46	7860	283.87	7865	292.14	7870	295.65	7872.57	301.58	7875
313.78	7880	325.99	7885	338.22	7890	345.33	7892.95	350.34	7895
361.65	7900								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
.53	0	177.05	0	203.71	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

177.05	203.71	154.55	159.68	160.08	.3	.5
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CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4830

INPUT

Description: XSEC Upstream of Culvert # 20

Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7920	8.38	7915	16.36	7910	24.24	7905	32.14	7900
40.04	7895	47.87	7890	55.62	7885	59	7882.85	63.75	7880
72.51	7875	81.4	7870	90.2	7865	99.03	7860	107.9	7855
116.67	7850	125.12	7845	133.7	7840	142.49	7835	151.32	7830
160.13	7825	167.65	7821.03	191.27	7822.32	196.41	7820	207.67	7815.02
218.66	7820	228.65	7825	238.51	7830	248.34	7835	258.29	7840
268.15	7845	279.24	7850	292.01	7855	304.18	7860	315.79	7865
327.39	7870	341.24	7875	355.23	7880	368.25	7885	381.3	7890
388.74	7892.95	392.84	7895	402.85	7900				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	191.27	0	218.66	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

191.27	218.66	48.5	48.05	48.26	.3	.5
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	201.11	7820	F
214.11	402.85	7820	F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4625

INPUT

Description: Culvert #20

Distance from Upstream XS = 6
 Deck/Roadway Width = 20
 Weir Coefficient = 3.1

Upstream Deck/Roadway Coordinates num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
160.13	7825	228.65	7823.16						

Upstream Bridge Cross Section Data Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7920	8.38	7915	16.36	7910	24.24	7905	32.14	7900
40.04	7895	47.87	7890	55.62	7885	59	7882.85	63.75	7880
72.51	7875	81.4	7870	90.2	7865	99.03	7860	107.9	7855
116.67	7850	125.12	7845	133.7	7840	142.49	7835	151.32	7830
160.13	7825	167.65	7821.03	191.27	7822.32	196.41	7820	207.67	7815.02
218.66	7820	228.65	7825	238.51	7830	248.34	7835	258.29	7840
268.15	7845	279.24	7850	292.01	7855	304.18	7860	315.79	7865
327.39	7870	341.24	7875	355.23	7880	368.25	7885	381.3	7890
388.74	7892.95	392.84	7895	402.85	7900				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	191.27	0	218.66	0

Bank Sta: Left Right Coeff Contr. Expan.

191.27	218.66	.3	.5
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	201.11	7820	F
214.11	402.85	7820	F

Downstream Deck/Roadway Coordinates num= 3

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
166.73	7822	233.04	7820.55		256.33	7821.32			

Downstream Bridge Cross Section Data Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7929.7	6.73	7925	14.1	7920	21.5	7915	28.98	7910
36.44	7905	43.55	7900	51.43	7895	58.66	7890	65.6	7885
68.53	7892.85	73.5	7880	82.15	7875	91.02	7870	99.81	7865
108.74	7860	117.29	7855	125.35	7850	133.56	7845	141.71	7840
149.77	7835	157.79	7830	166.73	7825	178.27	7820	178.47	7820
204.17	7818.83	215.42	7815	225.31	7811.68	233.04	7815	244.86	7820
256.33	7825	267.36	7830	278.31	7835	289.81	7840	301.11	7845
311.96	7850	322.51	7855	332.77	7860	343.09	7865	357.04	7870

371.31 7875 384.61 7880 396.44 7885 408.32 7890 415.48 7892.95
419.52 7895

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 204.17 0 244.86 0

Bank Sta: Left Right Coeff Contr. Expan.
204.17 244.86 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 219.34 7815 F
232.34 419.52 7815 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 =
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 Arch 4 6
FHWA Chart # 41- Arch; Corrugated metal
FHWA Scale # 1 - 90 Degree headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
6 20 .024 .024 0 .5 1

Number of Barrels = 2
Upstream Elevation = 7816.6
Centerline Stations
Sta. Sta.
204.11 211.11
Downstream Elevation = 7812.68
Centerline Stations
Sta. Sta.
222.34 229.34

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4920

INPUT

Description: XSEC Downstream of Culvert # 20

Station Elevation Data num= 46
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7929.7 6.73 7925 14.1 7920 21.5 7915 28.98 7910
36.44 7905 43.95 7900 51.43 7895 58.66 7890 65.6 7885
68.53 7882.85 73.5 7880 82.15 7875 91.02 7870 99.21 7865
108.74 7860 117.29 7855 125.35 7850 133.56 7845 141.71 7840
149.77 7835 157.79 7830 166.73 7825 178.27 7820 178.47 7820
204.17 7818.83 215.42 7815 225.31 7811.68 233.04 7815 244.86 7820
256.33 7825 267.36 7830 278.31 7935 289.81 7840 301.11 7845
311.96 7850 322.51 7855 332.77 7860 343.09 7865 357.04 7870
371.31 7875 384.61 7880 396.44 7885 408.32 7890 415.48 7892.95
419.52 7895

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 204.17 0 244.86 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
204.17 244.86 164.6 153.11 138.65 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 219.34 7815 F
232.34 419.52 7815 F

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4810

INPUT

Description:

Station Elevation Data num= 47
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7915 7.66 7910 15.68 7905 26.07 7900 36.71 7895
47.11 7890 56.59 7885 60.51 7882.85 74.99 7880 86.94 7875
98.26 7870 109.57 7865 120.2 7860 131.21 7855 142.14 7850
151.62 7845 160.97 7840 170.27 7835 179.87 7830 190.53 7825
201.39 7820 212.6 7815 223.76 7810 228.83 7807.44 248.16 7808.53
255.8 7805 264.58 7801.11 274.29 7805 287.92 7810 301.5 7815
315.15 7820 328.78 7825 342.07 7830 355.2 7835 366.72 7840
382.65 7845 396.22 7850 410.22 7855 419.28 7860 427.23 7865
435.09 7870 442.9 7875 450.76 7880 458.97 7885 467.43 7890
472.45 7892.95 476.45 7895

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .013 248.16 .04 287.92 .03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
248.16 287.92 275.35 305.07 315.05 .1 .3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4800

INPUT

Description:

Station Elevation Data num= 46
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7880 15.89 7875 31.63 7870 46.86 7865 61.56 7860
75.94 7850 90.57 7850 105.45 7845 121.4 7840 137.09 7835
142.29 7833.37 165.78 7833.77 173.12 7830 182.91 7825 192.66 7820

201.95	7815	214.65	7810	229.01	7805	243.26	7800	258.52	7795
273.95	7790	281.29	7787.57	305.26	7787.63	323.24	7784.96	324.16	7784.16
326.77	7784.09	327.09	7785.04	334.87	7790	343.66	7795	352.32	7800
360.73	7805	369.34	7810	377.69	7815	385.88	7820	394	7825
402.42	7830	411.45	7835	419.8	7840	427.87	7845	435.89	7850
444.02	7855	444.64	7855.45	460.3	7860	478.56	7865	497.77	7870
518.37	7875								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 305.26 .04 334.87 .03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 305.26 334.87 128.1 88.46 74.01 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4790

INPUT

Description:
 Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7830	9.57	7825	20.6	7820	34.65	7815	48.61	7810
62.09	7805	76.58	7800	92.01	7795	106.96	7790	121.05	7785
126.31	7783.96	220.18	7780.28	225.05	7780	245.15	7778.22	245.97	7777.01
248.48	7777.01	249.23	7778.2	251.36	7780	261.13	7785	271.43	7790
281.8	7795	290.96	7800	299.83	7805	308.76	7810	317.59	7815
326.22	7820	334.52	7825	342.45	7830	350.26	7835	358	7840
365.73	7845	373.77	7850	382.4	7855	383.09	7855.45	396.67	7860
411.1	7865	426.83	7870						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 220.18 0 261.13 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 220.18 261.13 185.19 110.34 113.96 .3 .5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4780

INPUT

Description: Upstream of Culvert #9
 Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7845	15.21	7840	31.46	7835	43.71	7830	53.79	7825
63.08	7820	71.78	7815	73.03	7814.14	83.33	7812.32	103.89	7810
115.5	7808.74	120.01	7805	126.02	7800	132.06	7795	132.37	7794.67
143.19	7790	150.51	7786.74	182.84	7785.9	186.05	7785	203.55	7780
211.61	7777.64	262.07	7775	318.04	7771.97	329.17	7769.94	334.52	7766.73
337.73	7766.43	344.69	7766.43	347.9	7766.58	350.58	7770.23	351.96	7773.3
357.47	7775	377.77	7780	379.48	7780.35	407.68	7785	417.42	7790
427.25	7795	437.79	7800	450.36	7805	457.27	7807.76	460.41	7810
468.79	7815	477.32	7820	486.69	7825	496.31	7830	505.89	7835
515.44	7840	525.27	7845	536	7850	548.49	7855	549.73	7855.45
567.3	7860								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 318.04 0 351.96 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 318.04 351.96 180.71 135.48 113.78 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 335.4 7770.38 F
 347.37 567.3 7770.38 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4775

INPUT

Description: Culvert #9
 Distance from Upstream XS = 15
 Deck/Roadway Width = 115
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
320	7769.27				360	7769.59			

Upstream Bridge Cross Section Data
 Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7845	15.21	7840	31.46	7835	43.71	7830	53.79	7825
63.08	7820	71.78	7815	73.03	7814.14	83.33	7812.32	103.89	7810
115.5	7808.74	120.01	7805	126.02	7800	132.06	7795	132.37	7794.67
143.19	7790	150.51	7786.74	182.84	7785.9	186.05	7785	203.55	7780
211.61	7777.64	262.07	7775	318.04	7771.97	329.17	7769.94	334.52	7766.73
337.73	7766.43	344.69	7766.43	347.9	7766.58	350.58	7770.23	351.96	7773.3
357.47	7775	377.77	7780	379.48	7780.35	407.68	7785	417.42	7790
427.25	7795	437.79	7800	450.36	7805	457.27	7807.76	460.41	7810
468.79	7815	477.32	7820	486.69	7825	496.31	7830	505.89	7835
515.44	7840	525.27	7845	536	7850	548.49	7855	549.73	7855.45
567.3	7860								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 318.04 0 351.96 0

Bank Sta: Left Right Coeff Contr. Expan.
 318.04 351.96 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 335.4 7770.38 F

347.17 567.3 7770.38 F

Downstream Deck/Roadway Coordinates

num=	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
2	100	7765.68				200	7765.35			

Downstream Bridge Cross Section Data

Station Elevation Data num= 28											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7793.37	8.55	7790	21.16	7785	34.28	7780	47.01	7775		
59.1	7770	65.59	7767.38	84.83	7767.23	104.03	7766.75	107.58	7765		
108.99	7763.31	110.18	7762.38	111.27	7762.3	113.87	7762.16	115.72	7762.38		
117.62	7762.23	117.99	7762.75	120.75	7764.47	146.74	7765	182.65	7765.82		
192.5	7769.56	202.22	7770	221.95	7775	234.31	7780	244.98	7785		
255.31	7790	265.61	7795	270	7800						

Manning's n Values

num= 3					
Sta	n	Val	Sta	n	Val
0	0	108.99	0	120.75	0

Bank Sta: Left Right

Left	Right	Coeff	Contr.	Expan.
108.99	120.75	.3		.5

Ineffective Flow

num= 2				
Sta L	Sta R	Elev	Permanent	
0	108.99	7764	F	
120.75	270	7764	F	

- Upstream Embankment side slope = 2 horiz. to 1.0 vertical
- Downstream Embankment side slope = 1 horiz. to 1.0 vertical
- Maximum allowable submergence for weir flow = .95
- Elevation at which weir flow begins =
- Energy head used in spillway design =
- Spillway height used in design =
- Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert #1	Shape	Rise	Span
1	Arch	2.5	4

FHWA Chart # 41- Arch; Corrugated metal
 FHWA Scale # 1 - 90 Degree headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 14 118 .024 .024 0 .7 1

Number of Barrels = 2
 Upstream Elevation = 7765.65
 Centerline Stations
 Sta. Sta.
 337.41 345.41
 Downstream Elevation = 7762.275
 Centerline Stations
 Sta. Sta.
 111.25 116.5

CROSS SECTION

RIVER: Reach #1 REACH: Sabino Canyon RS: 4770

INPUT

Description: Downstream of Culvert #9

Station Elevation Data num= 28											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7793.37	8.55	7790	21.16	7785	34.28	7780	47.01	7775		
59.1	7770	65.59	7767.38	84.83	7767.23	104.03	7766.75	107.58	7765		
108.99	7763.31	110.18	7762.38	111.27	7762.3	113.87	7762.16	115.72	7762.38		
117.62	7762.23	117.99	7762.75	120.75	7764.47	146.74	7765	182.65	7765.82		
192.5	7769.56	202.22	7770	221.95	7775	234.31	7780	244.98	7785		
255.31	7790	265.61	7795	270	7800						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 108.99 0 120.75 0

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
108.99	120.75	152.22	145.66	138.18	.3		.5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 108.99 7764 F
 120.75 270 7764 F

CROSS SECTION

RIVER: Reach #1 REACH: Sabino Canyon RS: 4765

INPUT

Description:

Station Elevation Data num= 30											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7793.37	8.43	7790	21.05	7785	35.54	7780	60.89	7775		
61.89	7774.76	98.62	7771.82	101.59	7770	105.34	7769.32	114.58	7765.57		
129.34	7765.93	130.97	7765	140.17	7760	149.24	7755	150.51	7754.31		
153.49	7755	171.62	7759.25	190.61	7760	224.99	7761.95	233.98	7765		
244.4	7768.4	255.01	7770	283.74	7772.88	286.83	7775	292.57	7780		
300.01	7785	306.44	7790	312.82	7795	318.99	7800	319.54	7800.48		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 140.17 .04 171.62 .045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
140.17	171.62	178.1	172.24	175.18	.1		.3

CROSS SECTION

RIVER: Reach #1 REACH: Sabino Canyon RS: 4760

INPUT

Description:
 Station Elevation Data num= 36
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7800 48.13 7795 57.91 7793.37 70.73 7790 87.74 7785
 103.72 7780 119.23 7775 135.68 7770 152.1 7765 168.46 7760
 191.63 7755 216.97 7753.01 224.1 7750 234.82 7745.58 236.49 7745
 245.14 7740.23 252.63 7740.23 267.13 7745 276.33 7747.54 323.9 7748.45
 329.02 7750 346.84 7755 356.02 7757.42 405.99 7760 418.63 7761.05
 434.12 7765 452.29 7770 465.67 7775 466.32 7775.26 480.51 7775.88
 487.53 7780 496.79 7785 507.65 7790 518.6 7795 520.87 7795.81
 558.11 7796.51

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 234.82 0 276.33 0
 Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 234.82 276.33 116.92 125.62 133.13 .3 .5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4750

INPUT
 Description: XSEC Upstream of Culvert # 8
 Station Elevation Data num= 30
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7775 25.04 7770 52.39 7765 74.31 7760 112.6 7757.98
 124.17 7755 131.34 7750 136.33 7747.92 160.75 7745 181.69 7740
 195.81 7737.68 198.48 7733.95 200.76 7731.6 203.39 7730.73 208.74 7730.73
 212.05 7732.07 212.76 7734.24 215.88 7737.68 228.79 7738.29 270.58 7740
 276.7 7740.58 309.3 7745 328.13 7750 342.76 7755 362.19 7760
 366.45 7761.19 379.42 7761.69 389.12 7765 403.32 7770 411.96 7775

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 195.81 0 215.88 0
 Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 195.81 215.88 16.73 43.9 85.3 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 201.16 7735.63 F
 210.97 411.96 7735.7 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4745

INPUT
 Description: Culvert #8
 Distance from Upstream XS = 10
 Deck/Roadway Width = 18
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7737 203 7737 273 7737

Upstream Bridge Cross Section Data
 Station Elevation Data num= 30
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7775 25.04 7770 52.39 7765 74.31 7760 112.6 7757.98
 124.17 7755 131.34 7750 136.33 7747.92 160.75 7745 181.69 7740
 195.81 7737.68 198.48 7733.95 200.76 7731.6 203.39 7730.73 208.74 7730.73
 212.05 7732.07 212.76 7734.24 215.88 7737.68 228.79 7738.29 270.58 7740
 276.7 7740.58 309.3 7745 328.13 7750 342.76 7755 362.19 7760
 366.45 7761.19 379.42 7761.69 389.12 7765 403.32 7770 411.96 7775

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 195.81 0 215.88 0
 Bank Sta: Left Right Coeff Contr. Expan.
 195.81 215.88 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 201.16 7735.63 F
 210.97 411.96 7735.7 F

Downstream Deck/Roadway Coordinates num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7737 335 7737 450 7737

Downstream Bridge Cross Section Data
 Station Elevation Data num= 30
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7790 18.17 7788.85 25.56 7785 29.11 7782.96 78.38 7780
 115.58 7777.28 123.3 7775 145.09 7770 168.25 7765 186.28 7760
 210.81 7755 231.71 7752.09 263.3 7750 286.47 7745 304.43 7740
 319.7 7735 331.44 7730 332.85 7729.32 336.81 7730 363.39 7734.61
 370.52 7735 399.4 7735.46 423.43 7740 445.76 7742.78 456.35 7745
 477.1 7750 493.85 7755 503.59 7760 525.12 7765 540.4 7770

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 319.7 0 363.39 0
 Bank Sta: Left Right Coeff Contr. Expan.
 319.7 363.39 .3 .5

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 =
 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 4
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 10 18 .024 .024 1 .5 1

Number of Barrels = 2
 Upstream Elevation = 7730.3
 Centerline Stations
 Sta. Sta.
 203.04 208.04
 Downstream Elevation = 7730
 Centerline Stations
 Sta. Sta.
 331.44 336.44

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4740

INPUT

Description: XSEC Downstream of Culvert # 8
 Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7790	18.17	7788.85	25.56	7785	29.11	7782.96	78.38	7780
115.58	7777.28	123.3	7775	145.09	7770	168.25	7765	186.28	7760
210.81	7755	231.71	7752.09	263.3	7750	286.47	7745	304.43	7740
319.7	7735	331.44	7730	332.85	7729.32	336.81	7730	363.39	7734.61
370.52	7735	399.4	7735.46	429.43	7740	445.76	7742.78	456.25	7745
477.1	7750	493.65	7755	509.59	7760	525.12	7765	540.4	7770

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 319.7 0 363.39 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan
 319.7 363.39 50.45 40.63 29.76 .3 .5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4730

INPUT

Description: XSEC Upstream of Culvert # 7
 Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	1.57	7768.14	19.16	7765	37.8	7761.87	42.81	7760
54.83	7755	68.18	7750	111.13	7745	152.63	7740	172.75	7735
183.79	7732.09	192.68	7730	206.71	7726.52	225.94	7730	238.84	7732.31
275.52	7732.55	292.96	7735	309.07	7740	311.46	7740.73	327.8	7745
345.99	7750	364.34	7755	379.53	7760	394.84	7765	410.2	7770

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 183.79 0 238.84 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan
 183.79 238.84 24.27 25.79 30.08 .3 .5

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4725

INPUT

Description: Culvert #7
 Distance from Upstream XS = 3
 Deck/Roadway Width = 18.5
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7736.81 206.71 7732.68 300 7730.81

Upstream Bridge Cross Section Data
 Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	1.57	7768.14	19.16	7765	37.8	7761.87	42.81	7760
54.83	7755	68.18	7750	111.13	7745	152.63	7740	172.75	7735
183.79	7732.09	192.68	7730	206.71	7726.52	225.94	7730	238.84	7732.31
275.52	7732.55	292.96	7735	309.07	7740	311.46	7740.73	327.8	7745
345.99	7750	364.34	7755	379.53	7760	394.84	7765	410.2	7770

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 183.79 0 238.84 0

Bank Sta: Left Right Coeff Contr. Expan
 183.79 238.84 .3 .5

Downstream Deck/Roadway Coordinates num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7735.8 225 7731.3 300 7732.8

Downstream Bridge Cross Section Data
 Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	16.1	7766.74	23.33	7765	37.67	7761.76	42.16	7760
59.64	7755	73	7750	101.01	7745	140.61	7740	179.47	7735
202.2	7730	224.77	7726.01	248.4	7730	255.9	7731.35	286.97	7731.83
311.58	7735	319.29	7735.04	335.52	7740	355.13	7745	370.65	7750
389.42	7755	406.22	7760	420.04	7765	432.56	7770		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 183.79 0 238.84 0

0 0 202.2 0 255.9 0
 Bank Sta: Left Right Coeff Contr. Expan.
 202.2 255.9 .3 .5

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 =
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Culverts = 2

Culvert Name Shape Rise Span
 CULVERT#1 Circular 2
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 3 18.5 .024 .024 0 .5 1

Number of Barrels = 2

Upstream Elevation = 7727.82

Centerline Stations
 Sta. Sta.
 202.71 210.71

Downstream Elevation = 7727.31

Centerline Stations
 Sta. Sta.
 220.77 228.77

Culvert Name Shape Rise Span
 CULVERT#2 Circular 3
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 3 18.5 .024 .024 0 .5 1

Upstream Elevation = 7726.52

Centerline Station = 206.71

Downstream Elevation = 7726.01

Centerline Station = 224.77

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4720

INPUT

Description: XSBC Downstream of Culvert # 7

Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	16.1	7766.74	23.33	7765	37.67	7761.76	42.16	7760
59.64	7755	73	7750	101.01	7745	140.61	7740	179.47	7735
202.2	7730	224.77	7726.01	248.4	7730	255.9	7731.35	286.97	7731.83
311.58	7735	319.29	7735.04	335.52	7740	353.13	7745	370.69	7750
389.42	7755	406.22	7760	420.04	7765	432.56	7770		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	202.2	0	255.9	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 202.2 255.9 66.79 45.57 38.28 .3 .5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4710

INPUT

Description: XSBC Upstream of Culvert # 6

Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7750	18.81	7745	64.05	7740	83.89	7735	142.51	7730
152.76	7727.75	154.24	7724.87	166.73	7724.86	169.26	7727.82	179.94	7730
188.46	7730.6	224.23	7730.81	242.67	7734.44	249.01	7735	265.56	7736.64
277.28	7740	294.97	7745	314.8	7750	336.67	7755		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	142.51	0	179.94	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 142.51 179.94 58.79 39.28 43.38 .3 .5

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4705.5

INPUT

Description: Culvert #6

Distance from Upstream XS = 10
 Deck/Roadway Width = 19
 Weir Coefficient = 3.1

Upstream Deck/Roadway Coordinates
 num= 3

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
75.93		7730			156		7730		
					249.01		7730		

Upstream Bridge Cross Section Data
 Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7750	18.81	7745	64.05	7740	83.89	7735	142.51	7730
152.76	7727.75	154.24	7724.87	166.73	7724.86	169.26	7727.82	179.94	7730
188.46	7730.6	224.23	7730.81	242.67	7734.44	249.01	7735	265.56	7736.64
277.28	7740	294.97	7745	314.8	7750	336.67	7755		

Manning's n Values num= 3

Sta n Val Sta n Val Sta n Val
0 0 142.51 0 179.94 0

Bank Sta: Left Right Coeff Contr. Expan.
142.51 179.94 .3 .5

Downstream Deck/Roadway Coordinates

num= 3
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
99.24 7730 215 7730 240 7730

Downstream Bridge Cross Section Data

Station Elevation Data num= 22
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7740 2.96 7740.27 25.64 7741.2 86.03 7740.4 86.77 7740
95.64 7735 99.24 7732.98 152.16 7730 172.93 7728.67 176.44 7724.44
182.37 7724.31 188.43 7724.44 199.4 7727.91 234.24 7729.2 237.32 7730
251.86 7733.46 263.95 7735 305.08 7740 327.17 7745 346.76 7750
365.54 7755 383.89 7760

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 172.93 0 199.4 0

Bank Sta: Left Right Coeff Contr. Expan.
172.93 199.4 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 177 7729 F
187 383.89 7729 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 =
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 # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 1 - Headwall
Solution Criteria = Highest U.S. BG
Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
10 19 .024 .024 0 .5 1

Number of Barrels = 2
Upstream Elevation = 7724.8
Centerline Stations
Sta. Sta.
157.5 162.5
Downstream Elevation = 7724.3
Centerline Stations
Sta. Sta.
179.69 184.69

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4701

INPUT

Description: XSEC Downstream of Culvert # 6
Station Elevation Data num= 22
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7740 2.96 7740.27 25.64 7741.2 86.03 7740.4 86.77 7740
95.64 7735 99.24 7732.98 152.16 7730 172.93 7728.67 176.44 7724.44
182.37 7724.31 188.43 7724.44 199.4 7727.91 234.24 7729.2 237.32 7730
251.86 7733.46 263.95 7735 305.08 7740 327.17 7745 346.76 7750
365.54 7755 383.89 7760

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 172.93 0 199.4 0

Bank Sta: Left Right Length: Left Channel Right Coeff Contr. Expan.
172.93 199.4 54.16 64.9 53.38 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 177 7729 F
187 383.89 7729 F

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4690

INPUT

Description:
Station Elevation Data num= 22
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7739.79 50.97 7740 84.99 7740 135.78 7736.21 175.75 7735
240.15 7731.37 258.9 7730 290.91 7728.13 296.07 7725 304 7720.19
306.47 7720.21 326.63 7723.94 356.03 7725 359.97 7725.17 380.47 7730
384.85 7730.94 424.12 7735 444.45 7740 460.22 7745 476.51 7750
493.61 7755 510.23 7760

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 296.07 0 326.63 0

Bank Sta: Left Right Length: Left Channel Right Coeff Contr. Expan.
296.07 326.63 147.86 67.35 63.49 .3 .5

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4680

INPUT

Description: XSEC Upstream of Culvert # 5

Station Elevation Data num= 28									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7745	10.04	7740	18.77	7735.14	19.68	7735	53.09	7730
115.99	7725	231.33	7720	271.11	7718.38	296.61	7718.19	297.5	7714.68
297.67	7713.83	301.03	7713.83	301.65	7714.72	303.75	7715.12	308.65	7717.68
313.18	7719.31	332.93	7720	352.68	7720.9	366.95	7725	367.96	7725.27
397.1	7730	408.97	7732.12	414.94	7735	422.75	7738.71	429.93	7740
446.32	7745	462.51	7750	478.81	7755				

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	271.11	0	313.18	0

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Concr.	Expan.
	271.11	313.18		72.84	32.89	41.45		.3	.5

Ineffective Flow num= 2				
Sta L	Sta R	Elev	Permanent	
0	297.06	7718.26	F	
302.75	478.81	7718.26	F	

CULVERT

RIVER: Reach #1
REACH: Sabino Canyon RS: 4675

INPUT

Description: Culvert #5

Distance from Upstream XS = 5
Deck/Roadway Width = 12
Weir Coefficient = 3.1

Upstream Deck/Roadway Coordinates num= 3														
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
0	7718.5				300	7718.5				350	7718.5			

Upstream Bridge Cross Section Data num= 28									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7745	10.04	7740	18.77	7735.14	19.68	7735	53.09	7730
115.99	7725	231.33	7720	271.11	7718.38	296.61	7718.19	297.5	7714.68
297.67	7713.83	301.03	7713.83	301.65	7714.72	303.75	7715.12	308.65	7717.68
313.18	7719.31	332.93	7720	352.68	7720.9	366.95	7725	367.96	7725.27
397.1	7730	408.97	7732.12	414.94	7735	422.75	7738.71	429.93	7740
446.32	7745	462.51	7750	478.81	7755				

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	271.11	0	313.18	0

Bank Sta:	Left	Right	Coeff	Concr.	Expan.
	271.11	313.18		.3	.5

Ineffective Flow num= 2				
Sta L	Sta R	Elev	Permanent	
0	297.06	7718.26	F	
302.75	478.81	7718.26	F	

Downstream Deck/Roadway Coordinates num= 3														
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
0	7718				283	7718				333	7718			

Downstream Bridge Cross Section Data num= 28									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7751.04	4.25	7750	23.1	7745	41.87	7740	64.07	7735
83.6	7730	107.14	7725	107.31	7725	166.59	7720	231.44	7718.55
269.4	7717.63	278.39	7717.59	281.61	7714.26	281.77	7713.98	282.47	7713.69
284.13	7713.71	284.78	7714	285.98	7717.66	295.27	7717.63	324.77	7719.05
328.28	7720	346.87	7725	358.44	7730	369.96	7735	394.17	7740
417.38	7745	432.42	7749.76	442.64	7750				

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	269.4	0	295.27	0

Bank Sta:	Left	Right	Coeff	Concr.	Expan.
	269.4	295.27		.3	.5

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 =
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Spar.
CULVERT#1	Circular	1.5	

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
	5	12	.013	.013	0	.2	1

Number of Barrels = 2
 Upstream Elevation = 7714.2
 Centerline Stations
 Sta. Sta.
 298.5 300.5
 Downstream Elevation = 7714
 Centerline Stations
 Sta. Sta.
 282.4 284

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4670

INPUT

Description: XSEC Downstream of Culvert # 5

Station Elevation Data num= 28
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7751.04 4.25 7750 23.1 7745 41.87 7740 64.07 7735

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 269.4 0 295.27 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
269.4 295.27 148.52 144.4 110.22 .3 .5

CROSS SECTION

RIVER: Reach #1
REACH: Sabine Canyon RS: 4640

INPUT

Description: XSEC Upstream of Culvert # 4

Station Elevation Data num= 50
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7780 10.47 7775.67 12.02 7775 23.26 7770 34.56 7765

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 298.08 0 328.46 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
298.08 328.46 82.29 83.96 83.73 .3 .5

CULVERT

RIVER: Reach #1
REACH: Sabine Canyon RS: 4635

INPUT

Description: Culvert #4
Distance from Upstream XS = 28
Deck/Roadway Width = 25
Weir Coefficient = 2.5
Upstream Deck/Roadway Coordinates
num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
200 7709.51 360 7709.51

Upstream Bridge Cross Section Data
Station Elevation Data num= 50
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7780 10.47 7775.67 12.02 7775 23.26 7770 34.56 7765

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 298.08 0 328.46 0

Bank Sta: Left Right Coeff Contr. Expan.
298.08 328.46 .3 .5

Downstream Deck/Roadway Coordinates
num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
200 7708.75 400 7708.75

Downstream Bridge Cross Section Data
Station Elevation Data num= 61
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7785 11.85 7780 25.59 7775.67 26.96 7775 36.66 7770

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 284.34 0 331.36 0

Bank Sta: Left Right Coeff Contr. Expan.
284.34 331.36 .3 .5

Upstream Embankment side slope = 3 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 =
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 3 - Pipe projecting from fill
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Ccoef Exit Loss Ccoef
 28 28 .024 0 9 1

Upstream Elevation = 7702.66
 Centerline Station = 314
 Downstream Elevation = 7701.69
 Centerline Station = 314

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4630

INPUT
 Description: XSEC Downstream of Culvert #4
 Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7785	13.85	7780	25.59	7775.67	26.96	7775	26.66	7770
46.45	7765	56.24	7760	66.05	7755	76.37	7750	86.66	7745
97.07	7740	97.13	7739.95	133.17	7736.02	134.53	7735	141.5	7730
143.55	7728.56	156.58	7727.78	159.87	7725	163.45	7721.94	178.59	7720
197.99	7715	218.58	7710	274.2	7704.81	284.34	7703.53	287.08	7702.54
306.33	7702.95	307.15	7702.68	308.3	7702.79	309.94	7701.92	310.82	7701.88
311.97	7701.86	313.41	7701.86	314.13	7701.78	314.85	7701.85	316.07	7701.86
317.51	7701.89	319.51	7702.06	321.73	7702.22	323.69	7702.44	324.92	7702.81
331.36	7702.85	340.26	7703.47	349.09	7706.23	386.38	7707.72	396.35	7710
414.91	7715	433.47	7720	439.35	7721.66	448.16	7722.42	454.11	7725
459.85	7727.45	499.79	7730	554.51	7735	572.8	7736.27	584.63	7740
617.82	7742.92	627.13	7745	633.31	7746.47	664.45	7750	667.05	7750.31
679.21	7755								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	284.34	0	331.36	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 284.34 331.36 331.3 308.04 212.42 .3 5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4620

INPUT
 Description:
 Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	11.16	7765.57	18.87	7765	63.11	7760	89.09	7755
108.3	7750	118.84	7745	129.64	7740	140.67	7735	151.98	7730
158.84	7727.71	179.6	7725	217.91	7720	223.87	7719.22	234.83	7715
248.81	7710	262.08	7706.03	309.86	7705.74	311.84	7705	325.41	7700
340.05	7695	354.73	7690	359.17	7688.44	438.97	7689.31	464.11	7690
482.34	7690.26	507.15	7695	528.63	7700	550.45	7705	572.43	7710
593.92	7715	615.78	7720	637.28	7725	650.61	7727.8	675.95	7730
741.36	7734.43	743.4	7735	758.56	7740	772.44	7745	785.6	7750
798.68	7755								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	354.73	.04	438.97	.045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 354.73 438.97 216.67 217.6 172.7 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4610

INPUT
 Description:
 Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7785	5.37	7780	13.02	7775	31.8	7771.04	54.39	7770
46.8	7765	59.14	7760	72.05	7755	85.5	7750	98.6	7745
111.63	7740	120.21	7737.04	126.33	7735	141.05	7730	155.37	7725
169.54	7720	183.87	7715	198.46	7710	213.87	7705	226.12	7700
242.41	7695	256.94	7690	271.47	7685	286.34	7680	289.22	7679.08
358.74	7678.15	392.12	7679.16	396.86	7680	433.85	7685	452.78	7686.43
470.03	7690	496.61	7694.66	498.87	7695	528.93	7700	555.44	7705
576.45	7710	602.15	7715	639.28	7720	689.53	7725	687.64	7730
711.13	7735	742.29	7740	753.67	7745	762.97	7750	772.68	7755

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	289.22	0	368.74	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 289.22 368.74 84.94 105.27 136.16 .3 5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4600

INPUT
 Description: XSEC Upstream of Culvert # 3
 Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	14.17	7765	28.06	7760	40.77	7755	54.24	7750
68.07	7745	81.8	7740	90.04	7737.04	96.07	7735	111.15	7730
126.21	7725	140.81	7720	155.05	7715	170.02	7710	184.86	7705
199.39	7700	213.92	7695	228.8	7690	243.69	7685.03	243.93	7685
273.02	7680	285.51	7677.25	320.38	7675	340.99	7673.68	358.96	7673.49
372.03	7675	410.43	7680	443.27	7685	494.2	7690	549.19	7695
564.65	7696.26	580.1	7700	582.89	7700.53	621.43	7705	648.47	7710
671.72	7715	674.59	7715.55	685.79	7720	698.43	7725	711.53	7730
714.52	7731.01	727.46	7735	744.29	7740				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 320.38 0 372.03 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 320.38 372.03 28.83 26.7 50.57 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 354.46 7677.49 F
 363.46 744.29 7677.49 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4595

INPUT

Description: Culvert #3
 Distance from Upstream XS = 4.5
 Deck/Roadway Width = 17
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7684.67 358.96 7677.49 401.25 7676.44

Upstream Bridge Cross Section Data

Station	Elevation	Data	num=	43					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	14.17	7765	28.06	7760	40.77	7755	54.24	7750
68.07	7745	81.8	7740	90.04	7737.04	96.07	7735	111.15	7730
126.21	7725	140.81	7720	155.05	7715	170.02	7710	184.86	7705
199.39	7700	213.92	7695	228.8	7690	243.69	7685.03	243.93	7685
273.02	7680	285.51	7677.25	320.38	7675	340.99	7673.68	358.96	7673.49
372.03	7675	410.43	7680	443.27	7685	494.2	7690	549.19	7695
564.65	7696.26	580.1	7700	582.89	7700.53	621.43	7705	648.47	7710
671.72	7715	674.59	7715.55	685.79	7720	698.43	7725	711.53	7730
714.52	7731.01	727.46	7735	744.29	7740				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 320.38 0 372.03 0

Bank Sta: Left Right Coeff Contr. Expan.
 320.38 372.03 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 354.46 7677.49 F
 363.46 744.29 7677.49 F

Downstream Deck/Roadway Coordinates

num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 225.54 7676.7 283.59 7677.4 343 7676.21

Downstream Bridge Cross Section Data

Station	Elevation	Data	num=	32					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7745	14.54	7740	22.87	7737.04	28.56	7735	44.32	7730
60.71	7725	76.37	7720	91.26	7715	106.13	7710	121.72	7705
138.38	7700	155.7	7695	170.3	7690	176.15	7688.3	197.62	7685.06
197.99	7685	214.62	7680	225.54	7676.7	245.65	7675	283.59	7671.87
297.12	7672.66	312.77	7675	343.38	7680	347.52	7685	391.39	7690
415.53	7695	444.36	7700	472.3	7703.95	480.29	7701.98	508.86	7705
559.8	7710	588.47	7714.79						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 245.65 .04 312.77 .045

Bank Sta: Left Right Coeff Contr. Expan.
 245.65 312.77 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 278.04 7676.45 F
 289.04 588.47 7676.45 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 =
- 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 Arch 3 4
 FHWA Charr # 41- Arch: Corrugated metal
 FHWA Scale # 1 - 90 Degree headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Ccoef Exit Loss Ccoef
 4.5 20 .024 .024 0 .5 1
 Upstream Elevation = 7677.49
 Centerline Station = 358.96
 Downstream Elevation = 7672.5
 Centerline Station = 283.59

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4590

INPUT

Description: XSEC Downstream of Culvert # 3

Station Elevation Data num= 32									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7745	14.54	7740	22.87	7737.04	28.56	7735	44.32	7730
60.71	7725	76.37	7720	91.26	7715	106.13	7710	121.72	7705
138.38	7700	155.7	7695	170.3	7690	176.15	7688.3	197.62	7685.06
197.99	7685	214.62	7680	225.54	7676.7	245.65	7675	283.59	7671.87
297.12	7672.66	312.77	7675	343.38	7680	367.52	7685	391.39	7690
415.53	7695	444.36	7700	472.3	7703.95	480.29	7701.98	508.86	7705
559.8	7710	588.47	7714.79						

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	245.65	.04	312.77	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	245.65	312.77		96.17	126.79	150.79	.3	.5

Ineffective Flow num= 2				
Sta L	Sta R	Elev	Permanent	
0	278.04	7676.45	F	
289.04	588.47	7676.45	F	

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4580

INPUT

Description:

Station Elevation Data num= 35									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7760	12.16	7755	27.55	7750	51.1	7745	67.86	7740
76.44	7737.04	82.27	7735	95.25	7730	109	7725	125.25	7720
140.72	7715	156.92	7710	173.33	7705	189.53	7700	205.44	7695
221.53	7690	237.94	7685	254.29	7680	265.11	7676.7	272.62	7675
292.46	7670	306.68	7666.61	315.96	7665	346.1	7665	349.26	7665.66
378.86	7666.09	399.69	7670	425.53	7675	451.78	7680	477.19	7685
502.29	7690	527.71	7695	567.35	7700	585.23	7702.2	635.84	7701.66

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	306.68	0	349.26	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	306.68	349.26		199.74	193.07	167.78	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4570

INPUT

Description:

Station Elevation Data num= 41									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7765	14.69	7760	26.92	7755	35.15	7751.57	38.73	7750
51.19	7745	64.94	7740	78.24	7735	91.3	7730	103.53	7725
117.02	7720	130.65	7715	144.43	7710	158.88	7705	173.78	7700
188.64	7695	203.38	7690	217.1	7685	231.69	7680	246.34	7675
260.96	7670	267.78	7667.58	276.67	7665	295.47	7660	306.93	7656.78
317.19	7655	353.12	7655	364.27	7656.53	400.57	7656.19	422.91	7660
440.64	7665	463.49	7670	483.53	7675	495.82	7680	509.23	7685
523.51	7690	530.47	7695	533.57	7697.16	616.67	7700	650.22	7701.18
708.01	7705								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	306.93	0	364.27	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	306.93	364.27		158.75	158.29	160.89	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4565

INPUT

Description:

Station Elevation Data num= 23									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7705	10.21	7700	22.62	7695	33.11	7690	43.71	7685
58.26	7680	72.94	7675	84.2	7670	89.82	7667.58	101.04	7665
122.97	7660	135.62	7657.19	143.79	7655	162.52	7650	184.64	7649.43
171.83	7645	174.05	7643.61	185.03	7645	219.18	7650	241.41	7650.94
266.64	7650.9	278.63	7655	308.83	7660				

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	162.53	.035	219.18	.02

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	162.53	219.18		277.99	280.48	288.65	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4560

INPUT

Description:

Station Elevation Data num= 24									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7690	13.59	7685	25.81	7680	39.49	7675	53.73	7670
71.26	7665	88.35	7660	104.35	7655	120.09	7650	135.76	7645
151.2	7640	167.13	7635	182.2	7630.5	196.83	7635	212.77	7640

214.13 7640.45 264.78 7645 268.61 7645.32 309.77 7645.76 334.67 7650
 364.18 7655 413.1 7660 436.83 7665 464.52 7670

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 167.13 .035 196.83 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 167.13 196.83 187.13 234.04 247.65 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4550

INPUT

Description:
 Station Elevation Data num= 30
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7690 13.31 7685 26.89 7680 37.87 7675 48.83 7670
 59.71 7665 70.44 7660 79.54 7655 91.17 7650 102.88 7645
 116.09 7640 133.94 7635 142.59 7632.86 164.9 7630 192.92 7626.37
 224.98 7625 257.53 7623.67 264.91 7621.5 282.51 7625 301.99 7630
 311.94 7632.09 356.83 7633.76 362.16 7635 383.73 7640 403.89 7645
 429.41 7650 453.71 7655 477.89 7660 499.95 7665 520.89 7670

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 257.53 .035 282.51 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 257.53 282.51 108.96 135.09 121.38 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4540

INPUT

Description:
 Station Elevation Data num= 34
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7700 12.36 7695 24.37 7690 36.22 7685 40.41 7683.49
 45.55 7680 54.04 7675 62.27 7670 74.48 7665 86.96 7660
 99.85 7655 113.02 7650 125.98 7645 138.87 7640 151.32 7635
 163.9 7630 177.15 7625 190.17 7620 199.06 7616.24 218.07 7620
 223.16 7621.04 276.64 7625 289.63 7626.81 316 7628.02 328.71 7630
 356.18 7635 383.89 7640 413.11 7645 434.26 7650 452.22 7655
 470.45 7660 491.5 7665 514.02 7670 534.32 7675

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 177.15 .035 223.16 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 177.15 223.16 336.24 347.95 375.73 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4530

INPUT

Description:
 Station Elevation Data num= 46
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7695 13.73 7690 27.72 7685 41.64 7680 54.89 7675
 68.26 7670 81.92 7665 96.57 7660 113.56 7655 131.67 7650
 161.19 7645 174.12 7640 185.2 7635 195.52 7630 206.65 7625
 218.67 7620 230.19 7615 241.78 7610 249.35 7605.46 250.74 7603.92
 250.98 7600.49 251.64 7600.49 252.57 7600.46 252.99 7601.87 254.23 7605.48
 279.07 7610 286.33 7611.24 315.39 7611.59 328.8 7615 340.88 7620
 352.28 7625 363.14 7630 373.89 7635 384.75 7640 394.88 7645
 404.77 7650 414.59 7655 425.09 7660 437.39 7665 449.89 7670
 465.83 7675 479.98 7680 491.41 7685 503.04 7690 515.64 7695
 529.38 7700

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 230.19 0 286.33 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 230.19 286.33 123.67 125.76 135.08 .3 .5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4520

INPUT

Description: XSEC Upstream of Culvert # 2
 Station Elevation Data num= 55
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7695 10.99 7690 22.11 7685 37.49 7680 54.27 7675
 70.1 7670 86.05 7665 105.18 7660 126.31 7655 144.44 7650
 150.01 7648.33 169.74 7645 176.55 7640 192.29 7635 208.21 7630
 223.79 7625 238.86 7620 253.14 7615 266.02 7610 272.52 7606.69
 278.35 7597.18 279.67 7595.25 280.89 7592.32 292.27 7592.28 293.47 7592.28
 295.26 7597.28 300.44 7597.51 304.18 7597.8 309.23 7597.93 312.88 7598.13
 318.03 7599.21 326.55 7601.91 334.88 7605.47 340.16 7608.25 347.11 7610
 355.3 7615 363.74 7620 372.46 7625 383.3 7630 392.59 7635
 401.18 7640 411.09 7645 422.94 7650 433.38 7655 444.73 7660
 455.21 7665 464.94 7670 474.71 7675 484.44 7680 494.57 7685
 505.01 7690 515.6 7695 526.34 7700 536.75 7705 548.47 7710

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 278.35 .035 295.26 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 278.35 295.26 123.67 125.76 135.08 .3 .5

278.35 295.26 56.55 52.81 57.42 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 279.38 7597.22 F
 294.64 548.47 7597.22 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4515

INPUT

Description: Culvert #2
 Distance from Upstream XS = 5
 Deck/Roadway Width = 33
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates
 num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7597.53 287 7597.53 347 7597.68

Upstream Bridge Cross Section Data

Station Elevation Data num= 55
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7695 10.99 7690 22.11 7685 37.49 7680 54.27 7675
 70.1 7670 86.05 7665 105.18 7660 126.31 7655 144.44 7650
 150.01 7648.33 160.74 7645 176.55 7640 192.29 7635 208.21 7630
 223.79 7625 238.86 7620 253.14 7615 266.02 7610 272.52 7606.69
 278.35 7597.18 279.67 7595.25 280.89 7592.32 292.27 7592.28 293.47 7592.28
 295.26 7597.28 300.44 7597.51 304.18 7597.8 309.23 7597.93 312.88 7598.13
 318.03 7599.21 326.55 7601.91 334.88 7605.47 340.16 7608.25 347.11 7610
 355.3 7615 363.74 7620 372.46 7625 383.3 7630 392.59 7635
 401.18 7640 411.09 7645 422.94 7650 433.38 7655 444.73 7660
 455.21 7665 464.94 7670 474.71 7675 484.44 7680 494.57 7685
 505.01 7690 515.6 7695 526.34 7700 536.75 7705 548.47 7710

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 278.35 .035 295.26 .055

Bank Sta: Left Right Coeff Contr. Expan.
 278.35 295.26 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 279.38 7597.22 F
 294.64 548.47 7597.22 F

Downstream Deck/Roadway Coordinates

num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7596.65 287 7596.65 347 7596.82

Downstream Bridge Cross Section Data

Station Elevation Data num= 51
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7690 15.2 7685 20.08 7680 38 7675 45.54 7670
 60.37 7670 78.64 7665 96.16 7660 113.19 7655 132.2 7650
 139.78 7648.13 154.39 7645 178.45 7640 198.99 7635 217 7630
 234.82 7625 250.7 7620 265.34 7615 279.93 7610 294.54 7605
 299.44 7597.48 302.44 7591.48 306.37 7591.61 315.86 7591.61 318.77 7591.58
 319.69 7603.02 344.13 7605 354.43 7605.76 367.14 7610 372.19 7611.68
 385.77 7614.33 386.81 7615 395.3 7620 403.67 7625 412.25 7630
 420.79 7635 430.01 7640 440.4 7645 451.3 7650 462.56 7655
 472.38 7660 482.07 7665 491.7 7670 501.48 7675 511.42 7680
 522.47 7685 533.68 7690 544.07 7695 552.6 7700 563.66 7705
 573.67 7710

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 294.54 .035 319.69 .055

Bank Sta: Left Right Coeff Contr. Expan.
 294.54 319.69 .3 .5
 Ineffective Flow num= 0
 Sta L Sta R Elev Permanent

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 =
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Culverts = 2

Culvert Name Shape Rise Span
 CULVERT#1 Arch 3 4
 FHWA Chart # 41- Arch; Corrugated metal
 FHWA Scale # 1 - 90 Degree headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 5 33 .024 .024 0 .5 1
 Upstream Elevation = 7592.88
 Centerline Station = 282.79
 Downstream Elevation = 7592.2
 Centerline Station = 306.45

Culvert Name Shape Rise Span
 Culvert #2 Arch 3 4
 FHWA Chart # 41- Arch; Corrugated metal
 FHWA Scale # 1 - 90 Degree headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 5 33 .024 .024 0 .5 1
 Upstream Elevation = 7593.61
 Centerline Station = 291.79
 Downstream Elevation = 7592.54
 Centerline Station = 315.45

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4510

INPUT
Description: XSEC Downstream of Culvert # 2
Station Elevation Data num= 51
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7690 15.2 7685 20.08 7683.38 30.42 7680 45.54 7675
60.37 7670 78.64 7665 96.16 7660 113.19 7655 133.2 7650
139.78 7648.33 154.39 7645 178.45 7640 198.99 7635 217 7630
234.82 7625 250.7 7620 265.34 7615 279.93 7610 294.54 7605
299.44 7597.48 302.44 7591.48 306.37 7591.61 315.86 7591.61 318.77 7591.58
319.69 7603.02 344.13 7605 354.43 7605.76 367.14 7610 372.19 7611.68
385.77 7614.33 386.81 7615 395.3 7620 403.87 7625 412.25 7630
420.79 7635 430.01 7640 440.4 7645 451.3 7650 462.56 7655
472.38 7660 482.07 7665 491.7 7670 501.48 7675 511.42 7680
522.47 7685 533.68 7690 544.07 7695 553.6 7700 563.66 7705
573.67 7710

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .055 294.54 .035 319.69 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
294.54 319.69 107.29 123.56 141.49 .3 .5

Ineffective Flow num= 0
Sta L Sta R Elev Permanent

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4500

INPUT
Description:
Station Elevation Data num= 49
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7685 6.33 7683.38 18.84 7680 37.39 7675 54.49 7670
69.6 7665 84.16 7660 98.57 7655 113.67 7650 118.95 7649.33
129.03 7645 147.04 7640 165.23 7635 187.42 7630 202.6 7626.9
222.65 7625 224.79 7624.72 244.05 7620 262.5 7615 281.61 7610
288.69 7607.91 315.14 7605.71 318.32 7605 341.66 7600 355.16 7591.34
357.67 7588.31 359.38 7588.27 361.48 7591.28 369.25 7599.33 395.81 7600
395.85 7599.89 409.7 7620 410.81 7621.64 418.09 7625 428.52 7630
433.98 7632.7 456.67 7633.05 461.31 7635 473.81 7640 488.18 7645
505.22 7650 521.07 7655 536.98 7660 552.96 7665 568.64 7670
581.66 7675 594.85 7680 608.22 7685 621.67 7690

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .055 341.66 .035 369.25 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
341.66 369.25 212.29 193.78 168.97 .1 .3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4495

INPUT
Description:
Station Elevation Data num= 23
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7620 25.33 7615 39.91 7610 61.8 7605 86.12 7600
126.11 7595 169.22 7591.33 175 7590 185 7587 187.5 7585
190 7587 200 7590 220.25 7592.59 234.67 7595 243.75 7600
252.89 7605 261.38 7610 269.58 7615 277.81 7620 281.08 7621.69
291.61 7625 308.24 7630 324.88 7635

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 175 0 200 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
175 200 154.64 128.78 101.48 .1 .3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4490

INPUT
Description:
Station Elevation Data num= 19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7610 69.74 7605 92.58 7600 101.71 7595 109.7 7590
112 7587.5 115.85 7585 118.94 7582.32 128.46 7585 138.78 7587.83
166.99 7587.51 168.08 7590 170.08 7595 171.94 7600 173.63 7605.18
173.64 7605 201.76 7610 220.77 7615 239.61 7620

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 112 0 138.78 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
112 138.78 109.24 128.53 146.49 .1 .3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4485

INPUT
Description:
Station Elevation Data num= 21
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7606.84 2.4 7605 8.72 7600 15.05 7595 21.22 7590
27.6 7585 32.59 7581.05 33.28 7580 36.66 7575 40.06 7570
40.17 7569.79 40.81 7570 56.83 7575 61.04 7576.33 82.48 7576.32

86.83 7580 92.85 7585 99.84 7590 104.94 7595 111.28 7600
118.3 7605

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .055 36.66 .03 61.04 .02

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
36.66 61.04 252.86 253.96 252.06 .1 .3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4480

INPUT
Description:
Station Elevation Data num= 49
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7670 52.51 7665.98 55.57 7665 72.74 7660 87.84 7655
102.78 7650 118.08 7645 131.92 7640 145.59 7635 149.27 7633 69
157.13 7630 168.04 7625 178.7 7620 182.54 7618.1 187.86 7615
196.66 7610 205.74 7605 215 7600.07 215.12 7600 229.24 7575
236.02 7560 244.23 7555 255.74 7550 260.87 7547.8 266.48 7550
276.39 7551.9 298.83 7554.22 299.87 7555 305.45 7560 311.05 7565
316.51 7570 322.19 7575 327.74 7580 333.38 7585 339.1 7590
345.15 7595 352 7600 359.17 7605 366.16 7610 373.32 7615
380.39 7620 387.45 7625 394.52 7630 401.6 7635 408.71 7640
416.76 7645 424 7647.58 433.18 7650 453.39 7655

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .045 244.23 .04 276.39 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
244.23 276.39 147.56 141.71 117.21 .1 .3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4470

INPUT
Description:
Station Elevation Data num= 49
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7640 11.24 7635 22.48 7630 33.75 7625 44.85 7620
55.23 7615 65.23 7610 66.77 7609.29 69.37 7605 72.37 7600
84.31 7575 84.7 7573.7 90.59 7570 98.41 7565 106.35 7560
114.3 7555 122.13 7550 129.49 7545 137.01 7540 142.75 7536.09
154.92 7540 156.2 7540.38 175.66 7540 184.5 7540 184.76 7539.88
190.8 7545 196.63 7550 202.33 7555 208.34 7560 214.25 7565
220.19 7570 227.65 7575 237.07 7580 246.12 7585 255.04 7590
264.17 7595 274.36 7600 284.65 7605 294.94 7610 305.24 7615
315.59 7620 325.81 7625 335.79 7630 345.66 7635 355.71 7640
365.71 7645 370.83 7647.58 376.74 7650 386.34 7655

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .045 137.01 .04 156.2 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
137.01 156.2 156.78 157.33 154.35 .1 .3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4460

INPUT
Description:
Station Elevation Data num= 50
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7605 11.91 7601.53 18.41 7600 35.72 7595 51.23 7590
59.35 7585 67.76 7580 76.24 7575 90.45 7570 107.86 7565
130.25 7560 147.45 7556.1 172.6 7555 173.95 7554.91 179.39 7550
184.98 7545 190.51 7540 196.07 7535 201.5 7530 206.61 7525
208.48 7523.07 215.46 7525 232.58 7530 233.89 7530.4 247.67 7530
266.11 7530 266.6 7530 273.73 7535 281.02 7540 288.34 7545
295.6 7550 303.91 7555 312.07 7560 319.43 7565 326.49 7570
329.87 7572.36 334.15 7575 341.92 7580 349.59 7585 357.52 7590
365.55 7595 373.97 7600 382.58 7605 391.4 7610 400.44 7615
409.05 7620 417.64 7625 426.09 7630 434.34 7635 442.79 7640

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 201.5 0 232.58 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
201.5 232.58 142.5 176.67 197.19 .1 .3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4450

INPUT
Description:
Station Elevation Data num= 48
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7600 2.15 7598.75 28.76 7595 36.61 7594.04 39.84 7590
43.96 7585 48.1 7580 50 7577.69 56.59 7575 68.78 7570
79.47 7565 91.15 7560 102.87 7555 114.87 7550 128.82 7545
143.14 7540 159.44 7535 176.77 7530 179.7 7529.17 187.73 7525
197.24 7520 206.9 7515 212.27 7512.29 228.18 7515 238.42 7516.81
252.17 7516.81 269.77 7520 278.74 7525 287.26 7530 295.83 7535
304.48 7540 312.96 7545 320.53 7550 327.69 7555 335.22 7560
345.27 7565 355.5 7570 360.28 7572.36 368.34 7575 381.47 7580
393.99 7585 407.74 7590 421.94 7595 435.39 7600 448.16 7605
460.18 7610 471.86 7615 482.62 7620

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 0 197.24 0 238.42 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 197.24 238.42 375.2 359.22 371.73 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4440

INPUT
 Description:
 Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7620	10.17	7615	20.33	7610	30.57	7605	41.27	7600
52.32	7595	64.56	7590	81.13	7585	95	7580	108.56	7575
121.13	7570	134.32	7565	146.75	7560	158.71	7555.19	159.2	7555
173.84	7550	190.18	7545	206.17	7540	220.87	7535	240.43	7530
268.26	7525	299.85	7520	317.13	7515	328.69	7510	338.87	7505
349.03	7500	358.95	7495	360.09	7494.44	362.42	7495	382.57	7500
390.85	7501.75	411.34	7501.89	416.79	7505	425.55	7510	434.36	7515
443.19	7520	451.94	7525	460.93	7530	470.46	7535	480.05	7540
489.33	7545	498.56	7550	507.76	7555	516.95	7560	526.72	7565
537.15	7570	542.05	7572.36	545.31	7575	551.56	7580	558.7	7585
566.65	7590	574.62	7595	582.86	7600	591.13	7605	599.27	7610
607.41	7615	615.46	7620	623.39	7625	631.31	7630	639.26	7635

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 .055 338.87 .035 390.85 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 338.87 390.85 365.73 362.91 348.13 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4430

INPUT
 Description:
 Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7570	8.47	7565	17.41	7560	28.58	7555	39.98	7550
51.41	7545	64.17	7540	75.45	7535	86.37	7530	97	7525
108.13	7520	114.88	7516.65	117.96	7515	128.47	7510	139.55	7505
148.46	7500	149.48	7499.53	157.97	7495	166.9	7490	180.9	7485
193.97	7480.36	213.43	7485	225.28	7487.91	245.92	7487.95	253.62	7490
269.16	7495	279.57	7500	289.99	7505	300.7	7510	311.71	7515
322.93	7520	336.08	7525	348.65	7530	360.24	7535	371.07	7540
381.64	7545	391.46	7550	400.99	7555	410.38	7560	419.63	7565
430.1	7570	441.52	7575	450.37	7578.46	454.24	7580	470.98	7585

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 .055 166.9 .05 225.28 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 166.9 225.28 234.83 263.29 199.76 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4420

INPUT
 Description:
 Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7510	7.76	7505	12.93	7502.16	107.17	7500.89	111.37	7500
127.34	7495	141.6	7490	153.66	7485	163.14	7480	184.99	7475
210.04	7470	223.77	7467.85	229.44	7470	242.51	7475	246.72	7476.49
270.34	7476.49	279.06	7480	287.36	7485	295.61	7490	303.29	7495
310.8	7500	318.38	7505	325.87	7510	333.55	7515	341.18	7520
348.9	7525	357.89	7530	366.17	7535	374.17	7540	382.3	7545
390.56	7550	404.02	7555	419	7560				

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 0 184.99 0 242.51 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 184.99 242.51 120.24 143.62 144.02 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4410

INPUT
 Description:
 Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7485.32	2.11	7485	23.48	7480	47.58	7475	74.96	7470
77.27	7469.53	89.82	7465	98.41	7461.89	110.96	7465	131.15	7470
131.46	7470.08	141.99	7470	144.75	7470	151.79	7470.31	164.39	7475
173.53	7480	180.49	7485	187.19	7490	194.09	7495		

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 0 77.27 0 131.46 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 77.27 131.46 97.41 49.85 12.34 .3 .5

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4400

INPUT

Description: Upstream of Culvert #1
Station Elevation Data num= 30
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7490 25.72 7485 54.29 7480 89.75 7475 109.26 7472.37
117.81 7470 153.33 7465 186.03 7464.45 194.02 7460 196.09 7457.89
197.16 7455.96 198.22 7455.18 200.71 7455.09 203.55 7455.09 204.97 7455.79
206.39 7457.46 207.82 7458.6 210.33 7460 236.59 7465 271.39 7468.27
300.01 7469.74 300.72 7470 312.08 7475 324.87 7480 334.02 7485
341.42 7490 348.93 7495 356.64 7500 365.3 7505 374.81 7510

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 186.03 0 236.59 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
186.03 236.59 47.53 53.74 68.32 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 197 7457.63 F
205.1 374.81 7457.72 F

CULVERT

RIVER: Reach #1
REACH: Sabino Canyon RS: 4397.5

INPUT

Description: Culvert #1
Distance from Upstream XS = 3
Deck/Roadway Width = 22
Weir Coefficient = 3.1
Upstream Deck/Roadway Coordinates num= 3
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
175 7458 192 7460 230 7458

Upstream Bridge Cross Section Data
Station Elevation Data num= 30
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7490 25.72 7485 54.29 7480 89.75 7475 109.26 7472.37
117.81 7470 153.33 7465 186.03 7464.45 194.02 7460 196.09 7457.89
197.16 7455.96 198.22 7455.18 200.71 7455.09 203.55 7455.09 204.97 7455.79
206.39 7457.46 207.82 7458.6 210.33 7460 236.59 7465 271.39 7468.27
300.01 7469.74 300.72 7470 312.08 7475 324.87 7480 334.02 7485
341.42 7490 348.93 7495 356.64 7500 365.3 7505 374.81 7510

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 186.03 0 236.59 0

Bank Sta: Left Right Coeff Contr. Expan.
186.03 236.59 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 197 7457.63 F
205.1 374.81 7457.72 F

Downstream Deck/Roadway Coordinates num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
170 7460 2157459.842

Downstream Bridge Cross Section Data
Station Elevation Data num= 40
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7485 32.73 7480 66.84 7475 108.69 7470 109.85 7469.87
129.88 7465 148.17 7460 13 158.68 7460 173.03 7459.8 186.28 7455.37
186.65 7455.01 187.2 7454.68 187.55 7454.67 187.99 7454.62 188.51 7454.55
189.16 7454.54 189.93 7454.54 190.45 7454.6 190.92 7454.69 191.43 7454.73
192.58 7454.86 192.9 7454.95 193.09 7455.04 193.27 7455.29 212.81 7460
231.06 7465 240.56 7467.45 264.58 7468.13 269.1 7470 281.7 7475
293.41 7480 304.48 7485 315.3 7490 326.24 7495 337.17 7500
347.88 7505 358.45 7510 368.85 7515 379.05 7520 388.89 7525

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .055 173.03 .032 212.81 .06

Bank Sta: Left Right Coeff Contr. Expan.
173.03 212.81 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 183.66 7455.01 F
195.74 388.89 7459.01 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 =
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 Arch 3 4
FHWA Chart # 41- Arch; Corrugated metal
FHWA Scale # 1 - 90 Degree Headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
199 203.1 3 22 .024 .024 0 .5 1

