Maricopa County Department of Transportation

Camelback Road

Litchfield Road to El Mirage Road

Final Drainage Report

MCDOT Contract No. 68227
CBA File No. 241729-01-0301

Prepared by:

CELLA BARR
ASSOCIATES
5062 N. 19th Avenue
Phoenix, Arizona 85015

May 3, 1995

Maricopa County Department of Transportation

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Registered Professional Engineer (Civil)
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Date Signed 5-4-95
ARIZONA U.S.A.

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INTRODUCTION

The purpose of this Drainage Report is to provide documentation for the drainage improvements as presented in the Construction Plans prepared by Cella Barr Associates (CBA) and submitted to the Maricopa Department of Transportation (MCDOT) for the Camelback Road Project No. 68227. The project begins just west of Litchfield Road and extends approximately two (2) miles east, terminating just east of El Mirage Road (Figure 1). Drainage improvements proposed for the Camelback Road Project consist of a major interim drainage channel (North Channel), collector swales, drainage swales, culvert drainage structures, catch basins, and storm drains.

A drainage concept study was originally conducted for the Camelback Road channel (North Channel) as part of a Concept Design Report prepared by the WLB Group, entitled, "Camelback Road Channel, Concept Design Report, October 21, 1993". The purpose of the study was to evaluate alternatives for the Camelback Road channel. The alternatives evaluated consisted of a channel design for the 100-year, 24-hour design storm assuming that the Colter Channel would not be built, a channel design for the future 10-year, 24-hour design storm assuming that the Colter Channel is constructed and the area between Colter Channel and Camelback Road is fully developed (future condition) and channel designs for the 2-year and 5-year, 24-hour design events using existing development conditions and assuming that Colter Channel is constructed. The 5-year, 24-hour design (Interim Design) was selected as the preferred alternative.

The existing condition 5-year, 24-hour design storm event is the basis for the Camelback Road Interim Channel Design presented in this report.

At the direction of the Maricopa Department of Transportation, the Interim Channel Design shall eliminate flow breakouts at Dysart Road and El Mirage Road for the 100-year, 24-hour event and that all roadway and driveway crossing of the proposed channel are subject to drainage criteria referenced in the Flood Control District/Maricopa County's "Drainage Design Manual for Maricopa County". However, freeboard is not required in the channel for the 100-year, 24-hour event.

This drainage report presents the following:

1. Updated HEC-1 hydrologic models.

2. HEC-2 hydraulic analyses for the proposed channel and associated drainage improvements.

3. Documentation of all proposed pavement and offsite drainage system improvements.

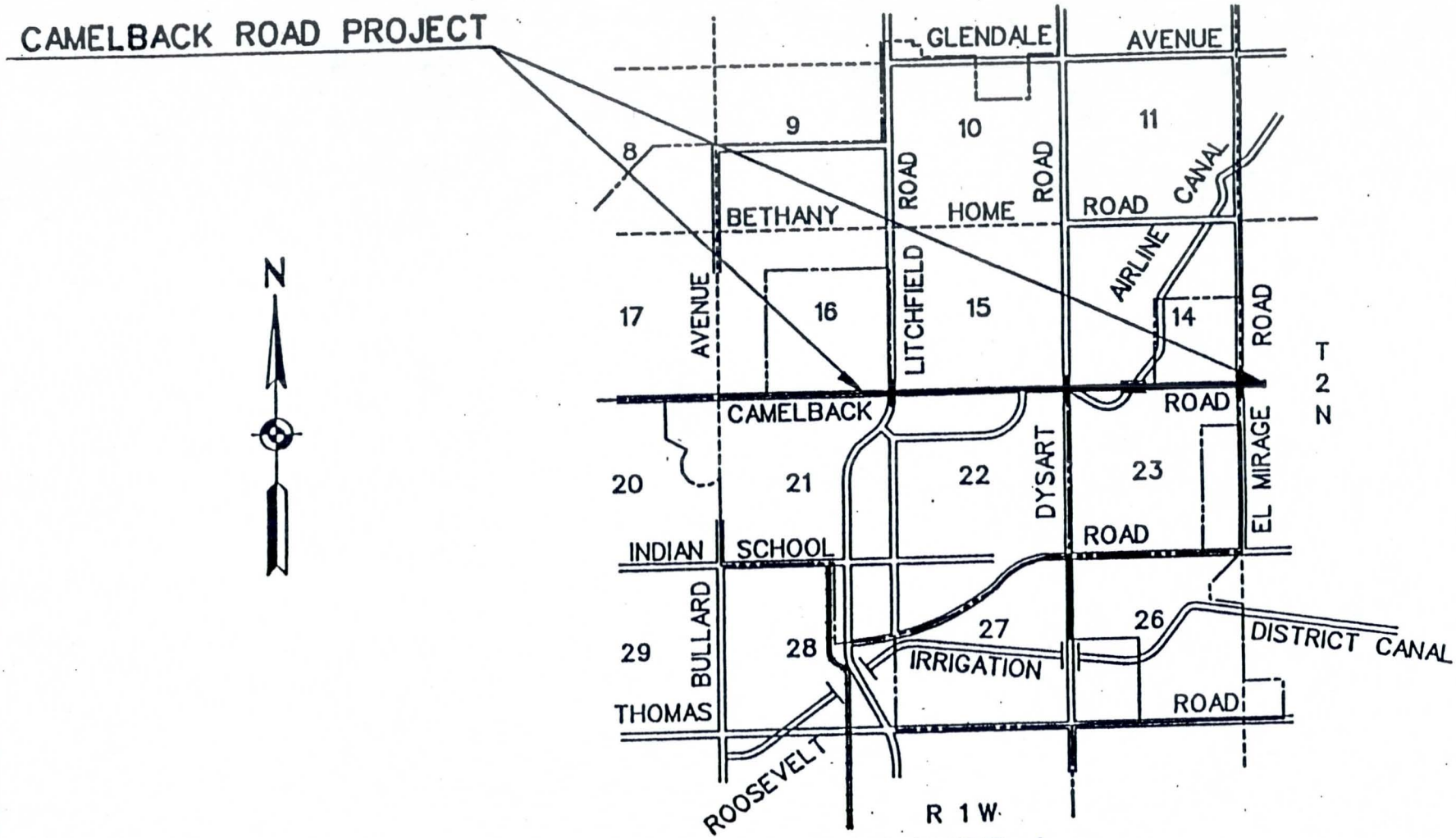


FIGURE 1
VICINITY MAP
Not to Scale

HYDROLOGIC ANALYSIS OF CAMELBACK ROAD INTERIM CHANNEL WATERSHEDS

Introduction

This section of the report presents the estimated 5-, 10- and 100-year, 24-hour design discharges utilized to evaluate proposed drainage facilities. As previously mentioned, the WLB Group had conducted a hydrologic analysis of the watersheds impacting the proposed Camelback Channel alignment for the Flood Control District of Maricopa County (FCDMC). The HEC-1 hydrologic models presented in the previous report formed the basis for watershed modeling conducted by CBA.

Hydrologic Modeling

The HEC-1 rainfall runoff model presented in the Camelback Road Channel, Concept Design Report, dated October 21, 1993 by the WLB Group was developed utilizing portions of the HEC-1 model created for White Tanks/Agua Fria Area Drainage Master Study along with criteria cited in the "Hydrologic Design Manual for Maricopa County" (Volume I, Hydrology).

The concept design report cites the following criteria and procedures utilized in the development of their HEC-1 model.

1. Green - Ampt soil loss rate parameters were utilized.

2. The Phoenix valley S-Graph was incorporated to calculate unit hydrographs.

3. The SCS Type II rainfall distribution was utilized.

4. Rainfall data was computed using the Hydrologic Design Manual for Maricopa County Volume I, Hydrology (Appendix A).

5. An elliptical pattern of area reduction was utilized for rainfall reduction.

The HEC-1 models developed for the Concept Design Report were obtained (input data) by CBA and revised for the 5-, 10-, and 100-year, 24-hour existing condition design event. Watersheds previously delineated were revised to account for additional area draining to the watersheds as a result of a realignment of Camelback Road. The area of watershed numbers 504, 505, 506, 507, and 508 were increased by 1.36 acres, 1.65 acres, 3.24 acres, 2.56 acres, and 3.53 acres respectively. Watersheds impacting the Camelback Road channel are presented in Figure 2.

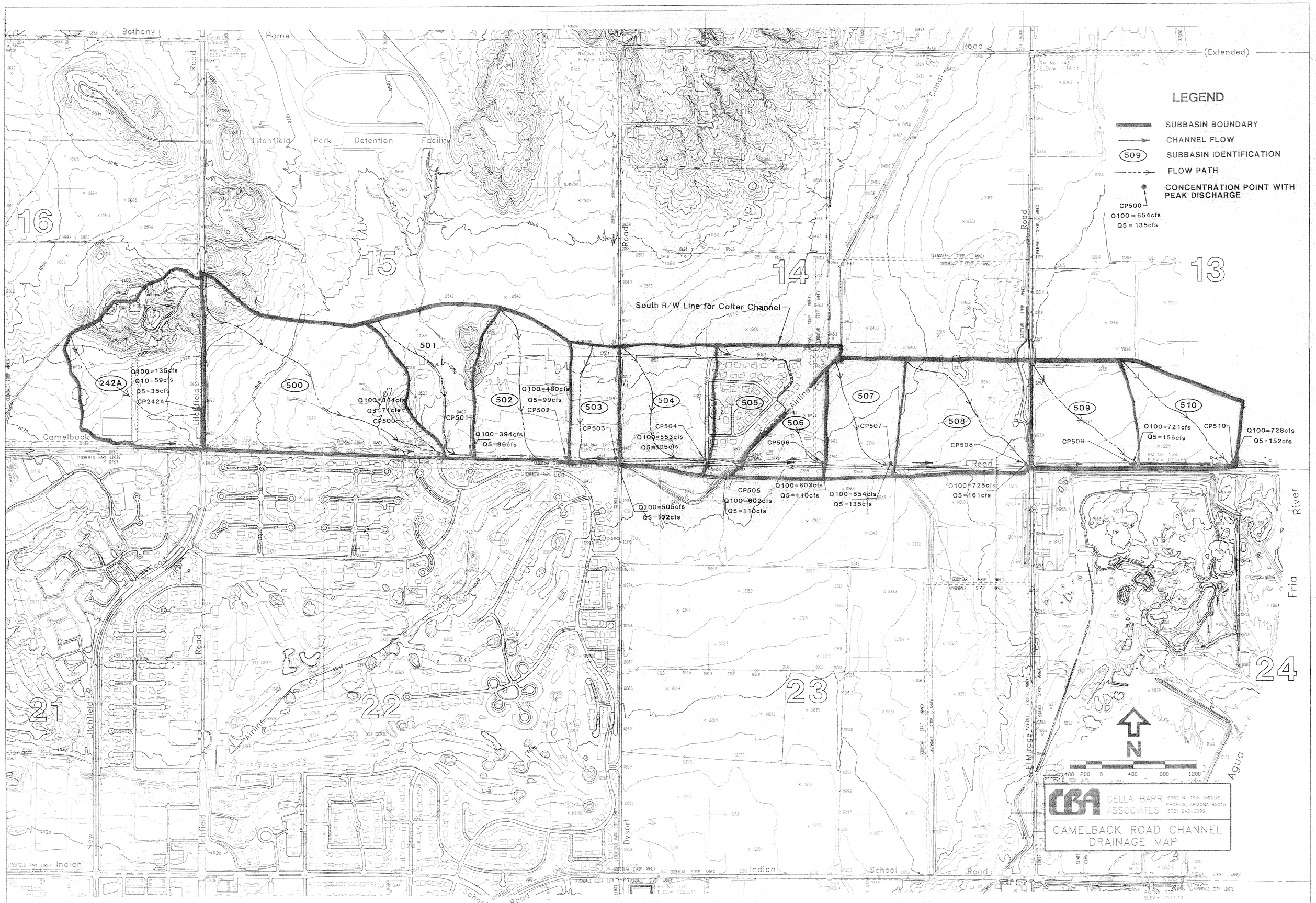
Estimated peak discharges from the 5- and 100-year runoff models were utilized to evaluate and design the proposed Camelback Road Interim Channel. Peak discharges estimated with the 5-year model were utilized to design all collector drainage swales that drain to the Camelback Road Interim Channel.

Summary of Results

The HEC-1 models utilized for the Camelback Road Interim Channel are located in Appendix B. Table 1 lists peak discharges estimated for the 5-, 10-, and 100-year runoff events at key concentration points.

TABLE 1
Summary of Discharges

Concentration Point	Q100 (CFS)	Q10 (CFS)	Q5 (CFS)
CP242A	135	59	36
CP500	314	127	71
CP501	394	157	86
CP502	480	184	99
CP503	505	192	102
CP504	553	207	105
CP505	602	223	110
CP506	603	222	110
CP507	654	255	135
CP508	725	294	161
CP509	721	287	156
CP510	728	283	152



NOTE: Watershed Map taken from the Camelback Road Channel Concept Design Report (October 21, 1993). Revisions to Southern Watershed Boundary between Dysart and El Mirage Roads by Cella Barr Associates

HYDRAULIC ANALYSIS OF CAMELBACK ROAD INTERIM CHANNEL

Introduction

The hydraulic analysis of Camelback Road Channel commences approximately 2300 feet east of the intersection of Camelback and El Mirage Roads (Sta. 157+59) and extends to the west of Litchfield Road (Sta. 29+40). The proposed typical channel geometry is characterized by a earth channel with a 5 foot bottom width and 4:1 (horizontal to vertical) side slopes (Figure 3). The channel alignment will cross a number of roadways and driveways that require drainage structures. The analysis models the proposed channel and associated drainage facilities and serves as a design tool and as a evaluation of the performance of the channel in relation to drainage design criteria sited in the FCDMC's "Drainage Design Manual" for Maricopa County.

Study Criteria and Procedures

The following criteria and design assumptions have been employed in the hydraulic evaluation of Camelback Road Interim Channel:

1) The U.S. Army Corps of Engineers' HEC-2 Flood Plain Analysis computer Program (Version 4.6, Dodson and Associates) was utilized to evaluate the proposed channel and associated drainage structures.

2) The channel and overbank roughness values (Mannings "n") used in the hydraulic computations were obtained from the "Drainage Design Manual for Maricopa County, Arizona" (Volume 2,Hydraulics, Table 5.11) and engineering judgement. A channel "n" value of 0.025 and overbank "n" values of 0.025 (earthen roadway/shoulders) and 0.045 (agriculture fields) were utilized.

3) The proposed channel is a earthen trapezoidal channel with 4:1 (horizontal-vertical) side slopes and has a 5 foot to 45 foot bottom width. Transitions from the 5 foot bottom width occur upstream and downstream of roadway culvert crossings. Through the transitions, side slopes will vary. Contraction and expansion coefficients of 0.1 and 0.3, respectively, were employed for channel reaches between culvert roadway crossings where as values of 0.3 and 0.5, respectively, were employed upstream and downstream of culvert roadway crossings.

4) Transition length for open-channel flow described by the U.S. Army Corps of Engineers (1970) and in the City of Tucson Drainage Design Manual (1989) are based on rapid flow, and may not apply (calculated entrance transition lengths ranged from 4' to 30' and exit transition lengths range from 35 to 60 feet) to the low velocity flow (1.0 to4.5 f.p.s.) determined for the proposed channel. Therefore, channel transitions from the trapezoidal channel to the subject culvert are proposed to begin (upstream) and end (downstream) at the termination of the headwalls of the subject culvert. Transition lengths will range from 16 to 25 feet. It is CBA's opinion that the use of shorter or longer transition lengths will not adversely impact flow conditions for the design event.

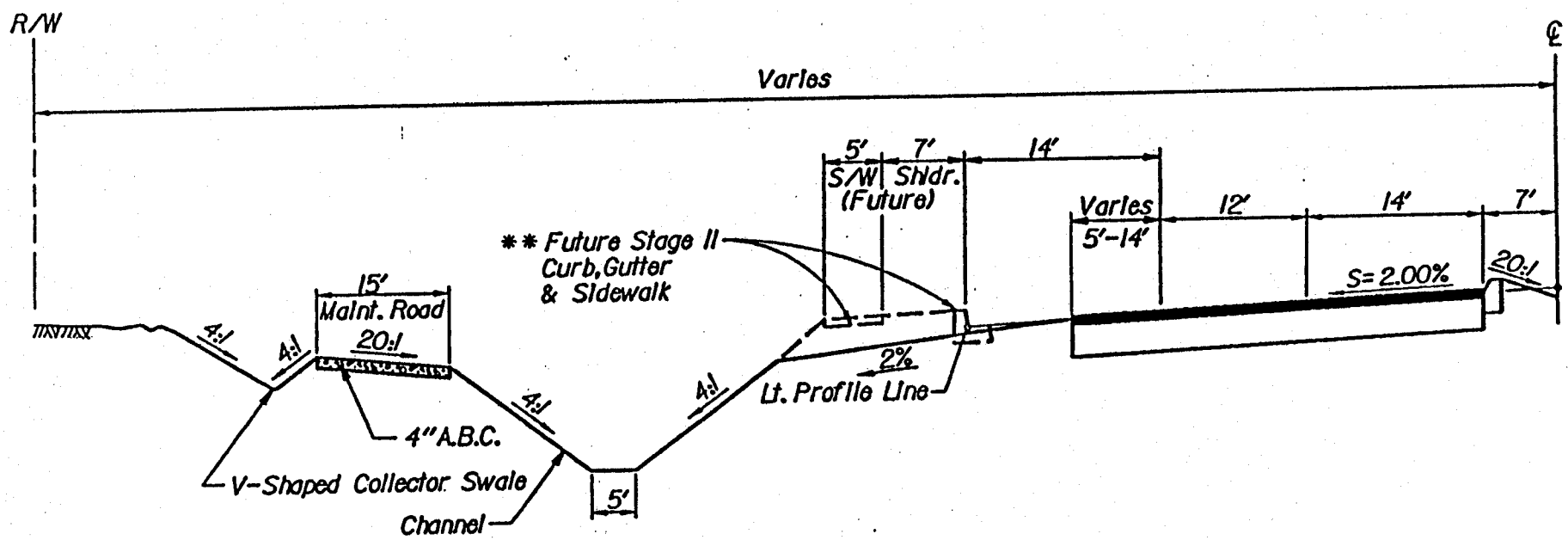


FIGURE 3
TYPICAL SECTION
CAMELBACK ROAD - DYSART RD. TO EL MIRAGE RD.

5) The channel was designed/located to accommodate addition of a future lane (Camelback Road ultimate buildout) without reconstruction of the channel.

6) The 5-year existing condition runoff event is the design event.

7) The difference between the water surface elevations associated with the 100-year existing condition runoff event and top of roadway crossing shall not exceed 0.5 feet. No flow break outs are allowed at the crossings of El Mirage and Dysart Roads.

8) The starting water surface elevation for the 5-year design runoff event is based on the slope-area method.

9) It is unlikely that coincidental 100-year runoff events for the Camelback Road Interim Channel and Agua Fria River will occur. Therefore, the starting water surface elevation for Camelback Road channel for the 100-year runoff event was estimated to be the 10-year Agua Fria River water surface elevation of 1020.6 (Agua Fria water surface elevation taken from Maricopa County, Arizona Flood Insurance Study, December 3, 1993). The 100-year Camelback Road Interim Channel HEC-2 model was run utilizing both, the 10-year Agua Fria River water surface elevation and a starting water surface evaluation determined by the slope area method to determine which water surface elevation was controlling the hydraulics. The Agua Fria River water surface elevation showed to be the controlling water surface elevation.

10) For modeling purposes, minimum spacing between culverts is ¼ mile, even if culverts are not proposed at this time to accomodate potential future needs.

11) Approximately 500 feet upstream of the intersection of Litchfield Road and Camelback Road, subbasin 242 A of the Camelback Road Interim Channel watershed drains to Litchfield Road. At this point, split flow will occur, with runoff draining down Litchfield Road to Camelback Road and across Litchfield Road to an historic flow path. The 10-year peak discharge was utilized as the maximum peak discharge draining to the Camelback Road channel at the location of the intersection of Litchfield Road and Camelback Road.

Hydraulic Evaluation

The hydraulic evaluation for proposed conditions consisted of developing hydraulic models for the 5-year and 100-year runoff events which incorporated the proposed channel and culverts. Table 2 and 3 lists the location and type of proposed drainage features that were modeled for the proposed channel reach along with a summary of flow characteristics.

Drainage improvements for the proposed channel from El Mirage Road to outfall the are discussed seperately in the *Outfall Considerations* section.

Table 2 - Summary of Channel Characteristics								
Location	Discharge Q5 (cfs)	Discharge Q100 (cfs)[2]	Depth of Flow Q5 (ft)	Depth of Flow Q100 (ft)[2]	Average Velocity Q5 (fps)	Slope	Right of Way Requirements[1]	Remarks
Sta 30+54 to Sta 39+00	36	59	.9 to 1.5	1.3 to 1.5	3 to 6.9	0.0051	78'	6.9 fps at proposed culvert outlet
Sta 39+00 to Sta 39+10	36	59				0.186	78'	Drop Structure
Sta 39+10 to Sta 49+00	36	59	0.9 to 3.0	1.2 to 4.2	1 to 2	0.002	78'	
Sta 49+00 to Sta 49+10	36	59				0.272	78'	Drop Structure
Sta 49+10 to Sta 52+00	36	59	1.4	1.9	2.5	0.002	78 to 88'	
Sta 52+00 to Sta 55+73	36	59	1.0 2.1	1.2 to 3.8	2.5 to 4.6	0.00785	88'	
Sta 55+73 to Sta 63+67	86	394	1.5 2.7	3.8 to 5.5	.8 to 6.9	0.0082	88'	6.9 fps at proposed culvert outlet
Sta 63+67 to Sta 75+23	99	480	2.3 to 2.4	5.5	2.3 to 2.8	0.0015	88' to 100'	
Sta 75+23 to Sta 81+81	102	505	2.2 to 2.5	5.2 to 5.5	2.5 to 3.2	0.0015	100'	
Sta 81+81 to Sta 92+89	105	553	2.3 to 2.4	5.3 to 6.1	1.8 to 2.9	0.0015	107'	
Sta 92+89 to Sta 97+68	110	602	2.4	5.5 to 6.1	1.8 to 3.0	0.0015	92'	
Sta 97+68 to Sta 105+21	110	603	1.9 to 2.5	5.5 to 5.7	2.2 to 3.5	0.0015	92'	
Sta 105+21 to Sta 105+47.5	135	654	1.9 to 2.0	4.7 to 5.7	3.5	0.0015	92'	
Sta 105+47.5 to Sta 120+49	135	654	2.0 to 2.4	4.7 to 6.4	3.5 to 4.0	0.0032	91'	
Sta 120+49 to Sta 133+61	161	725	1.5 to 2.4	3.6 to 6.4	3.6 to 4.9	0.00426	91'	
Sta 133+61 to Sta 157+59	156 to 152	721 to 728	1.4 to 2.6	3.6 to 4.5	3.6 to 4.9	0.00165		

1. Length extends from back of sidewalk to R/W limits (See Figure 2).
2. Ten year discharge utilized for 100 year flow conditions from Sta 30+54 to Sta 56+58. It is assumed that the ten year discharge from subarea 242A (Figure 2) will drain within the Litchfield roadway to the proposal channel and the 100 year flow will cross Litchfield draining to historic flow path.

Table 3 Drainage Improvements - Summary of Culvert Drainage Structures				
Location	Culvert Type	Upstream Ponding Depth Q100	Upstream Ponding Depth Q5	Remarks
Sta 25+87	15" x 55' CMP	2.52'	1.03'	100 year flow depth over driveway = 0.17 foot. See Appendix L for culvert performance calculations.
Sta 30+00	42" x 108' CMP	3.51'	2.84'	Downstream energy dissipator required.
Sta 56+58	42" x 42' CMP	3.69'	2.71'	Downstream energy dissipator required.
Sta 63+98	2 cell, 4' x 8' x 40' CBC	5.54'	2.31'	100 year flow spills into Camelback Road. Depth of Flow = 0.5'
Sta 75+43	2 cell, 5' x 8' x 40' CBC	5.44'	2.41'	
Sta 82+36	2 cell, 5' x 8' x 110' CBC	5.27'	2.27'	
Sta 93+19	3 cell, 4' x 8' x 60'CBC	6.09'	2.35'	100 year flowspills into Camelback Road. Depth of Flow = 0.55
Sta 97+98	2 cell, 5' x 10' x 60' CBC	5.45'	2.45'	
Sta 105+67.5	2 cell, 5' x 8' x 40' CBC	4.75'	1.94'	
Sta 134+17	3 cell, 4' x 10' x 110' CBC	3.62'	1.46'	
Sta 43+30	42" x 42' CMP	3.89'	2.83'	Modeled only (HEC-2) Not to be constructed.
Sta 120+96	2 cell, 5' x 8' x 40' CBC	5.53'	2.10'	Modeled only (HEC-2) Not to be constructed.

Flood profiles for the proposed drainage improvements for the 5- and 100-year runoff events are displayed on the construction drawings. The HEC-2 analysis is provided in Appendix C. Input files on a floppy disk are provided in Appendix K.

Erosion Potential

Erosion potential of the proposed channel was evaluated utilizing Western Technologies, Inc., Camelback Road Geotechnical Report and Table 5.1 from the Drainage Design Manual for Maricpa County, Arizona (Volume II, Hydraulics). Permissible velocities estimated by Western Technologies for the proposed channel range from 3.5 fps [Soil type - Sandy Clay (Loam)] to 2.5 fps [Soil Type = Sandy Loam]. From approximately Sta. 30+00 to Sta 97+92 the permissible velocity is estimated to be 3.5 fps and from Sta 97+92 to Sta 157+59 the permissible velocity is estimated to be 2.5 fps.

Estimated channel velocities for the 5-year peak discharge event for the channel reach between Sta 30+00 and Sta 97+92 range between 1.0 and 6.9 fps, with the higher velocities being located at the outlet of proposed 42" cmp culvert structures, and drop structures. Velocities of 1.0 fps to 3.2 fps were estimated for channel reaches between culvert and drop structures and, therefore, do not require erosion protection.

Estimated channel velocities for the channel reach between Sta 97+92 and Sta 157+59 for the 5-year peak discharge event range from 2.8 fps to 4.9 fps. Higher velocities tend to be located at culvert locations, however, velocities between 3.5 fps and 4.9 were also estimated for channel reaches between culverts. Estimated velocities are outside of the permissible range of 2.5 fps, indicating that a channel vegetative lining may be required for this reach to minimize channel maintenance. If lower flow velocities were obtained it is highly unlikely that the flow could transport sediment, thus leading to greater maintenance. It is CBA's recommendation that vegetative lining be considered for this reach. However, McDOT has directed CBA not to specify any channel lining at this time.

There is a potential for channel erosion at culvert, storm drain lateral and spillway outlets to the channel, and at drop structure locations within the channel. The following erosion protection measures are proposed as a measure to mitigate potential erosion:

1. At the outlets to the proposed 42" CMP drainage structures (drainage structure Sta 30+00 and Sta 56+58) rip-rap (d_{50}=0.5') lined channel segment extending approximately 25' downstream of the culvert outlet are proposed. (Appendix H)

2. To minimize erosion potential upstream and downstream of box culverts rip-rap (d_{50}=0.5') is proposed for the transition lengths between channel bottom and box culvert.

3. At the location of spillway (spillways are concrete lined) outlets to the channel, the earthern channel is proposed to be lined with rip-rap. Rip-rap (d_{50}=0.5') shall extend from the termination of the concrete spillway at the channel invert, extend across the channel bottom, and up the opposite 4:1 channel side slope. (Appendix H).

4. Drop structures will require erosion protection measures. Erosion protection measures consist of rip-rap (d50=0.5') placed at the drop structures downstream toe as specified on the construction drawings.

5. At the outlets of storm drain laterals to the channel erosion protection measures will be required. Erosion protection measures consist of rip-rap (d50-0.5') placed at each stormdarin outlet as specified on the construction drawings.

Outfall Considerations

Two possible drainage outfall options for the Camelback Road Interim Channel were identified: Option 1) Regrade and extend existing channel located adjacent to the north of the Camelback Roadway from El Mirage Road to the Agua Fria River; and, Option 2) Regrade the existing channel to an existing 8' x 8' concrete box culvert located approximately 2400 feet east of El Mirage Road. The following design considerations are offered for the two options identified.

1) Outfall to the Agua Fria River would have to be accomplished by extending and regrading the existing channel to Colter Channel or to the Colter Channel outfall to the Agua Fria River from El Mirage Road. This outfall solution would require approximately 4500 feet of channel. The channel invert elevation at El Mirage Road would be approximately 1021 feet and the invert elevation at the Agua Fria River would be 1018 feet. The available grade for this option would be 0.07 percent.

2) The invert elevation of the existing 8' x 8' concrete box culvert is 1013.96 feet (drop inlet provided).

3) The existing ground elevation adjacent to the upstream end of the existing 8' x 8' concrete box culvert is approximately 1017 feet.

4) An access road to a sand and gravel operation is located approximately 100 feet east of the existing 8' x 8' concrete box culvert.

5) Power line towers located east of the sand and gravel access road will limit possible channel alignments because of required set-back distances.

6) Either option is within the 10-year post Waddell Dam, Agua Fria River flood plain (Wood, Patel Associates, Inc. - "Colter Channel Project, Recommendation Report", November 1992).

Given that either option is within the Agua Fria River 100-year floodplain and that the impacts to adjacent properties from the Camelback Road Interim Channel would be equivalent to impacts from a 100-year flow in the Agua Fria River, CBA recommends Option 2. The following conclusions are offered for the selection of Option 2.

1) Option 2 will require less right-of-way take than Option 1. The existing channel, in part, can be utilized and will require approximately a 2400 foot long improved channel segment.

2) The Aqua Fria River's 10-year water surface elevation of 1020.6 feet is equivalent to normal depth in the proposed channel for the 100-year Camelback Road Interim Channel runoff event at the location of the existing concrete box culvert. therefore, future improvements to the properties adjacent to the Interim Channel required to remove them from the Aqua Fria River's 100-year water surface elevation will raise the properties above the Interim Channel's 100-year water surface elevation.

3) The existing 8' x 8' concrete box culvert is located within a historic flow path.

CBA met with FCDMC personnel to discuss the options identified in CBA's Initial Drainage Report (40% Design Submittal) for the channel outfall and to present additional information that was requested in the progress meeting following the 40% Design Submittal review. The following items were presented or discussed in the meeting.

1. The existing condition 100-year and 10-year discharges from Camelback Road drainage system, taking into consideration split flow at Dysart and El Mirage roads, concentrating at the 8' x 8' CBC location (proposed outfall) are 214 cfs and 123 cfs, respectively.

2. With a ponding elevation of 1020.6 feet (10-year water surface elevation for Agua Fria River) at the 8' x 8' CBC, the 8' x 8' CBC drainage structure will convey approximately 382 cfs (proposed Q_{10} = 287 cfs, Q_{100} = 728 cfs).

3. With a ponding elevation of 1022.2 feet (Agua Fria River 10-year water surface elevation at the Colter Channel, the 8' x 8' CBC drainage structure will convey approximately 526 cfs. Runoff from the Camelback Road Interim Channel ponding upstream of the 8' x 8' CBC will spill into the Colter Channel.

4. It was related that the FCDMC had obtained flowage easements for Colter Channel in areas that flow would break-out during infrequent runoff events.

5. FCDMC personnel also related that perpetual flowage easements have been obtained in the floodway fringe. The total discharge impacting the subject property is used to determine the impact area or area of perpetual flowage easement.

6. Taking into consideration that the channel reach from the El Mirage Road to the 8' x 8' CBC is in the floodway fringe of the Aqua Fria River, the most practical solution for the channel outfall is to provide minor improvements to the existing channel that will convey frequent events and obtain perpetual flowage easements upstream and downstream of the 8' x 8' CBC drainage structure for infrequent events.

The proposed outfall channel for Option 2 will consist of an earthen channel with 4:1 side slopes and varying bottom widths. From Station 134+37 LT to Station 139+16 LT the proposed bottom width is 45 feet. From Station 139+16 LT to Station 144+16 LT the bottom width transitions from 45 feet to 40 feet. From Station 144+16 to Station 149+16 the bottom width varies from 40 feet to 10 feet. From Station 149+16 to the 8' x 8' concrete box culvert the proposed bottom width is 10 feet. The transition in bottom width allows the limit of flooding associated with a 100-year runoff event for the Interim Cannel to be confined to the Agua Fria River's 10-year floodplain.

Summary of Results/Design Considerations

Velocities within the channel range between 1.5 and 6.9 F.P.S. during the 5-year runoff event. The higher velocities occur predominantly at the outlet of proposed box culverts. Rip-rap channel protection is proposed at these locations. The 100-year runoff event will overtop driveway/roadway culvert crossings at two locations. At Station 93+19 (129th Avenue), the depth of flow within the intersection of 129th Avenue and Camelback Road is approximately 0.54 feet at the proposed roadway grade (See Appendix I). At Station 63+98 the depth of flow is approximately 0.5 feet at the proposed driveway grade.

The existing channel, from El Mirage Road to the 8' x 8' concrete box culvert, will be modified to moderately increase its conveyance. A perpetual drainage easement will be acquired for this segment of the drainage system.

PAVEMENT DRAINAGE, DRAINAGE SWALES, OFFSITE COLLECTOR SWALES AND SPILLWAYS

Introduction

This section of the report is a summary of the hydraulic analysis of proposed drainage improvements for the design segment of Camelback Road are in addition to interim Channel improvements. In general, the proposed drainage improvements analyzed for this report consist of catch basins, V-shaped drainage swales, and V-shaped offsite collector swales, side channel weir inlets and associated spillways. Drainage components consisting of V-shaped offsite collector swales, side channel weir inlets and associated spillways drain offsite flow into the proposed Interim Channel at various locations.

Study Criteria and Procedures

The following criteria and procedures have been employed in the evaluation of proposed drainage facilities for the design reach.

1) The rational method described in the "Drainage Design Manual for Maricopa County, Arizona (Volume I, Hydrology) has been utilized to determine 10-year design discharges for pavement drainage employing a 10-year runoff coefficient "C" cap of 0.80. Rainfall intensities are presented in Appendix A. Calculation sheets for the rational method are provided in Appendix D.

2) Catch basin location and size are based on design procedures described in the design procedures described in the "Design Manual" for Maricopa County, Arizona (Volume II, Hydraulics). Calculation sheets are provided in Appendix D.

3) Proposed earthen V-shaped drainage swales and earthen V-shaped offsite collector swales were evaluated utilizing Manning's Equation. A Manning's "n" value of 0.025 was utilized. Dodson and Associates "Hydrocalc" (1989) program was utilized for the analysis. Calculation sheets are provided in Appendix E.

4) Peak discharges from the 5-year existing condition runoff event from offsite watersheds impacting the Camelback Road Interim Channel were utilized to evaluate/design a proposed earthen V-shaped offsite collector swales located north and adjacent of the proposed Camelback Road Interim Channel maintenance road. For a given V-shaped offsite collector swale reach, the 5-year peak discharges impacting the swale was estimated by determining a unit discharge per acre, and applying it to the number of acres impacting the reach. V-shaped offsite collector swales drain to side weir inlets and into the Interim Channel.

5) At areas of concentrated swale inflow to the Interim Channel, concrete side weir inlets are proposed. The weir equation $Q=CLY^{1.5}$ was utilized to size each weir. The evaluation of side weir inlets is located in Appendix F. Associated spillways were designed to be consistent with weir requirements.

6) Manning's Equation was used to estimate spillway flow conditions. A Manning's "n" value of 0.015 was utilized. Calculation sheets are provided in Appendix H.

Summary of Results

Table 4, 5, 6 and 7 summarizes the location type and size of proposed catch basins and lateral storm drains, earthen V-shaped drainage swales, earthen V-shaped collector ditches and side channel weir inlets respectively.

Table 4 - Summary of Catch Basin Types

Location	Catch Basin Type	Lateral Size [1,3]	Remarks[2]
Sta 23+40.23-62'RT	ADOT C15.30	18" RGRCP	Use LB type grate. Catch basin located in drainage swale.
Sta 39+65.67-47'RT	MAG 533-1	15" RGRCP	Use 17' wing.
Sta 50+65.67-47'RT	MAG 533-1	15" RGRCP	Use 17' wing.
Sta 58+87-47'RT	MAG 533-1	15" RCRCP	Use double 10' wing.
Sta 64+45.45-47'RT	MAG 532	30" RGRCP	Catch basin in a sump condition, 100-year discharge confined to Camelback Right of Way
Sta 73+00-47'RT	MAG 533-1	15" RGRCP	Use 10' wing.
Sta 76+45-47'RT	MAG 532	24" RGRCP	Catch basin in a sump condition, 100-year discharge confined to Camelback Right of Way.
Sta 78+00-47'RT	MAG 533-1	15" RGRCP	Use 10' wing.
Sta 85+69.41-7'LT	MAG 532	15" RGRCP	
Sta 87+75.10-65'RT	ADOT C15.30	24" RGRCP	Use LB type grate. Catch basin located in drainage swale. Catch basin in sump condition, 100-year discharge confined to Camelback Right of Way.
Sta 89+45.10-7'LT	MAG 533-2	15" RGRCP	
Sta 95+54.79-7'RT	MAG 533-2	15" RGRCP	
Sta 132+70.64-57'RT	ADOT C15.30	24" RGRCP	Use LB type grate. Catch basin located in drainage swale.

1. All lateral drain to the proposed Camelback Road Channel.
2. All catch basin are designed to intercept the Q10 without bypass.
3. Hydraulic grade line calculations and associated watersurface elevations are provided in Appendix D.

Table 5 Earthen V-Shaped Drainage Swales						
Reach Location	**Maximum Q10[2]**	**Velocity (fps)**	**Depth of Swale (ft)**	**Depth of Flow (ft)**	**Slope of Swale (ft/ft)[3]**	**Flow Top Width (ft)**
Sta 21+45-LT to Sta 25+67-LT[2]	3cfs	3.0	2[1]	0.58	0.014	1.0
Sta 25+67-LT to Sta 29+28-LT[2]	5cfs	3.4	2	0.7	0.014	4.2
Sta 20+44-RT to Sta 29+23-RT[1]	6cfs	2.0	1 to 2	0.83	0.0081	5.0
Sta 83+15-RT to Sta 86+35.41-RT[3]	1.5cfs	2.4	1.5	0.4	0.0144	3.2
Sta 86+35.41-RT to Sta 87+75.10-RT[3]	1.5cfs	1.26	1.5	0.5	0.00262	4.4
Sta 87+75.10-RT to Sta 92+75.10-RT[3]	1.5cfs	2	1.5	0.45	0.0092	3.6
Sta 97+50-RT to Sta 125+00-RT[4]	11cfs	2	1.5	1.1	0.00262	11.0
Sta 125+00-RT to Sta 132+70.64-RT[4]	11cfs	3.1	1.5	0.85	0.0088	8.5

1. Proposed V-Shaped earthern dainage swales are located on the southside of Camelback Road and consist of 2:1 and 4:1 side slopes.

2. Proposed V-Shaped earthen drainage swales are located on the north side of Camelback Road and consist of 2:1 and 4:1 side slopes.

3. Proposed V-Shaped earthen drainage swales are located on the southside of Camelback Road and consist of 4:1 side slopes.

4. Proposed V-Shaped earten drainage swales are located on the southside of Camelback Road and consist of 6:1 and 4:1 side slopes.

5. Rational method utilized. Discharge calculation sheets located in Appendix D.

6. Channel slopes are consistent with roadway slopes.

Table 6 - Earthen V-Shaped Collector Swales						
Reach Location[2]	Discharge Q5 [1]	Velocity (fps)	Depth of Swale (ft)	Depth of Flow (ft)	Slope of Swale (ft/ft)	Top Width (ft)
Sta 61+50-LT to Sta 63+43-LT	2.4 cfs	1.3	1.0	0.7	0.002	5.6
Sta 64+39.4-LT to Sta 74+45-LT	3 to 28 cfs	1.3 to 2.1	1.5 to 2	0.8 to 1.8	0.0065 to 0.0015	6.4 to 14.4
Sta 76+52.5 - LT to Sta 81+97.43	5 to 9 cfs	1.4 to 1.6	1.5	1 to 1.2	0.0015 to 0.0017	8 to 9.6
Sta 83+00-LT to Sta 84+32.5	4 cfs	2.6	1.5	0.6	0.0099	4.8
Sta 100+00-LT to Sta 105+10-LT	1 to 4 cfs	1.6	1.0	0.8	0.00262	6.4
Sta106+05-LT to Sta 108+00-LT	4 cfs	1.6	1.0	0.8	0.00262	6.4
Sta 108+00-LT to Sta 109+00-LT	4 cfs	2.3	1 to 1.5	0.65	0.0077	5.1
Sta 109+00-LT to Sta 113+00-LT	8 cfs	2.0	1.5	1.1	0.0262	8.4
Sta 113+00-LT to Sta 114+00-LT	8 cfs	2.8	1.5 to 2	0.83	0.0077	6.6
Sta 114+00-LT to Sta 116+80-LT	18 cfs	2.35	2.0	1.4	0.00262	11.2
Sta 117+14-LT to Sta 121+00-LT	2 cfs	1.35	1.0	0.6	0.00262	4.9
Sta 121+00-LT to Sta 126+00-LT	2 cfs	2.1	1.0	0.5	0.008	4.1
Sta 126+00-LT to Sta 127+00-LT	6 cfs	2.9	1.5	0.7	0.0096	5.7
Sta 127+00-LT to Sta 131+00-LT	6 cfs	2.2	1.5	0.8	0.0046	6.5
Sta 131+00-LT to Sta 132+60-LT	11 cfs	3.4	2	0.9	0.0095	7.3
Sta 132+70 to Sta 133+62.05	19 cfs	1.9	2	1.6	0.0015	12.5

1. Discharge estimated from HEC-1 output by determining a unit discharge for a given watershed and applying the unit discharge to the respective area draining to the collector swale.
2. Proposed earthen V-shaped swales are located on the northern side of the proposed maintenance road and consist of 4:1 sideslopes. V-shaped collector swales were designed to intercept local runoff from Litchfield, Dysart and El Mirage Roads.

Table 7 - Side Weir Inlets					
Location	**Discharge Q5**	**Weir Length(ft)**	**Wing Length(ft)**	**Flow Depth(ft)**	**Remarks**
Sta 59+13 -LT to Sta 60+55-LT[1]	86 cfs	132'	5'	0.36	Weir top width: 142 Flow top width: 141
Sta 63+38-LT to Sta 63+53-LT	5 cfs	5'	5'	0.35	Weir top width: 15 Flow top width: 13.75
Sta 74+36-LT to Sta 74+64-LT	28 cfs	10'	9'	0.69	Weir top width: 28 Flow top width: 27.25
Sta 76+41.5-LT to Sta 76+58.5-LT	9 cfs	5'	6'	0.48	Weir top width: 17 Flow top width: 17
Sta 84+24.5-LT to Sta 84+45.5 LT	14 cfs	5'	8'	0.59	Weir top width: 21 Flow top width: 19.75
Sta 97+10-LT to Sta 97+36-LT	23 cfs	10'	8'	0.62	Weir top width: 26 Flow top width: 25.5
Sta 105+05-LT to Sta 105+20-LT	4 cfs	5'	5'	0.31	Weir Top width: 15' Flow Top Width: 12.75
Sta 116+55-LT to Sta116+85-LT	36 cfs	10'	10'	0.79	Weir top width: 30' Flow Top width: 29.75
Sta 132+50-LT to Sta 132+80-LT	32 cfs	10'	10'	0.74	Weir top width: 30' Flow top width: 28.5

1. Weir length was designed to minimize 100 year impact to upstream properties (See Appendix F).

AIRLINE CANAL IRRIGATION SIPHON STRUCTURE

The crossing of Airline Canal with Camelback Road and the proposed Interim Channel will require modifying an existing inverted irrigation siphon structure. The following design procedures/assumptions were utilized in the design of the inverted siphon structure.

1. Design procedures outlined in the "Design of Small Canal Structures" (United Department of Interior, 1978) were utilized to design the siphon structure and to estimate headwater losses.

2. Siphon replacement will be "in kind". Existing siphon pipe size is 45 inches diameter (inside). Estimated siphon capacity is equal to 52cfs.

3. To meet existing siphon conditions, proposed inlet and outlet invert elevations are consistent with existing.

4. Existing siphon inlet will remain in place. Outlet will be relocated.

5. Assume that entrance, exit and bend head losses are equivalent for existing and proposed conditions. Therefore, the difference in head losses between existing and proposed conditions are attributed to friction head losses due to increased length of siphon.

The proposed inverted irrigation siphon structure will consist of 45" diameter pressure concrete pipe. The profile of the siphon commencing at the inlet will have a negative transition 2:1 slope extending to a point that will at a minimum provide 3 feet of cover below the proposed Interim Channel invert, from this point the siphon will have a minimum 0.005 ft/ft slope to a point where positive 2:1 transition slope can be made to the outlet. The total length of the siphon is estimated to be 375 feet, approximately 113 feet longer than the existing siphon. The increase in friction head losses between existing and proposed conditions is 0.21'. The estimated freeboard of the canal assuming a peak discharge of 52 cfs and unrestricted flow at the outlet is approximately 1 foot. Therefore, the available freeboard of 1 foot will accommodate the increase in head loss. Siphon design calculation sheets are provided in Appendix I.

APPENDIX A

Rainfall Data

Point Values Return Period FREQUENCY								
DURATION	**2-YR**	**5-YR**	**10-YR**	**25-YR**	**50-YR**	**100-YR**	**500-YR**	
5-Min	.33	.42	.49	.58	.65	.72	.89	5-Min
10-Min	.49	.64	.74	.88	.99	1.11	1.36	10-Min
15-Min	.59	.80	.93	1.12	1.27	1.42	1.76	15-Min
30-Min	.79	1.06	1.25	1.52	1.72	1.92	2.39	30-Min
1-Hr	.96	1.31	1.56	1.89	2.15	2.40	3.00	1-Hr
2-Hr	1.04	1.44	1.70	2.07	2.36	2.64	3.30	2-Hr
3-Hr	1.10	1.52	1.80	2.19	2.50	2.80	3.50	3-Hr
6-Hr	1.20	1.67	1.99	2.43	2.76	3.10	3.88	6-Hr
12-Hr	1.30	1.84	2.20	2.69	3.07	3.45	4.33	12-Hr
24-Hr	1.40	2.00	2.40	2.95	3.38	3.80	4.78	24-Hr

Taken from WLB's Group Camelback Road Channel Concept Design Report (10/21/93).

APPENDIX B

HEC-1 Models

5-Year, 24-Hour Event

```
*************************************
                                    *
 FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
          MAY  1991                 *
        VERSION 4.0.1E              *
  Lahey F77L-EM/32 version 5.01     *
    Hodson & Associates, Inc.       *
   DATE 01/19/95  TIME  20:14:13    *
*************************************
```

```
*************************************
*                                   *
*   U.S. ARMY CORPS OF ENGINEERS    *
*   HYDROLOGIC ENGINEERING CENTER   *
*         609 SECOND STREET         *
*       DAVIS, CALIFORNIA 95616     *
*         (916) 551-1748            *
*                                   *
*************************************
```

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

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

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

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

  1           ID        CAMELBACK ROAD CHANNEL
  2           ID        MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
  3           ID        FILENAME          CAM5EX
  4           ID        CBA # 241729-01                  1/6/95
  5           ID        THIS MODEL IS FOR RAINFALL AMOUNT ASSOCIATED WITH 5-YEAR,24-HOUR STORM
  6           ID
  7           ID
              *DIAGRAM
  8           IT      5                    300
  9           IO      5
 10           IN     30
 11           JD   2.00     .01
 12           PC    .000    .005    .011    .016    .022    .028    .035    .041    .048    .056
 13           PC    .063    .071    .080    .089    .098    .109    .120    .133    .147    .163
 14           PC    .181    .204    .235    .283    .663    .735    .772    .799    .820    .838
 15           PC    .854    .868    .880    .891    .902    .912    .921    .929    .937    .945
 16           PC    .952    .959    .965    .972    .978    .984    .989    .995   1.000
 17           JD   2.00     .27
 18           JD  1.998     .45
 19           JD  1.993     .59
 20           JD  1.986     .72
 21           JD  1.979     .85

 22           KK    242A
 23           KM        RUNOFF FROM SUBBASIN 242A
 24           BA     .11
 25           LG     .34     .18    4.25     .39    6.00
 26           UI     17.     67.    101.    153.    190.    129.     90.     47.     26.     15.
 27           UI      5.      5.      5.      0.      0.      0.      0.      0.      0.      0.
 28           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 29           KK    R500
 30           KM        ROUTE FLOW FROM 242A TO 500
 31           RD    2640    .004    .025            TRAP      10       4

 32           KK     500
 33           KM        RUNOFF FROM SUBBASIN 500
 34           BA     .16
 35           LG     .35     .35    3.74     .31     .00
 36           UI     37.    128.    196.    322.    241.    159.     78.     40.     18.      9.
 37           UI      9.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 38           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 39           KK   CP500
 40           KM        ADD HYDROGRAPHS AT CP500
 41           HC       2

 42           KK    R501
 43           KM        ROUTE FLOW FROM 500 TO 501
 44           RD     800    .004    .025            TRAP      10       4
```

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

  45          KK    501
  46          KM       RUNOFF FROM SUBBASIN 501
  47          BA    .07
  48          LG    .35     .37    3.99     .25     .00
  49          UI    21.     68.    112.    152.     95.     53.     22.     10.      4.      4.
  50          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
  51          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

  52          KK   CP501
  53          KM       ADD HYDROGRAPHS AT CP501
  54          HC      2

  55          KK    R502
  56          KM       ROUTE FLOW FROM 501 TO 502
  57          RD   1150    .004    .025           TRAP     10      4

  58          KK    502
  59          KM       RUNOFF FROM SUBBASIN 502
  60          BA    .08
  61          LG    .35     .36    3.57     .28     .00
  62          UI    27.     87.    152.    169.    101.     46.     21.      7.      5.      0.
  63          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
  64          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

  65          KK   CP502
  66          KM       ADD HYDROGRAPHS AT CP502
  67          HC      2

  68          KK    R503
  69          KM       ROUTE FLOW FROM 502 TO 503
  70          RD    650    .004    .025           TRAP     10      4

  71          KK    503
  72          KM       RUNOFF FROM SUBBASIN 503
  73          BA    .03
  74          LG    .35     .35    3.81     .32     .00
  75          UI    12.     37.     68.     59.     34.     13.      5.      2.      0.      0.
  76          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

  77          KK   CP503
  78          KM       ADD HYDROGRAPHS AT CP503
  79          HC      2

  80          KK    R504
  81          KM       ROUTE FLOW FROM 503 TO 504
  82          RD   1125   .0036    .025           TRAP     15      4

  83          KK    504
  84          KM       RUNOFF FROM SUBBASIN 504
  85          BA   .0621
  86          LG    .34     .35    3.99     .35    1.00
  87          UI    21.     65.    114.    127.     76.     35.     16.      5.      4.      0.
  88          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
  89          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```

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

 90         KK   CP504
 91         KM       ADD HYDROGRAPHS AT CP504
 92         HC      2

 93         KK    R505
 94         KM       ROUTE FLOW FROM 504 TO 505
 95         RD    430   .0036    .025           TRAP      15       4

 96         KK     505
 97         KM       RUNOFF FROM SUBBASIN 505
 98         BA   .0526
 99         LG    .19     .27    3.95     .35   14.00
100         UI    20.     61.    113.     99.    57.     22.      9.      3.      0.      0.
101         UI     0.      0.      0.      0.     0.      0.      0.      0.      0.      0.

102         KK   CP505
103         KM       ADD HYDROGRAPHS AT CP505
104         HC      2

105         KK    R506
106         KM       ROUTE FLOW FROM 505 TO 506
107         RD   1050   .0036    .025           TRAP      15       4

108         KK     506
109         KM       RUNOFF FROM SUBBASIN 506
110         BA   .0351
111         LG    .35     .32    3.75     .25     .00
112         UI    28.     88.     79.     28.      6.      0.      0.      0.      0.      0.
113         UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

114         KK   CP506
115         KM       ADD HYDROGRAPHS AT CP506
116         HC      2

117         KK    R507
118         KM       ROUTE FLOW FROM 506 TO 507
119         RD    875   .0036    .025           TRAP      15       4

120         KK     507
121         KM       RUNOFF FROM SUBBASIN 507
122         BA    .054
123         LG    .49     .01    8.60     .11     .00
124         UI     5.     13.     25.     32.     42.     63.     58.     44.     34.     26.
125         UI    16.      9.      7.      5.      2.      2.      2.      2.      0.      0.
126         UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

127         KK   CP507
128         KM       ADD HYDROGRAPHS AT CP507
129         HC      2
```

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

 130          KK   R508
 131          KM       ROUTE FLOW FROM 507 TO 508
 132          RD   1700   .0036    .025           TRAP     15      4

 133          KK    508
 134          KM       RUNOFF FROM SUBBASIN 508
 135          BA  .0855
 136          LG    .49     .02    3.91     .43     .00
 137          UI     8.     16.     34.     44.     55.     73.     98.     76.     61.     48.
 138          UI    37.     23.     14.     11.      8.      4.      2.      2.      2.      2.
 139          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 140          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 141          KK  CP508
 142          KM       ADD HYDROGRAPHS AT CP508
 143          HC      2

 144          KK   R509
 145          KM       ROUTE FLOW FROM 508 TO 509
 146          RD   1350   .0015    .025           TRAP     20      4

 147          KK    509
 148          KM       RUNOFF FROM SUBBASIN 509
 149          BA    .07
 150          LG    .36     .31    4.12     .53     .00
 151          UI    28.     86.    158.    138.     80.     31.     13.      5.      0.      0.
 152          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 153          KK  CP509
 154          KM       ADD HYDROGRAPHS AT CP509
 155          HC      2

 156          KK   R510
 157          KM       ROUTE FLOW FROM 509 TO 510
 158          RD   1275   .0015    .025           TRAP     20      4

 159          KK    510
 160          KM       RUNOFF FROM SUBBASIN 510
 161          BA    .06
 162          LG    .44     .14    3.54     .96     .00
 163          UI     7.     20.     36.     47.     67.     86.     63.     48.     36.     20.
 164          UI    12.      8.      5.      2.      2.      2.      0.      0.      0.      0.