Number of Barrels = 2
Upstream Elevation = 7455
Centerline Stations
Sta. Sta.
199 203.1

Downstream Elevation = 7454.9

Centerline Stations
Sta Sta
187.9 192

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4395

INPUT

Description: XSEC Downstream of Culvert # 1

Station Elevation Data		num= 40							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7485	32.71	7480	86.84	7475	108.69	7470	109.85	7469.87
129.88	7465	148.17	7460.13	158.68	7460	173.03	7459.8	186.28	7455.37
186.65	7455.01	187.2	7454.68	187.55	7454.67	187.99	7454.62	188.51	7454.55
189.16	7454.54	189.93	7454.54	190.45	7454.6	190.92	7454.69	191.43	7454.73
192.58	7454.86	192.9	7454.95	193.09	7455.04	193.27	7455.28	212.81	7460
231.05	7465	240.56	7467.45	264.58	7468.13	269.1	7470	281.7	7475
293.41	7480	304.48	7485	315.3	7490	326.24	7495	337.17	7500
347.88	7505	358.45	7510	368.85	7515	379.05	7520	388.89	7525

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	173.03	.032	212.81	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	173.03	212.81		51.3	62.2	72.85	.3	.5
Ineffective Flow		num= 2						
Sta L	Sta R	Elev	Permanent					
0	183.66	7459.01	F					
195.74	388.89	7459.01	F					

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4390

INPUT

Description:

Station Elevation Data		num= 31							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7480	50.91	7475	80.26	7470	115.35	7465	144.96	7460
149.45	7459.16	183.05	7457.32	186.13	7455	188.67	7453.08	191.11	7453.14
196.06	7455	216.44	7460	235.74	7465	241.43	7466.4	267.21	7466.31
275.75	7470	287.26	7475	298.72	7480	311.17	7485	322.92	7490
333.97	7495	344.78	7500	355.31	7505	365.19	7510	377.22	7515
388.88	7520	400.05	7525	411.14	7530	423.92	7535	438.64	7540
456.57	7545								

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	183.05	.032	216.44	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	183.05	216.44		422.01	367.85	348.08	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4380

INPUT

Description:

Station Elevation Data		num= 40							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7540	13.98	7535	26.19	7530	42.04	7525	58.43	7520
66.18	7515	74.12	7510	82.04	7505	90.08	7500	98.26	7495
106.26	7490	113.93	7485	121.73	7480	129.55	7475	137.45	7470
145.25	7465	154.5	7460	165.33	7455	166.6	7454.34	190.14	7453.21
196.54	7450	209.71	7445	224.72	7441.87	246.21	7445	253.1	7446.02
287.65	7480	317.35	7485	328.27	7486.9	342.73	7480	365.68	7485
386.96	7470	404.73	7475	414.69	7480	423.96	7485	433.3	7490
442.59	7495	452	7500	460.16	7505	468.51	7510	476.71	7515

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	209.71	.035	246.21	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	209.71	246.21		159.8	158.36	130.15	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4370

INPUT

Description:

Station Elevation Data		num= 33							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7500	11.06	7495	23.08	7490	35.07	7485	46.99	7480
58.78	7475	72.27	7470	85.19	7465	100.43	7460	122.74	7455
145.98	7450	169.03	7445	180.69	7442.31	190.83	7440	199.26	7438.05
209.07	7440	222.45	7442.73	238.8	7445	273.98	7450	276.41	7450.24
293.99	7455	311.9	7460	328.47	7465	344.88	7470	361.12	7475
373.03	7480	382.36	7485	391.48	7490	398.52	7495	404.89	7500
411.27	7505	418.21	7510	425.13	7515				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	0	180.69	0	222.45	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	180.69	222.45		121.8	124.38	118.98	.1	.3

SUMMARY OF MANNING'S N VALUES

River: Reach #1

Reach	River Sta.	n1	n2	n3
Sabino Canyon	5000	.013	.045	.055
Sabino Canyon	4990	0	0	0
Sabino Canyon	4980	0	0	0
Sabino Canyon	4970	.013	.045	.055
Sabino Canyon	4955	0	0	0
Sabino Canyon	4950	.013	.045	.055
Sabino Canyon	4949	Culvert		
Sabino Canyon	4948	.013	.045	.055
Sabino Canyon	4940	.013	.045	.055
Sabino Canyon	4930	0	0	0
Sabino Canyon	4925	Culvert		
Sabino Canyon	4920	0	0	0
Sabino Canyon	4910	0	0	0
Sabino Canyon	4900	0	0	0
Sabino Canyon	4890	.013	.045	.055
Sabino Canyon	4885	Culvert		
Sabino Canyon	4880	0	0	0
Sabino Canyon	4870	0	0	0
Sabino Canyon	4860	0	0	0
Sabino Canyon	4855	Culvert		
Sabino Canyon	4850	0	0	0
Sabino Canyon	4840	0	0	0
Sabino Canyon	4830	0	0	0
Sabino Canyon	4825	Culvert		
Sabino Canyon	4820	0	0	0
Sabino Canyon	4810	.013	.04	.03
Sabino Canyon	4800	.013	.04	.03
Sabino Canyon	4790	0	0	0
Sabino Canyon	4780	0	0	0
Sabino Canyon	4775	Culvert		
Sabino Canyon	4770	0	0	0
Sabino Canyon	4765	.055	.04	.045
Sabino Canyon	4760	0	0	0
Sabino Canyon	4750	0	0	0
Sabino Canyon	4745	Culvert		
Sabino Canyon	4740	0	0	0
Sabino Canyon	4730	0	0	0
Sabino Canyon	4725	Culvert		
Sabino Canyon	4720	0	0	0
Sabino Canyon	4710	0	0	0
Sabino Canyon	4705.5	Culvert		
Sabino Canyon	4701	0	0	0
Sabino Canyon	4690	0	0	0
Sabino Canyon	4680	0	0	0
Sabino Canyon	4675	Culvert		
Sabino Canyon	4670	0	0	0
Sabino Canyon	4640	0	0	0
Sabino Canyon	4635	Culvert		
Sabino Canyon	4630	0	0	0
Sabino Canyon	4620	.055	.04	.045
Sabino Canyon	4610	0	0	0
Sabino Canyon	4600	0	0	0
Sabino Canyon	4595	Culvert		
Sabino Canyon	4590	.055	.04	.045
Sabino Canyon	4580	0	0	0
Sabino Canyon	4570	0	0	0
Sabino Canyon	4565	.055	.035	.02
Sabino Canyon	4560	.055	.035	.045
Sabino Canyon	4550	.055	.035	.055
Sabino Canyon	4540	.055	.035	.055
Sabino Canyon	4530	0	0	0
Sabino Canyon	4520	.055	.035	.055
Sabino Canyon	4515	Culvert		
Sabino Canyon	4510	.055	.035	.055
Sabino Canyon	4500	.055	.035	.055
Sabino Canyon	4495	0	0	0
Sabino Canyon	4490	0	0	0
Sabino Canyon	4485	.055	.03	.02
Sabino Canyon	4480	.045	.04	.045
Sabino Canyon	4470	.045	.04	.045
Sabino Canyon	4460	0	0	0
Sabino Canyon	4450	0	0	0
Sabino Canyon	4440	.055	.035	.055
Sabino Canyon	4430	.055	.05	.055
Sabino Canyon	4420	0	0	0
Sabino Canyon	4410	0	0	0
Sabino Canyon	4400	0	0	0
Sabino Canyon	4397.5	Culvert		
Sabino Canyon	4395	.055	.032	.06
Sabino Canyon	4390	.055	.032	.06
Sabino Canyon	4380	.055	.025	.055
Sabino Canyon	4370	0	0	0

SUMMARY OF REACH LENGTHS

River: Reach #1

Reach	River Sta.	Left	Channel	Right
Sabino Canyon	5000	280.23	292.12	289.78
Sabino Canyon	4990	259.73	254.78	208.78
Sabino Canyon	4980	195.74	195.12	199.47
Sabino Canyon	4970	109.28	110.18	116.2
Sabino Canyon	4955	48.65	43.54	36.65
Sabino Canyon	4950	44.18	37.93	31.14
Sabino Canyon	4949	Culvert		
Sabino Canyon	4948	100.62	93.02	81.56
Sabino Canyon	4940	183.11	200.29	206.49
Sabino Canyon	4930	35.99	31.3	37.79
Sabino Canyon	4925	Culvert		
Sabino Canyon	4920	85.2	95.09	89.24
Sabino Canyon	4910	242.99	229.2	209.27
Sabino Canyon	4900	163.32	152.05	152.08
Sabino Canyon	4890	65.94	55.62	51.72
Sabino Canyon	4885	Culvert		
Sabino Canyon	4880	120.36	140.56	143.52
Sabino Canyon	4870	86.06	123.02	129.77

Sabino Canyon	4860	29.33	33.29	29.29
Sabino Canyon	4855	Culvert		
Sabino Canyon	4850	173.2	160.5	156.03
Sabino Canyon	4840	154.55	159.68	160.08
Sabino Canyon	4830	48.5	48.05	48.26
Sabino Canyon	4825	Culvert		
Sabino Canyon	4820	164.6	153.11	138.65
Sabino Canyon	4810	275.35	305.07	315.05
Sabino Canyon	4800	128.1	88.46	74.01
Sabino Canyon	4790	185.19	110.34	113.96
Sabino Canyon	4780	180.71	135.48	113.78
Sabino Canyon	4775	Culvert		
Sabino Canyon	4770	152.22	145.66	138.18
Sabino Canyon	4765	178.1	172.24	175.18
Sabino Canyon	4760	116.92	125.62	133.13
Sabino Canyon	4750	36.73	43.9	85.3
Sabino Canyon	4745	Culvert		
Sabino Canyon	4740	50.45	40.63	29.76
Sabino Canyon	4730	24.27	25.79	30.08
Sabino Canyon	4725	Culvert		
Sabino Canyon	4720	66.79	45.57	38.28
Sabino Canyon	4710	58.79	39.28	43.38
Sabino Canyon	4705.5	Culvert		
Sabino Canyon	4701	54.16	64.9	53.38
Sabino Canyon	4690	147.86	67.35	63.49
Sabino Canyon	4680	72.84	32.89	41.45
Sabino Canyon	4675	Culvert		
Sabino Canyon	4670	148.52	148.4	110.22
Sabino Canyon	4640	82.29	81.96	83.73
Sabino Canyon	4635	Culvert		
Sabino Canyon	4630	331.3	308.04	312.42
Sabino Canyon	4620	216.67	217.6	172.7
Sabino Canyon	4610	84.94	105.27	136.16
Sabino Canyon	4600	28.83	26.7	50.57
Sabino Canyon	4595	Culvert		
Sabino Canyon	4590	96.17	126.79	150.79
Sabino Canyon	4580	199.74	193.07	167.78
Sabino Canyon	4570	158.75	158.29	160.89
Sabino Canyon	4565	277.99	280.48	288.65
Sabino Canyon	4560	187.13	234.04	247.65
Sabino Canyon	4550	108.96	135.09	121.38
Sabino Canyon	4540	336.24	347.95	375.73
Sabino Canyon	4530	123.67	125.76	135.08
Sabino Canyon	4520	56.55	52.81	57.42
Sabino Canyon	4515	Culvert		
Sabino Canyon	4510	107.29	123.56	141.49
Sabino Canyon	4500	212.29	193.78	168.97
Sabino Canyon	4495	154.64	128.78	101.48
Sabino Canyon	4490	109.24	128.53	146.49
Sabino Canyon	4485	252.86	253.96	252.06
Sabino Canyon	4480	147.56	141.71	117.21
Sabino Canyon	4470	156.78	157.33	154.35
Sabino Canyon	4460	142.5	176.67	197.19
Sabino Canyon	4450	375.2	359.22	371.73
Sabino Canyon	4440	365.73	362.91	348.13
Sabino Canyon	4430	234.83	263.29	195.76
Sabino Canyon	4420	120.24	143.62	144.02
Sabino Canyon	4410	97.41	49.85	12.34
Sabino Canyon	4400	47.53	53.74	68.32
Sabino Canyon	4397.5	Culvert		
Sabino Canyon	4395	51.1	62.2	72.85
Sabino Canyon	4390	422.01	367.85	348.08
Sabino Canyon	4380	159.8	158.36	130.15
Sabino Canyon	4370	121.8	124.38	118.98

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Reach #1

Reach	River Sta.	Contr.	Expan.
Sabino Canyon	5000	.1	.3
Sabino Canyon	4990	.1	.3
Sabino Canyon	4980	.1	.3
Sabino Canyon	4970	.1	.3
Sabino Canyon	4955	.3	.5
Sabino Canyon	4950	.3	.5
Sabino Canyon	4949	Culvert	
Sabino Canyon	4948	.3	.5
Sabino Canyon	4940	.3	.5
Sabino Canyon	4930	.3	.5
Sabino Canyon	4925	Culvert	
Sabino Canyon	4920	.3	.5
Sabino Canyon	4910	.1	.3
Sabino Canyon	4900	.3	.5
Sabino Canyon	4890	.3	.5
Sabino Canyon	4885	Culvert	
Sabino Canyon	4880	.3	.5
Sabino Canyon	4870	.3	.5
Sabino Canyon	4860	.3	.5
Sabino Canyon	4855	Culvert	
Sabino Canyon	4850	.3	.5
Sabino Canyon	4840	.3	.5
Sabino Canyon	4830	.3	.5
Sabino Canyon	4825	Culvert	
Sabino Canyon	4820	.3	.5
Sabino Canyon	4810	.1	.3
Sabino Canyon	4800	.1	.3
Sabino Canyon	4790	.3	.5
Sabino Canyon	4780	.3	.5
Sabino Canyon	4775	Culvert	
Sabino Canyon	4770	.3	.5
Sabino Canyon	4765	.1	.3
Sabino Canyon	4760	.3	.5
Sabino Canyon	4750	.3	.5
Sabino Canyon	4745	Culvert	
Sabino Canyon	4740	.3	.5
Sabino Canyon	4730	.3	.5
Sabino Canyon	4725	Culvert	
Sabino Canyon	4720	.3	.5
Sabino Canyon	4710	.3	.5

Sabino Canyon	4705.5	Culvert	
Sabino Canyon	4701	.3	.5
Sabino Canyon	4690	.3	.5
Sabino Canyon	4680	.3	.5
Sabino Canyon	4675	Culvert	
Sabino Canyon	4670	.3	.5
Sabino Canyon	4640	.3	.5
Sabino Canyon	4635	Culvert	
Sabino Canyon	4630	.3	.5
Sabino Canyon	4620	.1	.3
Sabino Canyon	4610	.3	.5
Sabino Canyon	4600	.3	.5
Sabino Canyon	4595	Culvert	
Sabino Canyon	4590	.3	.5
Sabino Canyon	4580	.1	.3
Sabino Canyon	4570	.1	.3
Sabino Canyon	4565	.1	.3
Sabino Canyon	4560	.1	.3
Sabino Canyon	4550	.1	.3
Sabino Canyon	4540	.1	.3
Sabino Canyon	4530	.3	.5
Sabino Canyon	4520	.3	.5
Sabino Canyon	4515	Culvert	
Sabino Canyon	4510	.3	.5
Sabino Canyon	4500	.1	.3
Sabino Canyon	4495	.1	.3
Sabino Canyon	4490	.1	.3
Sabino Canyon	4485	.1	.3
Sabino Canyon	4480	.1	.3
Sabino Canyon	4470	.1	.3
Sabino Canyon	4460	.1	.3
Sabino Canyon	4450	.1	.3
Sabino Canyon	4440	.1	.3
Sabino Canyon	4430	.1	.3
Sabino Canyon	4420	.1	.3
Sabino Canyon	4410	.3	.5
Sabino Canyon	4400	.3	.5
Sabino Canyon	4397.5	Culvert	
Sabino Canyon	4395	.3	.5
Sabino Canyon	4390	.1	.3
Sabino Canyon	4380	.1	.3
Sabino Canyon	4370	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch Bl (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Frcude #	Ch. (ft)
Sabino Canyon	5000	Pre-Fire	113.00	7976.07	7978.37	7978.37	7978.96	0.030609	6.17	18.31	15.91		1.01
Sabino Canyon	5000	Post-Fire	322.00	7976.07	7979.58	7979.58	7980.47	0.026283	7.57	42.52	24.25		1.01
Sabino Canyon	4990	Pre-Fire	113.00	7954.38	7956.03	7956.03	7956.52	0.010661	4.12	24.00	27.74		0.63
Sabino Canyon	4990	Post-Fire	322.00	7954.38	7957.03	7957.03	7957.76	0.005202	4.18	59.67	43.28		0.48
Sabino Canyon	4980	Pre-Fire	113.00	7939.00	7941.23	7941.23	7941.72	0.003754	2.73	27.77	30.99		0.37
Sabino Canyon	4980	Post-Fire	322.00	7939.00	7942.23	7942.23	7943.00	0.002860	3.23	66.36	46.20		0.35
Sabino Canyon	4970	Pre-Fire	113.00	7927.21	7928.50	7928.50	7928.86	0.031076	4.81	24.15	37.40		0.57
Sabino Canyon	4970	Post-Fire	322.00	7927.21	7929.23	7929.23	7929.78	0.023254	6.22	58.87	58.37		0.93
Sabino Canyon	4955	Pre-Fire	113.00	7919.90	7921.94	7921.94	7922.47	0.031509	5.82	19.41	19.04		1.02
Sabino Canyon	4955	Post-Fire	322.00	7919.90	7923.01	7923.01	7923.80	0.025540	7.17	45.35	32.12		0.99
Sabino Canyon	4950	Pre-Fire	113.00	7915.09	7920.69	7916.51	7920.72	0.000274	1.47	76.91	24.69		0.11
Sabino Canyon	4950	Post-Fire	322.00	7915.09	7921.68	7917.83	7921.77	0.000666	2.31	147.90	65.78		0.17
Sabino Canyon	4949	Culvert											
Sabino Canyon	4948	Pre-Fire	113.00	7913.45	7915.70	7915.70	7916.45	0.032118	6.96	16.24	10.96		1.01
Sabino Canyon	4948	Post-Fire	322.00	7913.45	7917.23	7917.23	7918.30	0.027433	8.30	38.83	18.39		1.01
Sabino Canyon	4940	Pre-Fire	113.00	7907.29	7909.49	7909.49	7910.05	0.030485	6.01	18.79	17.07		1.01
Sabino Canyon	4940	Post-Fire	322.00	7907.29	7910.62	7910.62	7911.51	0.022209	7.58	43.13	26.08		0.95
Sabino Canyon	4930	Pre-Fire	129.00	7885.96	7891.47	7889.15	7891.66	0.003618	3.49	36.97	10.24		0.32
Sabino Canyon	4930	Post-Fire	369.00	7885.96	7893.72	7891.27	7894.24	0.007208	5.79	63.73	13.53		0.47
Sabino Canyon	4925	Culvert											
Sabino Canyon	4920	Pre-Fire	129.00	7884.74	7887.83	7887.83	7888.81	0.034258	7.96	16.21	7.98		0.98
Sabino Canyon	4920	Post-Fire	369.00	7884.74	7890.07	7890.07	7891.60	0.027357	9.93	37.57	12.85		0.91
Sabino Canyon	4910	Pre-Fire	129.00	7880.00	7883.11	7883.11	7883.90	0.030423	7.09	18.18	11.68		1.00
Sabino Canyon	4910	Post-Fire	369.00	7880.00	7884.73	7884.73	7885.93	0.026854	8.80	41.91	17.73		1.01
Sabino Canyon	4900	Pre-Fire	129.00	7869.05	7871.98	7871.98	7872.76	0.032417	7.09	18.20	11.87		1.01
Sabino Canyon	4900	Post-Fire	369.00	7869.05	7873.58	7873.58	7874.63	0.027006	8.21	44.92	21.48		1.00
Sabino Canyon	4890	Pre-Fire	129.00	7860.00	7864.09	7862.18	7864.25	0.003002	3.20	40.26	13.49		0.33
Sabino Canyon	4890	Post-Fire	369.00	7860.00	7868.29	7863.94	7868.46	0.001258	3.35	110.25	65.56		0.24
Sabino Canyon	4885	Culvert											
Sabino Canyon	4880	Pre-Fire	129.00	7859.27	7861.60	7861.60	7862.55	0.033524	7.82	16.49	8.45		0.99
Sabino Canyon	4880	Post-Fire	369.00	7859.27	7863.75	7862.75	7864.36	0.016038	6.16	98.83	52.14		0.75
Sabino Canyon	4870	Pre-Fire	129.00	7851.00	7853.98	7853.98	7855.03	0.036200	8.22	15.70	7.55		1.00
Sabino Canyon	4870	Post-Fire	369.00	7851.00	7856.34	7856.34	7857.79	0.032140	9.59	38.07	15.02		1.00
Sabino Canyon	4860	Pre-Fire	129.00	7841.00	7846.17	7843.77	7846.37	0.003557	3.57	36.11	10.24		0.32
Sabino Canyon	4860	Post-Fire	369.00	7841.00	7852.24	7845.98	7852.39	0.000903	3.06	122.02	69.51		0.20
Sabino Canyon	4855	Culvert											
Sabino Canyon	4850	Pre-Fire	129.00	7841.00	7843.60	7843.60	7844.65	0.036578	8.19	15.76	7.64		1.00
Sabino Canyon	4850	Post-Fire	369.00	7841.00	7845.96	7845.96	7847.24	0.030978	9.07	40.67	16.11		1.01
Sabino Canyon	4840	Pre-Fire	129.00	7828.07	7828.35	7828.35	7828.93	0.029971	6.11	21.10	18.50		1.01
Sabino Canyon	4840	Post-Fire	369.00	7828.07	7829.46	7829.46	7830.23	0.019571	6.80	52.92	44.25		0.88
Sabino Canyon	4830	Pre-Fire	129.00	7815.02	7819.13	7817.93	7819.34	0.003958	3.74	34.46	18.34		0.41
Sabino Canyon	4830	Post-Fire	369.00	7815.02	7822.55	7819.43	7822.65	0.000889	2.47	148.34	58.96		0.21

Sabino Canyon	4825			Culvert									
Sabino Canyon	4820	Pre-Fire	129.00	7811.68	7814.38	7814.38	7815.13	0.027441	6.91	18.67	14.35	0.99	
Sabino Canyon	4820	Post-Fire	369.00	7811.68	7815.83	7815.83	7816.84	0.024612	8.06	45.76	22.04	0.99	
Sabino Canyon	4810	Pre-Fire	129.00	7801.11	7803.94	7803.94	7804.65	0.023556	6.80	18.98	13.43	1.01	
Sabino Canyon	4810	Post-Fire	369.00	7801.11	7805.41	7805.41	7806.50	0.020487	8.38	44.03	20.51	1.01	
Sabino Canyon	4800	Pre-Fire	129.00	7784.09	7786.65	7786.65	7787.25	0.032168	6.22	20.75	17.72	1.01	
Sabino Canyon	4800	Post-Fire	369.00	7784.09	7787.99	7787.99	7788.56	0.016174	6.24	61.15	51.68	0.79	
Sabino Canyon	4790	Pre-Fire	127.00	7777.01	7779.62	7779.62	7780.15	0.027061	5.82	21.81	21.53	1.02	
Sabino Canyon	4790	Post-Fire	395.00	7777.01	7780.83	7780.83	7781.49	0.016426	6.56	60.47	46.73	0.88	
Sabino Canyon	4780	Pre-Fire	127.00	7766.43	7769.50	7769.50	7769.69	0.002017	3.50	36.34	20.14	0.35	
Sabino Canyon	4780	Post-Fire	395.00	7766.43	7771.47	7769.71	7771.72	0.002823	4.01	98.57	30.38	0.39	
Sabino Canyon	4775			Culvert									
Sabino Canyon	4770	Pre-Fire	127.00	7762.16	7764.15	7764.15	7764.94	0.022720	7.15	17.99	11.95	1.00	
Sabino Canyon	4770	Post-Fire	395.00	7762.16	7765.65	7765.65	7766.16	0.005503	5.40	70.84	68.97	0.55	
Sabino Canyon	4765	Pre-Fire	127.00	7754.31	7756.94	7756.94	7757.49	0.018238	6.47	19.64	15.46	1.01	
Sabino Canyon	4765	Post-Fire	395.00	7754.31	7758.30	7758.30	7759.33	0.015689	8.12	48.67	24.33	1.01	
Sabino Canyon	4760	Pre-Fire	127.00	7740.23	7741.94	7741.94	7742.57	0.023185	6.40	19.84	15.77	1.01	
Sabino Canyon	4760	Post-Fire	395.00	7740.23	7743.38	7743.38	7744.45	0.020006	8.28	47.69	22.78	1.01	
Sabino Canyon	4750	Pre-Fire	127.00	7730.73	7734.69	7732.67	7734.97	0.001512	3.43	37.00	15.22	0.31	
Sabino Canyon	4750	Post-Fire	395.00	7730.73	7738.46	7734.64	7738.63	0.001107	3.30	123.87	41.91	0.24	
Sabino Canyon	4745			Culvert									
Sabino Canyon	4740	Pre-Fire	127.00	7729.32	7732.40	7732.40	7732.57	0.004805	3.34	38.02	24.82	0.48	
Sabino Canyon	4740	Post-Fire	395.00	7729.32	7733.15	7732.91	7733.85	0.014765	6.69	59.05	30.94	0.85	
Sabino Canyon	4730	Pre-Fire	127.00	7726.52	7728.47	7728.47	7732.48	0.000093	0.75	171.71	80.61	0.07	
Sabino Canyon	4730	Post-Fire	395.00	7726.52	7733.45	7729.86	7733.49	0.000243	1.45	267.54	103.31	0.13	
Sabino Canyon	4725			Culvert									
Sabino Canyon	4720	Pre-Fire	127.00	7726.01	7729.88	7729.88	7729.91	0.000657	1.46	86.75	44.82	0.19	
Sabino Canyon	4720	Post-Fire	395.00	7726.01	7731.23	7731.23	7731.33	0.001185	2.57	156.44	58.59	0.27	
Sabino Canyon	4710	Pre-Fire	127.00	7724.86	7729.86	7726.30	7729.89	0.000378	1.31	96.95	36.12	0.14	
Sabino Canyon	4710	Post-Fire	395.00	7724.86	7731.20	7727.87	7731.28	0.000703	2.30	180.88	97.72	0.21	
Sabino Canyon	4705.5			Culvert									
Sabino Canyon	4701	Pre-Fire	127.00	7724.31	7726.09	7726.09	7726.93	0.018948	7.36	17.26	18.58	0.99	
Sabino Canyon	4701	Post-Fire	395.00	7724.31	7728.03	7728.02	7729.83	0.014958	10.79	36.61	29.05	0.99	
Sabino Canyon	4690	Pre-Fire	127.00	7720.19	7722.28	7722.28	7722.89	0.023908	6.25	20.31	17.10	1.01	
Sabino Canyon	4690	Post-Fire	395.00	7720.19	7723.65	7723.65	7724.61	0.020490	7.85	50.30	26.75	1.01	
Sabino Canyon	4680	Pre-Fire	147.00	7713.83	7719.28	7716.82	7719.33	0.001256	1.83	87.03	64.12	0.24	
Sabino Canyon	4680	Post-Fire	398.00	7713.83	7719.92	7718.88	7720.08	0.002809	3.35	138.55	97.45	0.28	
Sabino Canyon	4675			Culvert									
Sabino Canyon	4670	Pre-Fire	147.00	7713.69	7717.95	7717.95	7718.32	0.019918	4.86	30.32	45.71	0.84	
Sabino Canyon	4670	Post-Fire	398.00	7713.69	7718.63	7718.63	7719.11	0.008268	4.37	75.78	88.19	0.59	
Sabino Canyon	4640	Pre-Fire	147.00	7702.75	7710.52	7706.21	7710.56	0.000381	1.46	100.78	28.81	0.14	
Sabino Canyon	4640	Post-Fire	398.00	7702.75	7711.74	7708.15	7711.87	0.001025	2.83	153.46	57.56	0.23	
Sabino Canyon	4635			Culvert									
Sabino Canyon	4630	Pre-Fire	147.00	7701.78	7703.26	7703.26	7703.60	0.025920	4.55	31.80	51.69	0.98	
Sabino Canyon	4630	Post-Fire	398.00	7701.78	7703.90	7703.90	7704.53	0.015208	5.39	68.42	63.32	0.84	
Sabino Canyon	4620	Pre-Fire	147.00	7688.44	7689.34	7689.34	7689.57	0.030793	3.85	37.90	83.27	1.01	
Sabino Canyon	4620	Post-Fire	398.00	7688.44	7689.77	7689.77	7690.18	0.021683	5.04	77.99	100.42	0.94	
Sabino Canyon	4610	Pre-Fire	147.00	7678.15	7679.16	7679.16	7679.40	0.005982	1.90	54.62	103.01	0.46	
Sabino Canyon	4610	Post-Fire	398.00	7678.15	7679.62	7679.62	7680.10	0.005349	2.73	103.65	107.20	0.48	
Sabino Canyon	4600	Pre-Fire	147.00	7673.49	7677.95	7675.68	7677.97	0.000032	0.52	300.99	111.52	0.05	
Sabino Canyon	4600	Post-Fire	398.00	7673.49	7678.72	7677.50	7678.74	0.000107	1.07	389.53	121.76	0.09	
Sabino Canyon	4595			Culvert									
Sabino Canyon	4590	Pre-Fire	147.00	7671.87	7673.85	7673.85	7674.72	0.023992	7.50	19.59	45.41	0.99	
Sabino Canyon	4590	Post-Fire	398.00	7671.87	7675.50	7675.50	7677.22	0.019747	10.54	37.76	76.04	1.00	
Sabino Canyon	4580	Pre-Fire	147.00	7665.00	7665.91	7665.91	7666.21	0.024327	4.49	33.51	55.37	0.88	
Sabino Canyon	4580	Post-Fire	398.00	7665.00	7666.42	7666.42	7666.96	0.020701	5.50	68.19	72.80	0.87	
Sabino Canyon	4570	Pre-Fire	147.00	7655.00	7655.76	7655.76	7656.11	0.020532	4.70	31.27	45.90	1.00	
Sabino Canyon	4570	Post-Fire	398.00	7655.00	7656.55	7656.55	7656.95	0.010738	5.16	78.86	94.45	0.81	
Sabino Canyon	4565	Pre-Fire	147.00	7643.61	7645.86	7645.86	7646.46	0.018472	6.20	23.71	20.49	1.02	
Sabino Canyon	4565	Post-Fire	398.00	7643.61	7647.01	7647.01	7647.89	0.015855	7.55	52.69	30.16	1.01	
Sabino Canyon	4560	Pre-Fire	165.00	7630.50	7633.23	7633.23	7633.93	0.017437	6.70	24.62	18.03	1.01	
Sabino Canyon	4560	Post-Fire	490.00	7630.50	7634.72	7634.72	7635.80	0.015578	8.32	58.88	27.88	1.01	
Sabino Canyon	4550	Pre-Fire	165.00	7621.50	7624.00	7624.00	7624.60	0.015647	6.25	27.53	28.07	0.96	
Sabino Canyon	4550	Post-Fire	490.00	7621.50	7625.25	7625.25	7626.01	0.011762	7.52	85.66	64.42	0.89	
Sabino Canyon	4540	Pre-Fire	165.00	7616.24	7618.86	7618.86	7619.51	0.017261	6.50	25.40	15.41	1.00	
Sabino Canyon	4540	Post-Fire	490.00	7616.24	7620.27	7620.27	7621.30	0.015793	8.14	60.21	29.91	1.01	
Sabino Canyon	4530	Pre-Fire	165.00	7600.46	7606.54	7606.54	7607.43	0.029878	7.59	21.73	12.62	1.02	
Sabino Canyon	4530	Post-Fire	490.00	7600.46	7608.37	7608.37	7609.52	0.021722	8.60	56.98	25.71	1.02	
Sabino Canyon	4520	Pre-Fire	165.00	7592.28	7597.76	7594.02	7597.82	0.000438	2.03	83.20	25.60	0.16	
Sabino Canyon	4520	Post-Fire	490.00	7592.28	7599.75	7595.80	7599.92	0.000849	3.50	158.51	42.96	0.24	
Sabino Canyon	4515			Culvert									
Sabino Canyon	4510	Pre-Fire	186.00	7591.48	7594.48	7594.48	7594.70	0.002702	3.74	49.78	18.06	0.40	
Sabino Canyon	4510	Post-Fire	808.00	7591.48	7598.90	7599.46	7599.46	0.003592	5.96	135.50	20.85	0.41	

Sabino Canyon	4500	Pre-Fire	186.00	7588.27	7592.50	7592.50	7593.68	0.021950	8.71	21.35	9.22	1.01
Sabino Canyon	4500	Post-Fire	808.00	7588.27	7596.17	7596.17	7598.14	0.021284	11.26	71.73	18.24	1.00
Sabino Canyon	4495	Pre-Fire	186.00	7585.00	7588.31	7588.31	7589.66	0.017950	6.97	26.70	17.73	1.00
Sabino Canyon	4495	Post-Fire	808.00	7585.00	7591.34	7591.34	7592.56	0.012861	9.11	97.95	46.58	0.88
Sabino Canyon	4490	Pre-Fire	186.00	7582.32	7585.61	7585.61	7586.43	0.017646	7.28	25.54	15.77	1.01
Sabino Canyon	4490	Post-Fire	808.00	7582.32	7588.35	7588.35	7589.27	0.010193	7.95	106.63	56.13	0.78
Sabino Canyon	4485	Pre-Fire	186.00	7569.79	7573.35	7573.35	7574.25	0.028231	7.63	24.39	13.76	1.01
Sabino Canyon	4485	Post-Fire	808.00	7569.79	7576.69	7576.69	7577.80	0.012922	8.58	99.74	47.40	0.78
Sabino Canyon	4480	Pre-Fire	186.00	7547.80	7551.03	7551.03	7551.86	0.022539	7.30	25.48	15.74	1.01
Sabino Canyon	4480	Post-Fire	808.00	7547.80	7553.60	7553.60	7555.11	0.019618	9.87	81.88	28.18	1.02
Sabino Canyon	4470	Pre-Fire	186.00	7536.09	7539.40	7539.40	7540.25	0.022992	7.40	25.15	15.18	1.01
Sabino Canyon	4470	Post-Fire	808.00	7536.09	7541.35	7541.35	7542.56	0.008915	6.97	98.33	51.52	0.69
Sabino Canyon	4460	Pre-Fire	186.00	7523.07	7526.39	7526.39	7527.24	0.023425	7.41	25.10	15.02	1.01
Sabino Canyon	4460	Post-Fire	808.00	7523.07	7529.09	7529.09	7530.60	0.019574	9.88	81.79	27.01	1.00
Sabino Canyon	4450	Pre-Fire	186.00	7512.29	7514.96	7514.96	7515.65	0.023018	6.65	27.97	20.96	1.91
Sabino Canyon	4450	Post-Fire	808.00	7512.29	7517.28	7517.28	7518.16	0.012385	7.61	107.69	60.78	0.82
Sabino Canyon	4440	Pre-Fire	186.00	7494.44	7497.38	7497.38	7498.13	0.020263	6.93	26.83	18.26	1.01
Sabino Canyon	4440	Post-Fire	808.00	7494.44	7499.74	7499.74	7501.07	0.016414	9.25	87.36	32.95	1.00
Sabino Canyon	4430	Pre-Fire	186.00	7480.36	7483.16	7483.16	7483.87	0.042116	6.76	27.53	19.65	1.01
Sabino Canyon	4430	Post-Fire	808.00	7480.36	7485.39	7485.39	7486.68	0.044191	9.11	88.74	35.22	1.01
Sabino Canyon	4420	Pre-Fire	186.00	7467.85	7470.37	7470.37	7471.03	0.012861	6.51	28.57	22.23	1.01
Sabino Canyon	4420	Post-Fire	808.00	7467.85	7472.46	7472.46	7473.67	0.010252	8.81	91.76	38.18	1.00
Sabino Canyon	4410	Pre-Fire	186.00	7461.89	7464.73	7464.73	7465.45	0.012383	6.77	27.47	19.32	1.00
Sabino Canyon	4410	Post-Fire	808.00	7461.89	7466.99	7466.99	7468.29	0.010379	9.15	88.33	34.67	1.01
Sabino Canyon	4400	Pre-Fire	186.00	7455.09	7458.81	7458.81	7459.04	0.001969	3.79	49.04	15.79	0.38
Sabino Canyon	4400	Post-Fire	808.00	7455.09	7462.96	7462.96	7463.55	0.004103	6.16	131.15	37.16	0.58
Sabino Canyon	4397.5	Culvert										
Sabino Canyon	4395	Pre-Fire	186.00	7454.54	7457.10	7457.10	7458.05	0.012506	7.86	23.67	19.64	0.99
Sabino Canyon	4395	Post-Fire	808.00	7454.54	7459.42	7459.42	7460.60	0.011308	8.73	92.59	36.21	0.96
Sabino Canyon	4390	Pre-Fire	186.00	7453.08	7456.08	7456.08	7456.90	0.014608	7.29	25.51	15.76	1.01
Sabino Canyon	4390	Post-Fire	808.00	7453.08	7458.78	7458.78	7459.94	0.009717	8.88	105.67	55.01	0.90
Sabino Canyon	4380	Pre-Fire	186.00	7441.87	7444.15	7444.15	7444.74	0.017884	6.13	30.32	26.59	1.01
Sabino Canyon	4380	Post-Fire	808.00	7441.87	7445.95	7445.95	7447.12	0.014252	8.72	95.95	45.40	0.97
Sabino Canyon	4370	Pre-Fire	273.00	7438.05	7440.99	7440.99	7441.70	0.015653	6.77	40.34	27.42	0.98
Sabino Canyon	4370	Post-Fire	1076.00	7438.05	7443.06	7443.05	7444.40	0.015660	9.30	117.07	47.35	0.99

Profile Output Table - Culvert Only

Reach	River Sta	Profile	E.G. US.	W.S. US.	E.G. IC	E.G. OC	Min El Weir	Flow	Q Culv	Group	Q Weir	Delta WS	Culv Vel US
Culv Vel DS			(ft)	(ft)	(ft)	(ft)		(ft)		(cfs)	(cfs)	(ft)	(ft/s)
9.59	14.89	Sabino Canyon 4949	CULVERT#1	Pre-Fire	7920.72	7920.69	7920.71	7920.40	7920.41		67.82	8.60	4.99
11.64	11.64	Sabino Canyon 4949	CULVERT#2	Pre-Fire	7920.72	7920.69	7921.86	7920.74	7920.41		36.58	8.60	4.99
12.11	12.11	Sabino Canyon 4949	CULVERT#1	Post-Fire	7921.77	7921.68	7922.78	7921.77	7920.41		85.57	201.38	4.45
11.16	11.16	Sabino Canyon 4949	CULVERT#2	Post-Fire	7921.77	7921.68	7921.44	7921.77	7920.41		35.05	201.38	4.45
9.35	9.35	Sabino Canyon 4925	CULVERT#1	Pre-Fire	7891.66	7891.47	7891.80	7891.66	7890.13		66.11	62.89	3.64
10.94	10.94	Sabino Canyon 4925	CULVERT#1	Post-Fire	7894.24	7893.72	7894.23	7894.24	7890.13		77.34	291.66	3.65
7.35	8.71	Sabino Canyon 4885	CULVERT#1	Pre-Fire	7864.26	7864.09	7864.05	7864.26	7866.37		129.00		2.49
12.71	12.71	Sabino Canyon 4885	CULVERT#1	Post-Fire	7868.47	7868.29	7868.47	7868.47	7866.37		244.52	124.48	4.54
9.12	9.90	Sabino Canyon 4855	CULVERT#1	Pre-Fire	7846.38	7846.17	7846.41	7846.38	7849.93		129.00		2.57
14.45	14.45	Sabino Canyon 4855	CULVERT#1	Post-Fire	7852.39	7852.24	7852.24	7852.39	7849.93		204.33	164.67	6.28
7.24	15.74	Sabino Canyon 4825	CULVERT#1	Pre-Fire	7819.34	7819.13	7818.63	7819.34	7823.26		129.00		4.74
11.46	19.75	Sabino Canyon 4825	CULVERT#1	Post-Fire	7822.65	7822.55	7822.59	7822.65	7823.26		369.00		6.71
9.05	9.25	Sabino Canyon 4775	Culvert #1	Pre-Fire	7769.70	7769.50	7769.63	7769.70	7769.40		122.14	4.86	5.35
8.99	8.99	Sabino Canyon 4775	Culvert #1	Post-Fire	7771.72	7771.47	7771.59	7771.72	7769.40		141.20	253.80	5.82
8.03	8.37	Sabino Canyon 4745	CULVERT#1	Pre-Fire	7734.86	7734.69	7734.70	7734.88	7737.01		127.00		2.29
11.81	14.70	Sabino Canyon 4745	CULVERT#1	Post-Fire	7738.64	7738.46	7738.64	7737.94	7737.01		238.88	196.12	5.31
8.57	8.57	Sabino Canyon 4725	CULVERT#1	Pre-Fire	7732.48	7732.47	7731.96	7732.49	7732.07		53.87	7.89	2.59
9.23	9.23	Sabino Canyon 4725	CULVERT#2	Pre-Fire	7732.48	7732.47	7731.78	7732.47	7732.07		65.24	7.89	2.59
7.96	7.96	Sabino Canyon 4725	CULVERT#1	Post-Fire	7733.49	7733.45	7731.58	7733.48	7732.07		50.04	283.68	2.22
8.64	8.64	Sabino Canyon 4725	CULVERT#2	Post-Fire	7733.49	7733.45	7731.38	7733.49	7732.07		61.07	283.88	2.22
8.98	11.28	Sabino Canyon 4705.5	CULVERT#1	Pre-Fire	7729.89	7729.86	7729.89	7729.59	7730.01		127.00		3.77
9.81	9.81	Sabino Canyon 4705.5	CULVERT#1	Post-Fire	7731.28	7731.20	7731.22	7731.28	7730.01		138.64	256.36	3.17

Sabino Canyon	4675	CULVERT#1	Pre-Fire	7719.33	7719.28	7719.28	7719.33	7718.51	28.02	118.98	1.33
7.93	7.93										
Sabino Canyon	4675	CULVERT#1	Post-Fire	7720.08	7719.92	7719.99	7720.08	7718.51	28.68	169.32	1.29
8.11	8.11										
Sabino Canyon	4635	CULVERT#1	Pre-Fire	7710.56	7710.52	7710.56	7709.09	7709.52	75.61	71.39	7.26
10.70	14.31										
Sabino Canyon	4635	CULVERT#1	Post-Fire	7711.87	7711.74	7711.94	7711.87	7709.52	94.43	103.57	7.84
13.36	13.36										
Sabino Canyon	4595	CULVERT#1	Pre-Fire	7677.97	7677.96	7677.97	7677.85	7677.41	76.28	70.72	4.12
9.67	11.69										
Sabino Canyon	4595	CULVERT#1	Post-Fire	7678.74	7678.72	7678.79	7678.74	7677.41	95.18	102.82	3.22
10.10	10.10										
Sabino Canyon	4515	CULVERT#1	Pre-Fire	7597.82	7597.76	7597.81	7597.53	7597.54	82.36	10.92	3.27
8.74	10.08										
Sabino Canyon	4515	Culvert #2	Pre-Fire	7597.82	7597.76	7597.81	7597.75	7597.54	71.72	10.92	3.27
9.32	10.27										
Sabino Canyon	4515	CULVERT#1	Post-Fire	7599.93	7599.75	7595.54	7599.93	7597.54	46.19	197.72	0.85
4.90	4.90										
Sabino Canyon	4515	Culvert #2	Post-Fire	7599.93	7599.75	7596.25	7599.92	7597.54	46.09	197.72	0.85
4.89	4.89										
Sabino Canyon	4397.5	CULVERT#1	Pre-Fire	7460.04	7459.81	7460.04	7460.02	7459.85	166.90	19.10	2.72
8.85	10.17										
Sabino Canyon	4397.5	CULVERT#1	Post-Fire	7463.55	7462.96	7463.46	7463.55	7459.85	217.12	590.88	3.54
11.52	11.52										

HEC-RAS OUTPUT

SABINO CREEK (100-YEAR)

```

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  X  X
XXXXXXXX XXXX X  XXX XXXX XXXXXXX XXXX
X  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: Summerhaven
 Project File : SABINO CANYON CREEK.prj
 Run Date and Time: 12/19/2003 11:24:20 AM

Project in English units

Project Description:
 Sabino Canyon

PLAN DATA

Plan Title: 100 year event SCS Type I
 Plan File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\SABINO CANYON CREEK.p04

Geometry Title: Edited Geometry
 Geometry File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\SABINO CANYON CREEK.g03

Flow Title : 100 year SCS Type I event
 Flow File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\SABINO CANYON CREEK.f04

Plan Summary Information:

Number of: Cross Sections = 68 Multiple Openings = 0
 Culverts = 14 Inline Structures = 0
 Bridges = 0 Lateral Structures = 0

Computational Information

Water surface calculation tolerance = 0.01
 Critical depth calculation tolerance = 0.01
 Maximum number of iterations = 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: 100 year SCS Type I event
 Flow File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\SABINO CANYON CREEK.f04

Flow Data (cfs)

River	Reach	RS	Pre Fire	Post Fire
Reach #1	Sabino Canyon	5000	247	594
Reach #1	Sabino Canyon	4930	282	687
Reach #1	Sabino Canyon	4790	297	787
Reach #1	Sabino Canyon	4680	299	883
Reach #1	Sabino Canyon	4560	366	1030
Reach #1	Sabino Canyon	4510	493	1446
Reach #1	Sabino Canyon	4370	684	1969

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Reach #1	Sabino Canyon	Pre Fire	Critical	Normal S = 0.015
Reach #1	Sabino Canyon	Post Fire	Critical	Normal S = 0.015

GEOMETRY DATA

Geometry Title: Edited Geometry
 Geometry File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\SABINO CANYON CREEK.g03

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 5000

INPUT

Description:

Station	Elevation	Data	num=	25					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev		
0	8030	10.48	8025	21.09	8020	31.2	8015	40.37	8010
49.49	8005	58.93	8000	68.54	7995	77.96	7990	88.64	7985
96.83	7982.98	142.41	7980	153.47	7976.07	169.59	7980	190.91	7982.53
201.25	7985	206.54	7986.31	221.18	7990	243.82	7995	267.78	8000
280.24	8002.52	288.85	8005	305.86	8010	321.81	8015	337.7	8020

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	142.41	.045	169.59	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 142.41 169.59 280.23 292.32 289.78 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon **RS: 4990**

INPUT
 Description:
 Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	8010	10.25	8005	20.5	8000	30.67	7995	40.73	7990
50.88	7985	60.93	7980	70.76	7975	80.29	7970	90.03	7965
100.32	7960	102.86	7958.87	120.3	7957.44	147.12	7955	155.89	7954.38
159	7955	169.81	7957.19	183.52	7960	215.73	7965	230.92	7967.47
215.72	7970	259.52	7975	279.34	7980	302.17	7985	307.56	7986.12
332.88	7990	372.22	7995						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	147.12	0	159	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 147.12 159 259.73 254.38 208.78 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon **RS: 4980**

INPUT
 Description:
 Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10.99	7990	23.56	7985	36.13	7980	48.9	7975	61.61	7970
74.39	7965	87.3	7960	101.02	7955	114.26	7950	120.99	7947.43
135.21	7945	148.27	7942.85	163.34	7940.24	172.75	7940	175	7939
177.1	7940	202.85	7942.73	210.37	7943.62	214.64	7945	229.73	7950
258.14	7955	261.59	7955.16	270.72	7960	280.11	7965	289.44	7970
299.74	7975	314.19	7980	329.81	7985	333.62	7986.12	358.82	7990

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
10.99	0	172.75	0	177.1	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 172.75 177.1 195.74 195.12 199.47 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon **RS: 4970**

INPUT
 Description:
 Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7990	8.68	7985	16.46	7980	24.1	7975	31.63	7970
39.22	7965	47.07	7960	57.44	7955	76.43	7950	96.26	7945
112.04	7940	123.18	7935	128.04	7932.69	158.34	7930	169.33	7927.21
195.13	7928.24	239.1	7930	256.36	7930.6	264.61	7935	270.84	7940
276.9	7945	282.9	7950	288.87	7955	295.3	7960	302.24	7965
309.34	7970	322.98	7975	339.39	7980				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	158.34	.045	195.13	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 158.34 195.13 109.28 110.18 116.2 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon **RS: 4955**

INPUT
 Description:
 Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7965	9.74	7960	20.56	7955	32.86	7950	42.4	7945
52.04	7940	61.69	7935	71.37	7930	81.03	7925	82.88	7924.11
101.18	7925	112.8	7920	113	7919.9	113.74	7920	133.3	7922.79
181.02	7925	184.2	7925.13	195.47	7930	207.28	7935	219.9	7940
233.19	7945	249.07	7950	265	7955	280.49	7960		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	101.18	0	133.3	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 101.18 133.3 48.65 43.54 36.65 .3 .5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon **RS: 4950**

INPUT
 Description: XSEC Upstream of Culvert # 16
 Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7965	9.02	7960	18.62	7955	27.88	7950	37.05	7945
46.22	7940	55.38	7935	64.38	7930	73.76	7925	81.27	7920.95
104.24	7920.78	105.78	7920	107.63	7915.22	114.55	7915.09	119.62	7915.16

126.13 7920 127.89 7920.63 182.08 7923.25 186.68 7925 199.43 7930
 212.03 7935 224.8 7940 238.83 7945 252.79 7950 266.83 7955
 283.81 7960

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 105.78 .045 126.13 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 105.78 126.13 44.18 37.93 31.14 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 106.1 7921.5 F
 120.6 283.81 7921.5 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4949

INPUT
 Description: Culvert #16

Distance from Upstream XS = 4.5
 Deck/Roadway Width = 20
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates
 num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 78.63 7920.4 114 7920.4 150 7920.4

Upstream Bridge Cross Section Data
 Station Elevation Data num= 26
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7965 9.02 7960 18.62 7955 27.88 7950 37.05 7945
 46.22 7940 55.38 7935 64.38 7930 73.76 7925 81.27 7920.95
 104.24 7920.78 105.78 7920 107.63 7915.22 114.55 7915.09 119.62 7915.16
 126.13 7920 127.89 7920.63 182.08 7923.25 186.68 7925 199.43 7930
 212.03 7935 224.8 7940 238.83 7945 252.79 7950 266.83 7955
 283.81 7960

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 105.78 .045 126.13 .055

Bank Sta: Left Right Coeff Contr. Expan.
 105.78 126.13 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 106.1 7921.5 F
 120.6 283.81 7921.5 F

Downstream Deck/Roadway Coordinates
 num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 83.93 7918.81 131 7918.81 158.35 7918.81

Downstream Bridge Cross Section Data
 Station Elevation Data num= 30
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7970 7.83 7965 16.4 7960 25.34 7955 33.74 7950
 42.36 7945 51.07 7940 60.01 7935 68.77 7930 77.22 7925
 85.58 7920 87.95 7918.59 116.77 7918.95 126.78 7915 128.03 7913.55
 130.48 7913.45 133.47 7913.52 134.38 7915 143.93 7919.16 162.55 7920
 187.79 7921.36 195.75 7925 207.84 7930 220.19 7935 234.38 7940
 250.34 7945 267.17 7950 287.05 7955 306.95 7960 326.64 7965

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 116.77 .045 143.93 .055

Bank Sta: Left Right Coeff Contr. Expan.
 116.77 143.93 .3 .5

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 =
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Culverts = 2

Culvert Name Shape Rise Span
 CULVERT#1 Circular 3
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 4.5 20 .024 .024 0 .5 1
 Upstream Elevation = 7915.29
 Centerline Station = 112.1
 Downstream Elevation = 7913.5
 Centerline Station = 128.93

Culvert Name Shape Rise Span
 CULVERT#2 Circular 2
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 4.5 20 .024 .024 0 .5 1
 Upstream Elevation = 7915.42
 Centerline Station = 115.1
 Downstream Elevation = 7913.8
 Centerline Station = 131.93

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4948

INPUT

Description: XSEC Downstream of Culvert # 16

Station Elevation Data num= 30									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7970	7.83	7965	16.4	7960	25.34	7955	33.74	7950
42.36	7945	51.07	7940	60.01	7935	68.77	7930	77.22	7925
85.58	7920	87.95	7918.59	116.77	7918.95	126.78	7915	128.03	7913.55
130.48	7913.45	133.47	7913.52	134.38	7915	143.93	7919.16	162.55	7920
187.79	7921.36	195.75	7925	207.84	7930	220.19	7935	234.38	7940
250.34	7945	267.17	7950	287.05	7955	306.95	7960	326.64	7965

Manning's n Values num= 3									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.013	116.77	.045	143.93	.055				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	116.77	143.93		100.62	93.02	81.56	.3	.5

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RG: 4940

INPUT

Description: XSEC Upstream of Culvert # 17

Station Elevation Data num= 32									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7990	12.37	7985	19.46	7980	26.13	7975	32.82	7970
39.39	7965	46.02	7960	52.67	7955	59.87	7950	67.67	7945
75.92	7940	84.24	7935	92.56	7930	100.84	7925	109.17	7920
117.47	7915	118.25	7914.55	144.77	7914.55	160.69	7910	169.94	7907.29
181.71	7910	204.89	7915	226.01	7920	242.77	7925	260.28	7930
277.83	7935	293.54	7940	307.26	7945	321.97	7950	341.81	7955
364.39	7960	382.07	7965						

Manning's n Values num= 3									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.013	160.69	.045	181.71	.055				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	160.69	181.71		183.11	200.29	206.49	.3	.5

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RG: 4930

INPUT

Description: XSEC Upstream of Culvert # 17

Station Elevation Data num= 40									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7990	10.2	7985	19.18	7980	25.92	7975	32.35	7970
38.84	7965	45.32	7960	51.83	7955	58.31	7950	64.86	7945
72.28	7940	79.83	7935	87.33	7930	94.86	7925	102.3	7920
109.63	7915	116.66	7910	125.8	7905	133.96	7900	136.06	7898.73
153.35	7899.17	175.42	7895	178.77	7891.05	180.55	7887.89	184.12	7885.96
187.33	7887.72	188.4	7891.05	190.82	7895	203.47	7898.35	209.94	7900
228.39	7905	246.25	7910	263.87	7915	281.84	7920	300.86	7925
321.17	7930	340.34	7935	349.09	7937.27	367.86	7937.89	378.66	7940

Manning's n Values num= 3									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	0	175.42	0	190.82	0				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	175.42	190.82		35.99	31.3	37.79	.3	.5

Ineffective Flow num= 2			
Sta L	Sta R	Elev	Permanent
0	178.85	7886.34	F
189.85	378.66	7886.34	F

CULVERT

RIVER: Reach #1
REACH: Sabino Canyon RG: 4925

INPUT

Description: Culvert #17

Distance from Upstream XS = 6
Deck/Roadway Width = 18
Weir Coefficient = 3.1

Upstream Deck/Roadway Coordinates

num=	4				
Sta Hi	Cord	Lo Cord	Sta Hi	Cord	Lo Cord
130	7890.3	140	7898.35	150	7890.12
200	7889.9				

Upstream Bridge Cross Section Data

Station Elevation Data num= 40									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7990	10.2	7985	19.18	7980	25.92	7975	32.35	7970
38.84	7965	45.32	7960	51.83	7955	58.31	7950	64.86	7945
72.28	7940	79.83	7935	87.33	7930	94.86	7925	102.3	7920
109.63	7915	116.66	7910	125.8	7905	133.96	7900	136.06	7898.73
153.35	7899.17	175.42	7895	178.77	7891.05	180.55	7887.89	184.12	7885.96
187.33	7887.72	188.4	7891.05	190.82	7895	203.47	7898.35	209.94	7900
228.39	7905	246.25	7910	263.87	7915	281.84	7920	300.86	7925
321.17	7930	340.34	7935	349.09	7937.27	367.86	7937.89	378.66	7940

Manning's n Values num= 3									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	0	175.42	0	190.82	0				

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	175.42	190.82		.3	.5

Ineffective Flow num= 2			
Sta L	Sta R	Elev	Permanent
0	178.85	7886.34	F
189.85	378.66	7886.34	F

Downstream Deck/Roadway Coordinates

num= 4
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 120 7890.3 130 7898.35 160 7890.12
 200 7890.12

Downstream Bridge Cross Section Data

Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7985	9.17	7980	16.69	7975	24.03	7970	31.43	7965		
38.68	7960	45.88	7955	52.8	7950	59.7	7945	68.04	7940		
76.34	7935	84.57	7930	92.6	7925	100.29	7920	107.92	7915		
115.59	7910	123.35	7905	131.14	7900	137.2	7896.12	155.49	7895.55		
158.84	7895	179.13	7889.65	181.27	7887.19	181.27	7886.32	185.55	7884.74		
188.4	7886.67	189.12	7889.47	200.69	7895	218.76	7900	237.9	7905		
255.89	7910	272.71	7915	288.67	7920	305.6	7925	324.29	7930		
344.75	7935	354.74	7937.24	380.58	7937.21	389.75	7940				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	179.13	0	189.12	0

Bank Sta: Left Right Coeff Contr. Expan.
 179.13 189.12 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	171.84	7884.69	F
200	389.75	7884.69	F

Upstream Embankment side slope = 3 horiz. to 1.0 vertical
 Downstream Embankment side slope = 3 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .95
 Elevation at which weir flow begins =
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 2 - Mitered to conform to slope
 Solution Criteria - Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 6 22 .024 .024 0 .7 1
 Upstream Elevation = 7886.34
 Centerline Station = 184.35
 Downstream Elevation = 7884.69
 Centerline Station = 185.27

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4920

INPUT

Description: XSEC Downstream of Culvert # 17
 Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7985	9.17	7980	16.69	7975	24.03	7970	31.43	7965		
38.68	7960	45.88	7955	52.8	7950	59.7	7945	68.04	7940		
76.34	7935	84.57	7930	92.6	7925	100.29	7920	107.92	7915		
115.59	7910	123.35	7905	131.14	7900	137.2	7896.12	155.49	7895.55		
158.84	7895	179.13	7889.65	181.27	7887.19	181.27	7886.32	185.55	7884.74		
188.4	7886.67	189.12	7889.47	200.69	7895	218.76	7900	237.9	7905		
255.89	7910	272.71	7915	288.67	7920	305.6	7925	324.29	7930		
344.75	7935	354.74	7937.24	380.58	7937.21	389.75	7940				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	179.13	0	189.12	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 179.13 189.12 89.2 95.09 89.24 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	171.84	7884.69	F
200	389.75	7884.69	F

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4910

INPUT

Description:
 Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7975	7.07	7970	14.12	7965	21.13	7960	28.12	7955		
35.14	7950	44.47	7945	54.08	7940	63.13	7935	71.73	7930		
80.21	7925	88.56	7920	96.05	7915	103.85	7910	112.71	7905		
121.86	7900	130.79	7895	136.8	7891.8	162.5	7890.92	167.98	7890		
191.23	7880	205.48	7890	223.02	7895	241.18	7900	260.68	7905		
280.52	7910	300.22	7915	318.22	7920	335.93	7925	352.05	7930		
369.3	7935	386.94	7940								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	167.98	0	205.48	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 167.98 205.48 242.99 229.2 209.27 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4900

INPUT

Description:
 Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7945	5.47	7940	17.24	7935	29.38	7930	39.56	7925
47.76	7920	55.06	7915	62.29	7910	70.05	7905	77.87	7900
86.67	7895	95.65	7890	105.03	7885	114.41	7880	119.95	7877.12
171.48	7876.87	179.79	7875	193.15	7871.16	195.33	7869.13	198.51	7869.05
200.13	7871.16	209.78	7875	228.29	7880	247.26	7885	264.39	7890
275.92	7895	287.41	7900	298.92	7905	311.4	7910	323.73	7915
336.22	7920	350.49	7925	364.8	7930	379.29	7935	393.38	7940

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 179.79 0 209.78 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 179.79 209.78 163.32 152.05 152.08 .3 .5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4890

INPUT
 Description: XSEC Upstream of Culvert # 18
 Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7955	8.03	7950	15.42	7945	22.55	7940	28.1	7936.09
29.86	7935	37.6	7930	45.48	7925	53.39	7920	61.34	7915
69.89	7910	80	7905	91.69	7900	103.43	7895	115.24	7890
126.76	7885	131.22	7882.85	139.5	7880	154.12	7875	168.79	7870
176.85	7867.21	208.12	7867.08	218.11	7864.82	222.12	7860.44	225.25	7860
229.26	7860.15	233.27	7865.41	242.92	7870	257.15	7875	272.4	7880
287.28	7885	299.18	7890	310.69	7895	322.19	7900	335.77	7905
349.16	7910	362.25	7915	374.81	7920	386.81	7925	397.22	7930
409.76	7935	422.59	7940						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 208.12 .045 242.92 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 208.12 242.92 65.94 55.62 51.72 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 217.51 7871.51 F
 235.51 422.59 7871.51 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4885

INPUT
 Description: Culvert #18
 Distance from Upstream XS = 5
 Deck/Roadway Width = 17
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates num= 3

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	7871.07		228	7866.51		250	7866.07	

Upstream Bridge Cross Section Data

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7955	8.03	7950	15.42	7945	22.55	7940	28.1	7936.09
29.86	7935	37.6	7930	45.48	7925	53.39	7920	61.34	7915
69.89	7910	80	7905	91.69	7900	103.43	7895	115.24	7890
126.76	7885	131.22	7882.85	139.5	7880	154.12	7875	168.79	7870
176.85	7867.21	208.12	7867.08	218.11	7864.82	222.12	7860.44	225.25	7860
229.26	7860.15	233.27	7865.41	242.92	7870	257.15	7875	272.4	7880
287.28	7885	299.18	7890	310.69	7895	322.19	7900	335.77	7905
349.16	7910	362.25	7915	374.81	7920	386.81	7925	397.22	7930
409.76	7935	422.59	7940						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 208.12 .045 242.92 .055

Bank Sta: Left Right Coeff Contr. Expan.
 208.12 242.92 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 217.51 7871.51 F
 235.51 422.59 7871.51 F

Downstream Deck/Roadway Coordinates

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
175.25		7865	228	7865		260	7865	

Downstream Bridge Cross Section Data

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7955	9.24	7950	18.01	7945	26.61	7940	34.66	7936.16
37.14	7935	47.91	7930	58.28	7925	68.5	7920	78.59	7915
88.77	7910	99.02	7905	109.08	7900	118.97	7895	128.92	7890
138.76	7885	143.11	7882.85	149.4	7880	162	7875	175.25	7870
188.62	7865	193.66	7863.09	222.3	7863.8	235.22	7861.86	237.29	7859.27
243.09	7859.3	243.97	7861.86	248.21	7865	259.41	7870	271.61	7875
283.77	7880	295.55	7885	307.06	7890	318.39	7895	329.64	7900
340.95	7905	353.78	7910	364.74	7915	375.13	7920	385.29	7925
395.01	7930	404.8	7935	417.95	7940				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 222.3 0 248.21 0

Bank Sta: Left Right Coeff Contr. Expan.
 222.3 248.21 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 235.22 7861 F

243.97 417.95 7861 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 =
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 3.5
FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 1 - Headwall
Solution Criteria - Highest U.S. EG
Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
Number of Barrels = 2
Upstream Elevation = 7860
Centerline Stations
Sta. Sta.
223.5 228
Downstream Elevation = 7859.87
Centerline Stations
Sta. Sta.
238 242

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4880

INPUT
Description: XSEC Downstream of Culvert # 18
Station Elevation Data num= 43
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7955 9.24 7950 18.01 7945 26.61 7940 34.66 7936.16
37.14 7935 47.91 7930 58.28 7925 68.5 7920 78.59 7915
88.77 7910 99.02 7905 109.08 7900 118.97 7895 128.92 7890
138.76 7885 143.11 7882.85 149.4 7880 162 7875 175.25 7870
188.62 7865 193.66 7863.09 222.3 7863.8 235.22 7861.86 237.29 7859.27
243.09 7859.3 243.97 7861.86 248.21 7865 259.41 7870 271.61 7875
283.77 7880 295.55 7885 307.06 7890 318.39 7895 329.64 7900
340.95 7905 353.78 7910 364.74 7915 375.13 7920 385.29 7925
395.01 7930 404.8 7935 417.95 7940

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 222.3 0 248.21 0
Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
222.3 248.21 120.36 140.56 143.52 .3 .5
Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 235.22 7861 F
243.97 417.95 7861 F

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4870

INPUT
Description:
Station Elevation Data num= 38
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7935 6.76 7930 13.54 7925 20.47 7920 27.76 7915
35.18 7910 43.8 7905 54.91 7900 66.11 7895 77.35 7890
89.08 7885 94.94 7882.85 100.9 7880 111.4 7875 121.69 7870
131.18 7865 140.28 7860 152.35 7857.12 193.66 7857.78 205 7856
209 7851 212 7851 218.55 7860 227.88 7865 236.85 7870
245.63 7875 253.64 7880 261.55 7885 269.55 7890 277.72 7895
285.91 7900 294.31 7905 308.91 7910 322.62 7915 334.41 7920
345.18 7925 355.23 7930 364.25 7935

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 193.66 0 218.55 0
Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
193.66 218.55 86.06 123.02 129.77 .3 .5

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4860

INPUT
Description: XSEC Upstream of Culvert # 19
Station Elevation Data num= 33
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
12.24 7925 18.7 7920 25.39 7915 33.1 7910 41.04 7905
48.88 7900 56.81 7895 64.57 7890 72.1 7885 75.66 7882.85
81.53 7880 91.68 7875 101.81 7870 111.95 7865 122.09 7860
133.19 7855 144.7 7850.65 176.31 7850 183.19 7849.88 190 7846.11
193 7841 197 7841 200.03 7846.11 206.33 7850 214.52 7855
222.64 7860 233.18 7865 259.4 7869.91 259.51 7870 278.65 7875
333.65 7880 363.57 7885 390.4 7890

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
12.24 0 183.19 0 206.33 0
Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
183.19 206.33 29.33 33.29 29.29 .3 .5
Ineffective Flow num= 2
Sta L Sta R Elev Permanent
12.24 190.61 7853.67 F
207.61 390.4 7853.67 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4855

INPUT

Description: Culvert #19
 Distance from Upstream XS = 5
 Deck/Roadway Width = 19.5
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates

num	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
2	183.19	7849.88				206.33	7850			

Upstream Bridge Cross Section Data

Station	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
12.24	7925	18.7	7920	25.39	7915	33.1	7910	41.94	7905
48.88	7900	56.81	7895	64.57	7890	72.3	7885	75.66	7882.85
81.53	7880	91.68	7875	101.81	7870	111.95	7865	122.09	7860
133.19	7855	144.7	7850.65	176.31	7850	183.19	7849.88	190	7846.11
193	7841	197	7841	200.03	7846.11	206.33	7850	214.52	7855
222.64	7860	233.18	7865	259.4	7869.91	259.51	7870	278.65	7875
333.65	7880	363.57	7885	390.4	7890				

Manning's n	Val	Sta	n	Val	Sta	n	Val
12.24	0	183.19	0	206.33	0		

Bank Sta.	Left	Right	Coeff	Contr.	Expan.
183.19	206.33		.3		.5

Ineffective Flow	num	Sta L	Sta R	Elev	Permanent
12.24	190.61	7853.67			F
207.61	390.4	7853.67			F

Downstream Deck/Roadway Coordinates

num	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
2	154.95	7848.82				188.12	7848.43			

Downstream Bridge Cross Section Data

Station	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7915	7.98	7910	15.95	7905	23.71	7900	31.42	7895
39.08	7890	46.67	7885	49.95	7882.85	56.09	7880	66.94	7875
77.81	7870	88.64	7865	99.23	7860	110.84	7855	122.45	7850
123.67	7849.52	154.95	7848.82	169.66	7845	171.58	7843.52	172.5	7841
177	7841	179.08	7843.52	179.7	7845	188.12	7848.43	194.32	7850
207.99	7855	221.51	7859.84	222.15	7860	241.04	7865	300.86	7870
320.26	7872.94	325.04	7875	337.24	7880	349.74	7885	364.98	7890

Manning's n	Val	Sta	n	Val	Sta	n	Val
0	0	154.95	0	188.12	0		

Bank Sta.	Left	Right	Coeff	Contr.	Expan.
154.95	188.12		.3		.5

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 =
 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 # 2 - Corrugated Metal Pipe Culvert			
FHWA Scale # 1 - Headwall			
Solution Criteria = Highest U.S. EG			
Culvert Upstrm Dist	Length	Top n	Bottom n
5	19.5	.024	.024
Depth Blocked	Entrance Loss Coef	Exit Loss Coef	
0	.5	1	

Number of Barrels = 2
 Upstream Elevation = 7841.2

Centerline Stations

Sta.	Sta.
193.25	196.75

Downstream Elevation = 7841

Centerline Stations

Sta.	Sta.
173.52	176.6

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4850

INPUT

Description: XSEC Downstream of Culvert # 19

Station	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7915	7.98	7910	15.95	7905	23.71	7900	31.42	7895
39.08	7890	46.67	7885	49.95	7882.85	56.09	7880	66.94	7875
77.81	7870	88.64	7865	99.23	7860	110.84	7855	122.45	7850
123.67	7849.52	154.95	7848.82	169.66	7845	171.58	7843.52	172.5	7841
177	7841	179.08	7843.52	179.7	7845	188.12	7848.43	194.32	7850
207.99	7855	221.51	7859.84	222.15	7860	241.04	7865	300.86	7870
320.26	7872.94	325.04	7875	337.24	7880	349.74	7885	364.98	7890

Manning's n	Val	Sta	n	Val	Sta	n	Val
0	0	154.95	0	188.12	0		

Bank Sta.	Left	Right	Lengths	Left Channel	Right	Coeff	Contr.	Expan.
154.95	188.12		173.2	160.5	156.03	.3		.5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4840

INPUT

Description:

Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
53	7925	8.01	7920	15.1	7915	22.33	7910	29.54	7905		
36.77	7900	44	7895	51.19	7890	58.4	7885	61.45	7882.85		
67.06	7880	76.72	7875	85.89	7870	94.72	7865	103.5	7860		
112.21	7855	121.03	7850	130.02	7845	139.05	7840	148.05	7835		
156.85	7830	158.04	7829.26	177.05	7828.93	190.97	7826.07	203.71	7830		
220.15	7835	234.67	7840	245.73	7845	255.42	7850	264.94	7855		
274.46	7860	283.87	7865	292.14	7870	295.65	7872.57	301.58	7875		
313.78	7880	325.99	7885	338.22	7890	345.33	7892.95	350.34	7895		
361.65	7900										

Manning's n Values num= 3

Sta	n	Val	Sta	n	Val	Sta	n	Val
53	0	177.05	0	203.71	0			

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 177.05 203.71 154.55 159.68 160.08 .3 .5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4830

INPUT

Description: XSEC Upstream of Culvert # 20

Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7920	8.38	7915	16.36	7910	24.24	7905	32.14	7900		
40.04	7895	47.87	7890	55.62	7885	59	7882.85	63.75	7880		
72.51	7875	81.4	7870	90.2	7865	99.03	7860	107.9	7855		
116.67	7850	125.12	7845	133.7	7840	142.49	7835	151.32	7830		
160.13	7825	167.65	7821.03	191.27	7822.32	196.41	7820	207.67	7815.02		
218.66	7820	228.65	7825	238.51	7830	248.34	7835	258.29	7840		
268.15	7845	279.24	7850	292.01	7855	304.18	7860	315.79	7865		
327.39	7870	341.24	7875	355.23	7880	368.25	7885	381.3	7890		
388.74	7892.95	392.84	7895	402.85	7900						

Manning's n Values num= 3

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	0	191.27	0	218.66	0			

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 191.27 218.66 48.5 48.05 48.26 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	201.11	7820	F
218.11	402.85	7820	F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4825

INPUT

Description: Culvert #20

Distance from Upstream XS = 6
 Deck/Roadway Width = 20
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates

num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
160.13		7825		228.65	7823.16				

Upstream Bridge Cross Section Data

Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7920	8.38	7915	16.36	7910	24.24	7905	32.14	7900		
40.04	7895	47.87	7890	55.62	7885	59	7882.85	63.75	7880		
72.51	7875	81.4	7870	90.2	7865	99.03	7860	107.9	7855		
116.67	7850	125.12	7845	133.7	7840	142.49	7835	151.32	7830		
160.13	7825	167.65	7821.03	191.27	7822.32	196.41	7820	207.67	7815.02		
218.66	7820	228.65	7825	238.51	7830	248.34	7835	258.29	7840		
268.15	7845	279.24	7850	292.01	7855	304.18	7860	315.79	7865		
327.39	7870	341.24	7875	355.23	7880	368.25	7885	381.3	7890		
388.74	7892.95	392.84	7895	402.85	7900						

Manning's n Values num= 3

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	0	191.27	0	218.66	0			

Bank Sta: Left Right Coeff Contr. Expan.
 191.27 218.66 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	201.11	7820	F
218.11	402.85	7820	F

Downstream Deck/Roadway Coordinates

num= 3

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
166.73		7822		233.04	7820.55			256.33	7821.32					

Downstream Bridge Cross Section Data

Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7929.7	6.73	7925	14.1	7920	21.5	7915	28.98	7910		
36.44	7905	43.95	7900	51.43	7895	58.66	7890	65.6	7885		
68.53	7882.85	73.5	7880	82.15	7875	91.02	7870	99.81	7865		
108.74	7860	117.29	7855	125.35	7850	133.56	7845	141.71	7840		
149.77	7835	157.79	7830	166.73	7825	176.27	7820	184.47	7820		
204.17	7818.83	215.42	7815	225.31	7811.68	233.04	7815	244.86	7820		
256.33	7825	267.36	7830	278.31	7835	289.81	7840	301.11	7845		
311.96	7850	322.51	7855	332.77	7860	343.09	7865	357.04	7870		

371.31 7875 384.61 7880 396.44 7885 408.32 7890 415.48 7892.95
419.52 7895

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 204.17 0 244.86 0

Bank Sta: Left Right Coeff Contr. Expan.
204.17 244.86 .3 .5
Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 219.34 7815 F
232.34 419.52 7815 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 =
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 Arch 4 6
FHWA Chart # 41 - Arch, Corrugated metal
FHWA Scale # 1 - 90 Degree headwall
Solution Criteria - Highest U.S. EG
Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
6 20 .024 .024 0 .5 1

Number of Barrels = 2
Upstream Elevation = 7816.6
Centerline Stations
Sta. Sta.
204.11 211.11
Downstream Elevation = 7812.68
Centerline Stations
Sta. Sta.
222.34 229.34

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4820

INPUT

Description: XSEC Downstream of Culvert # 20

Station Elevation Data num= 46
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7929.7 6.73 7925 14.1 7920 21.5 7915 28.98 7910
36.44 7905 43.95 7900 51.43 7895 58.66 7890 65.6 7885
68.53 7882.85 73.5 7880 82.15 7875 91.02 7870 99.81 7865
108.74 7860 117.29 7855 125.35 7850 133.56 7845 141.71 7840
149.77 7835 157.79 7830 166.73 7825 178.27 7820 178.47 7820
204.17 7818.93 215.42 7815 225.31 7811.68 233.04 7815 244.86 7820
256.33 7825 267.36 7830 278.31 7835 289.81 7840 301.11 7845
311.96 7850 322.51 7855 332.77 7860 343.09 7865 357.04 7870
371.31 7875 384.61 7880 396.44 7885 408.32 7890 415.48 7892.95
419.52 7895

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 204.17 0 244.86 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
204.17 244.86 164.6 153.11 138.65 .3 .5
Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 219.34 7815 F
232.34 419.52 7815 F

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4810

INPUT

Description:

Station Elevation Data num= 47
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7915 7.66 7910 15.68 7905 26.07 7900 36.71 7895
47.11 7890 56.59 7885 60.51 7882.85 74.99 7880 85.96 7875
98.26 7870 109.57 7865 120.2 7860 131.21 7855 142.14 7850
151.62 7845 160.97 7840 170.27 7835 179.87 7830 190.53 7825
201.39 7820 212.6 7815 223.76 7810 228.83 7807.44 248.16 7808.53
255.8 7805 264.58 7801.11 274.29 7805 287.92 7810 301.5 7815
315.15 7820 328.78 7825 342.07 7830 355.2 7835 362.72 7840
382.65 7845 396.22 7850 410.22 7855 419.28 7860 427.23 7865
435.09 7870 442.3 7875 450.76 7880 458.97 7885 467.43 7890
472.45 7892.95 476.45 7895

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0.13 248.16 .04 287.92 .03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
248.16 287.92 275.38 305.07 315.05 .1 .3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4800

INPUT

Description:

Station Elevation Data num= 46
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7880 15.89 7875 31.63 7870 46.86 7865 61.58 7860
75.94 7855 90.57 7850 105.45 7845 121.4 7840 137.09 7835
142.29 7833.37 165.78 7833.77 173.12 7830 182.91 7825 192.66 7820

201.95	7815	214.65	7810	229.01	7805	243.26	7800	258.52	7795
273.96	7790	281.29	7787.57	305.26	7787.63	323.24	7784.96	324.16	7784.16
326.77	7784.09	327.09	7785.04	334.87	7790	343.66	7795	352.32	7800
360.73	7805	369.34	7810	377.69	7815	385.88	7820	394	7825
402.42	7830	411.45	7835	419.8	7840	427.87	7845	435.89	7850
444.02	7855	444.64	7855.45	460.3	7860	478.56	7865	497.77	7870
518.37	7875								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 305.26 .04 334.87 .03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 305.26 334.87 128.1 88.46 74.01 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4790

INPUT

Description: Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7830	9.57	7825	20.6	7820	34.65	7815	48.61	7810
62.09	7805	76.58	7800	92.01	7795	106.96	7790	121.05	7785
126.31	7783.96	220.18	7780.28	225.05	7780	245.15	7778.22	245.97	7777.01
248.48	7777.01	249.23	7778.3	251.36	7780	261.13	7785	271.43	7790
281.8	7795	290.96	7800	299.83	7805	308.76	7810	317.59	7815
326.22	7820	334.52	7825	342.45	7830	350.26	7835	358	7840
365.73	7845	373.77	7850	382.4	7855	383.09	7855.45	396.67	7860
411.1	7865	426.83	7870						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 220.18 0 261.13 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 220.18 261.13 185.19 110.34 113.96 .3 .5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4780

INPUT

Description: Upstream of Culvert #9 Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7845	15.21	7840	31.46	7835	43.71	7830	53.79	7825
63.00	7820	71.78	7815	73.03	7814.14	83.33	7812.32	103.89	7810
115.5	7808.74	120.01	7805	126.02	7800	132.06	7795	132.37	7794.67
143.19	7790	150.51	7786.74	182.84	7785.9	186.05	7785	203.55	7780
211.61	7777.64	262.07	7775	318.04	7771.97	329.17	7769.94	334.52	7766.73
337.73	7766.43	344.69	7766.43	347.9	7766.58	350.58	7770.23	351.96	7773.3
357.47	7775	377.77	7780	379.48	7780.35	407.68	7785	417.42	7790
427.25	7795	437.79	7800	450.36	7805	457.27	7807.76	460.41	7810
468.79	7815	477.32	7820	486.69	7825	496.31	7830	505.89	7835
515.44	7840	525.27	7845	536	7850	548.49	7855	549.73	7855.45
567.3	7860								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 318.04 0 351.96 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 318.04 351.96 180.71 135.48 113.78 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 335.4 7770.38 F
 347.37 567.3 7770.38 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4775

INPUT

Description: Culvert #9
 Distance from Upstream XS = 15
 Deck/Roadway Width = 115
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates num= 2
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 320 7769.27 360 7769.59

Upstream Bridge Cross Section Data Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7845	15.21	7840	31.46	7835	43.71	7830	53.79	7825
63.00	7820	71.78	7815	73.03	7814.14	83.33	7812.32	103.89	7810
115.5	7808.74	120.01	7805	126.02	7800	132.06	7795	132.37	7794.67
143.19	7790	150.51	7786.74	182.84	7785.9	186.05	7785	203.55	7780
211.61	7777.64	262.07	7775	318.04	7771.97	329.17	7769.94	334.52	7766.73
337.73	7766.43	344.69	7766.43	347.9	7766.58	350.58	7770.23	351.96	7773.3
357.47	7775	377.77	7780	379.48	7780.35	407.68	7785	417.42	7790
427.25	7795	437.79	7800	450.36	7805	457.27	7807.76	460.41	7810
468.79	7815	477.32	7820	486.69	7825	496.31	7830	505.89	7835
515.44	7840	525.27	7845	536	7850	548.49	7855	549.73	7855.45
567.3	7860								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 318.04 0 351.96 0

Bank Sta: Left Right Coeff Contr. Expan.
 318.04 351.96 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 335.4 7770.38 F

347.37 567.3 7770.38 F
 Downstream Deck/Roadway Coordinates
 num= 2
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 100 7765.68 200 7765.35

Downstream Bridge Cross Section Data
 Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7793.37	8.55	7790	21.16	7785	34.28	7780	47.01	7775
59.1	7770	65.59	7767.38	84.83	7767.23	104.03	7766.75	107.58	7765
108.99	7763.31	110.18	7762.38	111.27	7762.3	113.87	7762.16	115.72	7762.38
117.62	7762.23	117.99	7762.75	120.75	7764.47	146.74	7765	182.65	7765.82
192.5	7769.56	202.22	7770	221.95	7775	234.31	7780	244.98	7785
255.31	7790	265.61	7795	270	7800				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	108.99	0	120.75	0

Bank Sta: Left Right Coeff Contr. Expan.
 108.99 120.75 .3 .5
 Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	108.99	7764	F
120.75	270	7764	F

Upstream Embankment side slope = 2 horiz. to 1.0 vertical
 Downstream Embankment side slope = 1 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .95
 Elevation at which weir flow begins =
 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 Arch 2.5 4
 FHWA Chart # 41- Arch; Corrugated metal
 FHWA Scale # 1 - 90 Degree headwall
 Solution Criteria = Highest U.S. SG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
1	14	118	.024	.024	0	.7	1

Number of Barrels = 2
 Upstream Elevation = 7765.65
 Centerline Stations
 Sta. Sta.
 337.41 345.41
 Downstream Elevation = 7762.275
 Centerline Stations
 Sta. Sta.
 111.25 116.5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4770

INPUT

Description: Downstream of Culvert #9
 Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7793.37	8.55	7790	21.16	7785	34.28	7780	47.01	7775
59.1	7770	65.59	7767.38	84.83	7767.23	104.03	7766.75	107.58	7765
108.99	7763.31	110.18	7762.38	111.27	7762.3	113.87	7762.16	115.72	7762.38
117.62	7762.23	117.99	7762.75	120.75	7764.47	146.74	7765	182.65	7765.82
192.5	7769.56	202.22	7770	221.95	7775	234.31	7780	244.98	7785
255.31	7790	265.61	7795	270	7800				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	108.99	0	120.75	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 108.99 120.75 152.22 145.66 138.18 .3 .5
 Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	108.99	7764	F
120.75	270	7764	F

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4765

INPUT

Description:
 Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7793.37	8.43	7790	21.05	7785	35.54	7780	60.89	7775
61.89	7774.76	98.62	7771.82	103.59	7770	105.34	7769.32	114.58	7765.57
129.34	7765.91	130.97	7765	140.17	7760	149.24	7755	150.51	7754.31
153.49	7755	171.62	7759.25	190.61	7760	224.99	7761.95	233.98	7765
244.4	7768.4	255.01	7770	283.74	7772.88	286.83	7775	293.57	7780
300.01	7785	306.44	7790	312.82	7795	318.99	7800	319.54	7800.48

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	140.17	.04	171.62	.045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 140.17 171.62 178.1 172.24 175.18 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4760

INPUT

Description:

Station Elevation Data num= 36											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7800	48.13	7795	57.91	7791.17	70.73	7790	87.74	7785		
103.72	7780	119.23	7775	135.68	7770	152.1	7765	168.46	7760		
191.63	7755	216.97	7753.01	224.1	7750	234.82	7745.58	236.49	7745		
245.14	7740.23	252.63	7740.23	267.13	7745	276.33	7747.54	323.9	7748.45		
329.02	7750	346.84	7755	356.02	7757.42	405.99	7760	438.63	7761.05		
434.12	7765	452.29	7770	465.67	7775	466.32	7775.26	480.51	7775.88		
487.53	7780	496.79	7785	507.65	7790	518.6	7795	520.87	7795.81		
558.11	7796.51										

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	234.82	0	276.33	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	234.82	276.33		116.92	125.62	133.13	.3	.5

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4750

INPUT

Description: XSEC Upstream of Culvert # 8

Station Elevation Data num= 10											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7775	25.04	7770	52.39	7765	74.31	7760	112.6	7757.98		
124.17	7755	131.34	7750	136.33	7747.92	160.75	7745	181.69	7740		
195.81	7737.68	198.48	7733.95	200.76	7731.6	203.39	7730.73	208.74	7730.73		
212.05	7732.07	212.76	7734.24	215.88	7737.68	228.79	7738.29	270.58	7740		
276.7	7740.58	309.3	7745	328.13	7750	342.76	7755	362.19	7760		
366.45	7761.19	379.42	7761.69	389.12	7765	403.32	7770	411.96	7775		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	195.81	0	215.88	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	195.81	215.88		36.72	43.9	85.3	.3	.5

Ineffective Flow num= 2				
Sta L	Sta R	Elev	Permanent	
0	201.16	7735.63	F	
210.97	411.96	7735.7	F	

CULVERT

RIVER: Reach #1
REACH: Sabino Canyon RS: 4745

INPUT

Description: Culvert #8

Distance from Upstream XS = 10
Deck/Roadway Width = 18
Weir Coefficient = 3.1

Upstream Deck/Roadway Coordinates num= 3														
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
0	7737				203	7737				273	7737			

Upstream Bridge Cross Section Data

Station Elevation Data num= 30											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7775	25.04	7770	52.39	7765	74.31	7760	112.6	7757.98		
124.17	7755	131.34	7750	136.33	7747.92	160.75	7745	181.69	7740		
195.81	7737.68	198.48	7733.95	200.76	7731.6	203.39	7730.73	208.74	7730.73		
212.05	7732.07	212.76	7734.24	215.88	7737.68	228.79	7738.29	270.58	7740		
276.7	7740.58	309.3	7745	328.13	7750	342.76	7755	362.19	7760		
366.45	7761.19	379.42	7761.69	389.12	7765	403.32	7770	411.96	7775		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	195.81	0	215.88	0

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	195.81	215.88		.3	.5

Ineffective Flow num= 2				
Sta L	Sta R	Elev	Permanent	
0	201.16	7735.63	F	
210.97	411.96	7735.7	F	

Downstream Deck/Roadway Coordinates

num= 3														
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
0	7737				335	7737				450	7737			

Downstream Bridge Cross Section Data

Station Elevation Data num= 30											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7790	18.17	7788.85	25.56	7785	29.11	7782.96	78.38	7780		
115.58	7777.28	123.3	7775	145.09	7770	168.25	7765	186.28	7760		
210.81	7755	231.71	7752.09	263.3	7750	286.47	7745	304.43	7740		
319.7	7735	331.44	7730	332.85	7729.32	336.81	7730	363.39	7734.61		
370.52	7735	399.4	7735.46	429.43	7740	445.76	7742.78	456.35	7745		
477.1	7750	493.85	7755	505.59	7760	525.12	7765	540.4	7770		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	319.7	0	363.39	0

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	319.7	363.39		.3	.5

- 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 *
- 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 4
FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 1 - Headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
10 18 .024 .024 1 .5 1

Number of Barrels = 2
Upstream Elevation = 7730.3
Centerline Stations
Sta. Sta.
203.04 208.04
Downstream Elevation = 7730
Centerline Stations
Sta. Sta.
331.44 336.44

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4740

INPUT

Description: XSEC Downstream of Culvert # 8
Station Elevation Data num= 30
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7790 18.17 7788.85 25.36 7785 29.11 7782.96 78.38 7780
115.58 7777.28 123.3 7775 145.09 7770 168.25 7765 186.28 7760
210.81 7755 231.71 7752.09 263.3 7750 286.47 7745 304.42 7740
319.7 7735 331.44 7730 352.85 7729.32 336.81 7720 362.39 7734.61
370.52 7735 399.4 7735.46 429.43 7740 445.76 7742.78 456.35 7745
477.1 7750 493.85 7755 509.59 7760 525.12 7765 540.4 7770

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 319.7 0 363.39 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
319.7 363.39 50.45 40.63 29.76 .3 .5

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4730

INPUT

Description: XSEC Upstream of Culvert # 7
Station Elevation Data num= 25
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7770 1.57 7768.14 19.16 7765 37.8 7761.87 42.81 7760
54.83 7755 68.18 7750 111.13 7745 152.63 7740 172.75 7735
183.79 7732.09 192.68 7730 206.71 7726.52 225.94 7730 238.84 7732.31
275.52 7732.55 292.96 7735 309.07 7740 311.46 7740.72 327.8 7745
345.99 7750 364.34 7755 379.53 7760 394.84 7765 410.2 7770

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 183.79 0 238.84 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
183.79 238.84 24.27 25.79 30.08 .3 .5

CULVERT

RIVER: Reach #1
REACH: Sabino Canyon RS: 4725

INPUT

Description: Culvert #7
Distance from Upstream XS = 3
Deck/Roadway Width = 18.5
Weir Coefficient = 3.1
Upstream Deck/Roadway Coordinates num= 3
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
0 7736.81 206.71 7732.68 300 7730.81

Upstream Bridge Cross Section Data
Station Elevation Data num= 25
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7770 1.57 7768.14 19.16 7765 37.8 7761.87 42.81 7760
54.83 7755 68.18 7750 111.13 7745 152.63 7740 172.75 7735
183.79 7732.09 192.68 7730 206.71 7726.52 225.94 7730 238.84 7732.31
275.52 7732.55 292.96 7735 309.07 7740 311.46 7740.72 327.8 7745
345.99 7750 364.34 7755 379.53 7760 394.84 7765 410.2 7770

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 183.79 0 238.84 0

Bank Sta: Left Right Coeff Contr. Expan.
183.79 238.84 .3 .5

Downstream Deck/Roadway Coordinates num= 3
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
0 7735.8 225 7731.3 300 7732.8

Downstream Bridge Cross Section Data
Station Elevation Data num= 24
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7770 16.1 7766.74 23.33 7765 37.67 7761.76 42.16 7760
59.64 7755 73 7750 101.01 7745 140.61 7740 179.47 7735
202.2 7730 224.77 7726.01 248.4 7730 255.9 7731.35 286.97 7731.83
311.58 7735 319.29 7735.04 335.52 7740 353.13 7745 370.69 7750
389.42 7755 406.22 7760 420.04 7765 432.56 7770

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val

0 0 202.2 0 255.9 0
 Bank Sta: Left Right Coeff Contr. Expan.
 202.2 255.9 .3 .5

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 =
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Culverts = 2

Culvert Name Shape Rise Span
 CULVERT#1 Circular 2
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 3 18.5 .024 .024 0 .5 1
 Number of Barrels = 2
 Upstream Elevation = 7727.82
 Centerline Stations
 Sta. Sta.
 202.71 210.71
 Downstream Elevation = 7727.31
 Centerline Stations
 Sta. Sta.
 220.77 228.77

Culvert Name Shape Rise Span
 CULVERT#2 Circular 3
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 3 18.5 .024 .024 0 .5 1
 Upstream Elevation = 7726.52
 Centerline Station = 206.71
 Downstream Elevation = 7726.01
 Centerline Station = 224.77

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4720

INPUT

Description: XSEC Downstream of Culvert # 7
 Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	16.1	7766.74	23.33	7765	37.67	7761.76	42.16	7760
59.64	7755	73	7750	101.01	7745	140.61	7740	179.47	7735
202.2	7730	224.77	7726.01	248.4	7730	255.9	7731.35	286.97	7731.83
311.58	7735	319.29	7735.04	335.52	7740	353.13	7745	370.69	7750
369.42	7755	406.22	7760	420.04	7765	432.56	7770		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	202.2	0	255.9	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 202.2 255.9 66.79 45.57 38.28 .3 .5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4710

INPUT

Description: XSEC Upstream of Culvert # 6
 Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7750	18.81	7745	64.05	7740	83.89	7735	142.51	7730
152.76	7727.75	154.24	7724.87	166.73	7724.86	169.26	7727.82	179.94	7730
188.46	7730.6	224.23	7730.81	242.67	7734.44	249.01	7735	265.56	7736.64
277.28	7740	294.97	7745	314.8	7750	336.67	7755		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	142.51	0	179.94	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 142.51 179.94 58.79 39.28 43.38 .3 .5

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4705.5

INPUT

Description: Culvert #6
 Distance from Upstream XS = 10
 Deck/Roadway Width = 19
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates num= 3

Sta	H1	Cord	Lc	Cord	Sta	H1	Cord	Lc	Cord	Sta	H1	Cord	Lc	Cord
75.93		7730			156		7730			249.01		7730		

Upstream Bridge Cross Section Data
 Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7750	18.81	7745	64.05	7740	83.89	7735	142.51	7730
152.76	7727.75	154.24	7724.87	166.73	7724.86	169.26	7727.82	179.94	7730
188.46	7730.6	224.23	7730.81	242.67	7734.44	249.01	7735	265.56	7736.64
277.28	7740	294.97	7745	314.8	7750	336.67	7755		

Manning's n Values num= 3

Sta n Val Sta n Val Sta n Val
 0 0 142.51 0 179.94 0

Bank Sta: Left Right Coeff Contr. Expan.
 142.51 179.94 .3 .5

Downstream Deck/Roadway Coordinates
 num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 99.24 7730 215 7730 240 7730

Downstream Bridge Cross Section Data
 Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7740	2.98	7740.27	25.64	7741.2	86.03	7740.4	86.77	7740
95.64	7735	99.24	7732.98	152.16	7730	172.93	7728.67	176.44	7724.44
182.37	7724.31	188.43	7724.44	199.4	7727.91	234.24	7729.2	237.32	7730
251.86	7733.46	263.95	7735	305.08	7740	327.17	7745	346.76	7750
365.54	7755	383.89	7760						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 172.93 0 199.4 0

Bank Sta: Left Right Coeff Contr. Expan.
 172.93 199.4 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 177 7729 F
 187 383.89 7729 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 =
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 10 19 .024 .024 0 .5 1

Number of Barrels = 2
 Upstream Elevation = 7724.8
 Centerline Stations
 Sta. Sta.
 157.5 162.5
 Downstream Elevation = 7724.3
 Centerline Stations
 Sta. Sta.
 179.69 184.69

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4701

INPUT
 Description: XSEC Downstream of Culvert # 6
 Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7740	2.98	7740.27	25.64	7741.2	86.03	7740.4	86.77	7740
95.64	7735	99.24	7732.98	152.16	7730	172.93	7728.67	176.44	7724.44
182.37	7724.31	188.43	7724.44	199.4	7727.91	234.24	7729.2	237.32	7730
251.86	7733.46	263.95	7735	305.08	7740	327.17	7745	346.76	7750
365.54	7755	383.89	7760						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 172.93 0 199.4 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 172.93 199.4 54.16 64.9 53.38 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 177 7729 F
 187 383.89 7729 F

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4690

INPUT
 Description:
 Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7739.79	50.97	7740	84.99	7740	135.78	7736.21	175.75	7735
240.15	7731.37	258.9	7730	290.91	7728.13	296.07	7725	304	7720.19
305.47	7720.21	326.63	7723.94	356.03	7725	359.97	7725.17	380.47	7730
384.85	7730.94	424.12	7735	444.45	7740	460.22	7745	476.51	7750
493.61	7755	510.23	7760						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 296.07 0 326.63 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 296.07 326.63 147.86 67.35 63.49 .3 .5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4680

INPUT

Description: XSEC Upstream of Culvert # 5

Station	Elevation	Data	num=	28
Sta	Elev	Sta	Elev	Sta Elev Sta Elev
0	7745	10.04	7740	18.77 7735.14 19.58 7735 53.09 7730
115.99	7725	231.33	7720	271.11 7718.38 296.61 7718.19 297.5 7714.68
297.67	7713.83	301.03	7713.83	301.65 7714.72 303.75 7715.12 308.65 7717.68
313.18	7719.31	332.93	7720	352.68 7720.9 366.95 7725 367.96 7725.27
397.1	7730	408.97	7732.12	414.94 7735 422.75 7738.71 429.93 7740
446.32	7745	462.51	7750	478.01 7755

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
0	0	271.11	0 313.18 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 271.11 313.18 72.84 32.89 41.45 .3 .5

Ineffective Flow	num=	2
Sta L Sta R Elev Permanent		
0 297.06 7718.26	F	
303.75 478.81 7718.26	F	

CULVERT

RIVER: Reach #1

REACH: Sabino Canyon RS: 4675

INPUT

Description: Culvert #5

Distance from Upstream XS = 5
 Deck/Roadway Width = 12
 Weir Coefficient = 3.1

Upstream Deck/Roadway Coordinates	num=	3
Sta Hi Cord Lo Cord	Sta Hi Cord Lo Cord	Sta Hi Cord Lo Cord
0 7718.5	300 7718.5	350 7718.5

Upstream Bridge Cross Section Data

Station	Elevation	Data	num=	28
Sta	Elev	Sta	Elev	Sta Elev Sta Elev
0	7745	10.04	7740	18.77 7735.14 19.58 7735 53.09 7730
115.99	7725	231.33	7720	271.11 7718.38 296.61 7718.19 297.5 7714.68
297.67	7713.83	301.03	7713.83	301.65 7714.72 303.75 7715.12 308.65 7717.68
313.18	7719.31	332.93	7720	352.68 7720.9 366.95 7725 367.96 7725.27
397.1	7730	408.97	7732.12	414.94 7735 422.75 7738.71 429.93 7740
446.32	7745	462.51	7750	478.01 7755

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
0	0	271.11	0 313.18 0

Bank Sta: Left Right Coeff Contr. Expan.
 271.11 313.18 .3 .5

Ineffective Flow	num=	2
Sta L Sta R Elev Permanent		
0 297.06 7718.26	F	
303.75 478.81 7718.26	F	

Downstream Deck/Roadway Coordinates

num=	3
Sta Hi Cord Lo Cord	Sta Hi Cord Lo Cord
0 7718	283 7718 333 7718

Downstream Bridge Cross Section Data

Station	Elevation	Data	num=	28
Sta	Elev	Sta	Elev	Sta Elev Sta Elev
0	7751.04	4.25	7750	23.1 7745 41.87 7740 64.07 7735
83.6	7730	107.14	7725	107.31 7725 166.59 7720 221.44 7718.55
269.4	7717.63	278.99	7717.59	281.61 7714.26 281.77 7713.98 282.47 7713.69
284.13	7713.71	284.78	7714	285.98 7717.66 295.27 7717.63 324.77 7719.05
328.28	7720	346.87	7725	358.44 7730 369.96 7735 394.17 7740
417.38	7745	432.42	7749.76	442.64 7750

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
0	0	269.4	0 295.27 0

Bank Sta: Left Right Coeff Contr. Expan.
 269.4 295.27 .3 .5

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 =
 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	1.5	
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
5	12	.013	.013
Depth Blocked	Entrance Loss Coef	Exit Loss Coef	
0	.2	1	

Number of Barrels = 2
 Upstream Elevation = 7714.2
 Centerline Stations
 Sta. Sta.
 298.5 300.5
 Downstream Elevation = 7714
 Centerline Stations
 Sta. Sta.
 282.4 284

CROSS SECTION

RIVER: Reach #1

REACH: Sabino Canyon RS: 4670

INPUT

Description: XSEC Downstream of Culvert # 5

Station Elevation Data num= 28
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7751.04 4.25 7750 23.1 7745 41.87 7740 64.07 7735

Manning's n Values num= 3
Sta n Val Sta n Val
0 0 269.4 0 295.27 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
269.4 295.27 148.52 146.4 110.22 .3 5

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4640

INPUT

Description: XSEC Upstream of Culvert # 4

Station Elevation Data num= 50
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7780 10.47 7775.67 12.02 7775 23.26 7770 34.56 7765

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 298.08 0 328.46 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
298.08 328.46 82.29 83.96 83.73 .3 5

CULVERT

RIVER: Reach #1
REACH: Sabino Canyon RS: 4635

INPUT

Description: Culvert #4

Distance from Upstream XS = 28

Deck/Roadway Width = 25

Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
200 7709.51 360 7709.51

Upstream Bridge Cross Section Data

Station Elevation Data num= 50