 165          KK  CP510
 166          KM       ADD HYDROGRAPHS AT CP510
 167          HC      2
 168          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

         (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

          242A
            V
            V
 29        R500
            .
            .
 32         .          500
            .            .
            .            .
 39       CP500............
            V
            V
 42        R501
            .
            .
 45         .          501
            .            .
            .            .
 52       CP501............
            V
            V
 55        R502
            .
            .
            .          502
            .            .
            .            .
 65       CP502............
            V
            V
 68        R503
            .
            .
 71         .          503
            .            .
            .            .
 77       CP503............
            V
            V
 80        R504
            .
            .
 83         .          504
            .            .
            .            .
 90       CP504............
            V
            V
 93        R505
            .
            .
 96         .          505
            .            .
            .            .
 02       CP505............
```

```
            V
            V
105       R506
            .
            .
            .          506
            .            .
            .            .
114     CP506............
            V
            V
117       R507
            .
            .
120         .          507
            .            .
            .            .
127     CP507............
            V
            V
130       R508
            .
            .
133         .          508
            .            .
            .            .
141     CP508............
            V
            V
144       R509
            .
            .
14          .          509
            .            .
            .            .
153     CP509............
            V
            V
156       R510
            .
            .
159         .          510
            .            .
            .            .
165     CP510............
```

**) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*************************************
                                    *
 FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
           MAY   1991               *
        VERSION 4.0.1E              *
   Lahey F77L-EM/32 version 5.01    *
      Dodson & Associates, Inc.     *
 RUN DATE  01/19/95  TIME  20:14:13 *
*************************************
```

```
*************************************
*                                   *
*   U.S. ARMY CORPS OF ENGINEERS    *
*   HYDROLOGIC ENGINEERING CENTER   *
*         609 SECOND STREET         *
*       DAVIS, CALIFORNIA 95616     *
*         (916) 551-1748            *
*                                   *
*************************************
```

```
                    CAMELBACK ROAD CHANNEL
                    MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
                    FILENAME          CAM5EX
                    CBA # 241729-01                  1/6/95
                    THIS MODEL IS FOR RAINFALL AMOUNT ASSOCIATED WITH 5-YEAR,24-HOUR STORM

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

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

            COMPUTATION INTERVAL    0.08 HOURS
                 TOTAL TIME BASE   24.92 HOURS

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

11 JD        INDEX STORM NO. 1
                 STRM       2.00  PRECIPITATION DEPTH
                 TRDA       0.01  TRANSPOSITION DRAINAGE AREA

12 PI          PRECIPITATION PATTERN
                 0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00
                 0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00
                 0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00
                 0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00
                 0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00
                 0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00
                 0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00
                 0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00
                 0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00
```

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.06
0.06	0.06	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

17 JD INDEX STORM NO. 2

STRM 2.00 PRECIPITATION DEPTH
TRDA 0.27 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.06
0.06	0.06	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

INDEX STORM NO. 3

STRM 2.00 PRECIPITATION DEPTH
TRDA 0.45 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.06
0.06	0.06	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

19 JD INDEX STORM NO. 4

STRM 1.99 PRECIPITATION DEPTH

TRDA 0.59 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.06
0.06	0.06	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

20 JD INDEX STORM NO. 5

STRM 1.99 PRECIPITATION DEPTH

TRDA 0.72 TRANSPOSITION DRAINAGE AREA

PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.06
0.06	0.06	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

21 JD INDEX STORM NO. 6

STRM 1.98 PRECIPITATION DEPTH

TRDA 0.85 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.06
0.06	0.06	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	242A	135.	12.08	14.	4.	4.	0.11		
ROUTED TO	R500	134.	12.25	14.	4.	4.	0.11		
HYDROGRAPH AT	500	200.	12.08	18.	5.	4.	0.16		
2 COMBINED AT	CP500	314.	12.17	32.	8.	8.	0.27		
ROUTED TO	R501	311.	12.17	32.	8.	8.	0.27		
HYDROGRAPH AT	501	94.	12.08	8.	2.	2.	0.07		
2 COMBINED AT	CP501	394.	12.17	41.	10.	10.	0.34		
ROUTED TO	R502	388.	12.17	41.	10.	10.	0.34		
HYDROGRAPH AT	502	107.	12.00	9.	2.	2.	0.08		
2 COMBINED AT	CP502	480.	12.17	50.	13.	12.	0.42		
ROUTED TO	R503	473.	12.17	50.	13.	12.	0.42		
HYDROGRAPH AT	503	39.	12.00	3.	1.	1.	0.03		
2 COMBINED AT	CP503	505.	12.17	53.	14.	13.	0.45		
ROUTED TO	R504	489.	12.17	53.	14.	13.	0.45		
HYDROGRAPH AT	504	74.	12.08	7.	2.	2.	0.06		
2 COMBINED AT	CP504	553.	12.17	60.	15.	15.	0.51		
ROUTED TO	R505	544.	12.17	60.	15.	15.	0.51		
HYDROGRAPH AT	505	71.	12.00	7.	2.	2.	0.05		
2 COMBINED AT	CP505	602.	12.17	67.	17.	16.	0.56		
ROUTED TO	R506	582.	12.17	67.	17.	16.	0.56		
HYDROGRAPH AT	506	44.	12.00	4.	1.	1.	0.04		
2 COMBINED AT	CP506	603.	12.17	70.	18.	17.	0.60		
ROUTED TO	R507	591.	12.25	70.	18.	17.	0.60		
HYDROGRAPH AT	507	66.	12.25	10.	3.	2.	0.05		
2 COMBINED AT	CP507	654.	12.25	80.	20.	20.	0.65		
ROUTED TO	R508	644.	12.25	80.	20.	20.	0.65		
HYDROGRAPH AT	508	83.	12.33	11.	3.	3.	0.09		

HEC 1
100yr, 24hr

2 COMBINED AT	CP508	725.	12.25	90.	23.	22.	0.74
ROUTED TO	R509	706.	12.33	90.	23.	22.	0.74
HYDROGRAPH AT	509	74.	12.00	6.	2.	2.	0.07
2 COMBINED AT	CP509	721.	12.33	96.	24.	24.	0.81
ROUTED TO	R510	697.	12.42	96.	24.	24.	0.81
HYDROGRAPH AT	510	42.	12.25	5.	1.	1.	0.06
2 COMBINED AT	CP510	728.	12.42	100.	25.	25.	0.87

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	INTERPOLATED TO COMPUTATION INTERVAL DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)
FOR STORM = 1 STORM AREA (SQ MI) =				0.01					
R500	MANE	5.00	35.79	740.00	0.35	5.00	35.79	740.00	0.35

NTINUITY SUMMARY (AC-FT) - INFLOW=0.2055E+01 EXCESS=0.0000E+00 OUTFLOW=0.2052E+01 BASIN STORAGE=0.5583E-02 PERCENT ERROR= -0.1

FOR STORM = 2 STORM AREA (SQ MI) =				0.27					
R500	MANE	5.00	35.79	740.00	0.35	5.00	35.79	740.00	0.35

NTINUITY SUMMARY (AC-FT) - INFLOW=0.2055E+01 EXCESS=0.0000E+00 OUTFLOW=0.2052E+01 BASIN STORAGE=0.5583E-02 PERCENT ERROR= -0.1

FOR STORM = 3 STORM AREA (SQ MI) =				0.45					
R500	MANE	5.00	35.67	740.00	0.35	5.00	35.67	740.00	0.35

NTINUITY SUMMARY (AC-FT) - INFLOW=0.2049E+01 EXCESS=0.0000E+00 OUTFLOW=0.2045E+01 BASIN STORAGE=0.5579E-02 PERCENT ERROR= -0.1

FOR STORM = 4 STORM AREA (SQ MI) =				0.59					
R500	MANE	5.00	35.37	740.00	0.35	5.00	35.37	740.00	0.35

NTINUITY SUMMARY (AC-FT) - INFLOW=0.2033E+01 EXCESS=0.0000E+00 OUTFLOW=0.2030E+01 BASIN STORAGE=0.5571E-02 PERCENT ERROR= -0.1

FOR STORM = 5 STORM AREA (SQ MI) =				0.72					
R500	MANE	5.00	34.95	740.00	0.34	5.00	34.95	740.00	0.34

NTINUITY SUMMARY (AC-FT) - INFLOW=0.2011E+01 EXCESS=0.0000E+00 OUTFLOW=0.2008E+01 BASIN STORAGE=0.5558E-02 PERCENT ERROR= -0.1

FOR STORM = 6 STORM AREA (SQ MI) =				0.85					
R500	MANE	5.00	34.52	740.00	0.34	5.00	34.52	740.00	0.34

NTINUITY SUMMARY (AC-FT) - INFLOW=0.1989E+01 EXCESS=0.0000E+00 OUTFLOW=0.1987E+01 BASIN STORAGE=0.5545E-02 PERCENT ERROR= -0.1

FOR STORM = 1 STORM AREA (SQ MI) =				0.01					
R501	MANE	3.33	69.67	736.91	0.26	5.00	67.77	735.00	0.26

SUMMARY (AC-FT) - INFLOW=0.3736E+01 EXCESS=0.0000E+00 OUTFLOW=0.3733E+01 BASIN STORAGE=0.2425E-02 PERCENT ERROR= 0.0

FOR STORM = 2 STORM AREA (SQ MI) =				0.27					
R501	MANE	3.33	69.67	736.91	0.26	5.00	67.77	735.00	0.26

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NTINUITY SUMMARY (AC-FT) - INFLOW=0.3736E+01 EXCESS=0.0000E+00 OUTFLOW=0.3733E+01 BASIN STORAGE=0.2425E-02 PERCENT ERROR=   0.0

      FOR STORM = 3  STORM AREA (SQ MI) =       0.45
         R501  MANE        3.34     69.54    737.73      0.26      5.00     67.62    735.00       0.26

NTINUITY SUMMARY (AC-FT) - INFLOW=0.3723E+01 EXCESS=0.0000E+00 OUTFLOW=0.3721E+01 BASIN STORAGE=0.2510E-02 PERCENT ERROR=   0.0

      FOR STORM = 4  STORM AREA (SQ MI) =       0.59
         R501  MANE        3.35     68.44    736.47      0.26      5.00     66.63    735.00       0.26

NTINUITY SUMMARY (AC-FT) - INFLOW=0.3686E+01 EXCESS=0.0000E+00 OUTFLOW=0.3683E+01 BASIN STORAGE=0.2463E-02 PERCENT ERROR=   0.0

      FOR STORM = 5  STORM AREA (SQ MI) =       0.72
         R501  MANE        3.36     67.07    736.05      0.25      5.00     65.50    735.00       0.25

NTINUITY SUMMARY (AC-FT) - INFLOW=0.3637E+01 EXCESS=0.0000E+00 OUTFLOW=0.3634E+01 BASIN STORAGE=0.2496E-02 PERCENT ERROR=   0.0

      FOR STORM = 6  STORM AREA (SQ MI) =       0.85
         R501  MANE        3.37     66.05    739.04      0.25      5.00     64.60    740.00       0.25

NTINUITY SUMMARY (AC-FT) - INFLOW=0.3588E+01 EXCESS=0.0000E+00 OUTFLOW=0.3585E+01 BASIN STORAGE=0.2352E-02 PERCENT ERROR=   0.0

      FOR STORM = 1  STORM AREA (SQ MI) =       0.01
         R502  MANE        4.54     85.22    739.57      0.26      5.00     84.43    740.00       0.26

NTINUITY SUMMARY (AC-FT) - INFLOW=0.4653E+01 EXCESS=0.0000E+00 OUTFLOW=0.4650E+01 BASIN STORAGE=0.4288E-02 PERCENT ERROR=   0.0

      FOR STORM = 2  STORM AREA (SQ MI) =       0.27
         R502  MANE        4.54     85.22    739.57      0.26      5.00     84.43    740.00       0.26

TINUITY SUMMARY (AC-FT) - INFLOW=0.4653E+01 EXCESS=0.0000E+00 OUTFLOW=0.4650E+01 BASIN STORAGE=0.4288E-02 PERCENT ERROR=   0.0

      FOR STORM = 3  STORM AREA (SQ MI) =       0.45
         R502  MANE        4.54     84.05    740.07      0.26      5.00     84.01    740.00       0.26

NTINUITY SUMMARY (AC-FT) - INFLOW=0.4629E+01 EXCESS=0.0000E+00 OUTFLOW=0.4626E+01 BASIN STORAGE=0.4274E-02 PERCENT ERROR=   0.0

      FOR STORM = 4  STORM AREA (SQ MI) =       0.59
         R502  MANE        4.56     83.08    738.26      0.25      5.00     81.22    740.00       0.25

   SUMMARY (AC-FT) - INFLOW=0.4572E+01 EXCESS=0.0000E+00 OUTFLOW=0.4569E+01 BASIN STORAGE=0.4222E-02 PERCENT ERROR=   0.0

      FOR STORM = 5  STORM AREA (SQ MI) =       0.72
         R502  MANE        4.58     80.44    736.98      0.25      5.00     79.73    740.00       0.25
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NTINUITY SUMMARY (AC-FT) - INFLOW=0.4499E+01 EXCESS=0.0000E+00 OUTFLOW=0.4496E+01 BASIN STORAGE=0.4307E-02 PERCENT ERROR= 0.0

FOR STORM = 6 STORM AREA (SQ MI) = 0.85

R502	MANE	4.60	81.14	739.88	0.25	5.00	80.93	740.00	0.25

NTINUITY SUMMARY (AC-FT) - INFLOW=0.4463E+01 EXCESS=0.0000E+00 OUTFLOW=0.4460E+01 BASIN STORAGE=0.4224E-02 PERCENT ERROR= 0.0

FOR STORM = 1 STORM AREA (SQ MI) = 0.01

R503	MANE	2.46	98.86	736.73	0.25	5.00	96.94	740.00	0.25

NTINUITY SUMMARY (AC-FT) - INFLOW=0.5674E+01 EXCESS=0.0000E+00 OUTFLOW=0.5671E+01 BASIN STORAGE=0.2598E-02 PERCENT ERROR= 0.0

FOR STORM = 2 STORM AREA (SQ MI) = 0.27

R503	MANE	2.46	98.86	736.73	0.25	5.00	96.94	740.00	0.25

NTINUITY SUMMARY (AC-FT) - INFLOW=0.5674E+01 EXCESS=0.0000E+00 OUTFLOW=0.5671E+01 BASIN STORAGE=0.2598E-02 PERCENT ERROR= 0.0

FOR STORM = 3 STORM AREA (SQ MI) = 0.45

R503	MANE	2.47	98.11	737.48	0.25	5.00	96.63	740.00	0.25

NTINUITY SUMMARY (AC-FT) - INFLOW=0.5650E+01 EXCESS=0.0000E+00 OUTFLOW=0.5647E+01 BASIN STORAGE=0.2577E-02 PERCENT ERROR= 0.0

FOR STORM = 4 STORM AREA (SQ MI) = 0.59

R503	MANE	2.48	95.72	738.34	0.25	5.00	94.21	735.00	0.25

NTINUITY SUMMARY (AC-FT) - INFLOW=0.5549E+01 EXCESS=0.0000E+00 OUTFLOW=0.5546E+01 BASIN STORAGE=0.2575E-02 PERCENT ERROR= 0.0

FOR STORM = 5 STORM AREA (SQ MI) = 0.72

R503	MANE	2.49	93.53	738.46	0.24	5.00	91.98	735.00	0.24

NTINUITY SUMMARY (AC-FT) - INFLOW=0.5464E+01 EXCESS=0.0000E+00 OUTFLOW=0.5461E+01 BASIN STORAGE=0.2577E-02 PERCENT ERROR= 0.0

FOR STORM = 6 STORM AREA (SQ MI) = 0.85

R503	MANE	2.49	93.86	738.44	0.24	5.00	92.45	740.00	0.24

NTINUITY SUMMARY (AC-FT) - INFLOW=0.5442E+01 EXCESS=0.0000E+00 OUTFLOW=0.5439E+01 BASIN STORAGE=0.2568E-02 PERCENT ERROR= 0.0

FOR STORM = 1 STORM AREA (SQ MI) = 0.01

R504	MANE	4.58	99.60	742.39	0.25	5.00	99.29	740.00	0.25

NTINUITY SUMMARY (AC-FT) - INFLOW=0.5939E+01 EXCESS=0.0000E+00 OUTFLOW=0.5935E+01 BASIN STORAGE=0.5642E-02 PERCENT ERROR= 0.0

FOR STORM = 2 STORM AREA (SQ MI) = 0.27

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R504  MANE        4.58    99.60   742.39     0.25     5.00    99.29   740.00       0.25

NTINUITY SUMMARY (AC-FT) - INFLOW=0.5939E+01 EXCESS=0.0000E+00 OUTFLOW=0.5935E+01 BASIN STORAGE=0.5642E-02 PERCENT ERROR=   0.0

FOR STORM = 3  STORM AREA (SQ MI) =      0.45
R504  MANE        4.59   100.80   739.14     0.25     5.00   100.28   740.00       0.25

NTINUITY SUMMARY (AC-FT) - INFLOW=0.5949E+01 EXCESS=0.0000E+00 OUTFLOW=0.5946E+01 BASIN STORAGE=0.5649E-02 PERCENT ERROR=   0.0

FOR STORM = 4  STORM AREA (SQ MI) =      0.59
R504  MANE        4.62    98.42   739.00     0.24     5.00    97.80   740.00       0.24

NTINUITY SUMMARY (AC-FT) - INFLOW=0.5837E+01 EXCESS=0.0000E+00 OUTFLOW=0.5833E+01 BASIN STORAGE=0.5642E-02 PERCENT ERROR=   0.0

FOR STORM = 5  STORM AREA (SQ MI) =      0.72
R504  MANE        4.65    96.90   739.52     0.24     5.00    96.52   740.00       0.24

NTINUITY SUMMARY (AC-FT) - INFLOW=0.5757E+01 EXCESS=0.0000E+00 OUTFLOW=0.5754E+01 BASIN STORAGE=0.5621E-02 PERCENT ERROR=   0.0

FOR STORM = 6  STORM AREA (SQ MI) =      0.85
R504  MANE        4.66    95.97   740.81     0.24     5.00    95.07   740.00       0.24

Y SUMMARY (AC-FT) - INFLOW=0.5714E+01 EXCESS=0.0000E+00 OUTFLOW=0.5712E+01 BASIN STORAGE=0.5626E-02 PERCENT ERROR=  -0.1

FOR STORM = 1  STORM AREA (SQ MI) =      0.01
R505  MANE        1.74   104.43   739.99     0.24     5.00   104.43   740.00       0.24

NTINUITY SUMMARY (AC-FT) - INFLOW=0.6433E+01 EXCESS=0.0000E+00 OUTFLOW=0.6431E+01 BASIN STORAGE=0.2185E-02 PERCENT ERROR=   0.0

FOR STORM = 2  STORM AREA (SQ MI) =      0.27
R505  MANE        1.74   104.43   739.99     0.24     5.00   104.43   740.00       0.24

NTINUITY SUMMARY (AC-FT) - INFLOW=0.6433E+01 EXCESS=0.0000E+00 OUTFLOW=0.6431E+01 BASIN STORAGE=0.2185E-02 PERCENT ERROR=   0.0

FOR STORM = 3  STORM AREA (SQ MI) =      0.45
R505  MANE        1.73   105.41   739.69     0.24     5.00   105.39   740.00       0.24

NTINUITY SUMMARY (AC-FT) - INFLOW=0.6469E+01 EXCESS=0.0000E+00 OUTFLOW=0.6467E+01 BASIN STORAGE=0.2185E-02 PERCENT ERROR=   0.0

FOR STORM = 4  STORM AREA (SQ MI) =      0.59
R505  MANE        1.74   103.03   739.85     0.23     5.00   103.00   740.00       0.23

TINUITY SUMMARY (AC-FT) - INFLOW=0.6342E+01 EXCESS=0.0000E+00 OUTFLOW=0.6340E+01 BASIN STORAGE=0.2181E-02 PERCENT ERROR=   0.0
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FOR STORM = 5  STORM AREA (SQ MI) =      0.72
    R505  MANE        1.75    101.50    741.03      0.23      5.00    101.45    740.00        0.23

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.6266E+01 EXCESS=0.0000E+00 OUTFLOW=0.6264E+01 BASIN STORAGE=0.2176E-02 PERCENT ERROR=   0.0

FOR STORM = 6  STORM AREA (SQ MI) =      0.85
    R505  MANE        1.76     99.81    740.88      0.23      5.00     99.41    740.00        0.23

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.6210E+01 EXCESS=0.0000E+00 OUTFLOW=0.6209E+01 BASIN STORAGE=0.2173E-02 PERCENT ERROR=   0.0

FOR STORM = 1  STORM AREA (SQ MI) =      0.01
    R506  MANE        4.17    110.94    741.65      0.26      5.00    109.63    740.00        0.26

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.7802E+01 EXCESS=0.0000E+00 OUTFLOW=0.7797E+01 BASIN STORAGE=0.5322E-02 PERCENT ERROR=   0.0

FOR STORM = 2  STORM AREA (SQ MI) =      0.27
    R506  MANE        4.17    110.94    741.65      0.26      5.00    109.63    740.00        0.26

NTINUITY SUMMARY (AC-FT) - INFLOW=0.7802E+01 EXCESS=0.0000E+00 OUTFLOW=0.7797E+01 BASIN STORAGE=0.5322E-02 PERCENT ERROR=   0.0

FOR STORM = 3  STORM AREA (SQ MI) =      0.45
    R506  MANE        4.16    112.36    739.78      0.26      5.00    112.31    740.00        0.26

NT[illegible]Y SUMMARY (AC-FT) - INFLOW=0.7836E+01 EXCESS=0.0000E+00 OUTFLOW=0.7831E+01 BASIN STORAGE=0.5317E-02 PERCENT ERROR=   0.0

FOR STORM = 4  STORM AREA (SQ MI) =      0.59
    R506  MANE        4.18    109.93    740.44      0.26      5.00    109.17    740.00        0.26

NTINUITY SUMMARY (AC-FT) - INFLOW=0.7699E+01 EXCESS=0.0000E+00 OUTFLOW=0.7693E+01 BASIN STORAGE=0.5310E-02 PERCENT ERROR=   0.0

FOR STORM = 5  STORM AREA (SQ MI) =      0.72
    R506  MANE        4.20    108.24    739.50      0.25      5.00    108.16    740.00        0.25

NTINUITY SUMMARY (AC-FT) - INFLOW=0.7620E+01 EXCESS=0.0000E+00 OUTFLOW=0.7616E+01 BASIN STORAGE=0.5294E-02 PERCENT ERROR=   0.0

FOR STORM = 6  STORM AREA (SQ MI) =      0.85
    R506  MANE        4.23    105.50    743.83      0.25      5.00    105.49    740.00        0.25

NTINUITY SUMMARY (AC-FT) - INFLOW=0.7552E+01 EXCESS=0.0000E+00 OUTFLOW=0.7547E+01 BASIN STORAGE=0.5278E-02 PERCENT ERROR=   0.0

FOR STORM = 1  STORM AREA (SQ MI) =      0.01
    R507  MANE        3.49    108.83    742.61      0.26      5.00    108.63    745.00        0.26

NTINUITY SUMMARY (AC-FT) - INFLOW=0.8249E+01 EXCESS=0.0000E+00 OUTFLOW=0.8245E+01 BASIN STORAGE=0.4482E-02 PERCENT ERROR=   0.0
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FOR STORM = 2  STORM AREA (SQ MI) =      0.27
   R507  MANE        3.49    108.83    742.61      0.26      5.00    108.63    745.00       0.26

'ITY SUMMARY (AC-FT) - INFLOW=0.8249E+01 EXCESS=0.0000E+00 OUTFLOW=0.8245E+01 BASIN STORAGE=0.4482E-02 PERCENT ERROR=   0.0

FOR STORM = 3  STORM AREA (SQ MI) =      0.45
   R507  MANE        3.46    111.58    744.19      0.26      5.00    111.01    745.00       0.26

NTINUITY SUMMARY (AC-FT) - INFLOW=0.8298E+01 EXCESS=0.0000E+00 OUTFLOW=0.8293E+01 BASIN STORAGE=0.4481E-02 PERCENT ERROR=   0.0

FOR STORM = 4  STORM AREA (SQ MI) =      0.59
   R507  MANE        3.49    108.96    743.55      0.25      5.00    108.32    745.00       0.25

NTINUITY SUMMARY (AC-FT) - INFLOW=0.8154E+01 EXCESS=0.0000E+00 OUTFLOW=0.8149E+01 BASIN STORAGE=0.4446E-02 PERCENT ERROR=   0.0

FOR STORM = 5  STORM AREA (SQ MI) =      0.72
   R507  MANE        3.50    106.55    745.63      0.25      5.00    106.52    745.00       0.25

TINUITY SUMMARY (AC-FT) - INFLOW=0.8075E+01 EXCESS=0.0000E+00 OUTFLOW=0.8071E+01 BASIN STORAGE=0.4430E-02 PERCENT ERROR=   0.0

FOR STORM = 6  STORM AREA (SQ MI) =      0.85
   R507  MANE        3.53    105.19    744.17      0.25      5.00    104.79    745.00       0.25

TINUITY SUMMARY (AC-FT) - INFLOW=0.7998E+01 EXCESS=0.0000E+00 OUTFLOW=0.7994E+01 BASIN STORAGE=0.4454E-02 PERCENT ERROR=   0.0

FOR STORM = 1  STORM AREA (SQ MI) =      0.01
   R508  MANE        5.00    136.30    750.00      0.29      5.00    136.30    750.00       0.29

TINUITY SUMMARY (AC-FT) - INFLOW=0.1020E+02 EXCESS=0.0000E+00 OUTFLOW=0.1020E+02 BASIN STORAGE=0.9678E-02 PERCENT ERROR=  -0.1

FOR STORM = 2  STORM AREA (SQ MI) =      0.27
   R508  MANE        5.00    136.30    750.00      0.29      5.00    136.30    750.00       0.29

TINUITY SUMMARY (AC-FT) - INFLOW=0.1020E+02 EXCESS=0.0000E+00 OUTFLOW=0.1020E+02 BASIN STORAGE=0.9678E-02 PERCENT ERROR=  -0.1

FOR STORM = 3  STORM AREA (SQ MI) =      0.45
   R508  MANE        5.00    138.24    750.00      0.29      5.00    138.24    750.00       0.29

TINUITY SUMMARY (AC-FT) - INFLOW=0.1023E+02 EXCESS=0.0000E+00 OUTFLOW=0.1024E+02 BASIN STORAGE=0.9661E-02 PERCENT ERROR=  -0.1

FOR STORM = 4  STORM AREA (SQ MI) =      0.59
   R508  MANE        5.00    135.63    750.00      0.29      5.00    135.63    750.00       0.29

INUITY SUMMARY (AC-FT) - INFLOW=0.1010E+02 EXCESS=0.0000E+00 OUTFLOW=0.1009E+02 BASIN STORAGE=0.9642E-02 PERCENT ERROR=  -0.1
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FOR STORM = 5  STORM AREA (SQ MI) =      0.72
   R508  MANE        5.00    133.82    750.00      0.29      5.00    133.82    750.00       0.29

...TY SUMMARY (AC-FT) - INFLOW=0.1000E+02 EXCESS=0.0000E+00 OUTFLOW=0.1000E+02 BASIN STORAGE=0.9631E-02 PERCENT ERROR=  -0.1

FOR STORM = 6  STORM AREA (SQ MI) =      0.85
   R508  MANE        5.00    131.76    750.00      0.28      5.00    131.76    750.00       0.28

)NTINUITY SUMMARY (AC-FT) - INFLOW=0.9918E+01 EXCESS=0.0000E+00 OUTFLOW=0.9915E+01 BASIN STORAGE=0.9637E-02 PERCENT ERROR=  -0.1

FOR STORM = 1  STORM AREA (SQ MI) =      0.01
   R509  MANE        5.00    159.65    755.00      0.31      5.00    159.65    755.00       0.31

)NTINUITY SUMMARY (AC-FT) - INFLOW=0.1216E+02 EXCESS=0.0000E+00 OUTFLOW=0.1212E+02 BASIN STORAGE=0.1467E-01 PERCENT ERROR=   0.2

FOR STORM = 2  STORM AREA (SQ MI) =      0.27
   R509  MANE        5.00    159.65    755.00      0.31      5.00    159.65    755.00       0.31

NTINUITY SUMMARY (AC-FT) - INFLOW=0.1216E+02 EXCESS=0.0000E+00 OUTFLOW=0.1212E+02 BASIN STORAGE=0.1467E-01 PERCENT ERROR=   0.2

FOR STORM = 3  STORM AREA (SQ MI) =      0.45
   R509  MANE        5.00    161.06    755.00      0.31      5.00    161.06    755.00       0.31

NTINUITY SUMMARY (AC-FT) - INFLOW=0.1220E+02 EXCESS=0.0000E+00 OUTFLOW=0.1216E+02 BASIN STORAGE=0.1464E-01 PERCENT ERROR=   0.2

FOR STORM = 4  STORM AREA (SQ MI) =      0.59
   R509  MANE        5.00    158.33    755.00      0.30      5.00    158.33    755.00       0.30

TINUITY SUMMARY (AC-FT) - INFLOW=0.1204E+02 EXCESS=0.0000E+00 OUTFLOW=0.1200E+02 BASIN STORAGE=0.1463E-01 PERCENT ERROR=   0.2

FOR STORM = 5  STORM AREA (SQ MI) =      0.72
   R509  MANE        5.00    156.57    755.00      0.30      5.00    156.57    755.00       0.30

NTINUITY SUMMARY (AC-FT) - INFLOW=0.1193E+02 EXCESS=0.0000E+00 OUTFLOW=0.1189E+02 BASIN STORAGE=0.1463E-01 PERCENT ERROR=   0.2

FOR STORM = 6  STORM AREA (SQ MI) =      0.85
   R509  MANE        5.00    154.41    755.00      0.30      5.00    154.41    755.00       0.30

NTINUITY SUMMARY (AC-FT) - INFLOW=0.1183E+02 EXCESS=0.0000E+00 OUTFLOW=0.1179E+02 BASIN STORAGE=0.1461E-01 PERCENT ERROR=   0.2

FOR STORM = 1  STORM AREA (SQ MI) =      0.01
   R510  MANE        5.00    156.20    760.00      0.28      5.00    156.20    760.00       0.28
```

NTINUITY SUMMARY (AC-FT) - INFLOW=0.1222E+02 EXCESS=0.0000E+00 OUTFLOW=0.1218E+02 BASIN STORAGE=0.1599E-01 PERCENT ERROR= 0.2

FOR STORM = 2 STORM AREA (SQ MI) = 0.27

R510	MANE	5.00	156.20	760.00	0.28	5.00	156.20	760.00	0.28

NTINUITY SUMMARY (AC-FT) - INFLOW=0.1222E+02 EXCESS=0.0000E+00 OUTFLOW=0.1218E+02 BASIN STORAGE=0.1599E-01 PERCENT ERROR= 0.2

FOR STORM = 3 STORM AREA (SQ MI) = 0.45

R510	MANE	5.00	157.46	760.00	0.28	5.00	157.46	760.00	0.28

NTINUITY SUMMARY (AC-FT) - INFLOW=0.1226E+02 EXCESS=0.0000E+00 OUTFLOW=0.1222E+02 BASIN STORAGE=0.1597E-01 PERCENT ERROR= 0.2

FOR STORM = 4 STORM AREA (SQ MI) = 0.59

R510	MANE	5.00	154.76	760.00	0.28	5.00	154.76	760.00	0.28

NTINUITY SUMMARY (AC-FT) - INFLOW=0.1209E+02 EXCESS=0.0000E+00 OUTFLOW=0.1205E+02 BASIN STORAGE=0.1596E-01 PERCENT ERROR= 0.2

FOR STORM = 5 STORM AREA (SQ MI) = 0.72

R510	MANE	5.00	153.08	760.00	0.28	5.00	153.08	760.00	0.28

NTINUITY SUMMARY (AC-FT) - INFLOW=0.1198E+02 EXCESS=0.0000E+00 OUTFLOW=0.1194E+02 BASIN STORAGE=0.1594E-01 PERCENT ERROR= 0.2

FOR STORM = 6 STORM AREA (SQ MI) = 0.85

R510	MANE	5.00	151.04	760.00	0.27	5.00	151.04	760.00	0.27

NTINUITY SUMMARY (AC-FT) - INFLOW=0.1188E+02 EXCESS=0.0000E+00 OUTFLOW=0.1183E+02 BASIN STORAGE=0.1591E-01 PERCENT ERROR= 0.2

NORMAL END OF HEC-1 ***

10-Year, 24-Hour Event

```
**************************************
*                                    *
FLOOD HYDROGRAPH PACKAGE  (HEC-1)    *
MAY  1991                            *
VERSION 4.0.1E                       *
Lahey F77L-EM/32 version 5.01        *
Dodson & Associates, Inc.            *
RUN DATE 01/08/95  TIME  10:48:21    *
**************************************
```

```
**************************************
*                                    *
*   U.S. ARMY CORPS OF ENGINEERS     *
*   HYDROLOGIC ENGINEERING CENTER    *
*         609 SECOND STREET          *
*      DAVIS, CALIFORNIA 95616       *
*         (916) 551-1748             *
*                                    *
**************************************
```

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

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

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

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

  1           ID       CAMELBACK ROAD CHANNEL
  2           ID       MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
  3           ID       FILENAME   CAM10
  4           ID         1/6/95
  5           ID       CBA # 241729-01-0300
  6           ID
  7           ID
  8           ID       THIS MODEL IS FOR RAINFALL AMOUNT ASSOCIATED WITH  10-YEAR 24-HOUR EVENT
  9           ID
 10           ID
              *DIAGRAM
 11           IT      5                   300
 12           IO      5
 13           IN     30
 14           JD    2.4     .01
 15           PC   .000    .005    .011    .016    .022    .028    .035    .041    .048    .056
 16           PC   .063    .071    .080    .089    .098    .109    .120    .133    .147    .163
 17           PC   .181    .204    .235    .283    .663    .735    .772    .799    .820    .838
 18           PC   .854    .868    .880    .891    .902    .912    .921    .929    .937    .945
 19           PC   .952    .959    .965    .972    .978    .984    .989    .995   1.000
 20           JD    2.4     .27
 21           JD  2.398     .45
 22           JD  2.392     .59
 23           JD  2.383     .72
 24           JD  2.375     .85

 25           KK   242A
 26           KM       RUNOFF FROM SUBBASIN 242A
 27           BA    .11
 28           LG    .34     .18    4.25     .39    6.00
 29           UI    17.     67.    101.    153.    190.    129.     90.     47.     26.     15.
 30           UI     5.      5.      5.      0.      0.      0.      0.      0.      0.      0.
 31           UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 32           KK   R500
 33           KM       ROUTE FLOW FROM 242A TO 500
 34           RD   2640    .004    .025            TRAP      10       4

 35           KK    500
 36           KM       RUNOFF FROM SUBBASIN 500
 37           BA    .16
 38           LG    .35     .35    3.74     .31     .00
 39           UI    37.    128.    196.    322.    241.    159.     78.     40.     18.      9.
 40           UI     9.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 41           UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 42           KK  CP500
 43           KM       ADD HYDROGRAPHS AT CP500
 44           HC      2
```

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

  45          KK   R501
  46          KM       ROUTE FLOW FROM 500 TO 501
  47          RD    800    .004    .025           TRAP     10      4

  48          KK    501
  49          KM       RUNOFF FROM SUBBASIN 501
  50          BA    .07
  51          LG    .35     .37    3.99     .25     .00
  52          UI    21.     68.    112.    152.     95.     53.     22.     10.      4.      4.
  53          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
  54          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

  55          KK   CP501
  56          KM       ADD HYDROGRAPHS AT CP501
  57          HC      2

  58          KK   R502
  59          KM       ROUTE FLOW FROM 501 TO 502
  60          RD   1150    .004    .025           TRAP     10      4

  61          KK    502
  62          KM       RUNOFF FROM SUBBASIN 502
  63          BA    .08
  64          LG    .35     .36    3.57     .28     .00
  65          UI    27.     87.    152.    169.    101.     46.     21.      7.      5.      0.
  66          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
  67          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

  68          KK   CP502
  69          KM       ADD HYDROGRAPHS AT CP502
  70          HC      2

  71          KK   R503
  72          KM       ROUTE FLOW FROM 502 TO 503
  73          RD    650    .004    .025           TRAP     10      4

  74          KK    503
  75          KM       RUNOFF FROM SUBBASIN 503
  76          BA    .03
  77          LG    .35     .35    3.81     .32     .00
  78          UI    12.     37.     68.     59.     34.     13.      5.      2.      0.      0.
  79          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

  80          KK   CP503
  81          KM       ADD HYDROGRAPHS AT CP503
  82          HC      2

  83          KK   R504
  84          KM       ROUTE FLOW FROM 503 TO 504
  85          RD   1125   .0036    .025           TRAP     15      4
```

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

 86           KK    504
 87           KM       RUNOFF FROM SUBBASIN 504
 88           BA   .0621
 89           LG    .34     .35    3.99     .35    1.00
 90           UI    21.     65.    114.    127.     76.     35.     16.      5.      4.      0.
 91           UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 92           UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 93           KK   CP504
 94           KM       ADD HYDROGRAPHS AT CP504
 95           HC      2

 96           KK    R505
 97           KM       ROUTE FLOW FROM 504 TO 505
 98           RD    430   .0036    .025           TRAP     15      4

 99           KK    505
100           KM       RUNOFF FROM SUBBASIN 505
101           BA   .0526
102           LG    .19     .27    3.95     .35   14.00
103           UI    20.     61.    113.     99.     57.     22.      9.      3.      0.      0.
104           UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

105           KK   CP505
106           KM       ADD HYDROGRAPHS AT CP505
107           HC      2

108           KK    R506
109           KM       ROUTE FLOW FROM 505 TO 506
110           RD   1050   .0036    .025           TRAP     15      4

111           KK    506
112           KM       RUNOFF FROM SUBBASIN 506
113           BA   .0351
114           LG    .35     .32    3.75     .25     .00
115           UI    28.     88.     79.     28.      6.      0.      0.      0.      0.      0.
116           UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

117           KK   CP506
118           KM       ADD HYDROGRAPHS AT CP506
119           HC      2

120           KK    R507
121           KM       ROUTE FLOW FROM 506 TO 507
122           RD    875   .0036    .025           TRAP     15      4

123           KK    507
124           KM       RUNOFF FROM SUBBASIN 507
125           BA   .054
126           LG    .49     .01    8.60     .11     .00
127           UI     5.     13.     25.     32.     42.     63.     58.     44.     34.     26.
128           UI    16.      9.      7.      5.      2.      2.      2.      2.      0.      0.
129           UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```

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

  130         KK   CP507
  131         KM        ADD HYDROGRAPHS AT CP507
  132         HC       2

  133         KK    R508
  134         KM        ROUTE FLOW FROM 507 TO 508
  135         RD    1700   .0036    .025            TRAP      15       4

  136         KK     508
  137         KM        RUNOFF FROM SUBBASIN 508
  138         BA   .0855
  139         LG     .49      .02    3.91     .43     .00
  140         UI      8.      16.     34.     44.     55.     73.     98.     76.     61.     48.
  141         UI     37.      23.     14.     11.      8.      4.      2.      2.      2.      2.
  142         UI      0.       0.      0.      0.      0.      0.      0.      0.      0.      0.
  143         UI      0.       0.      0.      0.      0.      0.      0.      0.      0.      0.

  144         KK   CP508
  145         KM        ADD HYDROGRAPHS AT CP508
  146         HC       2

  147         KK    R509
  148         KM        ROUTE FLOW FROM 508 TO 509
  149         RD    1350   .0015    .025            TRAP      20       4

  150         KK     509
  151         KM        RUNOFF FROM SUBBASIN 509
  152         BA     .07
  153         LG     .36      .31    4.12     .53     .00
  154         UI     28.      86.    158.    138.     80.     31.     13.      5.      0.      0.
  155         UI      0.       0.      0.      0.      0.      0.      0.      0.      0.      0.

  156         KK   CP509
  157         KM        ADD HYDROGRAPHS AT CP509
  158         HC       2

  159         KK    R510
  160         KM        ROUTE FLOW FROM 509 TO 510
  161         RD    1275   .0015    .025            TRAP      20       4

  162         KK     510
  163         KM        RUNOFF FROM SUBBASIN 510
  164         BA     .06
  165         LG     .44      .14    3.54     .96     .00
  166         UI      7.      20.     36.     47.     67.     86.     63.     48.     36.     20.
  167         UI     12.       8.      5.      2.      2.      2.      0.      0.      0.      0.

  168         KK   CP510
  169         KM        ADD HYDROGRAPHS AT CP510
  170         HC       2
  171         ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

         (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

 2        242A
           V
           V
32        R500
           .
           .
35         .          500
           .            .
           .            .
42       CP500............
           V
           V
45        R501
           .
           .
48         .          501
           .            .
           .            .
55       CP501............
           V
           V
58        R502
           .
           .
           .          502
           .            .
           .            .
68       CP502............
           V
           V
71        R503
           .
           .
74         .          503
           .            .
           .            .
80       CP503............
           V
           V
83        R504
           .
           .
86         .          504
           .            .
           .            .
93       CP504............
           V
           V
96        R505
           .
           .
99         .          505
           .            .
           .            .
05       CP505............
```

```
            V
108       R506
            .
            .
            .          506
            .            .
            .            .
117      CP506............
            V
            V
120       R507
            .
            .
123         .          507
            .            .
            .            .
130      CP507............
            V
            V
133       R508
            .
            .
136         .          508
            .            .
            .            .
144      CP508............
            V
            V
147       R509
            .
            .
150         .          509
            .            .
            .            .
156      CP509............
            V
            V
159       R510
            .
            .
162         .          510
            .            .
            .            .
168      CP510............
```

*) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
**********************************
*                                *
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
*          MAY  1991             *
*       VERSION 4.0.1E           *
*  Lahey F77L-EM/32 version 5.01 *
*    Dodson & Associates, Inc.   *
*    DATE 01/08/95  TIME 10:48:21 *
**********************************
```

```
**********************************
*                                *
*   U.S. ARMY CORPS OF ENGINEERS *
*   HYDROLOGIC ENGINEERING CENTER *
*        609 SECOND STREET       *
*      DAVIS, CALIFORNIA 95616   *
*        (916) 551-1748          *
*                                *
**********************************
```

```
                    CAMELBACK ROAD CHANNEL
                    MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
                    FILENAME   CAM10
                      1/6/95
                    CBA # 241729-01-0300

                    THIS MODEL IS FOR RAINFALL AMOUNT ASSOCIATED WITH  10-YEAR 24-HOUR EVENT

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

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

           COMPUTATION INTERVAL    0.08 HOURS
                TOTAL TIME BASE   24.92 HOURS

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

4 JD         INDEX STORM NO. 1
                 STRM       2.40  PRECIPITATION DEPTH
                 TRDA       0.01  TRANSPOSITION DRAINAGE AREA

5 PI          PRECIPITATION PATTERN
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
```

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.06
0.06	0.06	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

20 JD INDEX STORM NO. 2

STRM 2.40 PRECIPITATION DEPTH

TRDA 0.27 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.06
0.06	0.06	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

1 JD INDEX STORM NO. 3

STRM 2.40 PRECIPITATION DEPTH

TRDA 0.45 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.06
0.06	0.06	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

2 INDEX STORM NO. 4

STRM 2.39 PRECIPITATION DEPTH
TRDA 0.59 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.06
0.06	0.06	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.06
0.06	0.06	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

24 JD INDEX STORM NO. 6

STRM 2.38 PRECIPITATION DEPTH

TRDA 0.85 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.06
0.06	0.06	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	242A	59.	12.17	6.	2.	2.	0.11		
ROUTED TO	R500	58.	12.33	6.	2.	2.	0.11		
HYDROGRAPH AT	500	79.	12.08	7.	2.	2.	0.16		
2 COMBINED AT	CP500	127.	12.17	13.	3.	3.	0.27		
ROUTED TO	R501	124.	12.25	13.	3.	3.	0.27		
HYDROGRAPH AT	501	40.	12.08	3.	1.	1.	0.07		
2 COMBINED AT	CP501	157.	12.17	16.	4.	4.	0.34		
ROUTED TO	R502	154.	12.25	16.	4.	4.	0.34		
HYDROGRAPH AT	502	46.	12.08	4.	1.	1.	0.08		
2 COMBINED AT	CP502	184.	12.17	20.	5.	5.	0.42		
ROUTED TO	R503	183.	12.25	20.	5.	5.	0.42		
HYDROGRAPH AT	503	16.	12.08	1.	0.	0.	0.03		
2 COMBINED AT	CP503	192.	12.25	21.	5.	5.	0.45		
ROUTED TO	R504	188.	12.25	21.	5.	5.	0.45		
HYDROGRAPH AT	504	28.	12.08	2.	1.	1.	0.06		
2 COMBINED AT	CP504	207.	12.25	24.	6.	6.	0.51		
ROUTED TO	R505	204.	12.25	24.	6.	6.	0.51		
HYDROGRAPH AT	505	33.	12.08	3.	1.	1.	0.05		
2 COMBINED AT	CP505	223.	12.25	27.	7.	7.	0.56		
ROUTED TO	R506	219.	12.25	27.	7.	7.	0.56		
HYDROGRAPH AT	506	21.	12.00	2.	0.	0.	0.04		
2 COMBINED AT	CP506	222.	12.25	28.	7.	7.	0.60		
ROUTED TO	R507	218.	12.33	28.	7.	7.	0.60		
HYDROGRAPH AT	507	39.	12.25	5.	1.	1.	0.05		
2 COMBINED AT	CP507	255.	12.33	34.	9.	8.	0.65		
ROUTED TO	R508	252.	12.42	34.	9.	8.	0.65		
HYDROGRAPH AT	508	44.	12.33	6.	1.	1.	0.09		

HEC 1
100yr, 24hr

2 COMBINED AT	CP508	294.	12.33	39.	10.	10.	0.74
ROUTED TO	R509	286.	12.42	39.	10.	10.	0.74
HYDROGRAPH AT	509	19.	12.08	1.	0.	0.	0.07
2 COMBINED AT	CP509	287.	12.42	40.	10.	10.	0.81
ROUTED TO	R510	281.	12.50	40.	10.	10.	0.81
HYDROGRAPH AT	510	6.	12.33	1.	0.	0.	0.06
2 COMBINED AT	CP510	283.	12.50	40.	10.	10.	0.87

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)

FOR STORM = 1 STORM AREA (SQ MI) = 0.01

R500	MANE	5.00	58.13	740.00	0.56	5.00	58.13	740.00	0.56

NTINUITY SUMMARY (AC-FT) - INFLOW=0.3315E+01 EXCESS=0.0000E+00 OUTFLOW=0.3311E+01 BASIN STORAGE=0.5496E-02 PERCENT ERROR= 0.0

FOR STORM = 2 STORM AREA (SQ MI) = 0.27

R500	MANE	5.00	58.13	740.00	0.56	5.00	58.13	740.00	0.56

TINUITY SUMMARY (AC-FT) - INFLOW=0.3315E+01 EXCESS=0.0000E+00 OUTFLOW=0.3311E+01 BASIN STORAGE=0.5496E-02 PERCENT ERROR= 0.0

FOR STORM = 3 STORM AREA (SQ MI) = 0.45

R500	MANE	5.00	58.02	740.00	0.56	5.00	58.02	740.00	0.56

TINUITY SUMMARY (AC-FT) - INFLOW=0.3309E+01 EXCESS=0.0000E+00 OUTFLOW=0.3304E+01 BASIN STORAGE=0.5493E-02 PERCENT ERROR= 0.0

FOR STORM = 4 STORM AREA (SQ MI) = 0.59

R500	MANE	5.00	57.70	740.00	0.56	5.00	57.70	740.00	0.56

TINUITY SUMMARY (AC-FT) - INFLOW=0.3291E+01 EXCESS=0.0000E+00 OUTFLOW=0.3286E+01 BASIN STORAGE=0.5484E-02 PERCENT ERROR= 0.0

FOR STORM = 5 STORM AREA (SQ MI) = 0.72

R500	MANE	5.00	57.22	740.00	0.56	5.00	57.22	740.00	0.56

TINUITY SUMMARY (AC-FT) - INFLOW=0.3263E+01 EXCESS=0.0000E+00 OUTFLOW=0.3259E+01 BASIN STORAGE=0.5471E-02 PERCENT ERROR= 0.0

FOR STORM = 6 STORM AREA (SQ MI) = 0.85

R500	MANE	5.00	56.79	740.00	0.55	5.00	56.79	740.00	0.55

TINUITY SUMMARY (AC-FT) - INFLOW=0.3238E+01 EXCESS=0.0000E+00 OUTFLOW=0.3234E+01 BASIN STORAGE=0.5459E-02 PERCENT ERROR= 0.0

FOR STORM = 1 STORM AREA (SQ MI) = 0.01

R501	MANE	2.83	125.37	733.45	0.47	5.00	124.48	735.00	0.47

SUMMARY (AC-FT) - INFLOW=0.6741E+01 EXCESS=0.0000E+00 OUTFLOW=0.6737E+01 BASIN STORAGE=0.2356E-02 PERCENT ERROR= 0.0

FOR STORM = 2 STORM AREA (SQ MI) = 0.27

R501	MANE	2.83	125.37	733.45	0.47	5.00	124.48	735.00	0.47

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)NTINUITY SUMMARY (AC-FT) - INFLOW=0.6741E+01 EXCESS=0.0000E+00 OUTFLOW=0.6737E+01 BASIN STORAGE=0.2356E-02 PERCENT ERROR=   0.0

      FOR STORM = 3  STORM AREA (SQ MI) =       0.45
         R501  MANE        2.83    125.10    733.93      0.47      5.00    124.16    735.00       0.47

)NTINUITY SUMMARY (AC-FT) - INFLOW=0.6723E+01 EXCESS=0.0000E+00 OUTFLOW=0.6719E+01 BASIN STORAGE=0.2285E-02 PERCENT ERROR=   0.0

      FOR STORM = 4  STORM AREA (SQ MI) =       0.59
         R501  MANE        2.84    124.01    735.38      0.46      5.00    124.00    735.00       0.46

NTINUITY SUMMARY (AC-FT) - INFLOW=0.6682E+01 EXCESS=0.0000E+00 OUTFLOW=0.6678E+01 BASIN STORAGE=0.2274E-02 PERCENT ERROR=   0.0

      FOR STORM = 5  STORM AREA (SQ MI) =       0.72
         R501  MANE        2.85    123.12    734.73      0.46      5.00    122.76    735.00       0.46

TINUITY SUMMARY (AC-FT) - INFLOW=0.6612E+01 EXCESS=0.0000E+00 OUTFLOW=0.6608E+01 BASIN STORAGE=0.2358E-02 PERCENT ERROR=   0.0

      FOR STORM = 6  STORM AREA (SQ MI) =       0.85
         R501  MANE        2.86    121.89    733.86      0.45      5.00    121.06    735.00       0.45

TINUITY SUMMARY (AC-FT) - INFLOW=0.6552E+01 EXCESS=0.0000E+00 OUTFLOW=0.6548E+01 BASIN STORAGE=0.2271E-02 PERCENT ERROR=   0.0

      FOR STORM = 1  STORM AREA (SQ MI) =       0.01
         R502  MANE        3.83    155.74    734.75      0.46      5.00    155.39    735.00       0.46

TINUITY SUMMARY (AC-FT) - INFLOW=0.8418E+01 EXCESS=0.0000E+00 OUTFLOW=0.8413E+01 BASIN STORAGE=0.4422E-02 PERCENT ERROR=   0.0

      FOR STORM = 2  STORM AREA (SQ MI) =       0.27
         R502  MANE        3.83    155.74    734.75      0.46      5.00    155.39    735.00       0.46

TINUITY SUMMARY (AC-FT) - INFLOW=0.8418E+01 EXCESS=0.0000E+00 OUTFLOW=0.8413E+01 BASIN STORAGE=0.4422E-02 PERCENT ERROR=   0.0

      FOR STORM = 3  STORM AREA (SQ MI) =       0.45
         R502  MANE        3.83    154.04    735.69      0.46      5.00    153.40    735.00       0.46

TINUITY SUMMARY (AC-FT) - INFLOW=0.8392E+01 EXCESS=0.0000E+00 OUTFLOW=0.8386E+01 BASIN STORAGE=0.4275E-02 PERCENT ERROR=   0.0

      FOR STORM = 4  STORM AREA (SQ MI) =       0.59
         R502  MANE        3.84    152.40    732.79      0.46      5.00    152.35    735.00       0.46

  SUMMARY (AC-FT) - INFLOW=0.8347E+01 EXCESS=0.0000E+00 OUTFLOW=0.8342E+01 BASIN STORAGE=0.4397E-02 PERCENT ERROR=   0.0

      FOR STORM = 5  STORM AREA (SQ MI) =       0.72
         R502  MANE        3.85    151.76    735.66      0.46      5.00    151.01    735.00       0.45
```

```
NTINUITY SUMMARY (AC-FT) - INFLOW=0.8256E+01 EXCESS=0.0000E+00 OUTFLOW=0.8251E+01 BASIN STORAGE=0.4282E-02 PERCENT ERROR=   0.0

     FOR STORM = 6  STORM AREA (SQ MI) =       0.85
        R502  MANE        3.86    150.98    733.62      0.45      5.00    150.01    735.00       0.45

NTINUITY SUMMARY (AC-FT) - INFLOW=0.8182E+01 EXCESS=0.0000E+00 OUTFLOW=0.8178E+01 BASIN STORAGE=0.4259E-02 PERCENT ERROR=   0.0

     FOR STORM = 1  STORM AREA (SQ MI) =       0.01
        R503  MANE        2.06    185.44    734.70      0.46      5.00    185.02    735.00       0.46

TINUITY SUMMARY (AC-FT) - INFLOW=0.1031E+02 EXCESS=0.0000E+00 OUTFLOW=0.1030E+02 BASIN STORAGE=0.2754E-02 PERCENT ERROR=   0.0

     FOR STORM = 2  STORM AREA (SQ MI) =       0.27
        R503  MANE        2.06    185.44    734.70      0.46      5.00    185.02    735.00       0.46

TINUITY SUMMARY (AC-FT) - INFLOW=0.1031E+02 EXCESS=0.0000E+00 OUTFLOW=0.1030E+02 BASIN STORAGE=0.2754E-02 PERCENT ERROR=   0.0

     FOR STORM = 3  STORM AREA (SQ MI) =       0.45
        R503  MANE        2.07    183.95    733.81      0.46      5.00    182.92    735.00       0.46

TINUITY SUMMARY (AC-FT) - INFLOW=0.1027E+02 EXCESS=0.0000E+00 OUTFLOW=0.1026E+02 BASIN STORAGE=0.2723E-02 PERCENT ERROR=   0.0

     FOR STORM = 4  STORM AREA (SQ MI) =       0.59
        R503  MANE        2.07    183.26    734.26      0.46      5.00    182.21    735.00       0.46

TINUITY SUMMARY (AC-FT) - INFLOW=0.1021E+02 EXCESS=0.0000E+00 OUTFLOW=0.1021E+02 BASIN STORAGE=0.2765E-02 PERCENT ERROR=   0.0

     FOR STORM = 5  STORM AREA (SQ MI) =       0.72
        R503  MANE        2.08    180.67    733.78      0.45      5.00    179.86    735.00       0.45

INUITY SUMMARY (AC-FT) - INFLOW=0.1010E+02 EXCESS=0.0000E+00 OUTFLOW=0.1010E+02 BASIN STORAGE=0.2711E-02 PERCENT ERROR=   0.0

     FOR STORM = 6  STORM AREA (SQ MI) =       0.85
        R503  MANE        2.08    180.19    733.91      0.45      5.00    179.03    735.00       0.45

INUITY SUMMARY (AC-FT) - INFLOW=0.1001E+02 EXCESS=0.0000E+00 OUTFLOW=0.1001E+02 BASIN STORAGE=0.2702E-02 PERCENT ERROR=   0.0

     FOR STORM = 1  STORM AREA (SQ MI) =       0.01
        R504  MANE        3.78    191.48    737.42      0.45      5.00    190.28    735.00       0.45

INUITY SUMMARY (AC-FT) - INFLOW=0.1091E+02 EXCESS=0.0000E+00 OUTFLOW=0.1090E+02 BASIN STORAGE=0.6154E-02 PERCENT ERROR=   0.0

     FOR STORM = 2  STORM AREA (SQ MI) =       0.27
```