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7780 10.47 7775.67 12.02 7775 23.26 7770 34.56 7765

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 298.08 0 328.46 0

Bank Sta: Left Right Coeff Contr. Expan.
298.08 328.46 .3 .5

Downstream Deck/Roadway Coordinates

num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
200 7708.75 400 7708.75

Downstream Bridge Cross Section Data

Station Elevation Data num= 61
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7785 13.85 7780 25.59 7775.67 26.96 7775 36.66 7770

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 284.34 0 331.36 0

Bank Sta: Left Right Coeff Contr. Expan.
284.34 331.36 .3 .5

Upstream Embankment side slope = 1 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 =
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 3 - Pipe projecting from fill
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 28 28 .024 0 .9 1
 Upstream Elevation = 7702.66
 Centerline Station = 314
 Downstream Elevation = 7701.69
 Centerline Station = 314

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4630

INPUT

Description: XSEC Downstream of Culvert #4
 Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7785	13.85	7780	25.59	7775.67	26.96	7775	36.66	7770
46.45	7765	56.24	7760	66.05	7755	76.37	7750	86.66	7745
97.07	7740	97.13	7739.95	133.17	7736.02	134.53	7735	141.5	7730
143.55	7728.56	156.58	7727.78	159.87	7725	163.45	7721.94	178.59	7720
197.99	7715	218.58	7710	274.2	7704.81	284.34	7703.53	287.08	7702.94
306.33	7702.95	307.15	7702.68	308.3	7702.29	309.94	7701.92	310.82	7701.88
311.97	7701.86	313.41	7701.86	314.13	7701.78	314.85	7701.85	316.07	7701.86
317.51	7701.89	319.51	7702.06	321.73	7702.22	323.69	7702.44	324.92	7702.81
331.36	7702.85	340.26	7703.47	369.09	7706.23	386.38	7707.72	396.35	7710
414.91	7715	433.47	7720	439.35	7721.66	448.16	7722.42	454.11	7725
459.85	7727.45	499.79	7730	554.51	7735	572.8	7738.27	584.63	7740
617.82	7742.92	627.13	7745	633.31	7746.47	664.45	7750	667.05	7750.31
679.21	7755								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	284.34	0	331.36	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 284.34 331.36 331.3 308.04 312.42 .3 .5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4620

INPUT

Description:
 Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	11.16	7765.57	18.87	7765	63.11	7760	89.09	7755
108.3	7750	118.84	7745	129.64	7740	140.67	7735	151.98	7730
158.84	7727.71	179.6	7725	217.91	7720	223.87	7719.22	234.83	7715
248.81	7710	262.08	7706.03	309.86	7705.74	311.84	7705	325.41	7700
340.05	7695	354.73	7690	359.17	7688.44	438.97	7689.31	464.11	7690
482.34	7690.26	507.15	7695	528.63	7700	550.45	7705	572.43	7710
593.92	7715	615.78	7720	637.88	7725	650.61	7727.8	675.95	7730
741.36	7734.43	743.4	7735	758.56	7740	772.44	7745	785.6	7750
798.68	7755								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	354.73	.04	438.97	.045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 354.73 438.97 216.67 217.6 172.7 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4610

INPUT

Description:
 Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7785	5.37	7780	13.02	7775	31.8	7771.04	34.39	7770
46.8	7765	59.24	7760	72.05	7755	85.5	7750	98.6	7745
111.63	7740	120.21	7737.04	126.33	7735	141.05	7730	155.37	7725
169.54	7720	183.87	7715	198.46	7710	213.87	7705	228.12	7700
242.41	7695	256.94	7690	271.47	7685	286.34	7680	289.22	7679.08
368.74	7678.15	392.12	7679.16	396.86	7680	433.85	7685	452.78	7686.43
470.03	7690	496.61	7694.66	498.87	7695	528.93	7700	555.44	7705
576.45	7710	602.15	7715	639.28	7720	669.53	7725	687.64	7730
711.13	7735	742.29	7740	753.67	7745	762.97	7750	772.68	7755

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	289.22	0	368.74	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 289.22 368.74 84.94 105.27 136.16 .3 .5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4600

INPUT

Description: XSEC Upstream of Culvert # 3
 Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	14.17	7765	28.06	7760	40.77	7755	54.24	7750
68.07	7745	81.8	7740	90.04	7737.04	96.07	7735	111.15	7730
126.21	7725	140.81	7720	155.05	7715	170.02	7710	184.86	7705
199.39	7700	213.92	7695	228.8	7690	243.69	7685.03	243.93	7685
273.02	7680	285.51	7677.25	320.38	7675	340.99	7673.68	358.96	7673.49
372.03	7675	410.43	7680	443.27	7685	494.2	7690	549.19	7695
564.65	7696.26	580.1	7700	582.89	7700.53	621.43	7705	648.47	7710
671.72	7715	674.59	7715.55	685.79	7720	698.43	7725	711.53	7730
714.52	7731.01	727.46	7735	744.29	7740				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	320.38	0	372.03	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
320.38 372.03 28.83 26.7 50.57 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	354.46	7677.49	F
363.46	744.29	7677.49	F

CULVERT

RIVER: Reach #1
REACH: Sabino Canyon RS: 4595

INPUT

Description: Culvert #3
Distance from Upstream XS = 4.5
Deck/Roadway Width = 17
Weir Coefficient = 3.1
Upstream Deck/Roadway Coordinates num= 3

Sta	H1	Cord	Lo Cord	Sta	H1	Cord	Lo Cord	Sta	H1	Cord	Lo Cord
0	7684.67		358.96	7677.49			401.25	7676.64			

Upstream Bridge Cross Section Data Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	14.17	7765	28.06	7760	40.77	7755	54.24	7750
68.07	7745	81.8	7740	90.04	7737.04	96.07	7735	111.15	7730
126.21	7725	140.81	7720	155.05	7715	170.02	7710	184.86	7705
199.39	7700	213.92	7695	228.8	7690	243.69	7685.03	243.93	7685
273.02	7680	285.51	7677.25	320.38	7675	340.99	7673.68	358.96	7673.49
372.03	7675	410.43	7680	443.27	7685	494.2	7690	549.19	7695
564.65	7696.26	580.1	7700	582.89	7700.53	621.43	7705	648.47	7710
671.72	7715	674.59	7715.55	685.79	7720	698.43	7725	711.53	7730
714.52	7731.01	727.46	7735	744.29	7740				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	320.38	0	372.03	0

Bank Sta: Left Right Coeff Contr. Expan.
320.38 372.03 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	354.46	7677.49	F
363.46	744.29	7677.49	F

Downstream Deck/Roadway Coordinates num= 3

Sta	H1	Cord	Lo Cord	Sta	H1	Cord	Lo Cord	
225.54	7676.7		283.59	7677.4			343	7676.21

Downstream Bridge Cross Section Data Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7745	14.54	7740	22.87	7737.04	28.56	7735	44.32	7730
60.71	7725	76.37	7720	91.26	7715	106.13	7710	121.72	7705
138.38	7700	155.7	7695	170.3	7690	176.15	7688.3	197.62	7685.06
197.99	7685	214.62	7680	225.54	7676.7	245.65	7675	283.59	7671.87
297.12	7672.66	312.77	7675	343.38	7680	367.52	7685	391.39	7690
415.53	7695	444.36	7700	472.3	7703.95	480.29	7701.98	508.86	7705
559.8	7710	588.47	7714.79						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	245.65	.04	312.77	.045

Bank Sta: Left Right Coeff Contr. Expan.
245.65 312.77 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	278.04	7676.45	F
289.04	588.47	7676.45	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 =
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 Arch 3 4
FHWA Chart # 41- Arch; Corrugated metal
FHWA Scale # 1 - 90 Degree headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Ccoef Exit Loss Ccoef

Upstream	Elevation	Centerline Station	Downstream	Elevation	Centerline Station
	7673.49	358.96		7672.5	283.59

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4590

INPUT

Description: XSEC Downstream of Culvert # 3

Station Elevation Data num= 32									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7745	14.54	7740	22.87	7737.04	28.56	7735	44.32	7730
60.71	7725	76.37	7720	91.26	7715	106.13	7710	121.72	7705
138.38	7700	155.7	7695	170.3	7690	176.15	7688.3	197.62	7685.06
197.99	7685	214.62	7680	225.54	7676.7	245.65	7675	283.59	7671.87
297.12	7672.66	312.77	7675	343.38	7680	367.52	7685	391.39	7690
415.53	7695	444.36	7700	472.3	7703.95	480.29	7701.98	508.86	7705
559.8	7710	588.47	7714.79						

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	245.65	.04	312.77	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	245.65	312.77		96.17	126.79	150.79	.3	.5

Ineffective Flow num= 2				
Sta L	Sta R	Elev	Permanent	
0	278.04	7676.45	F	
289.04	588.47	7676.45	F	

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4580

INPUT

Description:

Station Elevation Data num= 15									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7760	12.16	7755	27.55	7750	51.1	7745	67.86	7740
76.44	7737.04	82.27	7735	95.25	7730	109	7725	125.15	7720
140.72	7715	156.92	7710	173.33	7705	189.53	7700	205.44	7695
221.53	7690	237.94	7685	254.29	7680	265.11	7676.7	272.62	7675
292.46	7670	306.68	7666.61	315.96	7665	346.1	7665	349.26	7665.66
378.86	7666.09	399.69	7670	425.53	7675	451.98	7680	477.19	7685
502.29	7690	527.71	7695	567.35	7700	585.23	7702.2	635.84	7701.68

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	306.68	0	349.26	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	306.68	349.26		199.74	193.07	167.78	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4570

INPUT

Description:

Station Elevation Data num= 41									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7765	14.69	7760	26.92	7755	35.15	7751.57	38.73	7750
51.19	7745	64.94	7740	78.24	7735	91.3	7730	103.53	7725
117.02	7720	130.65	7715	144.43	7710	158.88	7705	173.78	7700
188.64	7695	203.38	7690	217.1	7685	231.69	7680	246.34	7675
260.96	7670	267.78	7667.58	276.67	7665	295.47	7660	306.93	7656.78
317.19	7655	353.12	7655	364.27	7656.53	400.57	7656.19	422.91	7660
440.64	7665	463.49	7670	483.53	7675	495.82	7680	509.23	7685
523.51	7690	530.47	7695	533.57	7697.16	616.67	7700	690.22	7701.18
708.01	7705								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	306.93	0	364.27	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	306.93	364.27		158.75	158.29	160.89	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4565

INPUT

Description:

Station Elevation Data num= 23									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7705	10.21	7700	22.62	7695	33.11	7690	43.71	7685
58.26	7680	71.94	7675	84.2	7670	89.82	7667.58	101.04	7665
122.97	7660	135.62	7657.19	143.79	7655	162.53	7650	164.64	7649.43
171.83	7645	174.05	7643.61	185.03	7645	219.18	7650	241.41	7650.94
266.64	7650.9	278.63	7655	308.83	7660				

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	162.53	.035	219.18	.02

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	162.53	219.18		277.99	280.48	288.65	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4560

INPUT

Description:

Station Elevation Data num= 24									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7690	13.59	7685	25.81	7680	39.49	7675	53.73	7670
71.26	7665	88.35	7660	104.35	7655	120.09	7650	135.76	7645
151.2	7640	167.13	7635	182.2	7630.5	196.83	7635	212.77	7640

214.13 7640.45 264.78 7645 268.41 7645.32 309.77 7645.76 334.67 7650
364.18 7655 413.1 7660 436.83 7665 464.52 7670

Manning's n Values num= 3
Sta n Val Sta n Val
0 .055 167.13 .035 196.83 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
167.13 196.83 187.13 234.04 247.65 .1 .3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4550

INPUT

Description:
Station Elevation Data num= 30
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7690 13.31 7685 26.89 7680 37.87 7675 48.83 7670
59.71 7665 70.44 7660 79.54 7655 91.17 7650 102.88 7645
116.09 7640 133.34 7635 142.59 7632.86 164.9 7630 192.92 7626.37
224.98 7625 257.53 7623.67 264.91 7621.5 282.51 7625 301.99 7630
311.94 7632.09 356.83 7633.76 382.16 7635 383.73 7640 403.89 7645
429.41 7650 453.71 7655 477.89 7660 499.95 7665 520.89 7670

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .055 257.53 .035 282.51 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
257.53 282.51 108.96 135.09 121.38 .1 .3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4540

INPUT

Description:
Station Elevation Data num= 34
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7700 12.36 7695 24.37 7690 36.22 7685 48.41 7683.49
45.53 7680 54.04 7675 63.27 7670 74.48 7665 86.36 7660
99.85 7655 111.02 7650 125.98 7645 138.87 7640 151.32 7635
163.9 7630 177.15 7625 190.17 7620 199.06 7616.24 218.07 7620
223.16 7621.04 276.64 7625 289.63 7626.81 316 7628.02 328.71 7630
356.18 7635 383.89 7640 413.11 7645 434.26 7650 452.22 7655
470.45 7660 491.5 7665 514.02 7670 534.32 7675

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .055 177.15 .035 223.16 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
177.15 223.16 136.24 347.95 375.73 .1 .3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4530

INPUT

Description:
Station Elevation Data num= 46
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7695 13.73 7690 27.72 7685 41.64 7680 54.89 7675
68.26 7670 81.91 7665 96.57 7660 113.56 7655 131.67 7650
161.19 7645 174.12 7640 185.2 7635 195.52 7630 206.65 7625
218.67 7620 230.19 7615 241.78 7610 249.15 7605.46 250.74 7603.92
250.98 7600.49 251.64 7600.49 252.57 7600.46 252.99 7603.87 254.21 7605.48
279.07 7610 286.33 7611.24 315.39 7611.59 328.8 7615 340.88 7620
352.28 7625 363.14 7630 373.89 7635 384.75 7640 394.88 7645
404.77 7650 414.59 7655 425.09 7660 437.39 7665 449.89 7670
465.83 7675 479.98 7680 491.41 7685 503.04 7690 515.64 7695
529.38 7700

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 230.19 0 286.33 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
230.19 286.33 123.67 125.76 135.08 .1 .5

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4520

INPUT

Description: XSEC Upstream of Culvert # 2
Station Elevation Data num= 55
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7695 10.99 7690 22.11 7685 37.49 7680 54.27 7675
70.1 7670 86.05 7665 105.18 7660 126.11 7655 144.44 7650
150.01 7648.33 160.74 7645 176.55 7640 192.29 7635 208.21 7630
223.79 7625 238.86 7620 253.14 7615 266.02 7610 272.52 7606.63
278.35 7597.18 279.67 7595.25 280.89 7592.32 292.27 7592.28 293.47 7592.28
295.26 7597.28 300.44 7597.51 304.18 7597.8 309.23 7597.93 312.88 7598.13
318.03 7599.21 326.55 7601.21 334.88 7605.47 340.16 7608.25 347.11 7610
355.3 7615 363.74 7620 372.46 7625 383.3 7630 392.59 7635
401.18 7640 411.09 7645 422.94 7650 433.38 7655 444.71 7660
455.21 7665 464.94 7670 474.71 7675 484.44 7680 494.57 7685
505.01 7690 515.6 7695 526.34 7700 536.75 7705 548.47 7710

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .055 278.35 .035 295.26 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
278.35 295.26 123.67 125.76 135.08 .1 .5

278.35 295.26 56.55 52.91 57.42 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 279.38 7597.22 F
 294.64 548.47 7597.22 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4515

INPUT

Description: Culvert #2
 Distance from Upstream XS = 5
 Deck/Roadway Width = 33
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates
 num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7597.53 287 7597.53 347 7597.68

Upstream Bridge Cross Section Data

Station Elevation Data num= 55
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7695 10.99 7690 22.11 7685 37.49 7660 54.27 7675
 70.1 7670 86.05 7665 105.18 7660 126.31 7655 144.44 7650
 150.01 7648.33 160.74 7645 176.55 7640 192.29 7635 208.21 7630
 223.79 7625 238.86 7620 253.14 7615 266.02 7610 272.52 7606.69
 278.35 7597.18 279.67 7595.25 280.89 7592.32 292.27 7592.28 293.47 7592.28
 295.26 7597.28 300.44 7597.51 304.18 7597.8 309.23 7597.93 312.88 7598.13
 318.03 7599.21 326.55 7601.91 334.88 7605.47 340.16 7608.25 347.11 7610
 355.3 7615 363.74 7620 372.46 7625 383.3 7630 392.59 7635
 401.18 7640 411.09 7645 422.94 7650 433.38 7655 444.73 7660
 455.21 7665 464.94 7670 474.71 7675 484.44 7680 494.57 7685
 505.01 7690 515.6 7695 526.34 7700 536.75 7705 546.47 7710

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 278.35 .035 295.26 .055

Bank Sta: Left Right Coeff Contr. Expan.
 278.35 295.26 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 279.38 7597.22 F
 294.64 548.47 7597.22 F

Downstream Deck/Roadway Coordinates
 num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7596.65 287 7596.65 347 7596.82

Downstream Bridge Cross Section Data

Station Elevation Data num= 51
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7690 15.2 7685 20.08 7680 30.42 7660 45.54 7675
 60.37 7670 78.64 7665 96.16 7660 113.19 7655 133.2 7650
 139.78 7648.33 154.39 7645 178.45 7640 198.99 7635 217 7630
 234.82 7625 250.7 7620 265.34 7615 279.93 7610 294.54 7605
 299.44 7597.48 302.44 7591.48 306.37 7591.61 315.86 7591.61 318.77 7591.58
 319.69 7603.02 344.13 7605 354.43 7605.76 367.14 7610 372.19 7611.68
 385.77 7614.33 386.81 7615 395.3 7620 403.87 7625 412.25 7630
 420.79 7635 430.01 7640 440.4 7645 451.3 7650 462.56 7655
 472.38 7660 482.07 7665 491.7 7670 501.48 7675 511.42 7680
 522.47 7685 533.68 7690 544.07 7695 553.6 7700 563.66 7705
 573.67 7710

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 294.54 .035 319.69 .055

Bank Sta: Left Right Coeff Contr. Expan.
 294.54 319.63 .3 .5

Ineffective Flow num= 0
 Sta L Sta R Elev Permanent

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 =
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Culverts = 2

Culvert Name Shape Rise Span
 CULVERT#1 Arch 3 4
 FHWA Chart # 41- Arch; Corrugated metal
 FHWA Scale # 1 - 90 Degree headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 5 33 .024 .024 0 .5 1
 Upstream Elevation = 7592.88
 Centerline Station = 282.75
 Downstream Elevation = 7592.2
 Centerline Station = 306.45

Culvert Name Shape Rise Span
 Culvert #2 Arch 3 4
 FHWA Chart # 41- Arch; Corrugated metal
 FHWA Scale # 1 - 90 Degree headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 5 33 .024 .024 0 .5 1
 Upstream Elevation = 7593.61
 Centerline Station = 291.75
 Downstream Elevation = 7592.54
 Centerline Station = 315.45

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4510

INPUT

Description: XSEC Downstream of Culvert # 2

Station Elevation Data num= 51									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7590	15.2	7685	20.08	7683.38	30.42	7680	45.54	7675
60.37	7670	78.64	7665	96.16	7660	113.19	7655	133.2	7650
139.78	7648.33	154.39	7645	178.45	7640	198.99	7635	217	7630
234.82	7625	250.7	7620	265.34	7615	279.93	7610	294.54	7605
299.44	7597.48	302.44	7591.48	306.37	7591.61	315.86	7591.61	318.77	7591.68
319.69	7603.02	344.13	7605	354.43	7605.76	367.14	7610	372.19	7611.68
385.77	7614.33	386.81	7615	395.3	7620	403.87	7625	412.25	7630
420.79	7635	430.01	7640	440.4	7645	451.3	7650	462.56	7655
472.38	7660	482.07	7665	491.7	7670	501.48	7675	511.42	7680
522.47	7685	533.68	7690	544.07	7695	553.6	7700	563.66	7705
573.67	7710								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	294.54	.035	319.69	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	294.54	319.69		107.29	123.56	141.49	.3	.5

Ineffective Flow num= 0
Sta L Sta R Elev Permanent

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4500

INPUT

Description:

Station Elevation Data num= 49									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7685	6.33	7682.38	18.84	7680	37.39	7675	54.49	7670
69.6	7665	84.16	7660	98.57	7655	113.67	7650	118.95	7648.33
129.03	7645	147.04	7640	165.23	7635	187.42	7630	202.6	7626.9
222.65	7625	224.75	7624.72	244.05	7620	262.5	7615	281.61	7610
288.59	7607.91	315.14	7605.71	318.32	7605	341.66	7600	355.16	7591.34
357.67	7588.31	359.38	7588.27	361.48	7591.28	369.25	7599.33	395.81	7600
395.85	7599.89	409.7	7620	410.81	7621.64	418.09	7625	428.52	7630
433.98	7632.7	456.67	7633.05	461.31	7635	473.81	7640	488.18	7645
505.22	7650	521.07	7655	536.98	7660	552.96	7665	568.64	7670
581.66	7675	594.85	7680	608.22	7685	621.67	7690		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	341.66	.035	369.25	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	341.66	369.25		212.29	193.78	168.97	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4495

INPUT

Description:

Station Elevation Data num= 23									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7620	25.33	7615	39.91	7610	61.8	7605	86.12	7600
126.11	7595	169.22	7591.33	175	7590	185	7587	187.5	7585
190	7587	200	7590	230.25	7592.59	234.67	7595	243.75	7600
252.89	7605	261.38	7610	269.58	7615	277.81	7620	281.06	7621.69
291.61	7625	308.24	7630	324.88	7635				

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	175	0	200	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	175	200		154.64	128.78	101.48	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4490

INPUT

Description:

Station Elevation Data num= 19									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7610	69.74	7605	92.58	7600	101.71	7595	109.7	7590
112	7587.5	115.85	7585	118.94	7582.32	128.46	7585	138.78	7587.83
166.99	7587.51	168.08	7590	170.08	7595	171.94	7600	173.63	7605.18
173.64	7605	201.76	7610	220.77	7615	239.61	7620		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	112	0	138.78	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	112	138.78		109.24	128.53	146.49	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4485

INPUT

Description:

Station Elevation Data num= 21									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7606.84	2.4	7605	8.72	7600	15.05	7595	21.22	7590
27.6	7585	32.59	7581.05	33.28	7580	36.66	7575	40.06	7570
40.17	7569.79	40.81	7570	56.82	7575	61.04	7576.33	82.48	7576.32

86.83 7580 92.85 7585 98.84 7590 104.94 7595 111.28 7600
118.3 7605

Manning's n Values num= 3
Sta n Val Sta n Val
0 .055 36.66 .03 61.04 .02

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
36.66 61.04 252.86 253.96 252.06 .1 .3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4480

INPUT

Description:

Station Elevation Data num= 49
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7670 52.51 7665.98 55.57 7665 72.74 7660 87.84 7655
102.78 7650 118.08 7645 131.92 7640 145.59 7635 149.27 7633.69
137.13 7630 168.04 7625 178.7 7620 182.54 7618.1 187.96 7615
196.66 7610 205.74 7605 215 7600.07 215.12 7600 229.24 7595
236.02 7560 244.23 7555 255.74 7550 260.87 7547.8 266.48 7550
276.39 7553.9 298.83 7554.22 299.87 7555 308.45 7560 311.05 7565
316.51 7570 322.19 7575 327.74 7580 333.38 7585 339.1 7590
345.15 7595 352 7600 359.17 7605 366.16 7610 373.32 7615
380.39 7620 387.45 7625 394.52 7630 401.6 7635 408.71 7640
416.76 7645 424 7647.58 433.18 7650 453.39 7655

Manning's n Values num= 3
Sta n Val Sta n Val
0 .045 244.23 .04 276.39 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
244.23 276.39 147.56 141.71 117.21 .1 .3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4470

INPUT

Description:

Station Elevation Data num= 49
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7640 11.24 7635 22.48 7630 33.75 7625 44.85 7620
55.23 7615 65.23 7610 66.77 7609.29 69.37 7605 72.37 7600
84.31 7575 84.7 7573.7 90.59 7570 98.41 7565 106.35 7560
114.3 7555 122.13 7550 129.49 7545 137.01 7540 142.75 7536.09
154.92 7540 156.2 7540.38 175.66 7540 184.5 7540 184.76 7539.88
190.8 7545 196.63 7550 202.33 7555 208.34 7560 214.25 7565
220.19 7570 227.65 7575 237.07 7580 246.12 7585 255.04 7590
264.17 7595 274.36 7600 284.65 7605 294.94 7610 305.24 7615
315.59 7620 325.81 7625 335.79 7630 345.66 7635 355.71 7640
365.71 7645 370.83 7647.58 376.74 7650 388.34 7655

Manning's n Values num= 3
Sta n Val Sta n Val
0 .045 137.01 .04 156.2 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
137.01 156.2 156.78 157.33 154.35 .1 .3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4460

INPUT

Description:

Station Elevation Data num= 50
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7605 11.91 7601.53 18.41 7600 35.72 7595 51.23 7590
59.35 7585 67.76 7580 78.24 7575 90.45 7570 107.86 7565
130.25 7560 147.45 7556.1 172.6 7555 173.95 7554.91 179.39 7550
184.98 7545 190.51 7540 196.07 7535 201.5 7530 206.61 7525
208.48 7523.07 215.46 7525 232.58 7530 233.89 7530.4 247.67 7530
266.11 7530 266.6 7530 273.73 7535 281.02 7540 288.34 7545
295.6 7550 303.91 7555 312.07 7560 319.43 7565 326.49 7570
329.87 7572.36 334.15 7575 341.92 7580 349.59 7585 357.52 7590
365.55 7595 373.97 7600 382.58 7605 391.4 7610 400.44 7615
409.05 7620 417.64 7625 426.09 7630 434.34 7635 442.79 7640

Manning's n Values num= 3
Sta n Val Sta n Val
0 0 201.5 0 232.58 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
201.5 232.58 142.5 176.67 197.19 .1 .3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4450

INPUT

Description:

Station Elevation Data num= 48
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7600 2.15 7598.75 28.76 7595 36.61 7594.04 39.84 7590
43.96 7585 48.1 7580 50 7577.69 56.59 7575 68.78 7570
79.47 7565 91.15 7560 102.87 7555 114.87 7550 128.82 7545
143.34 7540 159.44 7535 176.77 7530 179.7 7529.17 187.73 7525
197.24 7520 206.9 7515 212.27 7512.29 228.18 7515 238.42 7516.81
262.17 7516.81 269.77 7520 278.74 7525 287.26 7530 295.83 7535
304.48 7540 312.96 7545 320.53 7550 327.69 7555 335.22 7560
345.27 7565 355.5 7570 360.28 7572.36 368.34 7575 381.47 7580
393.99 7585 407.74 7590 421.94 7595 435.29 7600 448.16 7605
460.18 7610 471.86 7615 482.62 7620

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 197.24 0 238.42 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 197.24 238.42 375.2 359.22 371.73 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4440

INPUT

Description:
 Station Elevation Data num= 60
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7620 10.17 7615 20.33 7610 30.57 7605 41.27 7600
 52.32 7595 64.56 7590 81.13 7585 95 7580 108.56 7575
 121.13 7570 134.32 7565 146.75 7560 158.71 7555.19 159.2 7555
 173.84 7550 190.18 7545 206.17 7540 220.87 7535 240.43 7530
 268.26 7525 299.85 7520 317.11 7515 328.69 7510 338.87 7505
 349.03 7500 358.95 7495 360.09 7494.44 362.42 7495 383.57 7500
 390.85 7501.75 411.34 7501.89 416.79 7505 425.55 7510 434.36 7515
 443.19 7520 451.94 7525 460.93 7530 470.46 7535 480.05 7540
 489.33 7545 498.56 7550 507.76 7555 516.95 7560 526.72 7565
 537.15 7570 542.05 7572.36 545.31 7575 551.56 7580 558.7 7585
 566.65 7590 574.62 7595 582.86 7600 591.13 7605 599.27 7610
 607.41 7615 615.46 7620 623.39 7625 631.31 7630 639.26 7635

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 338.87 .035 390.85 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 338.87 390.85 365.73 362.91 348.13 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4430

INPUT

Description:
 Station Elevation Data num= 45
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7570 8.47 7565 17.41 7560 28.58 7555 39.98 7550
 51.41 7545 64.17 7540 75.45 7535 86.37 7530 97 7525
 108.13 7520 114.88 7516.65 117.96 7515 128.47 7510 139.55 7505
 148.46 7500 149.48 7499.53 157.97 7495 166.9 7490 180.9 7485
 193.97 7480.36 213.43 7485 225.28 7487.91 245.92 7487.95 253.62 7490
 269.16 7495 279.57 7500 289.99 7505 300.7 7510 311.71 7515
 322.93 7520 336.38 7525 348.65 7530 360.24 7535 371.07 7540
 381.64 7545 391.46 7550 400.99 7555 410.38 7560 419.63 7565
 430.1 7570 441.52 7575 450.37 7578.46 454.24 7580 470.98 7585

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 166.9 .05 225.28 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 166.9 225.28 234.83 263.29 199.76 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4420

INPUT

Description:
 Station Elevation Data num= 33
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7510 7.76 7505 12.93 7502.16 107.17 7500.89 111.37 7500
 127.34 7495 141.6 7490 153.66 7485 169.14 7480 184.99 7475
 210.04 7470 223.77 7467.85 229.44 7470 242.51 7475 246.72 7476.49
 270.34 7476.49 279.06 7480 287.36 7485 295.61 7490 303.29 7495
 310.8 7500 318.38 7505 325.87 7510 333.55 7515 341.18 7520
 348.9 7525 357.89 7530 366.17 7535 374.17 7540 382.3 7545
 390.56 7550 404.02 7555 419 7560

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 184.99 0 242.51 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 184.99 242.51 120.24 143.62 144.02 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4410

INPUT

Description:
 Station Elevation Data num= 19
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7485.32 2.11 7485 23.48 7480 47.58 7475 74.96 7470
 77.27 7469.53 89.82 7465 98.41 7461.89 110.96 7465 131.15 7470
 131.46 7470.08 141.99 7470 144.75 7470 151.79 7470.31 164.39 7475
 173.53 7480 180.49 7485 187.19 7490 194.09 7495

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 77.27 0 131.46 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 77.27 131.46 97.41 49.85 12.34 .3 .5

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4400

INPUT

Description: Upstream of Culvert #1
Station Elevation Data num= 30
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7490 25.72 7485 54.29 7480 89.75 7475 109.26 7472.37
117.81 7470 153.33 7465 186.03 7464.45 194.02 7460 196.09 7457.89
197.16 7455.96 198.22 7455.18 200.71 7455.09 203.55 7455.09 204.97 7455.79
206.39 7457.46 207.82 7458.6 210.33 7460 236.59 7465 271.39 7468.27
300.01 7469.74 300.72 7470 312.08 7475 324.87 7480 334.02 7485
341.42 7490 348.93 7495 356.64 7500 365.3 7505 374.81 7510

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 186.03 0 236.59 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
186.03 236.59 47.53 53.74 68.32 3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 197 7457.63 F
205.1 374.81 7457.72 F

CULVERT

RIVER: Reach #1
REACH: Sabino Canyon RS: 4397.5

INPUT

Description: Culvert #1
Distance from Upstream XS = 3
Deck/Roadway Width = 22
Weir Coefficient = 3.1
Upstream Deck/Roadway Coordinates num= 3
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
175 7458 192 7460 230 7458

Upstream Bridge Cross Section Data
Station Elevation Data num= 30
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7490 25.72 7485 54.29 7480 89.75 7475 109.26 7472.37
117.81 7470 153.33 7465 186.03 7464.45 194.02 7460 196.09 7457.89
197.16 7455.96 198.22 7455.18 200.71 7455.09 203.55 7455.09 204.97 7455.79
206.39 7457.46 207.82 7458.6 210.33 7460 236.59 7465 271.39 7468.27
300.01 7469.74 300.72 7470 312.08 7475 324.87 7480 334.02 7485
341.42 7490 348.93 7495 356.64 7500 365.3 7505 374.81 7510

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 186.03 0 236.59 0

Bank Sta: Left Right Coeff Contr. Expan.
186.03 236.59 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 197 7457.63 F
205.1 374.81 7457.72 F

Downstream Deck/Roadway Coordinates num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
170 7460 2157459.842

Downstream Bridge Cross Section Data
Station Elevation Data num= 40
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7485 32.71 7480 66.84 7475 108.69 7470 109.85 7469.87
129.88 7465 148.17 7460.13 158.68 7460 173.03 7459.8 186.28 7455.37
186.65 7455.01 187.2 7454.68 187.55 7454.67 187.99 7454.62 188.51 7454.55
189.16 7454.54 189.93 7454.54 190.45 7454.6 190.92 7454.69 191.43 7454.73
192.58 7454.86 192.9 7454.95 193.09 7455.04 193.27 7455.29 212.81 7460
231.06 7465 240.56 7467.45 264.58 7468.13 269.1 7470 281.7 7475
293.41 7480 304.48 7485 315.3 7490 326.24 7495 337.17 7500
347.88 7505 358.45 7510 368.85 7515 379.05 7520 388.89 7525

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0.55 173.03 0.32 212.81 0.06

Bank Sta: Left Right Coeff Contr. Expan.
173.03 212.81 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 183.66 7459.01 F
195.74 388.89 7459.01 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 =
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 Arch 3 4
FHWA Chart # 41- Arch; Corrugated metal
FHWA Scale # 1 - 90 Degree headwall
Solution Criteria = Rigness U.S. EG
Culvert Upstrm Disc Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
3 22 .024 .024 0 .5 1

Number of Barrels = 2

Upstream Elevation = 7455

Centerline Stations
Sta. Sta.
199 203.1

Downstream Elevation = 7454.9

Centerline Stations
 Sta. Sta.
 187.9 192

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4395

INPUT

Description: XSEC Downstream of Culvert # 1

Station Elevation Data num= 40											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7485	32.71	7480	66.84	7475	108.69	7470	109.85	7469.87		
129.88	7465	148.17	7460.13	158.68	7460	173.03	7459.8	186.28	7455.37		
186.65	7455.01	187.2	7454.68	187.55	7454.67	187.99	7454.62	188.51	7454.55		
189.16	7454.54	189.93	7454.54	190.45	7454.6	190.92	7454.69	191.43	7454.73		
192.58	7454.86	192.9	7454.95	193.09	7455.04	193.27	7455.29	212.81	7460		
231.06	7465	240.56	7467.45	264.58	7468.13	269.1	7470	281.7	7475		
293.41	7480	304.48	7485	315.3	7490	326.24	7495	337.17	7500		
347.88	7505	358.45	7510	368.85	7515	379.05	7520	388.89	7525		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	173.03	.032	212.81	.06

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	173.03	212.81		51.1	62.2	72.85		.3	.5

Ineffective Flow num= 2					
Sta L	Sta R	Elev	Permanent		
0	183.66	7459.01	F		
195.74	388.89	7459.01	F		

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4390

INPUT

Station Elevation Data num= 31											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7480	50.91	7475	80.36	7470	115.35	7465	144.96	7460		
149.45	7459.16	183.05	7457.32	186.13	7455	188.67	7453.08	191.11	7453.14		
195.06	7455	216.44	7460	235.74	7465	241.43	7466.4	267.21	7466.31		
275.75	7470	287.26	7475	298.73	7480	311.17	7485	322.92	7490		
333.97	7495	344.78	7500	355.31	7505	365.19	7510	377.22	7515		
388.88	7520	400.05	7525	411.14	7530	423.92	7535	438.64	7540		
456.57	7545										

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	183.05	.032	216.44	.06

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	183.05	216.44		422.01	367.85	348.08		.1	.3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4380

INPUT

Station Elevation Data num= 40											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7540	13.98	7535	26.19	7530	42.04	7525	58.43	7520		
66.18	7515	74.12	7510	82.04	7505	90.08	7500	98.26	7495		
105.26	7490	113.93	7485	121.73	7480	129.55	7475	137.45	7470		
145.25	7465	154.5	7460	165.33	7455	166.6	7454.34	190.14	7453.21		
196.54	7450	209.71	7445	224.72	7441.87	246.21	7445	253.1	7446.02		
287.65	7450	317.35	7455	328.27	7456.9	342.73	7460	365.68	7465		
386.96	7470	404.73	7475	414.69	7480	423.96	7485	433.3	7490		
442.59	7495	452	7500	460.16	7505	468.51	7510	476.71	7515		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	209.71	.035	246.21	.055

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	209.71	246.21		159.8	158.36	130.15		.1	.3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4370

INPUT

Station Elevation Data num= 33											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7500	11.06	7495	23.08	7490	35.07	7485	46.95	7480		
58.78	7475	72.27	7470	85.19	7465	100.43	7460	122.74	7455		
145.98	7450	169.03	7445	180.69	7442.31	190.83	7440	199.26	7438.05		
209.07	7440	222.45	7442.73	238.8	7445	273.98	7450	276.41	7450.24		
293.99	7455	311.9	7460	328.47	7465	344.88	7470	361.12	7475		
373.03	7480	382.36	7485	391.48	7490	398.52	7495	404.89	7500		
411.27	7505	418.21	7510	425.13	7515						

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	180.69	0	222.45	0

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	180.69	222.45		121.8	124.38	118.98		.1	.3

SUMMARY OF MANNING'S N VALUES

River: Reach #1

Reach	River Sta.	n1	n2	n3
Sabino Canyon	5000	.013	.045	.055
Sabino Canyon	4990	0	0	0
Sabino Canyon	4980	0	0	0
Sabino Canyon	4970	.013	.045	.055
Sabino Canyon	4955	0	0	0
Sabino Canyon	4950	.013	.045	.055
Sabino Canyon	4949	Culvert		
Sabino Canyon	4948	.013	.045	.055
Sabino Canyon	4940	.013	.045	.055
Sabino Canyon	4930	0	0	0
Sabino Canyon	4925	Culvert		
Sabino Canyon	4920	0	0	0
Sabino Canyon	4910	0	0	0
Sabino Canyon	4900	0	0	0
Sabino Canyon	4890	.013	.045	.055
Sabino Canyon	4885	Culvert		
Sabino Canyon	4880	0	0	0
Sabino Canyon	4870	0	0	0
Sabino Canyon	4860	0	0	0
Sabino Canyon	4855	Culvert		
Sabino Canyon	4850	0	0	0
Sabino Canyon	4840	0	0	0
Sabino Canyon	4830	0	0	0
Sabino Canyon	4825	Culvert		
Sabino Canyon	4820	0	0	0
Sabino Canyon	4810	.013	.04	.03
Sabino Canyon	4810	.013	.04	.03
Sabino Canyon	4790	0	0	0
Sabino Canyon	4780	0	0	0
Sabino Canyon	4775	Culvert		
Sabino Canyon	4770	0	0	0
Sabino Canyon	4765	.055	.04	.045
Sabino Canyon	4760	0	0	0
Sabino Canyon	4750	0	0	0
Sabino Canyon	4745	Culvert		
Sabino Canyon	4740	0	0	0
Sabino Canyon	4730	0	0	0
Sabino Canyon	4725	Culvert		
Sabino Canyon	4720	0	0	0
Sabino Canyon	4710	0	0	0
Sabino Canyon	4705.5	Culvert		
Sabino Canyon	4701	0	0	0
Sabino Canyon	4690	0	0	0
Sabino Canyon	4680	0	0	0
Sabino Canyon	4675	Culvert		
Sabino Canyon	4670	0	0	0
Sabino Canyon	4640	0	0	0
Sabino Canyon	4635	Culvert		
Sabino Canyon	4630	0	0	0
Sabino Canyon	4620	.055	.04	.045
Sabino Canyon	4610	0	0	0
Sabino Canyon	4600	0	0	0
Sabino Canyon	4595	Culvert		
Sabino Canyon	4590	.055	.04	.045
Sabino Canyon	4580	0	0	0
Sabino Canyon	4570	0	0	0
Sabino Canyon	4565	.055	.035	.02
Sabino Canyon	4560	.055	.035	.045
Sabino Canyon	4550	.055	.035	.055
Sabino Canyon	4540	.055	.035	.055
Sabino Canyon	4530	0	0	0
Sabino Canyon	4520	.055	.035	.055
Sabino Canyon	4515	Culvert		
Sabino Canyon	4510	.055	.035	.055
Sabino Canyon	4500	.055	.035	.055
Sabino Canyon	4495	0	0	0
Sabino Canyon	4490	0	0	0
Sabino Canyon	4485	.055	.03	.02
Sabino Canyon	4480	.045	.04	.045
Sabino Canyon	4470	.045	.04	.045
Sabino Canyon	4460	0	0	0
Sabino Canyon	4450	0	0	0
Sabino Canyon	4440	.055	.035	.055
Sabino Canyon	4430	.055	.05	.055
Sabino Canyon	4420	0	0	0
Sabino Canyon	4410	0	0	0
Sabino Canyon	4400	0	0	0
Sabino Canyon	4397.5	Culvert		
Sabino Canyon	4395	.055	.032	.06
Sabino Canyon	4390	.055	.032	.06
Sabino Canyon	4380	.055	.035	.055
Sabino Canyon	4370	0	0	0

SUMMARY OF REACH LENGTHS

River: Reach #1

Reach	River Sta.	Left	Channel	Right
Sabino Canyon	5000	280.23	292.32	289.78
Sabino Canyon	4990	259.73	254.38	208.78
Sabino Canyon	4980	195.74	195.12	199.47
Sabino Canyon	4970	109.28	110.18	116.2
Sabino Canyon	4955	48.65	43.54	36.65
Sabino Canyon	4950	44.18	37.93	31.14
Sabino Canyon	4949	Culvert		
Sabino Canyon	4948	100.62	93.02	81.56
Sabino Canyon	4940	183.11	200.29	206.49
Sabino Canyon	4930	35.99	31.3	37.79
Sabino Canyon	4925	Culvert		
Sabino Canyon	4920	89.2	95.09	89.24
Sabino Canyon	4910	242.99	229.2	209.27
Sabino Canyon	4900	163.32	152.05	152.08
Sabino Canyon	4890	65.94	55.62	51.72
Sabino Canyon	4885	Culvert		
Sabino Canyon	4880	120.36	140.56	143.52
Sabino Canyon	4870	86.06	123.02	129.77

Sabino Canyon	4860	29.33	33.29	29.29
Sabino Canyon	4855	Culvert		
Sabino Canyon	4850	173.2	160.5	156.03
Sabino Canyon	4840	154.55	159.68	160.08
Sabino Canyon	4830	48.5	48.05	48.26
Sabino Canyon	4825	Culvert		
Sabino Canyon	4820	164.6	153.11	138.65
Sabino Canyon	4810	275.35	305.07	315.05
Sabino Canyon	4800	128.1	88.45	74.01
Sabino Canyon	4790	185.19	110.34	113.96
Sabino Canyon	4780	180.71	135.48	113.78
Sabino Canyon	4775	Culvert		
Sabino Canyon	4770	152.22	145.66	138.18
Sabino Canyon	4765	178.1	172.24	175.18
Sabino Canyon	4760	116.92	125.62	133.13
Sabino Canyon	4750	36.73	43.9	85.3
Sabino Canyon	4745	Culvert		
Sabino Canyon	4740	50.45	40.63	29.76
Sabino Canyon	4730	24.27	25.79	30.08
Sabino Canyon	4725	Culvert		
Sabino Canyon	4720	66.79	45.57	38.28
Sabino Canyon	4710	58.79	39.28	43.38
Sabino Canyon	4705.5	Culvert		
Sabino Canyon	4701	54.16	64.9	53.38
Sabino Canyon	4690	147.86	67.35	63.49
Sabino Canyon	4680	72.84	32.89	41.45
Sabino Canyon	4675	Culvert		
Sabino Canyon	4670	148.52	148.4	110.22
Sabino Canyon	4640	82.29	83.96	83.73
Sabino Canyon	4635	Culvert		
Sabino Canyon	4630	331.3	308.04	312.42
Sabino Canyon	4620	216.67	217.6	172.7
Sabino Canyon	4610	84.94	105.27	136.16
Sabino Canyon	4600	28.83	26.7	50.57
Sabino Canyon	4595	Culvert		
Sabino Canyon	4590	96.17	126.79	150.79
Sabino Canyon	4580	199.74	193.07	167.78
Sabino Canyon	4570	158.75	158.29	160.89
Sabino Canyon	4565	277.99	280.48	288.65
Sabino Canyon	4560	187.13	234.04	247.65
Sabino Canyon	4550	108.96	135.09	121.38
Sabino Canyon	4540	336.24	347.95	375.73
Sabino Canyon	4530	123.67	125.76	135.08
Sabino Canyon	4520	56.58	52.81	57.42
Sabino Canyon	4515	Culvert		
Sabino Canyon	4510	107.29	123.56	141.49
Sabino Canyon	4500	212.29	193.78	168.97
Sabino Canyon	4495	154.64	128.78	101.48
Sabino Canyon	4490	109.24	128.53	146.49
Sabino Canyon	4485	252.86	253.96	252.06
Sabino Canyon	4480	147.56	141.71	117.21
Sabino Canyon	4470	156.78	157.33	154.35
Sabino Canyon	4460	142.5	176.67	197.19
Sabino Canyon	4450	375.2	359.22	371.73
Sabino Canyon	4440	365.73	362.91	348.13
Sabino Canyon	4430	234.83	263.29	199.76
Sabino Canyon	4420	120.24	143.62	144.02
Sabino Canyon	4410	97.41	49.85	12.34
Sabino Canyon	4400	47.53	53.74	68.32
Sabino Canyon	4397.5	Culvert		
Sabino Canyon	4395	51.1	62.2	72.85
Sabino Canyon	4390	422.01	367.85	348.08
Sabino Canyon	4380	159.8	158.36	130.15
Sabino Canyon	4370	121.8	124.38	118.98

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Reach #1

Reach	River Sta.	Contr.	Expan.
Sabino Canyon	5000	.1	.3
Sabino Canyon	4990	.1	.3
Sabino Canyon	4980	.1	.3
Sabino Canyon	4970	.1	.3
Sabino Canyon	4955	.3	.5
Sabino Canyon	4950	.3	.5
Sabino Canyon	4945	Culvert	
Sabino Canyon	4948	.3	.5
Sabino Canyon	4940	.1	.5
Sabino Canyon	4930	.3	.5
Sabino Canyon	4925	Culvert	
Sabino Canyon	4920	.3	.5
Sabino Canyon	4910	.1	.3
Sabino Canyon	4900	.3	.5
Sabino Canyon	4890	.3	.5
Sabino Canyon	4885	Culvert	
Sabino Canyon	4880	.3	.5
Sabino Canyon	4870	.3	.5
Sabino Canyon	4860	.3	.5
Sabino Canyon	4855	Culvert	
Sabino Canyon	4850	.3	.5
Sabino Canyon	4840	.3	.5
Sabino Canyon	4830	.3	.5
Sabino Canyon	4825	Culvert	
Sabino Canyon	4820	.3	.5
Sabino Canyon	4810	.1	.3
Sabino Canyon	4800	.1	.3
Sabino Canyon	4790	.3	.5
Sabino Canyon	4780	.3	.5
Sabino Canyon	4775	Culvert	
Sabino Canyon	4770	.3	.5
Sabino Canyon	4765	.1	.3
Sabino Canyon	4760	.3	.5
Sabino Canyon	4750	.3	.5
Sabino Canyon	4745	Culvert	
Sabino Canyon	4740	.3	.5
Sabino Canyon	4730	.3	.5
Sabino Canyon	4725	Culvert	
Sabino Canyon	4720	.3	.5
Sabino Canyon	4710	.3	.5

Sabino Canyon 4705.5 Culvert
 Sabino Canyon 4701 .3 .5
 Sabino Canyon 4690 .3 .5
 Sabino Canyon 4680 .3 .5
 Sabino Canyon 4675 Culvert
 Sabino Canyon 4670 .3 .5
 Sabino Canyon 4640 .3 .5
 Sabino Canyon 4635 Culvert
 Sabino Canyon 4630 .3 .5
 Sabino Canyon 4620 .1 .3
 Sabino Canyon 4610 .3 .5
 Sabino Canyon 4600 .3 .5
 Sabino Canyon 4595 Culvert
 Sabino Canyon 4590 .3 .5
 Sabino Canyon 4580 .1 .3
 Sabino Canyon 4570 .1 .3
 Sabino Canyon 4565 .1 .3
 Sabino Canyon 4560 .1 .3
 Sabino Canyon 4550 .1 .3
 Sabino Canyon 4540 .1 .3
 Sabino Canyon 4530 .1 .5
 Sabino Canyon 4520 .1 .5
 Sabino Canyon 4515 Culvert
 Sabino Canyon 4510 .3 .5
 Sabino Canyon 4500 .1 .3
 Sabino Canyon 4495 .1 .3
 Sabino Canyon 4490 .1 .3
 Sabino Canyon 4485 .1 .3
 Sabino Canyon 4480 .1 .3
 Sabino Canyon 4470 .1 .3
 Sabino Canyon 4460 .1 .3
 Sabino Canyon 4450 .1 .3
 Sabino Canyon 4440 .1 .3
 Sabino Canyon 4430 .1 .3
 Sabino Canyon 4420 .1 .3
 Sabino Canyon 4410 .3 .5
 Sabino Canyon 4400 .3 .5
 Sabino Canyon 4397.5 Culvert
 Sabino Canyon 4395 .3 .5
 Sabino Canyon 4390 .1 .3
 Sabino Canyon 4380 .1 .3
 Sabino Canyon 4370 .1 .3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #	Chl
Sabino Canyon	5000	Pre Fire	247.00	7976.07	7979.22	7979.22	7980.02	0.027212	7.18	34.40	21.81	1.01	
Sabino Canyon	5000	Post Fire	594.00	7976.07	7980.67	7980.67	7981.63	0.015888	7.92	76.96	43.08	0.86	
Sabino Canyon	4990	Pre Fire	247.00	7954.38	7956.75	7956.75	7957.40	0.005861	4.07	48.18	38.96	0.50	
Sabino Canyon	4990	Post Fire	594.00	7954.38	7957.77	7957.77	7958.65	0.004895	4.99	96.17	55.58	0.50	
Sabino Canyon	4980	Pre Fire	247.00	7939.00	7941.93	7941.93	7942.62	0.002993	3.06	53.46	41.74	0.35	
Sabino Canyon	4980	Post Fire	594.00	7939.00	7943.02	7943.02	7943.99	0.003194	4.15	107.66	58.06	0.39	
Sabino Canyon	4970	Pre Fire	247.00	7927.21	7929.02	7929.02	7929.51	0.024088	5.79	47.33	52.34	0.93	
Sabino Canyon	4970	Post Fire	594.00	7927.21	7929.84	7929.84	7930.53	0.019549	7.18	100.26	76.17	0.92	
Sabino Canyon	4955	Pre Fire	247.00	7919.90	7922.70	7922.70	7923.41	0.027704	6.75	36.61	26.15	1.00	
Sabino Canyon	4955	Post Fire	594.00	7919.90	7923.91	7923.91	7924.84	0.018051	7.94	84.15	53.74	0.91	
Sabino Canyon	4950	Pre Fire	247.00	7915.09	7921.38	7917.41	7921.50	0.000871	2.84	86.91	62.91	0.20	
Sabino Canyon	4950	Post Fire	594.00	7915.09	7922.31	7919.14	7922.49	0.001096	3.26	195.75	83.83	0.23	
Sabino Canyon	4949												
Sabino Canyon	4948	Pre Fire	247.00	7913.45	7916.80	7916.80	7917.77	0.028497	7.91	31.24	16.28	1.01	
Sabino Canyon	4948	Post Fire	594.00	7913.45	7918.40	7918.40	7919.76	0.024328	9.36	63.44	24.00	1.01	
Sabino Canyon	4940	Pre Fire	247.00	7907.29	7910.28	7910.28	7911.08	0.025286	7.14	34.78	23.33	0.98	
Sabino Canyon	4940	Post Fire	594.00	7907.29	7911.56	7911.56	7912.77	0.016209	8.60	71.14	33.70	0.89	
Sabino Canyon	4930	Pre Fire	282.00	7885.96	7893.06	7890.46	7893.47	0.006128	5.11	55.17	12.57	0.43	
Sabino Canyon	4930	Post Fire	687.00	7885.96	7895.45	7893.26	7896.36	0.009031	7.68	90.04	19.45	0.56	
Sabino Canyon	4925												
Sabino Canyon	4920	Pre Fire	282.00	7884.74	7889.27	7889.27	7890.75	0.034051	9.74	28.95	9.61	0.99	
Sabino Canyon	4920	Post Fire	687.00	7884.74	7891.76	7891.76	7893.63	0.015963	10.14	67.63	22.78	0.77	
Sabino Canyon	4910	Pre Fire	282.00	7880.00	7884.25	7884.25	7885.33	0.027810	8.34	33.81	15.92	1.01	
Sabino Canyon	4910	Post Fire	687.00	7880.00	7886.08	7886.08	7887.61	0.022492	9.91	69.36	22.81	1.00	
Sabino Canyon	4900	Pre Fire	282.00	7869.05	7873.12	7873.12	7874.09	0.028775	7.92	35.61	18.70	1.01	
Sabino Canyon	4900	Post Fire	687.00	7869.05	7874.76	7874.76	7876.08	0.023123	9.24	74.36	28.53	1.01	
Sabino Canyon	4890	Pre Fire	282.00	7860.00	7867.49	7863.41	7867.63	0.001170	2.94	95.90	61.60	0.22	
Sabino Canyon	4890	Post Fire	687.00	7860.00	7870.40	7865.57	7870.72	0.001503	4.63	148.28	76.44	0.28	
Sabino Canyon	4885												
Sabino Canyon	4880	Pre Fire	282.00	7859.27	7863.48	7863.48	7864.05	0.016730	6.10	46.83	38.67	0.76	
Sabino Canyon	4880	Post Fire	687.00	7859.27	7864.27	7864.27	7865.44	0.012725	6.46	87.97	56.69	0.72	
Sabino Canyon	4870	Pre Fire	282.00	7851.00	7855.49	7855.49	7856.97	0.034237	9.76	28.89	9.86	1.01	
Sabino Canyon	4870	Post Fire	687.00	7851.00	7857.99	7857.99	7858.84	0.014653	7.32	92.83	68.36	0.75	
Sabino Canyon	4860	Pre Fire	282.00	7841.00	7851.38	7845.30	7851.48	0.000795	2.65	107.30	65.80	0.18	
Sabino Canyon	4860	Post Fire	687.00	7841.00	7853.29	7848.08	7853.67	0.001870	4.99	139.77	73.98	0.30	
Sabino Canyon	4855												
Sabino Canyon	4850	Pre Fire	282.00	7841.00	7845.22	7845.22	7846.55	0.033247	9.27	30.41	11.40	1.00	
Sabino Canyon	4850	Post Fire	687.00	7841.00	7847.46	7847.46	7848.88	0.025097	9.57	71.81	25.54	1.01	
Sabino Canyon	4840	Pre Fire	282.00	7826.07	7829.33	7829.33	7829.89	0.016446	6.01	47.24	43.62	0.80	
Sabino Canyon	4840	Post Fire	687.00	7826.07	7830.19	7830.19	7831.35	0.012948	6.91	86.22	47.79	0.78	
Sabino Canyon	4830	Pre Fire	282.00	7815.02	7821.27	7818.94	7821.44	0.002159	3.27	87.75	32.54	0.31	
Sabino Canyon	4830	Post Fire	687.00	7815.02	7824.85	7820.69	7824.98	0.000267	1.87	294.67	67.94	0.13	

Sabino Canyon	4500	Pre Fire	493.00	7588.27	7594.73	7594.73	7596.37	0.019140	10.26	48.05	14.71	1.00
Sabino Canyon	4500	Post Fire	1446.00	7589.27	7598.22	7598.22	7600.71	0.023883	12.64	114.36	23.28	1.01
Sabino Canyon	4495	Pre Fire	493.00	7585.00	7590.34	7590.34	7591.43	0.014691	8.40	59.45	30.46	0.97
Sabino Canyon	4495	Post Fire	1446.00	7585.00	7592.75	7592.75	7593.98	0.011069	9.69	186.83	78.03	0.78
Sabino Canyon	4490	Pre Fire	493.00	7582.32	7587.15	7587.15	7588.35	0.016100	8.80	56.00	23.76	1.01
Sabino Canyon	4490	Post Fire	1446.00	7582.32	7589.21	7589.21	7590.57	0.013171	9.59	155.40	57.30	0.83
Sabino Canyon	4485	Pre Fire	493.00	7569.79	7575.04	7575.04	7576.37	0.024801	9.28	53.13	20.31	1.01
Sabino Canyon	4485	Post Fire	1446.00	7569.79	7577.75	7577.75	7579.23	0.012931	10.13	150.68	49.36	0.82
Sabino Canyon	4480	Pre Fire	493.00	7547.80	7552.60	7552.60	7553.80	0.019379	8.80	56.00	23.31	1.00
Sabino Canyon	4480	Post Fire	1446.00	7547.80	7555.15	7555.15	7556.52	0.013714	9.58	154.19	56.04	0.84
Sabino Canyon	4470	Pre Fire	493.00	7536.09	7540.72	7540.72	7541.61	0.011912	7.07	66.17	49.82	0.78
Sabino Canyon	4470	Post Fire	1446.00	7536.09	7542.34	7542.34	7543.92	0.010311	8.42	150.74	54.18	0.73
Sabino Canyon	4460	Pre Fire	493.00	7523.07	7528.00	7528.00	7529.24	0.020174	8.95	55.07	22.18	1.00
Sabino Canyon	4460	Post Fire	1446.00	7523.07	7520.97	7530.97	7532.14	0.011072	3.00	169.46	67.53	0.75
Sabino Canyon	4450	Pre Fire	493.00	7512.29	7516.24	7516.24	7517.25	0.020070	8.09	60.91	30.66	1.01
Sabino Canyon	4450	Post Fire	1446.00	7512.29	7518.09	7518.09	7519.38	0.014719	9.02	158.72	64.30	0.87
Sabino Canyon	4440	Pre Fire	493.00	7494.44	7498.79	7498.79	7499.88	0.017516	8.38	58.86	27.05	1.00
Sabino Canyon	4440	Post Fire	1446.00	7494.44	7501.13	7501.13	7502.81	0.015179	10.39	139.16	41.56	1.00
Sabino Canyon	4430	Pre Fire	493.00	7480.36	7484.49	7484.49	7485.55	0.037418	8.25	59.77	28.95	1.01
Sabino Canyon	4430	Post Fire	1446.00	7480.36	7486.72	7486.72	7488.34	0.079958	10.21	141.62	44.35	1.01
Sabino Canyon	4420	Pre Fire	493.00	7467.85	7473.61	7473.61	7472.59	0.010985	7.95	62.00	31.68	1.00
Sabino Canyon	4420	Post Fire	1446.00	7467.85	7473.70	7473.70	7475.25	0.009657	9.99	144.71	47.59	1.01
Sabino Canyon	4410	Pre Fire	493.00	7461.89	7466.08	7466.08	7467.14	0.010937	8.25	59.79	28.52	1.00
Sabino Canyon	4410	Post Fire	1446.00	7461.89	7468.33	7468.33	7469.96	0.009543	10.25	141.04	43.82	1.01
Sabino Canyon	4400	Pre Fire	493.00	7455.09	7461.92	7459.84	7462.32	0.003090	5.12	96.30	29.82	0.50
Sabino Canyon	4400	Post Fire	1446.00	7455.09	7464.21	7463.09	7465.18	0.006809	7.89	183.28	45.99	0.70
Sabino Canyon	4397.5											
Culvert												
Sabino Canyon	4395	Pre Fire	493.00	7454.54	7458.86	7458.86	7460.73	0.010307	10.95	45.03	32.26	1.00
Sabino Canyon	4395	Post Fire	1446.00	7454.54	7460.77	7460.77	7462.16	0.010353	9.62	166.90	69.81	0.89
Sabino Canyon	4390	Pre Fire	493.00	7453.08	7457.66	7457.66	7458.81	0.012086	8.63	58.02	29.96	0.98
Sabino Canyon	4390	Post Fire	1446.00	7453.08	7459.97	7459.97	7461.28	0.011100	9.87	183.01	71.20	0.90
Sabino Canyon	4380	Pre Fire	493.00	7441.87	7445.21	7445.21	7446.11	0.015578	7.61	64.97	38.47	1.01
Sabino Canyon	4380	Post Fire	1446.00	7441.87	7447.14	7447.14	7448.67	0.014037	10.17	157.72	58.71	0.93
Sabino Canyon	4370	Pre Fire	684.00	7438.05	7442.30	7442.26	7443.32	0.015023	8.13	84.15	39.57	0.98
Sabino Canyon	4370	Post Fire	1969.00	7438.05	7444.49	7444.49	7446.26	0.014994	10.84	196.63	63.86	0.93

Profile Output Table - Culvert Only

Reach	River Sta	Profile	E.G. US	W.S. US	E.G. IC	E.G. OC	Min El	Weir Flow	Q Culv Group	Q Weir	Delta WS	Culv Vel US
Culv Vel DS	(ft/s)		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(ft)	(ft/s)
Sabino Canyon	4949	CULVERT#1	Pre Fire	7921.50	7921.38	7922.99	7921.50		7920.41	87.18	137.17	4.58
Sabino Canyon	4949	CULVERT#2	Pre Fire	7921.50	7921.38	7921.61	7921.50		7920.41	35.71	137.17	4.58
Sabino Canyon	4949	CULVERT#1	Post Fire	7922.49	7922.31	7922.23	7922.49		7920.41	81.25	479.36	3.91
Sabino Canyon	4949	CULVERT#2	Post Fire	7922.49	7922.31	7921.00	7922.51		7920.41	33.39	479.36	3.91
Sabino Canyon	4925	CULVERT#1	Pre Fire	7893.47	7893.06	7893.51	7893.47		7890.13	77.59	204.41	3.79
Sabino Canyon	4925	CULVERT#1	Post Fire	7896.36	7895.45	7896.31	7896.36		7890.13	81.27	605.73	3.69
Sabino Canyon	4885	CULVERT#1	Pre Fire	7867.63	7867.49	7867.67	7867.63		7866.37	229.14	52.86	4.01
Sabino Canyon	4885	CULVERT#1	Post Fire	7870.74	7870.40	7870.74	7870.74		7866.37	286.36	400.64	6.13
Sabino Canyon	4855	CULVERT#1	Pre Fire	7851.49	7851.38	7851.40	7851.49		7849.93	201.84	80.16	6.16
Sabino Canyon	4855	CULVERT#1	Post Fire	7853.67	7853.29	7853.66	7853.67		7849.93	200.88	311.60	5.83
Sabino Canyon	4825	CULVERT#1	Pre Fire	7821.45	7821.27	7820.91	7821.45		7823.26	282.00		5.86
Sabino Canyon	4825	CULVERT#1	Post Fire	7824.98	7824.85	7825.11	7824.98		7823.26	518.53	168.47	7.87
Sabino Canyon	4775	Culvert #1	Pre Fire	7771.17	7770.98	7771.05	7771.17		7769.40	137.70	159.30	5.58
Sabino Canyon	4775	Culvert #1	Post Fire	7773.17	7772.69	7773.06	7773.17		7769.40	150.96	636.04	6.47
Sabino Canyon	4745	CULVERT#1	Pre Fire	7738.07	7737.95	7738.07	7737.48		7737.01	225.80	71.20	4.91
Sabino Canyon	4745	CULVERT#1	Post Fire	7739.80	7739.48	7739.81	7739.80		7737.01	284.68	502.32	5.45
Sabino Canyon	4725	CULVERT#1	Pre Fire	7733.25	7733.22	7731.68	7733.24		7732.07	51.07	183.80	2.32
Sabino Canyon	4725	CULVERT#2	Pre Fire	7733.25	7733.22	7731.48	7733.25		7732.07	62.13	183.80	2.32
Sabino Canyon	4725	CULVERT#1	Post Fire	7734.19	7734.10	7731.60	7734.18		7732.07	50.32	675.30	2.19
Sabino Canyon	4725	CULVERT#2	Post Fire	7734.19	7734.10	7731.41	7734.20		7732.07	61.38	675.30	2.19
Sabino Canyon	4705.5	CULVERT#1	Pre Fire	7730.94	7730.87	7730.99	7730.94		7730.01	152.41	144.59	3.48
Sabino Canyon	4705.5	CULVERT#1	Post Fire	7732.03	7731.86	7732.02	7732.03		7730.01	140.67	646.33	2.85

Sabino Canyon	4675	CULVERT#1	Pre Fire	7719.82	7719.69	7719.79	7719.82	7718.51	28.39	270.61	1.29
8.03	8.03										
Sabino Canyon	4675	CULVERT#1	Post Fire	7720.87	7720.49	7720.84	7720.87	7718.51	30.39	852.04	1.25
8.60	8.60										
Sabino Canyon	4635	CULVERT#1	Pre Fire	7711.45	7711.37	7711.49	7711.45	7709.52	91.65	207.35	7.71
12.97	12.97										
Sabino Canyon	4635	CULVERT#1	Post Fire	7713.18	7712.89	7713.22	7713.18	7709.52	102.46	780.54	8.16
14.50	14.50										
Sabino Canyon	4595	CULVERT#1	Pre Fire	7678.49	7678.48	7678.49	7678.23	7677.41	83.91	215.09	3.55
8.90	13.09										
Sabino Canyon	4595	CULVERT#1	Post Fire	7679.56	7679.50	7679.59	7679.56	7677.41	95.19	787.81	3.04
10.10	10.10										
Sabino Canyon	4515	CULVERT#1	Pre Fire	7599.20	7599.06	7597.24	7599.21	7597.54	73.74	218.62	2.00
7.82	7.82										
Sabino Canyon	4515	Culvert #2	Pre Fire	7599.20	7599.06	7597.95	7599.20	7597.54	73.64	218.62	2.00
7.81	7.81										
Sabino Canyon	4515	CULVERT#1	Post Fire	7602.48	7602.24	7594.17	7602.48	7597.54	17.80	995.29	0.70
1.89	1.89										
Sabino Canyon	4515	Culvert #2	Post Fire	7602.48	7602.24	7594.83	7602.47	7597.54	16.91	995.29	0.70
1.79	1.79										
Sabino Canyon	4397.5	CULVERT#1	Pre Fire	7462.33	7461.92	7462.16	7462.33	7459.85	190.74	302.26	3.05
10.12	10.12										
Sabino Canyon	4397.5	CULVERT#1	Post Fire	7465.19	7464.21	7465.11	7465.19	7459.85	224.61	1221.29	3.45
11.92	11.92										

HEC-RAS OUTPUT

SABINO CREEK

CULVERT ANALYSIS (10-YEAR)