R504 MANE 3.78 191.48 737.42 0.45 5.00 190.28 735.00 0.45

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.1091E+02 EXCESS=0.0000E+00 OUTFLOW=0.1090E+02 BASIN STORAGE=0.6154E-02 PERCENT ERROR= 0.0

FOR STORM = 3 STORM AREA (SQ MI) = 0.45
R504 MANE 3.79 190.04 736.06 0.45 5.00 188.13 735.00 0.45

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.1087E+02 EXCESS=0.0000E+00 OUTFLOW=0.1086E+02 BASIN STORAGE=0.6115E-02 PERCENT ERROR= 0.0

FOR STORM = 4 STORM AREA (SQ MI) = 0.59
R504 MANE 3.80 189.27 736.94 0.45 5.00 187.66 735.00 0.45

NTINUITY SUMMARY (AC-FT) - INFLOW=0.1081E+02 EXCESS=0.0000E+00 OUTFLOW=0.1080E+02 BASIN STORAGE=0.6171E-02 PERCENT ERROR= 0.0

FOR STORM = 5 STORM AREA (SQ MI) = 0.72
R504 MANE 3.81 186.61 735.95 0.45 5.00 184.65 735.00 0.45

NTINUITY SUMMARY (AC-FT) - INFLOW=0.1069E+02 EXCESS=0.0000E+00 OUTFLOW=0.1068E+02 BASIN STORAGE=0.6096E-02 PERCENT ERROR= 0.0

FOR STORM = 6 STORM AREA (SQ MI) = 0.85
R504 MANE 3.82 185.74 737.00 0.44 5.00 183.95 735.00 0.44

TY SUMMARY (AC-FT) - INFLOW=0.1059E+02 EXCESS=0.0000E+00 OUTFLOW=0.1059E+02 BASIN STORAGE=0.6127E-02 PERCENT ERROR= 0.0

FOR STORM = 1 STORM AREA (SQ MI) = 0.01
R505 MANE 1.41 207.31 736.05 0.44 5.00 206.43 735.00 0.44

TINUITY SUMMARY (AC-FT) - INFLOW=0.1205E+02 EXCESS=0.0000E+00 OUTFLOW=0.1204E+02 BASIN STORAGE=0.2416E-02 PERCENT ERROR= 0.0

FOR STORM = 2 STORM AREA (SQ MI) = 0.27
R505 MANE 1.41 207.31 736.05 0.44 5.00 206.43 735.00 0.44

TINUITY SUMMARY (AC-FT) - INFLOW=0.1205E+02 EXCESS=0.0000E+00 OUTFLOW=0.1204E+02 BASIN STORAGE=0.2416E-02 PERCENT ERROR= 0.0

FOR STORM = 3 STORM AREA (SQ MI) = 0.45
R505 MANE 1.42 205.07 735.54 0.44 5.00 204.30 735.00 0.44

TINUITY SUMMARY (AC-FT) - INFLOW=0.1200E+02 EXCESS=0.0000E+00 OUTFLOW=0.1200E+02 BASIN STORAGE=0.2413E-02 PERCENT ERROR= 0.0

FOR STORM = 4 STORM AREA (SQ MI) = 0.59
R505 MANE 1.42 204.67 736.16 0.44 5.00 203.87 735.00 0.44

TINUITY SUMMARY (AC-FT) - INFLOW=0.1192E+02 EXCESS=0.0000E+00 OUTFLOW=0.1192E+02 BASIN STORAGE=0.2421E-02 PERCENT ERROR= 0.0

```
FOR STORM = 5  STORM AREA (SQ MI) =      0.72
   R505  MANE        1.43    201.16    736.76      0.43      5.00    200.46    735.00        0.43

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1180E+02 EXCESS=0.0000E+00 OUTFLOW=0.1180E+02 BASIN STORAGE=0.2398E-02 PERCENT ERROR=   0.0

FOR STORM = 6  STORM AREA (SQ MI) =      0.85
   R505  MANE        1.43    200.67    736.26      0.43      5.00    199.80    735.00        0.43

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1168E+02 EXCESS=0.0000E+00 OUTFLOW=0.1168E+02 BASIN STORAGE=0.2408E-02 PERCENT ERROR=   0.0

FOR STORM = 1  STORM AREA (SQ MI) =      0.01
   R506  MANE        3.37    221.99    735.51      0.46      5.00    220.52    735.00        0.46

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1401E+02 EXCESS=0.0000E+00 OUTFLOW=0.1400E+02 BASIN STORAGE=0.6003E-02 PERCENT ERROR=   0.0

FOR STORM = 2  STORM AREA (SQ MI) =      0.27
   R506  MANE        3.37    221.99    735.51      0.46      5.00    220.52    735.00        0.46

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1401E+02 EXCESS=0.0000E+00 OUTFLOW=0.1400E+02 BASIN STORAGE=0.6003E-02 PERCENT ERROR=   0.0

FOR STORM = 3  STORM AREA (SQ MI) =      0.45
   R506  MANE        3.38    220.98    737.64      0.46      5.00    219.33    735.00        0.46

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1396E+02 EXCESS=0.0000E+00 OUTFLOW=0.1396E+02 BASIN STORAGE=0.6024E-02 PERCENT ERROR=   0.0

FOR STORM = 4  STORM AREA (SQ MI) =      0.59
   R506  MANE        3.39    219.89    738.15      0.46      5.00    218.70    735.00        0.46

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1388E+02 EXCESS=0.0000E+00 OUTFLOW=0.1387E+02 BASIN STORAGE=0.6008E-02 PERCENT ERROR=   0.0

FOR STORM = 5  STORM AREA (SQ MI) =      0.72
   R506  MANE        3.40    216.67    738.31      0.46      5.00    215.26    735.00        0.46

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1374E+02 EXCESS=0.0000E+00 OUTFLOW=0.1374E+02 BASIN STORAGE=0.5982E-02 PERCENT ERROR=   0.0

FOR STORM = 6  STORM AREA (SQ MI) =      0.85
   R506  MANE        3.41    214.89    735.68      0.45      5.00    213.03    735.00        0.45

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1361E+02 EXCESS=0.0000E+00 OUTFLOW=0.1360E+02 BASIN STORAGE=0.5992E-02 PERCENT ERROR=   0.0

FOR STORM = 1  STORM AREA (SQ MI) =      0.01
   R507  MANE        2.82    221.69    738.15      0.46      5.00    219.70    740.00        0.46

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1479E+02 EXCESS=0.0000E+00 OUTFLOW=0.1478E+02 BASIN STORAGE=0.5098E-02 PERCENT ERROR=   0.0
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```
FOR STORM = 2  STORM AREA (SQ MI) =       0.27
   R507  MANE        2.82    221.69    738.15      0.46      5.00    219.70    740.00        0.46

NUITY SUMMARY (AC-FT) - INFLOW=0.1479E+02 EXCESS=0.0000E+00 OUTFLOW=0.1478E+02 BASIN STORAGE=0.5098E-02 PERCENT ERROR=   0.0

FOR STORM = 3  STORM AREA (SQ MI) =       0.45
   R507  MANE        2.82    219.38    739.35      0.46      5.00    218.16    740.00        0.46

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1475E+02 EXCESS=0.0000E+00 OUTFLOW=0.1474E+02 BASIN STORAGE=0.5103E-02 PERCENT ERROR=   0.0

FOR STORM = 4  STORM AREA (SQ MI) =       0.59
   R507  MANE        2.82    219.00    737.16      0.46      5.00    218.17    740.00        0.46

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1466E+02 EXCESS=0.0000E+00 OUTFLOW=0.1465E+02 BASIN STORAGE=0.5081E-02 PERCENT ERROR=   0.0

FOR STORM = 5  STORM AREA (SQ MI) =       0.72
   R507  MANE        2.84    216.75    737.81      0.45      5.00    214.97    740.00        0.45

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1452E+02 EXCESS=0.0000E+00 OUTFLOW=0.1451E+02 BASIN STORAGE=0.5080E-02 PERCENT ERROR=   0.0

FOR STORM = 6  STORM AREA (SQ MI) =       0.85
   R507  MANE        2.85    213.77    737.27      0.45      5.00    213.30    740.00        0.45

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1436E+02 EXCESS=0.0000E+00 OUTFLOW=0.1436E+02 BASIN STORAGE=0.5056E-02 PERCENT ERROR=   0.0

FOR STORM = 1  STORM AREA (SQ MI) =       0.01
   R508  MANE        5.00    256.21    740.00      0.50      5.00    256.21    740.00        0.50

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1738E+02 EXCESS=0.0000E+00 OUTFLOW=0.1738E+02 BASIN STORAGE=0.1067E-01 PERCENT ERROR=   0.0

FOR STORM = 2  STORM AREA (SQ MI) =       0.27
   R508  MANE        5.00    256.21    740.00      0.50      5.00    256.21    740.00        0.50

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1738E+02 EXCESS=0.0000E+00 OUTFLOW=0.1738E+02 BASIN STORAGE=0.1067E-01 PERCENT ERROR=   0.0

FOR STORM = 3  STORM AREA (SQ MI) =       0.45
   R508  MANE        5.00    254.28    740.00      0.50      5.00    254.28    740.00        0.50

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1734E+02 EXCESS=0.0000E+00 OUTFLOW=0.1733E+02 BASIN STORAGE=0.1066E-01 PERCENT ERROR=   0.0

FOR STORM = 4  STORM AREA (SQ MI) =       0.59
   R508  MANE        5.00    253.74    745.00      0.49      5.00    253.74    745.00        0.49

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1723E+02 EXCESS=0.0000E+00 OUTFLOW=0.1723E+02 BASIN STORAGE=0.1064E-01 PERCENT ERROR=   0.0
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```
FOR STORM = 5  STORM AREA (SQ MI) =      0.72
   R508  MANE        5.00    250.79    745.00      0.49      5.00    250.79    745.00       0.49

JITY SUMMARY (AC-FT) - INFLOW=0.1708E+02 EXCESS=0.0000E+00 OUTFLOW=0.1708E+02 BASIN STORAGE=0.1062E-01 PERCENT ERROR=   0.0

FOR STORM = 6  STORM AREA (SQ MI) =      0.85
   R508  MANE        5.00    248.74    745.00      0.48      5.00    248.74    745.00       0.48

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.1691E+02 EXCESS=0.0000E+00 OUTFLOW=0.1691E+02 BASIN STORAGE=0.1059E-01 PERCENT ERROR=   0.0

FOR STORM = 1  STORM AREA (SQ MI) =      0.01
   R509  MANE        5.00    292.70    745.00      0.51      5.00    292.69    745.00       0.51

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.2011E+02 EXCESS=0.0000E+00 OUTFLOW=0.2007E+02 BASIN STORAGE=0.1499E-01 PERCENT ERROR=   0.1

FOR STORM = 2  STORM AREA (SQ MI) =      0.27
   R509  MANE        5.00    292.70    745.00      0.51      5.00    292.69    745.00       0.51

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.2011E+02 EXCESS=0.0000E+00 OUTFLOW=0.2007E+02 BASIN STORAGE=0.1499E-01 PERCENT ERROR=   0.1

FOR STORM = 3  STORM AREA (SQ MI) =      0.45
   R509  MANE        5.00    290.97    745.00      0.51      5.00    290.97    745.00       0.51

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.2006E+02 EXCESS=0.0000E+00 OUTFLOW=0.2002E+02 BASIN STORAGE=0.1499E-01 PERCENT ERROR=   0.1

FOR STORM = 4  STORM AREA (SQ MI) =      0.59
   R509  MANE        5.00    289.73    745.00      0.50      5.00    289.73    745.00       0.50

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.1995E+02 EXCESS=0.0000E+00 OUTFLOW=0.1990E+02 BASIN STORAGE=0.1497E-01 PERCENT ERROR=   0.1

FOR STORM = 5  STORM AREA (SQ MI) =      0.72
   R509  MANE        5.00    286.60    745.00      0.50      5.00    286.60    745.00       0.50

NTINUITY SUMMARY (AC-FT) - INFLOW=0.1978E+02 EXCESS=0.0000E+00 OUTFLOW=0.1974E+02 BASIN STORAGE=0.1493E-01 PERCENT ERROR=   0.1

FOR STORM = 6  STORM AREA (SQ MI) =      0.85
   R509  MANE        5.00    283.74    745.00      0.50      5.00    283.74    745.00       0.50

ITY SUMMARY (AC-FT) - INFLOW=0.1960E+02 EXCESS=0.0000E+00 OUTFLOW=0.1955E+02 BASIN STORAGE=0.1491E-01 PERCENT ERROR=   0.1

FOR STORM = 1  STORM AREA (SQ MI) =      0.01
   R510  MANE        5.00    288.71    750.00      0.48      5.00    288.71    750.00       0.48
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```
CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2068E+02 EXCESS=0.0000E+00 OUTFLOW=0.2064E+02 BASIN STORAGE=0.1590E-01 PERCENT ERROR=   0.2

        FOR STORM = 2  STORM AREA (SQ MI) =       0.27
           R510  MANE        5.00    288.71    750.00      0.48      5.00    288.71    750.00       0.48

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2068E+02 EXCESS=0.0000E+00 OUTFLOW=0.2064E+02 BASIN STORAGE=0.1590E-01 PERCENT ERROR=   0.2

        FOR STORM = 3  STORM AREA (SQ MI) =       0.45
           R510  MANE        5.00    287.18    750.00      0.48      5.00    287.18    750.00       0.48

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2063E+02 EXCESS=0.0000E+00 OUTFLOW=0.2058E+02 BASIN STORAGE=0.1590E-01 PERCENT ERROR=   0.2

        FOR STORM = 4  STORM AREA (SQ MI) =       0.59
           R510  MANE        5.00    285.86    750.00      0.47      5.00    285.86    750.00       0.47

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2051E+02 EXCESS=0.0000E+00 OUTFLOW=0.2046E+02 BASIN STORAGE=0.1588E-01 PERCENT ERROR=   0.1

        FOR STORM = 5  STORM AREA (SQ MI) =       0.72
           R510  MANE        5.00    282.74    750.00      0.47      5.00    282.74    750.00       0.47

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2033E+02 EXCESS=0.0000E+00 OUTFLOW=0.2028E+02 BASIN STORAGE=0.1584E-01 PERCENT ERROR=   0.1

        FOR STORM = 6  STORM AREA (SQ MI) =       0.85
           R510  MANE        5.00    279.93    750.00      0.47      5.00    279.93    750.00       0.47

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2013E+02 EXCESS=0.0000E+00 OUTFLOW=0.2009E+02 BASIN STORAGE=0.1582E-01 PERCENT ERROR=   0.1


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

100-Year, 24-Hour Event

```
****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*             MAY   1991               *
*          VERSION 4.0.1E              *
*     Lahey F77L-EM/32 version 5.01    *
*       Dodson & Associates, Inc.      *
* RUN DATE  01/08/95  TIME  10:51:19   *
****************************************
```

```
****************************************
*                                      *
*   U.S. ARMY CORPS OF ENGINEERS       *
*   HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616        *
*          (916) 551-1748              *
*                                      *
****************************************
```

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

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

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

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

  1           ID        CAMELBACK ROAD CHANNEL
  2           ID        MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
  3           ID        FILENAME  CAM100
  4           ID          1/6/95
  5           ID        CBA # 241729-01-0300
  6           ID
  7           ID
  8           ID        THIS MODEL IS FOR RAINFALL AMOUNT ASSOCIATED WITH 100-YEAR 24-HOUR EVENT
  9           ID
 10           ID
              *DIAGRAM
 11           IT      5                   300
 12           IO      5
 13           IN     30
 14           JD    3.8     .01
 15           PC   .000    .005    .011    .016    .022    .028    .035    .041    .048    .056
 16           PC   .063    .071    .080    .089    .098    .109    .120    .133    .147    .163
 17           PC   .181    .204    .235    .283    .663    .735    .772    .799    .820    .838
 18           PC   .854    .868    .880    .891    .902    .912    .921    .929    .937    .945
 19           PC   .952    .959    .965    .972    .978    .984    .989    .995   1.000
 20           JD    3.8     .27
 21           JD  3.797     .45
 22           JD  3.787     .59
 23           JD  3.773     .72
 24           JD  3.760     .85

 25           KK   242A
 26           KM        RUNOFF FROM SUBBASIN 242A
 27           BA    .11
 28           LG    .34     .18    4.25     .39    6.00
 29           UI    17.     67.    101.    153.    190.    129.     90.     47.     26.     15.
 30           UI     5.      5.      5.      0.      0.      0.      0.      0.      0.      0.
 31           UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 32           KK   R500
 33           KM        ROUTE FLOW FROM 242A TO 500
 34           RD   2640    .004    .025            TRAP      10       4

 35           KK    500
 36           KM        RUNOFF FROM SUBBASIN 500
 37           BA    .16
 38           LG    .35     .35    3.74     .31     .00
 39           UI    37.    128.    196.    322.    241.    159.     78.     40.     18.      9.
 40           UI     9.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 41           UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 42           KK  CP500
 43           KM        ADD HYDROGRAPHS AT CP500
 44           HC      2
```

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

 45         KK   R501
 46         KM       ROUTE FLOW FROM 500 TO 501
 47         RD    800    .004    .025           TRAP      10       4

 48         KK    501
 49         KM       RUNOFF FROM SUBBASIN 501
 50         BA    .07
 51         LG    .35     .37    3.99     .25     .00
 52         UI    21.     68.    112.    152.     95.     53.     22.     10.      4.      4.
 53         UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 54         UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 55         KK   CP501
 56         KM       ADD HYDROGRAPHS AT CP501
 57         HC      2

 58         KK   R502
 59         KM       ROUTE FLOW FROM 501 TO 502
 60         RD   1150    .004    .025           TRAP      10       4

 61         KK    502
 62         KM       RUNOFF FROM SUBBASIN 502
 63         BA    .08
 64         LG    .35     .36    3.57     .28     .00
 65         UI    27.     87.    152.    169.    101.     46.     21.      7.      5.      0.
 66         UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 67         UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 68         KK   CP502
 69         KM       ADD HYDROGRAPHS AT CP502
 70         HC      2

 71         KK   R503
 72         KM       ROUTE FLOW FROM 502 TO 503
 73         RD    650    .004    .025           TRAP      10       4

 74         KK    503
 75         KM       RUNOFF FROM SUBBASIN 503
 76         BA    .03
 77         LG    .35     .35    3.81     .32     .00
 78         UI    12.     37.     68.     59.     34.     13.      5.      2.      0.      0.
 79         UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 80         KK   CP503
 81         KM       ADD HYDROGRAPHS AT CP503
 82         HC      2

 83         KK   R504
 84         KM       ROUTE FLOW FROM 503 TO 504
 85         RD   1125   .0036    .025           TRAP      15       4
```

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

 86         KK    504
 87         KM       RUNOFF FROM SUBBASIN 504
 88         BA   .0621
 89         LG    .34     .35    3.99     .35    1.00
 90         UI    21.     65.    114.    127.     76.     35.     16.      5.      4.      0.
 91         UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 92         UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 93         KK   CP504
 94         KM       ADD HYDROGRAPHS AT CP504
 95         HC      2

 96         KK    R505
 97         KM       ROUTE FLOW FROM 504 TO 505
 98         RD    430   .0036    .025           TRAP     15      4

 99         KK    505
100         KM       RUNOFF FROM SUBBASIN 505
101         BA   .0526
102         LG    .19     .27    3.95     .35   14.00
103         UI    20.     61.    113.     99.     57.     22.      9.      3.      0.      0.
104         UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

105         KK   CP505
106         KM       ADD HYDROGRAPHS AT CP505
107         HC      2

108         KK    R506
109         KM       ROUTE FLOW FROM 505 TO 506
110         RD   1050   .0036    .025           TRAP     15      4

111         KK    506
112         KM       RUNOFF FROM SUBBASIN 506
113         BA   .0351
114         LG    .35     .32    3.75     .25     .00
115         UI    28.     88.     79.     28.      6.      0.      0.      0.      0.      0.
116         UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

117         KK   CP506
118         KM       ADD HYDROGRAPHS AT CP506
119         HC      2

120         KK    R507
121         KM       ROUTE FLOW FROM 506 TO 507
122         RD    875   .0036    .025           TRAP     15      4

123         KK    507
124         KM       RUNOFF FROM SUBBASIN 507
125         BA   .054
126         LG    .49     .01    8.60     .11     .00
127         UI     5.     13.     25.     32.     42.     63.     58.     44.     34.     26.
128         UI    16.      9.      7.      5.      2.      2.      2.      2.      0.      0.
129         UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```

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

 130          KK   CP507
 131          KM       ADD HYDROGRAPHS AT CP507
 132          HC       2

 133          KK    R508
 134          KM       ROUTE FLOW FROM 507 TO 508
 135          RD    1700   .0036    .025           TRAP      15       4

 136          KK     508
 137          KM       RUNOFF FROM SUBBASIN 508
 138          BA   .0855
 139          LG    .49     .02    3.91     .43     .00
 140          UI     8.     16.     34.     44.     55.     73.     98.     76.     61.     48.
 141          UI    37.     23.     14.     11.      8.      4.      2.      2.      2.      2.
 142          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 143          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 144          KK   CP508
 145          KM       ADD HYDROGRAPHS AT CP508
 146          HC       2

 147          KK    R509
 148          KM       ROUTE FLOW FROM 508 TO 509
 149          RD    1350   .0015    .025           TRAP      20       4

 150          KK     509
 151          KM       RUNOFF FROM SUBBASIN 509
 152          BA    .07
 153          LG    .36     .31    4.12     .53     .00
 154          UI    28.     86.    158.    138.     80.     31.     13.      5.      0.      0.
 155          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 156          KK   CP509
 157          KM       ADD HYDROGRAPHS AT CP509
 158          HC       2

 159          KK    R510
 160          KM       ROUTE FLOW FROM 509 TO 510
 161          RD    1275   .0015    .025           TRAP      20       4

 162          KK     510
 163          KM       RUNOFF FROM SUBBASIN 510
 164          BA    .06
 165          LG    .44     .14    3.54     .96     .00
 166          UI     7.     20.     36.     47.     67.     86.     63.     48.     36.     20.
 167          UI    12.      8.      5.      2.      2.      2.      0.      0.      0.      0.

 168          KK   CP510
 169          KM       ADD HYDROGRAPHS AT CP510
 170          HC       2
 171          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

          (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

  25        242A
              V
              V
  32        R500
              .
              .
  35          .          500
              .            .
              .            .
  42      CP500............
              V
              V
  45        R501
              .
              .
  48          .          501
              .            .
              .            .
  55      CP501............
              V
              V
  58        R502
              .
              .
              .          502
              .            .
              .            .
  68      CP502............
              V
              V
  71        R503
              .
              .
  74          .          503
              .            .
              .            .
  80      CP503............
              V
              V
  83        R504
              .
              .
  86          .          504
              .            .
              .            .
  93      CP504............
              V
              V
            R505
              .
              .
  99          .          505
              .            .
              .            .
 105      CP505............
```

```
            V
            V
108       R506
            .
            .
            .          506
            .            .
            .            .
117      CP506............
            V
            V
120       R507
            .
            .
123         .          507
            .            .
            .            .
130      CP507............
            V
            V
133       R508
            .
            .
136         .          508
            .            .
            .            .
144      CP508............
            V
            V
147       R509
            .
            .
150         .          509
            .            .
            .            .
156      CP509............
            V
            V
159       R510
            .
            .
162         .          510
            .            .
            .            .
168      CP510............
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*************************************
*                                   *
*  FLOOD HYDROGRAPH PACKAGE (HEC-1) *
*            MAY  1991              *
*         VERSION 4.0.1E            *
*   Lahey F77L-EM/32 version 5.01   *
*      Dodson & Associates, Inc.    *
* RUN DATE 01/08/95  TIME 10:51:19  *
*                                   *
*************************************
```

```
*************************************
*                                   *
*   U.S. ARMY CORPS OF ENGINEERS    *
*   HYDROLOGIC ENGINEERING CENTER   *
*         609 SECOND STREET         *
*       DAVIS, CALIFORNIA 95616     *
*          (916) 551-1748           *
*                                   *
*************************************
```

CAMELBACK ROAD CHANNEL
MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
FILENAME CAM100
1/6/95
CBA # 241729-01-0300

THIS MODEL IS FOR RAINFALL AMOUNT ASSOCIATED WITH 100-YEAR 24-HOUR EVENT

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

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

               COMPUTATION INTERVAL    0.08 HOURS
                    TOTAL TIME BASE   24.92 HOURS

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

14 JD        INDEX STORM NO. 1
                   STRM       3.80  PRECIPITATION DEPTH
                   TRDA       0.01  TRANSPOSITION DRAINAGE AREA

               PRECIPITATION PATTERN
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
```

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.06
0.06	0.06	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

20 JD INDEX STORM NO. 2

STRM 3.80 PRECIPITATION DEPTH
TRDA 0.27 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.06
0.06	0.06	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

21 JD INDEX STORM NO. 3

STRM 3.80 PRECIPITATION DEPTH
TRDA 0.45 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.06
0.06	0.06	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

22 JD INDEX STORM NO. 4

STRM 3.79 PRECIPITATION DEPTH

TRDA 0.59 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.06
0.06	0.06	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

JD INDEX STORM NO. 5

STRM 3.77 PRECIPITATION DEPTH

TRDA 0.72 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.06
0.06	0.06	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

24 JD INDEX STORM NO. 6

STRM 3.76 PRECIPITATION DEPTH

TRDA 0.85 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.06
0.06	0.06	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	242A	135.	12.08	14.	4.	4.	0.11		
ROUTED TO	R500	134.	12.25	14.	4.	4.	0.11		
HYDROGRAPH AT	500	200.	12.08	18.	5.	4.	0.16		
2 COMBINED AT	CP500	314.	12.17	32.	8.	8.	0.27		
ROUTED TO	R501	311.	12.17	32.	8.	8.	0.27		
HYDROGRAPH AT	501	94.	12.08	8.	2.	2.	0.07		
2 COMBINED AT	CP501	394.	12.17	41.	10.	10.	0.34		
ROUTED TO	R502	388.	12.17	41.	10.	10.	0.34		
HYDROGRAPH AT	502	107.	12.00	9.	2.	2.	0.08		
2 COMBINED AT	CP502	480.	12.17	50.	13.	12.	0.42		
ROUTED TO	R503	473.	12.17	50.	13.	12.	0.42		
HYDROGRAPH AT	503	39.	12.00	3.	1.	1.	0.03		
2 COMBINED AT	CP503	505.	12.17	53.	14.	13.	0.45		
ROUTED TO	R504	489.	12.17	53.	14.	13.	0.45		
HYDROGRAPH AT	504	74.	12.08	7.	2.	2.	0.06		
2 COMBINED AT	CP504	553.	12.17	60.	15.	15.	0.51		
ROUTED TO	R505	544.	12.17	60.	15.	15.	0.51		
HYDROGRAPH AT	505	71.	12.00	7.	2.	2.	0.05		
2 COMBINED AT	CP505	602.	12.17	67.	17.	16.	0.56		
ROUTED TO	R506	582.	12.17	67.	17.	16.	0.56		
HYDROGRAPH AT	506	44.	12.00	4.	1.	1.	0.04		
2 COMBINED AT	CP506	603.	12.17	70.	18.	17.	0.60		
ROUTED TO	R507	591.	12.25	70.	18.	17.	0.60		
HYDROGRAPH AT	507	66.	12.25	10.	3.	2.	0.05		
2 COMBINED AT	CP507	654.	12.25	80.	20.	20.	0.65		
ROUTED TO	R508	644.	12.25	80.	20.	20.	0.65		
HYDROGRAPH AT	508	83.	12.33	11.	3.	3.	0.09		

2 COMBINED AT	CP508	725.	12.25	90.	23.	22.	0.74
ROUTED TO	R509	706.	12.33	90.	23.	22.	0.74
HYDROGRAPH AT	509	74.	12.00	6.	2.	2.	0.07
2 COMBINED AT	CP509	721.	12.33	96.	24.	24.	0.81
ROUTED TO	R510	697.	12.42	96.	24.	24.	0.81
HYDROGRAPH AT	510	42.	12.25	5.	1.	1.	0.06
2 COMBINED AT	CP510	728.	12.42	100.	25.	25.	0.87

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	INTERPOLATED TO COMPUTATION INTERVAL DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)
FOR STORM = 1 STORM AREA (SQ MI) =				0.01					
	R500 MANE	5.00	133.54	735.00	1.24	5.00	133.54	735.00	1.24

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.7304E+01 EXCESS=0.0000E+00 OUTFLOW=0.7301E+01 BASIN STORAGE=0.4783E-02 PERCENT ERROR= 0.0

FOR STORM = 2 STORM AREA (SQ MI) =				0.27					
	R500 MANE	5.00	133.54	735.00	1.24	5.00	133.54	735.00	1.24

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.7304E+01 EXCESS=0.0000E+00 OUTFLOW=0.7301E+01 BASIN STORAGE=0.4783E-02 PERCENT ERROR= 0.0

FOR STORM = 3 STORM AREA (SQ MI) =				0.45					
	R500 MANE	5.00	133.38	735.00	1.24	5.00	133.38	735.00	1.24

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.7296E+01 EXCESS=0.0000E+00 OUTFLOW=0.7293E+01 BASIN STORAGE=0.4780E-02 PERCENT ERROR= 0.0

FOR STORM = 4 STORM AREA (SQ MI) =				0.59					
	R500 MANE	5.00	132.87	735.00	1.24	5.00	132.87	735.00	1.24

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.7269E+01 EXCESS=0.0000E+00 OUTFLOW=0.7266E+01 BASIN STORAGE=0.4772E-02 PERCENT ERROR= 0.0

FOR STORM = 5 STORM AREA (SQ MI) =				0.72					
	R500 MANE	5.00	132.16	735.00	1.23	5.00	132.16	735.00	1.23

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.7231E+01 EXCESS=0.0000E+00 OUTFLOW=0.7228E+01 BASIN STORAGE=0.4761E-02 PERCENT ERROR= 0.0

FOR STORM = 6 STORM AREA (SQ MI) =				0.85					
	R500 MANE	5.00	131.50	735.00	1.23	5.00	131.50	735.00	1.23

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.7196E+01 EXCESS=0.0000E+00 OUTFLOW=0.7193E+01 BASIN STORAGE=0.4750E-02 PERCENT ERROR= 0.0

FOR STORM = 1 STORM AREA (SQ MI) =				0.01					
	R501 MANE	2.18	310.87	729.48	1.14	5.00	310.79	730.00	1.14

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1638E+02 EXCESS=0.0000E+00 OUTFLOW=0.1637E+02 BASIN STORAGE=0.2226E-02 PERCENT ERROR= 0.0

FOR STORM = 2 STORM AREA (SQ MI) =				0.27					
	R501 MANE	2.18	310.87	729.48	1.14	5.00	310.79	730.00	1.14

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1638E+02 EXCESS=0.0000E+00 OUTFLOW=0.1637E+02 BASIN STORAGE=0.2226E-02 PERCENT ERROR= 0.0

FOR STORM = 3 STORM AREA (SQ MI) = 0.45

R501	MANE	2.18	310.81	729.73	1.14	5.00	310.73	730.00	1.14

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1636E+02 EXCESS=0.0000E+00 OUTFLOW=0.1635E+02 BASIN STORAGE=0.2173E-02 PERCENT ERROR= 0.0

FOR STORM = 4 STORM AREA (SQ MI) = 0.59

R501	MANE	2.19	309.51	730.58	1.13	5.00	308.62	730.00	1.13

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1630E+02 EXCESS=0.0000E+00 OUTFLOW=0.1629E+02 BASIN STORAGE=0.2216E-02 PERCENT ERROR= 0.0

FOR STORM = 5 STORM AREA (SQ MI) = 0.72

R501	MANE	2.19	307.53	729.58	1.12	5.00	307.46	730.00	1.12

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1621E+02 EXCESS=0.0000E+00 OUTFLOW=0.1620E+02 BASIN STORAGE=0.2188E-02 PERCENT ERROR= 0.0

FOR STORM = 6 STORM AREA (SQ MI) = 0.85

R501	MANE	2.19	306.01	730.69	1.12	5.00	305.06	730.00	1.12

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1612E+02 EXCESS=0.0000E+00 OUTFLOW=0.1612E+02 BASIN STORAGE=0.2175E-02 PERCENT ERROR= 0.0

FOR STORM = 1 STORM AREA (SQ MI) = 0.01

R502	MANE	2.94	388.62	732.77	1.13	5.00	387.73	730.00	1.13

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2051E+02 EXCESS=0.0000E+00 OUTFLOW=0.2051E+02 BASIN STORAGE=0.4481E-02 PERCENT ERROR= 0.0

FOR STORM = 2 STORM AREA (SQ MI) = 0.27

R502	MANE	2.94	388.62	732.77	1.13	5.00	387.73	730.00	1.13

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2051E+02 EXCESS=0.0000E+00 OUTFLOW=0.2051E+02 BASIN STORAGE=0.4481E-02 PERCENT ERROR= 0.0

FOR STORM = 3 STORM AREA (SQ MI) = 0.45

R502	MANE	2.94	388.34	732.85	1.13	5.00	387.43	730.00	1.13

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2049E+02 EXCESS=0.0000E+00 OUTFLOW=0.2048E+02 BASIN STORAGE=0.4834E-02 PERCENT ERROR= 0.0

FOR STORM = 4 STORM AREA (SQ MI) = 0.59

R502	MANE	2.95	386.96	731.20	1.12	5.00	383.57	730.00	1.12

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2041E+02 EXCESS=0.0000E+00 OUTFLOW=0.2040E+02 BASIN STORAGE=0.4488E-02 PERCENT ERROR= 0.0

FOR STORM = 5 STORM AREA (SQ MI) = 0.72

R502	MANE	2.95	384.90	732.06	1.12	5.00	381.69	730.00	1.12

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.2030E+02 EXCESS=0.0000E+00 OUTFLOW=0.2029E+02 BASIN STORAGE=0.4631E-02 PERCENT ERROR= 0.0

FOR STORM = 6 STORM AREA (SQ MI) = 0.85

R502	MANE	2.96	382.14	730.62	1.11	5.00	379.73	730.00	1.11

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.2019E+02 EXCESS=0.0000E+00 OUTFLOW=0.2018E+02 BASIN STORAGE=0.4601E-02 PERCENT ERROR= 0.0

FOR STORM = 1 STORM AREA (SQ MI) = 0.01

R503	MANE	1.57	475.22	731.01	1.12	5.00	472.83	730.00	1.12

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.2517E+02 EXCESS=0.0000E+00 OUTFLOW=0.2517E+02 BASIN STORAGE=0.3063E-02 PERCENT ERROR= 0.0

FOR STORM = 2 STORM AREA (SQ MI) = 0.27

R503	MANE	1.57	475.22	731.01	1.12	5.00	472.83	730.00	1.12

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.2517E+02 EXCESS=0.0000E+00 OUTFLOW=0.2517E+02 BASIN STORAGE=0.3063E-02 PERCENT ERROR= 0.0

FOR STORM = 3 STORM AREA (SQ MI) = 0.45

R503	MANE	1.57	474.97	731.19	1.12	5.00	472.57	730.00	1.12

UITY SUMMARY (AC-FT) - INFLOW=0.2514E+02 EXCESS=0.0000E+00 OUTFLOW=0.2514E+02 BASIN STORAGE=0.3166E-02 PERCENT ERROR= 0.0

FOR STORM = 4 STORM AREA (SQ MI) = 0.59

R503	MANE	1.58	471.37	731.45	1.12	5.00	469.90	730.00	1.12

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.2504E+02 EXCESS=0.0000E+00 OUTFLOW=0.2504E+02 BASIN STORAGE=0.3008E-02 PERCENT ERROR= 0.0

FOR STORM = 5 STORM AREA (SQ MI) = 0.72

R503	MANE	1.58	468.52	730.92	1.11	5.00	466.28	730.00	1.11

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.2490E+02 EXCESS=0.0000E+00 OUTFLOW=0.2490E+02 BASIN STORAGE=0.3043E-02 PERCENT ERROR= 0.0

FOR STORM = 6 STORM AREA (SQ MI) = 0.85

R503	MANE	1.58	465.65	730.41	1.11	5.00	464.27	730.00	1.11

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.2476E+02 EXCESS=0.0000E+00 OUTFLOW=0.2476E+02 BASIN STORAGE=0.3072E-02 PERCENT ERROR= 0.0

FOR STORM = 1 STORM AREA (SQ MI) = 0.01

R504	MANE	2.84	496.73	731.87	1.12	5.00	488.77	730.00	1.12

NTINUITY SUMMARY (AC-FT) - INFLOW=0.2685E+02 EXCESS=0.0000E+00 OUTFLOW=0.2683E+02 BASIN STORAGE=0.7226E-02 PERCENT ERROR= 0.0

FOR STORM = 2 STORM AREA (SQ MI) = 0.27

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R504  MANE        2.84    496.73    731.87      1.12      5.00    488.77    730.00        1.12

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2685E+02 EXCESS=0.0000E+00 OUTFLOW=0.2683E+02 BASIN STORAGE=0.7226E-02 PERCENT ERROR=   0.0

FOR STORM = 3  STORM AREA (SQ MI) =       0.45
R504  MANE        2.84    496.63    732.01      1.12      5.00    488.62    730.00        1.12

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2682E+02 EXCESS=0.0000E+00 OUTFLOW=0.2681E+02 BASIN STORAGE=0.7468E-02 PERCENT ERROR=   0.0

FOR STORM = 4  STORM AREA (SQ MI) =       0.59
R504  MANE        2.84    493.07    733.23      1.11      5.00    488.14    730.00        1.11

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2671E+02 EXCESS=0.0000E+00 OUTFLOW=0.2669E+02 BASIN STORAGE=0.7175E-02 PERCENT ERROR=   0.0

FOR STORM = 5  STORM AREA (SQ MI) =       0.72
R504  MANE        2.85    490.57    732.05      1.11      5.00    482.75    730.00        1.11

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2656E+02 EXCESS=0.0000E+00 OUTFLOW=0.2655E+02 BASIN STORAGE=0.7392E-02 PERCENT ERROR=   0.0

FOR STORM = 6  STORM AREA (SQ MI) =       0.85
R504  MANE        2.85    488.62    733.02      1.10      5.00    482.49    730.00        1.10

ITY SUMMARY (AC-FT) - INFLOW=0.2641E+02 EXCESS=0.0000E+00 OUTFLOW=0.2640E+02 BASIN STORAGE=0.7216E-02 PERCENT ERROR=   0.0

FOR STORM = 1  STORM AREA (SQ MI) =       0.01
R505  MANE        1.06    549.61    731.13      1.10      5.00    545.49    730.00        1.10

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.3015E+02 EXCESS=0.0000E+00 OUTFLOW=0.3014E+02 BASIN STORAGE=0.2940E-02 PERCENT ERROR=   0.0

FOR STORM = 2  STORM AREA (SQ MI) =       0.27
R505  MANE        1.06    549.61    731.13      1.10      5.00    545.49    730.00        1.10

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.3015E+02 EXCESS=0.0000E+00 OUTFLOW=0.3014E+02 BASIN STORAGE=0.2940E-02 PERCENT ERROR=   0.0

FOR STORM = 3  STORM AREA (SQ MI) =       0.45
R505  MANE        1.06    549.16    731.23      1.10      5.00    544.81    730.00        1.10

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.3011E+02 EXCESS=0.0000E+00 OUTFLOW=0.3011E+02 BASIN STORAGE=0.3025E-02 PERCENT ERROR=   0.0

FOR STORM = 4  STORM AREA (SQ MI) =       0.59
R505  MANE        1.06    547.17    731.53      1.10      5.00    543.48    730.00        1.10

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.2997E+02 EXCESS=0.0000E+00 OUTFLOW=0.2997E+02 BASIN STORAGE=0.2943E-02 PERCENT ERROR=   0.0
```

```
FOR STORM = 5  STORM AREA (SQ MI) =      0.72
   R505  MANE        1.06    541.76    731.71      1.09      5.00    537.92    730.00       1.09

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2982E+02 EXCESS=0.0000E+00 OUTFLOW=0.2981E+02 BASIN STORAGE=0.3010E-02 PERCENT ERROR=   0.0

FOR STORM = 6  STORM AREA (SQ MI) =      0.85
   R505  MANE        1.06    541.57    730.89      1.09      5.00    537.48    730.00       1.09

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2964E+02 EXCESS=0.0000E+00 OUTFLOW=0.2964E+02 BASIN STORAGE=0.2944E-02 PERCENT ERROR=   0.0

FOR STORM = 1  STORM AREA (SQ MI) =      0.01
   R506  MANE        2.51    598.02    732.66      1.13      5.00    585.75    730.00       1.13

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3406E+02 EXCESS=0.0000E+00 OUTFLOW=0.3405E+02 BASIN STORAGE=0.7557E-02 PERCENT ERROR=   0.0

FOR STORM = 2  STORM AREA (SQ MI) =      0.27
   R506  MANE        2.51    598.02    732.66      1.13      5.00    585.75    730.00       1.13

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3406E+02 EXCESS=0.0000E+00 OUTFLOW=0.3405E+02 BASIN STORAGE=0.7557E-02 PERCENT ERROR=   0.0

FOR STORM = 3  STORM AREA (SQ MI) =      0.45
   R506  MANE        2.51    595.93    732.93      1.13      5.00    584.18    730.00       1.13

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3402E+02 EXCESS=0.0000E+00 OUTFLOW=0.3402E+02 BASIN STORAGE=0.7604E-02 PERCENT ERROR=   0.0

FOR STORM = 4  STORM AREA (SQ MI) =      0.59
   R506  MANE        2.51    590.75    733.50      1.12      5.00    581.62    730.00       1.12

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3387E+02 EXCESS=0.0000E+00 OUTFLOW=0.3386E+02 BASIN STORAGE=0.7476E-02 PERCENT ERROR=   0.0

FOR STORM = 5  STORM AREA (SQ MI) =      0.72
   R506  MANE        2.52    587.20    733.13      1.12      5.00    577.61    735.00       1.12

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3369E+02 EXCESS=0.0000E+00 OUTFLOW=0.3368E+02 BASIN STORAGE=0.7650E-02 PERCENT ERROR=   0.0

FOR STORM = 6  STORM AREA (SQ MI) =      0.85
   R506  MANE        2.52    584.62    733.39      1.11      5.00    574.65    735.00       1.11

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3350E+02 EXCESS=0.0000E+00 OUTFLOW=0.3348E+02 BASIN STORAGE=0.7576E-02 PERCENT ERROR=   0.0

FOR STORM = 1  STORM AREA (SQ MI) =      0.01
   R507  MANE        2.09    602.93    732.61      1.12      5.00    596.29    735.00       1.12

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3590E+02 EXCESS=0.0000E+00 OUTFLOW=0.3589E+02 BASIN STORAGE=0.6501E-02 PERCENT ERROR=   0.0
```

```
FOR STORM = 2  STORM AREA (SQ MI) =       0.27
   R507  MANE        2.09    602.93    732.61      1.12      5.00    596.29    735.00        1.12

MUITY SUMMARY (AC-FT) - INFLOW=0.3590E+02 EXCESS=0.0000E+00 OUTFLOW=0.3589E+02 BASIN STORAGE=0.6501E-02 PERCENT ERROR=   0.0

FOR STORM = 3  STORM AREA (SQ MI) =       0.45
   R507  MANE        2.09    600.25    733.19      1.12      5.00    594.92    735.00        1.12

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.3586E+02 EXCESS=0.0000E+00 OUTFLOW=0.3585E+02 BASIN STORAGE=0.6511E-02 PERCENT ERROR=   0.0

FOR STORM = 4  STORM AREA (SQ MI) =       0.59
   R507  MANE        2.09    599.60    732.07      1.12      5.00    591.08    735.00        1.12

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.3569E+02 EXCESS=0.0000E+00 OUTFLOW=0.3569E+02 BASIN STORAGE=0.6470E-02 PERCENT ERROR=   0.0

FOR STORM = 5  STORM AREA (SQ MI) =       0.72
   R507  MANE        2.10    592.73    731.70      1.11      5.00    587.60    735.00        1.11

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.3548E+02 EXCESS=0.0000E+00 OUTFLOW=0.3548E+02 BASIN STORAGE=0.6582E-02 PERCENT ERROR=   0.0

FOR STORM = 6  STORM AREA (SQ MI) =       0.85
   R507  MANE        2.10    591.33    732.71      1.10      5.00    585.74    735.00        1.10

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.3528E+02 EXCESS=0.0000E+00 OUTFLOW=0.3527E+02 BASIN STORAGE=0.6557E-02 PERCENT ERROR=   0.0

FOR STORM = 1  STORM AREA (SQ MI) =       0.01
   R508  MANE        3.95    654.45    735.25      1.17      5.00    651.96    735.00        1.17

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.4098E+02 EXCESS=0.0000E+00 OUTFLOW=0.4096E+02 BASIN STORAGE=0.1332E-01 PERCENT ERROR=   0.0

FOR STORM = 2  STORM AREA (SQ MI) =       0.27
   R508  MANE        3.95    654.45    735.25      1.17      5.00    651.96    735.00        1.17

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.4098E+02 EXCESS=0.0000E+00 OUTFLOW=0.4096E+02 BASIN STORAGE=0.1332E-01 PERCENT ERROR=   0.0

FOR STORM = 3  STORM AREA (SQ MI) =       0.45
   R508  MANE        3.96    652.74    735.72      1.17      5.00    646.85    735.00        1.17

NUITY SUMMARY (AC-FT) - INFLOW=0.4094E+02 EXCESS=0.0000E+00 OUTFLOW=0.4092E+02 BASIN STORAGE=0.1356E-01 PERCENT ERROR=   0.0

FOR STORM = 4  STORM AREA (SQ MI) =       0.59
   R508  MANE        3.96    650.02    737.08      1.17      5.00    643.47    735.00        1.17

NTINUITY SUMMARY (AC-FT) - INFLOW=0.4076E+02 EXCESS=0.0000E+00 OUTFLOW=0.4074E+02 BASIN STORAGE=0.1331E-01 PERCENT ERROR=   0.0
```

```
FOR STORM = 5  STORM AREA (SQ MI) =      0.72
   R508  MANE        3.97    646.10    738.34      1.16      5.00    644.17    735.00        1.16

JITY SUMMARY (AC-FT) - INFLOW=0.4050E+02 EXCESS=0.0000E+00 OUTFLOW=0.4048E+02 BASIN STORAGE=0.1372E-01 PERCENT ERROR=   0.0

FOR STORM = 6  STORM AREA (SQ MI) =      0.85
   R508  MANE        3.97    642.22    735.08      1.15      5.00    641.32    735.00        1.15

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.4028E+02 EXCESS=0.0000E+00 OUTFLOW=0.4026E+02 BASIN STORAGE=0.1355E-01 PERCENT ERROR=   0.0

FOR STORM = 1  STORM AREA (SQ MI) =      0.01
   R509  MANE        4.19    714.88    741.03      1.17      5.00    709.56    740.00        1.17

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.4625E+02 EXCESS=0.0000E+00 OUTFLOW=0.4615E+02 BASIN STORAGE=0.1750E-01 PERCENT ERROR=   0.2

FOR STORM = 2  STORM AREA (SQ MI) =      0.27
   R509  MANE        4.19    714.88    741.03      1.17      5.00    709.56    740.00        1.17

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.4625E+02 EXCESS=0.0000E+00 OUTFLOW=0.4615E+02 BASIN STORAGE=0.1750E-01 PERCENT ERROR=   0.2

FOR STORM = 3  STORM AREA (SQ MI) =      0.45
   R509  MANE        4.20    708.12    742.67      1.17      5.00    707.68    740.00        1.17

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.4622E+02 EXCESS=0.0000E+00 OUTFLOW=0.4611E+02 BASIN STORAGE=0.1776E-01 PERCENT ERROR=   0.2

FOR STORM = 4  STORM AREA (SQ MI) =      0.59
   R509  MANE        4.20    709.39    739.63      1.16      5.00    708.37    740.00        1.16

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.4601E+02 EXCESS=0.0000E+00 OUTFLOW=0.4592E+02 BASIN STORAGE=0.1791E-01 PERCENT ERROR=   0.2

FOR STORM = 5  STORM AREA (SQ MI) =      0.72
   R509  MANE        4.20    707.97    739.53      1.16      5.00    706.59    740.00        1.16

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.4572E+02 EXCESS=0.0000E+00 OUTFLOW=0.4561E+02 BASIN STORAGE=0.1873E-01 PERCENT ERROR=   0.2

FOR STORM = 6  STORM AREA (SQ MI) =      0.85
   R509  MANE        4.21    704.42    740.55      1.15      5.00    700.58    740.00        1.15

ITY SUMMARY (AC-FT) - INFLOW=0.4546E+02 EXCESS=0.0000E+00 OUTFLOW=0.4537E+02 BASIN STORAGE=0.1820E-01 PERCENT ERROR=   0.2

FOR STORM = 1  STORM AREA (SQ MI) =      0.01
   R510  MANE        3.96    709.27    744.98      1.14      5.00    709.11    745.00        1.14
```

```
CONTINUITY SUMMARY (AC-FT) - INFLOW=0.4926E+02 EXCESS=0.0000E+00 OUTFLOW=0.4918E+02 BASIN STORAGE=0.1821E-01 PERCENT ERROR=   0.1

        FOR STORM = 2  STORM AREA (SQ MI) =       0.27
           R510  MANE        3.96    709.27    744.98      1.14      5.00    709.11    745.00        1.14

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.4926E+02 EXCESS=0.0000E+00 OUTFLOW=0.4918E+02 BASIN STORAGE=0.1821E-01 PERCENT ERROR=   0.1

        FOR STORM = 3  STORM AREA (SQ MI) =       0.45
           R510  MANE        3.97    706.39    741.62      1.14      5.00    702.65    745.00        1.14

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.4927E+02 EXCESS=0.0000E+00 OUTFLOW=0.4919E+02 BASIN STORAGE=0.1880E-01 PERCENT ERROR=   0.1

        FOR STORM = 4  STORM AREA (SQ MI) =       0.59
           R510  MANE        3.96    704.51    741.43      1.13      5.00    702.42    745.00        1.13

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.4903E+02 EXCESS=0.0000E+00 OUTFLOW=0.4895E+02 BASIN STORAGE=0.1826E-01 PERCENT ERROR=   0.1

        FOR STORM = 5  STORM AREA (SQ MI) =       0.72
           R510  MANE        3.97    703.62    742.04      1.13      5.00    697.08    745.00        1.13

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.4872E+02 EXCESS=0.0000E+00 OUTFLOW=0.4864E+02 BASIN STORAGE=0.1960E-01 PERCENT ERROR=   0.1

        FOR STORM = 6  STORM AREA (SQ MI) =       0.85
           R510  MANE        3.98    702.36    744.01      1.12      5.00    696.32    745.00        1.12

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.4838E+02 EXCESS=0.0000E+00 OUTFLOW=0.4830E+02 BASIN STORAGE=0.1937E-01 PERCENT ERROR=   0.1


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

APPENDIX C

HEC-2 Models

5-Year Runoff Event