```

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  X  X
XXXXXXXX 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  X  XXXXXX  XXXX  X  X  X  X  XXXXX
  
```

PROJECT DATA

Project Title: Summerhaven
 Project File : SABINO CANYON CREEK.prj
 Run Date and Time: 12/19/2003 11:25:08 AM

Project in English units

Project Description:
 Sabino Canyon

PLAN DATA

Plan Title: CMG 10 year
 Plan File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\SABINO CANYON CREEK.p06

Geometry Title: CMG Culverts
 Geometry File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\SABINO CANYON CREEK.g02

Flow Title : 10 year SCS Type I event
 Flow File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\SABINO CANYON CREEK.f03

Plan Summary Information:

Number of: Cross Sections = 68 Multiple Openings = 0
 Culverts = 14 Inline Structures = 0
 Bridges = 0 Lateral Structures = 0

Computational Information

Water surface calculation tolerance = 0.01
 Critical depth calculation tolerance = 0.01
 Maximum number of iterations = 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: 10 year SCS Type I event
 Flow File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\SABINO CANYON CREEK.f03

Flow Data (cfs)

River	Reach	RS	Pre-Fire	Post-Fire
Reach #1	Sabino Canyon	5000	113	322
Reach #1	Sabino Canyon	4930	129	369
Reach #1	Sabino Canyon	4790	127	395
Reach #1	Sabino Canyon	4680	147	398
Reach #1	Sabino Canyon	4560	165	490
Reach #1	Sabino Canyon	4510	186	808
Reach #1	Sabino Canyon	4370	273	1076

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Reach #1	Sabino Canyon	Pre-Fire		Normal S = 0.01565
Reach #1	Sabino Canyon	Post-Fire		Normal S = 0.01565

GEOMETRY DATA

Geometry Title: CMG Culverts
 Geometry File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\SABINO CANYON CREEK.g02

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 5000

INPUT

Description:

Station	Elevation	Data	num=	25
Sta	Elev	Sta	Elev	Sta Elev Sta Elev
0	8010	10.46	8025	21.09 8020 31.2 8015 40.37 8010
49.49	8005	58.93	8000	68.54 7995 77.96 7990 88.64 7985
96.83	7982.98	142.41	7980	153.47 7976.07 169.59 7980 190.91 7982.53
201.25	7985	206.54	7986.31	221.18 7990 243.82 7995 267.78 8000
280.24	8002.52	288.85	8005	305.86 8010 321.81 8015 337.7 8020

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	142.41	.045	169.59	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 142.41 169.59 280.23 292.32 289.78 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4990

INPUT

Description:
 Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	8010	10.25	8005	20.5	8000	30.67	7995	40.73	7990
50.88	7985	60.93	7980	70.76	7975	80.29	7970	90.03	7965
100.32	7960	102.86	7958.87	120.3	7957.44	147.12	7955	155.89	7954.38
159	7955	168.81	7957.19	183.52	7960	215.73	7965	230.92	7967.47
235.72	7970	259.52	7975	279.34	7980	302.17	7985	307.56	7986.12
332.88	7990	372.22	7995						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	147.12	0	159	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 147.12 159 259.73 254.38 208.78 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4980

INPUT

Description:
 Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10.99	7990	23.56	7985	36.13	7980	48.9	7975	61.61	7970
74.39	7965	87.3	7960	101.02	7955	114.26	7950	120.99	7947.43
135.21	7945	148.27	7942.85	163.34	7940.24	172.75	7940	175	7939
177.1	7940	202.85	7942.73	210.37	7943.62	214.64	7945	229.73	7950
258.14	7955	261.59	7955.16	270.72	7960	280.11	7965	289.44	7970
299.74	7975	314.19	7980	329.81	7985	333.62	7986.12	358.82	7990

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
10.99	0	172.75	0	177.1	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 172.75 177.1 195.74 195.12 199.47 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4970

INPUT

Description:
 Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7990	8.68	7985	16.46	7980	24.1	7975	31.63	7970
39.22	7965	47.07	7960	57.44	7955	76.43	7950	96.26	7945
112.04	7940	123.18	7935	128.04	7932.69	158.34	7930	169.33	7927.21
195.13	7928.24	239.1	7930	256.36	7930.6	264.61	7935	270.84	7940
276.9	7945	282.9	7950	288.87	7955	295.3	7960	302.24	7965
309.34	7970	322.98	7975	339.39	7980				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	158.34	.045	195.13	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 158.34 195.13 109.28 110.18 116.2 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4955

INPUT

Description:
 Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7965	9.74	7960	20.56	7955	32.86	7950	42.4	7945
52.04	7940	61.69	7935	71.37	7930	81.03	7925	82.88	7924.11
101.18	7925	112.8	7920	113	7919.9	113.74	7920	133.3	7922.79
181.02	7925	184.2	7925.13	195.47	7930	207.28	7935	219.9	7940
233.19	7945	249.07	7950	265	7955	280.49	7960		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	101.18	.045	133.3	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 101.18 133.3 48.65 43.54 36.65 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4950

INPUT

Description: XSEC Upstream of Culvert # 16
 Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7965	9.02	7960	18.62	7955	27.88	7950	37.05	7945
46.22	7940	55.38	7935	64.38	7930	73.76	7925	81.27	7920.95
104.24	7920.78	105.78	7920	107.63	7915.22	114.55	7915.09	119.62	7915.16

126.13 7920 127.89 7920.63 182.08 7923.25 186.68 7925 199.43 7930
 212.03 7935 224.8 7940 238.83 7945 252.79 7950 266.83 7955
 283.81 7960

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 105.78 .045 126.13 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 105.78 126.13 44.18 37.93 31.14 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 106.1 7921.5 F
 120.6 283.81 7921.5 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4949

INPUT

Description: Culvert #16
 Distance from Upstream XS = 4.5
 Deck/Roadway Width = 20
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates
 num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 78.63 7920.4 114 7920.4 150 7920.4

Upstream Bridge Cross Section Data

Station Elevation Data num= 26
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7965 9.02 7960 18.62 7955 27.88 7950 37.05 7945
 46.22 7940 55.38 7935 64.38 7930 73.76 7925 81.27 7920.95
 104.24 7920.78 105.78 7920 107.63 7915.22 114.55 7915.09 119.62 7915.16
 126.13 7920 127.89 7920.63 182.08 7923.25 186.68 7925 199.43 7930
 212.03 7935 224.8 7940 238.83 7945 252.79 7950 266.83 7955
 283.81 7960

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 105.78 .045 126.13 .055

Bank Sta: Left Right Coeff Contr. Expan.
 105.78 126.13 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 106.1 7921.5 F
 120.6 283.81 7921.5 F

Downstream Deck/Roadway Coordinates

num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 83.93 7918.81 131 7918.81 158.35 7918.81

Downstream Bridge Cross Section Data

Station Elevation Data num= 30
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7970 7.83 7965 16.4 7960 25.34 7955 33.74 7950
 42.36 7945 51.07 7940 60.01 7935 68.77 7930 77.22 7925
 85.58 7920 87.95 7918.59 116.77 7918.95 126.78 7915 128.03 7913.55
 130.48 7913.45 133.47 7913.52 134.38 7915 143.93 7919.16 162.55 7920
 187.79 7921.36 195.75 7925 207.84 7930 220.19 7935 234.38 7940
 250.34 7945 267.17 7950 287.05 7955 306.95 7960 326.64 7965

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 116.77 .045 143.93 .055

Bank Sta: Left Right Coeff Contr. Expan.
 116.77 143.93 .3 .5

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 =
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Culverts = 2

Culvert Name Shape Rise Span
 CULVERT#1 Circular 3
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstream Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 4.5 20 .024 .024 0 5 1
 Upstream Elevation = 7915.29
 Centerline Station = 112.1
 Downstream Elevation = 7913.5
 Centerline Station = 128.93

Culvert Name Shape Rise Span
 CULVERT#2 Circular 2
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstream Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 4.5 20 .024 .024 0 5 1
 Upstream Elevation = 7915.42
 Centerline Station = 115.1
 Downstream Elevation = 7913.8
 Centerline Station = 131.93

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4948

INPUT

Description: XSEC Downstream of Culvert # 16

Station Elevation Data num= 30											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7970	7.83	7965	16.4	7960	25.34	7955	33.74	7950		
42.36	7945	51.07	7940	60.01	7935	68.77	7930	77.22	7925		
85.58	7920	87.95	7918.59	116.77	7918.95	126.78	7915	128.03	7913.55		
130.48	7913.45	133.47	7913.52	134.38	7915	143.93	7919.16	162.55	7920		
187.79	7921.36	195.75	7925	207.84	7930	220.19	7935	234.38	7940		
250.34	7945	267.17	7950	287.05	7955	306.95	7960	326.64	7965		

Manning's n Values num= 3											
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.013	116.77	.045	143.93	.055						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
116.77	143.93	100.62	93.02	81.56		.3	.5

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4940

INPUT

Station Elevation Data num= 32											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7990	12.37	7985	19.46	7980	26.13	7975	32.82	7970		
39.39	7965	46.02	7960	52.67	7955	59.87	7950	67.67	7945		
75.92	7940	84.24	7935	92.56	7930	100.84	7925	109.17	7920		
117.47	7915	118.25	7914.55	144.77	7914.55	160.69	7910	169.94	7907.29		
181.71	7910	204.89	7915	226.01	7920	242.77	7925	260.28	7930		
277.83	7935	293.54	7940	307.26	7945	321.97	7950	341.81	7955		
364.39	7960	382.07	7965								

Manning's n Values num= 3											
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.013	160.69	.045	181.71	.055						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
160.69	181.71	183.11	200.29	206.49		.3	.5

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4930

INPUT

Station Elevation Data num= 40											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7990	10.2	7985	19.18	7980	25.92	7975	32.35	7970		
38.84	7965	45.32	7960	51.83	7955	58.31	7950	64.86	7945		
72.28	7940	79.83	7935	87.33	7930	94.86	7925	102.3	7920		
109.63	7915	116.66	7910	125.8	7905	133.96	7900	136.06	7898.73		
153.35	7899.17	175.42	7895	178.77	7891.05	179.5	7886.01	184.12	7885.96		
188.16	7886.01	188.4	7891.05	190.82	7895	203.47	7898.35	209.94	7900		
228.39	7905	246.25	7910	263.87	7915	281.84	7920	300.86	7925		
321.17	7930	340.34	7935	349.09	7937.27	367.86	7937.89	378.66	7940		

Manning's n Values num= 3											
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	0	175.42	0	190.82	0						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
175.42	190.82	35.99	31.3	37.79		.3	.5

Ineffective Flow num= 2										
Sta L	Sta R	Elev	Permanent	Sta L	Sta R	Elev	Permanent			
0	178.85	7886.34	F							
189.85	378.66	7886.34	F							

CULVERT

RIVER: Reach #1
REACH: Sabino Canyon RS: 4925

INPUT

Description: Culvert #17 Guthrie Road										
Distance from Upstream XS	num=	Deck/Roadway Width	num=	Weir Coefficient	num=	Upstream Deck/Roadway Coordinates				
num=	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
5	176.02	7891.757	184.12	7891.257	191.62	7891.757				

Upstream Bridge Cross Section Data num= 40											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7990	10.2	7985	19.18	7980	25.92	7975	32.35	7970		
38.84	7965	45.32	7960	51.83	7955	58.31	7950	64.86	7945		
72.28	7940	79.83	7935	87.33	7930	94.86	7925	102.3	7920		
109.63	7915	116.66	7910	125.8	7905	133.96	7900	136.06	7898.73		
153.35	7899.17	175.42	7895	178.77	7891.05	179.5	7886.01	184.12	7885.96		
188.16	7886.01	188.4	7891.05	190.82	7895	203.47	7898.35	209.94	7900		
228.39	7905	246.25	7910	263.87	7915	281.84	7920	300.86	7925		
321.17	7930	340.34	7935	349.09	7937.27	367.86	7937.89	378.66	7940		

Manning's n Values num= 3											
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	0	175.42	0	190.82	0						

Bank Sta: Left	Right	Coeff	Contr.	Expan.
175.42	190.82		.3	.5

Ineffective Flow num= 2										
Sta L	Sta R	Elev	Permanent	Sta L	Sta R	Elev	Permanent			
0	178.85	7886.34	F							
189.85	378.66	7886.34	F							

Downstream Deck/Roadway Coordinates num= 3										
--	--	--	--	--	--	--	--	--	--	--

Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 177.777890.107 185.277889.607 192.777890.107

Downstream Bridge Cross Section Data
 Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7985	9.17	7980	16.69	7975	24.03	7970	31.43	7965
38.68	7960	45.88	7955	52.8	7950	59.7	7945	68.04	7940
76.34	7935	84.57	7930	92.6	7925	100.29	7920	107.92	7915
115.59	7910	123.35	7905	131.14	7900	137.2	7896.12	155.49	7895.55
158.84	7895	179.13	7889.65	179.61	7887.67	181.31	7884.8	185.55	7884.74
188.56	7884.78	189.12	7889.47	200.69	7895	218.76	7900	237.9	7905
255.89	7910	272.71	7915	288.67	7920	305.6	7925	324.29	7930
344.75	7935	354.74	7937.24	380.58	7937.21	389.75	7940		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	179.13	0	189.12	0

Bank Sta: Left Right Coeff Contr. Expan.
 179.13 189.12 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	171.84	7884.69	F
200	389.75	7884.69	F

Upstream Embankment side slope = 3 horiz. to 1.0 vertical
 Downstream Embankment side slope = 3 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .95
 Elevation at which weir flow begins =
 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 Arch 3.9167 5.9167
 FHWA Chart # 41- Arch, Corrugated metal
 FHWA Scale # 1 - 90 Degree headwall
 Solution Criteria = Highest U.S. EG

Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 6 22 .024 0 0 .5 1

Upstream Elevation = 7886.34
 Centerline Station = 184.12
 Downstream Elevation = 7884.69
 Centerline Station = 185.27

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4920

INPUT

Description: XSEC Downstream of Culvert # 17
 Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7985	9.17	7980	16.69	7975	24.03	7970	31.43	7965
38.68	7960	45.88	7955	52.8	7950	59.7	7945	68.04	7940
76.34	7935	84.57	7930	92.6	7925	100.29	7920	107.92	7915
115.59	7910	123.35	7905	131.14	7900	137.2	7896.12	155.49	7895.55
158.84	7895	179.13	7889.65	179.61	7887.67	181.31	7884.8	185.55	7884.74
188.56	7884.78	189.12	7889.47	200.69	7895	218.76	7900	237.9	7905
255.89	7910	272.71	7915	288.67	7920	305.6	7925	324.29	7930
344.75	7935	354.74	7937.24	380.58	7937.21	389.75	7940		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	179.13	0	189.12	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 179.13 189.12 89.2 95.09 89.24 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	171.84	7884.69	F
200	389.75	7884.69	F

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4910

INPUT

Description:
 Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7975	7.07	7970	14.12	7965	21.13	7960	28.12	7955
35.14	7950	44.47	7945	54.08	7940	63.13	7935	71.73	7930
80.21	7925	88.56	7920	96.05	7915	103.85	7910	112.71	7905
121.86	7900	130.79	7895	136.8	7891.8	162.5	7890.92	167.98	7890
191.23	7880	205.48	7890	223.02	7895	241.18	7900	260.68	7905
280.52	7910	300.22	7915	318.22	7920	335.53	7925	352.05	7930
369.3	7935	386.54	7940						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	167.98	0	205.48	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 167.98 205.48 242.99 229.2 209.27 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4900

INPUT

Description:
 Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7945	6.47	7940	17.24	7935	29.38	7930	39.56	7925

47.76	7920	55.06	7915	62.29	7910	70.05	7905	77.87	7900
86.67	7895	95.65	7890	105.03	7885	114.41	7880	119.95	7877.12
171.48	7876.87	179.79	7875	193.15	7971.16	195.33	7869.13	198.51	7869.05
200.13	7871.16	209.78	7875	228.29	7880	247.26	7885	264.19	7890
275.92	7895	287.41	7900	298.92	7905	311.4	7910	323.73	7915
336.22	7920	350.49	7925	364.8	7930	379.29	7935	393.38	7940

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	179.79	0	209.78	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

179.79	209.78	163.32	152.05	152.08	.1	.3
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CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4890

INPUT

Description: XSEC Upstream of Culvert # 18

Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7955	8.03	7950	15.42	7945	22.55	7940	28.1	7936.09
29.86	7935	37.6	7930	45.48	7925	53.39	7920	61.34	7915
69.89	7910	80	7905	91.69	7900	103.43	7895	115.24	7890
126.76	7885	131.22	7882.85	139.5	7880	154.12	7875	168.79	7870
176.85	7867.21	208.12	7867.08	218.11	7864.82	222.12	7860.44	225.25	7860
229.26	7860.15	233.27	7865.41	242.92	7870	257.15	7875	272.4	7880
287.28	7885	299.18	7890	310.69	7895	322.19	7900	335.77	7905
349.16	7910	362.25	7915	374.81	7920	386.81	7925	397.22	7930
409.76	7935	422.59	7940						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	208.12	.045	242.92	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

208.12	242.92	65.94	55.62	51.72	.3	.5
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	217.51	7871.51	F
235.51	422.59	7871.51	F

CULVERT

RIVER: Reach #1
REACH: Sabino Canyon RS: 4895

INPUT

Description: Culvert #18

Distance from Upstream XS = 5
Deck/Roadway Width = 17
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates

num= 3

Sta	H1	Cord	Lo	Cord	Sta	H1	Cord	Lo	Cord	
0	7871.07				228	7866.51			250	7866.07

Upstream Bridge Cross Section Data

Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7955	8.03	7950	15.42	7945	22.55	7940	28.1	7936.09
29.86	7935	37.6	7930	45.48	7925	53.39	7920	61.34	7915
69.89	7910	80	7905	91.69	7900	103.43	7895	115.24	7890
126.76	7885	131.22	7882.85	139.5	7880	154.12	7875	168.79	7870
176.85	7867.21	208.12	7867.08	218.11	7864.82	222.12	7860.44	225.25	7860
229.26	7860.15	233.27	7865.41	242.92	7870	257.15	7875	272.4	7880
287.28	7885	299.18	7890	310.69	7895	322.19	7900	335.77	7905
349.16	7910	362.25	7915	374.81	7920	386.81	7925	397.22	7930
409.76	7935	422.59	7940						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	208.12	.045	242.92	.055

Bank Sta: Left Right Coeff Contr. Expan.

208.12	242.92	.3	.5		
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	217.51	7871.51	F
235.51	422.59	7871.51	F

Downstream Deck/Roadway Coordinates

num= 3

Sta	H1	Cord	Lo	Cord	Sta	H1	Cord	Lo	Cord	
175.25	7865				228	7865			260	7865

Downstream Bridge Cross Section Data

Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7955	9.24	7950	18.01	7945	26.61	7940	34.66	7936.16
37.14	7935	47.91	7930	58.28	7925	68.5	7920	78.59	7915
88.77	7910	99.02	7905	109.08	7900	118.97	7895	128.92	7890
138.76	7885	143.11	7882.85	149.4	7880	162	7875	175.25	7870
188.62	7865	193.66	7863.09	222.3	7863.8	235.22	7861.86	237.29	7859.27
243.09	7859.3	243.97	7861.86	248.21	7865	259.41	7870	271.61	7875
283.77	7880	295.55	7885	307.06	7890	318.39	7895	329.64	7900
340.95	7905	353.78	7910	364.74	7915	375.13	7920	385.29	7925
395.01	7930	404.8	7935	417.95	7940				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	222.3	0	248.21	0

Bank Sta: Left Right Coeff Contr. Expan.

222.3	248.21	.3	.5		
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	235.22	7861	F
243.97	417.95	7861	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 =
 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 3.5
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 5 19 .024 024 0 .5 1

Number of Barrels = 2
 Upstream Elevation = 7860
 Centerline Stations
 Sta. Sta.
 223.5 228
 Downstream Elevation = 7859.87
 Centerline Stations
 Sta Sta
 238 242

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4880

INPUT

Description: XSEC Downstream of Culvert # 18
 Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7955	9.24	7950	18.01	7945	26.61	7940	34.66	7936.16
37.14	7935	47.91	7930	58.28	7925	68.6	7920	78.59	7915
88.77	7910	99.02	7905	109.08	7900	118.97	7895	128.92	7890
139.76	7885	143.11	7882.85	149.4	7880	162	7875	175.25	7870
188.62	7865	193.66	7863.09	222.3	7863.8	235.22	7861.86	237.29	7859.27
243.09	7859.3	243.97	7861.86	248.21	7865	259.41	7870	271.61	7875
283.77	7880	295.55	7885	307.06	7890	318.39	7895	329.64	7900
340.95	7905	353.78	7910	364.74	7915	375.11	7920	385.29	7925
395.01	7920	404.8	7935	417.95	7940				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	222.3	0	248.21	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 222.3 248.21 120.36 140.56 143.52 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	225.22	7861	F
243.97	417.95	7861	F

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4870

INPUT

Description: XSEC Upstream of Culvert # 18
 Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7935	6.76	7930	13.54	7925	20.47	7920	27.76	7915
35.18	7910	43.8	7905	54.91	7900	66.11	7895	77.35	7890
89.08	7885	94.94	7882.85	100.9	7880	111.4	7875	121.69	7870
131.18	7865	140.28	7860	152.35	7857.12	193.66	7857.78	205	7856
209	7851	212	7851	218.55	7860	227.68	7865	236.85	7870
245.63	7875	253.64	7880	261.55	7885	269.55	7890	277.72	7895
285.91	7900	294.31	7905	308.91	7910	322.62	7915	334.41	7920
345.18	7925	355.23	7930	364.25	7935				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	193.66	0	218.55	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 193.66 218.55 86.06 123.02 129.77 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4860

INPUT

Description: XSEC Upstream of Culvert # 19
 Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
12.24	7925	18.7	7920	25.39	7915	33.1	7910	41.04	7905
48.88	7900	56.81	7895	64.57	7890	72.3	7885	75.66	7882.85
81.55	7880	91.68	7875	101.81	7870	111.95	7865	122.09	7860
133.19	7855	144.7	7850	156.31	7850	183.19	7849.88	190	7846.11
193	7841	197	7841	200.03	7846.11	206.33	7850	214.52	7855
222.64	7860	233.18	7865	259.4	7869.91	259.51	7870	278.65	7875
333.65	7880	363.57	7885	390.4	7890				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
12.24	0	183.19	0	206.33	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 183.19 206.33 29.33 33.29 29.29 .1 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
12.24	190.61	7853.67	F
207.61	390.4	7853.67	F

CULVERT

RIVER: Reach #1
REACH: Sabino Canyon RS: 4855

INPUT

Description: Culvert #19
Distance from Upstream XS = 5
Deck/Roadway Width = 19.5
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
183.19		7849.88			206.33		7850		

Upstream Bridge Cross Section Data

Station	Elevation	Data	num=	33					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
12.24	7925	18.7	7920	25.39	7915	33.1	7910	41.04	7905
48.88	7900	56.81	7895	64.57	7890	72.3	7885	75.66	7882.85
81.53	7890	91.88	7875	101.81	7870	111.95	7865	122.09	7860
133.19	7855	144.7	7850	176.31	7850	183.19	7849.88	190	7846.11
193	7841	197	7841	200.02	7846.11	206.33	7850	214.52	7855
222.64	7860	233.18	7865	259.4	7869.91	259.51	7870	278.65	7875
333.65	7880	363.57	7885	390.4	7890				

Manning's n Values

Sta	n	Val	Sta	n	Val	Sta	n	Val
12.24	0	183.19	0	206.33	0			

Bank Sta: Left Right

Left	Right	Coeff	Contr.	Expan.
183.19	206.33	.3		.5

Ineffective Flw num= 2

Sta L	Sta R	Elev	Permanent
12.24	190.61	7853.67	F
207.61	390.4	7853.67	F

Downstream Deck/Roadway Coordinates

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
154.95		7848.82			188.12		7848.43		

Downstream Bridge Cross Section Data

Station	Elevation	Data	num=	35					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7915	7.98	7910	15.95	7905	23.71	7900	31.42	7895
39.08	7890	46.67	7885	49.95	7882.85	56.09	7880	66.94	7875
77.81	7870	88.64	7865	95.23	7860	110.84	7855	122.45	7850
123.67	7849.52	154.95	7848.82	169.66	7845	171.58	7843.52	172.5	7841
177	7841	179.08	7843.52	179.7	7845	188.12	7846.43	194.32	7850
207.99	7855	221.51	7859.84	222.15	7860	241.04	7865	300.86	7870
320.26	7872.94	325.04	7875	337.24	7880	349.74	7885	364.98	7890

Manning's n Values

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	0	154.95	0	188.12	0			

Bank Sta: Left Right

Left	Right	Coeff	Contr.	Expan.
154.95	188.12	.3		.5

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 =
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 # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 1 - Headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
5 19.5 .024 .024 0 .5 1

Number of Barrels = 2

Upstream Elevation = 7841.2

Centerline Stations

Sta.	Sta.
193.25	196.75

Downstream Elevation = 7841

Centerline Stations

Sta.	Sta.
173.53	176.6

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4850

INPUT

Description: XSEC Downstream of Culvert # 19

Station	Elevation	Data	num=	35					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7915	7.98	7910	15.95	7905	23.71	7900	31.42	7895
39.08	7890	46.67	7885	49.95	7882.85	56.09	7880	66.94	7875
77.81	7870	88.64	7865	95.23	7860	110.84	7855	122.45	7850
123.67	7849.52	154.95	7848.82	169.66	7845	171.58	7843.52	172.5	7841
177	7841	179.08	7843.52	179.7	7845	188.12	7846.43	194.32	7850
207.99	7855	221.51	7859.84	222.15	7860	241.04	7865	300.86	7870
320.26	7872.94	325.04	7875	337.24	7880	349.74	7885	364.98	7890

Manning's n Values

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	0	154.95	0	188.12	0			

Bank Sta: Left Right

Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
154.95	188.12	173.2	160.5	156.02	.3		.5

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4840

INPUT

Description: Station Elevation Data num= 41
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
53 7925 8.01 7920 15.1 7915 22.33 7910 29.54 7905
36.77 7900 44 7895 51.19 7890 58.4 7885 61.45 7882.85
67.06 7880 76.72 7875 85.89 7870 94.72 7865 103.5 7860
112.21 7855 121.03 7850 130.02 7845 139.05 7840 148.05 7835
156.85 7830 158.04 7829.26 177.05 7828.93 190.97 7826.07 203.71 7830
220.15 7835 234.67 7840 245.73 7845 255.42 7850 264.94 7855
274.46 7860 283.87 7865 292.14 7870 295.65 7872.57 301.58 7875
313.78 7880 325.99 7885 338.22 7890 345.33 7892.95 350.34 7895
361.65 7900

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
.53 0 177.05 0 203.71 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr Expan.
177.05 203.71 154.55 159.38 160.08 .1 .2

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4830

INPUT

Description: XSEC Upstream of Culvert # 20 Station Elevation Data num= 43
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7920 8.38 7915 16.36 7910 24.24 7905 32.14 7900
40.04 7895 47.87 7890 55.62 7885 59 7882.85 63.75 7880
72.51 7875 81.4 7870 90.2 7865 99.03 7860 107.9 7855
116.67 7850 125.12 7845 133.7 7840 142.49 7835 151.32 7830
160.13 7825 167.65 7821.03 191.27 7822.32 196.41 7820 207.67 7815.02
218.66 7820 228.65 7825 238.51 7830 248.34 7835 258.29 7840
268.15 7845 279.24 7850 292.01 7855 304.18 7860 315.79 7865
327.39 7870 341.24 7875 355.23 7880 368.25 7885 381.2 7890
388.74 7892.95 392.84 7895 402.85 7900

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 191.27 0 218.66 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr Expan.
191.27 218.66 48.5 48.05 48.26 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 201.11 7820 F
214.11 402.85 7820 F

CULVERT

RIVER: Reach #1
REACH: Sabino Canyon RS: 4825

INPUT

Description: Culvert #20
Distance from Upstream XS = 6
Deck/Roadway Width = 20
Weir Coefficient = 3.1
Upstream Deck/Roadway Coordinates num= 2
Sta H: Cord Lo Cord Sta H: Cord Lo Cord
160.13 7825 228.65 7823.16

Upstream Bridge Cross Section Data Station Elevation Data num= 43
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7920 8.38 7915 16.36 7910 24.24 7905 32.14 7900
40.04 7895 47.87 7890 55.62 7885 59 7882.85 63.75 7880
72.51 7875 81.4 7870 90.2 7865 99.03 7860 107.9 7855
116.67 7850 125.12 7845 133.7 7840 142.49 7835 151.32 7830
160.13 7825 167.65 7821.03 191.27 7822.32 196.41 7820 207.67 7815.02
218.66 7820 228.65 7825 238.51 7830 248.34 7835 258.29 7840
268.15 7845 279.24 7850 292.01 7855 304.18 7860 315.79 7865
327.39 7870 341.24 7875 355.23 7880 368.25 7885 381.2 7890
388.74 7892.95 392.84 7895 402.85 7900

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 191.27 0 218.66 0

Bank Sta: Left Right Coeff Contr Expan.
191.27 218.66 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 201.11 7820 F
214.11 402.85 7820 F

Downstream Deck/Roadway Coordinates num= 3
Sta H: Cord Lo Cord Sta H: Cord Lo Cord Sta H: Cord Lo Cord
166.73 7822 233.04 7820.55 256.33 7821.32

Downstream Bridge Cross Section Data Station Elevation Data num= 46
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7929.7 6.73 7925 14.1 7920 21.5 7915 28.98 7910
36.44 7905 43.95 7900 51.43 7895 58.66 7890 65.6 7885
68.53 7882.85 73.5 7880 82.15 7875 91.02 7870 99.81 7865
108.74 7860 117.29 7855 125.35 7850 133.56 7845 141.71 7840
149.77 7835 157.79 7830 166.73 7825 178.27 7820 178.47 7820
204.17 7818.83 215.42 7815 225.31 7811.68 233.04 7815 244.86 7820
256.33 7825 267.36 7830 278.31 7835 289.81 7840 301.11 7845
311.96 7850 322.51 7855 332.77 7860 343.09 7865 357.04 7870
371.31 7875 384.61 7880 396.44 7885 408.32 7890 415.48 7892.95
419.52 7895

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 204.17 0 244.86 0

Bank Sta: Left Right Coeff Contr. Expan.
 204.17 244.86 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 219.34 7815 F
 232.34 419.52 7815 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 =
 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 Arch 4 6
 FHWA Chart # 41 - Arch; Corrugated metal
 FHWA Scale # 1 - 90 Degree headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 6 20 .024 .024 0 .5 1

Number of Barrels = 2
 Upstream Elevation = 7816.6
 Centerline Stations
 Sta. Sta.
 204.11 211.11
 Downstream Elevation = 7812.68
 Centerline Stations
 Sta. Sta.
 222.34 229.34

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4820

INPUT
 Description: XSEC Upstream of Culvert # 20
 Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7929.7	6.73	7925	14.1	7920	21.5	7915	28.98	7910
36.44	7905	43.95	7900	51.43	7895	58.66	7890	65.6	7885
68.53	7882.85	73.5	7880	82.15	7875	91.02	7870	99.81	7865
108.74	7860	117.29	7855	125.35	7850	133.56	7845	141.71	7840
149.77	7835	157.79	7830	166.73	7825	178.27	7820	178.47	7820
204.17	7818.83	215.42	7815	225.31	7811.68	233.04	7815	244.86	7820
256.33	7825	267.36	7830	278.31	7835	289.81	7840	301.11	7845
311.96	7850	322.51	7855	332.77	7860	343.09	7865	357.04	7870
371.31	7875	384.61	7880	396.44	7885	408.32	7890	415.48	7892.95
419.52	7895								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 204.17 0 244.86 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 204.17 244.86 164.6 153.11 138.65 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 219.34 7815 F
 232.34 419.52 7815 F

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4810

INPUT
 Description:
 Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7915	7.66	7910	15.68	7905	26.07	7900	36.71	7895
47.11	7890	56.59	7885	60.53	7882.85	74.99	7880	86.96	7875
98.26	7870	109.57	7865	120.2	7860	131.21	7855	142.14	7850
151.62	7845	160.97	7840	170.27	7835	179.87	7830	190.53	7825
201.39	7820	212.6	7815	223.76	7810	228.83	7807.44	248.16	7808.53
255.8	7805	264.58	7801.11	274.29	7805	287.92	7810	301.5	7815
315.15	7820	328.78	7825	342.07	7830	355.2	7835	368.72	7840
382.65	7845	396.22	7850	410.22	7855	419.28	7860	427.23	7865
435.09	7870	442.9	7875	450.76	7880	458.97	7885	467.43	7890
472.45	7892.95	476.45	7895						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 248.16 .04 287.92 .03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 248.16 287.92 275.35 305.07 315.05 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4800

INPUT
 Description:
 Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7880	15.89	7875	31.63	7870	46.86	7865	61.58	7860
75.94	7855	90.57	7850	105.45	7845	121.4	7840	137.09	7835
142.29	7833.37	165.78	7833.77	173.12	7830	182.91	7825	192.66	7820
201.95	7815	214.65	7810	229.01	7805	243.26	7800	258.52	7795
273.96	7790	281.29	7787.57	305.26	7787.63	323.24	7784.96	324.16	7784.16

326.77	7784.09	327.09	7785.04	334.87	7790	343.66	7795	352.32	7800
360.73	7805	369.34	7810	377.69	7815	385.88	7820	394	7825
402.42	7830	411.45	7835	419.8	7840	427.87	7845	435.89	7850
444.02	7855	444.64	7855.45	460.3	7860	478.56	7865	497.77	7870
518.37	7875								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 305.26 .04 334.87 .03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 305.26 334.87 128.1 88.46 74.01 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4790

INPUT

Description:
 Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7830	9.57	7825	20.6	7820	34.65	7815	48.61	7810
62.09	7805	76.58	7800	92.01	7795	106.96	7790	121.05	7785
126.31	7783.96	220.18	7780.18	225.05	7780	245.15	7778.22	245.97	7777.01
248.48	7777.01	249.23	7778.3	251.36	7780	261.13	7785	271.43	7790
281.8	7795	290.96	7800	299.83	7805	308.76	7810	317.59	7815
326.22	7820	334.52	7825	342.45	7830	350.26	7835	358	7840
365.73	7845	373.77	7850	382.4	7855	383.09	7855.45	396.67	7860
411.1	7865	426.83	7870						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 220.18 .04 261.13 .03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 220.18 261.13 185.19 110.34 113.96 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4780

INPUT

Description: Upstream of Culvert #9
 Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7845	15.21	7840	31.46	7835	43.71	7830	53.79	7825
63.08	7820	71.78	7815	73.03	7814.14	83.33	7812.32	103.89	7810
115.5	7808.74	120.01	7805	126.02	7800	132.06	7795	132.37	7794.67
143.19	7790	150.51	7786.74	182.84	7785.9	186.05	7785	203.55	7780
211.61	7777.64	262.07	7775	318.04	7771.97	329.17	7769.94	334.52	7766.73
337.81	7765.57	344.59	7765.57	347.9	7766.58	350.58	7770.23	351.96	7773.3
357.47	7775	377.77	7780	379.48	7780.35	407.68	7785	417.42	7790
427.25	7795	437.79	7800	450.36	7805	457.27	7807.76	460.41	7810
468.79	7815	477.32	7820	486.69	7825	496.31	7830	505.89	7835
515.44	7840	525.27	7845	536	7850	548.49	7855	549.73	7855.45
567.3	7860								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 318.04 0 351.96 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 318.04 351.96 180.71 135.48 113.78 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 335.59 7770.38 F
 347.37 567.3 7770.38 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4775

INPUT

Description: Culvert #9 Under Sabino Canyon Road
 Distance From Upstream XS = 15
 Deck/Roadway Width = 115
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates
 num= 5

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
318.04	7771.97				320	7772				331.41	7771.067			
341.41	7770.567				351.41	7771.067								

Upstream Bridge Cross Section Data
 Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7845	15.21	7840	31.46	7835	43.71	7830	53.79	7825
63.08	7820	71.78	7815	73.03	7814.14	83.33	7812.32	103.89	7810
115.5	7808.74	120.01	7805	126.02	7800	132.06	7795	132.37	7794.67
143.19	7790	150.51	7786.74	182.84	7785.9	186.05	7785	203.55	7780
211.61	7777.64	262.07	7775	318.04	7771.97	329.17	7769.94	334.52	7766.73
337.81	7765.57	344.59	7765.57	347.9	7766.58	350.58	7770.23	351.96	7773.3
357.47	7775	377.77	7780	379.48	7780.35	407.68	7785	417.42	7790
427.25	7795	437.79	7800	450.36	7805	457.27	7807.76	460.41	7810
468.79	7815	477.32	7820	486.69	7825	496.31	7830	505.89	7835
515.44	7840	525.27	7845	536	7850	548.49	7855	549.73	7855.45
567.3	7860								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 318.04 0 351.96 0

Bank Sta: Left Right Coeff Contr. Expan.
 318.04 351.96 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 335.59 7770.38 F
 347.37 567.3 7770.38 F

Downstream Deck/Roadway Coordinates
 num= 5

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
65.59	7767.38				103.88	7767.692				113.88	7767.192			
123.98	7767.692				190	7767								

Downstream Bridge Cross Section Data
 Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7793.37	8.55	7790	21.16	7785	34.28	7780	47.01	7775
59.1	7770	65.59	7767.38	84.83	7767.23	104.03	7766.75	107.58	7765
108.99	7763.31	110.18	7762.38	111.27	7762.3	113.87	7762.16	115.72	7762.38
117.62	7762.23	117.99	7762.75	120.75	7764.47	146.74	7765	182.65	7765.82
192.5	7769.56	202.22	7770	221.95	7775	234.31	7780	244.98	7785
255.31	7790	265.61	7795	270	7800				

Manning's n Values num= 3

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	0	108.99	0	120.75	0			

Bank Sta: Left Right Coeff Contr. Expan.
 108.99 120.75 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	108.99	7764	F
120.75	270	7764	F

Upstream Embankment side slope = 2 horiz. to 1.0 vertical
 Downstream Embankment side slope = 1 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .95
 Elevation at which weir flow begins =
 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 Arch 3.9167 5.9167
 FWA Chart # 41- Arch: Corrugated metal
 FWA Scale # 1 - 90 Degree headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 14 118 .024 .024 0 .5 1
 Upstream Elevation = 7765.65
 Centerline Station = 341.41
 Downstream Elevation = 7762.275
 Centerline Station = 113.88

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4770

INPUT

Description: Downstream of Culvert #9
 Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7793.37	8.55	7790	21.16	7785	34.28	7780	47.01	7775
59.1	7770	65.59	7767.38	84.83	7767.23	104.03	7766.75	107.58	7765
108.99	7763.31	110.18	7762.38	111.27	7762.3	113.87	7762.16	115.72	7762.38
117.62	7762.23	117.99	7762.75	120.75	7764.47	146.74	7765	182.65	7765.82
192.5	7769.56	202.22	7770	221.95	7775	234.31	7780	244.98	7785
255.31	7790	265.61	7795	270	7800				

Manning's n Values num= 3

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	0	108.99	0	120.75	0			

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 108.99 120.75 152.22 145.66 138.18 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	108.99	7764	F
120.75	270	7764	F

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4765

INPUT

Description:
 Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7793.37	8.43	7790	21.05	7785	35.54	7780	60.89	7775
61.89	7774.76	98.62	7771.82	103.59	7770	105.34	7769.32	114.58	7765.57
129.34	7765.91	130.97	7765	140.17	7760	149.24	7755	150.51	7754.31
153.49	7755	171.62	7759.25	190.61	7760	224.99	7761.95	233.98	7765
244.4	7768.4	255.01	7770	283.74	7772.88	286.83	7775	293.57	7780
300.01	7785	306.44	7790	312.82	7795	318.99	7800	319.54	7800.48

Manning's n Values num= 3

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	.055	140.17	.04	171.62	.045			

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 140.17 171.62 178.1 172.24 175.18 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4760

INPUT

Description:
 Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7800	48.13	7795	57.91	7793.37	70.73	7790	87.74	7785
103.72	7780	119.23	7775	135.68	7770	152.1	7765	168.46	7760

191.63	7755	216.97	7753.01	224.1	7750	234.82	7745.58	236.49	7745
245.14	7740.23	252.63	7740.23	267.13	7745	276.33	7747.54	323.9	7748.45
329.02	7750	346.84	7755	356.02	7757.42	405.99	7760	418.63	7761.05
434.12	7765	452.29	7770	465.67	7775	466.32	7775.26	480.51	7775.88
487.53	7780	496.79	7785	507.65	7790	518.6	7795	520.87	7795.81
558.11	7796.51								

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 .055 234.82 .04 276.33 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 234.82 276.33 116.92 125.62 133.13 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4750

INPUT

Description: XSEC Upstream of Culvert # 8
 Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7775	25.04	7770	52.39	7765	74.31	7760	112.6	7757.98
124.17	7755	131.34	7750	136.33	7747.92	160.75	7745	181.65	7740
195.81	7737.68	198.48	7733.95	200.76	7731.6	203.39	7730.73	208.74	7730.73
212.05	7732.07	212.76	7734.24	215.88	7737.68	228.79	7738.29	270.58	7740
276.7	7740.58	309.3	7745	328.13	7750	342.76	7755	362.19	7760
366.45	7761.19	379.42	7761.69	389.12	7765	403.32	7770	411.96	7775

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 0 195.81 0 215.88 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 195.81 215.88 36.73 43.9 85.3 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 201.04 7735.63 F
 210.97 411.96 7735.7 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4745

INPUT

Description: Culvert #8
 Distance from Upstream XS = 10
 Deck/Roadway Width = 18
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates num= 3

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
0	7737				203	7737				273	7737			

Upstream Bridge Cross Section Data
 Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7775	25.04	7770	52.39	7765	74.31	7760	112.6	7757.98						
124.17	7755	131.34	7750	136.33	7747.92	160.75	7745	181.65	7740						
195.81	7737.68	198.48	7733.95	200.76	7731.6	203.39	7730.73	208.74	7730.73						
212.05	7732.07	212.76	7734.24	215.88	7737.68	228.79	7738.29	270.58	7740						
276.7	7740.58	309.3	7745	328.13	7750	342.76	7755	362.19	7760						
366.45	7761.19	379.42	7761.69	389.12	7765	403.32	7770	411.96	7775						

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 0 195.81 0 215.88 0

Bank Sta: Left Right Coeff Contr. Expan.
 195.81 215.88 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 201.04 7735.63 F
 210.97 411.96 7735.7 F

Downstream Deck/Roadway Coordinates num= 3

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
0	7737				335	7737				450	7737			

Downstream Bridge Cross Section Data
 Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7790	18.17	7789.85	25.56	7785	29.11	7782.96	78.38	7780						
115.58	7777.28	123.3	7775	145.09	7770	168.25	7765	186.28	7760						
210.81	7755	231.71	7752.09	263.3	7750	286.47	7745	304.43	7740						
319.7	7735	331.44	7730	332.85	7729.32	336.81	7730	363.39	7734.61						
370.52	7735	399.4	7735.46	429.43	7740	445.76	7742.78	456.35	7745						
477.1	7750	493.85	7755	509.59	7760	525.12	7765	540.4	7770						

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 0 319.7 0 363.39 0

Bank Sta: Left Right Coeff Contr. Expan.
 319.7 363.39 .3 .5

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 =
 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	4	
FHWA Chart # 2 - Corrugated Metal Pipe Culvert			

FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef

10 18 .024 .024 1 .5 1
 Number of Barrels = 2
 Upstream Elevation = 7730.3
 Centerline Stations
 Sta. Sta.
 203.04 208.04
 Downstream Elevation = 7730
 Centerline Stations
 Sta. Sta.
 331.44 336.44

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4740

INPUT

Description: XSEC Downstream of Culvert # 8

Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7790	18.17	7788.85	25.56	7785	29.11	7782.96	38.38	7780
115.58	7777.28	123.3	7775	145.09	7770	168.25	7765	186.28	7760
210.81	7755	231.71	7752.09	263.3	7750	286.47	7745	304.43	7740
319.7	7735	331.44	7730	332.85	7729.32	336.81	7730	363.39	7734.61
370.52	7735	399.4	7735.46	429.43	7740	445.76	7742.78	456.35	7745
477.1	7750	493.85	7755	509.59	7760	525.12	7765	540.4	7770

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	319.7	0	363.39	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 319.7 363.39 50.45 40.63 29.76 .3 .5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4730

INPUT

Description: XSEC Upstream of Culvert # 7

Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	1.57	7768.14	19.16	7765	37.8	7761.87	42.81	7760
54.83	7755	68.18	7750	111.13	7745	152.63	7740	172.75	7735
183.79	7732.09	192.68	7730	206.71	7726.52	225.94	7730	238.84	7732.31
275.52	7732.55	292.96	7735	309.07	7740	311.46	7740.73	327.8	7745
345.99	7750	364.34	7755	379.53	7760	394.84	7765	410.2	7770

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	183.79	0	238.84	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 183.79 238.84 24.27 25.79 30.08 .3 .5

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4725

INPUT

Description: Culvert #7

Distance from Upstream XS = 3
 Deck/Roadway Width = 18.5
 Weir Coefficient = 3.1

Upstream Deck/Roadway Coordinates num= 3

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
0	7736.81				206.71	7732.68			
					300	7730.81			

Upstream Bridge Cross Section Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	1.57	7768.14	19.16	7765	37.8	7761.87	42.81	7760
54.83	7755	68.18	7750	111.13	7745	152.63	7740	172.75	7735
183.79	7732.09	192.68	7730	206.71	7726.52	225.94	7730	238.84	7732.31
275.52	7732.55	292.96	7735	309.07	7740	311.46	7740.73	327.8	7745
345.99	7750	364.34	7755	379.53	7760	394.84	7765	410.2	7770

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	183.79	0	238.84	0

Bank Sta: Left Right Coeff Contr. Expan.
 183.79 238.84 .3 .5

Downstream Deck/Roadway Coordinates num= 3

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
0	7735.8				225	7731.3			
					300	7732.8			

Downstream Bridge Cross Section Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	16.1	7766.74	23.33	7765	37.67	7761.76	42.16	7760
59.64	7755	73	7750	101.01	7745	140.61	7740	179.47	7735
202.2	7730	224.77	7726.01	248.4	7730	255.9	7731.35	286.97	7731.83
311.58	7735	319.29	7735.04	335.52	7740	353.13	7745	370.69	7750
389.42	7755	406.22	7760	420.04	7765	432.56	7770		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	202.2	0	255.9	0

Bank Sta: Left Right Coeff Contr. Expan.
 202.2 255.9 .3 .5

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 =
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Culverts = 2

Culvert Name Shape Rise Span
 CULVERT#1 Circular 2
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 3 18.5 .024 .024 0 .5 1
 Number of Barrels = 2
 Upstream Elevation = 7727.82
 Centerline Stations
 Sta. Sta.
 202.71 210.71
 Downstream Elevation = 7727.31
 Centerline Stations
 Sta. Sta.
 220.77 228.77

Culvert Name Shape Rise Span
 CULVERT#2 Circular 3
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 3 18.5 .024 .024 0 .5 1
 Upstream Elevation = 7726.52
 Centerline Station = 206.71
 Downstream Elevation = 7726.01
 Centerline Station = 224.77

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4720

INPUT
 Description: XSEC Downstream of Culvert # 7
 Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	16.1	7766.74	23.33	7765	37.67	7761.76	42.16	7760
59.64	7755	73	7750	101.01	7745	140.61	7740	179.47	7735
202.2	7730	224.77	7726.01	248.4	7730	255.9	7731.35	286.97	7731.83
311.58	7735	319.29	7735.04	335.52	7740	353.13	7745	370.69	7750
389.42	7755	406.22	7760	420.04	7765	432.56	7770		

Manning's n	Values	num=	1
Sta	n Val	Sta	n Val
0	0	202.2	0
255.9	0		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
202.2	255.9	66.79	45.97	38.28	.3	.5	

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4710

INPUT
 Description: XSEC Upstream of Culvert # 6
 Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7750	18.81	7745	64.05	7740	83.89	7735	142.51	7730
152.76	7727.75	154.24	7724.87	166.73	7724.86	169.26	7727.82	179.94	7730
188.46	7730.6	224.23	7730.81	242.67	7734.44	249.01	7735	265.56	7736.64
277.28	7740	294.97	7745	314.8	7750	336.67	7755		

Manning's n	Values	num=	1
Sta	n Val	Sta	n Val
0	0	142.51	0
179.94	0		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
142.51	179.94	58.79	39.28	43.38	.3	.5	

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4705.5

INPUT
 Description: Culvert #6
 Distance from Upstream XS = 10
 Deck/Roadway Width = 19
 Weir Coefficient = 3.1

Upstream Deck/Roadway Coordinates	num=	3
Sta Hi Cord Lo Cord	Sta Hi Cord Lo Cord	Sta Hi Cord Lo Cord
75.93	7730	156
249.01	7730	

Upstream Bridge Cross Section Data
 Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7750	18.81	7745	64.05	7740	83.89	7735	142.51	7730
152.76	7727.75	154.24	7724.87	166.73	7724.86	169.26	7727.82	179.94	7730
188.46	7730.6	224.23	7730.81	242.67	7734.44	249.01	7735	265.56	7736.64
277.28	7740	294.97	7745	314.8	7750	336.67	7755		

Manning's n	Values	num=	1
Sta	n Val	Sta	n Val
0	0	142.51	0
179.94	0		

Bank Sta:	Left	Right	Coeff Contr.	Expan.
142.51	179.94	.3	.5	

Downstream Deck/Roadway Coordinates
 num= 3

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
99.24		7730			215		7730			240		7730		

Downstream Bridge Cross Section Data
 Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7740	2.98	7740.27	25.64	7741.2	86.03	7740.4	86.77	7740
95.64	7735	99.24	7732.98	152.16	7730	172.93	7728.67	176.44	7724.44
182.37	7724.31	188.43	7724.44	199.4	7727.91	234.24	7729.2	237.32	7730
251.86	7733.46	263.95	7735	305.08	7740	327.17	7745	346.76	7750
365.54	7755	383.89	7760						

Manning's n Values num= 3

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	0	172.93	0	199.4	0			

Bank Sta: Left Right Coeff Contr. Expan.
 172.93 199.4 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	177	7729	F
187	383.89	7729	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 =
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef

10	19	.024	.024	0		.5	1
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Number of Barrels = 2
 Upstream Elevation = 7724.8
 Centerline Stations

Sta	Sta
157.5	162.5

 Downstream Elevation = 7724.3
 Centerline Stations

Sta	Sta
179.69	184.69

CROSS SECTION

RIVER: Reach #1
 REACH: Sabinc Canyon RS: 4701

INPUT

Description: XSEC Downstream of Culvert # 6
 Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7740	2.98	7740.27	25.64	7741.2	86.03	7740.4	86.77	7740
95.64	7735	99.24	7732.98	152.16	7730	172.93	7728.67	176.44	7724.44
182.37	7724.31	188.43	7724.44	199.4	7727.91	234.24	7729.2	237.32	7730
251.86	7733.46	263.95	7735	305.08	7740	327.17	7745	346.76	7750
365.54	7755	383.89	7760						

Manning's n Values num= 3

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	0	172.93	0	199.4	0			

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 172.93 199.4 54.16 64.9 53.38 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	177	7729	F
187	383.89	7729	F

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4690

INPUT

Description:
 Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7739.79	50.97	7740	84.99	7740	135.78	7736.21	175.75	7735
240.15	7731.37	258.9	7730	280.91	7728.13	296.07	7725	304	7720.19
306.47	7720.21	326.63	7723.94	356.03	7725	359.97	7725.17	380.47	7730
384.85	7730.94	424.12	7735	444.45	7740	460.22	7745	476.51	7750
493.61	7755	510.23	7760						

Manning's n Values num= 3

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	.055	296.07	.04	326.63	.045			

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 296.07 326.63 147.86 67.35 63.49 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4680

INPUT

Description: XSEC Upstream of Culvert # 5
 Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7745	10.04	7740	18.77	7735.14	19.68	7735	53.09	7730

115.99	7725	231.33	7720	271.11	7718.38	296.61	7718.19	297.5	7714.68
297.67	7713.83	301.03	7713.83	301.65	7714.72	303.75	7715.12	308.65	7717.68
313.18	7719.31	332.93	7720	352.68	7720.9	366.95	7725	367.96	7725.27
397.1	7730	408.97	7732.12	414.94	7735	422.75	7738.71	429.93	7740
446.32	7745	462.51	7750	478.81	7755				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 271.11 0 313.18 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 271.11 313.18 72.84 32.89 41.45 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 297.06 7718.26 F
 303.75 478.81 7718.26 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4675

INPUT

Description: Culvert #5
 Distance from Upstream XS = 5
 Deck/Roadway Width = 11
 Weir Coefficient = 1.1
 Upstream Deck/Roadway Coordinates

num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7718.5 300 7718.5 350 7718.5

Upstream Bridge Cross Section Data

Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7745	10.04	7740	18.77	7735.14	19.68	7735	53.09	7730
115.99	7725	231.33	7720	271.11	7718.38	296.61	7718.19	297.5	7714.68
297.67	7713.83	301.03	7713.83	301.65	7714.72	303.75	7715.12	308.65	7717.68
313.18	7719.31	332.93	7720	352.68	7720.9	366.95	7725	367.96	7725.27
397.1	7730	408.97	7732.12	414.94	7735	422.75	7738.71	429.93	7740
446.32	7745	462.51	7750	478.81	7755				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 271.11 0 313.18 0

Bank Sta: Left Right Coeff Contr. Expan.
 271.11 313.18 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 297.06 7718.26 F
 303.75 478.81 7718.26 F

Downstream Deck/Roadway Coordinates

num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7718 283 7718 333 7718

Downstream Bridge Cross Section Data

Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7751.04	4.25	7750	23.1	7745	41.87	7740	64.07	7735
83.6	7730	107.14	7725	107.31	7725	166.59	7720	231.44	7718.55
269.4	7717.63	278.99	7717.59	281.61	7714.26	281.77	7713.98	282.47	7713.69
284.13	7713.71	284.78	7714	285.98	7717.66	295.27	7717.63	324.77	7719.05
328.28	7720	346.87	7725	358.44	7730	369.96	7735	394.17	7740
417.38	7745	432.42	7749.76	442.64	7750				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 269.4 0 295.27 0

Bank Sta: Left Right Coeff Contr. Expan.
 269.4 295.27 .3 .5

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 =
 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 1.5
 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
 5 12 .013 .013 0 .2 .1

Number of Barrels = 2

Upstream Elevation = 7714.2
 Centerline Stations
 Sta. Sta.
 298.5 300.5
 Downstream Elevation = 7714
 Centerline Stations
 Sta. Sta.
 282.4 284

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4670

INPUT

Description: XSEC Downstream of Culvert # 5

Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7751.04	4.25	7750	23.1	7745	41.87	7740	64.07	7735

83.6	7730	107.14	7725	107.31	7725	166.59	7720	231.44	7718.55
269.4	7717.63	278.99	7717.59	281.61	7714.26	281.77	7713.98	282.47	7713.69
284.13	7713.71	284.78	7734	285.98	7717.66	295.27	7717.63	324.77	7719.05
328.28	7720	346.87	7725	358.44	7730	369.96	7735	394.17	7740
417.38	7745	432.42	7749.76	442.64	7750				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 269.4 0 295.27 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 269.4 295.27 148.52 148.4 110.22 .3 .5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4640

INPUT

Description: XSEC Upstream of Culvert # 4
 Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7780	10.47	7775.67	12.02	7775	23.26	7770	34.56	7765
45.9	7760	57.67	7755	66.93	7751.11	68.46	7750	76.04	7745
83.7	7740	84.63	7739.35	111.4	7737.57	115.64	7735	123.14	7730.49
124.31	7730	129.32	7728.07	132.82	7726.24	143.71	7725	170.1	7721.93
176.25	7720	192.36	7715	219.18	7714.05	241.71	7713.04	298.08	7710.53
306.6	7707.84	307.85	7707.13	308.47	7706.08	310.52	7702.64	312.16	7702.64
313.96	7702.64	315.77	7702.65	317.57	7702.65	318.31	7704.24	318.47	7707.02
322.84	7707.13	328.46	7711.81	344.8	7713.9	367.75	7715	373.68	7715.76
387.72	7720	405.21	7725	420.68	7730	433.26	7735	445.05	7740
451.26	7742.92	511.6	7745	603.42	7750	614.73	7750.69	624.94	7755

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 298.08 0 328.46 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 298.08 328.46 82.29 83.96 83.73 .3 .5

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RE: 4635

INPUT

Description: Culvert #4 Goat Hill Road
 Distance from Upstream XS = 28
 Deck/Roadway Width = 25
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates num= 3

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
304	7708	077			314	7707	577		
					324	7708	077		

Upstream Bridge Cross Section Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7780	10.47	7775.67	12.02	7775	23.26	7770	34.56	7765
45.9	7760	57.67	7755	66.93	7751.11	68.46	7750	76.04	7745
83.7	7740	84.63	7739.35	111.4	7737.57	115.64	7735	123.14	7730.49
124.31	7730	129.32	7728.07	132.82	7726.24	143.71	7725	170.1	7721.93
176.25	7720	192.36	7715	219.18	7714.05	241.71	7713.04	298.08	7710.53
306.6	7707.84	307.85	7707.13	308.47	7706.08	310.52	7702.64	312.16	7702.64
313.96	7702.64	315.77	7702.65	317.57	7702.65	318.31	7704.24	318.47	7707.02
322.84	7707.13	328.46	7711.81	344.8	7713.9	367.75	7715	373.68	7715.76
387.72	7720	405.21	7725	420.68	7730	433.26	7735	445.05	7740
451.26	7742.92	511.6	7745	603.42	7750	614.73	7750.69	624.94	7755

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 298.08 0 328.46 0

Bank Sta: Left Right Coeff Contr. Expan.
 298.08 328.46 .3 .5

Downstream Deck/Roadway Coordinates num= 5

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
240	7708				304	7708	077		
					324	7708	077		
					400	7708			

Downstream Bridge Cross Section Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7785	13.85	7780	25.59	7775.67	26.96	7775	36.66	7770
46.45	7765	56.24	7760	66.05	7755	76.37	7750	86.66	7745
97.07	7740	97.13	7739.95	133.17	7736.02	134.53	7735	141.5	7730
143.55	7728.56	156.58	7727.78	159.87	7725	163.45	7721.94	178.59	7720
197.99	7715	218.58	7710	274.2	7704.81	284.34	7703.53	287.08	7702.94
306.33	7702.95	307.15	7702.68	308.3	7702.49	309.94	7701.92	311	7701.74
312.04	7701.74	313.39	7701.74	314.22	7701.75	314.9	7701.75	316.09	7701.76
317.21	7701.75	319.51	7702.06	321.73	7702.22	323.69	7702.44	324.92	7702.81
331.36	7702.85	340.26	7703.47	369.09	7706.23	366.38	7707.72	396.35	7710
414.31	7715	433.47	7720	439.35	7721.66	448.16	7722.42	454.11	7725
459.85	7727.45	499.79	7730	554.51	7735	572.8	7738.27	584.63	7740
617.82	7742.92	627.13	7745	632.31	7746.47	664.45	7750	667.05	7750.31
679.21	7755								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 284.34 0 331.36 0

Bank Sta: Left Right Coeff Contr. Expan.
 284.34 331.36 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 306.16 7704.52 F
 324.85 679.21 7704.57 F

Upstream Embankment side slope = 3 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 =
 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 Arch 3.9167 5.9167
 FHWA Chart # 41- Arch; Corrugated metal
 FHWA Scale # 1 - 90 Degree headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 28 28 .024 .024 0 5 1
 Upstream Elevation = 7702.66
 Centerline Station = 314
 Downstream Elevation = 7701.69
 Centerline Station = 314

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4630

INPUT

Description: XSEC Downstream of Culvert #4
 Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7785	13.85	7780	25.59	7775.67	26.96	7775	36.66	7770
46.45	7765	56.24	7760	66.05	7755	76.37	7750	86.66	7745
97.07	7740	97.13	7739.95	133.17	7736.02	134.53	7735	141.5	7730
143.55	7728.56	156.58	7727.78	159.87	7725	163.45	7721.94	178.59	7720
197.99	7715	218.58	7710	274.2	7704.81	284.34	7703.53	287.08	7702.34
306.33	7702.95	307.15	7702.68	308.3	7702.29	309.94	7701.92	311	7701.74
312.04	7701.74	313.35	7701.74	314.22	7701.75	314.9	7701.75	316.09	7701.76
317.21	7701.75	319.51	7702.05	321.73	7702.22	323.59	7702.44	324.92	7702.81
331.36	7702.85	340.26	7703.47	369.09	7706.23	386.38	7707.72	396.35	7710
414.91	7715	433.47	7720	439.35	7721.66	448.16	7722.42	454.11	7725
459.85	7727.45	499.79	7730	554.51	7735	572.8	7738.27	584.63	7740
617.82	7742.92	627.13	7745	633.31	7746.47	664.45	7750	667.05	7750.31
679.21	7755								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	284.34	0	331.36	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan
 284.34 331.36 331.3 308.04 312.42 .3 5
 Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	106.16	7704.52	F
324.85	679.21	7704.57	F

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4620

INPUT

Description:
 Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	11.16	7765.57	18.87	7765	63.11	7760	89.09	7755
108.3	7750	118.84	7745	129.64	7740	140.67	7735	151.98	7730
158.84	7727.71	179.6	7725	217.91	7720	223.87	7719.22	234.83	7715
248.81	7710	262.08	7706.03	309.86	7705.74	311.84	7705	325.41	7700
340.05	7695	354.73	7690	359.17	7688.44	438.97	7689.31	464.11	7690
482.34	7690.26	507.15	7695	528.63	7700	550.45	7705	572.43	7710
593.92	7715	615.78	7720	637.88	7725	650.61	7727.8	675.95	7730
741.36	7734.43	743.4	7735	758.56	7740	772.44	7745	785.6	7750
798.68	7755								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	354.73	.04	438.97	.045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan
 354.73 438.97 216.67 217.6 172.7 .1 3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4610

INPUT

Description:
 Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7785	5.37	7780	13.02	7775	31.8	7771.04	14.39	7770
46.8	7765	59.14	7760	72.05	7755	85.5	7750	98.6	7745
111.63	7740	120.2	7737.04	146.33	7735	141.05	7730	155.37	7725
169.54	7720	183.87	7715	198.46	7710	213.87	7705	228.12	7700
242.41	7695	255.94	7690	271.47	7685	286.34	7680	289.22	7679.08
368.74	7678.15	392.12	7679.16	396.86	7680	433.85	7685	452.78	7686.43
470.03	7690	496.81	7694.56	498.87	7695	528.93	7700	555.44	7705
576.45	7710	602.15	7715	639.28	7720	669.53	7725	687.64	7730
711.13	7735	742.29	7740	753.67	7745	762.97	7750	772.68	7755

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	289.22	0	368.74	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan
 289.22 368.74 84.94 105.17 136.16 .1 3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4600

INPUT

Description: XSEC Upstream of Culvert # 3

Station Elevation Data num= 43
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7770 14.17 7765 28.06 7760 40.77 7755 54.24 7750
68.07 7745 81.8 7740 90.04 7737.04 96.07 7735 111.15 7730
126.21 7725 140.81 7720 155.05 7715 170.02 7710 184.86 7705
199.39 7700 213.92 7695 228.8 7690 243.69 7685.03 243.93 7685
273.02 7680 285.51 7677.25 320.38 7675 340.99 7673.68 358.96 7673.49
372.03 7675 410.43 7680 443.27 7685 494.2 7690 549.19 7695
564.65 7696.26 580.1 7700 582.89 7700.53 621.43 7705 648.47 7710
671.72 7715 674.59 7715.55 685.79 7720 698.43 7725 711.53 7730
714.52 7731.01 727.46 7735 744.29 7740

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 320.38 0 372.03 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
320.38 372.03 28.83 26.7 50.57 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 354.46 7677.49 F
363.46 744.29 7677.49 F

CULVERT

RIVER: Reach #1

REACH: Sabino Canyon RS: 4595

INPUT

Description: Culvert #3

Distance from Upstream XS = 4.5
Deck/Roadway Width = 17
Weir Coefficient = 3.1

Upstream Deck/Roadway Coordinates num= 3
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
0 7684.67 358.96 7677.49 401.25 7676.64

Upstream Bridge Cross Section Data

Station Elevation Data num= 43
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7770 14.17 7765 28.06 7760 40.77 7755 54.24 7750
68.07 7745 81.8 7740 90.04 7737.04 96.07 7735 111.15 7730
126.21 7725 140.81 7720 155.05 7715 170.02 7710 184.86 7705
199.39 7700 213.92 7695 228.8 7690 243.69 7685.03 243.93 7685
273.02 7680 285.51 7677.25 320.38 7675 340.99 7673.68 358.96 7673.49
372.03 7675 410.43 7680 443.27 7685 494.2 7690 549.19 7695
564.65 7696.26 580.1 7700 582.89 7700.53 621.43 7705 648.47 7710
671.72 7715 674.59 7715.55 685.79 7720 698.43 7725 711.53 7730
714.52 7731.01 727.46 7735 744.29 7740

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 320.38 0 372.03 0

Bank Sta: Left Right Coeff Contr. Expan.
320.38 372.03 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 354.46 7677.49 F
363.46 744.29 7677.49 F

Downstream Deck/Roadway Coordinates

num= 3
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
225.54 7676.7 283.59 7677.4 343 7676.21

Downstream Bridge Cross Section Data

Station Elevation Data num= 32
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7745 14.54 7740 22.87 7737.04 28.56 7735 44.32 7730
60.71 7725 76.37 7720 91.26 7715 106.13 7710 121.72 7705
138.38 7700 155.7 7695 170.3 7690 176.15 7688.3 197.62 7685.06
197.99 7685 214.62 7680 225.54 7676.7 245.65 7675 283.59 7671.87
297.12 7672.46 312.77 7675 343.38 7680 367.52 7685 391.39 7690
415.93 7695 444.36 7700 472.1 7703.95 480.29 7701.98 508.86 7705
559.8 7710 588.47 7714.79

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .055 245.65 .04 312.77 .045

Bank Sta: Left Right Coeff Contr. Expan.
245.65 312.77 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 278.04 7676.45 F
289.04 588.47 7676.45 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 =
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 Arch 3 4
FHWA Chart # 41- Arch; Corrugated metal
FHWA Scale # 1 - 90 Degree headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
4.5 20 .024 .024 0 .9 1
Upstream Elevation = 7673.49
Centerline Station = 358.96
Downstream Elevation = 7672.5
Centerline Station = 283.59

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4590

INPUT

Description: XSEC Downstream of Culvert # 3

Station Elevation Data num= 32											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7745	14.54	7740	22.87	7737.04	28.56	7735	44.32	7730		
60.71	7725	76.37	7720	91.26	7715	106.13	7710	121.72	7705		
138.38	7700	155.7	7695	170.3	7690	176.15	7688.3	197.62	7685.06		
197.99	7685	214.62	7680	225.54	7676.7	245.65	7675	283.59	7671.87		
297.12	7672.66	312.77	7675	343.38	7680	367.52	7685	391.39	7690		
415.53	7695	444.36	7700	472.3	7703.95	480.29	7701.98	508.86	7705		
559.8	7720	588.47	7714.79								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	245.65	.04	312.77	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	245.65	312.77		96.17	126.79	150.79	.3	.5

Ineffective Flow num= 2				
Sta L	Sta R	Elev	Permanent	
0	278.04	7676.45	F	
249.04	588.47	7676.45	F	

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4580

INPUT

Description:

Station Elevation Data num= 35											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7760	12.16	7755	27.55	7750	51.1	7745	67.86	7740		
76.44	7737.04	82.27	7735	95.25	7730	109	7725	125.15	7720		
140.72	7715	156.92	7710	173.33	7705	189.53	7700	205.44	7695		
221.53	7690	237.94	7685	254.29	7680	265.11	7676.7	275.62	7675		
292.46	7670	306.68	7666.61	315.96	7665	346.1	7665	349.26	7665.66		
378.86	7666.09	399.89	7670	425.53	7675	451.78	7680	477.19	7685		
502.29	7690	527.71	7695	567.35	7700	585.23	7702.2	635.84	7701.68		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	306.68	0	349.26	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	306.68	349.26		199.74	193.07	167.78	.1	.3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4570

INPUT

Description:

Station Elevation Data num= 41											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7765	14.69	7760	26.92	7755	35.15	7751.57	38.73	7750		
51.19	7745	64.94	7740	78.24	7735	91.3	7730	103.53	7725		
117.02	7720	130.65	7715	144.43	7710	158.88	7705	173.78	7700		
188.64	7695	203.38	7690	217.1	7685	231.69	7680	246.34	7675		
260.96	7670	267.78	7667.58	276.67	7665	295.47	7660	306.93	7656.78		
317.19	7655	353.12	7655	364.2	7656.53	400.57	7656.19	422.91	7660		
440.64	7665	463.49	7670	483.53	7675	495.82	7680	509.23	7685		
523.51	7690	530.47	7695	533.57	7697.16	616.67	7700	690.22	7701.18		
708.01	7705										

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	306.93	0	364.27	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	306.93	364.27		158.75	158.43	160.89	.1	.3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4565

INPUT

Description:

Station Elevation Data num= 23											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7705	10.21	7700	22.62	7695	33.11	7690	43.71	7685		
58.26	7680	72.94	7675	84.2	7670	89.82	7667.58	101.04	7665		
122.97	7660	135.62	7657.19	143.79	7655	162.53	7650	164.64	7649.43		
171.83	7645	174.05	7643.61	185.03	7645	219.18	7650	241.41	7650.94		
266.64	7650.9	278.63	7655	308.83	7660						

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	162.53	.035	219.18	.02

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	162.53	219.18		277.99	280.48	288.65	.1	.3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4560

INPUT

Description:

Station Elevation Data num= 24											
--------------------------------	--	--	--	--	--	--	--	--	--	--	--

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7690	13.59	7685	25.81	7680	39.49	7675	53.73	7670
71.26	7665	88.35	7660	104.35	7655	120.09	7650	135.76	7645
151.2	7640	167.13	7635	182.2	7630.5	196.83	7625	212.77	7620
214.13	7640.45	264.78	7645	268.61	7645.32	309.77	7645.76	334.67	7650
364.18	7655	413.1	7660	436.83	7665	464.52	7670		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 167.13 .035 196.83 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 167.13 196.83 187.13 234.04 247.65 .1 3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4550

INPUT

Description:

Station	Elevation	Data	num=	30					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7690	13.31	7685	26.89	7680	37.87	7675	48.83	7670
59.71	7665	70.44	7660	79.54	7655	91.17	7650	102.88	7645
116.09	7640	133.94	7635	142.59	7632.86	164.9	7630	192.92	7626.37
224.98	7625	257.53	7623.67	264.91	7621.5	282.51	7625	301.99	7630
311.94	7632.09	356.83	7633.76	362.14	7635	383.73	7640	403.89	7645
429.41	7650	453.71	7655	477.89	7660	499.95	7665	520.89	7670

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 257.53 .035 282.51 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 257.53 282.51 108.96 135.09 121.38 .1 3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4540

INPUT

Description:

Station	Elevation	Data	num=	34					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7700	12.36	7695	24.37	7690	36.22	7685	48.41	7683.49
45.55	7680	54.04	7675	63.27	7670	74.48	7665	86.96	7660
99.85	7655	113.02	7650	125.98	7645	138.87	7640	151.32	7635
163.9	7630	177.15	7625	190.17	7620	199.06	7616.24	218.07	7620
223.16	7621.04	276.64	7625	289.63	7626.81	316	7628.02	328.71	7630
356.18	7635	383.89	7640	413.11	7645	434.26	7650	452.22	7655
470.45	7660	491.5	7665	514.02	7670	534.32	7675		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 177.15 .035 223.16 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 177.15 223.16 336.24 347.95 375.73 .1 3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4530

INPUT

Description:

Station	Elevation	Data	num=	46					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7695	13.73	7690	27.72	7685	41.64	7680	54.89	7675
68.26	7670	81.92	7665	96.57	7660	113.56	7655	131.67	7650
161.19	7645	174.12	7640	185.2	7635	195.52	7630	206.65	7625
218.67	7620	230.19	7615	241.78	7610	249.15	7605.46	250.74	7603.92
250.98	7600.49	251.64	7600.49	252.57	7600.46	252.99	7603.87	254.23	7605.48
279.07	7610	286.33	7611.24	315.39	7611.59	328.8	7615	340.88	7620
352.28	7625	363.14	7630	373.89	7635	384.75	7640	394.88	7645
404.77	7650	414.59	7655	425.09	7660	437.39	7665	449.89	7670
465.83	7675	479.98	7680	491.41	7685	503.04	7690	515.64	7695
529.38	7700								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 230.19 .035 286.33 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 230.19 286.33 123.67 125.76 135.08 .1 3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4520

INPUT

Description: XSEC Upstream of Culvert # 2

Station	Elevation	Data	num=	55					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7695	10.99	7690	22.11	7685	37.49	7680	54.27	7675
70.1	7670	96.05	7665	105.18	7660	126.31	7655	144.44	7650
150.01	7648.33	160.74	7645	176.55	7640	192.29	7635	208.21	7630
223.79	7625	238.86	7620	253.14	7615	266.02	7610	272.52	7606.69
278.35	7597.18	279.67	7595.25	280.89	7592.32	292.27	7592.28	293.47	7592.28
295.26	7597.28	300.44	7597.51	304.18	7597.8	309.23	7597.93	312.88	7598.13
318.03	7599.21	326.55	7601.91	334.88	7605.47	340.16	7608.25	347.11	7610
355.3	7615	363.74	7620	372.46	7625	383.3	7630	392.59	7635
401.18	7640	411.09	7645	422.94	7650	433.38	7655	444.73	7660
455.21	7665	464.94	7670	474.71	7675	484.44	7680	494.57	7685
505.01	7690	515.6	7695	526.34	7700	536.75	7705	548.47	7710

Manning's n Values num= 3

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	.055	278.35	.035	295.26	.055			

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 278.35 295.26 56.55 52.81 57.42 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 279.38 7597.22 F
 294.64 548.47 7597.22 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4515

INPUT

Description: Culvert #2 East Sabino Road
 Distance from Upstream XS 5
 Deck/Roadway Width 33
 Weir Coefficient 3.1
 Upstream Deck/Roadway Coordinates
 num= 3

Sta	H1	Cord	Lo	Cord	Sta	H1	Cord	Lo	Cord	Sta	H1	Cord	Lo	Cord
0		7597.53			287		7597.53			347		7597.68		

Upstream Bridge Cross Section Data

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7695	10.99	7690	22.11	7685	37.49	7680	54.27	7675
70.1	7670	86.05	7665	105.18	7660	126.31	7655	144.44	7650
150.01	7648.33	160.74	7645	176.55	7640	192.29	7635	208.21	7630
221.79	7625	238.86	7620	253.14	7615	266.02	7610	272.52	7606.69
278.35	7597.18	279.67	7595.25	280.89	7592.32	292.27	7592.28	293.47	7592.18
295.26	7597.28	300.44	7597.51	304.18	7597.8	309.23	7597.93	312.88	7598.13
318.03	7599.21	326.55	7601.91	334.88	7605.47	340.16	7608.25	347.11	7610
355.3	7615	363.74	7620	372.46	7625	383.3	7630	392.59	7635
401.18	7640	411.09	7645	422.94	7650	433.38	7655	444.73	7660
455.21	7665	464.94	7670	474.71	7675	484.44	7680	494.57	7685
505.01	7690	515.6	7695	526.34	7700	536.75	7705	548.47	7710

Manning's n Values

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	.055	278.35	.035	295.26	.055			

Bank Sta: Left Right Coeff Contr. Expan.
 278.35 295.26 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 279.38 7597.22 F
 294.64 548.47 7597.22 F

Downstream Deck/Roadway Coordinates

Sta	H1	Cord	Lo	Cord	Sta	H1	Cord	Lo	Cord	Sta	H1	Cord	Lo	Cord
0		7596.65			287		7596.65			347		7596.82		

Downstream Bridge Cross Section Data

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7690	15.2	7685	20.08	7683.38	30.42	7680	45.54	7675
60.37	7670	78.64	7665	96.16	7660	113.19	7655	133.2	7650
139.78	7648.33	154.39	7645	178.45	7640	198.99	7635	217	7630
214.82	7625	250.7	7620	265.34	7615	279.93	7610	294.54	7605
299.44	7597.48	302.44	7591.48	306.37	7591.61	315.86	7591.61	318.77	7591.58
319.69	7603.02	344.13	7605	354.43	7605.76	367.14	7610	372.19	7611.68
385.77	7614.33	386.81	7615	395.3	7620	403.87	7625	412.25	7630
420.79	7635	430.01	7640	440.4	7645	451.3	7650	462.56	7655
472.38	7660	482.07	7665	491.7	7670	501.48	7675	511.42	7680
522.47	7685	533.68	7690	544.07	7695	553.6	7700	563.66	7705
573.67	7710								

Manning's n Values

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	.055	294.54	.035	319.69	.055			

Bank Sta: Left Right Coeff Contr. Expan.
 294.54 319.69 .3 .5

Ineffective Flow num= 0
 Sta L Sta R Elev Permanent

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 =
 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 Arch 3.9167 5.9167
 FHWA Chart # 41- Arch: Corrugated metal
 FHWA Scale # 1 - 90 Degree head-wall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 5 33 .024 .024 0 .5 1
 Upstream Elevation = 7592.88
 Centerline Station = 287.29
 Downstream Elevation = 7592.2
 Centerline Station = 310.95

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4510

INPUT

Description: XSEC Downstream of Culvert # 2

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev		
0	7690	15.2	7685	20.08	7683.38	30.42	7680	45.54	7675

60.37	7670	78.64	7665	96.16	7660	113.19	7655	133.2	7650
139.78	7648.33	154.39	7645	178.45	7640	198.99	7635	217	7630
234.82	7625	250.7	7620	265.34	7615	279.93	7610	294.54	7605
299.44	7597.48	302.44	7591.48	306.37	7591.61	315.86	7591.61	318.77	7591.58
319.69	7603.92	344.13	7605	354.43	7605.76	367.14	7610	372.19	7611.68
385.77	7614.33	386.81	7615	395.3	7620	403.87	7625	412.25	7630
420.79	7635	430.01	7640	440.4	7645	451.3	7650	462.56	7655
472.38	7660	482.07	7665	491.7	7670	501.48	7675	511.42	7680
522.47	7685	533.68	7690	544.07	7695	553.6	7700	563.66	7705
573.67	7710								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 294.54 .035 319.69 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 294.54 319.69 107.29 123.56 141.49 .3 .5
 Ineffective Flow num= 0
 Sta L Sta R Elev Permanent

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4500

INPUT
 Description:

Station Elevation Data num= 49									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7685	6.33	7683.38	18.84	7680	37.39	7675	54.49	7670
69.6	7665	84.16	7660	98.57	7655	113.67	7650	118.95	7648.33
129.03	7645	147.04	7640	165.23	7635	187.42	7630	202.6	7626.9
222.65	7625	224.79	7624.72	244.05	7620	262.5	7615	281.61	7610
288.59	7607.91	315.14	7605.71	318.32	7605	341.66	7600	355.16	7591.34
357.67	7588.11	359.38	7588.27	361.48	7591.28	369.25	7599.93	395.81	7600
395.85	7599.89	409.7	7620	410.81	7621.64	418.09	7625	428.52	7630
433.98	7632.7	456.67	7633.05	461.11	7635	473.81	7640	488.18	7645
505.22	7650	521.07	7655	536.98	7660	552.96	7665	568.64	7670
581.66	7675	594.85	7680	608.22	7685	621.67	7690		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 341.66 .035 369.25 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 341.66 369.25 212.29 193.78 168.97 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4495

INPUT
 Description:

Station Elevation Data num= 23									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7620	25.33	7615	39.91	7610	61.8	7605	86.12	7600
126.11	7595	169.22	7591.33	175	7590	185	7587	187.5	7585
190	7587	200	7590	230.25	7592.59	234.67	7595	243.75	7600
252.89	7605	261.38	7610	269.58	7615	277.81	7620	281.08	7621.69
291.61	7625	308.24	7630	324.88	7635				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 .175 0 200 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 175 200 154.64 128.78 101.48 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4490

INPUT
 Description:

Station Elevation Data num= 19									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7610	69.74	7605	92.58	7600	101.71	7595	109.7	7590
112	7587.5	115.85	7585	118.94	7582.32	128.46	7585	138.78	7587.83
166.99	7587.51	168.08	7590	170.08	7595	171.94	7600	173.63	7605.18
173.64	7605	201.76	7610	220.77	7615	239.61	7620		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 112 0 138.78 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 112 138.78 109.24 128.53 146.49 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4485

INPUT
 Description:

Station Elevation Data num= 21									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7606.84	2.4	7605	8.72	7600	15.05	7595	21.22	7590
27.6	7585	32.59	7581.05	33.28	7580	36.66	7575	40.06	7570
40.17	7569.79	40.81	7570	56.93	7575	61.04	7576.33	82.48	7576.32
86.83	7580	92.85	7585	98.84	7590	104.94	7595	111.28	7600
118.3	7605								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 36.66 .03 61.04 .02

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

36.66 61.04 252.86 253.96 252.06 .1 .3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4480

INPUT

Description:

Station Elevation Data		num= 49		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7670	52.51	7665.98	55.57	7665	72.74	7660	87.84	7655		
102.78	7650	118.08	7645	131.92	7640	145.59	7635	149.27	7633.69		
157.13	7630	168.04	7625	178.7	7620	182.54	7618.1	187.86	7615		
196.66	7610	205.74	7605	215	7600.07	215.12	7600	229.24	7575		
236.02	7560	244.23	7555	255.74	7550	260.87	7547.8	266.48	7550		
276.39	7533.9	298.83	7554.22	299.87	7555	305.45	7560	311.05	7565		
316.51	7570	322.19	7575	327.74	7580	333.38	7585	339.1	7590		
345.15	7595	352	7600	359.17	7605	366.16	7610	373.32	7615		
380.39	7620	387.45	7625	394.52	7630	401.6	7635	408.71	7640		
416.76	7645	424	7647.58	433.18	7650	453.39	7655				

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	244.23	.04	276.39	.045

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	244.23	276.39		147.56	141.71	117.21		.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4470

INPUT

Description:

Station Elevation Data		num= 49		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7640	11.24	7635	22.48	7630	33.75	7625	44.85	7620		
55.23	7615	65.23	7610	66.77	7609.29	69.37	7605	72.37	7600		
84.31	7575	84.7	7573.7	90.59	7570	98.41	7565	106.35	7560		
114.3	7555	122.13	7550	129.49	7545	137.01	7540	142.75	7536.09		
154.92	7540	156.2	7540.38	175.66	7540	184.5	7540	184.76	7539.88		
190.8	7545	196.63	7550	202.33	7555	208.34	7560	214.25	7565		
220.19	7570	227.65	7575	237.07	7580	246.12	7585	255.04	7590		
264.17	7595	274.36	7600	284.65	7605	294.94	7610	305.24	7615		
315.59	7620	325.81	7625	335.79	7630	345.66	7635	355.71	7640		
365.71	7645	370.83	7647.58	376.74	7650	388.34	7655				

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	137.01	.04	156.2	.045

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	137.01	156.2		156.78	157.33	154.35		.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4460

INPUT

Description:

Station Elevation Data		num= 50		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7605	11.91	7601.53	18.41	7600	35.72	7595	51.23	7590		
59.35	7585	67.76	7580	78.24	7575	90.45	7570	107.86	7565		
130.25	7560	147.45	7556.1	172.6	7555	173.95	7554.91	179.39	7550		
184.98	7545	190.51	7540	196.07	7535	201.5	7530	206.61	7525		
208.48	7523.07	215.46	7525	232.58	7530	233.89	7530.4	247.67	7530		
266.11	7530	266.6	7530	273.73	7535	281.02	7540	288.34	7545		
295.6	7550	303.91	7555	312.07	7560	319.43	7565	326.49	7570		
329.87	7572.36	334.15	7575	341.92	7580	349.59	7585	357.52	7590		
365.55	7595	373.97	7600	382.58	7605	391.4	7610	400.44	7615		
409.05	7620	417.64	7625	426.09	7630	434.34	7635	442.79	7640		

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
0	0	201.5	0	232.58	0

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	201.5	232.58		142.5	176.67	197.19		.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4450

INPUT

Description:

Station Elevation Data		num= 48		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7600	2.15	7598.75	28.76	7595	36.61	7594.04	39.84	7590		
43.96	7585	48.1	7580	50	7577.63	56.59	7575	68.78	7570		
79.47	7565	91.15	7560	102.87	7555	114.87	7550	128.82	7545		
143.14	7540	159.44	7535	176.77	7530	179.7	7529.17	187.73	7525		
197.24	7520	206.9	7515	212.27	7512.29	228.18	7515	238.42	7516.81		
262.17	7516.81	269.77	7520	278.74	7525	287.26	7530	295.83	7535		
304.48	7540	312.96	7545	320.53	7550	327.69	7555	335.22	7560		
345.27	7565	355.5	7570	360.28	7572.36	368.34	7575	381.47	7580		
393.99	7585	407.74	7590	421.94	7595	435.39	7600	448.16	7605		
460.18	7610	471.86	7615	482.62	7620						

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
0	0	197.24	0	238.42	0

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	197.24	238.42		375.2	359.22	371.73		.1	.3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4440

INPUT

Description:

Station Elevation Data num= 60									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7620	10.17	7615	20.33	7610	30.57	7605	41.27	7600
52.32	7595	64.56	7590	81.12	7585	95	7580	108.56	7575
121.13	7570	114.22	7565	146.75	7560	158.71	7555.19	159.2	7555
173.84	7550	190.18	7545	206.17	7540	220.87	7535	240.43	7530
268.26	7525	259.85	7520	317.13	7515	328.69	7510	338.87	7505
349.03	7500	358.95	7495	360.09	7494.44	362.42	7495	383.57	7500
390.85	7501.75	411.34	7501.89	416.79	7505	425.55	7510	434.36	7515
443.19	7520	451.94	7525	460.93	7530	470.46	7535	480.05	7540
489.33	7545	498.56	7550	507.76	7555	516.95	7560	526.72	7565
537.15	7570	542.05	7572.36	545.31	7575	551.56	7580	558.7	7585
566.65	7590	574.62	7595	582.86	7600	591.13	7605	599.27	7610
607.41	7615	615.46	7620	623.29	7625	631.31	7630	639.26	7635

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	338.87	.055	390.85	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	338.87	390.85		365.73	362.91	348.13	.1

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4430

INPUT

Description:

Station Elevation Data num= 45									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7570	8.47	7565	17.41	7560	28.58	7555	39.98	7550
51.41	7545	64.17	7540	75.45	7535	86.37	7530	97	7525
108.13	7520	114.88	7516.65	117.96	7515	128.47	7510	139.55	7505
148.46	7500	145.48	7495.53	157.97	7495	166.9	7490	180.9	7485
193.97	7480	211.43	7485	225.28	7487.91	245.92	7487.95	253.62	7490
269.16	7495	279.57	7500	289.99	7505	300.7	7510	311.71	7515
322.93	7520	336.08	7525	348.65	7530	360.24	7535	371.07	7540
381.64	7545	391.46	7550	400.99	7555	410.38	7560	419.63	7565
430.1	7570	441.52	7575	450.37	7578.46	454.24	7580	470.98	7585

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	166.9	.055	225.28	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	166.9	225.28		224.83	262.29	199.76	.1

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4420

INPUT

Description:

Station Elevation Data num= 33									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7510	7.76	7505	12.91	7502.16	107.17	7500.89	111.37	7500
127.34	7495	141.6	7490	153.66	7485	169.14	7480	184.99	7475
210.04	7470	223.77	7467.85	229.44	7470	242.51	7475	246.72	7476.49
270.34	7476.49	279.06	7480	287.36	7485	295.61	7490	303.29	7495
310.8	7500	318.38	7505	325.87	7510	333.55	7515	341.18	7520
348.9	7525	357.89	7530	366.17	7535	374.17	7540	382.3	7545
390.56	7550	404.02	7555	419	7560				

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	184.99	0	242.51	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	184.99	242.51		120.24	143.62	144.02	.1

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4410

INPUT

Description:

Station Elevation Data num= 19									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7485.32	2.11	7485	23.48	7480	47.58	7475	74.96	7470
77.27	7469.53	89.82	7465	98.41	7461.89	110.96	7465	131.15	7470
131.46	7470.08	141.99	7470	144.75	7470	151.79	7470.31	164.39	7475
173.53	7480	180.49	7485	187.15	7490	194.09	7495		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	77.27	.032	131.46	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	77.27	131.46		37.41	49.85	12.34	.1

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4400

INPUT

Description: Upstream of Culvert #1

Station Elevation Data num= 30									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

0	7490	25.72	7485	54.29	7480	89.75	7475	109.26	7472.37
117.81	7470	153.33	7465	186.03	7464.45	194.02	7460	196.09	7457.89
197.16	7455.96	198.22	7455.18	200.71	7455.09	203.55	7455.09	204.97	7455.79
206.39	7457.46	207.82	7458.6	210.33	7460	236.59	7465	271.39	7468.27
300.01	7469.74	300.72	7470	312.08	7475	324.87	7480	334.02	7485
341.42	7450	348.93	7495	356.64	7500	365.3	7505	374.81	7510

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 186.03 0 236.59 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 186.03 236.59 44.53 50.74 65.32 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 197 7457.63 F
 205.1 374.81 7457.72 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4397.5

INPUT

Description: Culvert #1
 Distance from Upstream XS = 3
 Deck/Roadway Width = 22
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates
 num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 175 7458 192 7460 230 7458

Upstream Bridge Cross Section Data
 Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7490	25.72	7485	54.29	7480	89.75	7475	109.26	7472.37
117.81	7470	153.33	7465	186.03	7464.45	194.02	7460	196.09	7457.89
197.16	7455.96	198.22	7455.18	200.71	7455.09	203.55	7455.09	204.97	7455.79
206.39	7457.46	207.82	7458.6	210.33	7460	236.59	7465	271.39	7468.27
300.01	7469.74	300.72	7470	312.08	7475	324.87	7480	334.02	7485
341.42	7450	348.93	7495	356.64	7500	365.3	7505	374.81	7510

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 186.03 0 236.59 0

Bank Sta: Left Right Coeff Contr. Expan.
 186.03 236.59 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 197 7457.63 F
 205.1 374.81 7457.72 F

Downstream Deck/Roadway Coordinates
 num= 2
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 170 7460 215 7460

Downstream Bridge Cross Section Data
 Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7485	32.71	7480	66.84	7475	108.69	7470	109.85	7469.87
129.88	7465	148.17	7460.13	158.68	7460	173.03	7459.8	186.28	7455.37
186.65	7455.01	187.2	7454.68	187.55	7454.67	187.99	7454.62	188.51	7454.55
189.16	7454.54	189.93	7454.54	190.45	7454.6	190.92	7454.69	191.43	7454.73
192.58	7454.86	192.9	7454.95	193.09	7455.04	193.27	7455.29	212.81	7460
231.06	7465	240.56	7467.45	264.58	7468.13	269.1	7470	281.7	7475
293.41	7480	304.48	7485	315.3	7490	326.24	7495	337.17	7500
347.88	7505	358.45	7510	368.65	7515	379.05	7520	388.89	7525

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 173.03 .032 212.81 .06

Bank Sta: Left Right Coeff Contr. Expan.
 173.03 212.81 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 183.66 7459.01 F
 195.74 188.89 7459.01 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 =
 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 Arch 3 4
 FHWA Chart # 41- Arch; Corrugated metal
 FHWA Scale # 1 - 90 Degree headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 3 22 .024 .024 0 .5 1

Number of Barrels = 2
 Upstream Elevation = 7455
 Centerline Stations
 Sta. Sta.
 199 203.1
 Downstream Elevation = 7454.9
 Centerline Stations
 Sta. Sta.
 187.9 192

CROSS SECTION

RIVER: Reach #1

REACH: Sabino Canyon RS: 4395

INPUT

Description: XSEC Downstream of Culvert # 1

Station	Elevation	Data	num=	40					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7485	12.71	7480	66.84	7475	108.69	7470	109.85	7469.87
129.88	7465	148.17	7460.11	158.68	7460	173.03	7459.8	186.28	7455.37
186.65	7455.01	187.2	7454.68	187.55	7454.67	187.99	7454.62	188.51	7454.55
189.16	7454.54	189.93	7454.54	190.45	7454.6	190.92	7454.69	191.43	7454.71
192.58	7454.86	192.9	7454.95	193.09	7455.04	193.27	7455.29	212.81	7460
211.06	7465	240.56	7467.45	264.58	7468.13	269.1	7470	281.7	7475
293.41	7460	304.48	7485	315.3	7490	326.24	7495	337.17	7500
347.88	7505	358.45	7510	368.85	7515	379.05	7520	388.89	7525

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
0	.055	173.03	.032
		212.81	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	173.03	212.81		51.1	62.2	72.85	.3	.5

Ineffective Flow	num=	2	
Sta L	Sta R	Elev	Permanent
0	183.66	7459.01	F
195.74	388.89	7459.01	F

CROSS SECTION

RIVER: Reach #1

REACH: Sabino Canyon RS: 4390

INPUT

Station	Elevation	Data	num=	31					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7480	50.91	7475	80.36	7470	115.35	7465	144.96	7460
149.45	7459.16	183.05	7457.32	186.12	7455	188.67	7453.08	191.11	7453.14
196.06	7455	216.44	7460	235.74	7465	241.43	7466.4	267.21	7466.11
275.75	7470	287.26	7475	298.73	7480	311.17	7485	322.92	7490
333.97	7495	344.78	7500	355.31	7505	365.19	7510	377.22	7515
388.88	7520	400.05	7525	411.14	7530	423.92	7535	438.64	7540
456.57	7545								

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
0	.055	183.05	.032
		216.44	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	183.05	216.44		422.01	367.85	348.08	.1	.3

CROSS SECTION

RIVER: Reach #1

REACH: Sabino Canyon RS: 4280

INPUT

Station	Elevation	Data	num=	40					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7540	13.98	7535	26.19	7530	42.04	7525	58.43	7520
56.18	7515	74.12	7510	82.04	7505	90.08	7500	98.26	7495
105.26	7490	113.91	7485	121.73	7480	129.55	7475	137.45	7470
145.28	7465	154.5	7460	165.33	7455	166.6	7454.34	190.14	7453.21
196.54	7450	209.71	7445	224.72	7441.87	246.21	7445	253.1	7446.02
287.65	7450	317.35	7455	328.27	7456.9	342.73	7460	365.68	7465
386.96	7470	404.73	7475	414.69	7480	423.96	7485	433.3	7490
442.59	7495	452	7500	460.16	7505	468.51	7510	476.71	7515

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
0	.055	209.71	.035
		246.21	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	209.71	246.21		159.8	158.36	130.15	.1	.3

CROSS SECTION

RIVER: Reach #1

REACH: Sabino Canyon RS: 4370

INPUT

Station	Elevation	Data	num=	33					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7500	11.06	7495	23.08	7490	35.07	7485	46.99	7480
58.78	7475	72.27	7470	85.19	7465	100.43	7460	122.74	7455
145.98	7450	169.03	7445	180.69	7442.31	190.83	7440	199.26	7438.05
209.07	7440	222.45	7442.73	238.4	7445	273.98	7450	276.41	7450.24
293.99	7455	311.9	7460	328.47	7465	344.88	7470	361.12	7475
373.03	7480	382.36	7485	391.48	7490	398.52	7495	404.69	7500
411.27	7505	418.21	7510	425.13	7515				

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
0	0	180.69	0
		222.45	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	180.69	222.45		121.8	124.38	118.98	.1	.3

SUMMARY OF MANNING'S N VALUES

River: Reach #1

Reach	River Sta.	n1	n2	n3
Sabino Canyon	5000	.013	.045	.055
Sabino Canyon	4990	0	0	0
Sabino Canyon	4980	0	0	0
Sabino Canyon	4970	.013	.045	.055

Sabino Canyon	4955	.013	.045	.055
Sabino Canyon	4950	.013	.045	.055
Sabino Canyon	4949	Culvert		
Sabino Canyon	4948	.013	.045	.055
Sabino Canyon	4940	.013	.045	.055
Sabino Canyon	4930	0	0	0
Sabino Canyon	4925	Culvert		
Sabino Canyon	4920	0	0	0
Sabino Canyon	4910	0	0	0
Sabino Canyon	4900	0	0	0
Sabino Canyon	4890	.013	.045	.055
Sabino Canyon	4885	Culvert		
Sabino Canyon	4880	0	0	0
Sabino Canyon	4870	0	0	0
Sabino Canyon	4860	0	0	0
Sabino Canyon	4855	Culvert		
Sabino Canyon	4850	0	0	0
Sabino Canyon	4840	0	0	0
Sabino Canyon	4830	0	0	0
Sabino Canyon	4825	Culvert		
Sabino Canyon	4820	0	0	0
Sabino Canyon	4810	.013	.04	.03
Sabino Canyon	4800	.013	.04	.03
Sabino Canyon	4790	.013	.04	.03
Sabino Canyon	4780	0	0	0
Sabino Canyon	4775	Culvert		
Sabino Canyon	4770	0	0	0
Sabino Canyon	4765	.055	.04	.045
Sabino Canyon	4760	.055	.04	.045
Sabino Canyon	4750	0	0	0
Sabino Canyon	4745	Culvert		
Sabino Canyon	4740	0	0	0
Sabino Canyon	4730	0	0	0
Sabino Canyon	4725	Culvert		
Sabino Canyon	4720	0	0	0
Sabino Canyon	4710	0	0	0
Sabino Canyon	4705.5	Culvert		
Sabino Canyon	4701	0	0	0
Sabino Canyon	4690	.055	.04	.045
Sabino Canyon	4680	0	0	0
Sabino Canyon	4675	Culvert		
Sabino Canyon	4670	0	0	0
Sabino Canyon	4640	0	0	0
Sabino Canyon	4635	Culvert		
Sabino Canyon	4630	0	0	0
Sabino Canyon	4620	.055	.04	.045
Sabino Canyon	4610	0	0	0
Sabino Canyon	4600	0	0	0
Sabino Canyon	4595	Culvert		
Sabino Canyon	4590	.055	.04	.045
Sabino Canyon	4580	0	0	0
Sabino Canyon	4570	0	0	0
Sabino Canyon	4565	.055	.035	.02
Sabino Canyon	4560	.055	.035	.045
Sabino Canyon	4550	.055	.035	.055
Sabino Canyon	4540	.055	.035	.055
Sabino Canyon	4530	.055	.035	.055
Sabino Canyon	4520	.055	.035	.055
Sabino Canyon	4515	Culvert		
Sabino Canyon	4510	.055	.035	.055
Sabino Canyon	4500	.055	.035	.055
Sabino Canyon	4495	0	0	0
Sabino Canyon	4490	0	0	0
Sabino Canyon	4485	.055	.03	.02
Sabino Canyon	4480	.045	.04	.045
Sabino Canyon	4470	.045	.04	.045
Sabino Canyon	4460	0	0	0
Sabino Canyon	4450	0	0	0
Sabino Canyon	4440	.055	.035	.055
Sabino Canyon	4430	.055	.05	.055
Sabino Canyon	4420	0	0	0
Sabino Canyon	4410	.055	.032	.06
Sabino Canyon	4400	0	0	0
Sabino Canyon	4397.5	Culvert		
Sabino Canyon	4395	.055	.032	.06
Sabino Canyon	4390	.055	.032	.06
Sabino Canyon	4380	.055	.035	.055
Sabino Canyon	4370	0	0	0

SUMMARY OF REACH LENGTHS

River: Reach #1

Reach	River Sta.	Left	Channel	Right
Sabino Canyon	5000	280.23	292.32	289.78
Sabino Canyon	4990	259.73	254.28	208.78
Sabino Canyon	4980	195.74	195.12	199.47
Sabino Canyon	4970	109.28	110.18	116.2
Sabino Canyon	4955	48.65	43.54	36.65
Sabino Canyon	4950	44.18	37.93	31.14
Sabino Canyon	4949	Culvert		
Sabino Canyon	4948	100.62	95.02	81.56
Sabino Canyon	4940	183.11	200.29	206.49
Sabino Canyon	4930	35.99	31.3	37.79
Sabino Canyon	4925	Culvert		
Sabino Canyon	4920	89.2	95.09	89.24
Sabino Canyon	4910	242.99	229.2	209.27
Sabino Canyon	4900	163.32	152.05	152.08
Sabino Canyon	4890	65.94	58.62	51.72
Sabino Canyon	4885	Culvert		
Sabino Canyon	4880	120.36	140.56	143.52
Sabino Canyon	4870	86.06	123.02	129.77
Sabino Canyon	4860	29.33	33.29	29.29
Sabino Canyon	4855	Culvert		
Sabino Canyon	4850	173.2	160.5	156.03
Sabino Canyon	4840	154.55	159.68	160.08
Sabino Canyon	4830	48.5	48.05	48.26
Sabino Canyon	4825	Culvert		
Sabino Canyon	4820	164.6	153.11	138.65
Sabino Canyon	4810	275.35	305.07	315.05

Sabino Canyon	4800	128.1	88.46	74.01
Sabino Canyon	4790	185.19	110.34	113.96
Sabino Canyon	4780	180.71	135.48	113.78
Sabino Canyon	4775	Culvert		
Sabino Canyon	4770	152.22	145.66	138.18
Sabino Canyon	4765	178.1	172.24	175.18
Sabino Canyon	4760	116.92	125.62	133.13
Sabino Canyon	4750	36.73	43.9	85.3
Sabino Canyon	4745	Culvert		
Sabino Canyon	4740	50.45	40.63	29.76
Sabino Canyon	4730	24.27	25.79	30.08
Sabino Canyon	4725	Culvert		
Sabino Canyon	4720	66.79	45.57	38.28
Sabino Canyon	4710	58.79	39.28	43.38
Sabino Canyon	4705.5	Culvert		
Sabino Canyon	4701	54.16	64.9	53.38
Sabino Canyon	4690	147.86	67.35	63.49
Sabino Canyon	4680	72.34	32.89	41.45
Sabino Canyon	4675	Culvert		
Sabino Canyon	4670	148.52	148.4	110.22
Sabino Canyon	4640	82.29	83.96	83.73
Sabino Canyon	4635	Culvert		
Sabino Canyon	4630	331.3	308.04	312.42
Sabino Canyon	4620	216.67	217.6	172.7
Sabino Canyon	4610	84.94	105.27	136.16
Sabino Canyon	4600	28.83	26.7	50.57
Sabino Canyon	4595	Culvert		
Sabino Canyon	4590	96.17	126.79	150.79
Sabino Canyon	4580	199.74	193.07	167.78
Sabino Canyon	4570	158.75	158.29	160.89
Sabino Canyon	4565	277.99	280.48	288.65
Sabino Canyon	4560	187.13	234.04	247.65
Sabino Canyon	4550	108.96	135.09	121.38
Sabino Canyon	4540	336.24	347.95	375.73
Sabino Canyon	4530	123.67	125.76	135.08
Sabino Canyon	4520	56.55	52.81	57.42
Sabino Canyon	4515	Culvert		
Sabino Canyon	4510	107.29	123.56	141.49
Sabino Canyon	4500	212.29	193.78	168.97
Sabino Canyon	4495	154.64	128.78	101.48
Sabino Canyon	4490	109.24	128.53	146.49
Sabino Canyon	4485	252.86	251.36	252.06
Sabino Canyon	4480	147.56	141.71	117.21
Sabino Canyon	4470	156.78	157.33	154.35
Sabino Canyon	4460	142.5	176.67	197.39
Sabino Canyon	4450	375.2	359.22	371.73
Sabino Canyon	4440	365.73	362.91	348.13
Sabino Canyon	4430	234.83	263.29	199.76
Sabino Canyon	4420	120.24	143.62	144.02
Sabino Canyon	4410	97.41	49.85	12.34
Sabino Canyon	4400	44.53	50.74	65.32
Sabino Canyon	4397.5	Culvert		
Sabino Canyon	4395	51.1	62.2	72.85
Sabino Canyon	4390	422.01	367.85	348.08
Sabino Canyon	4380	159.8	158.36	130.15
Sabino Canyon	4370	121.8	124.38	118.98

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Reach #1

Reach	River Sta.	Contr.	Expan.
Sabino Canyon	5000	.1	.3
Sabino Canyon	4990	.1	.3
Sabino Canyon	4980	.1	.3
Sabino Canyon	4970	.1	.3
Sabino Canyon	4955	.1	.3
Sabino Canyon	4950	.3	.5
Sabino Canyon	4949	Culvert	
Sabino Canyon	4948	.3	.5
Sabino Canyon	4940	.3	.5
Sabino Canyon	4930	.3	.5
Sabino Canyon	4925	Culvert	
Sabino Canyon	4920	.3	.5
Sabino Canyon	4910	.1	.3
Sabino Canyon	4900	.1	.3
Sabino Canyon	4890	.3	.5
Sabino Canyon	4885	Culvert	
Sabino Canyon	4880	.3	.5
Sabino Canyon	4870	.1	.3
Sabino Canyon	4860	.3	.5
Sabino Canyon	4855	Culvert	
Sabino Canyon	4850	.3	.5
Sabino Canyon	4840	.1	.3
Sabino Canyon	4830	.3	.5
Sabino Canyon	4825	Culvert	
Sabino Canyon	4820	.3	.5
Sabino Canyon	4810	.1	.3
Sabino Canyon	4800	.1	.3
Sabino Canyon	4790	.1	.3
Sabino Canyon	4780	.3	.5
Sabino Canyon	4775	Culvert	
Sabino Canyon	4770	.3	.5
Sabino Canyon	4765	.1	.3
Sabino Canyon	4760	.1	.3
Sabino Canyon	4750	.3	.5
Sabino Canyon	4745	Culvert	
Sabino Canyon	4740	.3	.5
Sabino Canyon	4730	.3	.5
Sabino Canyon	4725	Culvert	
Sabino Canyon	4720	.3	.5
Sabino Canyon	4710	.3	.5
Sabino Canyon	4705.5	Culvert	
Sabino Canyon	4701	.3	.5
Sabino Canyon	4690	.1	.3
Sabino Canyon	4680	.3	.5
Sabino Canyon	4675	Culvert	
Sabino Canyon	4670	.3	.5
Sabino Canyon	4640	.3	.5
Sabino Canyon	4635	Culvert	

Sabino Canyon	4630	.3	.5
Sabino Canyon	4620	.1	.3
Sabino Canyon	4610	.1	.3
Sabino Canyon	4600	.3	.5
Sabino Canyon	4595	Culvert	
Sabino Canyon	4590	.3	.5
Sabino Canyon	4580	.1	.3
Sabino Canyon	4570	.1	.3
Sabino Canyon	4565	.1	.3
Sabino Canyon	4560	.1	.3
Sabino Canyon	4550	.1	.3
Sabino Canyon	4540	.1	.3
Sabino Canyon	4530	.1	.3
Sabino Canyon	4520	.3	.5
Sabino Canyon	4515	Culvert	
Sabino Canyon	4510	.3	.5
Sabino Canyon	4500	.1	.3
Sabino Canyon	4495	.1	.3
Sabino Canyon	4490	.1	.3
Sabino Canyon	4485	.1	.3
Sabino Canyon	4480	.1	.3
Sabino Canyon	4470	.1	.3
Sabino Canyon	4460	.1	.3
Sabino Canyon	4450	.1	.3
Sabino Canyon	4440	.1	.3
Sabino Canyon	4430	.1	.3
Sabino Canyon	4420	.1	.3
Sabino Canyon	4410	.1	.3
Sabino Canyon	4400	.3	.5
Sabino Canyon	4397.5	Culvert	
Sabino Canyon	4395	.3	.5
Sabino Canyon	4390	.1	.3
Sabino Canyon	4380	.1	.3
Sabino Canyon	4370	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #	Chl
Sabino Canyon	5000	Pre-Fire	113.00	7976.07	7978.37	7978.37	7978.96	0.030609	6.17	18.31	15.91	1.01	
Sabino Canyon	5000	Post-Fire	322.00	7976.07	7979.58	7979.58	7980.47	0.026283	7.57	42.52	24.25	1.01	
Sabino Canyon	4990	Pre-Fire	113.00	7954.38	7956.03	7956.03	7956.52	0.010661	4.12	24.00	27.74	0.63	
Sabino Canyon	4990	Post-Fire	322.00	7954.38	7957.03	7957.03	7957.76	0.005202	4.18	59.67	43.28	0.48	
Sabino Canyon	4980	Pre-Fire	113.00	7939.00	7941.23	7941.23	7941.72	0.003754	2.73	27.77	30.99	0.37	
Sabino Canyon	4980	Post-Fire	322.00	7939.00	7942.23	7942.23	7943.00	0.002860	3.23	66.36	46.20	0.35	
Sabino Canyon	4970	Pre-Fire	113.00	7927.21	7928.50	7928.50	7928.86	0.031076	4.81	24.15	37.40	0.97	
Sabino Canyon	4970	Post-Fire	322.00	7927.21	7929.23	7929.23	7929.78	0.023254	6.22	58.87	58.37	0.93	
Sabino Canyon	4955	Pre-Fire	113.00	7919.90	7921.94	7921.94	7922.47	0.031509	5.82	19.41	19.04	1.02	
Sabino Canyon	4955	Post-Fire	322.00	7919.90	7923.01	7923.01	7923.80	0.025540	7.17	45.35	32.12	0.99	
Sabino Canyon	4950	Pre-Fire	113.00	7915.09	7920.69	7916.51	7920.72	0.000274	1.47	76.91	24.69	0.11	
Sabino Canyon	4950	Post-Fire	322.00	7915.09	7921.68	7917.83	7921.77	0.000666	2.31	147.90	69.78	0.17	
Sabino Canyon	4949	Culvert											
Sabino Canyon	4948	Pre-Fire	113.00	7913.45	7915.70	7915.70	7916.45	0.032118	6.96	16.24	10.96	1.01	
Sabino Canyon	4948	Post-Fire	322.00	7913.45	7917.23	7917.23	7918.30	0.027433	8.30	38.81	18.39	1.01	
Sabino Canyon	4940	Pre-Fire	113.00	7907.29	7909.49	7909.49	7910.05	0.030485	6.01	18.79	17.07	1.01	
Sabino Canyon	4940	Post-Fire	322.00	7907.29	7910.62	7910.62	7911.51	0.022209	7.58	43.13	26.08	0.95	
Sabino Canyon	4930	Pre-Fire	129.00	7885.96	7890.80	7887.89	7890.93	0.002469	2.94	43.88	9.58	0.24	
Sabino Canyon	4930	Post-Fire	369.00	7885.96	7893.54	7889.78	7893.92	0.005173	4.93	74.79	13.26	0.37	
Sabino Canyon	4925	Culvert											
Sabino Canyon	4920	Pre-Fire	129.00	7884.74	7886.86	7886.86	7887.79	0.034405	7.74	16.67	8.72	0.99	
Sabino Canyon	4920	Post-Fire	369.00	7884.74	7888.79	7888.79	7890.55	0.036639	10.67	34.58	9.70	1.00	
Sabino Canyon	4910	Pre-Fire	129.00	7880.00	7883.11	7883.11	7883.90	0.030423	7.09	18.18	11.68	1.00	
Sabino Canyon	4910	Post-Fire	369.00	7880.00	7884.73	7884.73	7885.93	0.026854	8.80	41.91	17.73	1.01	
Sabino Canyon	4900	Pre-Fire	129.00	7869.05	7871.98	7871.98	7872.76	0.032417	7.09	18.20	11.87	1.01	
Sabino Canyon	4900	Post-Fire	369.00	7869.05	7873.58	7873.58	7874.63	0.027006	8.21	44.92	21.48	1.00	
Sabino Canyon	4890	Pre-Fire	129.00	7860.00	7864.09	7862.18	7864.25	0.003002	3.20	40.26	13.49	0.33	
Sabino Canyon	4890	Post-Fire	369.00	7860.00	7868.29	7863.94	7868.46	0.001258	3.35	110.25	65.58	0.24	
Sabino Canyon	4885	Culvert											
Sabino Canyon	4880	Pre-Fire	129.00	7859.27	7861.60	7861.60	7862.55	0.033524	7.82	16.49	8.45	0.99	
Sabino Canyon	4880	Post-Fire	369.00	7859.27	7863.75	7863.75	7864.36	0.016038	6.16	58.83	52.14	0.75	
Sabino Canyon	4870	Pre-Fire	129.00	7851.00	7853.98	7853.98	7855.03	0.036200	8.22	15.70	7.55	1.00	
Sabino Canyon	4870	Post-Fire	369.00	7851.00	7856.34	7856.34	7857.79	0.021140	9.69	38.07	13.02	1.00	
Sabino Canyon	4860	Pre-Fire	129.00	7841.00	7846.17	7843.77	7846.37	0.003557	3.57	36.11	10.24	0.22	
Sabino Canyon	4860	Post-Fire	369.00	7841.00	7852.24	7845.98	7852.39	0.000903	3.06	122.02	69.51	0.20	
Sabino Canyon	4855	Culvert											
Sabino Canyon	4850	Pre-Fire	129.00	7841.00	7843.60	7843.60	7844.65	0.036578	8.19	15.76	7.64	1.00	
Sabino Canyon	4850	Post-Fire	369.00	7841.00	7845.98	7845.98	7847.24	0.030978	9.07	40.67	16.11	1.01	
Sabino Canyon	4840	Pre-Fire	129.00	7826.07	7828.35	7828.35	7828.93	0.029971	6.11	21.10	18.50	1.01	
Sabino Canyon	4840	Post-Fire	369.00	7826.07	7829.46	7829.46	7830.23	0.019571	6.80	52.92	44.25	0.88	
Sabino Canyon	4830	Pre-Fire	129.00	7815.02	7819.13	7817.93	7819.34	0.003958	3.74	34.46	18.34	0.41	
Sabino Canyon	4830	Post-Fire	369.00	7815.02	7822.55	7819.43	7822.65	0.000889	2.47	148.34	58.96	0.21	
Sabino Canyon	4825	Culvert											
Sabino Canyon	4820	Pre-Fire	129.00	7811.68	7814.38	7814.38	7815.13	0.027441	6.91	18.67	14.35	0.99	
Sabino Canyon	4820	Post-Fire	369.00	7811.68	7815.83	7815.83	7816.84	0.024612	8.06	45.76	22.04	0.99	
Sabino Canyon	4810	Pre-Fire	129.00	7801.11	7803.94	7803.94	7804.65	0.023556	6.80	18.98	13.43	1.01	
Sabino Canyon	4810	Post-Fire	369.00	7801.11	7805.41	7805.41	7806.50	0.020487	8.38	44.03	20.51	1.01	

Sabino Canyon	4800	Pre-Fire	129.00	7784.09	7786.65	7786.65	7787.25	0.032168	6.22	20.75	17.72	1.01
Sabino Canyon	4800	Post-Fire	369.00	7784.09	7787.99	7787.99	7788.56	0.016174	6.24	61.15	51.68	0.79
Sabino Canyon	4790	Pre-Fire	127.00	7777.01	7779.62	7779.62	7780.15	0.027061	5.82	21.81	21.53	1.02
Sabino Canyon	4790	Post-Fire	395.00	7777.01	7780.83	7780.83	7781.49	0.016426	6.56	60.47	46.73	0.88
Sabino Canyon	4780	Pre-Fire	127.00	7765.57	7770.09	7767.30	7770.18	0.000648	2.48	51.17	22.12	0.21
Sabino Canyon	4780	Post-Fire	395.00	7765.57	7772.52	7769.03	7772.64	0.000969	2.76	144.26	43.74	0.24
Sabino Canyon	4775			Culvert								
Sabino Canyon	4770	Pre-Fire	127.00	7762.16	7764.15	7764.15	7764.94	0.022720	7.15	17.99	11.95	1.00
Sabino Canyon	4770	Post-Fire	395.00	7762.16	7765.65	7765.65	7766.16	0.005503	5.40	70.94	68.97	0.55
Sabino Canyon	4765	Pre-Fire	127.00	7754.31	7756.84	7756.84	7757.49	0.018238	6.47	19.64	15.46	1.01
Sabino Canyon	4765	Post-Fire	395.00	7754.31	7758.30	7758.30	7759.33	0.015689	8.12	48.67	24.33	1.01
Sabino Canyon	4760	Pre-Fire	127.00	7740.23	7741.94	7741.94	7742.57	0.023185	6.40	19.84	15.77	1.01
Sabino Canyon	4760	Post-Fire	395.00	7740.23	7743.38	7743.38	7744.45	0.020006	8.28	47.69	22.78	1.01
Sabino Canyon	4750	Pre-Fire	127.00	7730.73	7734.69	7732.63	7734.87	0.001480	3.39	37.43	15.22	0.31
Sabino Canyon	4750	Post-Fire	395.00	7730.73	7738.46	7734.60	7728.63	0.001107	3.30	123.87	41.91	0.24
Sabino Canyon	4745			Culvert								
Sabino Canyon	4740	Pre-Fire	127.00	7729.32	7732.40		7732.57	0.004805	3.34	38.02	24.82	0.48
Sabino Canyon	4740	Post-Fire	395.00	7729.32	7733.15	7732.91	7733.85	0.014365	6.69	59.05	30.94	0.85
Sabino Canyon	4730	Pre-Fire	127.00	7726.52	7732.47	7728.64	7732.48	0.000093	0.75	171.71	80.61	0.07
Sabino Canyon	4730	Post-Fire	395.00	7726.52	7733.45	7729.86	7733.49	0.000243	1.45	267.54	103.31	0.13
Sabino Canyon	4725			Culvert								
Sabino Canyon	4720	Pre-Fire	127.00	7726.01	7729.88		7729.91	0.000657	1.46	86.75	44.82	0.19
Sabino Canyon	4720	Post-Fire	395.00	7726.01	7731.23		7731.33	0.001185	2.57	156.44	58.59	0.27
Sabino Canyon	4710	Pre-Fire	127.00	7724.86	7729.36	7726.30	7729.89	0.000378	1.31	96.95	36.12	0.14
Sabino Canyon	4710	Post-Fire	395.00	7724.86	7731.23	7727.87	7731.28	0.000703	2.30	180.88	37.72	0.21
Sabino Canyon	4705.5			Culvert								
Sabino Canyon	4701	Pre-Fire	127.00	7724.31	7726.09	7726.09	7726.93	0.018948	7.36	17.26	18.58	0.99
Sabino Canyon	4701	Post-Fire	395.00	7724.31	7728.03	7728.03	7729.83	0.014958	10.79	36.61	29.05	0.99
Sabino Canyon	4690	Pre-Fire	127.00	7720.19	7722.28	7722.28	7722.89	0.023908	6.25	20.31	17.10	1.01
Sabino Canyon	4690	Post-Fire	395.00	7720.19	7723.65	7723.65	7724.61	0.020490	7.85	50.30	26.75	1.01
Sabino Canyon	4680	Pre-Fire	147.00	7713.83	7719.28	7716.82	7719.33	0.001256	1.83	87.03	64.12	0.24
Sabino Canyon	4680	Post-Fire	398.00	7713.83	7719.32	7718.98	7720.08	0.002809	3.35	138.55	97.45	0.38
Sabino Canyon	4675			Culvert								
Sabino Canyon	4670	Pre-Fire	147.00	7713.69	7717.95	7717.95	7718.22	0.019918	4.86	30.32	45.71	0.84
Sabino Canyon	4670	Post-Fire	398.00	7713.69	7718.63	7718.63	7719.11	0.008268	4.37	75.78	88.19	0.59
Sabino Canyon	4640	Pre-Fire	147.00	7702.64	7707.60	7704.88	7707.75	0.002483	3.04	48.28	16.39	0.31
Sabino Canyon	4640	Post-Fire	398.00	7702.64	7709.89	7706.78	7710.15	0.003042	4.13	96.45	26.05	0.38
Sabino Canyon	4635			Culvert								
Sabino Canyon	4630	Pre-Fire	147.00	7701.74	7703.31	7703.31	7703.93	0.022108	6.33	23.23	52.61	1.00
Sabino Canyon	4630	Post-Fire	398.00	7701.74	7704.50	7704.50	7705.69	0.017346	8.76	45.42	74.32	0.99
Sabino Canyon	4620	Pre-Fire	147.00	7688.44	7689.34	7689.34	7689.57	0.030793	3.88	37.90	83.27	1.01
Sabino Canyon	4620	Post-Fire	398.00	7688.44	7689.77	7689.77	7690.18	0.021693	5.04	77.99	100.42	0.94
Sabino Canyon	4610	Pre-Fire	147.00	7678.15	7679.16	7679.16	7679.40	0.005982	1.90	54.62	103.01	0.46
Sabino Canyon	4610	Post-Fire	398.00	7678.15	7679.62	7679.62	7680.10	0.005349	2.73	103.65	107.20	0.48
Sabino Canyon	4600	Pre-Fire	147.00	7673.49	7677.97	7675.68	7677.98	0.000031	0.52	302.14	112.65	0.05
Sabino Canyon	4600	Post-Fire	398.00	7673.49	7678.76	7677.50	7678.79	0.000102	1.05	394.89	122.10	0.09
Sabino Canyon	4595			Culvert								
Sabino Canyon	4590	Pre-Fire	147.00	7671.87	7673.85	7673.85	7674.72	0.023992	7.50	19.59	45.41	0.99
Sabino Canyon	4590	Post-Fire	398.00	7671.87	7675.50	7675.50	7677.22	0.019747	10.54	37.76	76.04	1.00
Sabino Canyon	4580	Pre-Fire	147.00	7665.00	7665.91	7665.91	7666.21	0.024327	4.49	33.51	55.37	0.88
Sabino Canyon	4580	Post-Fire	398.00	7665.00	7666.42	7666.42	7666.96	0.020701	5.50	68.19	72.80	0.87
Sabino Canyon	4570	Pre-Fire	147.00	7655.00	7655.76	7655.76	7656.11	0.020532	4.70	31.27	45.90	1.00
Sabino Canyon	4570	Post-Fire	398.00	7655.00	7656.55	7656.55	7656.95	0.010738	5.16	78.86	94.45	0.81
Sabino Canyon	4565	Pre-Fire	147.00	7643.61	7645.86	7645.86	7646.46	0.018472	6.20	23.71	20.49	1.02
Sabino Canyon	4565	Post-Fire	398.00	7643.61	7647.01	7647.01	7647.89	0.015855	7.55	52.69	30.16	1.01
Sabino Canyon	4560	Pre-Fire	165.00	7630.50	7633.23	7633.23	7633.93	0.017437	6.70	24.62	18.03	1.01
Sabino Canyon	4560	Post-Fire	490.00	7630.50	7634.72	7634.72	7635.80	0.015578	8.32	58.88	27.88	1.01
Sabino Canyon	4550	Pre-Fire	165.00	7621.50	7624.00	7624.00	7624.60	0.015647	6.25	27.53	28.07	0.96
Sabino Canyon	4550	Post-Fire	490.00	7621.50	7625.25	7625.25	7626.01	0.011762	7.52	85.66	64.42	0.89
Sabino Canyon	4540	Pre-Fire	165.00	7616.24	7618.86	7618.86	7619.51	0.017261	6.50	25.40	19.41	1.00
Sabino Canyon	4540	Post-Fire	490.00	7616.24	7620.27	7620.27	7621.30	0.015793	8.14	60.21	29.91	1.01
Sabino Canyon	4530	Pre-Fire	165.00	7600.46	7606.54	7606.54	7607.43	0.029878	7.59	21.73	12.62	1.02
Sabino Canyon	4530	Post-Fire	490.00	7600.46	7608.38	7608.38	7609.52	0.021645	8.59	57.05	25.73	1.02
Sabino Canyon	4520	Pre-Fire	165.00	7592.28	7597.88	7594.02	7597.94	0.000398	1.97	86.71	29.51	0.16
Sabino Canyon	4520	Post-Fire	490.00	7592.28	7599.72	7595.80	7599.89	0.000869	3.53	157.21	42.85	0.24
Sabino Canyon	4515			Culvert								
Sabino Canyon	4510	Pre-Fire	186.00	7591.48	7594.48		7594.70	0.002702	3.74	49.78	18.06	0.40
Sabino Canyon	4510	Post-Fire	808.00	7591.48	7598.90		7599.46	0.003592	5.96	135.50	20.85	0.41
Sabino Canyon	4500	Pre-Fire	186.00	7588.27	7592.50	7592.50	7593.68	0.021950	8.71	21.35	9.22	1.01
Sabino Canyon	4500	Post-Fire	808.00	7588.27	7596.17	7596.17	7598.14	0.021264	11.26	71.73	17.74	1.00
Sabino Canyon	4495	Pre-Fire	186.00	7585.00	7588.91	7588.91	7589.66	0.017950	6.97	26.70	17.73	1.00
Sabino Canyon	4495	Post-Fire	808.00	7585.00	7591.34	7591.34	7592.56	0.012861	9.11	97.95	46.98	0.88
Sabino Canyon	4490	Pre-Fire	186.00	7582.32	7585.61	7585.61	7586.43	0.017646	7.28	25.54	15.77	1.01
Sabino Canyon	4490	Post-Fire	808.00	7582.32	7588.35	7588.35	7589.27	0.010193	7.95	106.63	56.13	0.78

Sabino Canyon	4485	Pre-Fire	186.00	7569.79	7573.35	7573.35	7574.25	0.026231	7.63	24.39	13.76	1.01
Sabino Canyon	4485	Post-Fire	808.00	7569.79	7576.69	7576.69	7577.80	0.012922	8.58	99.74	47.40	0.78
Sabino Canyon	4480	Pre-Fire	186.00	7547.80	7551.03	7551.03	7551.86	0.022539	7.30	25.48	15.74	1.01
Sabino Canyon	4480	Post-Fire	808.00	7547.80	7553.60	7553.60	7555.11	0.019618	9.87	81.88	28.18	1.02
Sabino Canyon	4470	Pre-Fire	186.00	7536.09	7539.40	7539.40	7540.25	0.022992	7.40	25.15	15.18	1.01
Sabino Canyon	4470	Post-Fire	808.00	7536.09	7541.35	7541.35	7542.56	0.008915	6.97	98.33	51.52	0.69
Sabino Canyon	4460	Pre-Fire	186.00	7523.07	7526.39	7526.39	7527.24	0.023425	7.41	25.10	15.02	1.01
Sabino Canyon	4460	Post-Fire	808.00	7523.07	7529.09	7529.09	7530.60	0.019574	9.88	81.79	27.01	1.00
Sabino Canyon	4450	Pre-Fire	186.00	7512.29	7514.96	7514.96	7515.65	0.023018	6.65	27.97	20.96	1.01
Sabino Canyon	4450	Post-Fire	808.00	7512.29	7517.28	7517.28	7518.16	0.012385	7.61	107.69	60.78	0.82
Sabino Canyon	4440	Pre-Fire	186.00	7494.44	7497.38	7497.38	7498.13	0.020263	6.93	26.83	18.26	1.01
Sabino Canyon	4440	Post-Fire	808.00	7494.44	7499.74	7499.74	7501.07	0.016414	9.25	87.36	32.95	1.00
Sabino Canyon	4430	Pre-Fire	186.00	7480.36	7483.16	7483.16	7483.87	0.042116	6.76	27.53	19.65	1.01
Sabino Canyon	4430	Post-Fire	808.00	7480.36	7485.39	7485.39	7486.68	0.044191	9.11	88.74	35.22	1.01
Sabino Canyon	4420	Pre-Fire	186.00	7467.85	7470.37	7470.37	7471.03	0.012861	6.51	28.57	22.23	1.01
Sabino Canyon	4420	Post-Fire	808.00	7467.85	7472.46	7472.46	7473.67	0.010252	8.81	91.76	38.18	1.00
Sabino Canyon	4410	Pre-Fire	186.00	7461.89	7464.73	7464.73	7465.45	0.012383	6.77	27.47	19.32	1.00
Sabino Canyon	4410	Post-Fire	808.00	7461.89	7466.99	7466.99	7468.29	0.010379	9.15	88.33	34.67	1.01
Sabino Canyon	4400	Pre-Fire	186.00	7455.09	7459.81	7459.81	7460.04	0.001969	3.79	49.04	15.79	0.38
Sabino Canyon	4400	Post-Fire	808.00	7455.09	7462.96	7461.39	7463.55	0.004103	6.16	131.15	37.16	0.58
Sabino Canyon 4397.5			Culvert									
Sabino Canyon	4395	Pre-Fire	186.00	7454.54	7457.10	7457.10	7458.05	0.012506	7.86	23.67	19.64	0.99
Sabino Canyon	4395	Post-Fire	808.00	7454.54	7459.42	7459.36	7460.60	0.011308	8.73	92.59	36.21	0.96
Sabino Canyon	4390	Pre-Fire	186.00	7453.08	7456.08	7456.08	7456.90	0.014608	7.29	25.51	15.76	1.01
Sabino Canyon	4390	Post-Fire	808.00	7453.08	7458.78	7458.78	7459.94	0.009717	8.88	105.67	55.01	0.90
Sabino Canyon	4380	Pre-Fire	186.00	7441.87	7444.15	7444.15	7444.74	0.017884	6.13	30.32	26.59	1.01
Sabino Canyon	4380	Post-Fire	808.00	7441.87	7445.95	7445.95	7447.12	0.014252	8.72	95.95	45.40	0.97
Sabino Canyon	4370	Pre-Fire	273.00	7438.05	7440.99	7440.99	7441.70	0.015653	6.77	40.34	27.42	0.98
Sabino Canyon	4370	Post-Fire	1076.00	7438.05	7443.06	7443.05	7444.40	0.015660	9.30	117.07	47.35	0.99

Profile Output Table - Culvert Only

Reach	River Sta	Profile	E.G. US	W.S. US	E.G. IC	E.G. OC	Min El	Flow	Q Culv	Group	Q Weir	Delta WS	Culv Vel US
Culv Vel DS			(ft)	(ft)	(ft)	(ft)		(ft)	(cfs)		(cfs)	(ft)	(ft/s)
(ft/s)													
Sabino Canyon	4949	CULVERT#1	Pre-Fire	7920.72	7920.69	7920.71	7920.40		7920.41		67.82	8.60	4.99
9.59	14.89												
Sabino Canyon	4949	CULVERT#2	Pre-Fire	7920.72	7920.69	7921.86	7920.74		7920.41		36.58	8.60	4.99
11.64	11.64												
Sabino Canyon	4949	CULVERT#1	Post-Fire	7921.77	7921.68	7922.78	7921.77		7920.41		85.57	201.38	4.45
12.11	12.11												
Sabino Canyon	4949	CULVERT#2	Post-Fire	7921.77	7921.68	7921.44	7921.77		7920.41		35.05	201.38	4.45
11.16	11.16												
Sabino Canyon	4925	CULVERT#1	Pre-Fire	7890.93	7890.80	7890.53	7890.93		7891.27		129.00		3.94
9.65	14.03												
Sabino Canyon	4925	CULVERT#1	Post-Fire	7893.92	7893.54	7894.10	7893.92		7891.27		229.44	139.56	4.75
12.61	12.61												
Sabino Canyon	4885	CULVERT#1	Pre-Fire	7864.26	7864.09	7864.05	7864.26		7866.37		129.00		2.49
7.35	8.71												
Sabino Canyon	4885	CULVERT#1	Post-Fire	7868.47	7868.29	7868.47	7868.47		7866.37		244.52	124.48	4.54
12.71	12.71												
Sabino Canyon	4855	CULVERT#1	Pre-Fire	7846.38	7846.17	7846.41	7846.38		7849.93		129.00		2.57
9.12	9.90												
Sabino Canyon	4855	CULVERT#1	Post-Fire	7852.39	7852.24	7852.24	7852.39		7849.93		204.33	164.67	6.28
14.45	14.45												
Sabino Canyon	4825	CULVERT#1	Pre-Fire	7819.34	7819.13	7818.63	7819.34		7823.26		129.00		4.74
7.24	15.74												
Sabino Canyon	4825	CULVERT#1	Post-Fire	7822.65	7822.55	7822.59	7822.65		7823.26		369.00		6.71
11.46	19.75												
Sabino Canyon	4775	Culvert #1	Pre-Fire	7770.18	7770.09	7769.84	7770.18		7770.58		127.00		5.94
9.55	11.30												
Sabino Canyon	4775	Culvert #1	Post-Fire	7772.64	7772.52	7772.64	7772.55		7770.58		194.92	200.08	6.87
10.71	11.40												
Sabino Canyon	4745	CULVERT#1	Pre-Fire	7734.88	7734.69	7734.70	7734.88		7737.01		127.00		2.29
8.03	8.37												
Sabino Canyon	4745	CULVERT#1	Post-Fire	7738.64	7738.46	7738.64	7737.94		7737.01		238.88	156.12	5.31
11.81	14.70												
Sabino Canyon	4725	CULVERT#1	Pre-Fire	7732.48	7732.47	7731.96	7732.49		7732.07		53.87	7.89	2.59
8.57	8.57												
Sabino Canyon	4725	CULVERT#2	Pre-Fire	7732.48	7732.47	7731.78	7732.47		7732.07		65.24	7.89	2.59
9.23	9.23												
Sabino Canyon	4725	CULVERT#1	Post-Fire	7733.49	7733.45	7731.58	7733.48		7732.07		50.04	283.88	2.22
7.96	7.96												
Sabino Canyon	4725	CULVERT#2	Post-Fire	7733.49	7733.45	7731.38	7733.49		7732.07		61.07	283.88	2.22
8.64	8.64												
Sabino Canyon	4705.5	CULVERT#1	Pre-Fire	7729.89	7729.86	7729.89	7729.59		7730.01		127.00		3.77
8.98	11.28												
Sabino Canyon	4705.5	CULVERT#1	Post-Fire	7731.28	7731.20	7731.22	7731.28		7730.01		138.64	256.36	3.17
9.81	9.81												
Sabino Canyon	4675	CULVERT#1	Pre-Fire	7719.33	7719.28	7719.28	7719.33		7718.51		28.02	118.98	1.33
7.93	7.93												
Sabino Canyon	4675	CULVERT#1	Post-Fire	7720.08	7719.92	7719.99	7720.08		7718.51		28.68	369.32	1.29
8.11	8.11												
Sabino Canyon	4635	CULVERT#1	Pre-Fire	7707.75	7707.60	7707.75	7707.74		7707.59		146.54	0.46	4.29
10.27	12.13												

Sabino Canyon	4635	CULVERT#1	Post-Fire	7710.15	7709.89	7710.15	7709.48	7707.59	206.10	191.90	5.39
11.32	15.46										
Sabino Canyon	4595	CULVERT#1	Pre-Fire	7677.98	7677.97	7677.47	7677.98	7677.41	68.19	78.81	4.13
9.10	11.34										
Sabino Canyon	4595	CULVERT#1	Post-Fire	7678.79	7678.76	7678.79	7678.79	7677.41	81.11	315.53	3.27
8.61	8.61										
Sabino Canyon	4515	CULVERT#1	Pre-Fire	7597.94	7597.88	7597.94	7597.91	7597.54	144.89	20.11	3.40
10.20	10.25										
Sabino Canyon	4515	CULVERT#1	Post-Fire	7599.90	7599.72	7599.57	7599.90	7597.54	97.21	392.79	0.82
5.34	5.34										
Sabino Canyon	4397.5	CULVERT#1	Pre-Fire	7460.04	7459.81	7460.04	7460.02	7459.85	166.90	19.10	2.72
8.85	10.17										
Sabino Canyon	4397.5	CULVERT#1	Post-Fire	7463.55	7462.96	7463.46	7463.55	7459.85	217.12	590.88	3.54
11.52	11.52										

HEC-RAS OUTPUT

SABINO CREEK

CULVERT ANALYSIS (100-YEAR)