```
*************************************
HEC-2 WATER SURFACE PROFILES        *
                                    *
Version  4.6.2;  May 1991           *
                                    *
DATE   01MAY95    TIME   12:43:01   *
*************************************
```

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

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

THIS RUN EXECUTED 01MAY95 12:43:01

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

1 CAMELBACK ROAD CHANNEL PREPARED BY CBA
2 5-YEAR EVENT CBA #241729-01-0300
3 FLOOD PROFILES DATE 1/18/95 REVISED 4/31/95

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2		0	.0019				1019.5	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1		-1							15

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

	38	1	26	42	4	8	13	14	15	55
NC	0.045	0.045	0.025	.1	.3					
QT	1	152								
X1	15759	6	1105	1118	0	0	0			
GR	1023	1000	1019	1060	1018	1105	1017.14	1112	1018	1118
GR	1025	1144								
X1	15416	5	1700	1744	343	343	343			
GR	1023	1000	1022	1700	1018.4	1714	1018.4	1724	1024	1744
QT	1	156								
X1	14916	7	1145	1177	500	500	500			
GR	1023.7	830	1022.9	885	1022.4	1000	1022	1145	1019.12	1154
GR	1019.1	1164	1024	1177						
X1	14416	6	1244	1314	500	500	500			
GR	1024	948	1023	1244	1019.64	1258	1019.64	1298	1024	1314
GR	1026	1336								
X1	13916	7	1485	1556	500	500	500			
GR	1024.7	990	1024	1485	1020.2	1500	1020.2	1545	1024	1556
GR	1025	1565	1026	1573						
QT	1	161								
NC	0.025	0.025	0.025	.1	.3					
[illegible]	13531	8	94	176.64	385	385	385			
G	1025	90	1025	94	1020.9	110.4	1020.9	155.4	1026.61	176.64
GR	1026.4	188.64	1025.95	188.74	1026.75	228.64				

				.3	.5					
[illegible]	13471	8	116	146	60	60	60			
3	10							1026.5	1026.5	
R	1025	100	1025	115	1021	116	1021	146	1026.12	151
R	1026.3	163.5	1025.86	163.6	1026.66	203.5				
C	3.013	0.2	2.95		4	10	110	8.1	1021.1	1021
1	13361	8	122.7	152.7	110	110	110			
2			2							
3	10							1026.97	1026.97	
T	-2	115	1026.97		160.4	1026.97				
R	1027.3	100	1026.97	115	1021.1	122.7	1021.1	152.7	1026.97	160.4
R	1026.3	172.4	1026.39	172.5	1026.69	212.4				
C				.1	.3					
X1	13339	8	115	159.36	22	22	22			
R	1027	100	1026.12	115	1021.2	134.7	1021.2	139.7	1026.12	159.36
R	1026.3	171.36	1025.86	171.46	1026.66	211.36				
X1	13270	8	115	156.35	69	69	69			
R	1028	100	1026.04	115	1021.49	133.17	1021.49	138.17	1026.04	156.35
R	1026.2	168.35	1025.78	168.45	1026.58	208.35				
X1	12224	8	115	174.16	1046	1046	1046			
R	1034	100	1032.76	115	1025.99	142.08	1025.99	147.08	1032.76	174.16
[illegible]	1033	186.16	1032.5	186.26	1033.3	226.16				
NC				.3	.5					
QT	1	135								
X1	12116	8	133.36	149.36	108	108	108			
X3	10							1032	1032	
GR	1034	100	1033.04	115	1026.45	133.36	1026.45	149.36	1033.04	167.72
GR	1032.3	179.72	1032.78	179.82	1033.58	219.72				
SC	2.013	0.2	2.95		5	8	40	8.1	1026.61	1026.45
X1	12076	8	133.16	149.16	40	40	40			
X2			2							
X3	10							1033.15	1033.15	
BT	-2	115	1033.15		167.32	1033.15				
GR	1034	100	1033.15	115	1026.61	133.16	1026.61	149.16	1033.15	167.32
GR	1033.4	179.32	1032.89	179.42	1033.69	219.32				
X1	12049	8	115	172.24	27	27	27			
GR	1034	100	1033.22	115	1026.63	141.12	1026.63	146.12	1033.22	172.24
GR	1033.4	184.24	1032.96	184.34	1033.76	224.24				
NC				.1	.3					
X1	11100	8	115	173.36	949	949	949			
GR	1036	100	1035.69	115	1029.71	141.68	1029.71	146.68	1035.69	173.36
GR	1035.9	185.36	1035.43	185.46	1036.23	225.36				

[illegible]	1	110								
X1	10696	8	115	162.72	404	404	404			
GR	1037.3	100	1036.35	115	1031.01	136.36	1031.01	141.36	1036.35	162.72
GR	1036.5	174.72	1036.09	174.82	1036.89	214.72				
NC				.3	.5					
X1	10588	8	132	148	108	108	108			
X3	10							1036.5	1036.5	
GR	1038	100	1037	115	1031.36	132	1031.36	148	1037	165.12
GR	1037.2	177.12	1036.74	177.22	1037.54	217.12				
SC	2.013	0.2	2.95		5	8	40	8.1	1031.48	1031.36
X1	10548	8	132.02	148.02	40	40	40			
X2			2							
X3	10							1037.11	1037.11	
BT	[illegible]	115	1037.11		165.04	1037.11				
GR	1038	100	1037.11	115	1031.48	132.02	1031.48	148.02	1037.11	165.04
GR	1037.3	177.01	1036.85	177.14	1037.65	217.04				
X1	10521	8	115	165.2	27	27	27			
GR	1038	100	1037.18	115	1031.52	137.6	1031.52	142.6	1037.18	165.2
GR	1037.4	177.2	1036.92	177.3	1037.72	217.2				
NC				.1	.3					
X1	9943	8	115	170.16	578	578	578			
[illegible]	1040	100	1038.66	115	1032.39	140.08	1032.39	145.08	1038.66	170.16
GR	1038.9	182.16	1038.4	182.26	1039.2	222.16				
QT	1	110								
NC				.3	.5					
X1	9823	8	133.14	153.14	120	120	120			
X3	10							1038.5	1038.5	
GR	1041	100	1038.98	115	1032.57	133.14	1032.57	153.14	1038.98	171.28
GR	1039.2	183.2	1038.72	183.3	1039.52	223.3				
SC	2.013	0.2	2.95		5	10	60	8.1	1032.66	1032.57
X1	9763	8	133.42	153.42	60	60	60			
X2			2							
X3	10							1039.14	1039.14	
BT	-2	115	1039.14		171.84	1039.14				
GR	1041	100	1039.14	115	1032.66	133.42	1032.66	153.42	1039.14	171.84
GR	1039.3	183.84	1038.88	183.94	1039.68	223.84				
X1	9733	8	115	172	30	30	30			
GR	1041	100	1039.21	115	1032.7	141	1032.7	146	1039.21	172
GR	1039.4	184	1038.95	184.1	1039.75	224				
NC				.1	.3					
X1	9479	8	115	168.4	254	254	254			
[illegible]	1040	100	1039.13	115	1033.08	139.2	1033.08	144.2	1039.13	168.4
[illegible]	1039.3	180.4	1038.87	180.5	1040.43	220.4				

	1	105								
C				.3	.5					
1	9359	8	127.7	151.7	120	120	120			
3	10							1038.5	1038.5	
R	1040	100	1038.81	115	1033.26	127.7	1033.26	151.7	1038.81	164.4
R	1039.0	176.4	1038.55	176.5	1040.75	215.4				
C	3.013	0.2	2.95		4	8	60	8.1	1033.35	1033.26
1	9299	8	128.1	152.1	60	60	60			
2			2							
3	10							1039	1039	
T	-3	100	1042.5		170.2	1038.89		182.2	1039.1	
R	1040	100	1039	115	1033.35	128.1	1033.35	152.1	1038.89	170.2
R	1039.1	182.2	1038.6	182.3	1040.94	222.2				
1	9269	8	115	169.76	30	30	30			
R	1040	100	1039.61	115	1033.39	139.88	1033.39	144.88	1039.61	169.76
R	1039.8	181.76	1039.95	181.86	1041.55	221.76				
C				.1	.3					
1	8410	8	115	188	859	859	859			
R	1044.8	100	1043.27	115	1034.77	149	1034.77	154	1043.27	188
R	1043.5	200	1043.01	200.1	1043.81	240				
T	1	102								
				.3	.5					
X	8283	8	143.5	159.5	127	127	127			
X3	10							1042.21	1042.21	
GR	1044.9	100	1043.46	115	1034.96	143.5	1034.96	159.5	1043.46	188
GR	1043.7	200	1043.2	200.1	1044	240				
SC	2.013	0.2	2.95		5	8	110	8.1	1035.12	1034.96
X1	8173	8	142.26	158.26	110	110	110			
X2			2							
X3	10							1043.31	1043.31	
BT	-2	115	1043.31		185.52	1043.31				
GR	1044.8	100	1043.31	115	1035.12	142.26	1035.12	158.26	1043.31	185.52
GR	1043.5	197.52	1043.05	197.62	1043.85	237.52				
X1	8141	8	115	185.12	32	32	32			
GR	1044.8	100	1043.31	115	1035.17	147.56	1035.17	152.56	1043.31	185.12
GR	1043.5	197.12	1043.05	197.22	1043.85	237.12				
NC				.1	.3					
X1	7702	8	115	169.44	566	566	566			
GR	1044	100	1042.01	115	1035.83	139.72	1035.83	144.72	1042.01	169.44
GR	1042.2	181.44	1041.75	181.54	1042.55	221.44				

	1	99								
C				.3	.5					
1	7575	8	133.6	149.6	127	127	127			
3	10							1042	1042	
R	1043	100	1042.06	115	1036.02	133.6	1036.02	149.6	1042.06	168.1
R	1042.3	180.1	1041.8	180.2	1042.6	220.2				
C	2.013	0.2	2.95		5	8	40	8.1	1036.08	1036.02
1	7535	8	131.24	147.24	40	40	40			
2			2							
3	10							1042.14	1042.14	
T	-2	115	1042.14		163.48	1042.14				
R	1044.0	100	1042.14	115	1036.08	131.24	1036.08	147.24	1042.14	163.48
R	1042.3	175.48	1041.88	175.58	1042.68	215.48				
X1	7503	8	115	168.72	32	32	32			
GR	1044	100	1042.21	115	1036.12	139.36	1036.12	144.36	1042.21	168.72
GR	1042.4	180.72	1041.95	180.82	1042.75	220.72				
NC				.1	.3					
X1	6566	8	115	166.56	937	937	937			
GR	1044.8	100	1043.35	115	1037.53	138.28	1037.53	143.28	1043.35	166.56
GR	1043.5	178.56	1043.09	178.66	1043.89	218.56				
QT	1	86								
				.3	.5					
X1	6439	8	131.3	147.3	127	127	127			
X3	10							1043	1043	
GR	1044	100	1043.17	115	1037.72	131.3	1037.72	147.3	1043.17	163.6
GR	1043.4	175.6	1042.91	175.7	1043.71	215.6				
SC	2.013	0.2	2.95		4	8	40	8.1	1037.78	1037.72
X1	6399	8	130.82	146.82	40	40	40			
X2			2							
X3	10							1043.11	1043.11	
BT	-2	115	1043.11		162.64	1043.11				
GR	1044	100	1043.11	115	1037.78	130.82	1037.78	146.82	1043.11	162.64
GR	1043.3	174.64	1042.85	174.75	1043.65	214.64				
X1	6367	8	115	163.6	32	32	32			
GR	1044	100	1043.27	115	1037.82	136.8	1037.82	141.8	1043.27	163.6
GR	1043.5	175.6	1043.01	175.7	1043.81	215.6				
QT	1	36								
NC				.1	.3					
X1	5800	8	115	159.2	567	567	567			
GR	1048.3	100	1047.25	115	1042.35	134.6	1042.35	139.6	1047.25	159.2
GR	1047.5	171.2	1046.99	171.3	1047.79	211.2				

				.3	.5					
X1	5645	8	134.79	138.29	155	155	155			
X3	10							1048.5	1048.5	
GR	1049	100	1048.49	115	1043.73	134.79	1043.73	138.29	1048.49	158.08
GR	1048.7	170.08	1048.23	170.18	1049.03	210.08				
SC	1.024	0.5	2.95		3.5	0	40	2.1	1044.09	1043.73
X1	5605	8	134.65	138.15	40	40	40			
X2			2							
X3	10							1048.88	1048.88	
BT	-2	115	1048.88		157.76	1048.88				
GR	1049.7	100	1048.88	115	1044.09	134.65	1044.09	138.15	1048.88	157.76
GR	1049.0	169.76	1048.55	169.86	1049.35	209.76				
X1	5590	8	115	156.48	15	15	15			
GR	1050.0	100	1049.05	115	1044.34	133.24	1044.34	138.24	1049.05	156.48
GR	1049.1	168.48	1048.67	168.58	1049.47	208.48				
NC				.1	.3					
X1	5573	8	115	156.48	17	17	17			
GR	1050	100	1048.57	115	1044.37	133.24	1044.37	138.24	1048.93	156.48
GR	1049.1	168.48	1048.67	168.58	1049.47	208.48				
X1	5500	8	115	156.54	73	73	73			
GR	1049.6	100	1048.93	115	1044.94	131	1044.94	136	1050.9	156.54
	1050.3	168.64	1049.83	168.74	1050.63	208.64				
X1	5350	8	115	158.92	150	150	150			
GR	1051.6	100	1050.9	115	1046.12	131	1046.12	136	1052.63	158.92
GR	1052.8	170.92	1052.37	171.02	1053.17	210.92				
X1	5200	8	115	168.68	150	150	150			
GR	1052.0	100	1051.3	115	1047.3	131	1047.3	136	1055.47	168.68
GR	1055.7	180.68	1055.21	180.78	1056	220.68				
X1	4910	8	115	168.4	290	290	290			
GR	1052.6	100	1051.88	115	1047.88	131	1047.88	136	1055.98	168.4
GR	1056.2	180.4	1055.72	180.5	1056.52	220.4				
X1	4900	8	115	157.6	10	10	10			
GR	1055.3	100	1054.6	115	1050.6	131	1050.6	136	1056	157.6
GR	1056.2	169.6	1055.74	169.7	1056.54	209.6				
X1	4390	8	115	158.64	510	510	510			
GR	1057.1	100	1056.37	115	1051.62	131	1051.62	136	1057.28	158.64
GR	1057.5	170.64	1057.02	170.74	1057.8	210.64				
QT	1	36								
NC				.3	.5					

	4360	8	131	134.5	30	30	30			
	10							1055.68	1055.68	
	1056.4	100	1055.68	115	1051.68	131	1051.68	134.5	1057.36	157.22
	1057.6	169.22	1057.1	169.32	1057.9	209.66				
	1.024	0.5	2.95		3.5	0	40	2.1	1051.76	1051.68
	4320	8	131	134.5	40	40	40			
			2							
	10							1056	1056	
	-4	100	1056.5		115	1056.5		134.5	1056.5	
		157.3	1057.46							
	1056.5	100	1055.76	115	1051.76	131	1051.76	134.5	1057.46	157.3
	1057.7	169.3	1057.2	169.4	1058	209.3				
	4310	8	115	158.8	10	10	10			
	1056.5	100	1055.78	115	1051.78	131	1051.78	136	1057.48	158.8
	1057.7	170.8	1057.22	170.9	1058.02	210.8				
				.1	.3					
	4000	8	115	154.6	310	310	310			
	1057.1	100	1056.4	115	1052.4	131	1052.4	136	1058.3	154.6
	1058.5	166.6	1058.04	166.7	1058.84	206.6				
	3910	8	115	160.08	90	90	90			
	1058.9	100	1058.24	115	1052.58	131	1052.58	136	1058.6	160.08
	1058.8	172.08	1058.34	172.08	1059.14	212.08				
	3900	8	115	156.84	10	10	10			
	1059.1	100	1058.44	115	1054.44	131	1054.44	136	1058.65	156.84
	1058.9	168.84	1058.4	168.94	1059.2	208.84				
X1	3600	8	115	151.44	300	300	300			
GR	1061.4	100	1059.96	115	1056.03	130.72	1056.03	135.72	1059.96	151.44
GR	1060.2	163.44	1059.7	163.54	1060.5	203.44				
X1	3108	8	115	160.88	492	492	492			
GR	1065.2	100	1063.7	115	1058.59	135.44	1058.59	140.44	1063.7	160.88
GR	1063.9	172.88	1063.4	172.98	1064.24	212.9				
NC				.3	.5					
X1	3055	6	140.07	143.57	53	53	53			
X3	10							1065	1065	
GR	1065.2	100	1065.25	115	1058.79	140.07	1058.79	143.57	1064.88	168.64
GR	1064.3	220.64								
SC	1.024	.5	2.95		3.5	0	110	2.1	1059.36	1058.79
X1	2945	6	138.91	142.41	110	110	110			
X2			2							
X3	10							1065.46	1065.11	
BT	-2	115	1065.46		166.32	1065.11				
GR	1065.4	100	1065.46	115	1059.36	138.91	1059.36	142.41	1065.11	166.32
	1064.7	218.32								

	2935	6	115	153.36	10	10	10			
R	1063.5	100	1063.54	115	1059.37	131.65	1059.37	136.68	1063.54	153.36
R	1064.7	205.36								

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


*PROF 1

CHV=     .100 CEHV=     .300
*SECNO 15759.000
 15759.000     2.27   1019.41      .00   1019.50   1019.56      .15      .00      .00   1018.00
     152.0     55.6      92.3      4.1      42.0      23.9      3.7       .0       .0   1018.00
       .00     1.32      3.87     1.11      .045      .025     .045     .000   1017.14   1053.90
   .001903       0.        0.       0.         0         0        6      .00    69.32   1123.22


FLOW DISTRIBUTION FOR SECNO=  15759.00         CWSEL=   1019.41

STA=    1054.    1060.    1105.    1118.    1123.
  PER Q=      .4     36.2     60.7      2.7
   AREA=     1.2     40.8     23.9      3.7
    VEL=      .5      1.3      3.9      1.1
  DEPTH=      .2       .9      1.8       .7

*SECNO 15416.000

3 ARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .63

 15416.000     1.84   1020.24      .00      .00   1020.61      .37      .99      .07   1022.00
     152.0       .0     152.0       .0       .0      31.1       .0       .4       .4   1024.00
       .02      .00      4.89      .00     .000      .025     .000     .000   1018.40   1706.84
   .004856     343.      343.     343.        2         0        0      .00    23.74   1730.58


FLOW DISTRIBUTION FOR SECNO=  15416.00         CWSEL=   1020.24

STA=    1707.    1744.
  PER Q=    100.0
   AREA=     31.1
    VEL=      4.9
  DEPTH=      1.3

*SECNO 14916.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.81

 14916.000     2.61   1021.71      .00      .00   1021.89      .18     1.26      .02   1022.00
     156.0       .0     156.0       .0       .0      45.5       .0       .8       .6   1024.00
       .06      .00      3.42      .00     .000      .025     .000     .000   1019.10   1145.90
   .001564     500.      500.     500.        2         0        0      .00    25.03   1170.93
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
ME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

FLOW DISTRIBUTION FOR SECNO= 14916.00 CWSEL= 1021.71

STA= 1146. 1177.
PER Q= 100.0
AREA= 45.5
VEL= 3.4
DEPTH= 1.8

*SECNO 14416.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.93

14416.000	2.45	1022.09	.00	.00	1022.11	.03	.20	.02	1023.00
156.0	.0	156.0	.0	.0	121.4	.0	1.8	1.1	1024.00
.17	.00	1.28	.00	.000	.025	.000	.000	1019.64	1247.80
.000182	500.	500.	500.	3	0	0	.00	59.19	1306.98

FLOW DISTRIBUTION FOR SECNO= 14416.00 CWSEL= 1022.09

1248. 1314.
Q= 100.0
AREA= 121.4
VEL= 1.3
DEPTH= 2.1

*SECNO 13916.000

13916.000	2.00	1022.20	.00	.00	1022.23	.04	.12	.00	1024.00
156.0	.0	156.0	.0	.0	103.4	.0	3.1	1.8	1024.00
.26	.00	1.51	.00	.000	.025	.000	.000	1020.20	1492.13
.000307	500.	500.	500.	2	0	0	.00	58.65	1550.77

FLOW DISTRIBUTION FOR SECNO= 13916.00 CWSEL= 1022.20

STA= 1492. 1556.
PER Q= 100.0
AREA= 103.4
VEL= 1.5
DEPTH= 1.8

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

CHV= .100 CEHV= .300
SECNO 13531.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .59

13531.000	1.46	1022.36	.00	.00	1022.44	.07	.19	.01	1025.00
161.0	.0	161.0	.0	.0	74.0	.0	3.9	2.3	1026.61
.31	.00	2.17	.00	.000	.025	.000	.000	1020.90	104.55
.000937	385.	385.	385.	2	0	0	.00	56.28	160.84

FLOW DISTRIBUTION FOR SECNO= 13531.00 CWSEL= 1022.36

STA= 105. 177.
PER Q= 100.0
AREA= 74.0
VEL= 2.2
DEPTH= 1.3

CCHV= .300 CEHV= .500
[illegible] 13471.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .57

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1026.50 ELREA= 1026.50

13471.000	1.37	1022.37	.00	.00	1022.61	.24	.09	.08	1021.00
161.0	.0	161.0	.0	.0	41.1	.0	3.9	2.4	1021.00
.31	.00	3.92	.00	.000	.025	.000	.000	1021.00	116.00
.002851	60.	60.	60.	2	0	0	.00	30.00	146.00

FLOW DISTRIBUTION FOR SECNO= 13471.00 CWSEL= 1022.37

STA= 116. 146.
PER Q= 100.0
AREA= 41.1
VEL= 3.9
DEPTH= 1.4

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

PECIAL CULVERT

C	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	3	.013	.20	2.95	.00	4.00	10.00	110.00	8	1	1021.10	1021.00

HART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
CALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

SECNO 13361.000

PECIAL CULVERT OUTLET CONTROL
GIC = 1022.613 EGOC = 1022.769 PCWSE= 1022.370 ELTRD= 1026.970

PECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1022.61	1022.77	.16	0.	161.	3.660	120.0	1026.97	0.

34 VERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1026.97 ELREA= 1026.97

13361.000	1.46	1022.56	.00	.00	1022.77	.21	.16	.00	1021.10
161.0	.0	161.0	.0	.0	44.0	.0	4.1	2.4	1021.10
.32	.00	3.66	.00	.000	.025	.000	.000	1021.10	122.70
.002275	110.	110.	110.	2	0	0	.00	30.00	152.70

FLOW DISTRIBUTION FOR SECNO= 13361.00 CWSEL= 1022.56

STA= 123. 153.
PER Q= 100.0
AREA= 44.0
VEL= 3.7
DEPTH= 1.5

CCHV= .100 CEHV= .300
*SECNO 13339.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

13339.000	1.98	1023.18	1023.18	.00	1023.80	.62	.09	.12	1026.12
161.0	.0	161.0	.0	.0	25.5	.0	4.1	2.5	1026.12
.32	.00	6.32	.00	.000	.025	.000	.000	1021.20	126.79
08892	22.	22.	22.	20	11	0	.00	20.80	147.59

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

LOW DISTRIBUTION FOR SECNO=  13339.00        CWSEL=   1023.18

TA=     127.     159.
 PER Q=    100.0
  AREA=     25.5
   VEL=      6.3
 DEPTH=      1.2

SECNO 13270.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.52

 13270.000     2.39   1023.88      .00      .00   1024.21      .33      .39      .03   1026.04
     161.0       .0     161.0       .0       .0     34.7       .0      4.1      2.5   1026.04
       .33      .00      4.64      .00     .000     .025     .000     .000  1021.49    123.63
   .003858      69.       69.      69.        2        0        0      .00    24.08    147.71

FLOW DISTRIBUTION FOR SECNO=  13270.00        CWSEL=   1023.88

S     124.     156.
 Q=    100.0
 AREA=     34.7
  VEL=      4.6
 DEPTH=      1.4

*SECNO 12224.000
 12224.000     2.29   1028.28      .00      .00   1028.66      .39      4.43      .02   1032.76
     161.0       .0     161.0       .0       .0     32.3       .0      4.9      3.1   1032.76
       .39      .00      4.98      .00     .000     .025     .000     .000  1025.99    132.94
   .004682    1046.     1046.    1046.        3        0        0      .00    23.28    156.22

FLOW DISTRIBUTION FOR SECNO=  12224.00        CWSEL=   1028.28

STA=     133.     174.
 PER Q=    100.0
  AREA=     32.3
   VEL=      5.0
 DEPTH=      1.4
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  SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
            QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
  ..ME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


CHV=     .300 CEHV=     .500
SECNO 12116.000

302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.61


.495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=     1032.00 ELREA=     1032.00

12116.000    2.30   1028.75      .00      .00   1028.96      .21      .25      .05   1026.45
    135.0      .0     135.0      .0       .0      36.7       .0      5.0      3.1   1026.45
      .39     .00      3.68     .00     .000      .025     .000     .000  1026.45    133.36
  .001263     108.     108.     108.        1         0        0      .00    16.00    149.36


'LOW DISTRIBUTION FOR SECNO=  12116.00         CWSEL=   1028.75

'TA=     133.     149.
 PER Q=    100.0
  AREA=     36.7
  VEL=       3.7
  H=         2.3


SPECIAL CULVERT

SC  CUNO      CUNV      ENTLC     COFQ      RDLEN     RISE      SPAN      CULVLN    CHRT      SCL       ELCHU     ELCHD
     2         .013      .20      2.95      .00       5.00      8.00      40.00     8         1         1026.61   1026.45

CHART  8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE  1 - WINGWALLS FLARED 30 TO 75 DEGREES

*SECNO 12076.000

SPECIAL CULVERT OUTLET CONTROL
EGIC =   1028.652  EGOC =   1028.821  PCWSE=   1028.754  ELTRD=   1033.150

5150, EG OF  1028.82 LESS THAN XEG OF  1028.96
SPECIAL CULVERT

    EGIC      EGOC       H4     QWEIR     QCULV      VCH     ACULV     ELTRD    WEIRLN
  1028.65   1028.82      .00       0.      135.     4.021     80.0   1033.15       0.


.495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=     1033.15 ELREA=     1033.15

1    .000      2.10   1028.71      .00      .00   1028.96      .25      .00      .00   1026.61
    135.0      .0     135.0      .0       .0      33.6       .0      5.0      3.1   1026.61
      .40     .00      4.02     .00     .000      .025     .000     .000  1026.61    133.16
  .001704      40.      40.      40.        1         0        0      .00    16.00    149.16
```

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

LOW DISTRIBUTION FOR SECNO= 12076.00 CWSEL= 1028.71

STA= 133. 149.
PER Q= 100.0
AREA= 33.6
VEL= 4.0
DEPTH= 2.1

SECNO 12049.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .59

12049.000	2.10	1028.73	.00	.00	1029.09	.36	.07	.06	1033.22
135.0	.0	135.0	.0	.0	28.0	.0	5.1	3.1	1033.22
.40	.00	4.83	.00	.000	.025	.000	.000	1026.63	132.80
.004837	27.	27.	27.	2	0	0	.00	21.64	154.44

FLOW DISTRIBUTION FOR SECNO= 12049.00 CWSEL= 1028.73

STA= 133. 172.
PER Q= 100.0
AREA= 28.0
VEL= 4.8
DEPTH= 1.3

CCHV= .100 CEHV= .300
*SECNO 11100.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.40

11100.000	2.37	1032.08	.00	.00	1032.29	.21	3.18	.02	1035.69
135.0	.0	135.0	.0	.0	36.9	.0	5.8	3.7	1035.69
.47	.00	3.66	.00	.000	.025	.000	.000	1029.71	131.11
.002458	949.	949.	949.	4	0	0	.00	26.14	157.25

FLOW DISTRIBUTION FOR SECNO= 11100.00 CWSEL= 1032.08

STA= 131. 173.
PER Q= 100.0
AREA= 36.9
VEL= 3.7
DEPTH= 1.4

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


*SECNO 10696.000
 10696.000     2.13   1033.14       .00       .00   1033.37       .23      1.08       .01   1036.35
     110.0       .0     110.0        .0        .0      28.9        .0       6.1       3.9   1036.35
       .50      .00      3.81       .00      .000      .025      .000      .000   1031.01    127.82
   .002958     404.      404.      404.         3         0         0       .00     22.07    149.90


FLOW DISTRIBUTION FOR SECNO=  10696.00         CWSEL=   1033.14

STA=     128.     163.
  PER Q=    100.0
   AREA=     28.9
    VEL=      3.8
  DEPTH=      1.3

CCHV=     .300 CEHV=     .500
*SECNO 10588.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.55

34   VERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      1036.50 ELREA=      1036.50

 10588.000     2.04   1033.40       .00       .00   1033.58       .18       .20       .01   1031.36
     110.0       .0     110.0        .0        .0      32.7        .0       6.2       3.9   1031.36
       .51      .00      3.36       .00      .000      .025      .000      .000   1031.36    132.00
   .001233     108.      108.      108.         2         0         0       .00     16.00    148.00


FLOW DISTRIBUTION FOR SECNO=  10588.00         CWSEL=   1033.40

STA=     132.     148.
  PER Q=    100.0
   AREA=     32.7
    VEL=      3.4
  DEPTH=      2.0
```

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

PECIAL CULVERT

C	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	2	.013	.20	2.95	.00	5.00	8.00	40.00	8	1	1031.48	1031.36

HART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
CALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

SECNO 10548.000

PECIAL CULVERT OUTLET CONTROL
GIC = 1033.257 EGOC = 1033.645 PCWSE= 1033.405 ELTRD= 1037.110

PECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1033.26	1033.65	.06	0.	110.	3.472	80.0	1037.11	0.

34. /ERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1037.11 ELREA= 1037.11

10548.000	1.98	1033.46	.00	.00	1033.65	.19	.06	.00	1031.48
110.0	.0	110.0	.0	.0	31.7	.0	6.2	3.9	1031.48
.51	.00	3.47	.00	.000	.025	.000	.000	1031.48	132.02
.001372	40.	40.	40.	16.00	2	0	0	.00	16.00	148.02

FLOW DISTRIBUTION FOR SECNO= 10548.00 CWSEL= 1033.46

STA=	132.	148.
PER Q=	100.0	
AREA=	31.7	
VEL=	3.5	
DEPTH=	2.0	

*SECNO 10521.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .55

10521.000	1.94	1033.46	.00	.00	1033.77	.31	.06	.06	1037.18
110.0	.0	110.0	.0	.0	24.7	.0	6.2	4.0	1037.18
.51	.00	4.45	.00	.000	.025	.000	.000	1031.52	129.86
.004505	27.	27.	27.	2	0	0	.00	20.49	150.34

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

FLOW DISTRIBUTION FOR SECNO= 10521.00 CWSEL= 1033.46

STA= 130. 165.
PER Q= 100.0
AREA= 24.7
VEL= 4.5
DEPTH= 1.2

CCHV= .100 CEHV= .300
*SECNO 9943.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.85

9943.000	2.56	1034.95	.00	.00	1035.07	.12	1.28	.02	1038.66
110.0	.0	110.0	.0	.0	39.0	.0	6.6	4.3	1038.66
.57	.00	2.82	.00	.000	.025	.000	.000	1032.39	129.85
.001320	578.	578.	578.	2	0	0	.00	25.47	155.31

FLOW DISTRIBUTION FOR SECNO= 9943.00 CWSEL= 1034.95

STA= 130. 170.
PER Q= 100.0
AREA= 39.0
VEL= 2.8
DEPTH= 1.5

CCHV= .300 CEHV= .500
*SECNO 9823.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.83

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1038.50 ELREA= 1038.50

9823.000	2.52	1035.09	.00	.00	1035.16	.07	.08	.01	1032.57
110.0	.0	110.0	.0	.0	50.4	.0	6.7	4.3	1032.57
.59	.00	2.18	.00	.000	.025	.000	.000	1032.57	133.14
.000393	120.	120.	120.	2	0	0	.00	20.00	153.14

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

FLOW DISTRIBUTION FOR SECNO= 9823.00 CWSEL= 1035.09

STA= 133. 153.
PER Q= 100.0
AREA= 50.4
VEL= 2.2
DEPTH= 2.5

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	2	.013	.20	2.95	.00	5.00	10.00	60.00	8	1	1032.66	1032.57

CHART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

*SECNO 9763.000

SPECIAL CULVERT OUTLET CONTROL
= 1034.189 EGOC = 1035.191 PCWSE= 1035.090 ELTRD= 1039.140

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1034.19	1035.19	.03	0.	110.	2.242	100.0	1039.14	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1039.14 ELREA= 1039.14

9763.000	2.45	1035.11	.00	.00	1035.19	.08	.03	.00	1032.66
110.0	.0	110.0	.0	.0	49.1	.0	6.8	4.4	1032.66
.59	.00	2.24	.00	.000	.025	.000	.000	1032.66	133.42
.000430	60.	60.	60.	2	0	0	.00	20.00	153.42

FLOW DISTRIBUTION FOR SECNO= 9763.00 CWSEL= 1035.11

STA= 133. 153.
PER Q= 100.0
AREA= 49.1
VEL= 2.2
DEPTH= 2.5

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


*SECNO 9733.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .49

 9733.000     2.40   1035.10       .00       .00   1035.25       .15       .02       .04   1039.21
    110.0       .0     110.0        .0        .0      35.0        .0       6.8       4.4   1039.21
      .60      .00      3.15       .00      .000      .025      .000      .000   1032.70    131.42
  .001766      30.       30.       30.         2         0         0       .00     24.16    155.58


FLOW DISTRIBUTION FOR SECNO=   9733.00          CWSEL=   1035.10

STA=     131.     172.
  PER Q=    100.0
   AREA=     35.0
    VEL=      3.1
  DEPTH=      1.4

CCHV=     .100 CEHV=     .300
*SECNO 9479.000
 9479.000     2.46   1035.54       .00       .00   1035.68       .14       .43       .00   1039.13
    110.0       .0     110.0        .0        .0      36.3        .0       7.0       4.5   1039.13
      .62      .00      3.03       .00      .000      .025      .000      .000   1033.08    129.39
  .001597     254.      254.      254.         2         0         0       .00     24.62    154.01


FLOW DISTRIBUTION FOR SECNO=   9479.00          CWSEL=   1035.54

STA=     129.     168.
  PER Q=    100.0
   AREA=     36.3
    VEL=      3.0
  DEPTH=      1.5

CCHV=     .300 CEHV=     .500
*SECNO 9359.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.34
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1038.50 ELREA= 1038.50

9359.000	2.46	1035.72	.00	.00	1035.77	.05	.07	.03	1033.26
105.0	.0	105.0	.0	.0	59.3	.0	7.2	4.6	1033.26
.64	.00	1.77	.00	.000	.025	.000	.000	1033.26	127.70
.000265	120.	120.	120.	1	0	0	.00	24.00	151.70

FLOW DISTRIBUTION FOR SECNO= 9359.00 CWSEL= 1035.72

STA=	128.	152.
PER Q=	100.0	
AREA=	59.3	
VEL=	1.8	
DEPTH=	2.5	

SPECIAL CULVERT

SECNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	.013	.20	2.95	.00	4.00	8.00	60.00	8	1	1033.35	1033.26

CHART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

*SECNO 9299.000

SPECIAL CULVERT OUTLET CONTROL
EGIC = 1034.665 EGOC = 1035.793 PCWSE= 1035.724 ELTRD= 1038.890

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1034.67	1035.79	.02	0.	105.	1.830	96.0	1038.89	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1039.00 ELREA= 1039.00

9299.000	2.39	1035.74	.00	.00	1035.79	.05	.02	.00	1033.35
105.0	.0	105.0	.0	.0	57.4	.0	7.3	4.6	1033.35
.65	.00	1.83	.00	.000	.025	.000	.000	1033.35	128.10
.000297	60.	60.	60.	2	0	0	.00	24.00	152.10

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

FLOW DISTRIBUTION FOR SECNO= 9299.00 CWSEL= 1035.74

STA= 128. 152.
PER Q= 100.0
AREA= 57.4
VEL= 1.8
DEPTH= 2.4

*SECNO 9269.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .40

9269.000	2.32	1035.71	.00	.00	1035.86	.16	.02	.05	1039.61
105.0	.0	105.0	.0	.0	33.0	.0	7.3	4.6	1039.61
.65	.00	3.18	.00	.000	.025	.000	.000	1033.39	130.61
.001876	30.	30.	30.	2	0	0	.00	23.53	154.15

FLOW DISTRIBUTION FOR SECNO= 9269.00 CWSEL= 1035.71

S[illegible] 131. 170.
[illegible]= 100.0
AREA= 33.0
VEL= 3.2
DEPTH= 1.4

CCHV= .100 CEHV= .300
*SECNO 8410.000

8410.000	2.42	1037.19	.00	.00	1037.33	.14	1.46	.00	1043.27
105.0	.0	105.0	.0	.0	35.5	.0	8.0	5.1	1043.27
.73	.00	2.96	.00	.000	.025	.000	.000	1034.77	139.33
.001548	859.	859.	859.	3	0	0	.00	24.35	163.67

FLOW DISTRIBUTION FOR SECNO= 8410.00 CWSEL= 1037.19

STA= 139. 188.
PER Q= 100.0
AREA= 35.5
VEL= 3.0
DEPTH= 1.5

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

CHV= .300 CEHV= .500
*SECNO 8283.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.52

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1042.21 ELREA= 1042.21

8283.000	2.38	1037.34	.00	.00	1037.45	.11	.12	.01	1034.96
102.0	.0	102.0	.0	.0	38.1	.0	8.1	5.2	1034.96
.74	.00	2.68	.00	.000	.025	.000	.000	1034.96	143.50
.000636	127.	127.	127.	2	0	0	.00	16.00	159.50

FLOW DISTRIBUTION FOR SECNO= 8283.00 CWSEL= 1037.34

STA= 144. 160.
PER Q= 100.0
AREA= 38.1
VEL= 2.7
H= 2.4

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	2	.013	.20	2.95	.00	5.00	8.00	110.00	8	1	1035.12	1034.96

CHART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

*SECNO 8173.000

SPECIAL CULVERT OUTLET CONTROL
EGIC = 1036.812 EGOC = 1037.517 PCWSE= 1037.343 ELTRD= 1043.310

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1036.81	1037.52	.06	0.	102.	2.801	80.0	1043.31	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1043.31 ELREA= 1043.31

3.000	2.28	1037.40	.00	.00	1037.52	.12	.06	.00	1035.12
02.0	.0	102.0	.0	.0	36.4	.0	8.2	5.2	1035.12
.75	.00	2.80	.00	.000	.025	.000	.000	1035.12	142.26
.000742	110.	110.	110.	2	0	0	.00	16.00	158.26

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

FLOW DISTRIBUTION FOR SECNO= 8173.00 CWSEL= 1037.40

STA= 142. 158.
PER Q= 100.0
AREA= 36.4
VEL= 2.8
DEPTH= 2.3

*SECNO 8141.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .61

8141.000	2.24	1037.41	.00	.00	1037.58	.16	.04	.02	1043.31
102.0	.0	102.0	.0	.0	31.4	.0	8.2	5.2	1043.31
.76	.00	3.24	.00	.000	.025	.000	.000	1035.17	138.57
.002023	32.	32.	32.	0	0	0	.00	22.98	161.55

FLOW DISTRIBUTION FOR SECNO= 8141.00 CWSEL= 1037.41

STA= 139. 185.
PER Q= 100.0
AREA= 31.4
VEL= 3.2
DEPTH= 1.4

CCHV= .100 CEHV= .300
*SECNO 7702.000

7702.000	2.52	1038.35	.00	.00	1038.46	.11	.88	.01	1042.01
102.0	.0	102.0	.0	.0	37.9	.0	8.6	5.5	1042.01
.82	.00	2.69	.00	.000	.025	.000	.000	1035.83	129.66
.001227	566.	566.	566.	2	0	0	.00	25.12	154.78

FLOW DISTRIBUTION FOR SECNO= 7702.00 CWSEL= 1038.35

STA= 130. 169.
PER Q= 100.0
AREA= 37.9
VEL= 2.7
DEPTH= 1.5

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

CCHV= .300 CEHV= .500
*SECNO 7575.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.45

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1042.00 ELREA= 1042.00

7575.000	2.44	1038.46	.00	.00	1038.56	.10	.10	.00	1036.02
99.0	.0	99.0	.0	.0	39.1	.0	8.8	5.6	1036.02
.83	.00	2.53	.00	.000	.025	.000	.000	1036.02	133.60
.000551	127.	127.	127.	2	0	0	.00	16.00	149.60

FLOW DISTRIBUTION FOR SECNO= 7575.00 CWSEL= 1038.46

STA= 134. 150.
PER Q= 100.0
AREA= 39.1
VEL= 2.5
H= 2.4

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	2	.013	.20	2.95	.00	5.00	8.00	40.00	8	1	1036.08	1036.02

CHART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

*SECNO 7535.000

SPECIAL CULVERT OUTLET CONTROL
EGIC = 1037.737 EGOC = 1038.595 PCWSE= 1038.463 ELTRD= 1042.140

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1037.74	1038.60	.03	0.	99.	2.563	80.0	1042.14	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1042.14 ELREA= 1042.14

5.000	2.41	1038.49	.00	.00	1038.60	.10	.03	.00	1036.08
99.0	.0	99.0	.0	.0	38.6	.0	8.8	5.6	1036.08
.83	.00	2.56	.00	.000	.025	.000	.000	1036.08	131.24
.000574	40.	40.	40.	2	0	0	.00	16.00	147.24

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


FLOW DISTRIBUTION FOR SECNO=   7535.00         CWSEL=   1038.49

STA=     131.     147.
  PER Q=    100.0
   AREA=     38.6
    VEL=      2.6
  DEPTH=      2.4

*SECNO 7503.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .63

  7503.000      2.39   1038.51       .00       .00   1038.63       .13       .03       .01   1042.21
     99.0        .0      99.0        .0        .0      34.8        .0       8.8       5.6   1042.21
       .84      .00      2.84       .00      .000      .025      .000      .000   1036.12    129.79
   .001447      32.       32.       32.         0         0         0       .00     24.13    153.93


FLOW DISTRIBUTION FOR SECNO=   7503.00         CWSEL=   1038.51

S[illegible]     130.     169.
    [illegible]Q=    100.0
   AREA=     34.8
    VEL=      2.8
  DEPTH=      1.4

CCHV=     .100 CEHV=     .300
*SECNO 6566.000
  6566.000      2.37   1039.90       .00       .00   1040.03       .13      1.39       .00   1043.35
     99.0        .0      99.0        .0        .0      34.2        .0       9.6       6.1   1043.35
       .93      .00      2.89       .00      .000      .025      .000      .000   1037.53    128.82
   .001520     937.      937.      937.         3         0         0       .00     23.92    152.74


FLOW DISTRIBUTION FOR SECNO=   6566.00         CWSEL=   1039.90

STA=     129.     167.
  PER Q=    100.0
   AREA=     34.2
    VEL=      2.9
  DEPTH=      1.4
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
ME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CHV= .300 CEHV= .500
SECNO 6439.000

302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.55

495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1043.00 ELREA= 1043.00

6439.000	2.34	1040.06	.00	.00	1040.14	.08	.10	.01	1037.72
86.0	.0	86.0	.0	.0	37.5	.0	9.7	6.2	1037.72
.94	.00	2.29	.00	.000	.025	.000	.000	1037.72	131.30
.000479	127.	127.	127.	2	0	0	.00	16.00	147.30

LOW DISTRIBUTION FOR SECNO= 6439.00 CWSEL= 1040.06

TA= 131. 147.
PER Q= 100.0
AREA= 37.5
VEL= 2.3
H= 2.3

PECIAL CULVERT

C	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	2	.013	.20	2.95	.00	4.00	8.00	40.00	8	1	1037.78	1037.72

HART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
CALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

SECNO 6399.000

PECIAL CULVERT OUTLET CONTROL
GIC = 1039.294 EGOC = 1040.171 PCWSE= 1040.063 ELTRD= 1043.110

PECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1039.29	1040.17	.03	0.	86.	2.329	64.0	1043.11	0.

495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1043.11 ELREA= 1043.11

.000	2.31	1040.09	.00	.00	1040.17	.08	.03	.00	1037.78
36.0	.0	86.0	.0	.0	36.9	.0	9.7	6.2	1037.78
.95	.00	2.33	.00	.000	.025	.000	.000	1037.78	130.82
.000504	40.	40.	40.	2	0	0	.00	16.00	146.82

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


FLOW DISTRIBUTION FOR SECNO=   6399.00         CWSEL=   1040.09

STA=     131.     147.
  PER Q=    100.0
   AREA=     36.9
    VEL=      2.3
  DEPTH=      2.3

*SECNO 6367.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .61

  6367.000      2.28   1040.10       .00       .00   1040.21       .11       .02       .01   1043.27
     86.0        .0      86.0        .0        .0      32.3        .0       9.7       6.2   1043.27
       .95      .00      2.67       .00      .000      .025      .000      .000   1037.82    127.67
   .001342      32.       32.       32.         0         0         0       .00     23.26    150.93


FLOW DISTRIBUTION FOR SECNO=   6367.00         CWSEL=   1040.10

[illegible]     128.     164.
  [illegible]Q=    100.0
  AREA=     32.3
    VEL=      2.7
  DEPTH=      1.4

CCHV=     .100 CEHV=     .300
*SECNO 5800.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  5800.000       .91   1043.26   1043.26       .00   1043.59       .33      1.17       .06   1047.25
     36.0        .0      36.0        .0        .0       7.9        .0      10.0       6.5   1047.25
       .98      .00      4.58       .00      .000      .025      .000      .000   1042.35    130.96
   .011002      567.      567.      567.        20        18         0       .00     12.28    143.24


FLOW DISTRIBUTION FOR SECNO=   5800.00         CWSEL=   1043.26

STA=     131.     159.
  PER Q=    100.0
   AREA=      7.9
    VEL=      4.6
  DEPTH=       .6
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
             QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


CCHV=     .300 CEHV=     .500
*SECNO 5645.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=     1048.50 ELREA=     1048.50

  5645.000     1.48   1045.21   1045.21      .00   1045.96      .75      1.45      .21   1043.73
     36.0       .0      36.0       .0       .0       5.2       .0      10.0      6.5   1043.73
      .99      .00      6.95      .00     .000      .025     .000      .000   1043.73    134.79
   .008094     155.     155.      155.        2        14        0       .00      3.50    138.29


FLOW DISTRIBUTION FOR SECNO=   5645.00         CWSEL=   1045.21

STA=     135.     138.
  PER Q=    100.0
   AREA=      5.2
    VEL=      6.9
  DEPTH=      1.5


SPECIAL CULVERT

SC  CUNO      CUNV      ENTLC     COFQ      RDLEN     RISE      SPAN      CULVLN    CHRT      SCL       ELCHU     ELCHD
    1          .024      .50      2.95      .00       3.50      .00       40.00     2         1       1044.09   1043.73

CHART  2 - CORRUGATED METAL PIPE CULVERT
SCALE  1 - HEADWALL

*SECNO 5605.000

SPECIAL CULVERT OUTLET CONTROL
EGIC =   1046.789  EGOC =   1047.022  PCWSE=   1045.211  ELTRD=   1048.880


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.74

SPECIAL CULVERT

     EGIC      EGOC       H4     QWEIR     QCULV      VCH     ACULV     ELTRD    WEIRLN
   1046.79   1047.02     1.06       0.       36.    3.795       9.6   1048.88       0.
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  SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
            QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
  ME        VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=     1048.88 ELREA=     1048.88

 5605.000      2.71   1046.80       .00       .00   1047.02       .22      1.06       .00   1044.09
     36.0        .0      36.0        .0        .0       9.5        .0      10.0       6.5   1044.09
      .99       .00      3.79       .00      .000      .025      .000      .000   1044.09    134.65
  .001079       40.       40.       40.         2         0         0       .00      3.50    138.15


FLOW DISTRIBUTION FOR SECNO=   5605.00         CWSEL=   1046.80

STA=     135.     138.
  PER Q=    100.0
   AREA=      9.5
    VEL=      3.8
  DEPTH=      2.7

*SECNO 5590.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.16

     .000      2.74   1047.08       .00       .00   1047.09       .01       .00       .06   1049.05
     36.0        .0      36.0        .0        .0      42.7        .0      10.0       6.5   1049.05
     1.00       .00       .84       .00      .000      .025      .000      .000   1044.34    122.63
  .000108       15.       15.       15.         2         0         0       .00     26.21    148.85


FLOW DISTRIBUTION FOR SECNO=   5590.00         CWSEL=   1047.08

STA=     123.     156.
  PER Q=    100.0
   AREA=     42.7
    VEL=       .8
  DEPTH=      1.6

CCHV=     .100 CEHV=     .300
*SECNO 5573.000
 5573.000      2.71   1047.08       .00       .00   1047.09       .01       .00       .00   1048.57
     36.0        .0      36.0        .0        .0      44.4        .0      10.0       6.5   1048.93
     1.00       .00       .81       .00      .000      .025      .000      .000   1044.37    121.43
  .000102       17.       17.       17.         0         0         0       .00     27.68    149.11
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  SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
            QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
            VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


FLOW DISTRIBUTION FOR SECNO=   5573.00         CWSEL=   1047.08

STA=     121.     156.
  PER Q=    100.0
   AREA=     44.4
    VEL=       .8
  DEPTH=      1.6

*SECNO 5500.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .55

  5500.000      2.14   1047.08       .00       .00   1047.11       .03       .01       .00   1048.93
     36.0        .0      36.0        .0        .0      28.0        .0      10.1       6.5   1050.90
      1.02       .00      1.29       .00      .000      .025      .000      .000   1044.94    122.38
   .000333      73.       73.       73.         0         0         0       .00     21.02    143.40


FLOW DISTRIBUTION FOR SECNO=   5500.00         CWSEL=   1047.08

S     122.     157.
    Q=    100.0
   AREA=     28.0
    VEL=      1.3
  DEPTH=      1.3

*SECNO 5350.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  5350.000       .94   1047.06   1047.06       .00   1047.40       .34       .14       .09   1050.90
     36.0        .0      36.0        .0        .0       7.7        .0      10.2       6.6   1052.63
      1.03       .00      4.68       .00      .000      .025      .000      .000   1046.12    127.87
   .010871     150.      150.      150.        20        14         0       .00     11.43    139.29


FLOW DISTRIBUTION FOR SECNO=   5350.00         CWSEL=   1047.06

STA=     128.     159.
  PER Q=    100.0
   AREA=      7.7
    VEL=      4.7
  DEPTH=       .7
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  SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
            QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
            VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


SECNO 5200.000
 5200.000      1.07   1048.37       .00       .00   1048.57       .20      1.16       .01   1051.30
    36.0        .0      36.0        .0        .0      9.9        .0      10.2       6.6   1055.47
    1.04       .00      3.63       .00      .000      .025      .000      .000   1047.30    126.72
  .005803      150.      150.      150.         3         0         0       .00     13.55    140.28


LOW DISTRIBUTION FOR SECNO=   5200.00         CWSEL=   1048.37

TA=     127.     169.
 PER Q=    100.0
  AREA=      9.9
   VEL=      3.6
 DEPTH=       .7

SECNO 4910.000

302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.86

 4910.000      1.45   1049.33       .00       .00   1049.41       .08       .82       .01   1051.88
    36.0        .0      36.0        .0        .0      15.6        .0      10.3       6.7   1055.98
    1.08       .00      2.31       .00      .000      .025      .000      .000   1047.88    125.22
  .001682      290.      290.      290.         5         0         0       .00     16.57    141.78


LOW DISTRIBUTION FOR SECNO=   4910.00         CWSEL=   1049.33

STA=     125.     168.
 PER Q=    100.0
  AREA=     15.6
   VEL=      2.3
 DEPTH=       .9

SECNO 4900.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 4900.000       .91   1051.51   1051.51       .00   1051.84       .33       .03       .07   1054.60
    36.0        .0      36.0        .0        .0       7.9        .0      10.3       6.7   1056.00
    1.08       .00      4.58       .00      .000      .025      .000      .000   1050.60    127.36
  .011054       10.       10.       10.        20        14         0       .00     12.27    139.64
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
[illegible]E	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

FLOW DISTRIBUTION FOR SECNO= 4900.00 CWSEL= 1051.51

STA= 127. 158.
PER Q= 100.0
AREA= 7.9
VEL= 4.6
DEPTH= .6

*SECNO 4390.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.99

4390.000	1.59	1053.21	.00	.00	1053.28	.07	1.42	.03	1056.37
36.0	.0	36.0	.0	.0	17.2	.0	10.4	6.9	1057.28
1.14	.00	2.10	.00	.000	.025	.000	.000	1051.62	125.66
.001237	510.	510.	510.	5	0	0	.00	16.68	142.34

FLOW DISTRIBUTION FOR SECNO= 4390.00 CWSEL= 1053.21

[illegible] 126. 159.
[illegible]Q= 100.0
AREA= 17.2
VEL= 2.1
DEPTH= 1.0

CCHV= .300 CEHV= .500
*SECNO 4360.000

3301 HV CHANGED MORE THAN HVINS

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1055.68 ELREA= 1055.68

4360.000	1.48	1053.16	1053.16	.00	1053.91	.75	.08	.34	1051.68
36.0	.0	36.0	.0	.0	5.2	.0	10.4	6.9	1051.68
1.14	.00	6.95	.00	.000	.025	.000	.000	1051.68	131.00
.008092	30.	30.	30.	20	11	0	.00	3.50	134.50

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

FLOW DISTRIBUTION FOR SECNO= 4360.00 CWSEL= 1053.16

STA= 131. 135.
PER Q= 100.0
AREA= 5.2
VEL= 6.9
DEPTH= 1.5

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	1	.024	.50	2.95	.00	3.50	.00	40.00	2	1	1051.76	1051.68

CHART 2 - CORRUGATED METAL PIPE CULVERT
SCALE 1 - HEADWALL

5140, NORMAL DEPTH EXCEEDS CULVERT HEIGHT
*SECNO 4320.000

L CULVERT OUTLET CONTROL
EG 1054.471 EGOC = 1054.795 PCWSE= 1053.161 ELTRD= 1056.500

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.95

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1054.47	1054.79	.88	0.	36.	3.633	9.6	1056.50	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1056.00 ELREA= 1056.00

4320.000	2.83	1054.59	.00	.00	1054.79	.20	.88	.00	1051.76
36.0	.0	36.0	.0	.0	9.9	.0	10.4	6.9	1051.76
1.15	.00	3.63	.00	.000	.025	.000	.000	1051.76	131.00
.000932	40.	40.	40.	2	0	0	.00	3.50	134.50

FLOW DISTRIBUTION FOR SECNO= 4320.00 CWSEL= 1054.59

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

TA= 131. 135.
PER Q= 100.0
AREA= 9.9
VEL= 3.6
DEPTH= 2.8

SECNO 4310.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.88

4310.000	3.07	1054.85	.00	.00	1054.86	.01	.00	.06	1055.78
36.0	.0	36.0	.0	.0	53.0	.0	10.5	6.9	1057.48
1.15	.00	.68	.00	.000	.025	.000	.000	1051.78	118.73
.000062	10.	10.	10.	2	0	0	.00	29.55	148.28

FLOW DISTRIBUTION FOR SECNO= 4310.00 CWSEL= 1054.85

STA= 119. 159.
PER Q= 100.0
[illegible]= 53.0
[illegible]L= .7
DEPTH= 1.8

CCHV= .100 CEHV= .300
SECNO 4000.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .57

4000.000	2.47	1054.87	.00	.00	1054.89	.02	.03	.00	1056.40
36.0	.0	36.0	.0	.0	34.2	.0	10.8	7.1	1058.30
1.23	.00	1.05	.00	.000	.025	.000	.000	1052.40	121.11
.000188	310.	310.	310.	2	0	0	.00	22.69	143.80

FLOW DISTRIBUTION FOR SECNO= 4000.00 CWSEL= 1054.87

STA= 121. 155.
PER Q= 100.0
AREA= 34.2
VEL= 1.1
DEPTH= 1.5

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


SECNO 3910.000
 3910.000     2.31   1054.89       .00       .00   1054.91       .02       .02       .00   1058.24
     36.0       .0      36.0       .0       .0      29.6       .0      10.8       7.2   1058.60
     1.25      .00      1.21       .00      .000      .025      .000      .000   1052.58    124.49
  .000271      90.       90.       90.        0         0         0       .00     20.73    145.22


LOW DISTRIBUTION FOR SECNO=   3910.00         CWSEL=   1054.89

TA=     124.     160.
 PER Q=    100.0
  AREA=     29.6
   VEL=      1.2
 DEPTH=      1.4

SECNO 3900.000
685 20 TRIALS ATTEMPTED WSEL,CWSEL
693 PROBABLE MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED
 3900.000      .89   1055.33   1055.33       .00   1055.64       .31       .01       .09   1058.44
     36.0       .0      36.0       .0       .0       8.0       .0      10.8       7.2   1058.65
     1.25      .00      4.48       .00      .000      .025      .000      .000   1054.44    127.43
  .011031      10.       10.       10.        20        18         0       .00     12.99    140.42


LOW DISTRIBUTION FOR SECNO=   3900.00         CWSEL=   1055.33

TA=     127.     157.
 PER Q=    100.0
  AREA=      8.0
   VEL=      4.5
 DEPTH=       .6

SECNO 3600.000

302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.78

 3600.000     1.21   1057.24       .00       .00   1057.38       .14      1.72       .02   1059.96
     36.0       .0      36.0       .0       .0      11.9       .0      10.9       7.3   1059.96
     1.28      .00      3.02       .00      .000      .025      .000      .000   1056.03    125.87
  .003498     300.      300.      300.         4         0         0       .00     14.69    140.57
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  SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
            QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
            VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


FLOW DISTRIBUTION FOR SECNO=   3600.00         CWSEL=   1057.24

STA=     126.     151.
 PER Q=    100.0
  AREA=     11.9
   VEL=      3.0
 DEPTH=       .8

*SECNO 3108.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .68

 3108.000      1.00   1059.59       .00       .00   1059.84       .25      2.43       .03   1063.70
     36.0        .0      36.0        .0        .0       9.0        .0      11.0       7.4   1063.70
     1.32       .00      3.98       .00      .000      .025      .000      .000   1058.59    131.43
  .007479      492.      492.      492.         4         0         0       .00     13.03    144.45


FLOW DISTRIBUTION FOR SECNO=   3108.00         CWSEL=   1059.59

ST[illegible]     131.     161.
  [illegible]Q=    100.0
  AREA=      9.0
   VEL=      4.0
 DEPTH=       .7

CCHV=     .300 CEHV=     .500
*SECNO 3055.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=     1065.00 ELREA=     1065.00

 3055.000      1.49   1060.28   1060.28       .00   1061.02       .74       .41       .25   1058.79
     36.0        .0      36.0        .0        .0       5.2        .0      11.0       7.4   1058.79
     1.32       .00      6.92       .00      .000      .025      .000      .000   1058.79    140.07
  .007992       53.       53.       53.        20        11         0       .00      3.50    143.57
```