```

X   X   XXXXX   XXXX   XXXX   XX   XXXX
X   X   X       X   X   X   X   X   X
X   X   X       X   X   X   X   X   X
XXXXXXXX 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   XXXXX   XXXX   X   X   X   X   XXXXX
  
```

PROJECT DATA

Project Title: Summerhaven
 Project File : SABINO CANYON CREEK.prj
 Run Date and Time: 12/19/2003 11:25:56 AM

Project in English units

Project Description:
 Sabino Canyon

PLAN DATA

Plan Title: CMG Culverts 100 year
 Plan File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\SABINO CANYON CREEK.p07

Geometry Title: CMG Culverts
 Geometry File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\SABINO CANYON CREEK.g02

Flow Title : 100 year SCS Type I event
 Flow File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\SABINO CANYON CREEK.f04

Plan Summary Information:

Number of: Cross Sections = 68 Multiple Openings = 0
 Culverts = 14 Inline Structures = 0
 Bridges = 0 Lateral Structures = 0

Computational Information

Water surface calculation tolerance = 0.01
 Critical depth calculation tolerance = 0.01
 Maximum number of iterations = 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: 100 year SCS Type I event
 Flow File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\SABINO CANYON CREEK.f04

Flow Data (cfs)

River	Reach	RS	Pre Fire	Post Fire
Reach #1	Sabino Canyon	5000	247	594
Reach #1	Sabino Canyon	4930	282	687
Reach #1	Sabino Canyon	4790	297	787
Reach #1	Sabino Canyon	4680	299	883
Reach #1	Sabino Canyon	4560	366	1030
Reach #1	Sabino Canyon	4510	493	1446
Reach #1	Sabino Canyon	4370	684	1969

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Reach #1	Sabino Canyon	Pre Fire	Critical	Normal S = 0.015
Reach #1	Sabino Canyon	Post Fire	Critical	Normal S = 0.015

GEOMETRY DATA

Geometry Title: CMG Culverts
 Geometry File : p:\Pima_County_DOT_FC\Summerhaven\Hydrology and Hydraulics\HEC-RAS\SABINO CANYON CREEK.g02

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 5000

INPUT

Description:
 Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	8030	10.48	8025	21.09	8020	31.2	8015	40.37	8010
49.45	8005	58.93	8000	68.54	7995	77.96	7990	88.64	7985
96.81	7982.98	142.41	7980	153.47	7976.07	169.59	7980	190.91	7982.53
201.25	7985	206.54	7986.31	221.18	7990	242.82	7995	267.78	8000
280.24	8002.52	288.85	8005	305.86	8010	321.81	8015	337.7	8020

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	142.41	.045	169.59	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 142.41 169.59 280.23 292.32 289.78 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4990

INPUT
 Description:
 Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	8010	10.25	8005	20.5	8000	30.67	7995	40.73	7990
50.88	7985	60.93	7980	70.76	7975	80.29	7970	90.03	7965
100.32	7960	102.86	7958.87	120.3	7957.44	147.12	7955	155.89	7954.38
159	7955	168.81	7957.19	183.52	7960	215.73	7965	230.23	7967.47
235.72	7970	259.52	7975	279.34	7980	302.17	7985	307.56	7986.12
332.88	7990	372.22	7995						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	147.12	0	159	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 147.12 159 259.73 254.38 208.78 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4980

INPUT
 Description:
 Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10.99	7990	23.56	7985	36.13	7980	48.9	7975	61.61	7970
74.39	7965	87.3	7960	101.02	7955	114.26	7950	120.99	7947.43
135.21	7945	148.27	7942.85	163.34	7940.24	172.75	7940	175	7945
177.1	7940	202.85	7942.73	210.27	7943.62	214.64	7945	229.73	7950
258.14	7955	261.59	7955.16	270.72	7960	280.11	7965	289.44	7970
299.74	7975	314.19	7980	329.81	7985	333.62	7986.12	358.82	7990

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
10.99	0	172.75	0	177.1	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 172.75 177.1 195.74 195.12 199.47 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4970

INPUT
 Description:
 Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7990	8.68	7985	16.46	7980	24.1	7975	31.63	7970
19.22	7965	47.07	7960	57.44	7955	76.43	7950	96.26	7945
112.04	7940	122.18	7935	128.04	7932.69	158.34	7930	169.33	7927.21
195.13	7928.24	239.1	7930	256.36	7930.6	264.61	7935	270.84	7940
276.9	7945	282.9	7950	288.87	7955	295.3	7960	302.24	7965
309.34	7970	322.58	7975	339.39	7980				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	158.34	.045	195.13	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 158.34 195.13 109.28 110.18 116.2 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4955

INPUT
 Description:
 Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7965	9.74	7960	20.56	7955	32.86	7950	42.4	7945
52.04	7940	61.69	7935	71.37	7930	81.03	7925	82.88	7924.11
101.18	7925	112.8	7920	113	7919.9	113.74	7920	133.3	7922.79
181.02	7925	184.2	7925.13	195.47	7930	207.28	7935	219.9	7940
233.19	7945	249.07	7950	265	7955	280.49	7960		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	101.18	.045	133.3	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 101.18 133.3 48.65 43.54 36.65 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4950

INPUT
 Description: XSEC Upstream of Culvert # 1E
 Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7965	9.02	7960	18.62	7955	27.88	7950	37.05	7945
46.22	7940	55.28	7935	64.38	7930	73.76	7925	81.27	7920.95
104.24	7920.78	105.78	7920	107.63	7915.22	114.55	7915.09	119.62	7915.16

126.13 7920 127.89 7920.63 182.08 7923.25 186.68 7925 199.43 7930
 212.03 7935 224.8 7940 238.83 7945 252.79 7950 266.83 7955
 283.81 7960

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 105.78 .045 126.13 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 105.78 126.13 44.18 37.93 11.14 .3 5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 106.1 7921.5 F
 120.6 283.81 7921.5 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4949

INPUT
 Description: Culvert #16
 Distance from Upstream XS = 4.5
 Deck/Roadway Width = 20
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates
 num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 78.63 7920.4 114 7920.4 150 7920.4

Upstream Bridge Cross Section Data
 Station Elevation Data num= 26
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7965 9.02 7960 18.62 7955 27.86 7950 37.05 7945
 46.22 7940 55.38 7935 64.38 7930 73.76 7925 81.27 7920.96
 104.24 7920.78 105.78 7920 107.63 7915.22 114.55 7915.09 119.62 7915.16
 126.13 7920 127.89 7920.63 182.08 7923.25 186.68 7925 199.43 7930
 212.03 7935 224.8 7940 238.83 7945 252.79 7950 266.83 7955
 283.81 7960

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 105.78 .045 126.13 .055

Bank Sta: Left Right Coeff Contr. Expan.
 105.78 126.13 .3 5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 106.1 7921.5 F
 120.6 283.81 7921.5 F

Downstream Deck/Roadway Coordinates
 num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 83.93 7918.81 131 7918.81 158.35 7918.81

Downstream Bridge Cross Section Data
 Station Elevation Data num= 30
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7970 7.83 7965 16.4 7960 25.34 7955 33.74 7950
 42.36 7945 51.07 7940 60.01 7935 68.77 7930 77.22 7925
 85.58 7920 87.95 7918.59 116.77 7918.95 126.76 7915 128.03 7913.55
 130.48 7913.45 133.47 7913.52 134.38 7915 143.93 7915.16 162.55 7920
 187.79 7921.36 195.75 7925 207.84 7930 220.19 7935 234.38 7940
 250.34 7945 267.17 7950 287.05 7955 306.95 7960 326.64 7965

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 116.77 .045 143.93 .055

Bank Sta: Left Right Coeff Contr. Expan.
 116.77 143.93 .3 5

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 =
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Culverts = 2

Culvert Name Shape Rise Span
 CULVERT#1 Circular 3
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 4.5 20 .024 .024 0 .5 1
 Upstream Elevation = 7915.29
 Centerline Station = 112.1
 Downstream Elevation = 7913.5
 Centerline Station = 128.93

Culvert Name Shape Rise Span
 CULVERT#2 Circular 2
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 4.5 20 .024 .024 0 .5 1
 Upstream Elevation = 7915.42
 Centerline Station = 115.1
 Downstream Elevation = 7913.8
 Centerline Station = 131.93

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4948

INPUT

Description: XSEC Downstream of Culvert # 16

Station Elevation Data num= 30									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7970	7.83	7965	16.4	7960	25.34	7955	33.74	7950
42.36	7945	51.07	7940	60.01	7935	68.77	7930	77.22	7925
85.58	7920	87.95	7918.59	116.77	7918.95	126.78	7915	128.03	7913.55
130.48	7913.45	133.47	7913.52	134.38	7915	143.93	7919.16	162.55	7920
187.79	7921.36	195.75	7925	207.84	7930	220.19	7935	234.38	7940
250.34	7945	267.17	7950	287.05	7955	306.95	7960	326.64	7965

Manning's n Values num= 3									
Sta	n	Sta	n	Sta	n	Sta	n	Sta	n
0	.013	116.77	.045	143.93	.055				

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	116.77	143.93		100.62	93.02	81.56		.3	.5

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4940

INPUT

Station Elevation Data num= 32									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7990	12.37	7985	19.46	7980	26.13	7975	32.82	7970
39.39	7965	46.02	7960	52.67	7955	59.87	7950	67.67	7945
75.92	7940	84.24	7935	92.56	7930	100.84	7925	109.17	7920
117.47	7915	118.25	7914.55	144.77	7914.55	160.69	7910	169.94	7907.29
181.71	7910	204.89	7915	226.01	7920	242.77	7925	260.28	7930
277.83	7935	293.54	7940	307.26	7945	321.97	7950	341.81	7955
364.19	7960	382.07	7965						

Manning's n Values num= 3									
Sta	n	Sta	n	Sta	n	Sta	n	Sta	n
0	.013	160.69	.045	181.71	.055				

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	160.69	181.71		183.11	200.29	206.49		.3	.5

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4930

INPUT

Station Elevation Data num= 40									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7990	10.2	7985	19.18	7980	25.92	7975	32.35	7970
38.84	7965	45.32	7960	51.83	7955	58.31	7950	64.86	7945
72.28	7940	79.83	7935	87.33	7930	94.86	7925	102.3	7920
109.63	7915	116.66	7910	125.8	7905	133.96	7900	136.06	7898.73
153.35	7899.17	175.42	7895	178.77	7891.05	179.5	7886.01	184.12	7885.96
188.16	7886.01	188.4	7891.05	190.82	7895	203.47	7898.35	209.94	7900
228.39	7905	246.25	7910	263.87	7915	281.84	7920	300.86	7925
321.17	7930	340.34	7935	349.09	7937.27	367.86	7937.89	378.66	7940

Manning's n Values num= 3									
Sta	n	Sta	n	Sta	n	Sta	n	Sta	n
0	0	175.42	0	190.82	0				

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	175.42	190.82		35.99	31.3	37.79		.3	.5

Ineffective Flow num= 2									
Sta L	Sta R	Elev	Permanent	Sta L	Sta R	Elev	Permanent	Sta L	Sta R
0	178.85	7886.34	F	189.85	378.66	7886.34	F		

CULVERT

RIVER: Reach #1
REACH: Sabino Canyon RS: 4925

INPUT

Description: Culvert #17 Guthrie Road
Distance from Upstream XS = 6
Deck/Roadway Width = 18
Weir Coefficient = 3.1

Upstream Deck/Roadway Coordinates num= 3

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
176.62	7891.757		184.12	7891.257	191.62	7891.757			

Upstream Bridge Cross Section Data num= 40									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7990	10.2	7985	19.18	7980	25.92	7975	32.35	7970
38.84	7965	45.32	7960	51.83	7955	58.31	7950	64.86	7945
72.28	7940	79.83	7935	87.33	7930	94.86	7925	102.3	7920
109.63	7915	116.66	7910	125.8	7905	133.96	7900	136.06	7898.73
153.35	7899.17	175.42	7895	178.77	7891.05	179.5	7886.01	184.12	7885.96
188.16	7886.01	188.4	7891.05	190.82	7895	203.47	7898.35	209.94	7900
228.39	7905	246.25	7910	263.87	7915	281.84	7920	300.86	7925
321.17	7930	340.34	7935	349.09	7937.27	367.86	7937.89	378.66	7940

Manning's n Values num= 3									
Sta	n	Sta	n	Sta	n	Sta	n	Sta	n
0	0	175.42	0	190.82	0				

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	175.42	190.82		.3	.5

Ineffective Flow num= 2									
Sta L	Sta R	Elev	Permanent	Sta L	Sta R	Elev	Permanent	Sta L	Sta R
0	178.85	7886.34	F	189.85	378.66	7886.34	F		

Downstream Deck/Roadway Coordinates num= 3

Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 177.777890.107 185.277889.607 192.777890.107

Downstream Bridge Cross Section Data

Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7985	9.17	7980	16.69	7975	24.01	7970	31.43	7965
38.68	7960	45.88	7955	52.8	7950	59.7	7945	68.04	7940
76.34	7935	84.57	7930	92.6	7925	100.29	7920	107.92	7915
115.59	7910	123.35	7905	131.14	7900	137.2	7896.12	155.49	7895.55
158.84	7895	179.13	7889.65	179.61	7887.67	181.31	7884.8	185.55	7884.74
188.56	7884.78	189.12	7889.47	200.69	7895	218.76	7900	237.9	7905
255.89	7910	272.71	7915	288.67	7920	305.6	7925	324.29	7930
344.75	7935	354.74	7937.24	380.58	7937.21	389.75	7940		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	179.13	0	189.12	0

Bank Sta: Left Right Coeff Contr. Expan.
 179.13 189.12 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	171.84	7884.69	F
200	389.75	7884.69	F

Upstream Embankment side slope = 3 horiz. to 1.0 vertical
 Downstream Embankment side slope = 3 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .95
 Elevation at which weir flow begins =
 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 Arch 3.9167 5.9167
 FHWA Chart # 41- Arch; Corrugated metal
 FHWA Scale # 1 - 90 Degree headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 6 22 .024 .024 0 .5 1
 Upstream Elevation = 7886.34
 Centerline Station = 184.12
 Downstream Elevation = 7884.69
 Centerline Station = 185.27

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4920

INPUT

Description: XSBC Downstream of Culvert # 17

Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7985	9.17	7980	16.69	7975	24.01	7970	31.43	7965
38.68	7960	45.88	7955	52.8	7950	59.7	7945	68.04	7940
76.34	7935	84.57	7930	92.6	7925	100.29	7920	107.92	7915
115.59	7910	123.35	7905	131.14	7900	137.2	7896.12	155.49	7895.55
158.84	7895	179.13	7889.65	179.61	7887.67	181.31	7884.8	185.55	7884.74
188.56	7884.78	189.12	7889.47	200.69	7895	218.76	7900	237.9	7905
255.89	7910	272.71	7915	288.67	7920	305.6	7925	324.29	7930
344.75	7935	354.74	7937.24	380.58	7937.21	389.75	7940		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	179.13	0	189.12	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 179.13 189.12 89.2 95.09 89.24 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	171.84	7884.69	F
200	389.75	7884.69	F

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4910

INPUT

Description:

Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7975	7.07	7970	14.12	7965	21.13	7960	28.12	7955
35.14	7950	44.47	7945	54.08	7940	63.13	7935	71.73	7930
80.21	7925	88.56	7920	96.05	7915	103.85	7910	112.71	7905
121.86	7900	130.79	7895	136.8	7891.8	162.5	7890.92	167.98	7890
191.23	7880	205.48	7890	223.02	7895	241.18	7900	260.68	7905
280.52	7910	300.22	7915	318.22	7920	335.53	7925	352.05	7930
369.3	7935	386.54	7940						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	167.98	0	205.48	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 167.98 205.48 242.99 229.2 209.27 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4900

INPUT

Description:

Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7945	6.47	7940	17.24	7935	29.38	7930	39.56	7925

47.76	7920	55.06	7915	62.29	7910	70.05	7905	77.87	7900
86.67	7895	95.65	7890	105.03	7885	114.41	7880	119.95	7877.12
171.48	7876.87	179.79	7875	193.15	7871.16	195.33	7865.13	198.51	7869.05
200.13	7871.16	209.78	7875	228.29	7880	247.26	7885	264.39	7890
275.92	7895	287.41	7900	298.92	7905	311.4	7910	323.73	7915
336.22	7920	350.49	7925	364.8	7930	379.29	7935	393.38	7940

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 179.79 0 209.78 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 179.79 209.78 163.32 152.05 152.08 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4890

INPUT

Description: XSEC Upstream of Culvert # 18
 Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7955	8.03	7950	15.42	7945	22.55	7940	28.1	7936.09
29.86	7935	37.6	7930	45.48	7925	53.19	7920	61.34	7915
69.89	7910	80	7905	91.69	7900	103.43	7895	115.24	7890
126.76	7885	131.22	7882.85	139.5	7880	154.12	7875	168.79	7870
176.95	7867.21	208.12	7867.08	218.11	7864.82	222.12	7860.44	225.25	7860
229.26	7860.15	233.27	7865.41	242.92	7870	257.15	7875	272.4	7880
287.28	7885	299.18	7890	310.69	7895	322.19	7900	335.77	7905
349.16	7910	362.25	7915	374.81	7920	386.81	7925	397.22	7930
409.76	7935	422.59	7940						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 208.12 .045 242.92 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 208.12 242.92 65.94 55.62 51.72 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 217.51 7871.51 F
 235.51 422.59 7871.51 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4885

INPUT

Description: Culvert #18
 Distance from Upstream XS = 5
 Deck/Roadway Width = 17
 Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7871.07 228 7866.51 250 7866.07

Upstream Bridge Cross Section Data
 Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7955	8.03	7950	15.42	7945	22.55	7940	28.1	7936.09
29.86	7935	37.6	7930	45.48	7925	53.19	7920	61.34	7915
69.89	7910	80	7905	91.69	7900	103.43	7895	115.24	7890
126.76	7885	131.22	7882.85	139.5	7880	154.12	7875	168.79	7870
176.95	7867.21	208.12	7867.08	218.11	7864.82	222.12	7860.44	225.25	7860
229.26	7860.15	233.27	7865.41	242.92	7870	257.15	7875	272.4	7880
287.28	7885	299.18	7890	310.69	7895	322.19	7900	335.77	7905
349.16	7910	362.25	7915	374.81	7920	386.81	7925	397.22	7930
409.76	7935	422.59	7940						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 208.12 .045 242.92 .055

Bank Sta: Left Right Coeff Contr. Expan.
 208.12 242.92 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 217.51 7871.51 F
 235.51 422.59 7871.51 F

Downstream Deck/Roadway Coordinates num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 175.25 7865 228 7865 260 7865

Downstream Bridge Cross Section Data
 Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7955	9.24	7950	18.01	7945	26.61	7940	34.66	7936.16
37.14	7935	47.51	7930	58.28	7925	68.5	7920	78.59	7915
88.77	7910	99.02	7905	109.08	7900	118.97	7895	128.92	7890
138.76	7885	143.11	7882.85	149.4	7880	162	7875	175.25	7870
188.62	7865	193.66	7861.09	222.3	7863.8	235.22	7861.86	237.29	7859.27
243.09	7859.3	243.97	7861.86	248.21	7865	259.41	7870	271.61	7875
283.77	7880	295.55	7885	307.06	7890	318.39	7895	329.64	7900
340.95	7905	353.78	7910	364.74	7915	375.13	7920	385.29	7925
395.01	7930	404.8	7935	417.95	7940				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 222.3 0 248.21 0

Bank Sta: Left Right Coeff Contr. Expan.
 222.3 248.21 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 235.22 7861 F
 243.97 417.95 7861 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 =
 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 3.5
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 5 19 .024 .024 0 .5 1
 Number of Barrels = 2
 Upstream Elevation = 7860
 Centerline Stations
 Sta. Sta.
 223.5 228
 Downstream Elevation = 7859.07
 Centerline Stations
 Sta. Sta.
 238 242

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4880

INPUT

Description: XSEC Downstream of Culvert # 18
 Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7955	9.24	7950	18.01	7945	26.61	7940	34.66	7936.16
37.14	7935	47.91	7910	56.28	7925	68.5	7920	78.59	7915
88.77	7910	99.02	7905	109.08	7900	118.97	7895	128.92	7890
138.76	7895	143.11	7882.95	149.4	7880	162	7875	175.25	7870
188.62	7865	193.66	7863.09	222.3	7853.8	235.22	7861.86	237.29	7859.27
243.09	7859.1	243.97	7861.86	248.21	7865	259.41	7870	271.61	7875
283.77	7880	285.55	7885	307.06	7890	318.39	7895	329.64	7900
340.95	7905	353.78	7910	364.74	7915	375.13	7920	385.29	7925
395.01	7930	404.8	7935	417.95	7940				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	222.3	0	248.21	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 222.3 248.21 120.36 140.56 143.52 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	235.22	7861	F
243.97	417.95	7861	F

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4870

INPUT

Description:
 Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7935	6.76	7930	13.54	7925	20.47	7920	27.76	7915
35.18	7910	43.8	7905	54.91	7900	66.11	7895	77.35	7890
89.08	7885	94.94	7882.95	100.9	7880	111.4	7875	121.69	7870
131.18	7865	140.28	7860	152.35	7857.12	193.66	7857.78	205	7856
209	7851	212	7851	218.55	7860	227.68	7865	236.85	7870
245.63	7875	253.64	7880	261.55	7885	269.55	7890	277.72	7895
285.91	7900	294.31	7905	308.91	7910	322.62	7915	334.41	7920
345.18	7925	355.23	7930	364.25	7935				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	193.66	0	218.55	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 193.66 218.55 86.06 123.02 129.77 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4860

INPUT

Description: XSEC Upstream of Culvert # 19
 Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
12.24	7925	18.7	7920	25.39	7915	33.1	7910	41.04	7905
46.88	7900	56.81	7895	64.57	7890	72.3	7885	75.66	7882.85
81.53	7880	91.68	7875	101.81	7870	111.95	7865	122.09	7860
133.19	7855	144.7	7850.65	176.31	7850	183.19	7849.88	190	7846.11
193	7841	197	7841	200.03	7846.11	206.33	7850	214.52	7855
222.64	7860	233.18	7865	259.4	7869.91	259.51	7870	278.65	7875
333.65	7880	363.57	7885	390.4	7890				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
12.24	0	183.19	0	206.33	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 183.19 206.33 29.33 33.29 29.29 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
12.24	190.61	7853.67	F
207.61	390.4	7853.67	F

CULVERT

RIVER: Reach #1
REACH: Sabino Canyon RS: 4855

INPUT

Description: Culvert #19
Distance from Upstream XS = 5
Deck/Roadway Width = 19.5
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates

num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
183.19 7849.88 206.33 7850

Upstream Bridge Cross Section Data

Station Elevation Data num= 33
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
12.24 7925 18.7 7920 25.39 7915 33.1 7910 41.04 7905
48.88 7900 56.81 7895 64.57 7890 72.3 7885 75.66 7882 85
81.53 7880 91.68 7875 101.81 7870 111.95 7865 122.09 7860
133.19 7855 144.7 7850 176.31 7850 183.19 7849.88 190 7846.11
193 7845 197 7841 200.03 7846.11 206.33 7850 214.52 7855
222.64 7860 233.18 7865 259.4 7869.91 259.51 7870 278.65 7875
333.65 7880 363.57 7885 390.4 7890

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
12.24 0 183.19 0 206.33 0

Bank Sta: Left Right Coeff Contr. Expan.
183.19 206.33 .3 .5

Ineffective Flow num= 2

Sta L Sta R Elev Permanent
12.24 190.61 7853.67 F
207.61 390.4 7853.67 F

Downstream Deck/Roadway Coordinates

num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
154.95 7848.82 188.12 7848.43

Downstream Bridge Cross Section Data

Station Elevation Data num= 35
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7915 7.98 7910 15.95 7905 23.71 7900 31.42 7895
39.08 7890 46.67 7885 49.95 7882.85 56.09 7880 66.94 7875
77.81 7870 88.64 7865 99.23 7860 110.84 7855 122.45 7850
123.67 7849.52 154.95 7848.82 169.66 7845 171.58 7843.52 172.5 7841
177 7841 179.08 7843.52 179.7 7845 188.12 7848.43 194.32 7850
207.99 7855 221.51 7859.84 222.15 7860 241.04 7865 300.86 7870
320.26 7872.94 325.04 7875 337.24 7880 349.74 7885 364.98 7890

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 154.95 0 188.12 0

Bank Sta: Left Right Coeff Contr. Expan.
154.95 188.12 .3 .5

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 =
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 # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 1 - Headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
5 19.5 .024 .024 0 .5 1

Number of Barrels = 2
Upstream Elevation = 7841.2

Centerline Stations
Sta. Sta.
193.25 196.75
Downstream Elevation = 7841
Centerline Stations
Sta. Sta.
173.53 176.6

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4850

INPUT

Description: XSEC Downstream of Culvert # 19

Station Elevation Data num= 35
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7915 7.98 7910 15.95 7905 23.71 7900 31.42 7895
39.08 7890 46.67 7885 49.95 7882.85 56.09 7880 66.94 7875
77.81 7870 88.64 7865 99.23 7860 110.84 7855 122.45 7850
123.67 7849.52 154.95 7848.82 169.66 7845 171.58 7843.52 172.5 7841
177 7841 179.08 7843.52 179.7 7845 188.12 7848.43 194.32 7850
207.99 7855 221.51 7859.84 222.15 7860 241.04 7865 300.86 7870
320.26 7872.94 325.04 7875 337.24 7880 349.74 7885 364.98 7890

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 154.95 0 188.12 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
154.95 188.12 173.2 160.5 156.03 .3 .5

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4840

INPUT

Description: Station Elevation Data num= 41
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
53 7925 8.01 7920 15.1 7915 22.33 7910 29.54 7905
36.77 7900 44 7895 51.19 7890 58.4 7885 61.45 7882.85
67.06 7880 76.72 7875 85.89 7870 94.72 7865 103.5 7860
112.21 7855 121.03 7850 130.02 7845 139.05 7840 148.05 7835
156.85 7830 158.04 7829.26 177.05 7828.93 190.97 7826.07 203.71 7830
220.15 7835 234.67 7840 245.73 7845 255.42 7850 264.94 7855
274.46 7860 283.87 7865 292.14 7870 295.65 7872.57 301.58 7875
313.78 7880 325.99 7885 338.22 7890 345.33 7892.95 350.34 7895
361.65 7900

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
.53 0 177.05 0 203.71 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
177.05 203.71 154.55 159.68 160.08 .1 .3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4830

INPUT

Description: XSEC Upstream of Culvert # 20
Station Elevation Data num= 43
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7920 8.38 7915 16.36 7910 24.24 7905 32.14 7900
40.04 7895 47.87 7890 55.62 7885 59 7882.85 63.75 7880
72.51 7875 81.4 7870 90.2 7865 99.03 7860 107.9 7855
116.67 7850 125.12 7845 133.7 7840 142.49 7835 151.32 7830
160.13 7825 167.65 7821.03 191.27 7822.32 196.41 7820 207.67 7815.02
218.66 7820 228.65 7825 238.51 7830 248.34 7835 258.29 7840
268.15 7845 279.24 7850 292.01 7855 304.18 7860 315.79 7865
327.39 7870 341.24 7875 355.23 7880 368.25 7885 381.3 7890
388.74 7892.95 392.84 7895 402.85 7900

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 191.27 0 218.66 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
191.27 218.66 48.5 48.05 48.26 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 201.11 7820 F
214.11 402.85 7820 F

CULVERT

RIVER: Reach #1
REACH: Sabino Canyon RS: 4825

INPUT

Description: Culvert #20
Distance from Upstream XS = 6
Deck/Roadway Width = 20
Weir Coefficient = 3.1
Upstream Deck/Roadway Coordinates
num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
160.13 7825 228.65 7823.16

Upstream Bridge Cross Section Data
Station Elevation Data num= 43
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7920 8.38 7915 16.36 7910 24.24 7905 32.14 7900
40.04 7895 47.87 7890 55.62 7885 59 7882.85 63.75 7880
72.51 7875 81.4 7870 90.2 7865 99.03 7860 107.9 7855
116.67 7850 125.12 7845 133.7 7840 142.49 7835 151.32 7830
160.13 7825 167.65 7821.03 191.27 7822.32 196.41 7820 207.67 7815.02
218.66 7820 228.65 7825 238.51 7830 248.34 7835 258.29 7840
268.15 7845 279.24 7850 292.01 7855 304.18 7860 315.79 7865
327.39 7870 341.24 7875 355.23 7880 368.25 7885 381.3 7890
388.74 7892.95 392.84 7895 402.85 7900

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 191.27 0 218.66 0

Bank Sta: Left Right Coeff Contr. Expan.
191.27 218.66 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 201.11 7820 F
214.11 402.85 7820 F

Downstream Deck/Roadway Coordinates
num= 3
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
166.73 7822 233.04 7820.55 256.33 7821.32

Downstream Bridge Cross Section Data
Station Elevation Data num= 46
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7929.7 6.73 7925 14.1 7920 21.5 7915 28.98 7910
36.44 7905 43.95 7900 51.43 7895 58.66 7890 65.6 7885
68.53 7882.85 73.5 7880 82.15 7875 91.02 7870 99.81 7865
108.74 7860 117.29 7855 125.35 7850 133.56 7845 141.71 7840
149.77 7835 157.79 7830 166.73 7825 178.27 7820 178.47 7820
204.17 7818.83 215.42 7815 225.31 7811.68 233.04 7815 244.86 7820
256.33 7825 267.36 7830 278.31 7835 289.81 7840 301.11 7845
311.96 7850 322.51 7855 332.77 7860 343.09 7865 357.04 7870
371.31 7875 384.61 7880 396.44 7885 408.32 7890 415.48 7892.95
419.52 7895

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 204.17 0 244.86 0

Bank Sta: Left Right Coeff Contr. Expan.
 204.17 244.86 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 219.34 7815 F
 232.34 419.52 7815 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 =
 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 Arch 4 5
 FHWA Chart # 41- Arch; Corrugated metal
 FHWA Scale # 1 - 90 Degree headwall
 Solution Criteria - Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 6 20 .024 .024 0 .5 1

Number of Barrels = 2
 Upstream Elevation = 7816.6
 Centerline Stations
 Sta. Sta.
 204.11 211.11
 Downstream Elevation = 7812.68
 Centerline Stations
 Sta. Sta.
 222.34 229.34

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4820

INPUT

Description: XSEC Upstream of Culvert # 20

Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7929.7	6.73	7925	14.1	7920	21.5	7915	28.98	7910
36.44	7905	43.95	7900	51.43	7895	58.66	7890	65.6	7885
68.53	7882.85	73.5	7880	82.15	7875	91.02	7870	99.81	7865
108.74	7860	117.29	7855	125.35	7850	133.56	7845	141.71	7840
149.77	7835	157.79	7830	166.73	7825	178.27	7820	178.47	7820
204.17	7818.83	215.42	7815	225.31	7811.68	233.04	7815	244.86	7820
254.33	7825	267.36	7830	278.31	7835	289.81	7840	301.11	7845
311.96	7850	322.51	7855	332.77	7860	343.09	7865	357.04	7870
371.31	7875	384.61	7880	396.44	7885	408.32	7890	419.48	7892.95
419.52	7895								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 204.17 0 244.86 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 204.17 244.86 164.6 153.11 138.65 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 219.34 7815 F
 232.34 419.52 7815 F

CROSS SECTION

RIVER: Reach #3
 REACH: Sabino Canyon RS: 4810

INPUT

Description:

Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7915	7.66	7910	15.68	7905	26.07	7900	36.71	7895
47.11	7890	56.59	7885	60.51	7882.85	74.99	7880	86.96	7875
98.26	7870	109.57	7865	120.2	7860	131.21	7855	142.14	7850
151.62	7845	160.97	7840	170.27	7835	179.87	7830	190.53	7825
201.39	7820	212.6	7815	223.76	7810	228.83	7807.44	248.16	7808.53
255.8	7805	264.58	7801.11	274.29	7805	287.92	7810	301.5	7815
315.15	7820	328.78	7825	342.07	7830	355.2	7835	368.72	7840
382.65	7845	396.22	7850	410.22	7855	419.28	7860	427.23	7865
435.09	7870	442.9	7875	450.76	7880	458.97	7885	467.43	7890
472.45	7892.95	478.45	7895						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 248.16 .04 287.92 .03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 248.16 287.92 275.35 305.07 315.05 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4800

INPUT

Description:

Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7880	15.89	7875	31.63	7870	46.86	7865	61.58	7860
75.94	7855	90.57	7850	105.45	7845	121.4	7840	137.09	7835
142.29	7833.37	165.78	7833.77	173.12	7830	182.91	7825	192.66	7820
201.95	7815	214.65	7810	229.01	7805	243.26	7800	258.52	7795
273.96	7790	281.29	7787.57	305.26	7787.63	323.24	7784.56	324.16	7784.16

326.77	7784.09	327.09	7785.04	334.87	7790	343.66	7795	352.32	7800
360.73	7805	369.24	7810	377.69	7815	385.88	7820	394	7825
402.42	7820	411.45	7835	419.8	7840	427.87	7845	435.89	7850
444.02	7855	444.64	7855.45	460.3	7860	478.56	7865	497.77	7870
518.37	7875								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 305.26 .04 334.87 .03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 305.26 334.87 128.1 88.46 74.01 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4790

INPUT

Description: Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7820	9.57	7825	20.6	7820	34.65	7815	48.61	7810
62.09	7805	76.58	7800	92.01	7795	106.96	7790	121.05	7785
126.31	7783.96	220.18	7780.28	225.05	7780	245.15	7778.22	245.97	7777.01
248.48	7777.01	249.23	7778.3	251.36	7780	261.33	7785	271.43	7790
281.8	7795	290.96	7800	299.83	7805	308.76	7810	317.59	7815
326.22	7820	334.52	7825	342.45	7830	350.26	7835	358	7840
365.73	7845	372.77	7850	382.4	7855	383.09	7855.45	396.67	7860
411.1	7865	426.83	7870						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .013 220.18 .04 261.13 .03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 220.18 261.13 185.19 110.34 113.96 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4780

INPUT

Description: Upstream of Culvert #9 Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7845	15.21	7840	31.46	7835	43.71	7830	53.79	7825
63.08	7820	71.78	7815	73.03	7814.14	83.33	7812.32	103.89	7810
115.5	7808.74	120.01	7805	126.02	7800	132.06	7795	132.37	7794.67
143.19	7790	150.51	7786.74	182.84	7785.9	186.05	7785	203.55	7780
211.61	7777.64	262.07	7775	318.04	7771.97	329.17	7769.94	334.52	7766.73
337.81	7765.57	344.59	7765.57	347.9	7766.58	350.58	7770.23	351.96	7773.3
357.47	7775	377.77	7780	379.48	7780.35	407.68	7785	417.42	7790
427.25	7795	437.79	7800	450.36	7805	457.27	7807.76	460.41	7810
468.79	7815	477.32	7820	486.69	7825	496.31	7830	505.89	7835
515.44	7840	525.27	7845	536	7850	548.49	7855	549.73	7855.45
567.3	7860								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 318.04 0 351.96 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 318.04 351.96 180.71 135.48 113.78 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 355.59 7770.38 F
 347.37 567.3 7770.38 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4775

INPUT

Description: Culvert #9 Under Sabino Canyon Road
 Distance from Upstream XS = 15
 Deck/Roadway Width = 115
 Weir Coefficient = 1.1
 Upstream Deck/Roadway Coordinates num= 5

Sta	Ht	Cord	Lo	Cord	Sta	Ht	Cord	Lo	Cord	Sta	Ht	Cord	Lo	Cord
318.04	7771.97				320	7772				331.41	7771.067			
341.41	7770.567				351	417771.067								

Upstream Bridge Cross Section Data Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7845	15.21	7840	31.46	7835	43.71	7830	53.79	7825
63.08	7820	71.78	7815	73.03	7814.14	83.33	7812.32	103.89	7810
115.5	7808.74	120.01	7805	126.02	7800	132.06	7795	132.37	7794.67
143.19	7790	150.51	7786.74	182.84	7785.9	186.05	7785	203.55	7780
211.61	7777.64	262.07	7775	318.04	7771.97	329.17	7769.94	334.52	7766.73
337.81	7765.57	344.59	7765.57	347.9	7766.58	350.58	7770.23	351.96	7773.3
357.47	7775	377.77	7780	379.48	7780.35	407.68	7785	417.42	7790
427.25	7795	437.79	7800	450.36	7805	457.27	7807.76	460.41	7810
468.79	7815	477.32	7820	486.69	7825	496.31	7830	505.89	7835
515.44	7840	525.27	7845	536	7850	548.49	7855	549.73	7855.45
567.3	7860								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 318.04 0 351.96 0

Bank Sta: Left Right Coeff Contr. Expan.
 318.04 351.96 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 355.59 7770.38 F
 347.37 567.3 7770.38 F

Downstream Deck/Roadway Coordinates
 num= 5
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 65.50 7767.38 103.987767.692 113.887767.192
 123.887767.692 190 7767

Downstream Bridge Cross Section Data
 Station Elevation Data num= 28
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7793.37 8.55 7790 21.16 7785 34.28 7780 47.01 7775
 59.1 7770 65.59 7767.38 84.83 7767.23 104.03 7766.75 107.58 7765
 108.99 7763.31 110.18 7762.38 111.27 7762.3 113.87 7762.18 115.72 7762.38
 117.62 7762.23 117.99 7762.75 120.75 7764.47 146.74 7765 182.65 7765.82
 192.5 7769.56 202.22 7770 221.95 7775 234.31 7780 244.98 7785
 255.31 7790 265.61 7795 270 7800

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 108.99 0 120.75 0

Bank Sta: Left Right Coeff Contr. Expan.
 108.99 120.75 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 108.99 7764 F
 120.75 270 7764 F

Upstream Embankment side slope = 2 horiz. to 1.0 vertical
 Downstream Embankment side slope = 1 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .95
 Elevation at which weir flow begins =
 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 Arch 3.9167 5.9167
 FHWA Chert # 41- Arch; Corrugated metal
 FHWA Scale # 1 = 90 Degree headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 14 118 .024 .024 0 .5 1
 Upstream Elevation = 7765.65
 Centerline Station = 341.41
 Downstream Elevation = 7762.275
 Centerline Station = 113.88

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4770

INPUT
 Description: Downstream of Culvert #9
 Station Elevation Data num= 28
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7793.37 8.55 7790 21.16 7785 34.28 7780 47.01 7775
 59.1 7770 65.59 7767.38 84.83 7767.23 104.03 7766.75 107.58 7765
 108.99 7763.31 110.18 7762.38 111.27 7762.3 113.87 7762.18 115.72 7762.38
 117.62 7762.23 117.99 7762.75 120.75 7764.47 146.74 7765 182.65 7765.82
 192.5 7769.56 202.22 7770 221.95 7775 234.31 7780 244.98 7785
 255.31 7790 265.61 7795 270 7800
 Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 108.99 0 120.75 0
 Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 108.99 120.75 152.22 145.66 138.18 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 108.99 7764 F
 120.75 270 7764 F

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4765

INPUT
 Description:
 Station Elevation Data num= 30
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7793.37 8.42 7790 21.05 7785 35.54 7780 60.59 7775
 61.89 7774.76 98.62 7771.82 103.59 7770 105.34 7769.32 114.58 7765.57
 129.34 7765.91 130.97 7765 140.17 7760 149.24 7755 150.51 7754.31
 152.49 7755 171.62 7759.25 190.61 7760 224.99 7761.95 232.98 7765
 244.4 7768.4 255.01 7770 283.74 7772.88 286.83 7775 293.57 7780
 300.01 7785 306.44 7790 312.82 7795 318.59 7800 319.54 7800 48
 Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 140.17 .04 171.62 .045
 Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 140.17 171.62 178.1 172.24 175.18 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4760

INPUT
 Description:
 Station Elevation Data num= 36
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 7800 48.13 7795 57.91 7793.17 70.73 7790 87.74 7785
 103.72 7780 115.23 7775 135.68 7770 152.1 7765 168.46 7760

191.63	7755	216.97	7753.01	224.1	7750	234.82	7745.58	236.49	7745
245.14	7740.23	252.63	7740.23	267.13	7745	276.33	7747.54	323.9	7748.45
329.02	7750	346.84	7755	356.02	7757.42	405.99	7760	418.63	7761.05
434.12	7765	452.29	7770	465.67	7775	466.32	7775.26	480.51	7775.88
487.53	7780	496.79	7785	507.65	7790	518.6	7795	520.87	7795.81
558.11	7796.51								

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 .055 234.82 .04 276.33 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 234.82 276.33 116.92 128.62 133.13 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4750

INPUT
 Description: XSEC Upstream of Culvert # 8
 Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7775	25.04	7770	52.39	7765	74.31	7760	112.6	7757.98
124.17	7755	131.34	7750	136.33	7747.92	160.75	7745	181.69	7740
195.81	7737.68	198.48	7733.95	200.76	7731.6	203.39	7730.73	208.74	7730.73
212.05	7732.07	212.76	7734.24	215.88	7737.68	228.79	7738.29	270.58	7740
276.7	7740.58	309.3	7745	328.13	7750	342.76	7755	362.19	7760
366.45	7761.19	379.42	7761.69	389.12	7765	403.32	7770	411.96	7775

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 195.81 0 215.88 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 195.81 215.88 36.73 43.9 85.3 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 201.04 7735.63 F
 210.97 411.96 7735.7 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4745

INPUT
 Description: Culvert #8
 Distance from Upstream XS = 10
 Deck/Roadway Width = 18
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates
 num= 3

Sta Hi	Cord	Lo	Cord	Sta Hi	Cord	Lo	Cord	Sta Hi	Cord	Lo	Cord
0	7737			203	7737			273	7737		

Upstream Bridge Cross Section Data

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7775	25.04	7770	52.39	7765	74.31	7760	112.6	7757.98
124.17	7755	131.34	7750	136.33	7747.92	160.75	7745	181.69	7740
195.81	7737.68	198.48	7733.95	200.76	7731.6	203.39	7730.73	208.74	7730.73
212.05	7732.07	212.76	7734.24	215.88	7737.68	228.79	7738.29	270.58	7740
276.7	7740.58	309.3	7745	328.13	7750	342.76	7755	362.19	7760
366.45	7761.19	379.42	7761.69	389.12	7765	403.32	7770	411.96	7775

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 195.81 0 215.88 0

Bank Sta: Left Right Coeff Contr. Expan.
 195.81 215.88 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 201.04 7735.63 F
 210.97 411.96 7735.7 F

Downstream Deck/Roadway Coordinates

Sta Hi	Cord	Lo	Cord	Sta Hi	Cord	Lo	Cord	Sta Hi	Cord	Lo	Cord
0	7737			335	7737			450	7737		

Downstream Bridge Cross Section Data

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7790	18.17	7788.85	25.56	7785	29.11	7782.96	78.39	7780
115.58	7777.18	123.3	7775	145.09	7770	168.25	7765	186.28	7760
210.81	7755	231.71	7752.09	263.3	7750	286.47	7745	304.43	7740
319.7	7735	331.44	7730	332.85	7729.12	336.81	7730	363.39	7734.61
370.52	7735	399.4	7735.46	429.43	7740	445.76	7742.78	456.35	7745
477.1	7750	493.85	7755	509.59	7760	525.12	7765	540.4	7770

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 319.7 0 363.39 0

Bank Sta: Left Right Coeff Contr. Expan.
 319.7 363.39 .3 .5

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 =
 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 4
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert

FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 10 18 .024 .024 1 5 1
 Number of Barrels = 2
 Upstream Elevation = 7730.3
 Centerline Stations
 Sta. Sta.
 203.04 208.04
 Downstream Elevation = 7730
 Centerline Stations
 Sta. Sta.
 331.44 336.44

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4740

INPUT

Description: XSEC Downstream of Culvert # 8

Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7790	18.17	7788.85	25.56	7785	29.11	7782.96	78.38	7780
115.58	7777.28	123.3	7775	145.09	7770	162.25	7765	186.28	7760
210.81	7755	231.71	7752.09	263.3	7750	286.47	7745	304.43	7740
319.7	7735	331.44	7730	332.85	7729.32	336.81	7730	363.39	7734.61
370.52	7735	399.4	7735.46	429.43	7740	445.76	7742.78	456.35	7745
477.1	7750	493.85	7755	509.59	7760	525.12	7765	540.4	7770

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	319.7	0	363.39	0

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
319.7	363.39	50.45	40.63	29.76	.3	.5	

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4730

INPUT

Description: XSEC Upstream of Culvert # 7

Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	1.57	7768.14	19.16	7765	37.8	7761.87	42.81	7760
54.83	7755	68.18	7750	111.13	7745	152.63	7740	172.75	7735
183.79	7732.09	192.68	7730	206.71	7726.52	225.94	7730	238.84	7732.31
275.52	7732.55	292.96	7735	309.07	7740	311.46	7740.73	327.8	7745
345.99	7750	364.34	7755	379.53	7760	394.84	7765	410.2	7770

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	183.79	0	238.84	0

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
183.79	238.84	24.27	25.79	30.08	.3	.5	

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4725

INPUT

Description: Culvert #7

Distance from Upstream XS = 3
 Deck/Roadway Width = 18.5
 Weir Coefficient = 3.1

Upstream Deck/Roadway Coordinates
 num= 3

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
0	7736.81				206.71	7732.68			
					300	7730.81			

Upstream Bridge Cross Section Data
 Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	1.57	7768.14	19.16	7765	37.8	7761.87	42.81	7760
54.83	7755	68.18	7750	111.13	7745	152.63	7740	172.75	7735
183.79	7732.09	192.68	7730	206.71	7726.52	225.94	7730	238.84	7732.31
275.52	7732.55	292.96	7735	309.07	7740	311.46	7740.73	327.8	7745
345.99	7750	364.34	7755	379.53	7760	394.84	7765	410.2	7770

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	183.79	0	238.84	0

Bank Sta: Left	Right	Coeff	Contr.	Expan.
183.79	238.84	.3	.5	

Downstream Deck/Roadway Coordinates
 num= 3

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
0	7735.8				225	7731.3			
					300	7732.8			

Downstream Bridge Cross Section Data
 Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	16.1	7766.74	23.33	7765	37.87	7761.76	42.16	7760
59.64	7755	73	7750	101.01	7745	140.61	7740	179.47	7735
202.2	7730	224.77	7726.01	248.4	7730	255.9	7731.35	286.57	7731.82
311.58	7735	319.29	7735.04	335.52	7740	353.13	7745	370.69	7750
389.42	7755	406.12	7760	420.04	7765	432.56	7770		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	202.2	0	255.9	0

Bank Sta: Left	Right	Coeff	Contr.	Expan.
202.2	255.9	.3	.5	

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 =
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Culverts = 2

Culvert Name Shape Rise Span
 CULVERT#1 Circular 2
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 3 18.5 .024 .024 0 .5 1

Number of Barrels = 2
 Upstream Elevation = 7727.82
 Centerline Stations
 Sta Sta
 202.71 219.71
 Downstream Elevation = 7727.31
 Centerline Stations
 Sta Sta
 220.77 228.77

Culvert Name Shape Rise Span
 CULVERT#2 Circular 3
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 3 18.5 .024 .024 0 .5 1
 Upstream Elevation = 7726.52
 Centerline Station = 206.71
 Downstream Elevation = 7726.01
 Centerline Station = 224.77

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4720

INPUT

Description: XSEC Downstream of Culvert # 7
 Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	16.1	7766.74	23.33	7765	37.67	7761.76	42.16	7760
59.64	7755	73	7750	101.01	7745	140.61	7740	179.47	7735
202.2	7730	224.77	7726.01	248.4	7730	255.9	7731.35	286.97	7731.83
311.58	7735	319.29	7735.04	335.52	7740	353.13	7745	370.69	7750
389.42	7755	406.22	7760	420.04	7765	432.56	7770		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 202.2 0 255.9 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 202.2 255.9 66.79 45.57 38.28 .3 .5

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4710

INPUT

Description: XSEC Upstream of Culvert # 6
 Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7750	18.81	7745	64.05	7740	83.89	7735	142.51	7730
152.76	7727.75	154.24	7724.87	166.73	7724.86	169.26	7727.82	179.94	7730
188.46	7730.6	224.23	7730.81	242.67	7734.44	249.01	7735	265.56	7736.64
277.28	7740	294.97	7745	314.8	7750	336.67	7755		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 142.51 0 179.94 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 142.51 179.94 58.79 39.28 43.38 .3 .5

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4705.5

INPUT

Description: Culvert #6
 Distance from Upstream XS = 10
 Deck/Roadway Width = 19
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates
 num= 3

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
75.93					156					249.01				

Upstream Bridge Cross Section Data

Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7750	18.81	7745	64.05	7740	83.89	7735	142.51	7730
152.76	7727.75	154.24	7724.87	166.73	7724.86	169.26	7727.82	179.94	7730
188.46	7730.6	224.23	7730.81	242.67	7734.44	249.01	7735	265.56	7736.64
277.28	7740	294.97	7745	314.8	7750	336.67	7755		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 142.51 0 179.94 0

Bank Sta: Left Right Coeff Contr. Expan.
 142.51 179.94 .3 .5

Downstream Deck/Roadway Coordinates
 num= 3

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
99.24		7730			215		7730			240		7730		

Downstream Bridge Cross Section Data
 Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7740	2.98	7740.27	25.64	7741.2	86.03	7740.4	86.77	7740
95.64	7735	99.24	7732.98	152.16	7730	172.93	7728.67	176.44	7724.44
182.37	7724.31	188.43	7724.44	199.4	7727.91	234.24	7729.2	237.32	7730
251.86	7733.46	263.95	7735	305.08	7740	327.17	7745	346.76	7750
365.54	7755	383.89	7760						

Manning's n Values num= 3

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	0	172.93	0	199.4	0			

Bank Sta: Left Right Coeff Contr. Expan.
 172.93 199.4 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	177	7729	F
187	383.89	7729	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 =
 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 # 2 - Corrugated Metal Pipe Culvert
 FHWA Scale # 1 - Headwall
 Solution Criteria = Highest U.S. EG

Culvert Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
10	19	.024	.024	0	.5	1

Number of Barrels = 2
 Upstream Elevation = 7724.8
 Centerline Stations
 Sta. Sta.
 157.5 162.5
 Downstream Elevation = 7724.3
 Centerline Stations
 Sta. Sta.
 179.69 184.69

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4701

INPUT
 Description: XSEC Downstream of Culvert # 6
 Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7740	2.98	7740.27	25.64	7741.2	86.03	7740.4	86.77	7740
95.64	7735	99.24	7732.98	152.16	7730	172.93	7728.67	176.44	7724.44
182.37	7724.31	188.43	7724.44	199.4	7727.91	234.24	7729.2	237.32	7730
251.86	7733.46	263.95	7735	305.08	7740	327.17	7745	346.76	7750
365.54	7755	383.89	7760						

Manning's n Values num= 3

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	0	172.93	0	199.4	0			

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 172.93 199.4 54.16 64.9 53.38 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	177	7729	F
187	383.89	7729	F

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4690

INPUT
 Description:
 Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7739.79	50.97	7740	84.99	7740	135.78	7736.21	175.75	7735
240.15	7731.37	258.9	7730	290.91	7728.13	296.07	7725	304	7720.19
306.47	7720.21	326.63	7723.94	356.03	7725	359.97	7725.17	380.47	7730
384.85	7730.94	424.12	7735	444.45	7740	460.22	7745	476.51	7750
493.61	7755	510.23	7760						

Manning's n Values num= 3

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	.055	296.07	.04	326.63	.045			

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 296.07 326.63 147.86 67.35 63.49 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4680

INPUT
 Description: XSEC Upstream of Culvert # 5
 Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7745	10.04	7740	18.77	7735.14	19.68	7735	53.09	7730

115.99	7725	231.33	7720	271.11	7718.38	296.61	7718.19	297.5	7714.68
297.67	7713.83	301.03	7713.83	301.65	7714.72	303.75	7715.12	308.65	7717.68
313.18	7719.31	332.93	7720	352.68	7720.9	366.95	7725	367.96	7725.27
397.1	7730	408.97	7732.12	414.94	7735	422.75	7738.71	429.93	7740
446.32	7745	462.51	7750	478.81	7755				

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 271.11 0 313.18 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 271.11 313.18 72.84 32.99 41.45 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 297.06 7718.26 F
 303.75 478.81 7718.26 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4675

INPUT

Description: Culvert #5
 Distance from Upstream XS = 5
 Deck/Roadway Width = 12
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates
 num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7718.5 300 7718.5 350 7718.5

Upstream Bridge Cross Section Data
 Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7745	10.04	7740	18.77	7735.14	19.68	7735	53.09	7730
115.99	7725	231.33	7720	271.11	7718.38	296.61	7718.19	297.5	7714.68
297.67	7713.83	301.03	7713.83	301.65	7714.72	303.75	7715.12	308.65	7717.68
313.18	7719.31	332.93	7720	352.68	7720.9	366.95	7725	367.96	7725.27
397.1	7730	408.97	7732.12	414.94	7735	422.75	7738.71	429.93	7740
446.32	7745	462.51	7750	478.81	7755				

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 271.11 0 313.18 0

Bank Sta: Left Right Coeff Contr. Expan.
 271.11 313.18 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 297.06 7718.26 F
 303.75 478.81 7718.26 F

Downstream Deck/Roadway Coordinates
 num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 0 7718 283 7718 333 7718

Downstream Bridge Cross Section Data
 Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7751.04	4.25	7750	23.1	7745	41.87	7740	64.07	7735
83.6	7730	107.14	7725	107.31	7725	166.59	7720	231.44	7718.56
269.4	7717.63	278.99	7717.59	281.61	7714.26	281.77	7713.98	282.47	7713.69
284.13	7713.71	284.78	7714	285.98	7717.66	295.27	7717.63	324.77	7719.05
328.28	7720	346.87	7725	358.44	7730	369.96	7735	394.17	7740
417.38	7745	432.42	7749.76	442.64	7750				

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 269.4 0 295.27 0

Bank Sta: Left Right Coeff Contr. Expan.
 269.4 295.27 .3 .5

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 =
 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 1.5
 FHWA Chart # 1 - Concrete Pipe Culvert
 FHWA Scale # 2 - Groove end entrance with headwall
 Solution Criteria = Highest U.S. BG

Culvert	Upstrm	Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	5	12	.013	.013	0		.2	1

Number of Barrels = 2
 Upstream Elevation = 7714.2
 Centerline Stations
 Sta. Sta.
 298.5 300.5
 Downstream Elevation = 7714
 Centerline Stations
 Sta. Sta.
 282.4 284

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4670

INPUT

Description: XSEC Downstream of Culvert # 5
 Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7751.04	4.25	7750	23.1	7745	41.87	7740	64.07	7735

83.6 7730 107.14 7725 107.31 7725 166.59 7720 231.44 7718.55
269.4 7717.63 278.99 7717.59 281.61 7714.26 281.77 7713.98 282.47 7713.69
284.13 7713.71 284.78 7714 285.98 7717.66 295.27 7717.63 324.77 7719.05
328.28 7720 346.87 7725 358.44 7730 369.96 7735 394.17 7740
417.38 7745 432.42 7749.76 442.64 7750

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 269.4 0 295.27 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
269.4 295.27 148.52 148.4 110.22 .3 .5

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4640

INPUT

Description: XS2C Upstream of Culvert # 4

Station Elevation Data num= 50
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7780 10.47 7775.67 12.02 7775 23.26 7770 34.56 7765
45.9 7760 57.67 7755 66.93 7751.11 68.46 7750 76.04 7745
83.7 7740 84.63 7739.35 111.4 7737.57 115.64 7735 123.14 7730.49
124.31 7730 129.32 7728.07 132.82 7726.24 143.71 7725 170.1 7721.93
176.25 7720 192.36 7715 219.18 7714.05 241.71 7713.04 298.08 7710.53
306.6 7707.84 307.85 7707.13 308.47 7706.08 310.52 7702.64 312.16 7702.64
313.96 7702.64 315.77 7702.65 317.57 7702.65 318.31 7704.24 318.47 7707.02
322.84 7707.13 328.46 7711.81 344.8 7713.9 367.75 7715 373.68 7715.76
387.72 7720 405.21 7725 420.68 7730 433.26 7735 445.05 7740
451.26 7742.92 511.6 7745 603.42 7750 614.73 7750.69 624.94 7755

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 298.08 0 328.46 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
298.08 328.46 82.29 83.96 83.73 .3 .5

CULVERT

RIVER: Reach #1
REACH: Sabino Canyon RS: 4635

INPUT

Description: Culvert #4 Goat Hill Road

Distance from Upstream XS = 28
Deck/Roadway Width = 25
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 3

Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
3047708.077 3147707.577 3247708.077

Upstream Bridge Cross Section Data

Station Elevation Data num= 50
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7780 10.47 7775.67 12.02 7775 23.26 7770 34.56 7765
45.9 7760 57.67 7755 66.93 7751.11 68.46 7750 76.04 7745
83.7 7740 84.63 7739.35 111.4 7737.57 115.64 7735 123.14 7730.49
124.31 7730 129.32 7728.07 132.82 7726.24 143.71 7725 170.1 7721.93
176.25 7720 192.36 7715 219.18 7714.05 241.71 7713.04 298.08 7710.53
306.6 7707.84 307.85 7707.13 308.47 7706.08 310.52 7702.64 312.16 7702.64
313.96 7702.64 315.77 7702.65 317.57 7702.65 318.31 7704.24 318.47 7707.02
322.84 7707.13 328.46 7711.81 344.8 7713.9 367.75 7715 373.68 7715.76
387.72 7720 405.21 7725 420.68 7730 433.26 7735 445.05 7740
451.26 7742.92 511.6 7745 603.42 7750 614.73 7750.69 624.94 7755

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 298.08 0 328.46 0

Bank Sta: Left Right Coeff Contr. Expan.
298.08 328.46 .3 .5

Downstream Deck/Roadway Coordinates

num= 5
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
240 7708 3047708.077 3147707.577
3247708.077 400 7708

Downstream Bridge Cross Section Data

Station Elevation Data num= 61
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7785 13.85 7780 25.59 7775.67 26.96 7775 36.66 7770
46.45 7765 56.24 7760 66.05 7755 76.37 7750 86.66 7745
97.07 7740 97.13 7739.95 133.17 7736.02 134.53 7735 141.5 7730
143.55 7728.56 156.58 7727.78 159.87 7725 163.45 7721.94 178.59 7720
197.99 7715 218.58 7710 274.2 7704.81 284.34 7703.53 287.08 7702.94
306.33 7702.95 307.15 7702.68 308.3 7702.29 309.94 7701.92 311 7701.74
312.04 7701.74 313.39 7701.74 314.22 7701.75 314.9 7701.75 316.09 7701.76
317.21 7701.75 319.51 7702.06 321.73 7702.22 323.69 7702.44 324.92 7702.81
331.36 7702.85 340.26 7703.47 369.09 7706.23 386.38 7707.72 396.35 7710
424.91 7715 433.47 7720 439.35 7721.66 448.16 7722.42 454.11 7725
459.85 7727.45 499.79 7730 554.51 7735 572.8 7738.27 584.5 7740
617.82 7742.92 627.13 7745 633.31 7746.47 664.45 7750 667.05 7750.31
679.21 7755

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 284.34 0 331.36 0

Bank Sta: Left Right Coeff Contr. Expan.
284.34 331.36 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 306.16 7704.52 F
324.85 679.21 7704.57 F

Upstream Embankment side slope = 3 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 =
 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 Arch 3.9167 5.9167
 FHWA Chart # 41- Arch; Corrugated metal
 FHWA Scale # 1 - 90 Degree headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstream Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
 28 28 .024 .024 0 .5 1
 Upstream Elevation = 7702.66
 Centerline Station = 314
 Downstream Elevation = 7701.69
 Centerline Station = 314

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4630

INPUT

Description: XSEC Downstream of Culvert #4
 Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7785	13.85	7780	25.59	7775.67	26.96	7775	36.66	7770
46.45	7765	56.24	7760	66.05	7755	76.37	7750	86.66	7745
97.07	7740	97.13	7739.95	133.17	7736.02	134.53	7735	141.5	7730
143.55	7728.56	156.58	7727.78	159.87	7725	163.45	7721.94	178.59	7720
197.99	7715	218.58	7710	274.2	7704.81	284.34	7703.53	287.08	7702.94
306.33	7702.95	307.15	7702.68	308.3	7702.29	309.94	7701.92	311	7701.74
312.04	7701.74	313.39	7701.74	314.22	7701.75	314.9	7701.75	316.09	7701.76