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

FLOW DISTRIBUTION FOR SECNO= 3055.00 CWSEL= 1060.28

STA= 140. 144.
PER Q= 100.0
AREA= 5.2
VEL= 6.9
DEPTH= 1.5

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	1	.024	.50	2.95	.00	3.50	.00	110.00	2	1	1059.36	1058.79

CHART 2 - CORRUGATED METAL PIPE CULVERT
SCALE 1 - HEADWALL

*SECNO 2945.000

SPECIAL CULVERT OUTLET CONTROL
= 1062.066 EGOC = 1062.401 PCWSE= 1060.276 ELTRD= 1065.110

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.94

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1062.07	1062.40	1.38	0.	36.	3.623	9.6	1065.11	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1065.46 ELREA= 1065.11

2945.000	2.84	1062.20	.00	.00	1062.40	.20	1.38	.00	1059.36
36.0	.0	36.0	.0	.0	9.9	.0	11.0	7.4	1059.36
1.33	.00	3.62	.00	.000	.025	.000	.000	1059.36	138.91
.000924	110.	110.	110.	2	0	0	.00	3.50	142.41

FLOW DISTRIBUTION FOR SECNO= 2945.00 CWSEL= 1062.20

139. 142.
Q= 100.0
AREA= 9.9
VEL= 3.6
DEPTH= 2.8

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

*SECNO 2935.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.92

2935.000	3.08	1062.45	.00	.00	1062.46	.01	.00	.06	1063.54
36.0	.0	36.0	.0	.0	53.5	.0	11.1	7.4	1063.54
1.33	.00	.67	.00	.000	.025	.000	.000	1059.37	119.33
.000060	10.	10.	10.	2	0	0	.00	29.69	149.02

FLOW DISTRIBUTION FOR SECNO= 2935.00 CWSEL= 1062.45

STA= 119. 153.
PER Q= 100.0
AREA= 53.5
VEL= .7
DEPTH= 1.8

THIS RUN EXECUTED 01MAY95 12:43:04

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

FLOOD PROFILES

SUMMARY PRINTOUT

	SECNO	CWSEL	VCH	ELMIN	TOPWID	DEPTH	QLOB	QCH	QROB	VLOB
	15759.000	1019.41	3.87	1017.14	69.32	2.27	55.63	92.28	4.09	1.32
*	15416.000	1020.24	4.89	1018.40	23.74	1.84	.00	152.00	.00	.00
*	14916.000	1021.71	3.42	1019.10	25.03	2.61	.00	156.00	.00	.00
*	[illegible]16.000	1022.09	1.28	1019.64	59.19	2.45	.00	156.00	.00	.00
	13916.000	1022.20	1.51	1020.20	58.65	2.00	.00	156.00	.00	.00
*	13531.000	1022.36	2.17	1020.90	56.28	1.46	.00	161.00	.00	.00
*	13471.000	1022.37	3.92	1021.00	30.00	1.37	.00	161.00	.00	.00
	13361.000	1022.56	3.66	1021.10	30.00	1.46	.00	161.00	.00	.00
*	13339.000	1023.18	6.32	1021.20	20.80	1.98	.00	161.00	.00	.00
*	13270.000	1023.88	4.64	1021.49	24.08	2.39	.00	161.00	.00	.00
	12224.000	1028.28	4.98	1025.99	23.28	2.29	.00	161.00	.00	.00
*	12116.000	1028.75	3.68	1026.45	16.00	2.30	.00	135.00	.00	.00
	12076.000	1028.71	4.02	1026.61	16.00	2.10	.00	135.00	.00	.00
*	12049.000	1028.73	4.83	1026.63	21.64	2.10	.00	135.00	.00	.00
*	11100.000	1032.08	3.66	1029.71	26.14	2.37	.00	135.00	.00	.00
	[illegible]696.000	1033.14	3.81	1031.01	22.07	2.13	.00	110.00	.00	.00
*	[illegible]88.000	1033.40	3.36	1031.36	16.00	2.04	.00	110.00	.00	.00

	SECNO	CWSEL	VCH	ELMIN	TOPWID	DEPTH	QLOB	QCH	QROB	VLOB
	48.000	1033.46	3.47	1031.48	16.00	1.98	.00	110.00	.00	.00
*	10521.000	1033.46	4.45	1031.52	20.49	1.94	.00	110.00	.00	.00
*	9943.000	1034.95	2.82	1032.39	25.47	2.56	.00	110.00	.00	.00
*	9823.000	1035.09	2.18	1032.57	20.00	2.52	.00	110.00	.00	.00
	9763.000	1035.11	2.24	1032.66	20.00	2.45	.00	110.00	.00	.00
*	9733.000	1035.10	3.15	1032.70	24.16	2.40	.00	110.00	.00	.00
	9479.000	1035.54	3.03	1033.08	24.62	2.46	.00	110.00	.00	.00
*	9359.000	1035.72	1.77	1033.26	24.00	2.46	.00	105.00	.00	.00
	9299.000	1035.74	1.83	1033.35	24.00	2.39	.00	105.00	.00	.00
*	9269.000	1035.71	3.18	1033.39	23.53	2.32	.00	105.00	.00	.00
	8410.000	1037.19	2.96	1034.77	24.35	2.42	.00	105.00	.00	.00
*	8283.000	1037.34	2.68	1034.96	16.00	2.38	.00	102.00	.00	.00
	73.000	1037.40	2.80	1035.12	16.00	2.28	.00	102.00	.00	.00
*	8141.000	1037.41	3.24	1035.17	22.98	2.24	.00	102.00	.00	.00
	7702.000	1038.35	2.69	1035.83	25.12	2.52	.00	102.00	.00	.00
*	7575.000	1038.46	2.53	1036.02	16.00	2.44	.00	99.00	.00	.00
	7535.000	1038.49	2.56	1036.08	16.00	2.41	.00	99.00	.00	.00
*	7503.000	1038.51	2.84	1036.12	24.13	2.39	.00	99.00	.00	.00
	6566.000	1039.90	2.89	1037.53	23.92	2.37	.00	99.00	.00	.00
*	6439.000	1040.06	2.29	1037.72	16.00	2.34	.00	86.00	.00	.00
	6399.000	1040.09	2.33	1037.78	16.00	2.31	.00	86.00	.00	.00
*	6367.000	1040.10	2.67	1037.82	23.26	2.28	.00	86.00	.00	.00
*	5800.000	1043.26	4.58	1042.35	12.28	.91	.00	36.00	.00	.00
*	5645.000	1045.21	6.95	1043.73	3.50	1.48	.00	36.00	.00	.00
*	5605.000	1046.80	3.79	1044.09	3.50	2.71	.00	36.00	.00	.00
*	90.000	1047.08	.84	1044.34	26.21	2.74	.00	36.00	.00	.00

SECNO	CWSEL	VCH	ELMIN	TOPWID	DEPTH	QLOB	QCH	QROB	VLOB
73.000	1047.08	.81	1044.37	27.68	2.71	.00	36.00	.00	.00
5500.000	1047.08	1.29	1044.94	21.02	2.14	.00	36.00	.00	.00
5350.000	1047.06	4.68	1046.12	11.43	.94	.00	36.00	.00	.00
5200.000	1048.37	3.63	1047.30	13.55	1.07	.00	36.00	.00	.00
4910.000	1049.33	2.31	1047.88	16.57	1.45	.00	36.00	.00	.00
4900.000	1051.51	4.58	1050.60	12.27	.91	.00	36.00	.00	.00
4390.000	1053.21	2.10	1051.62	16.68	1.59	.00	36.00	.00	.00
4360.000	1053.16	6.95	1051.68	3.50	1.48	.00	36.00	.00	.00
4320.000	1054.59	3.63	1051.76	3.50	2.83	.00	36.00	.00	.00
4310.000	1054.85	.68	1051.78	29.55	3.07	.00	36.00	.00	.00
4000.000	1054.87	1.05	1052.40	22.69	2.47	.00	36.00	.00	.00
3910.000	1054.89	1.21	1052.58	20.73	2.31	.00	36.00	.00	.00
00.000	1055.33	4.48	1054.44	12.99	.89	.00	36.00	.00	.00
3600.000	1057.24	3.02	1056.03	14.69	1.21	.00	36.00	.00	.00
3108.000	1059.59	3.98	1058.59	13.03	1.00	.00	36.00	.00	.00
3055.000	1060.28	6.92	1058.79	3.50	1.49	.00	36.00	.00	.00
2945.000	1062.20	3.62	1059.36	3.50	2.84	.00	36.00	.00	.00
2935.000	1062.45	.67	1059.37	29.69	3.08	.00	36.00	.00	.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
WARNING SECNO=  15416.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  14916.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  14416.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  13531.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  13471.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=  13339.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  13339.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  13339.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=  13270.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  12116.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  12049.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  11100.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  10588.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  10521.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   9943.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   9823.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   9733.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   9359.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   9269.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   8283.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   8141.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   7575.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   7503.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   6439.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   6367.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=   5800.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5800.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   5800.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
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CA[illegible] SECNO=  5645.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CA[illegible]N SECNO=  5645.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=  5605.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  5590.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  5500.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=  5350.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  5350.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  5350.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=  4910.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=  4900.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  4900.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  4900.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=  4390.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=  4360.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  4360.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  4360.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

W[illegible] SECNO=  4320.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  4310.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  4000.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=  3900.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  3900.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  3900.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=  3600.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  3108.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=  3055.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  3055.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  3055.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=  2945.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  2935.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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100-Year Runoff Event

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****************************************
* HEC-2 WATER SURFACE PROFILES         *
*                                      *
* Version   4.6.2;  May 1991           *
*                                      *
*  DATE    01MAY95    TIME   15:28:37  *
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****************************************
* U.S. ARMY CORPS OF ENGINEERS         *
* HYDROLOGIC ENGINEERING CENTER        *
* 609 SECOND STREET, SUITE D           *
* DAVIS, CALIFORNIA 95616-4687         *
*          (916) 756-1104              *
****************************************
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X     X  XXXXXXX  XXXXX            XXXXX
X     X  X       X    X           X    X
X     X  X       X                     X
XXXXXXX  XXXX    X        XXXXX   XXXXX
X     X  X       X                X
X     X  X       X    X           X
X     X  XXXXXXX  XXXXX            XXXXXXX
```

THIS RUN EXECUTED 01MAY95 15:28:37

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

Version  4.6.2;  May 1991
:**********************************


T1     CAMELBACK ROAD CHANNEL                PREPARED BY CBA
T2     100-YEAR EVENT                        CBA #241729-01-0300
T3             FLOOD PROFILES    DATE  1/18/94       REVISED  4/31/95

J1  ICHECK   INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

              2                 0        0                          1020.6

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     1                -1                                                              15


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38       1       26       42       4        8        13       14       15       55

NC   0.045    0.045   0.025    .1       .3
QT   1        728
X1   15759    6       1105     1118     0        0        0
GR   1023     1000    1019     1060     1018     1105     1017.14  1112     1018     1118
GR   1025     1144

X1   15416    5       1700     1744     343      343      343
GR   1023     1000    1022     1700     1018.4   1714     1018.4   1724     1024     1744

QT   1        721
X1   14916    7       1145     1177     500      500      500
GR   1023.7   830     1022.9   885      1022.4   1000     1022     1145     1019.12  1154
GR   1019.1   1164    1024     1177

X1   14416    6       1244     1314     500      500      500
GR   1024     948     1023     1244     1019.64  1258     1019.64  1298     1024     1314
GR   1026     1336

X1   13916    7       1485     1556     500      500      500
GR   1024.7   990     1024     1485     1020.2   1500     1020.2   1545     1024     1556
GR   1025     1565    1026     1573

QT   1        726
NC   0.025    0.025   0.025    .1       .3
X1   13531    8       94       176.64   385      385      385
GR   1025     90      1025     94       1020.9   110.4    1020.9   155.4    1026.61  176.64
GR   1026.4   188.64  1025.95  188.74   1026.75  228.64
```

				.3	.5					
1	13471	8	116	146	60	60	60			
3	10							1026.97	1026.97	
R	1025	100	1025	115	1021	116	1021	146	1026.12	151
R	1026.3	163.5	1025.86	163.6	1026.66	203.5				
C	3.013	0.2	2.95		4	10	110	8.1	1021.1	1021
1	13361	8	122.7	152.7	110	110	110			
2			2							
3	10							1026.97	1026.97	
T	-2	115	1026.97		160.4	1026.97				
R	1027.3	100	1026.97	115	1021.1	122.7	1021.1	152.7	1026.97	160.4
R	1026.3	172.4	1026.39	172.5	1026.69	212.4				
C				.1	.3					
1	13339	8	115	159.36	22	22	22			
R	1027	100	1026.12	115	1021.2	134.7	1021.2	139.7	1026.12	159.36
R	1026.3	171.36	1025.86	171.46	1026.66	211.36				
1	13270	8	115	156.35	69	69	69			
R	1028	100	1026.04	115	1021.49	133.17	1021.49	138.17	1026.04	156.35
R	1026.2	168.35	1025.78	168.45	1026.58	208.35				
1	12224	8	115	174.16	1046	1046	1046			
R	1034	100	1032.76	115	1025.99	142.08	1025.99	147.08	1032.76	174.16
	1033	186.16	1032.5	186.26	1033.3	226.16				
C				.3	.5					
T	1	654								
1	12116	8	133.36	149.36	108	108	108			
3	10							1032.3	1032.3	
R	1034	100	1033.04	115	1026.45	133.36	1026.45	149.36	1033.04	167.72
R	1032.3	179.72	1032.78	179.82	1033.58	219.72				
C	2.013	0.2	2.95		5	8	40	8.1	1026.61	1026.45
1	12076	8	133.16	149.16	40	40	40			
2			2							
3	10							1033.15	1033.15	
T	-2	115	1033.15		167.32	1033.15				
R	1034	100	1033.15	115	1026.61	133.16	1026.61	149.16	1033.15	167.32
R	1033.4	179.32	1032.89	179.42	1033.69	219.32				
1	12049	8	115	172.24	27	27	27			
R	1034	100	1033.22	115	1026.63	141.12	1026.63	146.12	1033.22	172.24
R	1033.4	184.24	1032.96	184.34	1033.76	224.24				
C				.1	.3					
1	11100	8	115	173.36	949	949	949			
R	1036	100	1035.69	115	1029.71	141.68	1029.71	146.68	1035.69	173.36
R	1035.9	185.36	1035.43	185.46	1036.23	225.36				

[illegible]	1	604								
X1	10696	8	115	162.72	404	404	404			
GR	1037.3	100	1036.35	115	1031.01	136.36	1031.01	141.36	1036.35	162.72
GR	1036.5	174.72	1036.09	174.82	1036.89	214.72				
NC				.3	.5					
X1	10588	8	132	148	108	108	108			
X3	10							1036.5	1036.5	
GR	1038	100	1037	115	1031.36	132	1031.36	148	1037	165.12
GR	1037.2	177.12	1036.74	177.22	1037.54	217.12				
SC	2.013	0.2	2.95		5	8	40	8.1	1031.48	1031.36
X1	10548	8	132.02	148.02	40	40	40			
X2			2							
X3	10							1037.11	1037.11	
BT	-2	115	1037.11		165.04	1037.11				
GR	1038	100	1037.11	115	1031.48	132.02	1031.48	148.02	1037.11	165.04
GR	1037.3	177.01	1036.85	177.14	1037.65	217.04				
X1	10521	8	115	165.2	27	27	27			
GR	1038	100	1037.18	115	1031.52	137.6	1031.52	142.6	1037.18	165.2
GR	1037.4	177.2	1036.92	177.3	1037.72	217.2				
NC				.1	.3					
X1	9943	8	115	170.16	578	578	578			
[illegible]	1040	100	1038.66	115	1032.39	140.08	1032.39	145.08	1038.66	170.16
G[illegible]	1038.9	182.16	1038.4	182.26	1039.2	222.16				
QT	1	602								
NC	0.015	0.013	0.015	.3	.5					
X1	9823	8	133.14	153.14	120	120	120			
X3	10							1038.5	1038.5	
GR	1041	100	1038.98	115	1032.57	133.14	1032.57	153.14	1038.98	171.28
GR	1039.2	183.2	1038.72	183.3	1039.52	223.3				
SC	2.013	0.2	2.95		5	10	60	8.1	1032.66	1032.57
X1	9763	8	133.42	153.42	60	60	60			
X2			2							
X3	10							1039.14	1039.14	
BT	-2	115	1039.14		171.84	1039.14				
GR	1041	100	1039.14	115	1032.66	133.42	1032.66	153.42	1039.14	171.84
GR	1039.3	183.84	1038.88	183.94	1039.68	223.84				
NC	0.025	0.025	0.025							
X1	9733	8	115	172	30	30	30			
GR	1041	100	1039.21	115	1032.7	141	1032.7	146	1039.21	172
GR	1039.4	184	1038.95	184.1	1039.75	224				

				.1	.3					
1	9479	8	115	168.4	254	254	254			
R	1040	100	1039.13	115	1033.08	140.2	1033.08	145.2	1039.13	168.4
R	1039.3	180.4	1038.87	180.5	1040.43	220.4				
T	1	553								
C				.3	.5					
1	9359	8	127.7	151.7	120	120	120			
3	10							1038.5	1038.5	
R	1040	100	1038.81	115	1033.26	127.7	1033.26	151.7	1038.81	164.4
R	1039.0	176.4	1038.55	176.5	1040.75	215.4				
C	3.013	0.2	2.95		4	8	60	8.1	1033.35	1033.26
1	9299	8	128.1	152.1	60	60	60			
2			2							
3	10							1039.37	1039.37	
T	-3	100	1042.5		170.2	1038.89		182.2	1039.1	
R	1042.5	100	1039	115	1033.35	128.1	1033.35	152.1	1038.89	170.2
R	1039.1	182.2	1038.6	182.3	1040.94	222.2				
1	9269	8	115	169.76	30	30	30			
R	1040	100	1039.61	115	1033.39	139.88	1033.39	144.88	1039.61	169.76
R	1039.8	181.76	1039.95	181.86	1041.55	221.76				
C				.1	.3					
	8410	8	115	188	859	859	859			
R	1044.8	100	1043.27	115	1034.77	149	1034.77	154	1043.27	188
R	1043.5	200	1043.01	200.1	1043.81	240				
T	1	505								
C				.3	.5					
1	8283	8	143.5	159.5	127	127	127			
3	10							1042.21	1042.21	
R	1044.9	100	1043.46	115	1034.96	143.5	1034.96	159.5	1043.46	188
R	1043.7	200	1043.2	200.1	1044	240				
C	2.013	0.2	2.95		5	8	110	8.1	1035.12	1034.96
1	8173	8	142.26	158.26	110	110	110			
2			2							
3	10							1043.31	1043.31	
T	-2	115	1043.31		185.52	1043.31				
R	1044.8	100	1043.31	115	1035.12	142.26	1035.12	158.26	1043.31	185.52
R	1043.5	197.52	1043.05	197.62	1043.85	237.52				
1	8141	8	115	185.12	32	32	32			
R	1044.8	100	1043.31	115	1035.17	147.56	1035.17	152.56	1043.31	185.12
R	1043.5	197.12	1043.05	197.22	1043.85	237.12				

NC				.1	.3					
X1	7702	8	115	169.44	566	566	566			
GR	1044	100	1042.01	115	1035.83	139.72	1035.83	144.72	1042.01	169.44
GR	1042.2	181.44	1041.75	181.54	1042.55	221.44				
QT	1	480								
NC				.3	.5					
X1	7575	8	133.6	149.6	127	127	127			
X3	10							1042	1042	
GR	1043	100	1042.06	115	1036.02	133.6	1036.02	149.6	1042.06	168.1
GR	1042.3	180.1	1041.8	180.2	1042.6	220.2				
SC	2.013	0.2	2.95		5	8	40	8.1	1036.08	1036.02
X1	7535	8	131.24	147.24	40	40	40			
X2			2							
X3	10							1042.14	1042.14	
BT	-2	115	1042.14		163.48	1042.14				
GR	1044.0	100	1042.14	115	1036.08	131.24	1036.08	147.24	1042.14	163.48
GR	1042.3	175.48	1041.88	175.58	1042.68	215.48				
X1	7503	8	115	168.72	32	32	32			
GR	1044	100	1042.21	115	1036.12	139.36	1036.12	144.36	1042.21	168.72
GR	1042.4	180.72	1041.95	180.82	1042.75	220.72				
NC				.1	.3					
X1	6566	8	115	166.56	937	937	937			
GR	1044.8	100	1043.35	115	1037.53	138.28	1037.53	143.28	1043.35	166.56
GR	1043.5	178.56	1043.09	178.66	1043.89	218.56				
QT	1	394								
NC				.3	.5					
X1	6439	8	131.3	147.3	127	127	127			
X3	10							1043	1043	
GR	1044	100	1043.17	115	1037.72	131.3	1037.72	147.3	1043.17	163.6
GR	1043.4	175.6	1042.91	175.7	1043.71	215.6				
SC	2.013	0.2	2.95		4	8	40	8.1	1037.78	1037.72
X1	6399	8	130.82	146.82	40	40	40			
X2			2							
X3	10							1043.11	1043.11	
BT	-2	101.94	1045		162.64	1043.26				
GR	1045	100	1045	101.94	1037.78	130.82	1037.78	146.82	1043.11	162.64
GR	1043.3	174.64	1042.85	174.75	1043.65	214.64				
X1	6367	8	115	163.6	32	32	32			
GR	1044	100	1043.27	115	1037.82	136.8	1037.82	141.8	1043.27	163.6
GR	1043.5	175.6	1043.01	175.7	1043.81	215.6				

	1	59								
C				.1	.3					
X1	5800	8	115	159.2	567	567	567			
GR	1048.3	100	1047.25	115	1042.35	134.6	1042.35	139.6	1047.25	159.2
GR	1047.5	171.2	1046.99	171.3	1047.79	211.2				
C				.3	.5					
X1	5645	8	134.79	138.29	155	155	155			
X3	10							1048.5	1048.5	
GR	1049	100	1048.49	115	1043.73	134.79	1043.73	138.29	1048.49	158.08
GR	1048.7	170.08	1048.23	170.18	1049.03	210.08				
C	1.024	0.5	2.95		3.5	0	40	2.1	1044.09	1043.73
X1	5605	8	134.65	138.15	40	40	40			
X2			2							
X3	10							1048.88	1048.88	
BT	-2	115	1048.88		157.76	1048.88				
GR	1049.7	100	1048.88	115	1044.09	134.65	1044.09	138.15	1048.88	157.76
GR	1049.0	169.76	1048.55	169.86	1049.35	209.76				
X1	5590	8	115	156.48	15	15	15			
GR	1050.0	100	1049.05	115	1044.34	133.24	1044.34	138.24	1049.05	156.48
GR	1049.1	168.48	1048.67	168.58	1049.47	208.48				
NC				.1	.3					
[illegible]	5573	8	115	156.48	17	17	17			
GR	1050	100	1048.57	115	1044.37	133.24	1044.37	138.24	1048.93	156.48
GR	1049.1	168.48	1048.67	168.58	1049.47	208.48				
X1	5500	8	115	156.54	73	73	73			
GR	1049.6	100	1048.93	115	1044.94	131	1044.94	136	1050.9	156.54
GR	1050.3	168.64	1049.83	168.74	1050.63	208.64				
X1	5350	8	115	158.92	150	150	150			
GR	1051.6	100	1050.9	115	1046.12	131	1046.12	136	1052.63	158.92
GR	1052.8	170.92	1052.37	171.02	1053.17	210.92				
X1	5200	8	115	168.68	150	150	150			
GR	1052.0	100	1051.3	115	1047.3	131	1047.3	136	1055.47	168.68
GR	1055.7	180.68	1055.21	180.78	1056	220.68				
X1	4910	8	115	168.4	290	290	290			
GR	1052.6	100	1051.88	115	1047.88	131	1047.88	136	1055.98	168.4
GR	1056.2	180.4	1055.72	180.5	1056.52	220.4				
X1	4900	8	115	157.6	10	10	10			
GR	1055.3	100	1054.6	115	1050.6	131	1050.6	136	1056	157.6
GR	1056.2	169.6	1055.74	169.7	1056.54	209.6				

[illegible]	4390	8	115	158.64	510	510	510			
[illegible]	1057.1	100	1056.37	115	1051.62	131	1051.62	136	1057.28	158.64
[illegible]	1057.5	170.64	1057.02	170.74	1057.8	210.64				
[illegible]T	1	59								
[illegible]C				.3	.5					
[illegible]1	4360	8	131	134.5	30	30	30			
[illegible]3	10							1055.68	1055.68	
[illegible]R	1056.4	100	1055.68	115	1051.68	131	1051.68	134.5	1057.36	157.22
[illegible]R	1057.6	169.22	1057.1	169.32	1057.9	209.66				
[illegible]C	1.024	0.5	2.95		3.5	0	40	2.1	1051.76	1051.68
[illegible]1	4320	8	131	134.5	40	40	40			
[illegible]2			2							
[illegible]3	10							1056	1056	
[illegible]T	-4	100	1056.5		115	1056.5		134.5	1056.5	
[illegible]T		157.3	1057.46							
[illegible]R	1056.5	100	1055.76	115	1051.76	131	1051.76	134.5	1057.46	157.3
[illegible]R	1057.7	169.3	1057.2	169.4	1058	209.3				
[illegible]1	4310	-- 8	115	158.8	10	10	10			
[illegible]R	1056.5	100	1055.78	115	1051.78	131	1051.78	136	1057.48	158.8
[illegible]R	1057.7	170.8	1057.22	170.9	1058.02	210.8				
[illegible]C				.1	.3					
[illegible]	4000	8	115	154.6	310	310	310			
[illegible]	1057.1	100	1056.4	115	1052.4	131	1052.4	136	1058.3	154.6
[illegible]R	1058.5	166.6	1058.04	166.7	1058.84	206.6				
[illegible]1	3910	8	115	160.08	90	90	90			
[illegible]R	1058.9	100	1058.24	115	1052.58	131	1052.58	136	1058.6	160.08
[illegible]R	1058.8	172.08	1058.34	172.08	1059.14	212.08				
[illegible]1	3900	8	115	156.84	10	10	10			
[illegible]R	1059.1	100	1058.44	115	1054.44	131	1054.44	136	1058.65	156.84
[illegible]R	1058.9	168.84	1058.4	168.94	1059.2	208.84				
[illegible]1	3600	8	115	151.44	300	300	300			
[illegible]R	1061.4	100	1059.96	115	1056.03	130.72	1056.03	135.72	1059.96	151.44
[illegible]R	1060.2	163.44	1059.7	163.54	1060.5	203.44				
[illegible]1	3108	8	115	160.88	492	492	492			
[illegible]R	1065.2	100	1063.7	115	1058.59	135.44	1058.59	140.44	1063.7	160.88
[illegible]R	1063.9	172.88	1063.4	172.98	1064.24	212.9				
[illegible]C				.3	.5					
[illegible]1	3055	6	140.07	143.57	53	53	53			
[illegible]3	10							1065	1065	
[illegible]R	1065.2	100	1065.25	115	1058.79	140.07	1058.79	143.57	1064.88	168.64
[illegible]R	1064.3	220.64								

	1.024	.5	2.95		3.5	0	110	2.1	1059.36	1058.79
1	2945	6	138.91	142.41	110	110	110			
2			2							
3	10							1065.46	1065.11	
1	-2	115	1065.46		166.32	1065.11				
2	1065.4	100	1065.46	115	1059.36	138.91	1059.36	142.41	1065.11	166.32
2	1064.7	218.32								
1	2935	6	115	153.36	10	10	10			
2	1063.5	100	1063.54	115	1059.37	131.65	1059.37	136.68	1063.54	153.36
2	1064.7	205.36								

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


*PROF 1


CHV=     .100 CEHV=     .300
*SECNO 15759.000
 15759.000      3.46   1020.60       .00   1020.60   1021.15       .55       .00       .00   1018.00
    728.0     374.1     322.0      31.9     113.7      39.4      12.6        .0        .0   1018.00
      .00      3.29      8.18      2.54      .045      .025      .045      .000   1017.14   1036.00
  .004365        0.        0.        0.         0         0         0       .00     91.66   1127.66


FLOW DISTRIBUTION FOR SECNO=  15759.00          CWSEL=   1020.60

STA=    1036.    1060.    1105.    1118.    1128.
  PER Q=      5.0     46.4     44.2      4.4
   AREA=     19.2     94.5     39.4     12.6
    VEL=      1.9      3.6      8.2      2.5
  DEPTH=       .8      2.1      3.0      1.3

*SECNO 15416.000
7. MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 15416.000      4.20   1022.60   1022.60       .00   1023.07       .47      1.15       .01   1022.00
    728.0      96.4     631.6        .0     126.5     107.1        .0       1.6       2.2   1024.00
      .02       .76      5.89       .00      .045      .025      .000      .000   1018.40   1279.16
  .002647      343.      343.      343.         2         8         0       .00    459.84   1739.00


FLOW DISTRIBUTION FOR SECNO=  15416.00          CWSEL=   1022.60

STA=    1279.    1700.    1744.
  PER Q=     13.2     86.8
   AREA=    126.5    107.1
    VEL=       .8      5.9
  DEPTH=       .3      2.7

*SECNO 14916.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.83

 14916.000      4.56   1023.66       .00       .00   1023.76       .10       .66       .04   1022.00
    721.0     364.9     356.1        .0     345.7     100.8        .0       5.5       6.8   1024.00
      .08      1.06      3.53       .00      .045      .025      .000      .000   1019.10    833.18
  .000777      500.      500.      500.         2         0         0       .00    342.90   1176.08
```

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

LOW DISTRIBUTION FOR SECNO= 14916.00 CWSEL= 1023.66

TA=	833.	885.	1000.	1145. 1177.
PER Q=	1.3	14.8	34.5	49.4
AREA=	19.5	115.4	210.8	100.8
VEL=	.5	.9	1.2	3.5
DEPTH=	.4	1.0	1.5	3.2

SECNO 14416.000

14416.000	4.29	1023.93	.00	.00	1024.04	.11	.28	.00	1023.00
721.0	52.1	668.9	.0	128.4	242.0	.0	10.2	10.7	1024.00
.13	.41	2.76	.00	.045	.025	.000	.000	1019.64	968.34
.000419	500.	500.	500.	2	0	0	.00	345.41	1313.75

FLOW DISTRIBUTION FOR SECNO= 14416.00 CWSEL= 1023.93

STA=	968.	1244.	1314.
PER Q=	7.2	92.8	
AREA=	128.4	242.0	
VEL=	.4	2.8	
DEPTH=	.5	3.5	

*SECNO 13916.000

13916.000	3.95	1024.15	.00	.00	1024.30	.15	.25	.01	1024.00
721.0	1.1	719.9	.0	7.9	231.0	.1	13.7	13.7	1024.00
.18	.14	3.12	.14	.045	.025	.045	.000	1020.20	1378.99
.000582	500.	500.	500.	2	0	0	.00	178.36	1557.35

FLOW DISTRIBUTION FOR SECNO= 13916.00 CWSEL= 1024.15

STA=	1379.	1485.	1556. 1557.
PER Q=	.2	99.8	.0
AREA=	7.9	231.0	.1
VEL=	.1	3.1	.1
DEPTH=	.1	3.3	.1

CCHV= .100 CEHV= .300

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


SECNO 13531.000
13531.000      3.49   1024.39        .00        .00   1024.59        .20        .28        .01   1025.00
    726.0        .0     726.0        .0        .0     204.3        .0       15.6       14.8   1026.61
      .21       .00      3.55       .00       .000      .025       .000       .000    1020.90      96.43
  .000904      385.      385.      385.          2         0          0        .00      71.97     168.40


FLOW DISTRIBUTION FOR SECNO=  13531.00          CWSEL=   1024.39

STA=      96.     177.
  PER Q=    100.0
   AREA=    204.3
    VEL=      3.6
  DEPTH=      2.8

CCHV=     .300 CEHV=     .500
*SECNO 13471.000

3301 HV CHANGED MORE THAN HVINS

3[illegible]ARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .49

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      1026.97 ELREA=      1026.97

 13471.000      3.13   1024.13        .00        .00   1025.05        .93        .10        .37   1021.00
    726.0        .0     726.0        .0        .0      93.9        .0       15.8       14.9   1021.00
      .21       .00      7.73       .00       .000      .025       .000       .000    1021.00     116.00
  .003690       60.       60.       60.          2         0          0        .00      30.00     146.00


FLOW DISTRIBUTION FOR SECNO=  13471.00          CWSEL=   1024.13

STA=     116.     146.
  PER Q=    100.0
   AREA=     93.9
    VEL=      7.7
  DEPTH=      3.1
```

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

PECIAL CULVERT

C	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	3	.013	.20	2.95	.00	4.00	10.00	110.00	8	1	1021.10	1021.00

HART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
CALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

140, NORMAL DEPTH EXCEEDS CULVERT HEIGHT
SECNO 13361.000

PECIAL CULVERT OUTLET CONTROL
GIC = 1025.357 EGOC = 1025.412 PCWSE= 1024.125 ELTRD= 1026.970

PECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1025.36	1025.41	.36	0.	726.	6.682	120.0	1026.97	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1026.97 ELREA= 1026.97

13361.000	3.62	1024.72	.00	.00	1025.41	.69	.36	.00	1021.10
726.0	.0	726.0	.0	.0	108.7	.0	16.1	15.0	1021.10
.21	.00	6.68	.00	.000	.025	.000	.000	1021.10	122.70
.002272	110.	110.	110.	3	0	0	.00	30.00	152.70

FLOW DISTRIBUTION FOR SECNO= 13361.00 CWSEL= 1024.72

STA= 123. 153.
PER Q= 100.0
AREA= 108.7
VEL= 6.7
DEPTH= 3.6

CCHV= .100 CEHV= .300
*SECNO 13339.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

13339.000	4.01	1025.21	1025.21	.00	1026.36	1.15	.08	.14	1026.12
726.0	.0	726.0	.0	.0	84.3	.0	16.1	15.0	1026.12
.21	.00	8.62	.00	.000	.025	.000	.000	1021.20	118.66
7279	22.	22.	22.	20	8	0	.00	37.06	155.71

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

LOW DISTRIBUTION FOR SECNO= 13339.00 CWSEL= 1025.21

STA= 119. 159.
PER Q= 100.0
AREA= 84.3
VEL= 8.6
DEPTH= 2.3

SECNO 13270.000

265 DIVIDED FLOW

13270.000	4.53	1026.02	.00	.00	1026.77	.74	.37	.04	1026.04
726.0	.0	724.7	1.3	.0	104.6	1.4	16.3	15.1	1026.04
.22	.00	6.93	.92	.000	.025	.025	.000	1021.49	115.08
.004064	69.	69.	69.	3	0	0	.00	53.17	180.38

FLOW DISTRIBUTION FOR SECNO= 13270.00 CWSEL= 1026.02

STA= 115. 156. 180.
Q= 99.8 .2
AREA= 104.6 1.4
VEL= 6.9 .9
DEPTH= 2.5 .1

*SECNO 12224.000

12224.000	4.44	1030.43	.00	.00	1031.23	.80	4.45	.02	1032.76
726.0	.0	726.0	.0	.0	101.3	.0	18.8	16.2	1032.76
.26	.00	7.17	.00	.000	.025	.000	.000	1025.99	124.30
.004450	1046.	1046.	1046.	3	0	0	.00	40.56	164.86

FLOW DISTRIBUTION FOR SECNO= 12224.00 CWSEL= 1030.43

STA= 124. 174.
PER Q= 100.0
AREA= 101.3
VEL= 7.2
DEPTH= 2.5

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

CHV= .300 CEHV= .500
SECNO 12116.000

301 HV CHANGED MORE THAN HVINS

495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1032.30 ELREA= 1032.30

12116.000	4.08	1030.53	.00	.00	1032.08	1.55	.47	.38	1026.45
654.0	.0	654.0	.0	.0	65.4	.0	19.0	16.3	1026.45
.26	.00	10.01	.00	.000	.025	.000	.000	1026.45	133.36
.004339	108.	108.	108.	2	0	0	.00	16.00	149.36

LOW DISTRIBUTION FOR SECNO= 12116.00 CWSEL= 1030.53

STA= 133. 149.
PER Q= 100.0
AREA= 65.4
VEL= 10.0
TH= 4.1

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	2	.013	.20	2.95	.00	5.00	8.00	40.00	8	1	1026.61	1026.45

CHART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

*SECNO 12076.000

SPECIAL CULVERT INLET CONTROL
EGIC = 1032.987 EGOC = 1032.557 PCWSE= 1030.529 ELTRD= 1033.150

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.66

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

PECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1032.99	1032.56	.90	0.	654.	7.392	80.0	1033.15	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1033.15 ELREA= 1033.15

12076.000	5.53	1032.14	.00	.00	1032.99	.85	.90	.00	1026.61
654.0	.0	654.0	.0	.0	88.5	.0	19.0	16.3	1026.61
.26	.00	7.39	.00	.000	.025	.000	.000	1026.61	133.16
.001582	40.	40.	40.	3	0	0	.00	16.00	149.16

FLOW DISTRIBUTION FOR SECNO= 12076.00 CWSEL= 1032.14

STA= 133. 149.
PER Q= 100.0
AREA= 88.5
[illegible]L= 7.4
[illegible]H= 5.5

*SECNO 12049.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.59

12049.000	6.41	1033.04	.00	.00	1033.21	.17	.03	.20	1033.22
654.0	.0	654.0	.0	.0	194.8	.2	19.1	16.3	1033.22
.26	.00	3.36	.17	.000	.025	.025	.000	1026.63	115.72
.000625	27.	27.	27.	3	0	0	.00	59.73	188.25

FLOW DISTRIBUTION FOR SECNO= 12049.00 CWSEL= 1033.04

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

TA= 116. 172. 188.
PER Q= 100.0 .0
AREA= 194.8 .2
VEL= 3.4 .2
DEPTH= 3.5 .0

CHV= .100 CEHV= .300
SECNO 11100.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .40

11100.000	4.20	1033.91	.00	.00	1034.58	.66	1.22	.15	1035.69
654.0	.0	654.0	.0	.0	100.0	.0	22.3	17.4	1035.69
.31	.00	6.54	.00	.000	.025	.000	.000	1029.71	122.91
.003988	949.	949.	949.	2	0	0	.00	42.54	165.45

FLOW DISTRIBUTION FOR SECNO= 11100.00 CWSEL= 1033.91

STA= 123. 173.
Q= 100.0
A= 100.0
VEL= 6.5
DEPTH= 2.4

*SECNO 10696.000

10696.000	4.44	1035.45	.00	.00	1036.01	.55	1.42	.01	1036.35
604.0	.0	604.0	.0	.0	101.3	.0	23.3	17.8	1036.35
.32	.00	5.96	.00	.000	.025	.000	.000	1031.01	118.58
.003080	404.	404.	404.	3	0	0	.00	40.56	159.14

FLOW DISTRIBUTION FOR SECNO= 10696.00 CWSEL= 1035.45

STA= 119. 163.
PER Q= 100.0
AREA= 101.3
VEL= 6.0
DEPTH= 2.5

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

CHV= .300 CEHV= .500
SECNO 10588.000

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1036.50 ELREA= 1036.50

10588.000	4.07	1035.43	.00	.00	1036.76	1.33	.37	.39	1031.36
604.0	.0	604.0	.0	.0	65.2	.0	23.5	17.9	1031.36
.33	.00	9.26	.00	.000	.025	.000	.000	1031.36	132.00
.003725	108.	108.	108.	2	0	0	.00	16.00	148.00

FLOW DISTRIBUTION FOR SECNO= 10588.00 CWSEL= 1035.43

STA= 132. 148.
PER Q= 100.0
AREA= 65.2
VEL= 9.3
TH= 4.1

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	2	.013	.20	2.95	.00	5.00	8.00	40.00	8	1	1031.48	1031.36

CHART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

*SECNO 10548.000

SPECIAL CULVERT INLET CONTROL + WEIR FLOW, EG = 1037.21
SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1037.22	1037.14	.44	4.	602.	7.936	80.0	1037.11	50.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1037.11 ELREA= 1037.11

10548.000	4.75	1036.23	.00	.00	1037.21	.98	.44	.00	1031.48
604.0	.0	604.0	.0	.0	76.1	.0	23.6	17.9	1031.48
.33	.00	7.94	.00	.000	.025	.000	.000	1031.48	132.02
12228	40.	40.	40.	11	0	0	.00	16.00	148.02

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

FLOW DISTRIBUTION FOR SECNO= 10548.00 CWSEL= 1036.23

STA= 132. 148.
PER Q= 100.0
AREA= 76.1
VEL= 7.9
DEPTH= 4.8

*SECNO 10521.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.57

10521.000	5.73	1037.25	.00	.00	1037.47	.22	.04	.23	1037.18
604.0	.0	602.6	1.4	.0	159.4	2.7	23.6	17.9	1037.18
.33	.02	3.78	.51	.025	.025	.025	.000	1031.52	113.84
0899	27.	27.	27.	3	0	0	.00	71.00	193.42

FLOW DISTRIBUTION FOR SECNO= 10521.00 CWSEL= 1037.25

STA= 114. 115. 165. 193.
PER Q= .0 99.8 .2
AREA= .0 159.4 2.7
VEL= .0 3.8 .5
DEPTH= .0 3.2 .1

CCHV= .100 CEHV= .300
*SECNO 9943.000

9943.000	5.42	1037.81	.00	.00	1038.08	.27	.60	.02	1038.66
604.0	.0	604.0	.0	.0	144.4	.0	25.7	18.7	1038.66
.37	.00	4.18	.00	.000	.025	.000	.000	1032.39	118.41
.001192	578.	578.	578.	2	0	0	.00	48.33	166.75

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

LOW DISTRIBUTION FOR SECNO= 9943.00 CWSEL= 1037.81

STA= 118. 170.
PER Q= 100.0
AREA= 144.4
VEL= 4.2
DEPTH= 3.0

CHV= .300 CEHV= .500
SECNO 9823.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.76

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1038.50 ELREA= 1038.50

9823.000	5.19	1037.76	.00	.00	1038.28	.52	.07	.13	1032.57
602.0	.0	602.0	.0	.0	103.7	.0	26.0	18.8	1032.57
.37	.00	5.80	.00	.000	.015	.000	.000	1032.57	133.14
000382	120.	120.	120.	2	0	0	.00	20.00	153.14

FLOW DISTRIBUTION FOR SECNO= 9823.00 CWSEL= 1037.76

STA= 133. 153.
PER Q= 100.0
AREA= 103.7
VEL= 5.8
DEPTH= 5.2

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	2	.013	.20	2.95	.00	5.00	10.00	60.00	8	1	1032.66	1032.57

CHART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

*SECNO 9763.000

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

PECIAL CULVERT OUTLET CONTROL
GIC = 1037.569 EGOC = 1038.516 PCWSE= 1037.757 ELTRD= 1039.140

PECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1037.57	1038.52	.24	0.	602.	5.600	100.0	1039.14	0.

495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1039.14 ELREA= 1039.14

9763.000	5.37	1038.03	.00	.00	1038.52	.49	.24	.00	1032.66
602.0	.0	602.0	.0	.0	107.5	.0	26.1	18.8	1032.66
.38	.00	5.60	.00	.000	.015	.000	.000	1032.66	133.42
.000339	60.	60.	60.	2	0	0	.00	20.00	153.42

FLOW DISTRIBUTION FOR SECNO= 9763.00 CWSEL= 1038.03

S 133. 153.
PER Q= 100.0
AREA= 107.5
VEL= 5.6
DEPTH= 5.4

*SECNO 9733.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .60

9733.000	5.68	1038.38	.00	.00	1038.61	.23	.02	.08	1039.21
602.0	.0	602.0	.0	.0	157.9	.0	26.2	18.9	1039.21
.38	.00	3.81	.00	.000	.025	.000	.000	1032.70	118.27
.000933	30.	30.	30.	2	0	0	.00	50.47	168.73

FLOW DISTRIBUTION FOR SECNO= 9733.00 CWSEL= 1038.38

STA= 118. 172.
PER Q= 100.0
AREA= 157.9
VEL= 3.8
DEPTH= 3.1

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

CCHV= .100 CEHV= .300
*SECNO 9479.000

9479.000	5.54	1038.62	.00	.00	1038.87	.25	.25	.01	1039.13
602.0	.0	602.0	.0	.0	150.6	.0	27.1	19.1	1039.13
.40	.00	4.00	.00	.000	.025	.000	.000	1033.08	117.12
.001060	254.	254.	254.	2	0	0	.00	49.33	166.45

FLOW DISTRIBUTION FOR SECNO= 9479.00 CWSEL= 1038.62

STA=	117.	168.
PER Q=	100.0	
AREA=	150.6	
VEL=	4.0	
DEPTH=	3.1	

CCHV= .300 CEHV= .500
*SECNO 9359.000

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.78

9359.000	5.58	1038.84	.00	.00	1038.97	.13	.06	.04	1033.26
553.0	66.5	419.7	66.7	35.6	133.9	36.4	27.6	19.3	1033.26
.41	1.87	3.14	1.84	.025	.025	.025	.000	1033.26	114.66
.000281	120.	120.	120.	2	0	0	.00	56.61	181.58

FLOW DISTRIBUTION FOR SECNO= 9359.00 CWSEL= 1038.84

STA=	115.	128.	152.	164.	182.
PER Q=	12.0	75.9	12.0	.0	
AREA=	35.6	133.9	35.6	.7	
VEL=	1.9	3.1	1.9	.3	
DEPTH=	2.7	5.6	2.8	.0	

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

SPECIAL CULVERT

C	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	3	.013	.20	2.95	.00	4.00	8.00	60.00	8	1	1033.35	1033.26

CHART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

*SECNO 9299.000

SPECIAL CULVERT OUTLET CONTROL + WEIR FLOW EG = 1039.50
SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1037.46	1039.56	.53	19.	529.	2.604	96.0	1038.89	24.