317.21	7701.75	319.51	7702.06	321.73	7702.22	323.69	7702.44	324.92	7702.81
331.36	7702.85	340.26	7703.47	349.09	7706.23	346.38	7707.72	346.35	7710
414.91	7715	433.47	7720	439.35	7721.66	448.16	7722.42	454.11	7725
459.85	7727.45	499.79	7730	554.51	7735	572.8	7738.27	584.63	7740
617.82	7742.92	627.13	7745	633.31	7746.47	664.45	7750	667.05	7750.31
679.21	7755								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	284.34	0	331.36	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 284.34 331.36 331.3 308.04 312.42 .3 .5
 Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	306.16	7704.52	F
324.85	679.21	7704.57	F

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4620

INPUT

Description:
 Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770	11.16	7765.57	18.87	7765	63.11	7760	89.09	7755
108.3	7750	118.84	7745	129.64	7740	140.67	7735	151.98	7730
158.84	7727.71	179.6	7725	217.91	7720	223.87	7719.22	234.83	7715
248.81	7710	262.08	7706.03	309.86	7705.74	311.84	7705	325.41	7700
340.05	7695	354.73	7690	359.17	7688.44	438.97	7689.31	464.11	7690
482.34	7690.26	507.15	7695	528.63	7700	550.45	7705	572.43	7710
593.92	7715	615.78	7720	637.88	7725	650.61	7727.8	675.95	7730
741.36	7734.43	743.4	7735	758.56	7740	772.44	7745	785.6	7750
798.68	7755								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	354.73	.04	438.97	.045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 354.73 438.97 216.67 217.6 172.7 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4610

INPUT

Description:
 Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7785	5.37	7780	13.02	7775	31.8	7771.04	34.39	7770
46.8	7765	59.14	7760	72.05	7755	85.5	7750	98.6	7745
111.63	7740	120.21	7737.04	126.33	7735	141.05	7730	155.37	7725
169.54	7720	183.87	7715	198.46	7710	213.87	7705	228.12	7700
242.41	7695	256.94	7690	271.47	7685	286.34	7680	289.22	7679.08
366.74	7678.15	392.12	7679.16	396.86	7680	433.85	7685	452.78	7686.43
470.03	7690	496.61	7694.66	498.87	7695	528.93	7700	555.44	7705
576.45	7710	602.15	7715	639.28	7720	669.53	7725	687.64	7730
711.13	7735	742.29	7740	753.67	7745	762.97	7750	772.68	7755

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	0	289.22	0	368.74	0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 289.22 368.74 84.94 105.27 136.16 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4600

INPUT

Description: XSEC Upstream of Culvert # 3

Station Elevation Data num= 43
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7770 14.17 7765 28.06 7760 40.77 7755 54.24 7750
68.07 7745 81.8 7740 90.04 7737.04 96.07 7735 111.15 7730
126.21 7725 140.81 7720 155.05 7715 170.02 7710 184.86 7705
199.39 7700 213.92 7695 228.8 7690 243.69 7685.03 243.93 7685
273.02 7680 285.51 7677.25 320.38 7675 340.99 7673.68 358.96 7673.49
372.03 7675 410.43 7680 443.27 7685 494.2 7690 549.19 7695
564.65 7696.26 580.1 7700 582.89 7700.53 621.43 7705 648.47 7710
671.72 7715 674.59 7715.55 685.79 7720 698.43 7725 711.53 7730
714.52 7731.01 727.46 7735 744.29 7740

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 320.38 0 372.03 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
320.38 372.03 28.83 26.7 50.57 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 354.46 7677.49 F
363.46 744.29 7677.49 F

CULVERT

RIVER: Reach #1

REACH: Sabine Canyon RS: 4595

INPUT

Description: Culvert #3

Distance from Upstream XS = 4.5
Deck/Roadway Width = 17
Weir Coefficient = 3.1

Upstream Deck/Roadway Coordinates num= 3
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
0 7684.67 358.96 7677.49 401.25 7676.54

Upstream Bridge Cross Section Data

Station Elevation Data num= 43
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7770 14.17 7765 28.06 7760 40.77 7755 54.24 7750
68.07 7745 81.8 7740 90.04 7737.04 96.07 7735 111.15 7730
126.21 7725 140.81 7720 155.05 7715 170.02 7710 184.86 7705
199.39 7700 213.92 7695 228.8 7690 243.69 7685.03 243.93 7685
273.02 7680 285.51 7677.25 320.38 7675 340.99 7673.68 358.96 7673.49
372.03 7675 410.43 7680 443.27 7685 494.2 7690 549.19 7695
564.65 7696.26 580.1 7700 582.89 7700.53 621.43 7705 648.47 7710
671.72 7715 674.59 7715.55 685.79 7720 698.43 7725 711.53 7730
714.52 7731.01 727.46 7735 744.29 7740

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 0 320.38 0 372.03 0

Bank Sta: Left Right Coeff Contr. Expan.
320.38 372.03 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 354.46 7677.49 F
363.46 744.29 7677.49 F

Downstream Deck/Roadway Coordinates num= 3
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
225.54 7676.7 283.59 7677.4 343 7676.21

Downstream Bridge Cross Section Data

Station Elevation Data num= 32
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 7745 14.54 7740 22.87 7737.04 28.56 7735 44.32 7730
60.71 7725 76.37 7720 91.26 7715 106.13 7710 121.72 7705
138.38 7700 155.7 7695 170.3 7690 176.15 7688.3 197.62 7685.06
197.99 7685 214.62 7680 225.54 7676.7 245.65 7675 283.59 7671.87
297.12 7672.66 312.77 7675 343.38 7680 367.52 7685 391.39 7690
415.53 7695 444.36 7700 472.3 7703.95 480.29 7701.98 508.86 7705
559.8 7710 588.47 7714.79

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .055 245.65 .04 312.77 .045

Bank Sta: Left Right Coeff Contr. Expan.
245.65 312.77 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
0 278.04 7676.45 F
289.04 588.47 7676.45 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 =
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 Arch 3 4
FHWA Chart # 41- Arch: Corrugated metal
FHWA Scale # 1 - 90 Degree headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef
4.5 20 .024 .024 0 .9 1
Upstream Elevation = 7673.49
Centerline Station = 358.96
Downstream Elevation = 7672.5
Centerline Station = 283.59

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4590

INPUT

Description: XSEC Downstream of Culvert # 3

Station Elevation Data num= 32											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7745	14.54	7740	22.87	7737.04	28.96	7735	44.32	7730		
60.71	7725	76.37	7720	91.26	7715	106.13	7710	121.72	7705		
138.38	7700	155.7	7695	170.3	7690	176.15	7688.3	197.62	7685.06		
197.99	7685	214.62	7680	225.54	7676.7	245.65	7675	283.59	7671.87		
297.12	7672.66	312.77	7675	343.38	7680	367.52	7685	391.39	7690		
415.53	7695	444.36	7700	472.3	7703.95	480.29	7701.98	508.86	7705		
559.8	7710	588.47	7714.79								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	245.65	.04	312.77	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	245.65	312.77		96.17	126.79		.3	.5

Ineffective Flow num= 2			
Sta L	Sta R	Elev	Permanent
0	278.04	7676.45	F
289.04	588.47	7676.45	F

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4580

INPUT

Description:

Station Elevation Data num= 35											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7760	12.16	7755	27.55	7750	51.1	7745	67.86	7740		
76.44	7737.04	82.27	7735	95.25	7730	109	7725	125.15	7720		
140.72	7715	156.92	7710	173.33	7705	189.53	7700	205.44	7695		
221.53	7690	237.94	7685	254.29	7680	265.11	7676.7	272.62	7675		
292.46	7670	306.68	7666.61	315.96	7665	346.1	7665	349.26	7665.66		
378.86	7666.09	399.69	7670	425.53	7675	451.78	7680	477.19	7685		
502.29	7690	527.71	7695	567.15	7700	585.23	7702.2	635.84	7701.68		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	306.68	0	349.26	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	306.68	349.26		199.74	193.07		.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4570

INPUT

Description:

Station Elevation Data num= 41											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7765	14.69	7760	26.92	7755	35.15	7751.57	38.73	7750		
51.19	7745	64.94	7740	78.24	7735	91.3	7730	103.53	7725		
117.02	7720	130.65	7715	144.43	7710	158.88	7705	173.78	7700		
188.64	7695	203.38	7690	217.1	7685	231.69	7680	246.34	7675		
260.96	7670	267.78	7667.58	276.67	7665	295.47	7660	306.93	7656.78		
317.19	7655	353.12	7655	364.27	7656.52	400.57	7656.19	422.91	7660		
440.64	7645	463.49	7670	483.53	7675	495.82	7680	509.23	7685		
523.51	7690	530.47	7695	533.57	7697.16	616.67	7700	690.22	7701.18		
708.01	7705										

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	306.93	0	364.27	0

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	306.93	364.27		158.75	158.29		.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4565

INPUT

Description:

Station Elevation Data num= 23											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7705	10.21	7700	22.62	7695	33.11	7690	43.71	7685		
58.26	7680	72.94	7675	84.2	7670	89.87	7667.58	101.04	7665		
122.97	7660	135.62	7657.19	143.79	7655	162.53	7650	164.64	7649.43		
171.83	7645	174.05	7643.61	185.03	7645	219.18	7650	241.41	7650.94		
266.64	7650.9	278.63	7655	308.83	7660						

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.055	162.53	.035	219.18	.02

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	162.53	219.18		277.59	280.48		.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4560

INPUT

Description:

Station Elevation Data num= 24										
--------------------------------	--	--	--	--	--	--	--	--	--	--

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7690	13.59	7685	25.81	7680	39.49	7675	53.73	7670
71.26	7665	88.35	7660	104.35	7655	120.09	7650	135.76	7645
151.2	7640	167.13	7635	182.2	7630.5	196.83	7635	212.77	7640
234.13	7640.45	264.78	7645	268.61	7645.32	309.77	7645.76	334.67	7650
364.18	7655	413.1	7660	436.83	7665	464.52	7670		

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 .055 167.13 .035 196.83 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 167.13 196.83 187.13 234.04 247.65 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4550

INPUT

Description:
 Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7690	13.31	7685	26.89	7680	37.87	7675	48.83	7670
59.71	7665	70.44	7660	79.54	7655	91.17	7650	102.86	7645
116.09	7640	133.94	7635	142.59	7632.86	164.9	7630	192.92	7626.37
224.98	7625	257.53	7623.67	264.91	7621.5	282.51	7625	301.99	7630
311.94	7632.09	356.83	7633.76	362.16	7635	383.73	7640	403.89	7645
429.41	7650	453.71	7655	477.89	7660	499.95	7665	520.29	7670

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 .055 257.53 .035 282.51 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 257.53 282.51 108.96 135.09 121.38 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4540

INPUT

Description:
 Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7700	12.36	7695	24.37	7690	36.22	7685	48.41	7680.49
45.55	7680	54.04	7675	63.27	7670	74.48	7665	86.96	7660
99.85	7655	113.02	7650	125.98	7645	138.87	7640	151.52	7635
163.9	7630	177.15	7625	190.17	7620	199.06	7616.24	218.07	7620
223.16	7621.04	276.64	7625	289.63	7626.81	316	7628.02	326.71	7630
356.18	7635	383.89	7640	413.11	7645	434.26	7650	452.22	7655
470.45	7660	491.5	7665	514.02	7670	534.32	7675		

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 .055 177.15 .035 223.16 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 177.15 223.16 336.24 347.95 375.73 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4530

INPUT

Description:
 Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7695	13.73	7690	27.72	7685	41.64	7680	54.89	7675
68.26	7670	81.92	7665	96.57	7660	113.56	7655	131.67	7650
161.19	7645	174.12	7640	185.2	7635	195.52	7630	206.65	7625
218.67	7620	230.19	7615	241.78	7610	249.15	7605.46	250.74	7603.92
250.98	7600.49	251.64	7600.49	252.57	7600.46	252.99	7603.87	254.23	7605.48
279.07	7610	286.32	7611.24	315.39	7611.59	328.8	7615	340.88	7620
352.28	7625	363.14	7630	373.89	7635	384.75	7640	394.88	7645
404.77	7650	414.59	7655	425.09	7660	437.39	7665	449.89	7670
465.83	7675	479.98	7680	491.41	7685	501.04	7690	515.64	7695
529.38	7700								

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 .055 230.19 .035 286.33 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 230.19 286.33 123.67 125.76 135.08 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4520

INPUT

Description: XSEC Upstream of Culvert # 2
 Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7695	10.99	7690	22.11	7685	37.49	7680	54.27	7675
70.1	7670	86.05	7665	105.18	7660	126.31	7655	144.44	7650
150.01	7648.33	160.74	7645	176.55	7640	192.29	7635	208.21	7630
223.79	7625	238.86	7620	253.14	7615	266.02	7610	272.52	7606.69
278.35	7597.18	279.67	7595.25	280.89	7592.32	292.27	7592.28	293.47	7592.28
295.26	7597.28	300.44	7597.51	304.18	7597.8	309.23	7597.93	312.86	7598.13
318.03	7599.21	326.55	7601.91	334.88	7605.47	340.16	7608.25	347.11	7610
355.3	7615	363.74	7620	372.46	7625	383.3	7630	392.59	7635
401.18	7640	411.09	7645	422.94	7650	433.38	7655	444.73	7660
455.21	7665	464.94	7670	474.71	7675	484.44	7680	494.57	7685
505.01	7690	515.6	7695	526.34	7700	536.75	7705	548.47	7710

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	278.35	.035	295.26	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 278.35 295.26 56.55 52.81 57.42 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 279.38 7597.22 F
 294.64 548.47 7597.22 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4515

INPUT

Description: Culvert #2 East Sabino Road
 Distance from Upstream XS = 5
 Deck/Roadway Width = 33
 Weir Coefficient = 3.1
 Upstream Deck/Roadway Coordinates
 num= 3

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
0	7597.53				287	7597.53				347	7597.68			

Upstream Bridge Cross Section Data

Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7695	13.99	7690	22.11	7685	37.49	7680	54.27	7675
70.1	7670	85.05	7665	105.18	7660	126.31	7655	144.44	7650
150.01	7648.33	163.74	7645	176.55	7640	192.29	7635	208.21	7630
223.79	7625	233.86	7620	253.14	7615	266.02	7610	272.52	7606.69
278.35	7597.18	279.67	7595.25	280.89	7592.32	292.27	7592.28	293.47	7592.28
295.26	7597.18	300.44	7597.51	304.18	7597.8	309.23	7597.93	312.88	7598.13
318.03	7599.21	326.55	7601.91	334.88	7605.47	340.16	7608.25	347.11	7610
355.3	7615	363.74	7620	372.46	7625	383.3	7630	392.59	7635
401.18	7640	411.09	7645	422.34	7650	433.38	7655	444.73	7660
455.21	7665	464.94	7670	474.71	7675	484.44	7680	494.57	7685
505.01	7690	515.6	7695	526.34	7700	536.75	7705	548.47	7710

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	278.35	.035	295.26	.055

Bank Sta: Left Right Coeff Contr. Expan.
 278.35 295.26 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 279.38 7597.22 F
 294.64 548.47 7597.22 F

Downstream Deck/Roadway Coordinates

num= 3

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord					
0	7596.65				287	7596.65				347	7596.82			

Downstream Bridge Cross Section Data

Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7690	15.2	7685	20.08	7683.38	30.42	7680	45.54	7675
60.37	7670	78.64	7665	96.16	7660	113.19	7655	133.2	7650
139.78	7648.33	154.39	7645	178.45	7640	198.99	7635	217	7630
234.82	7625	250.7	7620	265.34	7615	279.93	7610	294.54	7605
299.44	7597.48	302.44	7591.48	306.37	7591.61	315.86	7591.61	318.77	7591.68
319.69	7603.02	344.13	7605	354.43	7605.76	367.14	7610	372.19	7611.68
385.77	7614.33	385.81	7615	395.3	7620	403.87	7625	412.25	7630
420.79	7635	433.01	7640	440.4	7645	451.3	7650	462.56	7655
472.38	7660	482.07	7665	491.7	7670	501.48	7675	511.42	7680
522.47	7685	533.68	7690	544.07	7695	553.6	7700	563.66	7705
573.67	7710								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	294.54	.035	319.69	.055

Bank Sta: Left Right Coeff Contr. Expan.
 294.54 319.69 .3 .5

Ineffective Flow num= 0
 Sta L Sta R Elev Permanent

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 =
 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 Arch 3.9167 5.9167
 FHWA Chart # 41- Arch; Corrugated metal
 FHWA Scale # 1 - 90 Degree headwall
 Solution Criteria = Highest U.S. EG

Culvert	Upstrm	Disc	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
1	5	33	.024	.024	.024	0	.5	.2

Upstream Elevation = 7592.88
 Centerline Station = 287.29
 Downstream Elevation = 7532.1
 Centerline Station = 310.95

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4510

INPUT

Description: XSEC Downstream of Culvert # 2
 Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7690	15.2	7685	20.08	7683.38	30.42	7680	45.54	7675

60.37	7670	78.64	7665	96.16	7660	113.19	7655	133.2	7650
139.78	7648.33	154.39	7645	178.45	7640	198.99	7635	217	7630
234.82	7625	250.7	7620	265.34	7615	279.93	7610	294.54	7605
299.44	7597.48	302.44	7591.48	306.37	7591.61	315.86	7591.61	318.77	7591.58
319.69	7603.02	344.13	7605	354.43	7605.76	367.14	7610	372.19	7611.68
385.77	7614.33	386.81	7615	395.3	7620	403.87	7625	412.25	7630
420.79	7635	430.01	7640	440.4	7645	451.3	7650	462.56	7655
472.38	7660	482.07	7665	491.7	7670	501.48	7675	511.42	7680
522.47	7685	533.68	7690	544.07	7695	553.6	7700	563.66	7705
573.67	7710								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 294.54 .035 119.69 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 294.54 319.69 107.29 123.56 141.49 .3 .5
 Ineffective Flow num= 0
 Sta L Sta R Elev Permanent

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4500

INPUT

Description:
 Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7685	6.33	7682.38	18.84	7680	37.39	7675	54.49	7670
69.4	7665	94.16	7660	98.57	7655	113.67	7650	118.95	7648.33
129.03	7645	147.04	7640	165.23	7635	187.42	7630	202.6	7626.9
222.65	7625	224.79	7624.72	244.05	7620	262.5	7615	281.61	7610
288.59	7607.91	315.14	7605.71	318.32	7605	341.66	7600	355.16	7591.34
357.67	7588.31	359.38	7588.27	361.48	7591.28	369.25	7599.33	395.81	7600
395.85	7599.89	409.7	7620	410.81	7621.64	418.09	7625	428.52	7630
433.98	7632.7	456.67	7633.05	461.31	7635	473.81	7640	488.18	7645
505.22	7650	521.07	7655	536.98	7660	552.96	7665	568.64	7670
581.66	7675	594.85	7680	608.22	7685	621.67	7690		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 341.66 .035 369.25 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 341.66 369.25 212.29 193.78 168.97 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4495

INPUT

Description:
 Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7620	25.33	7615	39.91	7610	61.8	7605	86.12	7600
126.11	7595	169.22	7591.33	175	7590	185	7587	187.5	7585
190	7587	200	7590	230.25	7592.59	234.67	7595	243.75	7600
252.89	7605	261.38	7610	269.58	7615	277.81	7620	281.08	7621.69
291.61	7625	308.24	7630	324.88	7635				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 175 0 200 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 175 200 154.64 128.78 101.48 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4490

INPUT

Description:
 Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7610	69.74	7605	92.58	7600	101.71	7595	109.7	7590
112	7587.5	115.85	7585	118.94	7582.32	128.46	7585	138.78	7587.83
166.99	7587.51	168.08	7590	170.08	7595	171.94	7600	173.63	7605.18
173.64	7605	201.76	7610	220.77	7615	239.61	7620		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 .12 0 138.78 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 112 138.78 109.24 128.53 146.49 .1 .3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4485

INPUT

Description:
 Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7606.84	2.4	7605	8.72	7600	15.05	7595	21.22	7590
27.6	7585	32.59	7581.05	33.28	7580	36.66	7575	40.06	7570
40.17	7569.79	40.81	7570	56.83	7575	61.04	7576.33	82.48	7576.32
86.83	7580	92.85	7585	98.84	7590	104.94	7595	111.28	7600
118.3	7605								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 36.66 .03 61.04 .02

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

36.66 61.04 252.86 253.96 252.06 .1 .3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4480

INPUT

Description:

Station Elevation Data num= 49											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7670	52.51	7665.98	55.57	7665	72.74	7660	87.84	7655		
102.78	7650	118.08	7645	131.92	7640	145.59	7635	149.27	7633	69	
157.13	7630	168.04	7625	178.7	7620	182.54	7618.1	187.86	7615		
196.66	7610	205.74	7605	215	7600.07	215.12	7600	229.24	7575		
236.02	7560	244.23	7555	255.74	7550	260.87	7547.8	266.48	7550		
276.39	7553.9	298.83	7554.22	299.87	7555	305.45	7560	311.05	7565		
316.51	7570	322.19	7575	327.74	7580	333.38	7585	339.1	7590		
345.15	7595	352	7600	359.17	7605	366.16	7610	373.32	7615		
380.39	7620	387.45	7625	394.52	7630	401.6	7635	408.71	7640		
416.76	7645	424	7647.58	433.18	7650	453.39	7655				

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.045	244.23	.04	276.39	.045

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	244.23	276.39		147.56	141.71	117.21		.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4470

INPUT

Description:

Station Elevation Data num= 49											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7640	11.24	7635	22.48	7630	33.75	7625	44.85	7620		
55.23	7615	65.23	7610	66.77	7609.29	69.37	7605	72.37	7600		
84.31	7575	84.7	7573.7	90.59	7570	98.41	7565	106.35	7560		
114.3	7555	122.13	7550	129.49	7545	137.01	7540	142.75	7536.09		
154.92	7540	156.2	7540.38	175.66	7540	184.5	7540	184.76	7539.88		
190.8	7545	196.63	7550	202.33	7555	208.34	7560	214.25	7565		
220.19	7570	227.65	7575	237.07	7580	246.12	7585	255.04	7590		
264.17	7595	274.36	7600	284.65	7605	294.94	7610	305.24	7615		
315.59	7620	325.81	7625	335.79	7630	345.66	7635	355.71	7640		
365.71	7645	370.83	7647.58	376.74	7650	388.34	7655				

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.045	137.01	.04	156.2	.045

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	137.01	156.2		156.78	157.33	154.35		1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4460

INPUT

Description:

Station Elevation Data num= 50											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7605	11.91	7601.53	18.41	7600	35.72	7595	51.23	7590		
59.35	7585	67.76	7580	78.24	7575	90.45	7570	107.86	7565		
130.25	7560	147.45	7556.1	172.6	7555	173.98	7554.91	179.39	7550		
184.98	7545	190.51	7540	196.07	7535	201.5	7530	206.61	7525		
208.48	7523.07	215.46	7525	232.58	7530	233.89	7530.4	247.67	7530		
266.11	7530	266.6	7530	273.73	7535	281.02	7540	288.34	7545		
295.6	7550	303.91	7555	312.07	7560	319.43	7565	326.49	7570		
329.87	7572.36	334.15	7575	341.92	7580	349.59	7585	357.52	7590		
365.55	7595	373.97	7600	382.58	7605	391.4	7610	400.44	7615		
409.05	7620	417.64	7625	426.09	7630	434.34	7635	442.79	7640		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	201.5	0	232.58	0

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	201.5	232.58		142.5	176.67	197.19		.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4450

INPUT

Description:

Station Elevation Data num= 48											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7600	2.15	7598.75	28.76	7595	36.61	7594.04	39.84	7590		
43.96	7585	48.1	7580	50	7577.69	56.59	7575	68.78	7570		
79.47	7565	91.15	7560	102.87	7555	114.87	7550	128.82	7545		
143.14	7540	159.44	7535	176.77	7530	179.7	7529.17	187.73	7525		
197.24	7520	206.9	7515	212.27	7512.29	228.18	7515	238.42	7516.81		
262.17	7516.81	269.77	7520	278.74	7525	287.26	7530	295.83	7535		
304.48	7540	312.36	7545	320.53	7550	327.69	7555	335.22	7560		
345.27	7565	355.5	7570	360.28	7572.36	368.34	7575	381.47	7580		
393.99	7585	407.74	7590	421.94	7595	435.39	7600	448.16	7605		
460.18	7610	471.36	7615	482.62	7620						

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	0	197.24	0	238.42	0

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	197.24	238.42		375.2	359.22	371.73		.1	.3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4440

INPUT

Description:

Station Elevation Data		num= 60	
Sta	Elev	Sta	Elev
0	7620	10 17	7615
52.32	7595	64 56	7590
121.13	7570	134 32	7565
173.84	7550	190 18	7545
268.26	7525	239 85	7520
349.03	7500	258 95	7495
390.85	7501.75	411 34	7501.89
443.19	7520	451 94	7525
489.33	7545	498 56	7550
537.15	7570	542 05	7572.36
566.65	7590	574 62	7595
607.41	7615	615 46	7620

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.055	338.87	.035
		390.85	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	338.87	390.85		365.73	362.91		.1	.3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4430

INPUT

Description:

Station Elevation Data		num= 45	
Sta	Elev	Sta	Elev
0	7570	8.47	7565
51.41	7545	64.17	7540
108.13	7520	114.88	7516.65
148.46	7500	149.48	7499.53
193.97	7480.36	213.43	7485
269.16	7495	279.57	7500
322.93	7520	336.08	7525
381.64	7545	391.46	7550
430.1	7570	441.52	7575

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.055	166.9	.05
		225.28	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	166.9	225.28		234.83	263.29		.1	.3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4420

INPUT

Description:

Station Elevation Data		num= 33	
Sta	Elev	Sta	Elev
0	7510	7.76	7505
127.34	7495	141.6	7490
210.04	7470	223.77	7467.85
270.34	7476.49	279.36	7480
310.8	7500	338.38	7505
348.9	7525	357.89	7530
390.56	7550	404.32	7555

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0		0	184.39
		0	242.51
		0	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	184.99	242.51		120.24	143.62		.1	.3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4410

INPUT

Description:

Station Elevation Data		num= 19	
Sta	Elev	Sta	Elev
0	7485.32	2.11	7485
77.27	7469.53	89.82	7465
111.46	7470.08	141.99	7470
173.53	7480	180.49	7485

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.055	77.27	.032
		131.46	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	77.27	131.46		97.41	49.85		.1	.3

CROSS SECTION

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4400

INPUT

Description: Upstream of Culvert #1

Station Elevation Data		num= 30	
Sta	Elev	Sta	Elev

0	7490	25.72	7485	54.29	7480	89.75	7475	109.26	7472.37
117.81	7470	153.33	7465	186.03	7464.45	194.02	7460	196.09	7457.89
197.16	7455.96	198.22	7455.18	200.71	7455.09	203.55	7455.09	204.97	7455.79
206.39	7457.46	207.82	7458.6	210.33	7460	236.59	7465	271.39	7468.27
300.01	7469.74	300.72	7470	312.08	7475	324.87	7480	334.02	7485
341.42	7490	348.93	7495	356.64	7500	365.3	7505	374.81	7510

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 186.03 0 236.59 0

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 186.03 236.59 44.53 50.74 65.32 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 197 7457.63 F
 205.1 374.81 7457.72 F

CULVERT

RIVER: Reach #1
 REACH: Sabino Canyon RS: 4397.5

INPUT

Description: Culvert #1
 Distance from Upstream XS = 3
 Deck/Roadway Width = 22
 Weir Coefficient = 3.1

Upstream Deck/Roadway Coordinates num= 3
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 175 7458 132 7460 230 7458

Upstream Bridge Cross Section Data num= 30
 Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7490	25.72	7485	54.29	7480	89.75	7475	109.26	7472.37
117.81	7470	153.33	7465	186.03	7464.45	194.02	7460	196.09	7457.89
197.16	7455.96	198.22	7455.18	200.71	7455.09	203.55	7455.09	204.97	7455.79
206.39	7457.46	207.82	7458.6	210.33	7460	236.59	7465	271.39	7468.27
300.01	7469.74	300.72	7470	312.08	7475	324.87	7480	334.02	7485
341.42	7490	348.93	7495	356.64	7500	365.3	7505	374.81	7510

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 0 186.03 0 236.59 0

Bank Sta: Left Right Coeff Contr. Expan.
 186.03 236.59 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 197 7457.63 F
 205.1 374.81 7457.72 F

Downstream Deck/Roadway Coordinates num= 2
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 170 7460 215 7460

Downstream Bridge Cross Section Data num= 40
 Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7485	32.71	7480	66.84	7475	108.69	7470	109.85	7469.87
129.88	7465	148.17	7460.13	158.68	7460	173.03	7459.8	186.28	7455.37
186.65	7455.01	187.2	7454.68	187.55	7454.67	187.99	7454.62	188.51	7454.55
189.16	7454.54	189.93	7454.54	190.45	7454.6	190.92	7454.69	191.43	7454.73
192.58	7454.86	191.9	7454.95	193.09	7455.04	193.27	7455.29	212.81	7460
231.06	7465	240.56	7467.45	264.58	7468.13	269.1	7470	281.7	7475
293.41	7480	304.48	7485	315.3	7490	326.24	7495	337.17	7500
347.88	7505	358.45	7510	368.85	7515	379.05	7520	388.89	7525

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .055 173.03 .032 212.81 .06

Bank Sta: Left Right Coeff Contr. Expan.
 173.03 212.81 .3 .5
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 183.66 7459.01 F
 195.74 388.89 7459.01 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 =
 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 Arch 3 4
 FHWA Chart # 41- Arch; Corrugated metal
 FHWA Scale # 1 - 90 Degree headwall
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Lcss Coef Exit Lcss Coef
 3 22 .024 .024 0 .5 1
 Number of Barrels = 2
 Upstream Elevation = 7455
 Centerline Stations
 Sta. Sta.
 199 203.1
 Downstream Elevation = 7454.9
 Centerline Stations
 Sta. Sta.
 187.9 132

CROSS SECTION

RIVER: Reach #1

REACH: Sabino Canyon RS: 4395

INPUT

Description: XSEC Downstream of Culvert # 1

Station	Elevation	Data	num=	40	Sta	Elev	Sta	Elev	Sta	Elev
0	7485	32.71	7480	66.84	7475	108.69	7470	109.85	7469.87	
129.88	7465	148.17	7460.13	158.68	7460	173.03	7459.8	186.28	7455.37	
186.65	7455.01	187.2	7454.68	187.55	7454.67	187.99	7454.62	188.51	7454.55	
189.16	7454.54	189.93	7454.54	190.45	7454.6	190.92	7454.63	191.43	7454.71	
192.58	7454.86	192.9	7454.95	193.09	7455.04	193.27	7455.29	212.81	7460	
231.06	7465	240.56	7467.45	264.58	7468.13	269.1	7470	281.7	7475	
293.41	7480	304.48	7485	315.3	7490	326.24	7495	337.17	7500	
347.88	7505	358.45	7510	368.85	7515	379.05	7520	388.89	7525	

Manning's n Values	num=	3			
Sta n Val	Sta n Val	Sta n Val			
0	.055	173.03	.032	212.81	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
173.03	212.81	51.1	62.2	72.85	.3	.5

Ineffective Flow	num=	2	
Sta L	Sta R	Elev	Permanent
0	183.66	7459.01	F
195.74	388.89	7459.01	F

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4390

INPUT

Station	Elevation	Data	num=	31	Sta	Elev	Sta	Elev	Sta	Elev
0	7480	50.91	7475	80.36	7470	115.35	7465	144.96	7460	
149.45	7459.16	183.05	7457.32	186.13	7455	188.67	7453.08	191.11	7453.14	
196.06	7455	216.44	7460	235.74	7465	241.43	7466.4	267.21	7466.31	
275.75	7470	287.26	7475	298.73	7480	311.17	7485	322.92	7490	
333.97	7495	344.78	7500	355.31	7505	365.19	7510	377.22	7515	
388.88	7520	400.05	7525	411.14	7530	423.92	7535	438.64	7540	
456.57	7545									

Manning's n Values	num=	3			
Sta n Val	Sta n Val	Sta n Val			
0	.055	183.05	.032	216.44	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
183.05	216.44	422.01	367.85	348.08	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4380

INPUT

Station	Elevation	Data	num=	40	Sta	Elev	Sta	Elev	Sta	Elev
0	7540	13.98	7535	26.19	7530	42.04	7525	58.43	7520	
66.18	7515	74.12	7510	82.04	7505	90.08	7500	98.26	7495	
106.26	7490	113.93	7485	121.73	7480	129.55	7475	137.45	7470	
145.25	7465	154.5	7460	165.33	7455	166.6	7454.34	190.14	7453.21	
196.54	7450	209.71	7445	224.72	7441.87	246.21	7445	253.1	7446.02	
287.65	7450	317.35	7455	328.27	7456.9	342.73	7460	365.68	7465	
385.96	7470	404.73	7475	414.69	7480	423.96	7485	433.3	7490	
442.59	7495	452	7500	460.16	7505	468.51	7510	476.71	7515	

Manning's n Values	num=	3			
Sta n Val	Sta n Val	Sta n Val			
0	.055	209.71	.035	246.21	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
209.71	246.21	159.8	158.36	130.15	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Sabino Canyon RS: 4370

INPUT

Station	Elevation	Data	num=	33	Sta	Elev	Sta	Elev	Sta	Elev
0	7500	11.06	7495	23.08	7490	35.07	7485	46.99	7480	
58.78	7475	72.27	7470	85.19	7465	100.43	7460	122.74	7455	
145.98	7450	169.33	7445	180.69	7442.31	190.83	7440	199.26	7438.05	
209.07	7440	222.45	7442.73	238.8	7445	273.98	7450	276.41	7450.24	
293.99	7455	311.9	7460	328.47	7465	344.88	7470	361.12	7475	
373.03	7480	382.36	7485	391.48	7490	398.52	7495	404.89	7500	
411.27	7505	418.21	7510	425.13	7515					

Manning's n Values	num=	3			
Sta n Val	Sta n Val	Sta n Val			
0	0	180.69	0	222.45	0

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
180.69	222.45	121.8	124.38	118.98	.1	.3

SUMMARY OF MANNING'S N VALUES

River: Reach #1	Reach	River Sta.	n1	n2	n3
Sabino Canyon	3000		.013	.045	.055
Sabino Canyon	4990		0	0	0
Sabino Canyon	4980		0	0	0
Sabino Canyon	4970		.013	.045	.055

Sabino Canyon	4955	.013	.045	.055
Sabino Canyon	4950	.013	.045	.055
Sabino Canyon	4949	Culvert		
Sabino Canyon	4948	.013	.045	.055
Sabino Canyon	4940	.013	.045	.055
Sabino Canyon	4930	0	0	0
Sabino Canyon	4925	Culvert		
Sabino Canyon	4920	0	0	0
Sabino Canyon	4910	0	0	0
Sabino Canyon	4900	0	0	0
Sabino Canyon	4890	.013	.045	.055
Sabino Canyon	4885	Culvert		
Sabino Canyon	4880	0	0	0
Sabino Canyon	4870	0	0	0
Sabino Canyon	4860	0	0	0
Sabino Canyon	4855	Culvert		
Sabino Canyon	4850	0	0	0
Sabino Canyon	4840	0	0	0
Sabino Canyon	4830	0	0	0
Sabino Canyon	4825	Culvert		
Sabino Canyon	4820	0	0	0
Sabino Canyon	4810	.013	.04	.03
Sabino Canyon	4800	.013	.04	.03
Sabino Canyon	4790	.013	.04	.03
Sabino Canyon	4780	0	0	0
Sabino Canyon	4775	Culvert		
Sabino Canyon	4770	0	0	0
Sabino Canyon	4765	.055	.04	.045
Sabino Canyon	4760	.055	.04	.045
Sabino Canyon	4750	0	0	0
Sabino Canyon	4745	Culvert		
Sabino Canyon	4740	0	0	0
Sabino Canyon	4730	0	0	0
Sabino Canyon	4725	Culvert		
Sabino Canyon	4720	0	0	0
Sabino Canyon	4710	0	0	0
Sabino Canyon	4705.5	Culvert		
Sabino Canyon	4701	0	0	0
Sabino Canyon	4690	.055	.04	.045
Sabino Canyon	4680	0	0	0
Sabino Canyon	4675	Culvert		
Sabino Canyon	4670	0	0	0
Sabino Canyon	4660	0	0	0
Sabino Canyon	4635	Culvert		
Sabino Canyon	4630	0	0	0
Sabino Canyon	4620	.055	.04	.045
Sabino Canyon	4610	0	0	0
Sabino Canyon	4600	0	0	0
Sabino Canyon	4595	Culvert		
Sabino Canyon	4590	.055	.04	.045
Sabino Canyon	4580	0	0	0
Sabino Canyon	4570	0	0	0
Sabino Canyon	4565	.055	.035	.02
Sabino Canyon	4560	.055	.035	.045
Sabino Canyon	4550	.055	.035	.055
Sabino Canyon	4540	.055	.035	.055
Sabino Canyon	4530	.055	.035	.055
Sabino Canyon	4520	.055	.035	.055
Sabino Canyon	4515	Culvert		
Sabino Canyon	4510	.055	.035	.055
Sabino Canyon	4500	.055	.035	.055
Sabino Canyon	4495	0	0	0
Sabino Canyon	4490	0	0	0
Sabino Canyon	4485	.055	.03	.02
Sabino Canyon	4480	.045	.04	.045
Sabino Canyon	4470	.045	.04	.045
Sabino Canyon	4460	0	0	0
Sabino Canyon	4450	0	0	0
Sabino Canyon	4440	.055	.035	.055
Sabino Canyon	4430	.055	.05	.055
Sabino Canyon	4420	0	0	0
Sabino Canyon	4410	.055	.032	.06
Sabino Canyon	4400	0	0	0
Sabino Canyon	4397.5	Culvert		
Sabino Canyon	4395	.055	.032	.06
Sabino Canyon	4390	.055	.032	.06
Sabino Canyon	4380	.055	.035	.055
Sabino Canyon	4370	0	0	0

SUMMARY OF REACH LENGTHS

River: Reach #1

Reach	River Sta.	Left	Channel	Right
Sabino Canyon	5000	280.23	292.32	289.78
Sabino Canyon	4990	259.73	254.38	208.78
Sabino Canyon	4980	195.74	195.12	199.47
Sabino Canyon	4970	109.28	110.18	116.2
Sabino Canyon	4955	48.55	43.54	36.65
Sabino Canyon	4950	44.18	37.93	31.14
Sabino Canyon	4949	Culvert		
Sabino Canyon	4948	100.62	93.02	81.56
Sabino Canyon	4940	183.11	200.29	206.49
Sabino Canyon	4930	35.99	31.3	37.79
Sabino Canyon	4925	Culvert		
Sabino Canyon	4920	89.2	95.09	89.24
Sabino Canyon	4910	242.99	229.2	209.27
Sabino Canyon	4900	163.32	152.05	152.08
Sabino Canyon	4890	65.94	55.62	51.72
Sabino Canyon	4885	Culvert		
Sabino Canyon	4880	120.36	140.56	143.52
Sabino Canyon	4870	86.06	123.02	129.77
Sabino Canyon	4860	29.33	33.29	29.29
Sabino Canyon	4855	Culvert		
Sabino Canyon	4850	173.2	160.5	156.03
Sabino Canyon	4840	154.55	159.68	160.08
Sabino Canyon	4830	48.5	48.05	48.26
Sabino Canyon	4825	Culvert		
Sabino Canyon	4820	164.6	153.11	138.65
Sabino Canyon	4810	275.35	305.07	315.05

Sabino Canyon	4800	128.1	88.46	74.01
Sabino Canyon	4790	185.19	110.34	113.96
Sabino Canyon	4780	180.71	135.48	113.78
Sabino Canyon	4775	Culvert		
Sabino Canyon	4770	152.22	145.66	138.18
Sabino Canyon	4765	178.1	172.24	175.18
Sabino Canyon	4760	116.92	125.62	133.13
Sabino Canyon	4750	36.73	43.9	85.3
Sabino Canyon	4745	Culvert		
Sabino Canyon	4740	50.45	40.63	29.76
Sabino Canyon	4730	24.27	25.79	30.09
Sabino Canyon	4725	Culvert		
Sabino Canyon	4720	66.79	45.57	38.28
Sabino Canyon	4710	58.79	39.28	43.38
Sabino Canyon	4705.5	Culvert		
Sabino Canyon	4701	54.16	64.9	53.38
Sabino Canyon	4690	147.86	67.35	63.49
Sabino Canyon	4680	72.84	32.89	41.45
Sabino Canyon	4675	Culvert		
Sabino Canyon	4670	148.52	148.4	110.22
Sabino Canyon	4640	82.29	83.96	83.73
Sabino Canyon	4635	Culvert		
Sabino Canyon	4630	331.3	308.04	312.42
Sabino Canyon	4620	216.67	217.6	172.7
Sabino Canyon	4610	84.94	105.27	136.16
Sabino Canyon	4600	28.83	26.7	50.57
Sabino Canyon	4595	Culvert		
Sabino Canyon	4590	96.17	126.79	150.79
Sabino Canyon	4580	199.74	193.07	167.78
Sabino Canyon	4570	158.75	158.29	160.89
Sabino Canyon	4565	277.99	280.48	288.65
Sabino Canyon	4560	187.13	234.04	247.65
Sabino Canyon	4550	108.96	135.09	121.38
Sabino Canyon	4540	316.24	347.95	375.23
Sabino Canyon	4530	127.67	125.76	135.08
Sabino Canyon	4520	56.55	52.81	57.42
Sabino Canyon	4515	Culvert		
Sabino Canyon	4510	107.29	123.56	141.49
Sabino Canyon	4500	212.29	193.78	168.97
Sabino Canyon	4495	154.64	128.78	101.48
Sabino Canyon	4490	109.24	128.53	146.49
Sabino Canyon	4485	252.86	253.96	252.06
Sabino Canyon	4480	147.56	141.71	117.21
Sabino Canyon	4470	156.78	157.33	154.35
Sabino Canyon	4460	142.5	176.67	197.19
Sabino Canyon	4450	375.2	359.22	371.73
Sabino Canyon	4440	365.73	362.91	348.13
Sabino Canyon	4430	234.83	263.29	199.76
Sabino Canyon	4420	120.24	143.62	144.02
Sabino Canyon	4410	97.41	49.85	12.34
Sabino Canyon	4400	44.53	50.74	65.32
Sabino Canyon	4397.5	Culvert		
Sabino Canyon	4395	51.1	62.2	72.95
Sabino Canyon	4390	422.01	367.85	348.08
Sabino Canyon	4380	159.8	158.36	130.15
Sabino Canyon	4370	121.8	124.38	118.98

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Reach #1

Reach	River Sta.	Contr.	Expan.
Sabino Canyon	5000	.1	.3
Sabino Canyon	4990	.1	.3
Sabino Canyon	4980	.1	.3
Sabino Canyon	4970	.1	.3
Sabino Canyon	4955	.1	.3
Sabino Canyon	4950	.3	.5
Sabino Canyon	4949	Culvert	
Sabino Canyon	4948	.3	.5
Sabino Canyon	4940	.3	.5
Sabino Canyon	4930	.3	.5
Sabino Canyon	4925	Culvert	
Sabino Canyon	4920	.3	.5
Sabino Canyon	4910	.1	.3
Sabino Canyon	4900	.1	.3
Sabino Canyon	4890	.3	.5
Sabino Canyon	4885	Culvert	
Sabino Canyon	4880	.3	.5
Sabino Canyon	4870	.1	.3
Sabino Canyon	4860	.3	.5
Sabino Canyon	4855	Culvert	
Sabino Canyon	4850	.3	.5
Sabino Canyon	4840	.1	.3
Sabino Canyon	4830	.3	.5
Sabino Canyon	4825	Culvert	
Sabino Canyon	4820	.3	.5
Sabino Canyon	4810	.1	.3
Sabino Canyon	4800	.1	.3
Sabino Canyon	4790	.1	.3
Sabino Canyon	4780	.3	.5
Sabino Canyon	4775	Culvert	
Sabino Canyon	4770	.3	.5
Sabino Canyon	4765	.1	.3
Sabino Canyon	4760	.1	.3
Sabino Canyon	4750	.3	.5
Sabino Canyon	4745	Culvert	
Sabino Canyon	4740	.3	.5
Sabino Canyon	4730	.3	.5
Sabino Canyon	4725	Culvert	
Sabino Canyon	4720	.3	.5
Sabino Canyon	4710	.3	.5
Sabino Canyon	4705.5	Culvert	
Sabino Canyon	4701	.2	.5
Sabino Canyon	4690	.1	.3
Sabino Canyon	4680	.3	.5
Sabino Canyon	4675	Culvert	
Sabino Canyon	4670	.3	.5
Sabino Canyon	4640	.3	.5
Sabino Canyon	4635	Culvert	

Sabino Canyon	4630	.3	.5
Sabino Canyon	4620	.1	.3
Sabino Canyon	4610	.1	.3
Sabino Canyon	4600	.3	.5
Sabino Canyon	4595	Culvert	
Sabino Canyon	4590	.3	.5
Sabino Canyon	4580	.1	.3
Sabino Canyon	4570	.1	.3
Sabino Canyon	4565	.1	.3
Sabino Canyon	4560	.1	.3
Sabino Canyon	4550	.1	.3
Sabino Canyon	4540	.1	.3
Sabino Canyon	4530	.1	.3
Sabino Canyon	4520	.3	.5
Sabino Canyon	4515	Culvert	
Sabino Canyon	4510	.3	.5
Sabino Canyon	4500	.1	.3
Sabino Canyon	4495	.1	.3
Sabino Canyon	4490	.1	.3
Sabino Canyon	4485	.1	.3
Sabino Canyon	4480	.1	.3
Sabino Canyon	4470	.1	.3
Sabino Canyon	4460	.1	.3
Sabino Canyon	4450	.1	.3
Sabino Canyon	4440	.1	.3
Sabino Canyon	4430	.1	.3
Sabino Canyon	4420	.1	.3
Sabino Canyon	4410	.1	.3
Sabino Canyon	4400	.3	.5
Sabino Canyon	4397.5	Culvert	
Sabino Canyon	4395	.3	.5
Sabino Canyon	4390	.1	.3
Sabino Canyon	4380	.1	.3
Sabino Canyon	4370	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	O Total (cfs)	Min Ch (ft)	El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #	Chl (ft)
Sabino Canyon	5000	Pre Fire	247.00	7976.07	7979.22	7979.22	7980.02	0.027212	7.18	34.40	21.81	1.01		
Sabino Canyon	5000	Post Fire	594.00	7976.07	7980.67	7980.67	7981.63	0.015888	7.92	76.96	43.08	0.86		
Sabino Canyon	4990	Pre Fire	247.00	7954.38	7956.75	7956.75	7957.40	0.005861	4.07	48.18	38.96	0.50		
Sabino Canyon	4990	Post Fire	594.00	7954.38	7957.77	7957.77	7958.65	0.004895	4.99	96.17	55.58	0.50		
Sabino Canyon	4980	Pre Fire	247.00	7939.00	7941.93	7941.93	7942.62	0.002993	3.06	53.46	41.74	0.35		
Sabino Canyon	4980	Post Fire	594.00	7939.00	7943.02	7943.02	7943.99	0.003194	4.15	107.86	58.06	0.39		
Sabino Canyon	4970	Pre Fire	247.00	7927.21	7929.02	7929.02	7929.51	0.024088	5.79	47.33	52.34	0.93		
Sabino Canyon	4970	Post Fire	594.00	7927.21	7929.84	7929.84	7930.53	0.019549	7.18	100.26	76.17	0.92		
Sabino Canyon	4955	Pre Fire	247.00	7919.90	7922.70	7922.70	7923.41	0.027700	6.75	36.61	26.15	1.00		
Sabino Canyon	4955	Post Fire	594.00	7919.90	7923.91	7923.91	7924.84	0.018051	7.94	84.15	53.74	0.91		
Sabino Canyon	4950	Pre Fire	247.00	7915.09	7921.38	7921.38	7921.50	0.000871	2.84	86.91	62.91	0.20		
Sabino Canyon	4950	Post Fire	594.00	7915.09	7922.31	7922.31	7922.49	0.001096	3.26	195.75	83.83	0.23		
Sabino Canyon	4949	Culvert												
Sabino Canyon	4948	Pre Fire	247.00	7913.45	7916.80	7916.80	7917.77	0.028497	7.91	31.24	16.28	1.01		
Sabino Canyon	4948	Post Fire	594.00	7913.45	7918.40	7918.40	7919.76	0.024328	9.36	63.44	24.00	1.01		
Sabino Canyon	4940	Pre Fire	247.00	7907.29	7910.28	7910.28	7911.08	0.025286	7.14	34.78	23.33	0.99		
Sabino Canyon	4940	Post Fire	594.00	7907.29	7911.56	7911.56	7912.77	0.016209	8.60	71.14	33.70	0.89		
Sabino Canyon	4930	Pre Fire	282.00	7885.96	7893.00	7893.00	7893.27	0.003875	4.15	67.91	12.48	0.31		
Sabino Canyon	4930	Post Fire	687.00	7885.96	7895.61	7895.61	7896.26	0.006326	6.50	106.77	20.91	0.44		
Sabino Canyon	4925	Culvert												
Sabino Canyon	4920	Pre Fire	282.00	7884.74	7888.17	7888.17	7889.67	0.035868	9.84	28.65	9.47	1.00		
Sabino Canyon	4920	Post Fire	687.00	7884.74	7891.08	7891.08	7892.97	0.020733	10.97	63.91	19.76	0.81		
Sabino Canyon	4910	Pre Fire	282.00	7880.00	7884.25	7884.25	7885.33	0.027810	8.34	33.81	15.92	1.01		
Sabino Canyon	4910	Post Fire	687.00	7880.00	7886.08	7886.08	7887.61	0.022492	9.91	69.36	22.81	1.00		
Sabino Canyon	4900	Pre Fire	282.00	7869.05	7873.12	7873.12	7874.09	0.028775	7.92	35.61	18.70	1.01		
Sabino Canyon	4900	Post Fire	687.00	7869.05	7874.76	7874.76	7876.08	0.023123	9.24	74.36	28.53	1.01		
Sabino Canyon	4890	Pre Fire	282.00	7860.00	7867.49	7867.49	7867.63	0.001170	2.94	95.90	62.60	0.22		
Sabino Canyon	4890	Post Fire	687.00	7860.00	7870.40	7870.40	7870.73	0.001503	4.63	148.28	76.44	0.28		
Sabino Canyon	4885	Culvert												
Sabino Canyon	4880	Pre Fire	282.00	7859.27	7863.48	7863.48	7864.05	0.016730	6.10	46.83	38.67	0.76		
Sabino Canyon	4880	Post Fire	687.00	7859.27	7864.27	7864.27	7865.44	0.012725	6.46	87.97	56.69	0.72		
Sabino Canyon	4870	Pre Fire	282.00	7851.00	7855.49	7855.49	7856.97	0.034237	9.76	28.89	9.86	1.01		
Sabino Canyon	4870	Post Fire	687.00	7851.00	7857.99	7857.99	7858.84	0.014653	7.32	92.83	68.36	0.75		
Sabino Canyon	4860	Pre Fire	282.00	7841.00	7851.38	7851.38	7851.48	0.000795	2.65	107.30	65.80	0.18		
Sabino Canyon	4860	Post Fire	687.00	7841.00	7852.29	7852.29	7853.67	0.001870	4.99	139.77	73.98	0.30		
Sabino Canyon	4855	Culvert												
Sabino Canyon	4850	Pre Fire	282.00	7841.00	7845.22	7845.22	7846.55	0.033247	9.27	30.41	11.40	1.00		
Sabino Canyon	4850	Post Fire	687.00	7841.00	7847.46	7847.46	7848.88	0.025097	9.57	71.81	25.54	1.01		
Sabino Canyon	4840	Pre Fire	282.00	7826.07	7829.33	7829.33	7829.89	0.016446	6.01	47.24	43.62	0.80		
Sabino Canyon	4840	Post Fire	687.00	7826.07	7830.19	7830.19	7831.35	0.012948	6.91	86.22	47.79	0.78		
Sabino Canyon	4830	Pre Fire	282.00	7815.02	7821.27	7821.27	7821.44	0.002159	3.27	87.75	32.54	0.31		
Sabino Canyon	4830	Post Fire	687.00	7815.02	7824.85	7824.85	7824.98	0.000267	1.87	294.67	67.94	0.13		
Sabino Canyon	4825	Culvert												
Sabino Canyon	4820	Pre Fire	282.00	7811.68	7815.41	7815.41	7816.32	0.025507	7.64	36.91	19.79	0.99		
Sabino Canyon	4820	Post Fire	687.00	7811.68	7816.98	7816.98	7818.30	0.021436	9.21	74.62	28.13	1.00		
Sabino Canyon	4810	Pre Fire	282.00	7801.11	7804.99	7804.99	7805.96	0.020863	7.90	35.70	18.42	1.00		
Sabino Canyon	4810	Post Fire	687.00	7801.11	7806.64	7806.64	7808.02	0.020220	9.42	72.91	26.52	1.00		

Sabino Canyon	4800	Pre Fire	282.00	7784.09	7787.80	7787.80	7788.29	0.035192	5.71	51.66	50.84	0.75
Sabino Canyon	4800	Post Fire	687.00	7784.09	7788.52	7788.52	7789.46	0.016876	7.33	89.17	54.11	0.83
Sabino Canyon	4790	Pre Fire	297.00	7777.01	7780.50	7780.50	7781.13	0.020042	6.40	46.69	37.77	0.94
Sabino Canyon	4790	Post Fire	787.00	7777.01	7781.66	7781.66	7782.48	0.013023	6.96	108.99	69.63	0.78
Sabino Canyon	4780	Pre Fire	297.00	7765.57	7772.08	7768.47	7772.17	0.000795	2.34	126.78	35.38	0.21
Sabino Canyon	4780	Post Fire	787.00	7765.57	7772.64	7770.40	7773.87	0.001595	3.86	205.39	65.92	0.30
Sabino Canyon	4775											
Sabino Canyon	4770	Pre Fire	297.00	7762.16	7765.40	7765.40	7765.87	0.006489	5.52	54.81	57.33	0.59
Sabino Canyon	4770	Post Fire	787.00	7762.16	7766.23	7766.23	7767.02	0.006299	6.33	114.78	78.63	0.57
Sabino Canyon	4765	Pre Fire	297.00	7754.31	7757.87	7757.87	7758.78	0.016307	7.67	38.74	21.71	1.01
Sabino Canyon	4765	Post Fire	787.00	7754.31	7759.82	7759.82	7760.89	0.012276	8.38	95.90	45.50	0.86
Sabino Canyon	4760	Pre Fire	297.00	7740.22	7742.94	7742.94	7743.88	0.020730	7.78	38.20	20.66	1.01
Sabino Canyon	4760	Post Fire	787.00	7740.22	7744.71	7744.71	7746.13	0.020398	9.58	82.19	29.22	1.01
Sabino Canyon	4750	Pre Fire	297.00	7730.73	7732.95	7732.95	7733.07	0.000914	2.82	106.14	27.31	0.22
Sabino Canyon	4750	Post Fire	787.00	7730.73	7733.48	7736.08	7739.80	0.002021	4.69	182.68	73.12	0.32
Sabino Canyon	4745											
Sabino Canyon	4740	Pre Fire	297.00	7729.32	7733.04	7733.04	7733.48	0.009544	5.34	55.59	30.02	0.69
Sabino Canyon	4740	Post Fire	787.00	7729.32	7734.04	7734.04	7735.23	0.021081	8.79	89.55	38.11	1.01
Sabino Canyon	4730	Pre Fire	297.00	7726.52	7733.22	7729.50	7733.25	0.000185	1.22	244.26	100.82	0.11
Sabino Canyon	4730	Post Fire	787.00	7726.52	7734.10	7730.93	7734.19	0.000550	2.28	336.60	110.36	0.19
Sabino Canyon	4725											
Sabino Canyon	4720	Pre Fire	297.00	7726.01	7730.90	7730.90	7730.98	0.000950	2.18	137.95	55.31	0.24
Sabino Canyon	4720	Post Fire	787.00	7726.01	7731.91	7731.91	7732.15	0.002460	3.99	207.54	94.02	0.37
Sabino Canyon	4710	Pre Fire	297.00	7724.86	7730.87	7727.34	7730.94	0.000657	2.10	149.76	92.22	0.20
Sabino Canyon	4710	Post Fire	787.00	7724.86	7731.86	7729.54	7732.03	0.001288	3.27	249.53	108.89	0.27
Sabino Canyon	4705.5											
Sabino Canyon	4701	Pre Fire	297.00	7724.31	7727.39	7727.39	7728.89	0.016049	9.83	30.21	23.74	1.00
Sabino Canyon	4701	Post Fire	787.00	7724.31	7729.01	7729.01	7729.79	0.008827	7.28	112.36	61.37	0.68
Sabino Canyon	4690	Pre Fire	297.00	7720.19	7723.25	7723.25	7724.10	0.020508	7.37	40.32	23.97	1.00
Sabino Canyon	4690	Post Fire	787.00	7720.19	7725.01	7725.01	7725.87	0.011822	7.57	106.13	60.23	0.78
Sabino Canyon	4680	Pre Fire	299.00	7713.83	7719.69	7718.59	7719.82	0.002398	2.90	117.75	85.34	0.34
Sabino Canyon	4680	Post Fire	883.00	7713.83	7720.49	7719.96	7720.86	0.006030	5.24	201.54	123.67	0.53
Sabino Canyon	4675											
Sabino Canyon	4670	Pre Fire	299.00	7713.69	7718.40	7718.40	7718.86	0.011302	4.65	57.26	73.70	0.67
Sabino Canyon	4670	Post Fire	883.00	7713.69	7719.24	7719.24	7719.86	0.010855	5.89	141.06	124.74	0.66
Sabino Canyon	4640	Pre Fire	299.00	7702.64	7709.24	7706.11	7709.45	0.002762	3.72	80.38	23.20	0.35
Sabino Canyon	4640	Post Fire	883.00	7702.64	7711.65	7709.33	7712.18	0.004865	5.88	161.29	55.40	0.47
Sabino Canyon	4635											
Sabino Canyon	4630	Pre Fire	299.00	7701.74	7704.07	7704.07	7705.06	0.018621	7.98	37.45	66.49	0.99
Sabino Canyon	4630	Post Fire	883.00	7701.74	7704.74	7704.74	7705.59	0.012820	6.46	128.75	78.70	0.78
Sabino Canyon	4620	Pre Fire	299.00	7688.44	7689.62	7689.62	7689.97	0.024306	4.72	63.15	94.44	0.97
Sabino Canyon	4620	Post Fire	883.00	7688.44	7690.33	7690.33	7690.94	0.018985	6.05	142.03	128.96	0.89
Sabino Canyon	4610	Pre Fire	299.00	7678.15	7679.45	7679.45	7679.86	0.005599	2.47	85.82	105.73	0.48
Sabino Canyon	4610	Post Fire	883.00	7678.15	7680.18	7680.18	7680.89	0.008146	4.20	164.65	112.36	0.59
Sabino Canyon	4600	Pre Fire	299.00	7673.49	7678.53	7676.87	7678.54	0.000073	0.86	366.21	119.40	0.07
Sabino Canyon	4600	Post Fire	883.00	7673.49	7679.54	7677.50	7679.63	0.000320	1.92	493.85	131.82	0.14
Sabino Canyon	4595											
Sabino Canyon	4590	Pre Fire	299.00	7671.87	7674.93	7674.93	7676.33	0.020354	9.49	31.52	65.80	0.99
Sabino Canyon	4590	Post Fire	883.00	7671.87	7676.46	7676.46	7676.70	0.003145	3.98	231.58	93.28	0.39
Sabino Canyon	4580	Pre Fire	299.00	7665.00	7666.26	7666.26	7666.69	0.021073	5.16	56.95	71.07	0.85
Sabino Canyon	4580	Post Fire	883.00	7665.00	7667.19	7667.19	7668.07	0.012314	5.79	127.82	80.50	0.72
Sabino Canyon	4570	Pre Fire	299.00	7655.00	7656.20	7656.20	7656.70	0.017922	5.72	52.25	52.08	1.00
Sabino Canyon	4570	Post Fire	883.00	7655.00	7657.07	7657.07	7657.81	0.014387	6.51	129.36	99.85	0.86
Sabino Canyon	4565	Pre Fire	299.00	7643.61	7646.63	7646.63	7647.42	0.016533	7.14	41.90	26.97	1.01
Sabino Canyon	4565	Post Fire	883.00	7643.61	7648.31	7648.31	7649.54	0.014325	8.89	99.28	41.20	1.01
Sabino Canyon	4560	Pre Fire	366.00	7630.50	7634.26	7634.26	7635.22	0.015652	7.85	46.60	24.80	1.01
Sabino Canyon	4560	Post Fire	1030.00	7630.50	7636.15	7636.15	7637.72	0.016510	10.12	104.99	37.00	0.97
Sabino Canyon	4550	Pre Fire	366.00	7621.50	7624.91	7624.91	7625.60	0.012172	7.03	64.98	54.75	0.90
Sabino Canyon	4550	Post Fire	1030.00	7621.50	7626.27	7626.27	7627.19	0.013514	8.93	164.85	92.05	0.88
Sabino Canyon	4540	Pre Fire	366.00	7616.24	7619.84	7619.84	7620.74	0.015520	7.62	48.04	26.70	1.00
Sabino Canyon	4540	Post Fire	1030.00	7616.24	7621.67	7621.67	7623.05	0.017644	9.45	121.16	45.83	0.98
Sabino Canyon	4530	Pre Fire	366.00	7600.46	7607.85	7607.85	7608.90	0.022596	8.21	44.57	22.01	1.02
Sabino Canyon	4530	Post Fire	1030.00	7600.46	7609.95	7609.95	7611.41	0.023898	9.68	106.45	36.95	1.00
Sabino Canyon	4520	Pre Fire	366.00	7592.28	7599.04	7599.21	7599.19	0.000790	3.20	128.98	40.02	0.23
Sabino Canyon	4520	Post Fire	1030.00	7592.28	7602.24	7598.54	7602.46	0.001054	4.14	276.86	52.06	0.24
Sabino Canyon	4515											
Sabino Canyon	4510	Pre Fire	493.00	7591.48	7597.06	7597.45	7597.45	0.002727	5.02	98.26	19.56	0.39
Sabino Canyon	4510	Post Fire	1446.00	7591.48	7601.54	7602.41	7603.68	0.005268	7.50	192.91	22.77	0.45
Sabino Canyon	4500	Pre Fire	493.00	7588.27	7594.73	7594.73	7596.37	0.019140	10.26	48.05	14.71	1.00
Sabino Canyon	4500	Post Fire	1446.00	7588.27	7598.22	7598.22	7600.71	0.023883	12.64	114.36	23.28	1.01
Sabino Canyon	4495	Pre Fire	493.00	7585.00	7590.34	7590.34	7591.43	0.014691	8.40	59.45	30.46	0.97
Sabino Canyon	4495	Post Fire	1446.00	7585.00	7592.75	7592.75	7593.98	0.011069	9.69	186.83	78.03	0.78
Sabino Canyon	4490	Pre Fire	493.00	7582.32	7587.15	7587.15	7588.35	0.016100	8.80	56.00	23.76	1.01
Sabino Canyon	4490	Post Fire	1446.00	7582.32	7589.21	7589.21	7590.57	0.013171	9.59	155.40	57.30	0.83

Sabino Canyon	4485	Pre Fire	493.00	7569.79	7575.04	7575.04	7576.37	0.024801	9.28	53.13	20.31	1.01
Sabino Canyon	4485	Post Fire	1446.00	7569.79	7577.75	7577.75	7579.23	0.012931	10.13	150.68	49.36	0.82
Sabino Canyon	4480	Pre Fire	493.00	7547.80	7552.60	7552.60	7553.80	0.019379	8.80	56.00	23.31	1.00
Sabino Canyon	4480	Post Fire	1446.00	7547.80	7555.15	7555.15	7556.52	0.017714	9.58	154.19	56.04	0.84
Sabino Canyon	4470	Pre Fire	493.00	7536.09	7540.72	7540.72	7541.61	0.011912	7.07	66.17	49.82	0.78
Sabino Canyon	4470	Post Fire	1446.00	7536.09	7542.34	7542.34	7543.92	0.010311	8.42	150.74	54.18	0.73
Sabino Canyon	4460	Pre Fire	493.00	7523.07	7528.00	7528.00	7529.24	0.020174	8.95	55.07	22.18	1.00
Sabino Canyon	4460	Post Fire	1446.00	7523.07	7530.97	7530.97	7532.14	0.011072	9.00	169.46	67.53	0.75
Sabino Canyon	4450	Pre Fire	493.00	7512.29	7516.24	7516.24	7517.25	0.020070	8.09	60.91	30.66	1.01
Sabino Canyon	4450	Post Fire	1446.00	7512.29	7518.09	7518.09	7519.38	0.014719	9.02	158.72	64.30	0.87
Sabino Canyon	4440	Pre Fire	493.00	7494.44	7498.79	7498.79	7499.88	0.017516	8.38	58.86	27.05	1.00
Sabino Canyon	4440	Post Fire	1446.00	7494.44	7501.13	7501.13	7502.81	0.016179	10.39	139.16	41.56	1.00
Sabino Canyon	4430	Pre Fire	493.00	7480.36	7484.49	7484.49	7485.55	0.037418	8.25	59.77	28.95	1.01
Sabino Canyon	4430	Post Fire	1446.00	7480.36	7486.72	7486.72	7488.34	0.079958	10.21	141.62	44.35	1.01
Sabino Canyon	4420	Pre Fire	493.00	7467.85	7471.61	7471.61	7472.59	0.010985	7.95	62.00	31.68	1.00
Sabino Canyon	4420	Post Fire	1446.00	7467.85	7473.70	7473.70	7475.25	0.009657	9.99	144.71	47.59	1.01
Sabino Canyon	4410	Pre Fire	493.00	7461.89	7466.08	7466.08	7467.14	0.010937	8.25	59.79	28.52	1.00
Sabino Canyon	4410	Post Fire	1446.00	7461.89	7468.33	7468.33	7469.96	0.009543	10.25	141.04	43.82	1.01
Sabino Canyon	4400	Pre Fire	493.00	7455.09	7461.92	7459.84	7462.32	0.003090	5.12	96.10	29.82	0.50
Sabino Canyon	4400	Post Fire	1446.00	7455.09	7464.21	7463.09	7465.18	0.006809	7.89	183.28	45.99	0.70
Sabino Canyon	4397.5		Culvert									
Sabino Canyon	4395	Pre Fire	493.00	7454.54	7458.86	7458.86	7460.73	0.010307	10.95	45.03	32.26	1.00
Sabino Canyon	4395	Post Fire	1446.00	7454.54	7460.77	7460.77	7462.16	0.010353	9.62	166.90	69.81	0.89
Sabino Canyon	4390	Pre Fire	493.00	7453.08	7457.66	7457.66	7458.81	0.012086	8.63	58.02	29.96	0.98
Sabino Canyon	4390	Post Fire	1446.00	7453.08	7459.97	7459.97	7461.28	0.011100	9.87	183.01	71.20	0.90
Sabino Canyon	4380	Pre Fire	493.00	7441.87	7445.21	7445.21	7446.11	0.015578	7.61	64.97	38.47	1.01
Sabino Canyon	4380	Post Fire	1446.00	7441.87	7447.14	7447.14	7448.67	0.014037	10.17	157.72	58.71	0.93
Sabino Canyon	4370	Pre Fire	684.00	7438.05	7442.30	7442.26	7443.32	0.015023	8.13	84.15	39.57	0.98
Sabino Canyon	4370	Post Fire	1969.00	7438.05	7444.49	7444.49	7446.26	0.014994	10.84	196.63	62.86	0.93

Profile Output Table - Culvert Only

Reach	River Sta	Profile	E.G. US	W.S. US	E.G. IC	E.G. OC	Min El Weir	Flow	Q Culv Group	Q Weir	Delta WS	Culv Vel US
Culv Vel DS			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(ft)	(ft/s)
(ft/s)												
Sabino Canyon	4949	CULVERT#1	Pre Fire	7921.50	7921.38	7922.99	7921.50		7920.41	87.18	137.17	4.58
12.32	12.33											
Sabino Canyon	4949	CULVERT#2	Pre Fire	7921.50	7921.38	7921.61	7921.50		7920.41	35.71	137.17	4.58
11.37	11.37											
Sabino Canyon	4949	CULVERT#1	Post Fire	7922.49	7922.31	7922.23	7922.49		7920.41	81.25	479.36	3.91
11.49	11.49											
Sabino Canyon	4949	CULVERT#2	Post Fire	7922.49	7922.31	7921.00	7922.51		7920.41	33.39	479.36	3.91
10.63	10.63											
Sabino Canyon	4925	CULVERT#1	Pre Fire	7893.28	7893.00	7893.28	7892.84		7891.27	195.76	86.24	4.84
10.76	17.02											
Sabino Canyon	4925	CULVERT#1	Post Fire	7896.26	7895.61	7896.23	7896.26		7891.27	245.75	441.25	4.53
13.50	13.50											
Sabino Canyon	4885	CULVERT#1	Pre Fire	7867.63	7867.49	7867.67	7867.63		7866.37	229.14	52.86	4.01
11.91	11.91											
Sabino Canyon	4885	CULVERT#1	Post Fire	7870.74	7870.40	7870.74	7870.74		7866.37	286.36	400.64	6.13
14.88	14.88											
Sabino Canyon	4855	CULVERT#1	Pre Fire	7851.49	7851.38	7851.40	7851.49		7849.93	201.84	80.16	6.16
14.28	14.28											
Sabino Canyon	4855	CULVERT#1	Post Fire	7853.67	7853.29	7853.66	7853.67		7849.93	200.88	311.60	5.83
14.21	14.21											
Sabino Canyon	4825	CULVERT#1	Pre Fire	7821.45	7821.27	7820.91	7821.45		7823.26	282.00		5.86
9.92	18.63											
Sabino Canyon	4825	CULVERT#1	Post Fire	7824.98	7824.85	7825.11	7824.98		7823.26	518.53	168.47	7.87
13.75	13.75											
Sabino Canyon	4775	Culvert #1	Pre Fire	7772.17	7772.08	7772.17	7771.80		7770.58	183.90	113.10	6.68
10.10	12.25											
Sabino Canyon	4775	Culvert #1	Post Fire	7773.87	7773.64	7773.85	7773.87		7770.58	223.08	563.92	7.42
12.26	12.26											
Sabino Canyon	4745	CULVERT#1	Pre Fire	7738.07	7737.95	7738.07	7737.48		7737.01	225.80	71.20	4.91
11.17	13.95											
Sabino Canyon	4745	CULVERT#1	Post Fire	7739.80	7739.48	7739.81	7739.80		7737.01	284.68	502.32	5.45
14.08	14.08											
Sabino Canyon	4725	CULVERT#1	Pre Fire	7733.25	7733.22	7731.68	7733.24		7732.07	51.07	183.80	2.32
8.33	8.13											
Sabino Canyon	4725	CULVERT#2	Pre Fire	7733.25	7733.22	7731.48	7733.25		7732.07	62.13	183.80	2.32
8.75	8.79											
Sabino Canyon	4725	CULVERT#1	Post Fire	7734.19	7734.10	7731.60	7734.18		7732.07	50.32	675.30	2.19
8.01	8.01											
Sabino Canyon	4725	CULVERT#2	Post Fire	7734.19	7734.10	7731.41	7734.20		7732.07	61.38	675.30	2.19
8.68	8.68											
Sabino Canyon	4705.5	CULVERT#1	Pre Fire	7730.94	7730.87	7730.99	7730.94		7730.01	152.41	144.59	3.48
10.78	10.78											
Sabino Canyon	4705.5	CULVERT#1	Post Fire	7732.03	7731.86	7732.02	7732.03		7730.01	140.67	646.33	2.85
9.95	9.95											
Sabino Canyon	4675	CULVERT#1	Pre Fire	7719.82	7719.69	7719.79	7719.82		7718.51	28.39	270.61	1.29
8.03	8.02											
Sabino Canyon	4675	CULVERT#1	Post Fire	7720.87	7720.49	7720.84	7720.87		7718.51	30.39	852.04	1.25
8.60	8.60											
Sabino Canyon	4635	CULVERT#1	Pre Fire	7709.45	7709.24	7709.45	7709.01		7707.55	190.62	108.38	5.17
10.47	14.72											

Sabino Canyon	4635	CULVERT#1	Post Fire	7712.18	7711.65	7712.18	7710.74	7707.59	245.29	637.71	6.92
13.48	17.53										
Sabino Canyon	4595	CULVERT#1	Pre Fire	7678.54	7678.53	7678.09	7678.54	7677.41	78.17	220.83	3.60
9.79	11.77										
Sabino Canyon	4595	CULVERT#1	Post Fire	7679.61	7679.54	7679.59	7679.61	7677.41	87.35	794.93	3.08
9.27	9.27										
Sabino Canyon	4515	CULVERT#1	Pre Fire	7599.19	7599.04	7599.08	7599.19	7597.54	150.90	215.10	1.98
8.29	8.29										
Sabino Canyon	4515	CULVERT#1	Post Fire	7602.47	7602.24	7602.45	7602.47	7597.54	36.85	976.14	0.70
2.02	2.02										
Sabino Canyon	4397 S	CULVERT#1	Pre Fire	7462.33	7461.92	7462.16	7462.33	7459.85	190.74	302.26	3.05
10.12	10.12										
Sabino Canyon	4397 S	CULVERT#1	Post Fire	7465.19	7464.21	7465.11	7465.19	7459.85	224.61	1221.39	3.45
11.92	11.92										