9299.000	6.07	1039.42	.00	.00	1039.50	.08	.53	.00	1033.35
553.0	68.9	379.1	105.1	42.8	145.6	70.4	27.9	19.4	1033.35
.42	1.61	2.60	1.49	.025	.025	.025	.000	1033.35	113.22
0173	60.	60.	60.	2	0	0	.00	83.00	196.21

FLOW DISTRIBUTION FOR SECNO= 9299.00 CWSEL= 1039.42

STA=	113.	115.	128.	152.	170.	182.	196.
PER Q=	.0	12.4	68.6	18.2	.4	.4	
AREA=	.4	42.5	145.6	59.7	5.1	5.7	
VEL=	.3	1.6	2.6	1.7	.4	.4	
DEPTH=	.2	3.2	6.1	3.3	.4	.4	

*SECNO 9269.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .53

9269.000	6.00	1039.39	.00	.00	1039.54	.16	.01	.04	1039.61
553.0	.0	553.0	.0	.0	173.9	.0	28.1	19.4	1039.61
.42	.00	3.18	.00	.000	.025	.000	.000	1033.39	115.89
.000609	30.	30.	30.	2	0	0	.00	52.98	168.87

FLOW DISTRIBUTION FOR SECNO= 9269.00 CWSEL= 1039.39

STA=	116.	170.
Q=	100.0	
A=	173.9	
VEL=	3.2	
DEPTH=	3.3	

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


CHV=     .100 CEHV=     .300
SECNO 8410.000
 8410.000      5.25   1040.02       .00       .00   1040.28       .25       .70       .03   1043.27
    553.0        .0     553.0        .0        .0     136.7        .0      31.2      20.4   1043.27
      .48       .00      4.05       .00      .000      .025      .000      .000   1034.77    127.99
  .001158      859.      859.      859.         2         0         0       .00     47.03    175.01


FLOW DISTRIBUTION FOR SECNO=   8410.00         CWSEL=   1040.02

STA=     128.     188.
  PER Q=    100.0
   AREA=    136.7
    VEL=      4.0
  DEPTH=      2.9

CCHV=     .300 CEHV=     .500
*SECNO 8283.000

3405 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=     1042.21 ELREA=     1042.21

     .000      5.04   1040.00       .00       .00   1040.61       .61       .15       .18   1034.96
    505.0        .0     505.0        .0        .0      80.6        .0      31.5      20.5   1034.96
      .48       .00      6.26       .00      .000      .025      .000      .000   1034.96    143.50
  .001284      127.      127.      127.         2         0         0       .00     16.00    159.50


FLOW DISTRIBUTION FOR SECNO=   8283.00         CWSEL=   1040.00

STA=     144.     160.
  PER Q=    100.0
   AREA=     80.6
    VEL=      6.3
  DEPTH=      5.0


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

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	2	.013	.20	2.95	.00	5.00	8.00	110.00	8	1	1035.12	1034.96

CHART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

*SECNO 8173.000

SPECIAL CULVERT OUTLET CONTROL
EGIC = 1040.192 EGOC = 1040.931 PCWSE= 1040.000 ELTRD= 1043.310

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1040.19	1040.93	.32	0.	505.	5.999	80.0	1043.31	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1043.31 ELREA= 1043.31

000	5.25	1040.37	.00	.00	1040.93	.56	.32	.00	1035.12
5.0	.0	505.0	.0	.0	84.2	.0	31.7	20.6	1035.12
.49	.00	6.00	.00	.000	.025	.000	.000	1035.12	142.26
.001113	110.	110.	110.	2	0	0	.00	16.00	158.26

FLOW DISTRIBUTION FOR SECNO= 8173.00 CWSEL= 1040.37

STA= 142. 158.
PER Q= 100.0
AREA= 84.2
VEL= 6.0
DEPTH= 5.3

*SECNO 8141.000

8141.000	5.76	1040.93	.00	.00	1041.08	.15	.03	.12	1043.31
505.0	.0	505.0	.0	.0	161.4	.0	31.8	20.6	1043.31
.49	.00	3.13	.00	.000	.025	.000	.000	1035.17	124.53
.000620	32.	32.	32.	3	0	0	.00	51.06	175.59

FLOW DISTRIBUTION FOR SECNO= 8141.00 CWSEL= 1040.93

STA= 125. 185.
Q= 100.0
A= 161.4
= 3.1
DEPTH= 3.2

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

CHV= .100 CEHV= .300
SECNO 7702.000

7702.000	5.47	1041.30	.00	.00	1041.48	.18	.40	.01	1042.01
505.0	.0	505.0	.0	.0	147.1	.0	33.8	21.2	1042.01
.54	.00	3.43	.00	.000	.025	.000	.000	1035.83	117.83
.000794	566.	566.	566.	2	0	0	.00	48.77	166.61

LOW DISTRIBUTION FOR SECNO= 7702.00 CWSEL= 1041.30

TA= 118. 169.
PER Q= 100.0
AREA= 147.1
VEL= 3.4
DEPTH= 3.0

CHV= .300 CEHV= .500
SECNO 7575.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1042.00 ELREA= 1042.00

.000	5.23	1041.25	.00	.00	1041.76	.51	.11	.16	1036.02
480.0	.0	480.0	.0	.0	83.7	.0	34.1	21.3	1036.02
.54	.00	5.73	.00	.000	.025	.000	.000	1036.02	133.60
.001025	127.	127.	127.	2	0	0	.00	16.00	149.60

FLOW DISTRIBUTION FOR SECNO= 7575.00 CWSEL= 1041.25

STA= 134. 150.
PER Q= 100.0
AREA= 83.7
VEL= 5.7
DEPTH= 5.2

SPECIAL CULVERT

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

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	2	.013	.20	2.95	.00	5.00	8.00	40.00	8	1	1036.08	1036.02

CHART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

*SECNO 7535.000

SPECIAL CULVERT OUTLET CONTROL
EGIC = 1040.977 EGOC = 1041.984 PCWSE= 1041.251 ELTRD= 1042.140

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1040.98	1041.98	.22	0.	480.	5.519	80.0	1042.14	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1042.14 ELREA= 1042.14

.000	5.43	1041.51	.00	.00	1041.98	.47	.22	.00	1036.08
0.0	.0	480.0	.0	.0	87.0	.0	34.2	21.3	1036.08
.55	.00	5.52	.00	.000	.025	.000	.000	1036.08	131.24
.000902	40.	40.	40.	2	0	0	.00	16.00	147.24

FLOW DISTRIBUTION FOR SECNO= 7535.00 CWSEL= 1041.51

STA= 131. 147.
PER Q= 100.0
AREA= 87.0
VEL= 5.5
DEPTH= 5.4

*SECNO 7503.000

3265 DIVIDED FLOW

7503.000	5.86	1041.98	.00	.00	1042.11	.13	.02	.10	1042.21
480.0	.0	480.0	.0	.0	167.0	.0	34.3	21.4	1042.21
.55	.00	2.87	.01	.000	.025	.025	.000	1036.12	115.90
.000511	32.	32.	32.	2	0	0	.00	53.72	182.61

FLOW DISTRIBUTION FOR SECNO= 7503.00 CWSEL= 1041.98

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

STA= 116. 169.
PER Q= 100.0
AREA= 167.0
VEL= 2.9
DEPTH= 3.2

CCHV= .100 CEHV= .300
*SECNO 6566.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .70

6566.000	5.05	1042.58	.00	.00	1042.80	.22	.67	.03	1043.35
480.0	.0	480.0	.0	.0	127.3	.0	37.5	22.4	1043.35
.62	.00	3.77	.00	.000	.025	.000	.000	1037.53	118.07
.001054	937.	937.	937.	2	0	0	.00	45.41	163.49

FLOW DISTRIBUTION FOR SECNO= 6566.00 CWSEL= 1042.58

STA= 118. 167.
Q= 100.0
A= 127.3
VEL= 3.8
DEPTH= 2.8

CCHV= .300 CEHV= .500
*SECNO 6439.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1043.00 ELREA= 1043.00

6439.000	4.90	1042.62	.00	.00	1043.01	.39	.12	.09	1037.72
394.0	.0	394.0	.0	.0	78.4	.0	37.8	22.5	1037.72
.63	.00	5.03	.00	.000	.025	.000	.000	1037.72	131.30
.000860	127.	127.	127.	2	0	0	.00	16.00	147.30

FLOW DISTRIBUTION FOR SECNO= 6439.00 CWSEL= 1042.62

STA= 131. 147.
PER Q= 100.0
AREA= 78.4
VEL= 5.0
DEPTH= 4.9

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

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	2	.013	.20	2.95	.00	4.00	8.00	40.00	8	1	1037.78	1037.72

CHART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

*SECNO 6399.000

SPECIAL CULVERT OUTLET CONTROL + WEIR FLOW EG = 1043.39

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.16

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1042.09	1043.40	.38	0.	391.	2.532	64.0	1043.26	5.

6399.000	5.54	1043.32	.00	.00	1043.39	.07	.38	.00	1037.78
394.0	95.9	224.4	73.7	61.4	88.6	52.4	37.9	22.6	1037.78
.63	1.56	2.53	1.41	.025	.025	.025	.000	1037.78	108.66
.000185	40.	40.	40.	2	0	0	.00	89.50	198.16

FLOW DISTRIBUTION FOR SECNO= 6399.00 CWSEL= 1043.32

STA=	109.	131.	147.	163.	175.	198.
PER Q=	24.3	57.0	18.2	.1	.4	
AREA=	61.4	88.6	45.5	1.4	5.5	
VEL=	1.6	2.5	1.6	.2	.3	
DEPTH=	2.8	5.5	2.9	.1	.2	

*SECNO 6367.000

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .63

6367.000	5.49	1043.31	.00	.00	1043.42	.11	.01	.02	1043.27
394.0	.0	393.2	.8	.0	148.0	2.3	38.0	22.6	1043.27
.63	.01	2.66	.36	.025	.025	.025	.000	1037.82	114.19
.000470	32.	32.	32.	2	0	0	.00	66.46	190.63

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

FLOW DISTRIBUTION FOR SECNO= 6367.00 CWSEL= 1043.31

STA=	114.	164.	191.
PER Q=	99.8	.2	
AREA=	148.0	2.3	
VEL=	2.7	.4	
DEPTH=	3.0	.1	

CCHV= .100 CEHV= .300
*SECNO 5800.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

5800.000	1.19	1043.54	1043.54	.00	1043.94	.41	.33	.09	1047.25
59.0	.0	59.0	.0	.0	11.5	.0	39.1	23.2	1047.25
.66	.00	5.11	.00	.000	.025	.000	.000	1042.35	129.86
.010262	567.	567.	567.	20	21	0	.00	14.48	144.34

FLOW DISTRIBUTION FOR SECNO= 5800.00 CWSEL= 1043.54

STA=	130.	159.
PER Q=	100.0	
AREA=	11.5	
VEL=	5.1	
DEPTH=	.8	

CCHV= .300 CEHV= .500
*SECNO 5645.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1048.50 ELREA= 1048.50

5645.000	2.06	1045.79	1045.79	.00	1046.83	1.04	1.33	.32	1043.73
59.0	.0	59.0	.0	.0	7.2	.0	39.1	23.2	1043.73
.67	.00	8.18	.00	.000	.025	.000	.000	1043.73	134.79
.007234	155.	155.	155.	2	14	0	.00	3.50	138.29

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

LOW DISTRIBUTION FOR SECNO= 5645.00 CWSEL= 1045.79

STA= 135. 138.
PER Q= 100.0
AREA= 7.2
VEL= 8.2
DEPTH= 2.1

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	1	.024	.50	2.95	.00	3.50	.00	40.00	2	1	1044.09	1043.73

CHART 2 - CORRUGATED METAL PIPE CULVERT
SCALE 1 - HEADWALL

5140, NORMAL DEPTH EXCEEDS CULVERT HEIGHT
*SECNO 5605.000

L CULVERT OUTLET CONTROL
EC 1047.861 EGOC = 1048.106 PCWSE= 1045.790 ELTRD= 1048.880

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.65

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1047.86	1048.11	1.28	0.	59.	4.560	9.6	1048.88	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1048.88 ELREA= 1048.88

5605.000	3.69	1047.78	.00	.00	1048.11	.32	1.28	.00	1044.09
59.0	.0	59.0	.0	.0	12.9	.0	39.1	23.2	1044.09
.67	.00	4.56	.00	.000	.025	.000	.000	1044.09	134.65
.001030	40.	40.	40.	2	0	0	.00	3.50	138.15

FLOW DISTRIBUTION FOR SECNO= 5605.00 CWSEL= 1047.78

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

TA= 135. 138.
PER Q= 100.0
AREA= 12.9
VEL= 4.6
DEPTH= 3.7

SECNO 5590.000

302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 4.13

5590.000	3.85	1048.19	.00	.00	1048.20	.01	.00	.09	1049.05
59.0	.0	59.0	.0	.0	76.8	.0	39.1	23.2	1049.05
.68	.00	.77	.00	.000	.025	.000	.000	1044.34	118.32
.000060	15.	15.	15.	2	0	0	.00	34.85	153.16

LOW DISTRIBUTION FOR SECNO= 5590.00 CWSEL= 1048.19

TA= 118. 156.
PER Q= 100.0
AREA= 76.8
VEL= .8
DEPTH= 2.2

CHV= .100 CEHV= .300
SECNO 5573.000

5573.000	3.83	1048.20	.00	.00	1048.20	.01	.00	.00	1048.57
59.0	.0	59.0	.0	.0	80.4	.0	39.2	23.2	1048.93
.68	.00	.73	.00	.000	.025	.000	.000	1044.37	116.60
.000056	17.	17.	17.	0	0	0	.00	36.97	153.57

LOW DISTRIBUTION FOR SECNO= 5573.00 CWSEL= 1048.20

TA= 117. 156.
PER Q= 100.0
AREA= 80.4
VEL= .7
DEPTH= 2.2

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


*SECNO 5500.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .63

 5500.000      3.26   1048.19       .00       .00   1048.21       .02       .01       .00   1048.93
     59.0        .0      59.0        .0        .0      55.9        .0      39.3      23.3   1050.90
      .70       .00      1.06       .00      .000      .025      .000      .000   1044.94    117.93
  .000138       73.       73.       73.         0         0         0       .00     29.30    147.23


FLOW DISTRIBUTION FOR SECNO=   5500.00         CWSEL=   1048.19

STA=     118.     157.
  PER Q=    100.0
   AREA=     55.9
    VEL=      1.1
  DEPTH=      1.9

*SECNO 5350.000

3[illegible]RNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .35

 5350.000      2.07   1048.19       .00       .00   1048.28       .08       .05       .02   1050.90
     59.0        .0      59.0        .0        .0      25.3        .0      39.4      23.3   1052.63
      .72       .00      2.33       .00      .000      .025      .000      .000   1046.12    124.03
  .001119      150.      150.      150.         1         0         0       .00     19.30    143.33


FLOW DISTRIBUTION FOR SECNO=   5350.00         CWSEL=   1048.19

STA=     124.     159.
  PER Q=    100.0
   AREA=     25.3
    VEL=      2.3
  DEPTH=      1.3

*SECNO 5200.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 5200.000      1.19   1048.49   1048.49       .00   1048.89       .40       .38       .09   1051.30
     59.0        .0      59.0        .0        .0      11.6        .0      39.5      23.4   1055.47
      .73       .00      5.08       .00      .000      .025      .000      .000   1047.30    126.24
  .010091      150.      150.      150.        20        11         0       .00     14.52    140.76
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 SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
           QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
 TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
 SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


FLOW DISTRIBUTION FOR SECNO=   5200.00         CWSEL=   1048.49

STA=     126.     169.
 PER Q=    100.0
  AREA=     11.6
   VEL=      5.1
 DEPTH=       .8

*SECNO 4910.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.56

 4910.000      1.86   1049.74       .00       .00   1049.84       .10       .92       .03   1051.88
     59.0        .0      59.0        .0        .0      23.2        .0      39.6      23.5   1055.98
      .76       .00      2.54       .00      .000      .025      .000      .000   1047.88    123.55
  .001539       290.      290.      290.         5         0         0       .00     19.90    143.45


FLOW DISTRIBUTION FOR SECNO=   4910.00         CWSEL=   1049.74

     124.     168.
 PER Q=    100.0
  AREA=     23.2
   VEL=      2.5
 DEPTH=      1.2

*SECNO 4900.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 4900.000      1.19   1051.79   1051.79       .00   1052.19       .41       .03       .09   1054.60
     59.0        .0      59.0        .0        .0      11.5        .0      39.6      23.5   1056.00
      .76       .00      5.11       .00      .000      .025      .000      .000   1050.60    126.26
  .010258       10.       10.       10.        20        14         0       .00     14.48    140.74


FLOW DISTRIBUTION FOR SECNO=   4900.00         CWSEL=   1051.79

STA=     126.     158.
 PER Q=    100.0
  AREA=     11.5
   VEL=      5.1
 DEPTH=       .8
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 SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
           QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
 TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
 SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


*SECNO 4390.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.79

 4390.000      1.97   1053.59       .00       .00   1053.68       .09      1.46       .03   1056.37
     59.0        .0      59.0        .0        .0      24.1        .0      39.8      23.7   1057.28
      .82       .00      2.44       .00      .000      .025      .000      .000   1051.62    124.37
  .001320      510.      510.      510.         6         0         0       .00     19.51    143.88


FLOW DISTRIBUTION FOR SECNO=   4390.00         CWSEL=   1053.59

STA=     124.     159.
  PER Q=    100.0
   AREA=     24.1
    VEL=      2.4
  DEPTH=      1.2

CCHV=     .300 CEHV=     .500
*SECNO 4360.000

33   LV CHANGED MORE THAN HVINS

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=     1055.68 ELREA=     1055.68

 4360.000      2.06   1053.74   1053.74       .00   1054.78      1.04       .08       .47   1051.68
     59.0        .0      59.0        .0        .0       7.2        .0      39.8      23.7   1051.68
      .82       .00      8.19       .00      .000      .025      .000      .000   1051.68    131.00
  .007241       30.       30.       30.        20         8         0       .00      3.50    134.50


FLOW DISTRIBUTION FOR SECNO=   4360.00         CWSEL=   1053.74

STA=     131.     135.
  PER Q=    100.0
   AREA=      7.2
    VEL=      8.2
  DEPTH=      2.1
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	1	.024	.50	2.95	.00	3.50	.00	40.00	2	1	1051.76	1051.68

CHART 2 - CORRUGATED METAL PIPE CULVERT
SCALE 1 - HEADWALL

5140, NORMAL DEPTH EXCEEDS CULVERT HEIGHT
*SECNO 4320.000

SPECIAL CULVERT OUTLET CONTROL
EGIC = 1055.543 EGOC = 1055.942 PCWSE= 1053.739 ELTRD= 1056.500

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.89

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1055.54	1055.94	1.16	0.	59.	4.330	9.6	1056.50	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1056.00 ELREA= 1056.00

4320.000	3.89	1055.65	.00	.00	1055.94	.29	1.16	.00	1051.76
59.0	.0	59.0	.0	.0	13.6	.0	39.8	23.7	1051.76
.82	.00	4.33	.00	.000	.025	.000	.000	1051.76	131.00
.000867	40.	40.	40.	2	0	0	.00	3.50	134.50

FLOW DISTRIBUTION FOR SECNO= 4320.00 CWSEL= 1055.65

STA= 131. 135.
PER Q= 100.0
AREA= 13.6
VEL= 4.3
DEPTH= 3.9

*SECNO 4310.000

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

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 4.94

4310.000	4.24	1056.02	.00	.00	1056.03	.01	.00	.09	1055.78
59.0	.1	58.9	.0	.6	93.1	.0	39.8	23.7	1057.48
.83	.09	.63	.00	.025	.025	.000	.000	1051.78	109.95
.000036	10.	10.	10.	2	0	0	.00	43.01	152.97

FLOW DISTRIBUTION FOR SECNO= 4310.00 CWSEL= 1056.02

STA=	110.	115.	159.
PER Q=	.1	99.9	
AREA=	.6	93.1	
VEL=	.1	.6	
DEPTH=	.1	2.5	

CCHV= .100 CEHV= .300
*SECNO 4000.000

WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .63

4000.000	3.63	1056.03	.00	.00	1056.05	.01	.02	.00	1056.40
59.0	.0	59.0	.0	.0	65.4	.0	40.4	24.0	1058.30
.92	.00	.90	.00	.000	.025	.000	.000	1052.40	116.46
.000089	310.	310.	310.	2	0	0	.00	30.99	147.46

FLOW DISTRIBUTION FOR SECNO= 4000.00 CWSEL= 1056.03

STA=	116.	155.
PER Q=	100.0	
AREA=	65.4	
VEL=	.9	
DEPTH=	2.1	

*SECNO 3910.000

3910.000	3.46	1056.04	.00	.00	1056.06	.02	.01	.00	1058.24
59.0	.0	59.0	.0	.0	58.2	.0	40.5	24.1	1058.60
.95	.00	1.01	.00	.000	.025	.000	.000	1052.58	121.22
.000119	90.	90.	90.	0	0	0	.00	28.62	149.84

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


FLOW DISTRIBUTION FOR SECNO=   3910.00         CWSEL=   1056.04

STA=     121.     160.
 PER Q=    100.0
  AREA=     58.2
   VEL=      1.0
 DEPTH=      2.0

*SECNO 3900.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .18

 3900.000     1.49   1055.93      .00      .00   1056.11      .18      .00      .05   1058.44
     59.0       .0      59.0       .0       .0     17.4       .0     40.5     24.1   1058.65
      .95      .00      3.38      .00     .000     .025     .000     .000  1054.44    125.03
  .003553      10.       10.      10.        2        0        0      .00    18.36    143.39


FLOW DISTRIBUTION FOR SECNO=   3900.00         CWSEL=   1055.93

     125.     157.
 PER Q=    100.0
  AREA=     17.4
   VEL=      3.4
 DEPTH=       .9

*SECNO 3600.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .70

 3600.000     1.29   1057.32   1057.22      .00   1057.63      .32     1.48      .04   1059.96
     59.0       .0      59.0       .0       .0     13.1       .0     40.6     24.2   1059.96
      .97      .00      4.52      .00     .000     .025     .000     .000  1056.03    125.57
  .007340     300.      300.     300.       10       15        0      .00    15.29    140.87


FLOW DISTRIBUTION FOR SECNO=   3600.00         CWSEL=   1057.32

STA=     126.     151.
 PER Q=    100.0
  AREA=     13.1
   VEL=      4.5
 DEPTH=       .9
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  SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
            QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
  TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


*SECNO 3108.000
 3108.000     1.48   1060.07       .00       .00   1060.28       .21      2.64       .01   1063.70
     59.0       .0      59.0       .0       .0      16.2       .0      40.8      24.4   1063.70
     1.00      .00      3.64      .00      .000      .025      .000      .000   1058.59    129.51
  .004080     492.      492.     492.         3         0         0       .00     16.85    146.37


FLOW DISTRIBUTION FOR SECNO=   3108.00         CWSEL=   1060.07

STA=     130.     161.
  PER Q=    100.0
   AREA=     16.2
    VEL=      3.6
  DEPTH=      1.0

CCHV=     .300 CEHV=     .500
*SECNO 3055.000

3301 HV CHANGED MORE THAN HVINS

3[illegible]0 TRIALS ATTEMPTED WSEL,CWSEL
36[illegible]ROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=     1065.00 ELREA=     1065.00

 3055.000     2.06   1060.85   1060.85       .00   1061.89      1.04       .28       .42   1058.79
     59.0       .0      59.0       .0       .0       7.2       .0      40.8      24.4   1058.79
     1.01      .00      8.18      .00      .000      .025      .000      .000   1058.79    140.07
  .007225      53.       53.       53.        20        11         0       .00      3.50    143.57


FLOW DISTRIBUTION FOR SECNO=   3055.00         CWSEL=   1060.85

STA=     140.     144.
  PER Q=    100.0
   AREA=      7.2
    VEL=      8.2
  DEPTH=      2.1
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
ME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	1	.024	.50	2.95	.00	3.50	.00	110.00	2	1	1059.36	1058.79

CHART 2 - CORRUGATED METAL PIPE CULVERT
SCALE 1 - HEADWALL

5140, NORMAL DEPTH EXCEEDS CULVERT HEIGHT
*SECNO 2945.000

SPECIAL CULVERT OUTLET CONTROL
EGIC = 1063.137 EGOC = 1063.225 PCWSE= 1060.850 ELTRD= 1065.110

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.43

SP[illegible] CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1063.14	1063.23	1.34	0.	59.	4.799	9.6	1065.11	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1065.46 ELREA= 1065.11

2945.000	3.51	1062.87	.00	.00	1063.23	.36	1.34	.00	1059.36
59.0	.0	59.0	.0	.0	12.3	.0	40.8	24.4	1059.36
1.01	.00	4.80	.00	.000	.025	.000	.000	1059.36	138.91
.001220	110.	110.	110.	2	0	0	.00	3.50	142.41

FLOW DISTRIBUTION FOR SECNO= 2945.00 CWSEL= 1062.87

STA= 139. 142.
PER Q= 100.0
AREA= 12.3
VEL= 4.8
DEPTH= 3.5

*SECNO 2935.000

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

302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 4.89

2935.000	3.95	1063.32	.00	.00	1063.33	.01	.00	.10	1063.54
59.0	.0	59.0	.0	.0	82.4	.0	40.9	24.4	1063.54
1.02	.00	.72	.00	.000	.025	.000	.000	1059.37	115.86
.000051	10.	10.	10.	2	0	0	.00	36.63	152.50

LOW DISTRIBUTION FOR SECNO= 2935.00 CWSEL= 1063.32

TA= 116. 153.
PER Q= 100.0
AREA= 82.4
VEL= .7
DEPTH= 2.2

THIS RUN EXECUTED 01MAY95 15:28:40

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

FLOOD PROFILES

SUMMARY PRINTOUT

	SECNO	CWSEL	VCH	ELMIN	TOPWID	DEPTH	QLOB	QCH	QROB	VLOB
	15759.000	1020.60	8.18	1017.14	91.66	3.46	374.09	322.04	31.87	3.29
*	15416.000	1022.60	5.89	1018.40	459.84	4.20	96.43	631.57	.00	.76
*	14916.000	1023.66	3.53	1019.10	342.90	4.56	364.85	356.15	.00	1.06
	16.000	1023.93	2.76	1019.64	345.41	4.29	52.14	668.86	.00	.41
	13916.000	1024.15	3.12	1020.20	178.36	3.95	1.12	719.86	.01	.14
	13531.000	1024.39	3.55	1020.90	71.97	3.49	.00	726.00	.00	.00
*	13471.000	1024.13	7.73	1021.00	30.00	3.13	.00	726.00	.00	.00
	13361.000	1024.72	6.68	1021.10	30.00	3.62	.00	726.00	.00	.00
*	13339.000	1025.21	8.62	1021.20	37.06	4.01	.00	726.00	.00	.00
	13270.000	1026.02	6.93	1021.49	53.17	4.53	.00	724.69	1.31	.00
	12224.000	1030.43	7.17	1025.99	40.56	4.44	.00	726.00	.00	.00
	12116.000	1030.53	10.01	1026.45	16.00	4.08	.00	654.00	.00	.00
*	12076.000	1032.14	7.39	1026.61	16.00	5.53	.00	654.00	.00	.00
*	12049.000	1033.04	3.36	1026.63	59.73	6.41	.00	653.97	.03	.00
*	11100.000	1033.91	6.54	1029.71	42.54	4.20	.00	654.00	.00	.00
	10696.000	1035.45	5.96	1031.01	40.56	4.44	.00	604.00	.00	.00
	38.000	1035.43	9.26	1031.36	16.00	4.07	.00	604.00	.00	.00

	SECNO	CWSEL	VCH	ELMIN	TOPWID	DEPTH	QLOB	QCH	QROB	VLOB
	10548.000	1036.23	7.94	1031.48	16.00	4.75	.00	604.00	.00	.00
*	10521.000	1037.25	3.78	1031.52	71.00	5.73	.00	602.60	1.40	.02
	9943.000	1037.81	4.18	1032.39	48.33	5.42	.00	604.00	.00	.00
*	9823.000	1037.76	5.80	1032.57	20.00	5.19	.00	602.00	.00	.00
	9763.000	1038.03	5.60	1032.66	20.00	5.37	.00	602.00	.00	.00
*	9733.000	1038.38	3.81	1032.70	50.47	5.68	.00	602.00	.00	.00
	9479.000	1038.62	4.00	1033.08	49.33	5.54	.00	602.00	.00	.00
*	9359.000	1038.84	3.14	1033.26	56.61	5.58	66.54	419.73	66.74	1.87
	9299.000	1039.42	2.60	1033.35	83.00	6.07	68.87	379.08	105.05	1.61
*	9269.000	1039.39	3.18	1033.39	52.98	6.00	.00	553.00	.00	.00
	8410.000	1040.02	4.05	1034.77	47.03	5.25	.00	553.00	.00	.00
	8283.000	1040.00	6.26	1034.96	16.00	5.04	.00	505.00	.00	.00
	8173.000	1040.37	6.00	1035.12	16.00	5.25	.00	505.00	.00	.00
	8141.000	1040.93	3.13	1035.17	51.06	5.76	.00	505.00	.00	.00
	7702.000	1041.30	3.43	1035.83	48.77	5.47	.00	505.00	.00	.00
	7575.000	1041.25	5.73	1036.02	16.00	5.23	.00	480.00	.00	.00
	7535.000	1041.51	5.52	1036.08	16.00	5.43	.00	480.00	.00	.00
	7503.000	1041.98	2.87	1036.12	53.72	5.86	.00	480.00	.00	.00
*	6566.000	1042.58	3.77	1037.53	45.41	5.05	.00	480.00	.00	.00
	6439.000	1042.62	5.03	1037.72	16.00	4.90	.00	394.00	.00	.00
*	6399.000	1043.32	2.53	1037.78	89.50	5.54	95.92	224.40	73.68	1.56
*	6367.000	1043.31	2.66	1037.82	66.46	5.49	.00	393.19	.81	.01
*	5800.000	1043.54	5.11	1042.35	14.48	1.19	.00	59.00	.00	.00
*	5645.000	1045.79	8.18	1043.73	3.50	2.06	.00	59.00	.00	.00
*	5605.000	1047.78	4.56	1044.09	3.50	3.69	.00	59.00	.00	.00
*	90.000	1048.19	.77	1044.34	34.85	3.85	.00	59.00	.00	.00

	SECNO	CWSEL	VCH	ELMIN	TOPWID	DEPTH	QLOB	QCH	QROB	VLOB
	573.000	1048.20	.73	1044.37	36.97	3.83	.00	59.00	.00	.00
*	5500.000	1048.19	1.06	1044.94	29.30	3.26	.00	59.00	.00	.00
*	5350.000	1048.19	2.33	1046.12	19.30	2.07	.00	59.00	.00	.00
*	5200.000	1048.49	5.08	1047.30	14.52	1.19	.00	59.00	.00	.00
*	4910.000	1049.74	2.54	1047.88	19.90	1.86	.00	59.00	.00	.00
*	4900.000	1051.79	5.11	1050.60	14.48	1.19	.00	59.00	.00	.00
*	4390.000	1053.59	2.44	1051.62	19.51	1.97	.00	59.00	.00	.00
*	4360.000	1053.74	8.19	1051.68	3.50	2.06	.00	59.00	.00	.00
*	4320.000	1055.65	4.33	1051.76	3.50	3.89	.00	59.00	.00	.00
*	4310.000	1056.02	.63	1051.78	43.01	4.24	.05	58.95	.00	.09
*	4000.000	1056.03	.90	1052.40	30.99	3.63	.00	59.00	.00	.00
	3910.000	1056.04	1.01	1052.58	28.62	3.46	.00	59.00	.00	.00
	00.000	1055.93	3.38	1054.44	18.36	1.49	.00	59.00	.00	.00
*	3600.000	1057.32	4.52	1056.03	15.29	1.29	.00	59.00	.00	.00
	3108.000	1060.07	3.64	1058.59	16.85	1.48	.00	59.00	.00	.00
*	3055.000	1060.85	8.18	1058.79	3.50	2.06	.00	59.00	.00	.00
*	2945.000	1062.87	4.80	1059.36	3.50	3.51	.00	59.00	.00	.00
*	2935.000	1063.32	.72	1059.37	36.63	3.95	.00	59.00	.00	.00

ARY OF ERRORS AND SPECIAL NOTES

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CAUTION SECNO=  15416.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  15416.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=  14916.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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CAUTION SECNO=  13339.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  13339.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  13339.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

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CAUTION SECNO=   5200.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
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CAUTION SECNO=  4900.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

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CAUTION SECNO=  4360.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  4360.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=  4320.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  4310.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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WARNING SECNO=  3600.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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CAUTION SECNO=  3055.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  3055.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

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WARNING SECNO=  2935.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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APPENDIX D

Roadway Drainage Calculation Sheets

ROADWAY RUNOFF

Catch Basin Calculation Sheets

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: RJF Date: 05-03-1995

LOCATION DATA

Location: Camelback Road

Project Name: Camelback Road Subarea id: Sta 20+44 RT To 29+30 RT

Drainage Area Cover: Roadway

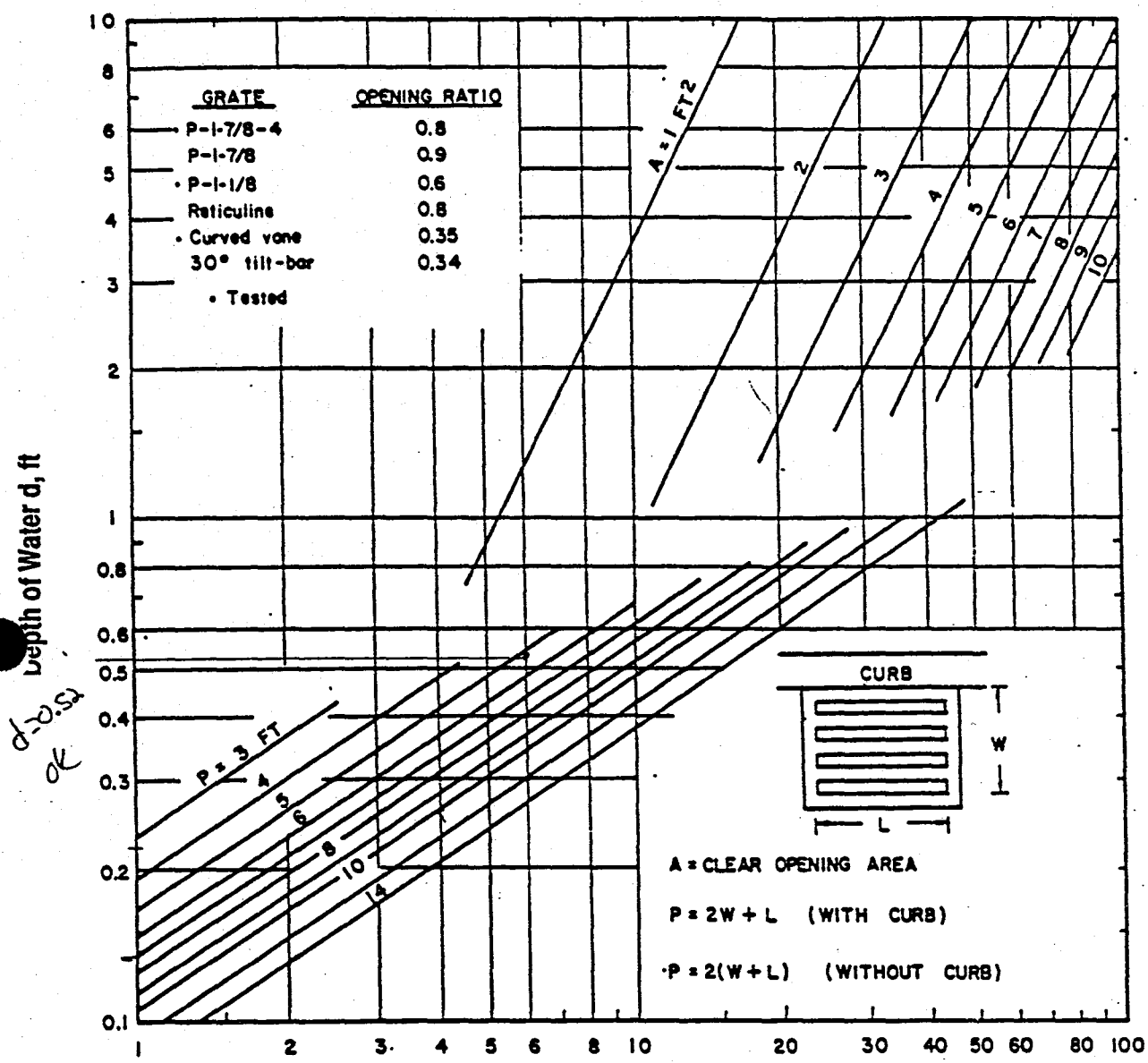
DESIGN DATA

Drainage Area	1.52 acres
Watercourse Length	884.0 feet
Top Elevation	76.8 feet
Bottom Elevation	64.7 feet
Slope	.01374 feet/feet
Roughness Coefficient (Kb)	.03886
10-Year, 6-Hour Rainfall	1.99 inches

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	4	5	6	8	10	12
C	0.800	0.800	0.800	0.880	0.950	0.950
Tc (min)	9.1	8.0	7.6	6.9	6.5	6.2
i (in/hr)	2.9	4.1	4.7	6.1	7.0	8.0

Sta 29+40



d=0.52
ok

Use ADOT Type 4 Catch Basin /LB grate

P = 10.6
0.5P = 5.3
/
reduction factor

Sta 29+40

Figure 3.29
Grate Inlet Capacity In Sump Conditions

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: DJE Date: 05-03-1995

LOCATION DATA

Location: Camelback Road

Project Name: Camelback Road Subarea id: Sta 24+45 Lt To Sta 25+67 LT

Drainage Area Cover: Roadway

Drains to 15" cmp at sta. 25+87 - 46 LT

DESIGN DATA

Drainage Area	0.68 acres
Watercourse Length	422.0 feet
Top Elevation	76.9 feet
Bottom Elevation	71.6 feet
Slope	.01261 feet/feet
Roughness Coefficient (Kb)	.04105
10-Year, 6-Hour Rainfall	1.99 inches

Hydrological Summary Table

.53

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	2	3	3	4	5	6
C	0.800	0.800	0.800	0.880	0.950	0.950
Tc (min)	6.3	5.6	5.2	5.0	5.0	5.0
i (in/hr)	3.4	4.6	5.6	6.7	7.7	8.7

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: PJF Date: 05-03-1995

LOCATION DATA

Location: Camelback Road

Project Name: Camelback Road Subarea id: Sta 21+45 - LT to Sta 29+28 - LT

Drainage Area Cover: Roadway

Drains to 42" cmp @ Litchfield Road

DESIGN DATA

Drainage Area	1.26 acres
Watercourse Length	785.0 feet
Top Elevation	76.9 feet
Bottom Elevation	65.1 feet
Slope	.01497 feet/feet
Roughness Coefficient (Kb)	.03937
10-Year, 6-Hour Rainfall	1.99 inches

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	3	4	5	7	9	10
C	0.800	0.800	0.800	0.880	0.950	0.950
Tc (min)	8.3	7.3	6.9	6.3	6.0	5.7
i (in/hr)	3.1	4.2	4.9	6.3	7.2	8.3

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: DJE Date: 01-11-1995

LOCATION DATA

Location: Camelback Road

Project Name: Camelback Road Subarea id: Sta 30+00 To Sta 39+65.67

Drainage Area Cover: Roadway

DESIGN DATA

Drainage Area	1.11 acres
Watercourse Length	965.7 feet
Top Elevation	65.5 feet
Bottom Elevation	59.0 feet
Slope	.00673 feet/feet
Roughness Coefficient (Kb)	.03972
10-Year, 6-Hour Rainfall	1.99 inches

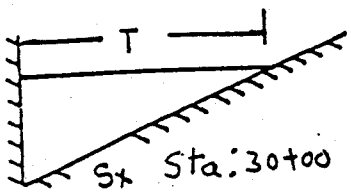
Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	2	3	4	5	7	8
C	0.800	0.800	0.800	0.880	0.950	0.950
Tc (min)	12.7	11.2	10.6	9.5	9.0	8.6
i (in/hr)	2.6	3.5	4.0	5.4	6.2	7.1

Date 1/11/95

Camelback Road
CBA # 241729-01

$$Q_t = \left(\frac{0.56}{n}\right) S_x^{1.67} S^{0.5} T^{2.67}$$



Sta: 30+00 to Sta: 39+65.67

Example:

Given:
n = 0.016 S_x = 0.03
S = 0.04 T = 6 ft

Find:
Q = 2.4 ft^3/s
Q_n = 0.038 ft^3/s

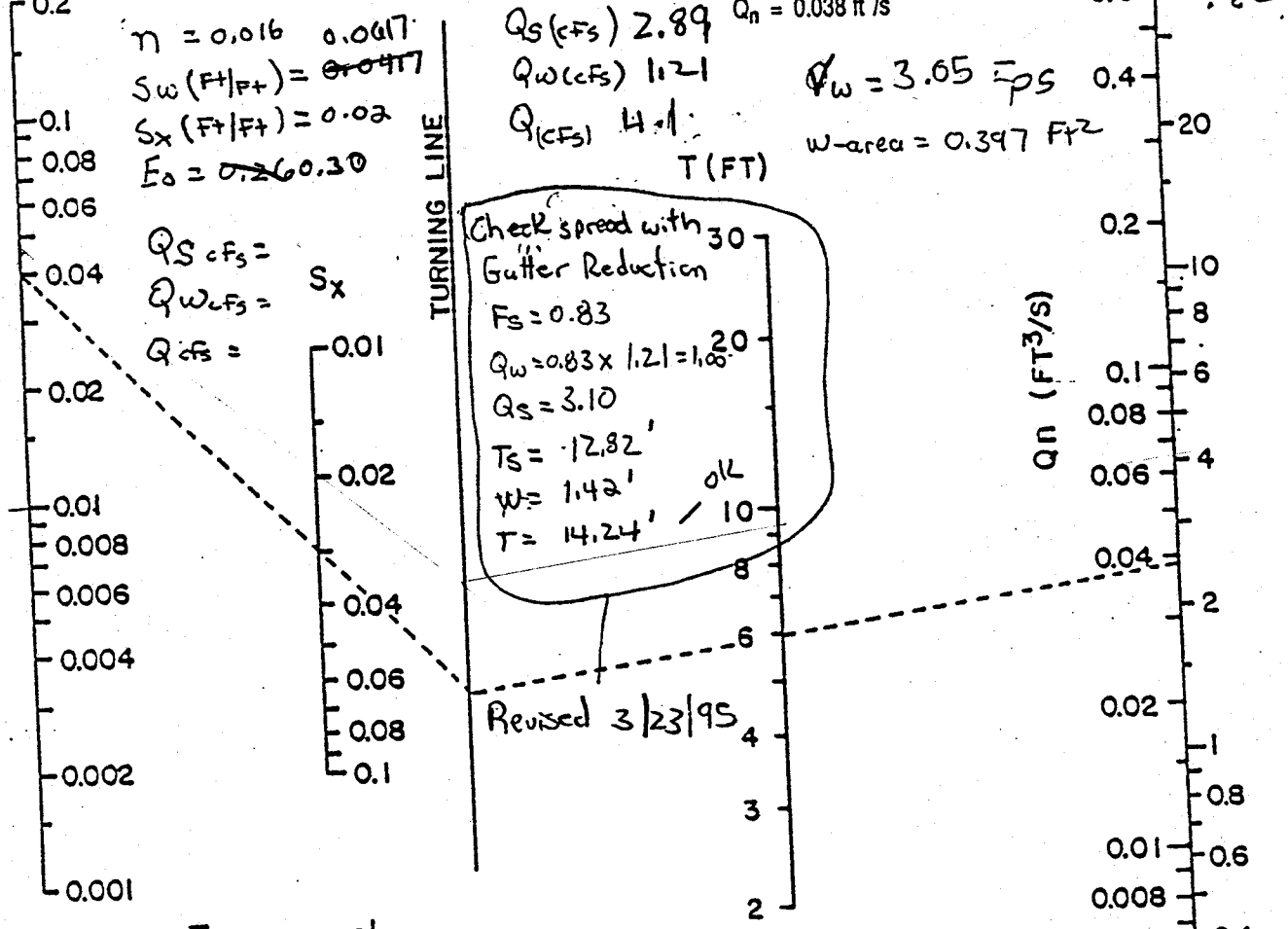
$S(ft/ft) = 0.0045$ $T_s = 12.5$

$n = 0.016$ 0.0617
$S_w(ft/ft) =$ ~~0.0417~~
$S_x(ft/ft) = 0.02$
$E_o =$ ~~0.26~~ 0.30

$Q_s(cfs)$ 2.89
$Q_w(cfs)$ 1.21
$Q_{(cfs)}$ 4.1

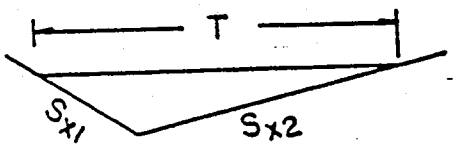
$V_w = 3.65$ fps
w-area = 0.397 ft^2

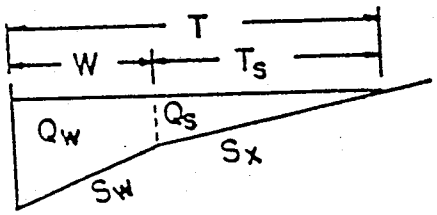
Q_s cfs =
Q_w cfs =
Q cfs =



Check spread with Gutter Reduction
$F_s = 0.83$
$Q_w = 0.83 \times 1.21 = 1.00$
$Q_s = 3.10$
$T_s = 12.82'$
$W = 1.42'$
$T = 14.24'$ OK

Revised 3/23/95





1) For V-shape, use the nomograph with

$$S_x = \frac{S_{x1} S_{x2}}{(S_{x1} + S_{x2})}$$

2) To determine discharge in gutter with composite cross slopes, find Q_s using T_s and S_x. Then, use Figure 3.24 (page 47) to find Eo. The total discharge is $Q = \frac{Q_s}{(1 - E_o)}$, and $Q_w = Q - Q_s$.

By: PJE
Checked: Date:

Figure 3.2
Nomograph for Triangular Gutters
(source: FHWA, 1984, HEC-12)

St 39+65.67

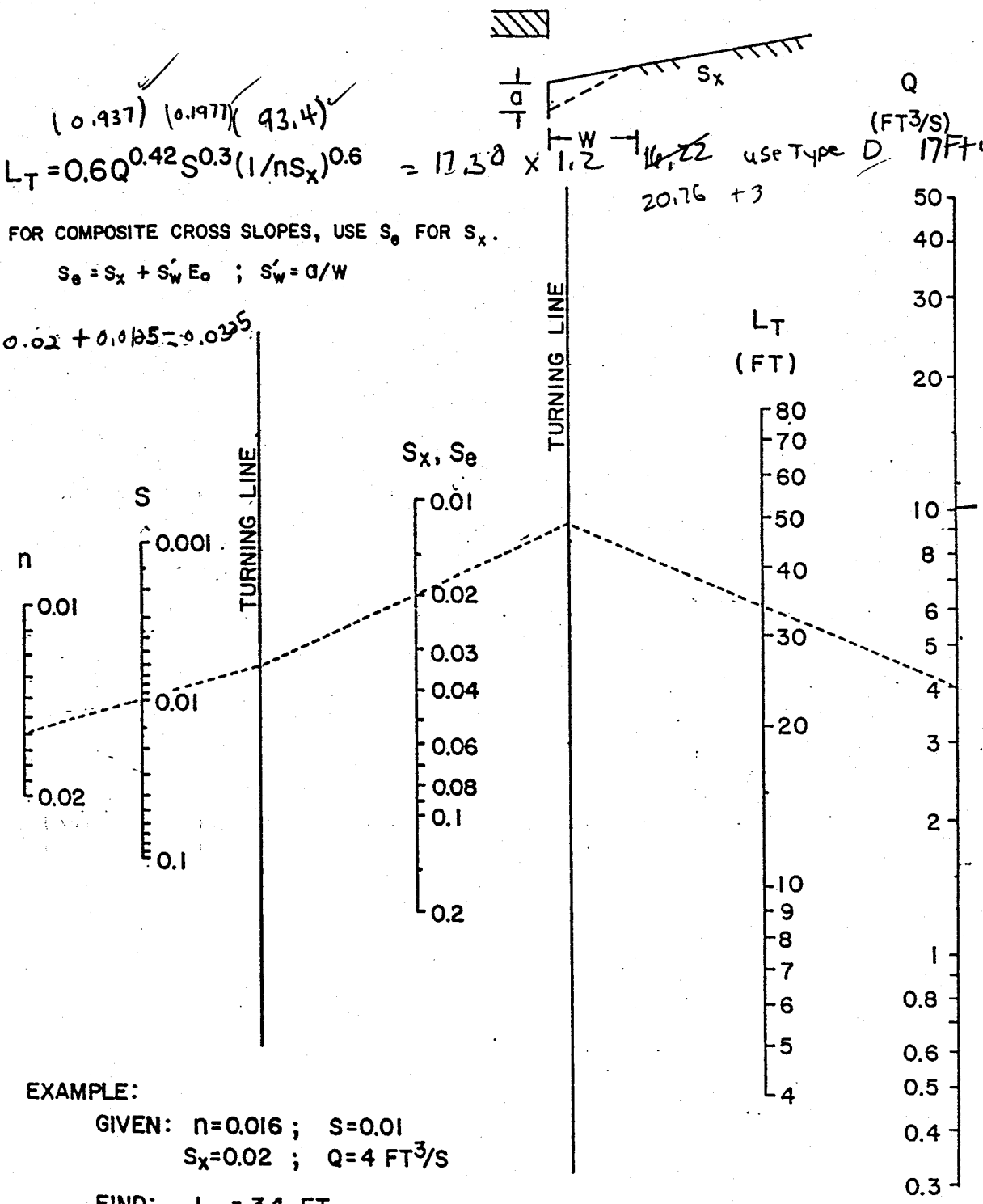
(0.937) (0.1977) (93.4)

$L_T = 0.6Q^{0.42}S^{0.3}(1/nS_x)^{0.6}$ = 17.30 x 1.2 ~~16.22~~ 20.76 +3 use Type D 17Ft wing

FOR COMPOSITE CROSS SLOPES, USE S_e FOR S_x.

$S_e = S_x + S'_w E_o$; $S'_w = a/W$

Se = 0.02 + 0.0135 = 0.0335



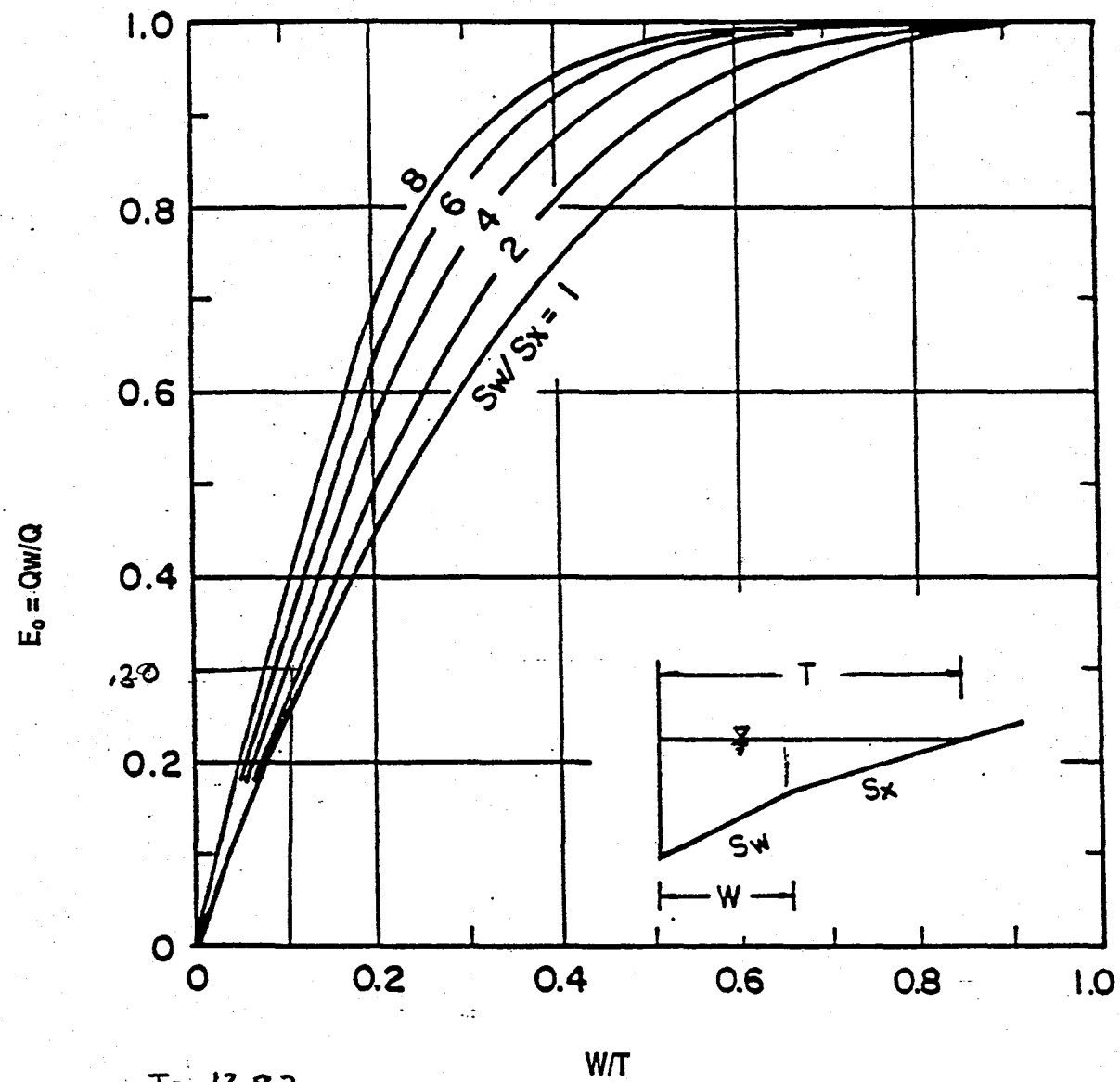
EXAMPLE:

GIVEN: n=0.016 ; S=0.01
S_x=0.02 ; Q=4 FT^3/S

FIND: L_T = 34 FT

CHART 9. Curb-opening and slotted drain inlet length for total interception.

Sta 39+65.67 and 50+65.7



T = 13.92

w = 1.42

w/T = 0.102

Sw' = 0.0417

Sx = 0.02

Sw/Sx = 3.08

Sw = Sw' + Sx = 0.0617

004

Figure 3.23
Ratio of Frontal Flow to Total Gutter Flow
(source: FHWA, 1984, HEC-12)

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: PJE Date: 01-11-1995

LOCATION DATA

Location: Camelback Road

Project Name: Camelback Road Subarea id: Sta 39+65.67 to Sta 50+65.67

Drainage Area Cover: Roadway

DESIGN DATA

Drainage Area	1.26	acres
Watercourse Length	1100.0	feet 1084.33
Top Elevation	59.0	feet
Bottom Elevation	56.0	feet
Slope	.00273	feet/feet
Roughness Coefficient (Kb)	.03991	
10-Year, 6-Hour Rainfall	1.99	inches

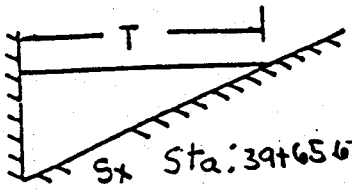
Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	2	3	3	5	6	7
C	0.800	0.800	0.800	0.880	0.950	0.950
Tc (min)	19.4	17.1	16.1	14.5	13.7	12.9
i (in/hr)	2.1	2.9	3.4	4.5	5.2	6.0

Date 1/11/95

Camelback Road
CBA # 241729-01

$$Q_t = \left(\frac{0.56}{n}\right) S_x^{1.67} S^{0.5} T^{2.67}$$



Sta: 39+65.67 to Sta: 50+65.67

Example:

Given:

n = 0.016 S_x = 0.03
S = 0.04 T = 6 ft

Find:

Q = 2.4 ft^3/s
Q_n = 0.038 ft^3/s

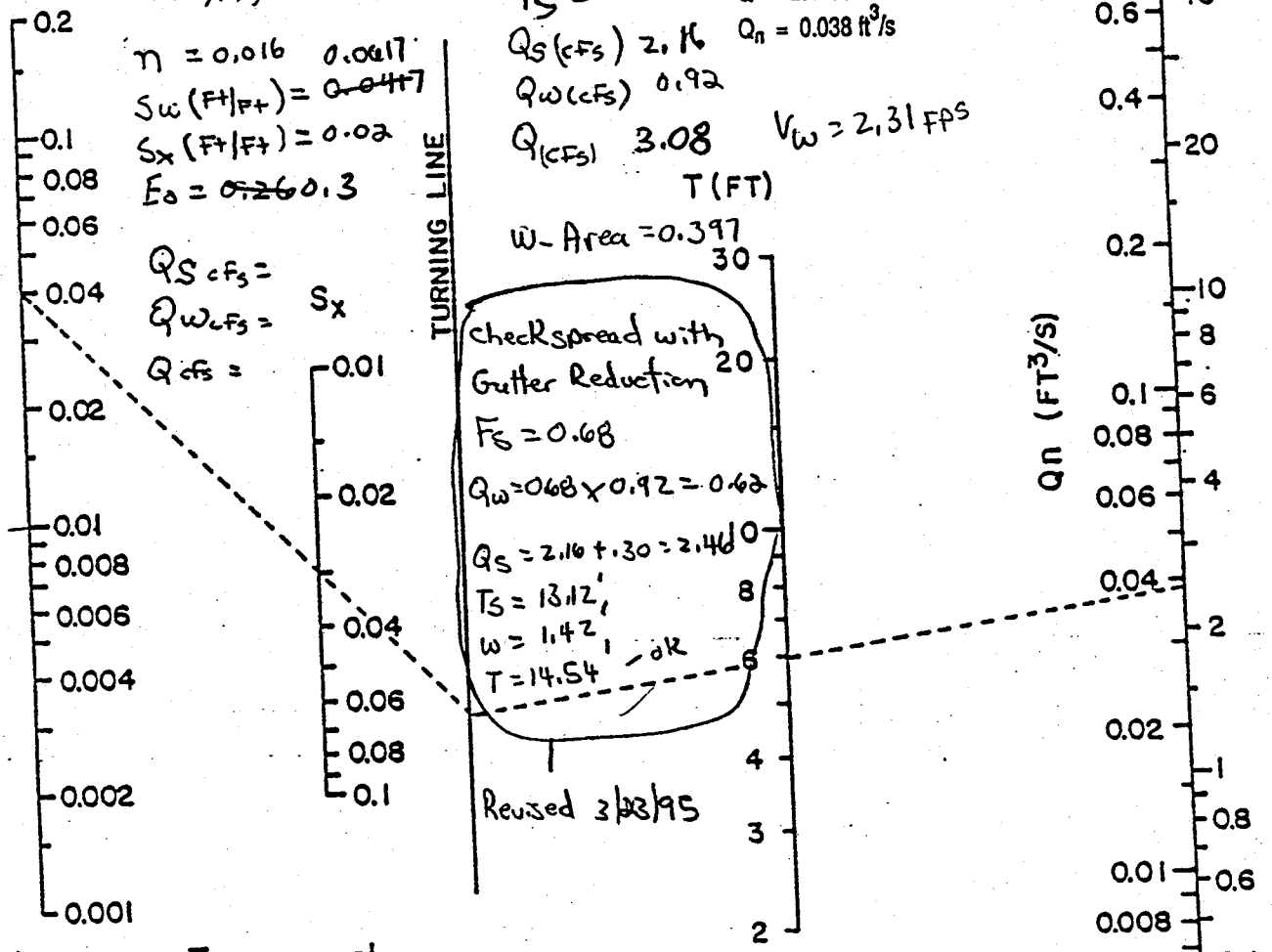
S (ft/ft) = 0.0025

n = 0.016 0.0017
S_w (ft/ft) = ~~0.0417~~
S_x (ft/ft) = 0.02
E_o = ~~0.26~~ 0.3

Q_S cfs =
Q_W cfs =
Q cfs =

T_S = 12.5
Q_S (cfs) 2.16
Q_W (cfs) 0.92
Q (cfs) 3.08 V_W = 2.31 FPS

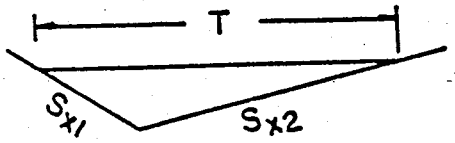
W - Area = 0.397

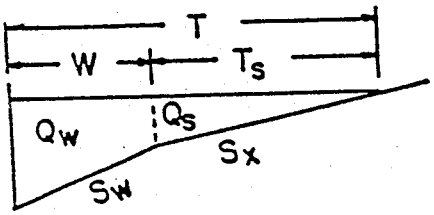


12.5 2.16

Check spread with Gutter Reduction
F_S = 0.68
Q_W = 0.68 × 0.92 = 0.62
Q_S = 2.16 + .30 = 2.46
T_S = 13.12'
W = 1.42'
T = 14.54' OK

Revised 3/23/95





1) For V-shape, use the nomograph with

$$S_x = \frac{S_{x1} S_{x2}}{(S_{x1} + S_{x2})}$$

2) To determine discharge in gutter with composite cross slopes, find Q_s using T_s and S_x. Then, use Figure 3.24 (page 47) to find Eo. The total discharge is $Q = \frac{Q_s}{(1 - E_o)}$, and $Q_W = Q - Q_s$.

By: PJE
Checked: / / Date. 5/1/95

Figure 3.2
Nomograph for Triangular Gutters
(source: FHWA, 1984, HEC-12)

Sta 50+65.67

(0.829) (0.1657)(93.4)

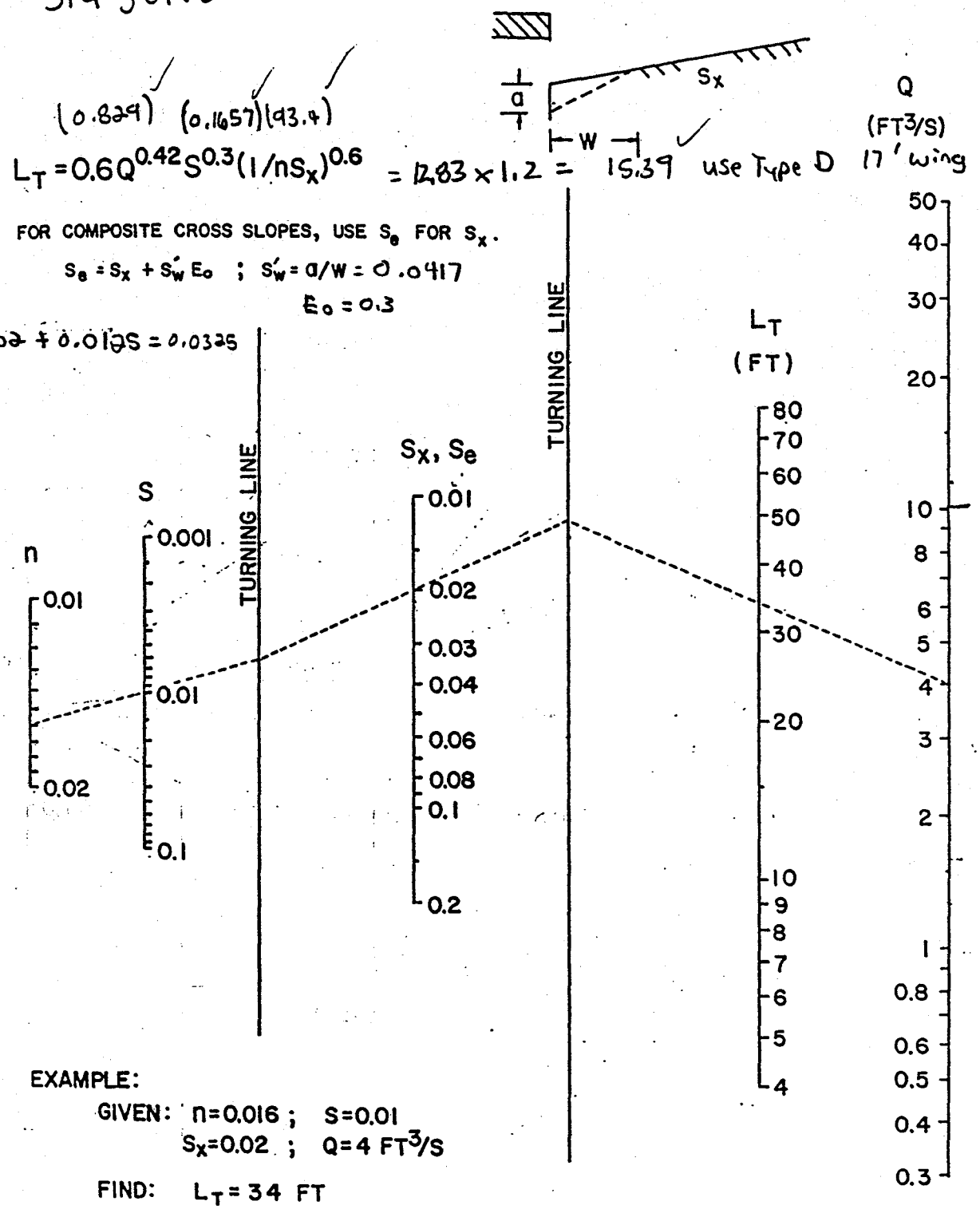
$L_T = 0.6Q^{0.42}S^{0.3}(1/nS_x)^{0.6}$ = 12.83 × 1.2 = 15.39 use Type D 17' wing

FOR COMPOSITE CROSS SLOPES, USE S_e FOR S_x.

$S_e = S_x + S'_w E_o$; $S'_w = a/W = 0.0417$

$E_o = 0.3$

Se = 0.02 + 0.012S = 0.0325



EXAMPLE:

GIVEN: n=0.016 ; S=0.01

S_x=0.02 ; Q=4 FT^3/S

FIND: L_T = 34 FT

CHART 9. Curb-opening and slotted drain inlet length for total interception.

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: PJE Date: 01-13-1995

LOCATION DATA

Location: Camelback Road

Project Name: Camelback Road Subarea id: Sta 50+64 to Sta 59+03)

Drainage Area Cover: Roadway

CB @ 58+87

DESIGN DATA

Drainage Area	0.96 acres
Watercourse Length	839.4 feet - 6
Top Elevation	56.1 feet
Bottom Elevation	47.0 feet
Slope	.01084 feet/feet
Roughness Coefficient (Kb)	.04010
10-Year, 6-Hour Rainfall	1.99 inches

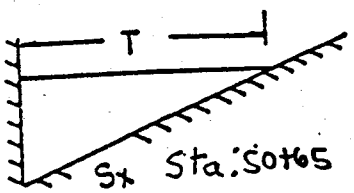
Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	2	3	3	5	6	7
C	0.800	0.800	0.800	0.880	0.950	0.950
Tc (min)	9.8	8.7	8.2	7.4	7.0	6.7
i (in/hr)	2.9	4.0	4.5	5.9	6.8	7.8

Camelback Road
CBA # 241729-01

2.1

$$Q_t = \left(\frac{0.56}{n}\right) S_x^{1.67} S^{0.5} T^{2.67}$$



Sta: 50+65 to Sta: 59+05

Example:

Given:
n = 0.016 S_x = 0.03
S = 0.04 T = 6 ft

Find:
Q = 2.4 ft³/s
Q_n = 0.038 ft³/s

S (ft/ft) = 0.1008

Ts = 10

n = 0.016 0.0017
Sw (ft/ft) = ~~0.0417~~
Sx (ft/ft) = 0.02
Eo = ~~0.26~~ 0.32

Qs (cfs) 2.13
Qw (cfs) 1 cfs
Q (cfs) 3.13

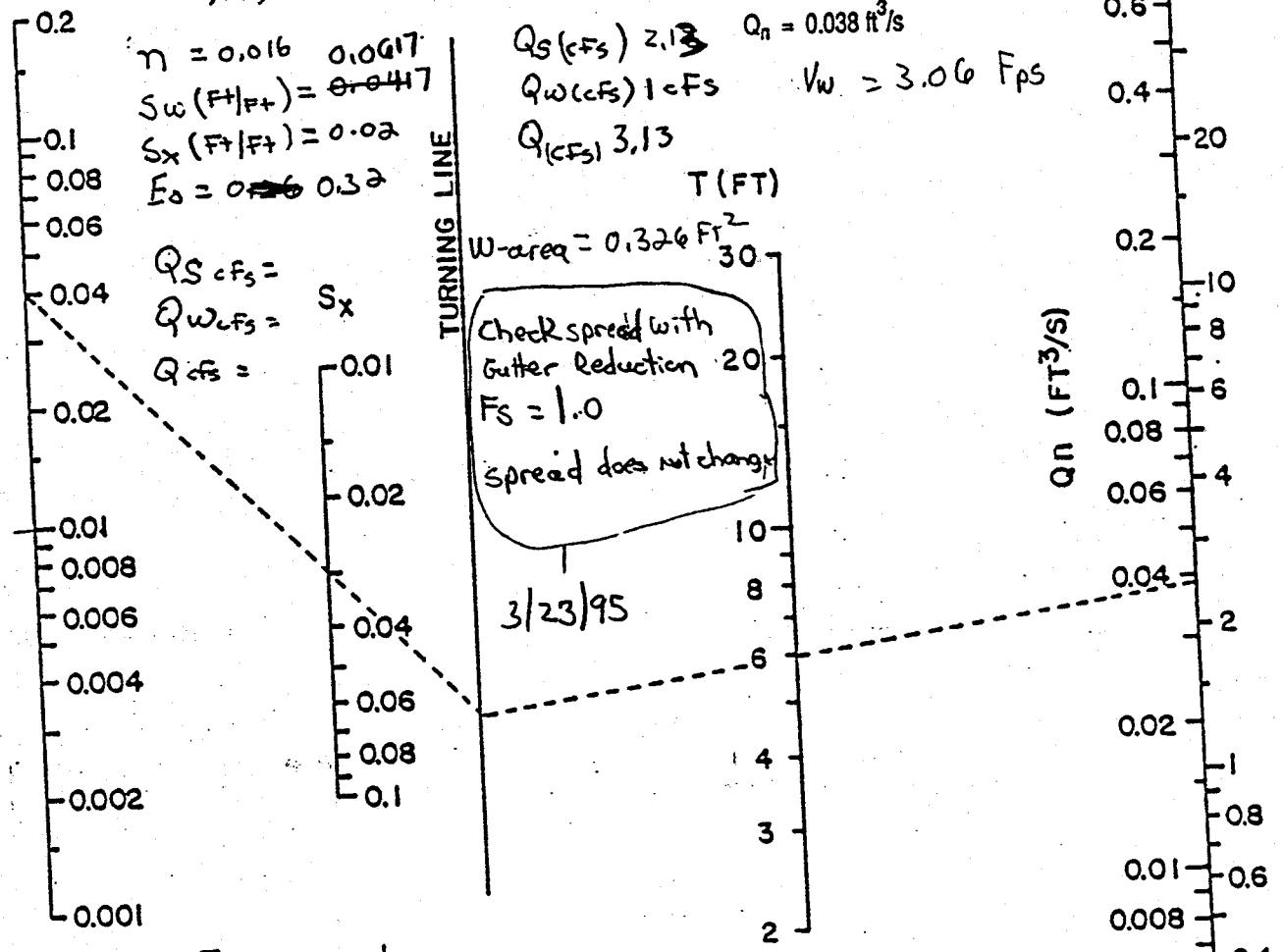
Vw = 3.06 fps

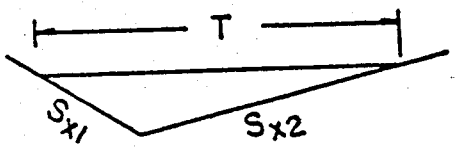
Qs cfs =
Qw cfs =
Q cfs =

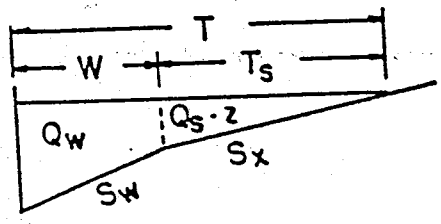
W-area = 0.326 ft²

Check spread with Gutter Reduction Fs = 1.0
spread does not change

3/23/95







1) For V-shape, use the nomograph with

$$S_x = \frac{S_{x1} S_{x2}}{(S_{x1} + S_{x2})}$$

2) To determine discharge in gutter with composite cross slopes, find Q_s using T_s and S_x. Then, use Figure 3.24 (page 47) to find Eo. The total discharge is $Q = \frac{Q_s}{(1 - E_o)}$, and $Q_w = Q - Q_s$.

By: PJE
Checked: SSS Date: 5/2/95

Figure 3.2
Nomograph for Triangular Gutters
(source: FHWA, 1984, HEC-12)

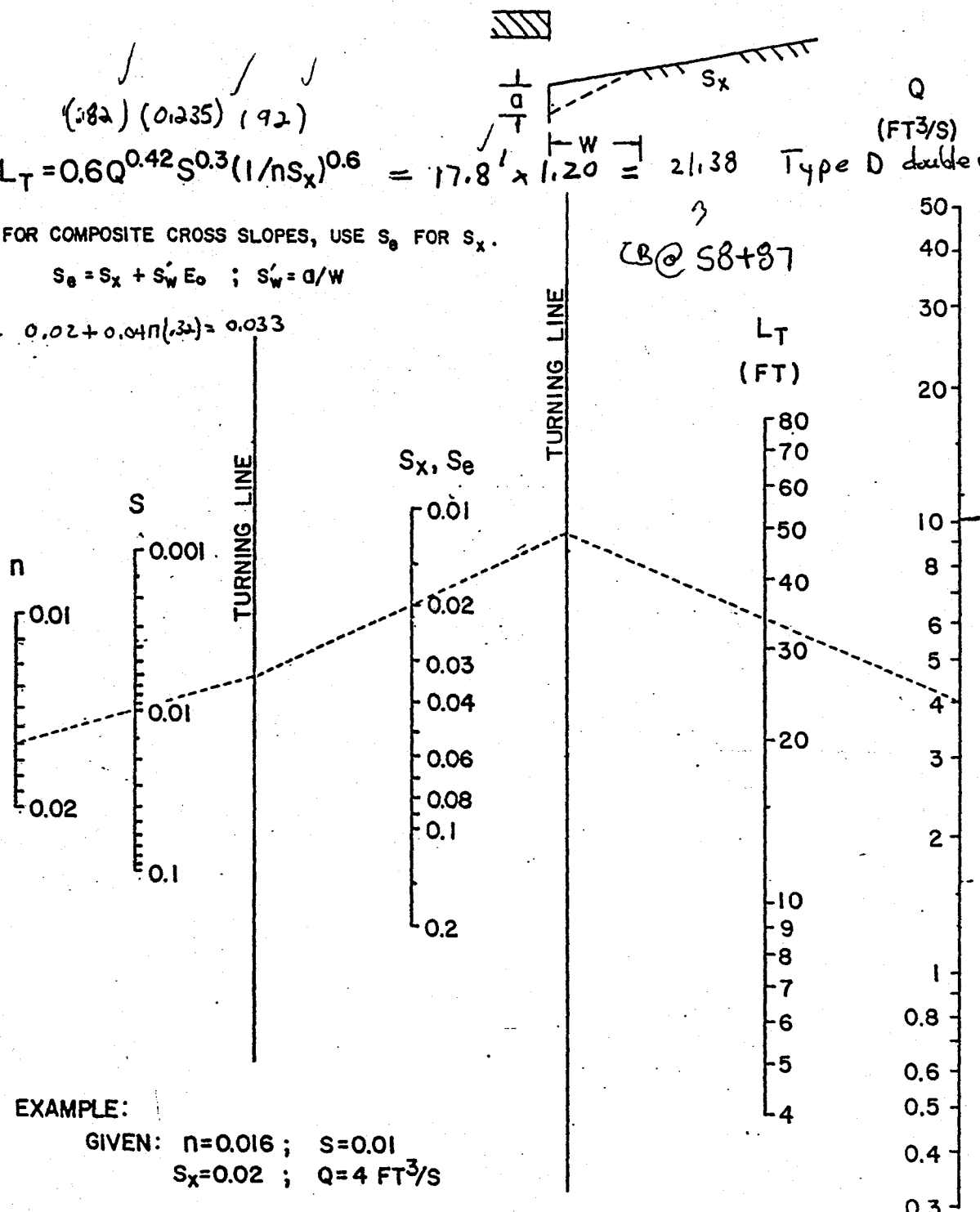
(.182) (0.1235) (92)

$L_T = 0.6Q^{0.42}S^{0.3}(1/nS_x)^{0.6}$ = 17.8' x 1.20 = 21.38 Type D double wings 10'

FOR COMPOSITE CROSS SLOPES, USE S_e FOR S_x.

$S_e = S_x + S'_w E_o$; $S'_w = a/W$

S_e = 0.02 + 0.04n(.32) = 0.033



EXAMPLE:

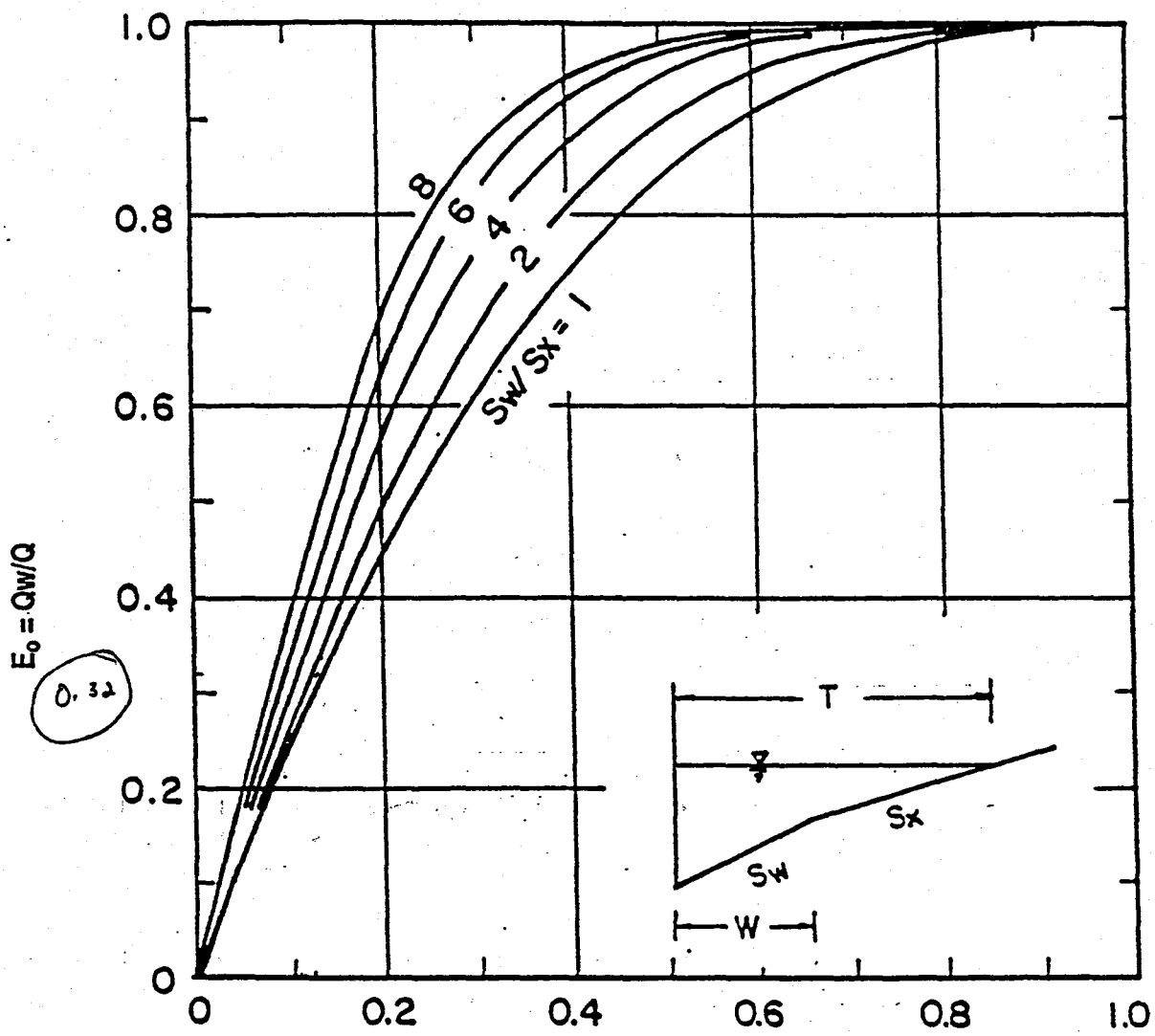
GIVEN: n=0.016 ; S=0.01

S_x=0.02 ; Q=4 FT^3/S

FIND: L_T = 34 FT

CHART 9. Curb-opening and slotted drain inlet length for total interception.

Sta 59+03



Sw/Sx = 3

T = 11.42

w = 1.42

w/T = 0.12

Figure 3.23
Ratio of Frontal Flow to Total Gutter Flow
(source: FHWA, 1984, HEC-12)

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: PJE Date: 01-13-1995

LOCATION DATA

Location: Camelback Road

Project Name: Camelback Road Subarea id: Sta 59+03 To Sta 64+50

Drainage Area Cover: Roadway

DESIGN DATA

check Spread upstream of dipsection @ 64+50 (West direction)

Drainage Area	0.63 acres
Watercourse Length	546.7 feet
Top Elevation	47.0 feet
Bottom Elevation	43.8 feet
Slope	.00585 feet/feet
Roughness Coefficient (Kb)	.04010
10-Year, 6-Hour Rainfall	1.99 inches

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	1	2	2	3	4	5
C	0.800	0.800	0.800	0.880	0.950	0.950
Tc (min)	9.5	8.4	8.0	7.2	6.9	6.5
i (in/hr)	2.9	4.0	4.6	6.0	6.9	7.9

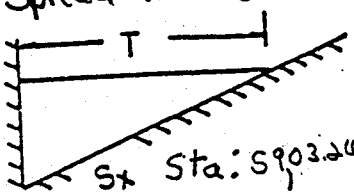
Date 1/11/95

Camelback Road
CBA # 241729-01

Check Spread limits upstream of dip section

$$Q_t = \left(\frac{0.56}{n}\right) S_x^{1.67} S^{0.5} T^{2.67}$$

spread ok



Sta: 590+20 to Sta: 604+50

Example:

Given:
n = 0.016 S_x = 0.03
S = 0.04 T = 6 ft

Find:
Q = 2.4 ft^3/s
Q_n = 0.038 ft^3/s

S(ft/ft) = 0.005

Ts = 9.2

n = 0.016 0.0617

Sw(ft/ft) = ~~0.0417~~

Sx(ft/ft) = 0.02

Eo = ~~0.26~~ 0.33

Qs(cfs) ~~1.27~~ 1.34

Qw(cfs) 0.66

Q(cfs) ~~2.22~~ 2.0

Check spread with Gutter Reduction

Fs = 0.87

Qw = 0.66 x .87 = 0.6

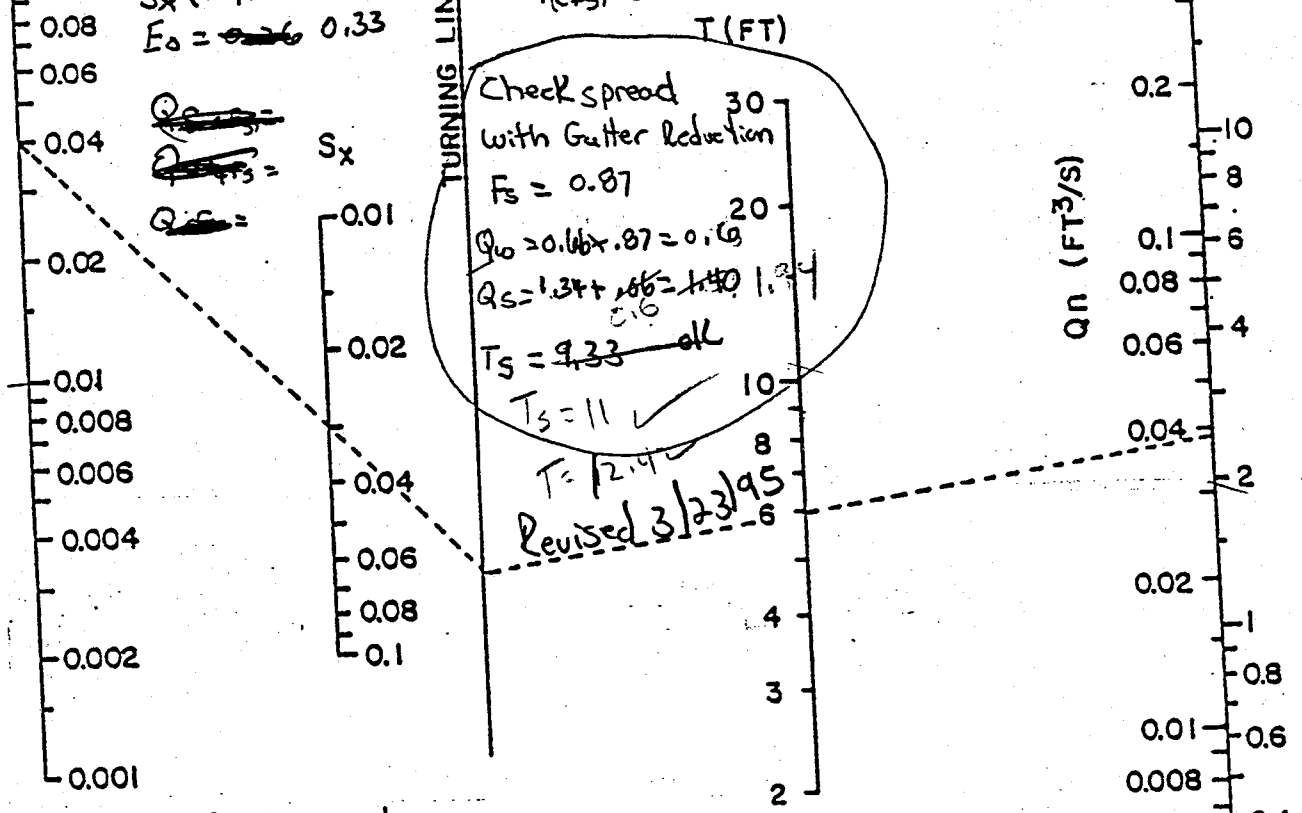
Qs = 1.34 + .66 = ~~1.40~~ 1.34 0.6

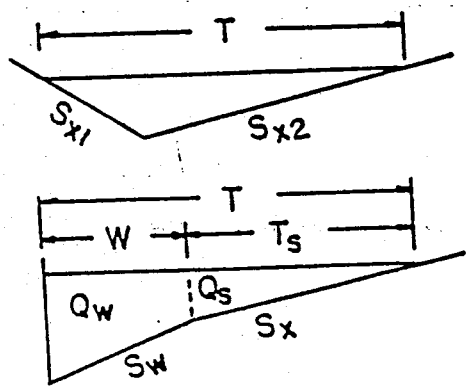
Ts = ~~9.33~~ ok

Ts = 11

T = 12.4

Revised 3/23/95





1) For V-shape, use the nomograph with

$$S_x = \frac{S_{x1} S_{x2}}{(S_{x1} + S_{x2})}$$

2) To determine discharge in gutter with composite cross slopes, find Q_s using T_s and S_x. Then, use Figure 3.24 (page 47) to find Eo. The total discharge is $Q = \frac{Q_s}{(1 - E_o)}$, and $Q_w = Q - Q_s$.

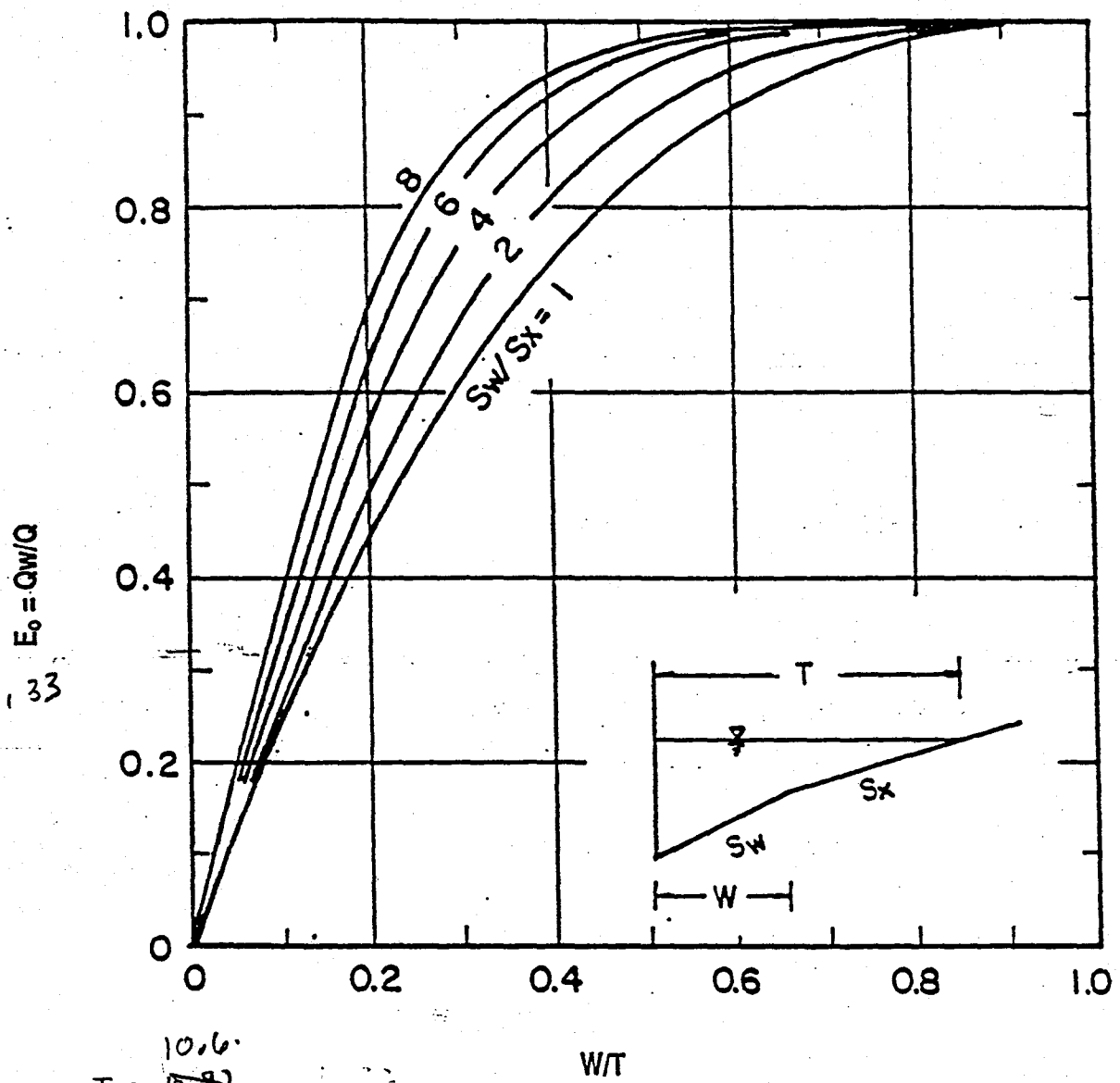
By: PJE

Checked: HM Date: 5/2/95

Figure 3.2
Nomograph for Triangular Gutters
(source: FHWA, 1984, HEC-12)

59+03.26 - Sta 64+50

8.0



.33

T = ~~10.92~~ 10.6

w = 1.42

w/T = 0.13

Figure 3.23
Ratio of Frontal Flow to Total Gutter Flow
(source: FHWA, 1984, HEC-12)

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: PJE Date: 01-13-1995

LOCATION DATA

Location: Camelback Road

Project Name: Camelback Road Subarea id: Sta 64+50 to Sta 68+00

Drainage Area Cover: Roadway

DESIGN DATA

check spread upstream of dipsection @ 64+50 (East direction)

Drainage Area	0.40	acres
Watercourse Length	350.0	feet
Top Elevation	44.2	feet
Bottom Elevation	43.8	feet
Slope	.00114	feet/feet
Roughness Coefficient (Kb)	.04247	
10-Year, 6-Hour Rainfall	1.99	inches

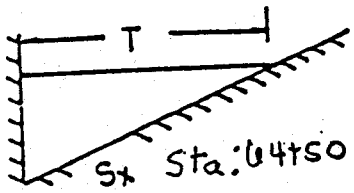
Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	1	1	1	2	2	3
C	0.800	0.800	0.800	0.880	0.950	0.950
Tc (min)	13.9	12.3	11.7	10.4	9.9	9.4
i (in/hr)	2.4	3.4	3.9	5.2	6.0	6.9

Date 1/11/95

Camelback Road
CBA # 241729-01

$$Q_t = \left(\frac{0.56}{n}\right) S_x^{1.67} S^{0.5} T^{2.67}$$



Sta: 64+50 to Sta: 68+00

Example:

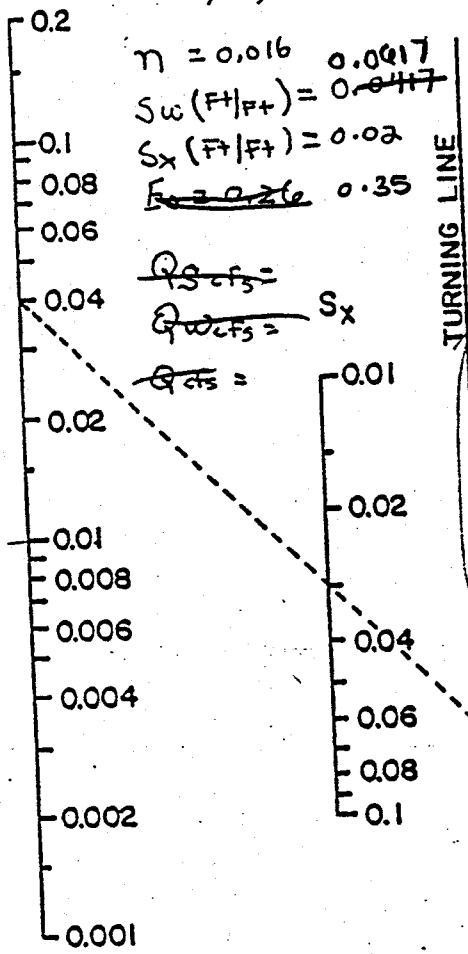
Given:
n = 0.016 S_x = 0.03
S = 0.04 T = 6 ft

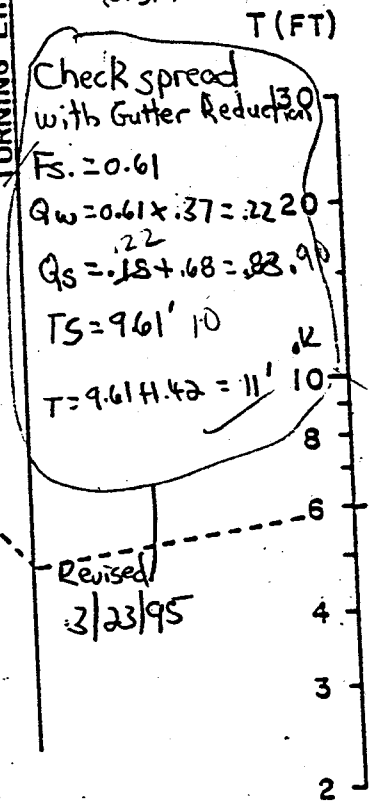
Find:
Q = 2.4 ft^3/s
Q_n = 0.038 ft^3/s

S(ft/ft) = 0.0015

n = 0.016 0.0017
Sw(ft/ft) = 0 ~~0.0417~~
Sx(ft/ft) = 0.02
~~Fo = 0.26~~ 0.35
~~Qs cfs =~~
~~Qw cfs =~~
~~Q cfs =~~

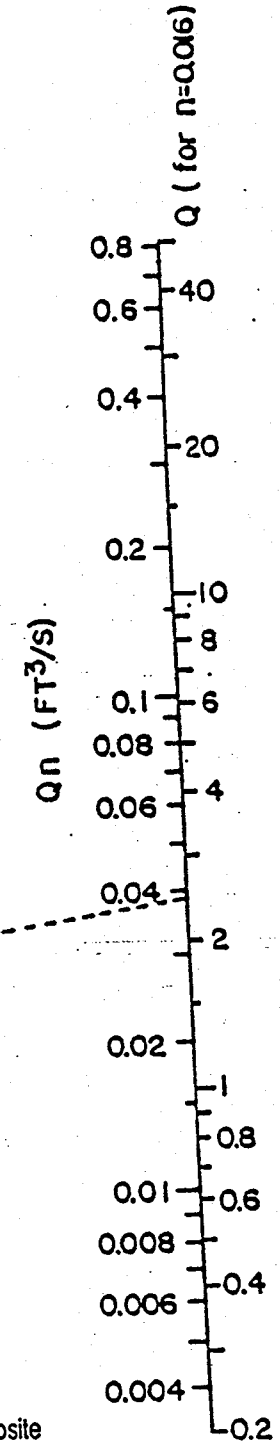
Ts = 9
Qs(cfs) 0.68
Qw(cfs) 0.37
Q(cfs) 1.05

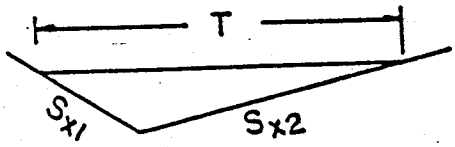


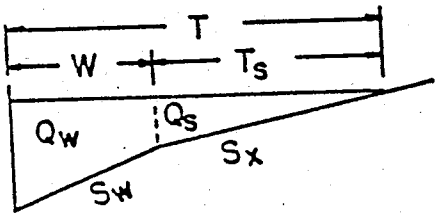


Check spread with Gutter Reduction
Fs. = 0.61
Qw = 0.61 × .37 = .22
Qs = .22 + .68 = .90
Ts = 9.61' 10
T = 9.61 + 1.42 = 11' 10

Revised 3/23/95







1) For V-shape, use the nomograph with

$$S_x = \frac{S_{x1} S_{x2}}{(S_{x1} + S_{x2})}$$

2) To determine discharge in gutter with composite cross slopes, find Q_s using T_s and S_x. Then, use Figure 3.24 (page 47) to find Eo. The total discharge is $Q = \frac{Q_s}{(1 - E_o)}$, and $Q_w = Q - Q_s$.

By: PJE
Checked: 1/17 Date: 5/2/95

Figure 3.2
Nomograph for Triangular Gutters
(source: FHWA, 1984, HEC-12)

2 10 foot wings

.002

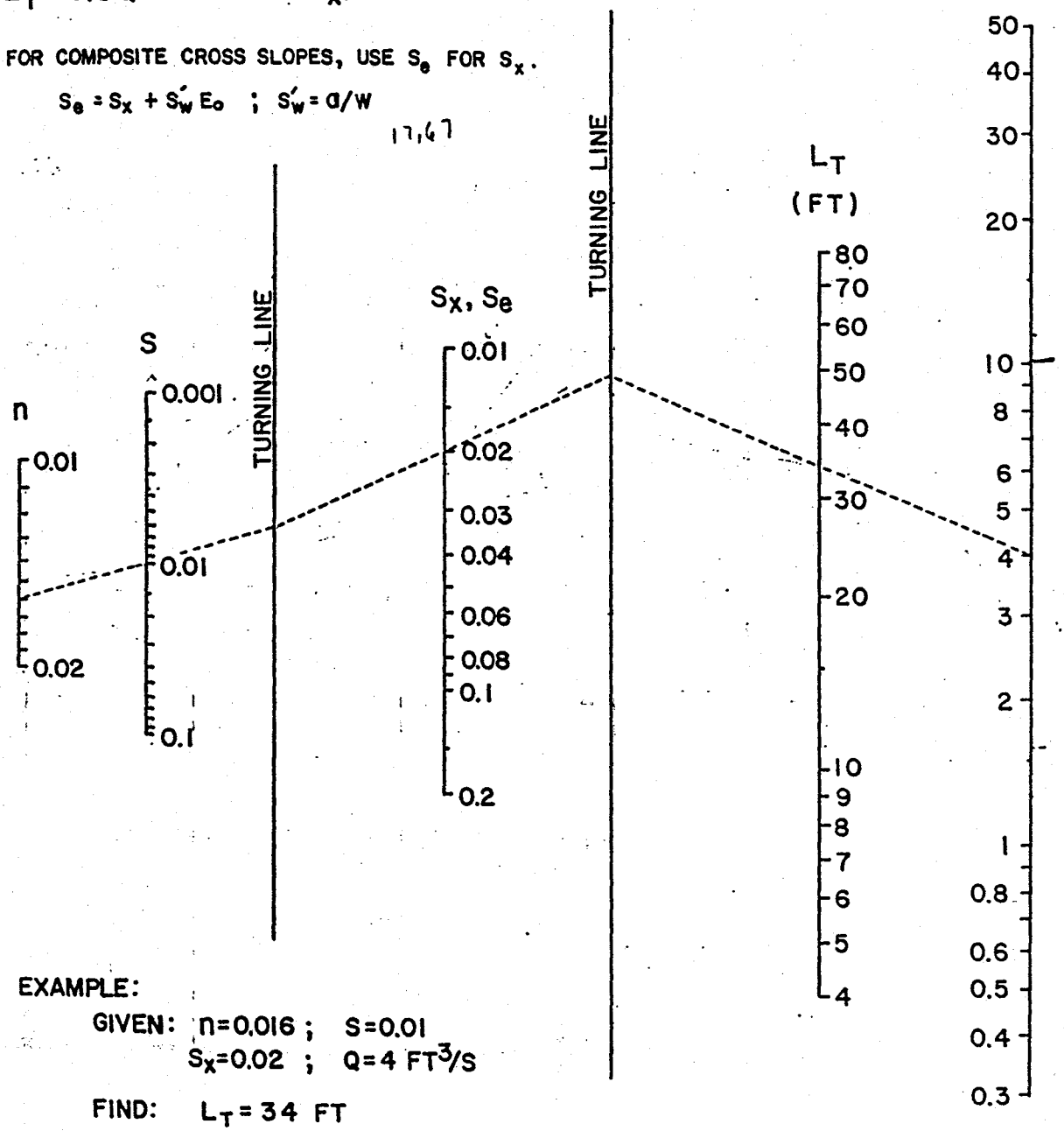
(0.23) (93.4)

$$L_T = 0.6 Q^{0.42} S^{0.3} (1/nS_x)^{0.6}$$

FOR COMPOSITE CROSS SLOPES, USE S_e FOR S_x.

$S_e = S_x + S_w' E_o$; $S_w' = a/W$

17,67



EXAMPLE:

GIVEN: $n = 0.016$; $S = 0.01$

$S_x = 0.02$; $Q = 4\ FT^3/S$

FIND: $L_T = 34$ FT

CHART 9. Curb-opening and slotted drain inlet length for total interception.

21,70

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: DJE Date: 01-13-1995

LOCATION DATA

Location: Camelback Road

Project Name: Camelback Road Subarea id: Sta 59+03.26 to Sta 68+00

Drainage Area Cover: Roadway

Size Catch basin @ 64+45.45

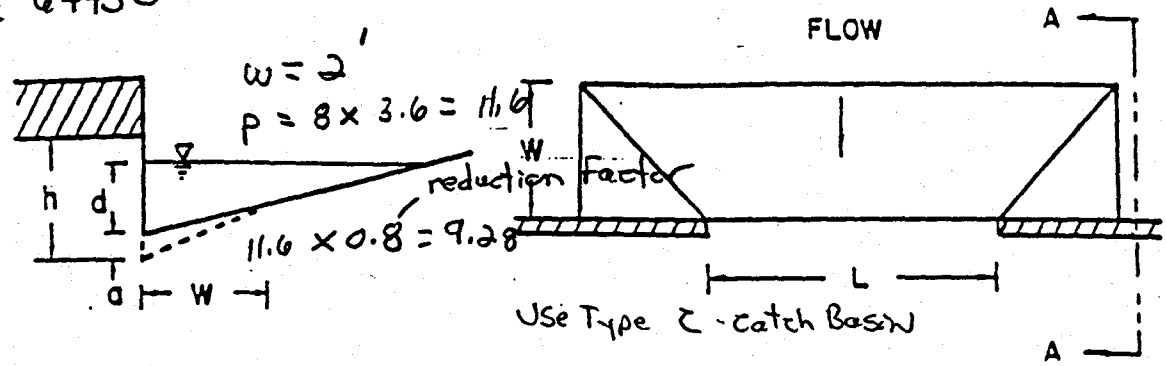
DESIGN DATA

Drainage Area	1.03 acres
Watercourse Length	896.7 feet
Top Elevation	47.0 feet
Bottom Elevation	43.8 feet
Slope	.00357 feet/feet
Roughness Coefficient (Kb)	.03992
10-Year, 6-Hour Rainfall	1.99 inches

Hydrological Summary Table

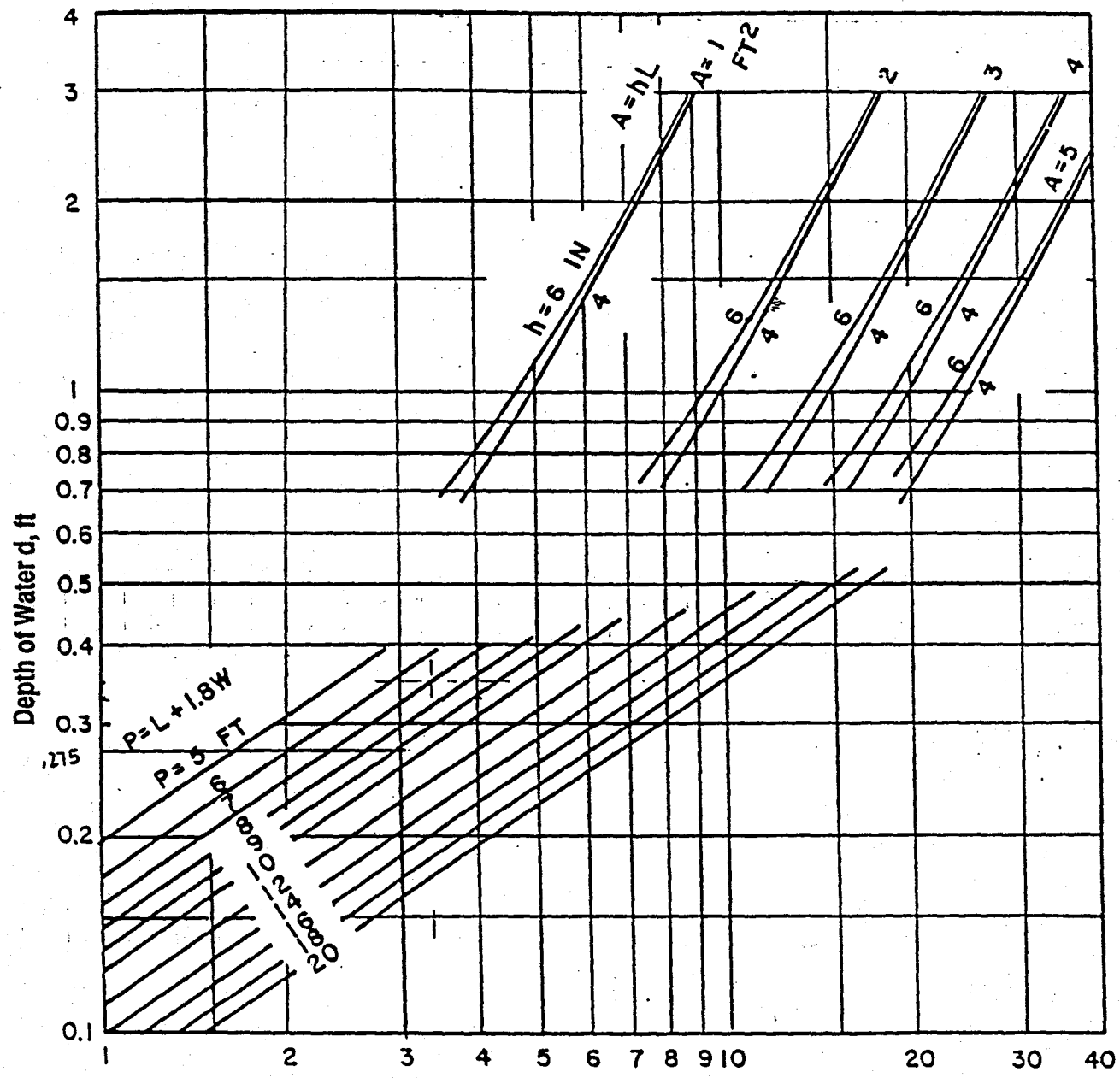
Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	2	3	3	5	6	6
C	0.800	0.800	0.800	0.880	0.950	0.950
Tc (min)	15.4	13.6	12.9	11.5	11.0	10.4
i (in/hr)	2.3	3.2	3.7	5.0	5.7	6.6

Sta 64+50



SECTION A - A

$d_1 = d + a$, ft



spread = $\frac{.275}{.02}$ = 13.75 - OK

Figure 3.24

Depressed Curb Opening Inlet Capacity in Sump Locations

(source: FHWA, 1984, HEC-12)

for w=2'

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: PJE Date: 01-13-1995

LOCATION DATA

Location: Camelback Road

Project Name: Camelback Road Subarea id: Sta 68+06 to Sta 73+00

Drainage Area Cover: Pavement

DESIGN DATA

Drainage Area	0.80 acres
Watercourse Length	500.0 feet
Top Elevation	44.2 feet
Bottom Elevation	43.3 feet
Slope	.00180 feet/feet
Roughness Coefficient (Kb)	.04059
10-Year, 6-Hour Rainfall	1.99 inches

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	2	2	2	4	5	5
C	0.800	0.800	0.800	0.880	0.950	0.950
Tc (min)	14.1	12.5	11.9	10.6	10.1	9.5
i (in/hr)	2.4	3.4	3.8	5.2	5.9	6.8

Camelback Road
CBA # 241729-01

Date 1/1/95

$$Q_t = \left(\frac{0.56}{n}\right) S_x^{1.67} S^{0.5} T^{2.67}$$

Example: Sta: 68+00 to Sta: 73+00

Given:
n = 0.016 S_x = 0.03
S = 0.04 T = 6 ft

Find:
Q = 2.4 ft³/s
Q_n = 0.038 ft³/s

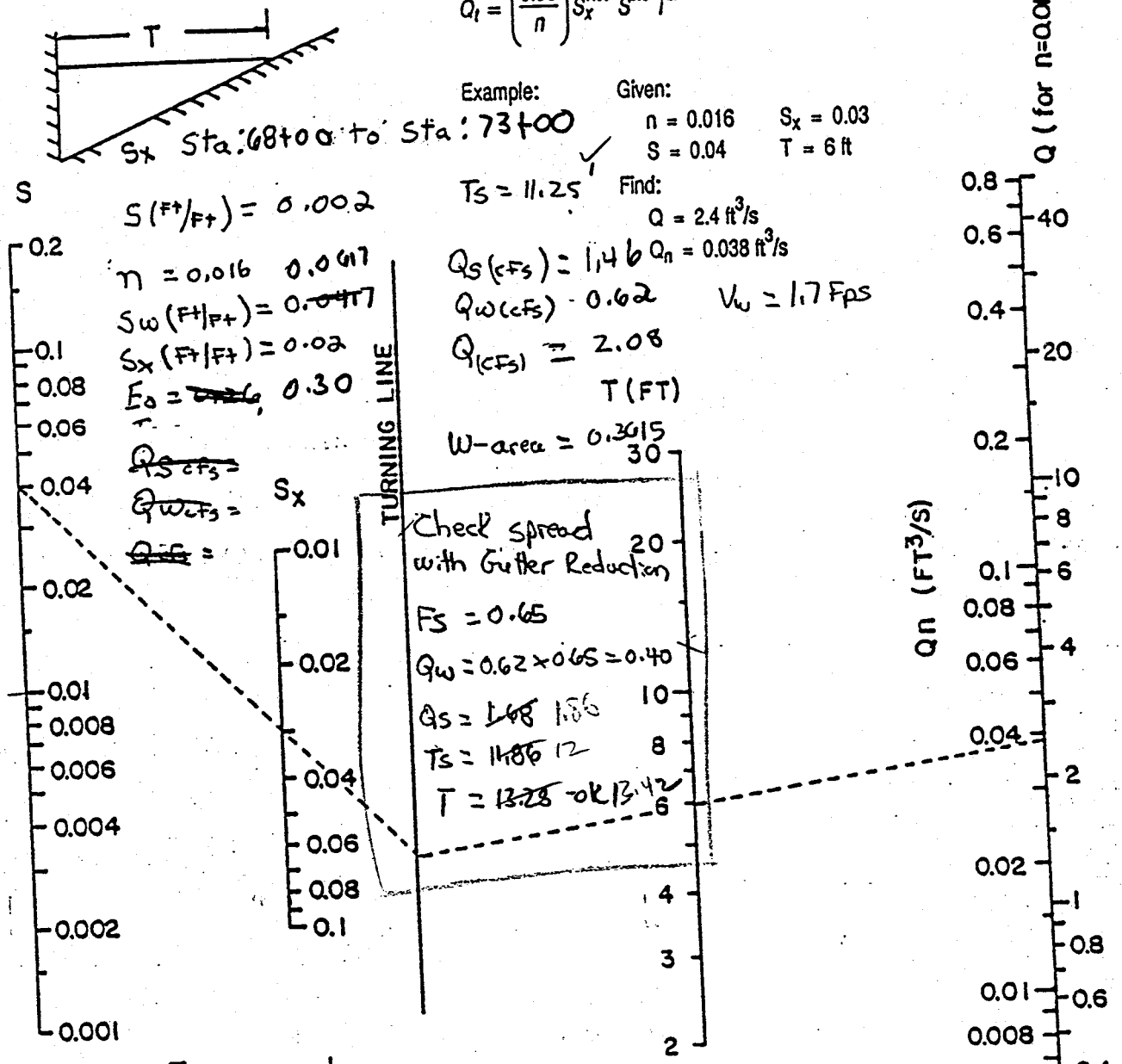
$S(ft/ft) = 0.002$

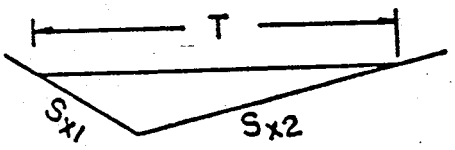
$T_s = 11.25$

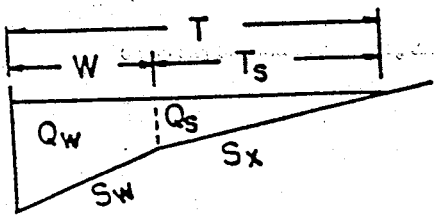
$n = 0.016$ 0.017
$S_w(ft/ft) = 0.0417$
$S_x(ft/ft) = 0.02$
$E_o =$ ~~0.026~~ 0.30
~~Q_s cfs =~~
~~Q_w cfs =~~
~~Q cfs =~~

$Q_s(cfs) = 1.46$
$Q_w(cfs) = 0.62$
$V_w = 1.7$ fps
$Q_{(cfs)} = 2.08$
W-area = 0.3615

Check spread with Gutter Reduction
$F_s = 0.65$
$Q_w = 0.62 \times 0.65 = 0.40$
$Q_s =$ ~~1.68~~ 1.86
$T_s =$ ~~11.86~~ 12
T = ~~13.28~~ ok 13.42







1) For V-shape, use the nomograph with

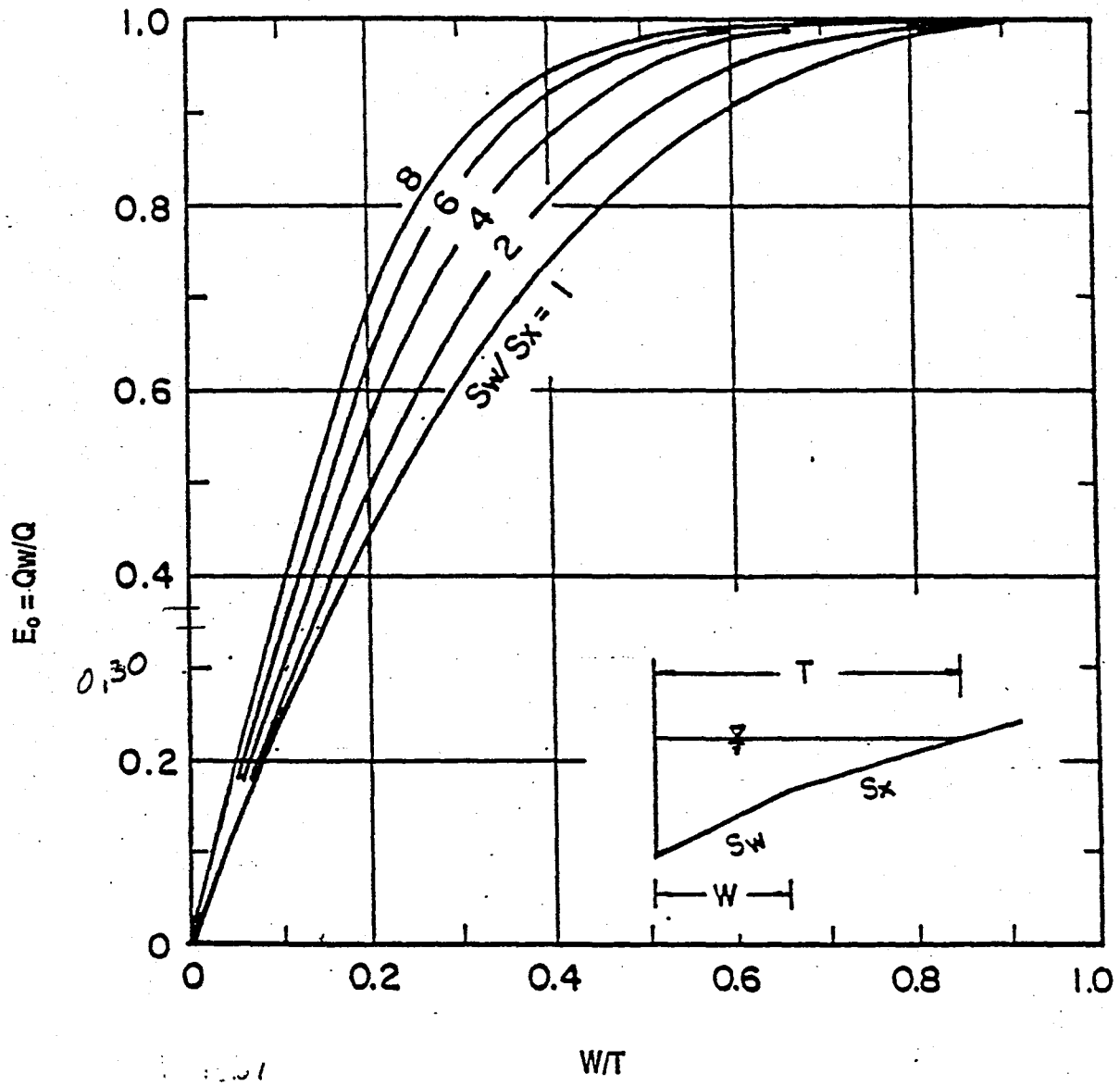
$$S_x = \frac{S_{x1} S_{x2}}{(S_{x1} + S_{x2})}$$

2) To determine discharge in gutter with composite cross slopes, find Q_s using T_s and S_x. Then, use Figure 3.24 (page 47) to find Eo. The total discharge is $Q = \frac{Q_s}{(1 - E_o)}$, and $Q_w = Q - Q_s$.

By: PJE
Checked: [illegible] Date: 5/2/95

Figure 3.2
Nomograph for Triangular Gutters
(source: FHWA, 1984, HEC-12)

Sta 73+00



T = 12.67
w = 1.42
Eo = 0.30

w/T = 0.11

Figure 3.23
Ratio of Frontal Flow to Total Gutter Flow
(source: FHWA, 1984, HEC-12)

Sta 73+60

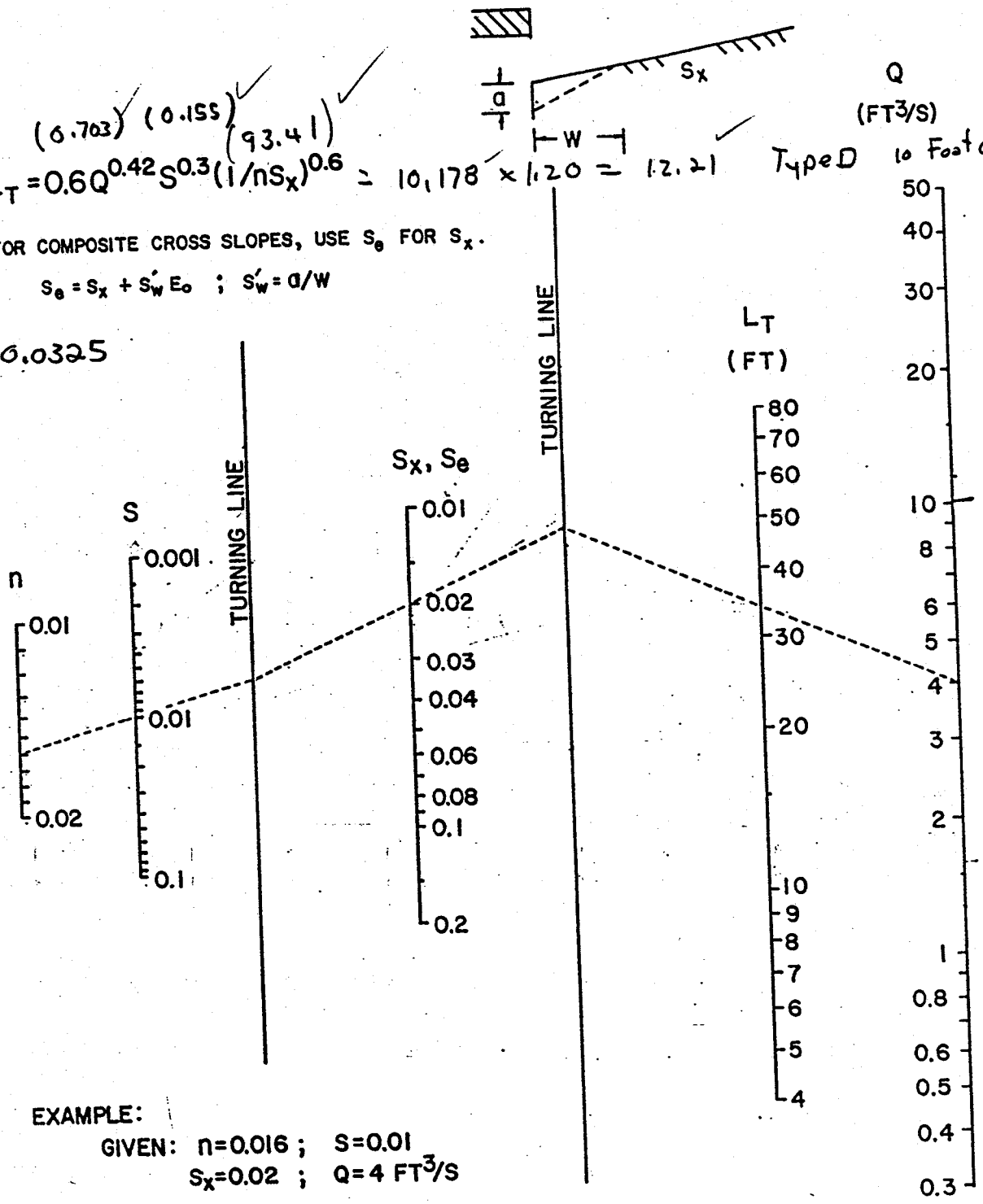
$(0.703)\ (0.155)\ (93.41)$

$L_T = 0.6Q^{0.42}S^{0.3}(1/nS_x)^{0.6} = 10{,}178 \times 1.20 = 12.21$ Type D 10 Foot wing

FOR COMPOSITE CROSS SLOPES, USE S_e FOR S_x.

$S_e = S_x + S'_w E_o$; $S'_w = a/W$

$S_e = 0.0325$



EXAMPLE:

GIVEN: $n=0.016$; $S=0.01$

$S_x=0.02$; $Q=4\ FT^3/S$

FIND: $L_T = 34$ FT

CHART 9. Curb-opening and slotted drain inlet length for total interception.

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: PJE Date: 01-13-1995

LOCATION DATA

Location: Camelback Road

Project Name: Camelback Road Subarea id: Sta 73+00 to Sta 78+00

Drainage Area Cover: Roadway

DESIGN DATA

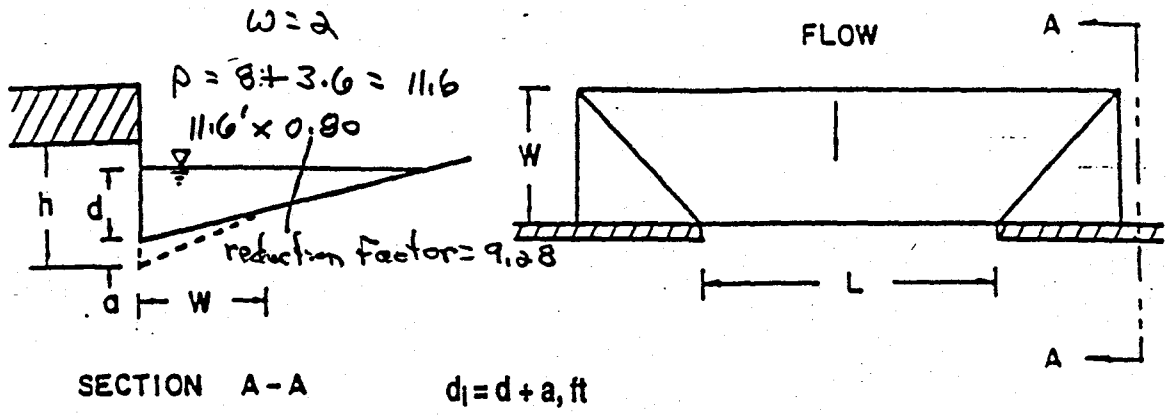
Catch basin @ 76+45

Drainage Area	0.80 acres
Watercourse Length	350.0 feet
Top Elevation	43.3 feet
Bottom Elevation	42.7 feet
Slope	.00171 feet/feet
Roughness Coefficient (Kb)	.03915
10-Year, 6-Hour Rainfall	1.99 inches

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	2	2	3	4	5	6
C	0.800	0.800	0.800	0.880	0.950	0.950
Tc (min)	11.3	10.0	9.5	8.5	8.1	7.7
i (in/hr)	2.7	3.7	4.2	5.6	6.5	7.4

Sta 76+50



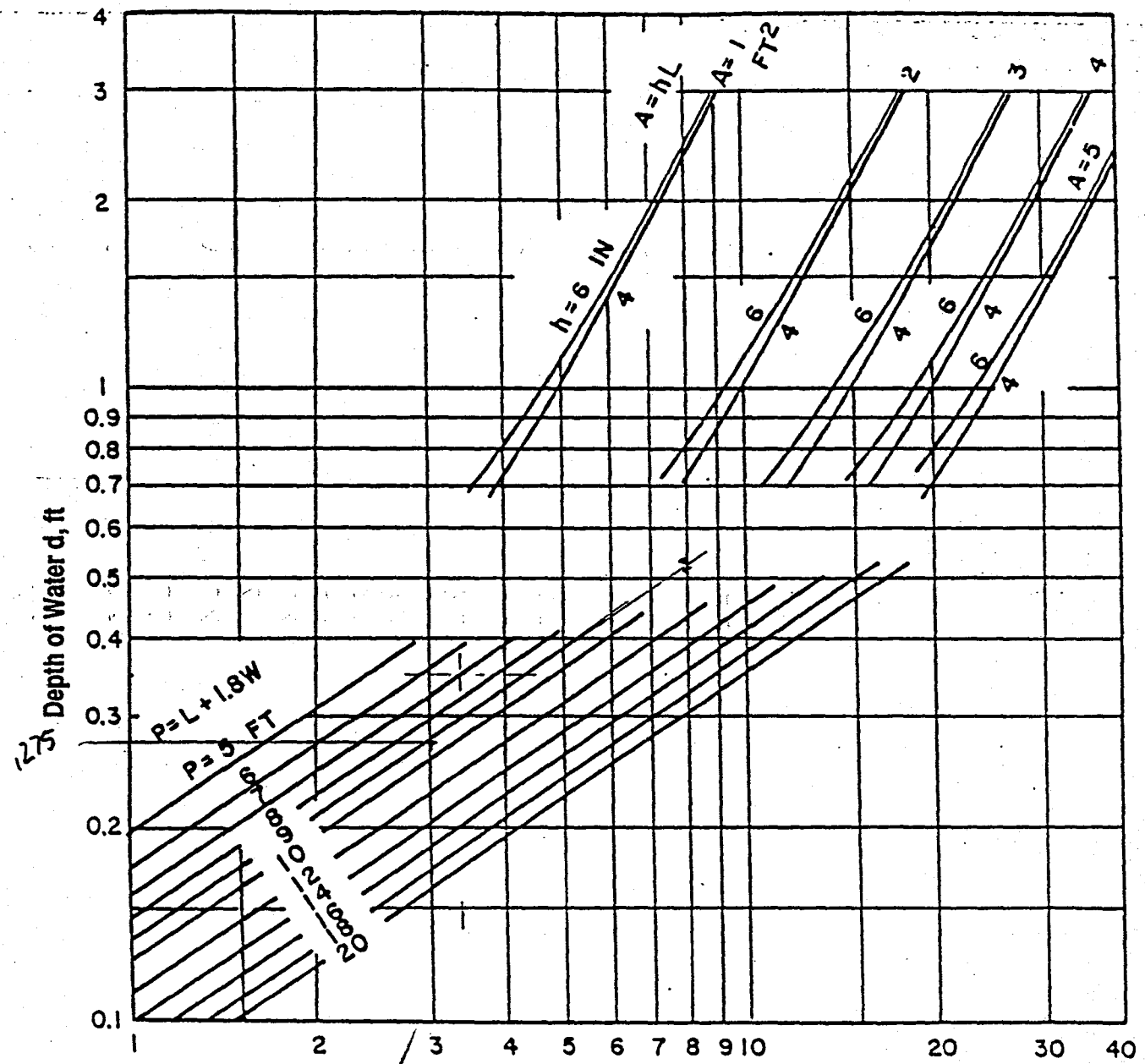


Figure 3.24
Depressed Curb Opening Inlet Capacity In Sump Locations
(source: FHWA, 1984, HEC-12)

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: AJE Date: 01-13-1995

LOCATION DATA

Location: Camelback Road

Project Name: Camelback Road Subarea id: Sta 78+00 to Sta 80+00

Drainage Area Cover: Roadway

DESIGN DATA

Catch Basin @ 78+00

Drainage Area	0.32 acres
Watercourse Length	200.0 feet
Top Elevation	44.3 feet
Bottom Elevation	43.1 feet
Slope	.00600 feet/feet
Roughness Coefficient (Kb)	.04309
10-Year, 6-Hour Rainfall	1.99 inches

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	1	1	1	2	2	3
C	0.800	0.800	0.800	0.880	0.950	0.950
Tc (min)	5.5	5.0	5.0	5.0	5.0	5.0
i (in/hr)	3.6	4.8	5.8	6.7	7.7	8.7

Date: 1/11/95

Camelback Road
CBA # 241729-01

$$Q_1 = \left(\frac{0.56}{n}\right) S_x^{1.67} S^{0.5} T^{2.67}$$

Spread ok

Example: Sta: 78+00 to Sta: 80+00

Given:
n = 0.016 S_x = 0.03
S = 0.04 T = 6 ft

Find:
Q = 2.4 ft³/s
Q_n = 0.038 ft³/s

S (Ft/Ft) = 0.00683
n = 0.016 0.0017
S_w (Ft/Ft) = ~~0.0417~~
S_x (Ft/Ft) = 0.02
E_o = ~~0.26~~ .47

T_s = 6.25
Q_s (cfs) 0.56
Q_w (cfs) 0.5
Q (cfs) 1.06

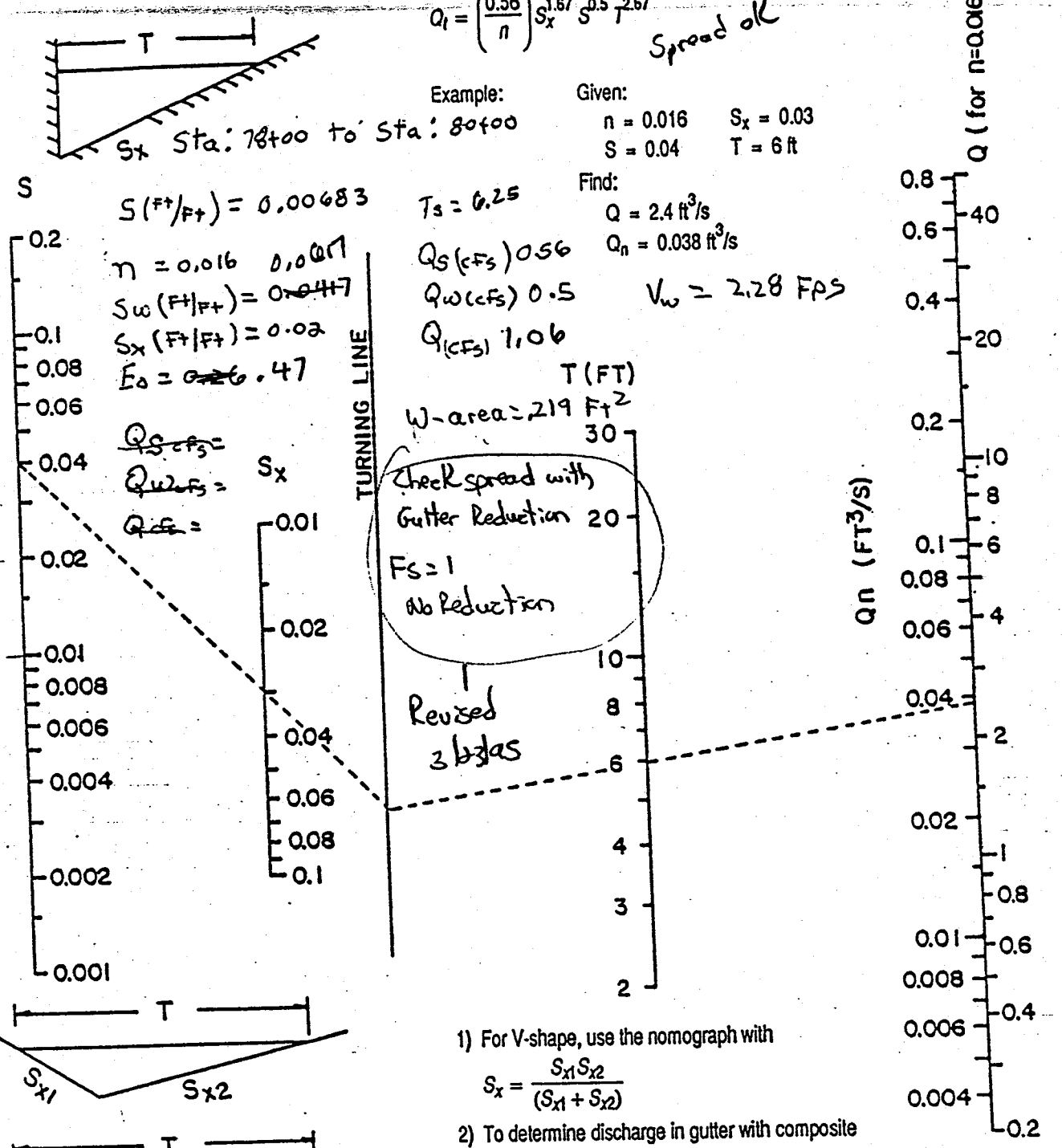
V_w = 2.28 FPS

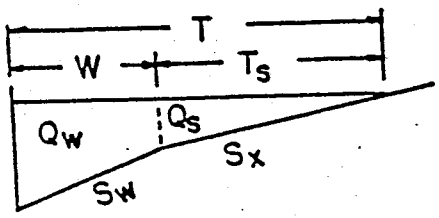
~~Q_s cfs =~~
~~Q_w cfs =~~
~~Q cfs =~~

W-area = .219 Ft²

Check spread with Gutter Reduction
Fs = 1
No Reduction

Revised 3 bags





1) For V-shape, use the nomograph with

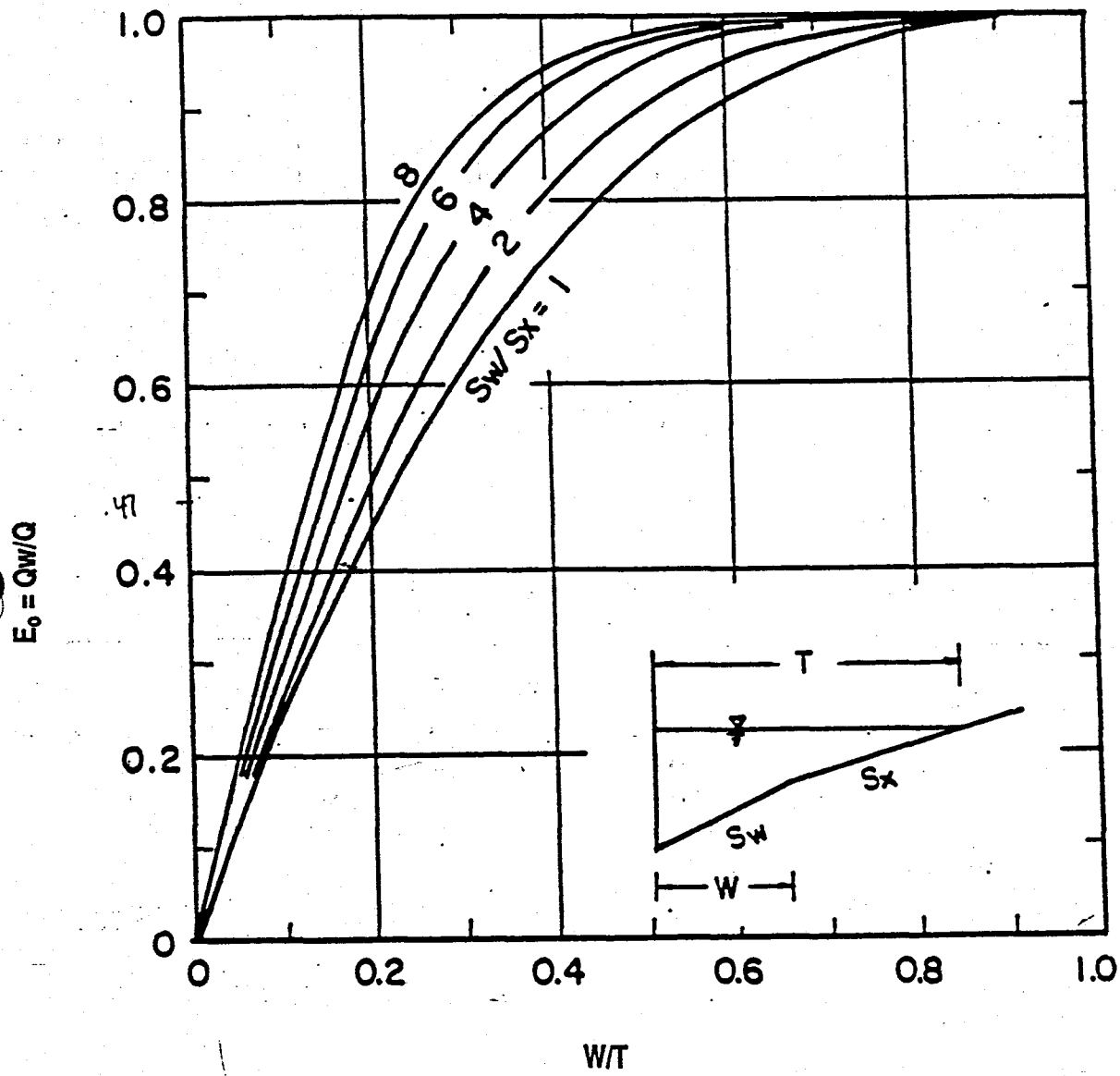
$$S_x = \frac{S_{x1} S_{x2}}{(S_{x1} + S_{x2})}$$

2) To determine discharge in gutter with composite cross slopes, find Q_s using T_s and S_x. Then, use Figure 3.24 (page 47) to find Eo. The total discharge is $Q = \frac{Q_s}{(1 - E_o)}$, and $Q_w = Q - Q_s$.

By: PJE
Checked: [illegible] Date: 5/2/95

Figure 3.2
Nomograph for Triangular Gutters
(source: FHWA, 1984, HEC-12)

Sta 78+00



w=1.42

T=7.67

w/T = 0.18

Figure 3.23
Ratio of Frontal Flow to Total Gutter Flow
(source: FHWA, 1984, HEC-12)

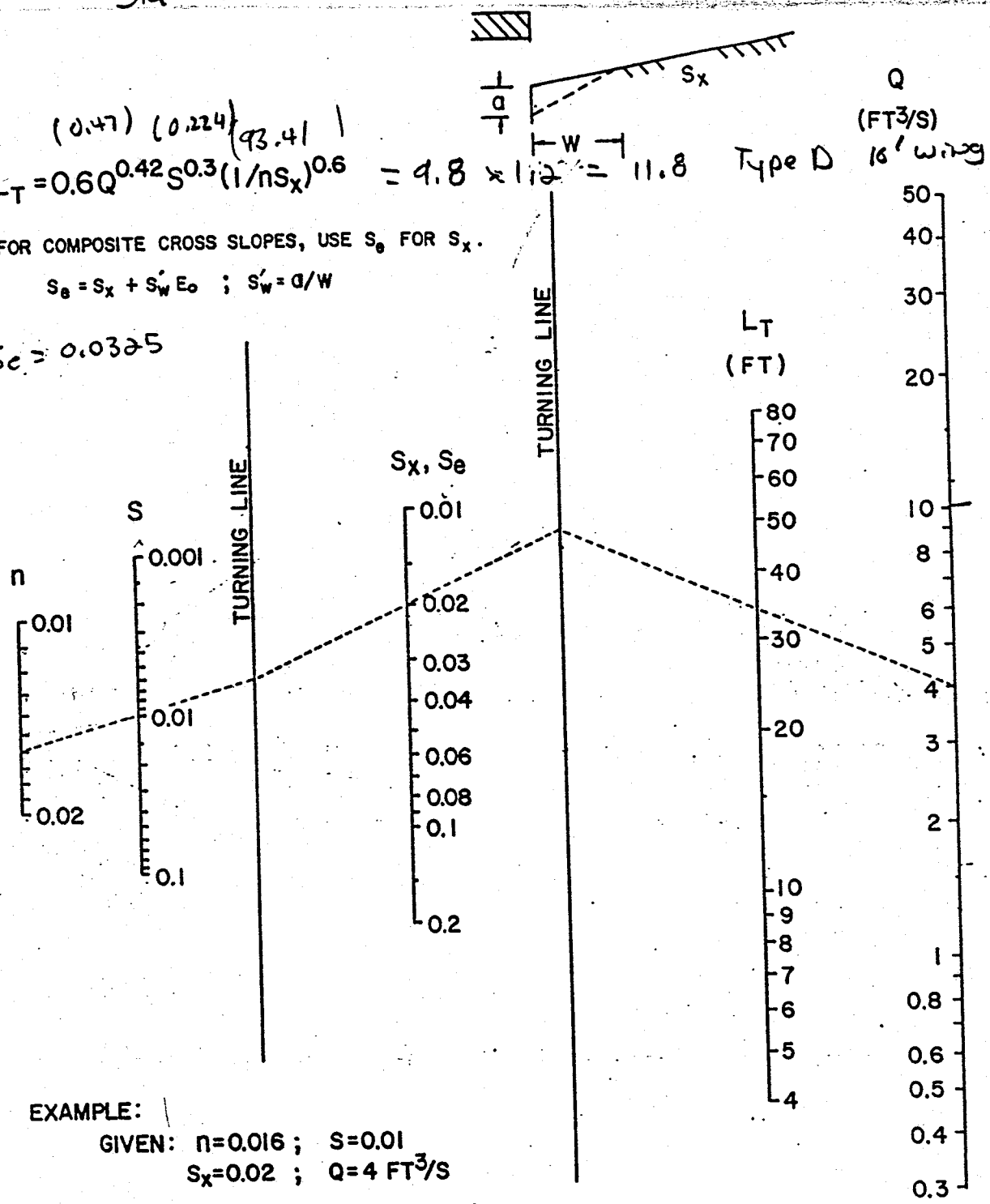
Sta 78+00

$L_T = 0.6 Q^{0.42} S^{0.3} (1/nS_x)^{0.6}$ $(0.47)\ (0.224)\ (93.41)$ $= 9.8 \times 1.12 = 11.8$ Type D 16' wing

FOR COMPOSITE CROSS SLOPES, USE S_e FOR S_x.

$S_e = S_x + S'_w E_o$; $S'_w = a/W$

$S_e = 0.0325$



EXAMPLE:

GIVEN: $n = 0.016$; $S = 0.01$

$S_x = 0.02$; $Q = 4\ FT^3/S$

FIND: $L_T = 34$ FT

CHART 9. Curb-opening and slotted drain inlet length for total interception.

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: PJE Date: 04-10-1995

LOCATION DATA

Location: Camelback Road sta 82+39.41 - sta 92+75.10

Project Name: Camelback Rd. Subarea id: _____

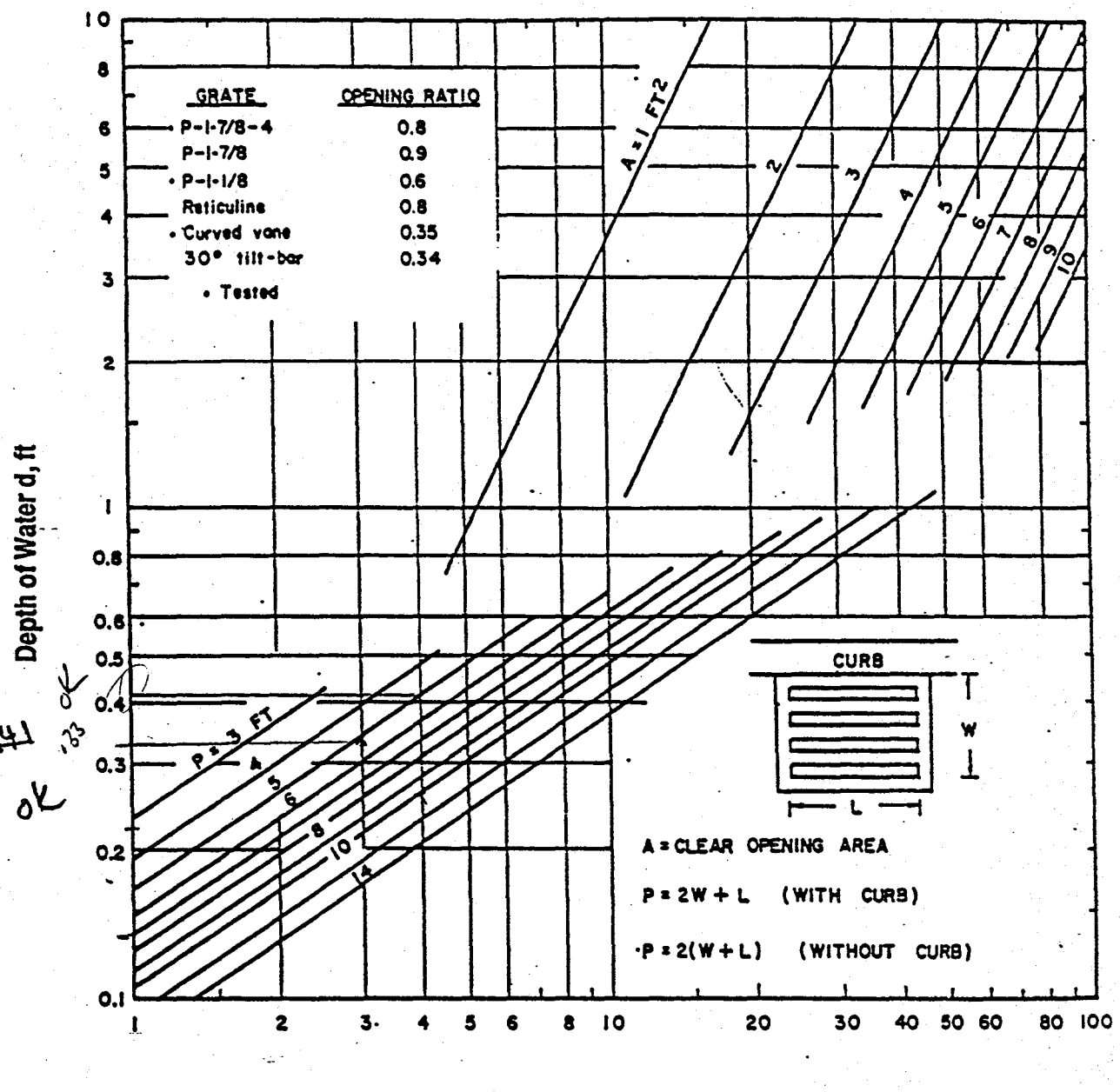
Drainage Area Cover: Roadway

DESIGN DATA CB at 87+75.10

Drainage Area	0.77 acres
Watercourse Length	535.6 feet
Top Elevation	43.9 feet
Bottom Elevation	39.9 feet
Slope	.00743 feet/feet
Roughness Coefficient (Kb)	.04071
10-Year, 6-Hour Rainfall	1.99 inches

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	2	3	3	4	5	6
C	0.800	0.800	0.800	0.880	0.950	0.950
Tc (min)	8.7	7.7	7.3	6.6	6.3	6.0
i (in/hr)	3.0	4.1	4.8	6.2	7.1	8.2



d=.41 ok .83 ok

use ADOT Type 4 Catch Basin / LB grate

P = 10.6

0.5P = 5.3

reduction Factor

Sta ~~89150~~ 7+75.10 Q_{10} = ~~4~~ 3 cfs

Revised 4/96

Figure 3.29
Grate Inlet Capacity In Sump Conditions

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: PJF Date: 01-18-1995

LOCATION DATA

Location: Camelback Road

Project Name: Camelback Road Subarea id: 97+50 - 117+52

Drainage Area Cover: Pasture

DESIGN DATA

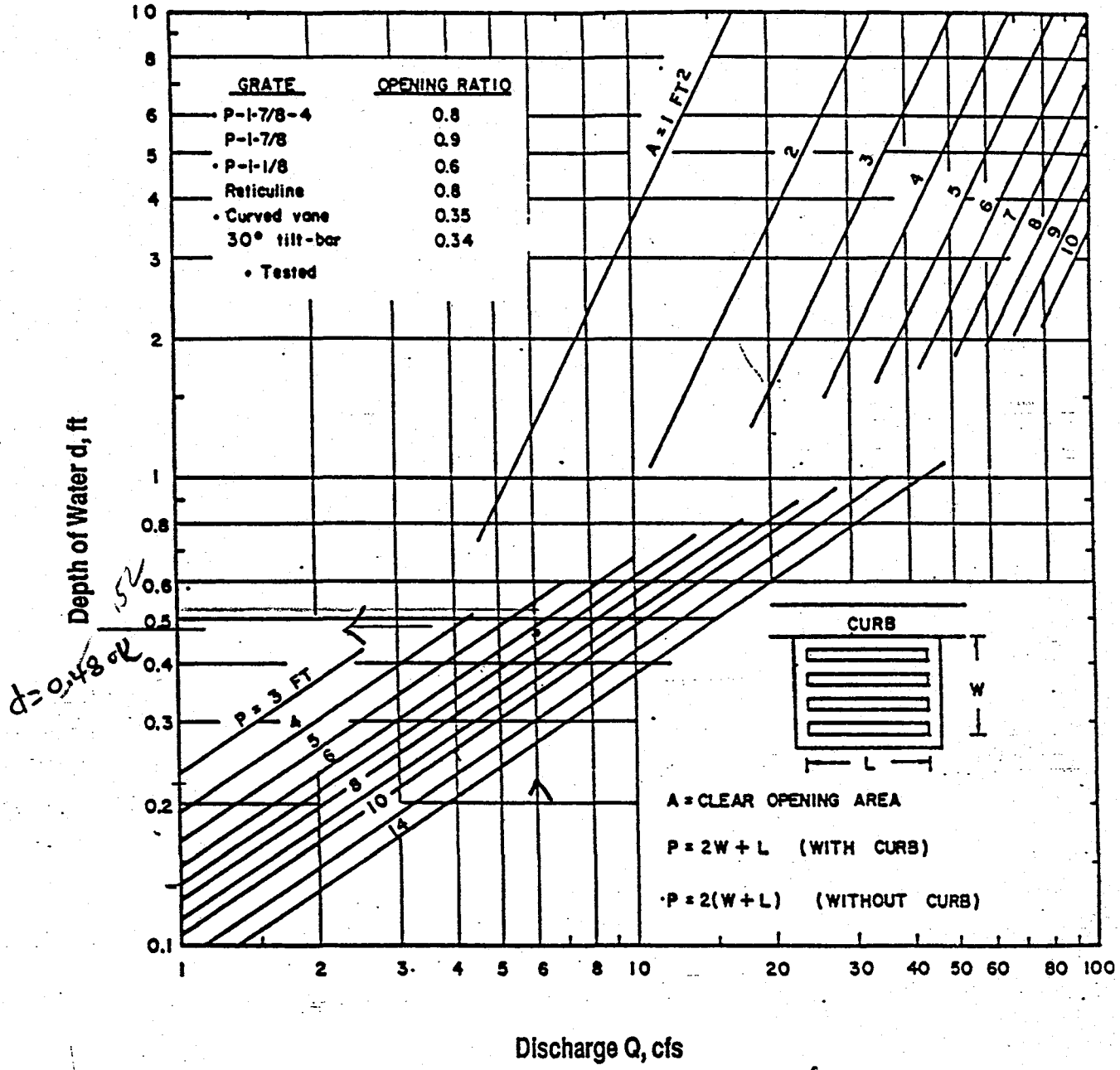
CB@ 117+52

Drainage Ditch

Drainage Area	2.85	acres
Watercourse Length	2002.0	feet
Top Elevation	39.9	feet
Bottom Elevation	36.7	feet
Slope	.00161	feet/feet
Roughness Coefficient (Kb)	.03716	
10-Year, 6-Hour Rainfall	1.99	inches

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	3	5	6	9	11	13
C	0.800	0.800	0.800	0.880	0.950	0.950
Tc (min)	34.8	30.0	27.0	24.4	23.0	21.8
i (in/hr)	1.4	2.0	2.7	3.5	4.1	4.7



d = 0.48 ft

Use ADOT Type 4 Catch Basin (LB grate)

P = 10.6 sta 11+752 Q_{10} = 6 cfs

.5 P = 5.3

reduction Factor

Figure 3.29
Grate Inlet Capacity In Sump Conditions

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: PJF Date: 04-20-1995

LOCATION DATA

Location: Camelback Roadway

Project Name: Camelback Subarea id: sta 97+50 - sta 134+19

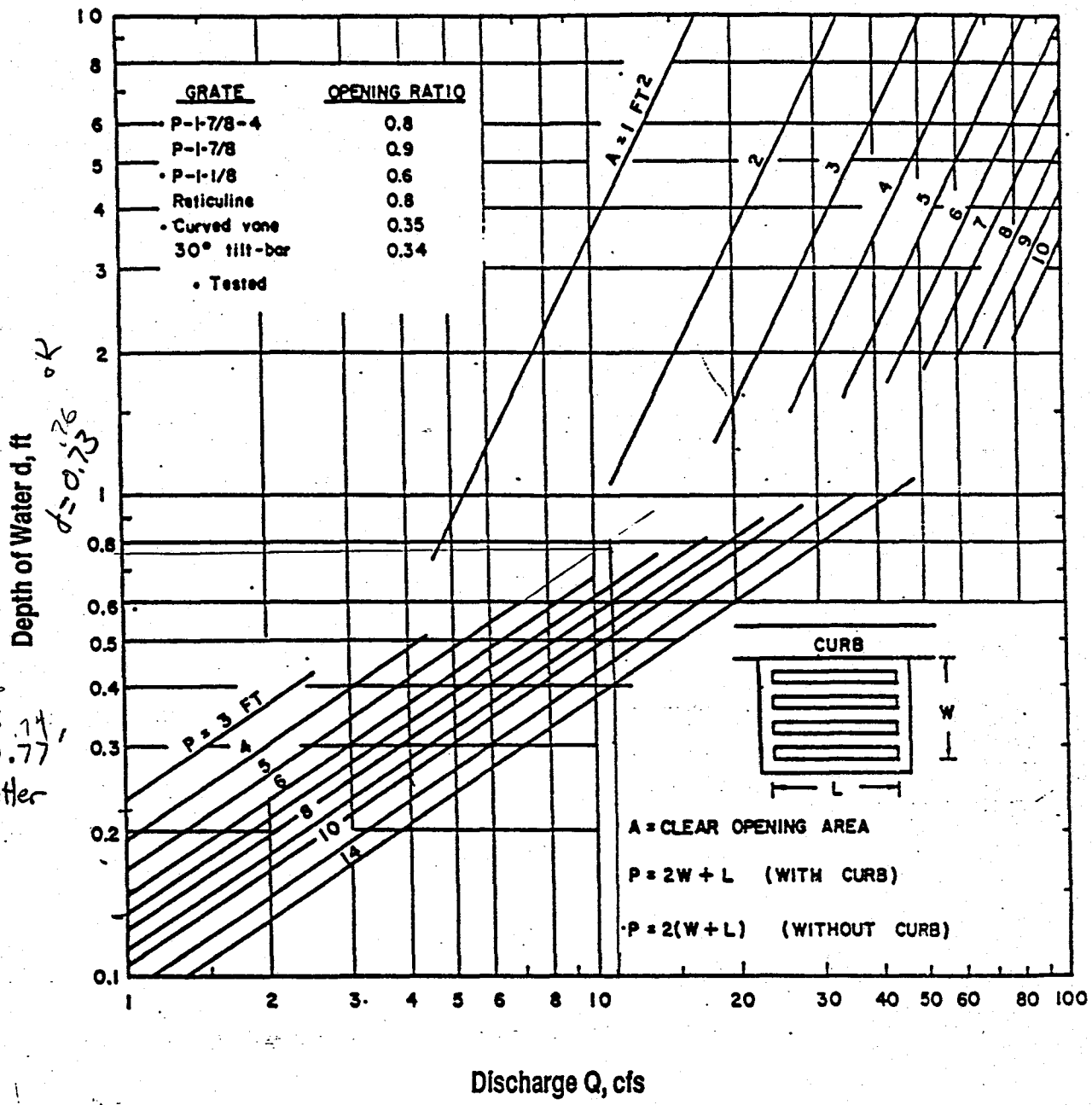
Drainage Area Cover: Roadway

DESIGN DATA

Drainage Area	5.22 acres
Watercourse Length	3520.0 feet
Top Elevation	37.2 feet
Bottom Elevation	24.3 feet
Slope	.00366 feet/feet
Roughness Coefficient (Kb)	.03552
10-Year, 6-Hour Rainfall	1.99 inches

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	6	8	11	16	20	23
C	0.800	0.800	0.800	0.880	0.950	0.950
Tc (min)	35.1	30.2	27.2	24.6	23.1	21.9
i (in/hr)	1.3	2.0	2.6	3.4	4.0	4.7



$d = 0.73^{.76}$

$d = 0.73^{.76}$ which is 0.77' below gutter grade.

Use ADOT Type 4 Catch Basin (LB grate)

$P \approx 10.6$

$0.5P = 5.3$

Reduction Factor

Figure 3.29
Grate Inlet Capacity in Sump Conditions

By PJE Date 4/95

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: DJE Date: 01-19-1995

LOCATION DATA

Location: Candlebark Road

Project Name: Candlebark Road Subarea id: Sta 84+15 to Sta 86+35.41

Drainage Area Cover: Roadway

Catch basin @ 85+69.41

DESIGN DATA

Drainage Area	0.20 acres
Watercourse Length	220.0 feet
Top Elevation	43.4 feet
Bottom Elevation	42.8 feet
Slope	.00264 feet/feet
Roughness Coefficient (Kb)	.04434
10-Year, 6-Hour Rainfall	1.99 inches

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	1	1	1	1	1	2
C	0.800	0.800	0.800	0.880	0.950	0.950
Tc (min)	7.9	7.0	6.6	6.1	5.7	5.4
i (in/hr)	3.1	4.3	5.0	6.3	7.3	8.4

Use MAG Type A 3.5' opening ok

3.5' x 0.8 (Reduction Factor) = 2.8'

Station 85+69.41 Q_{10} = 1cfs

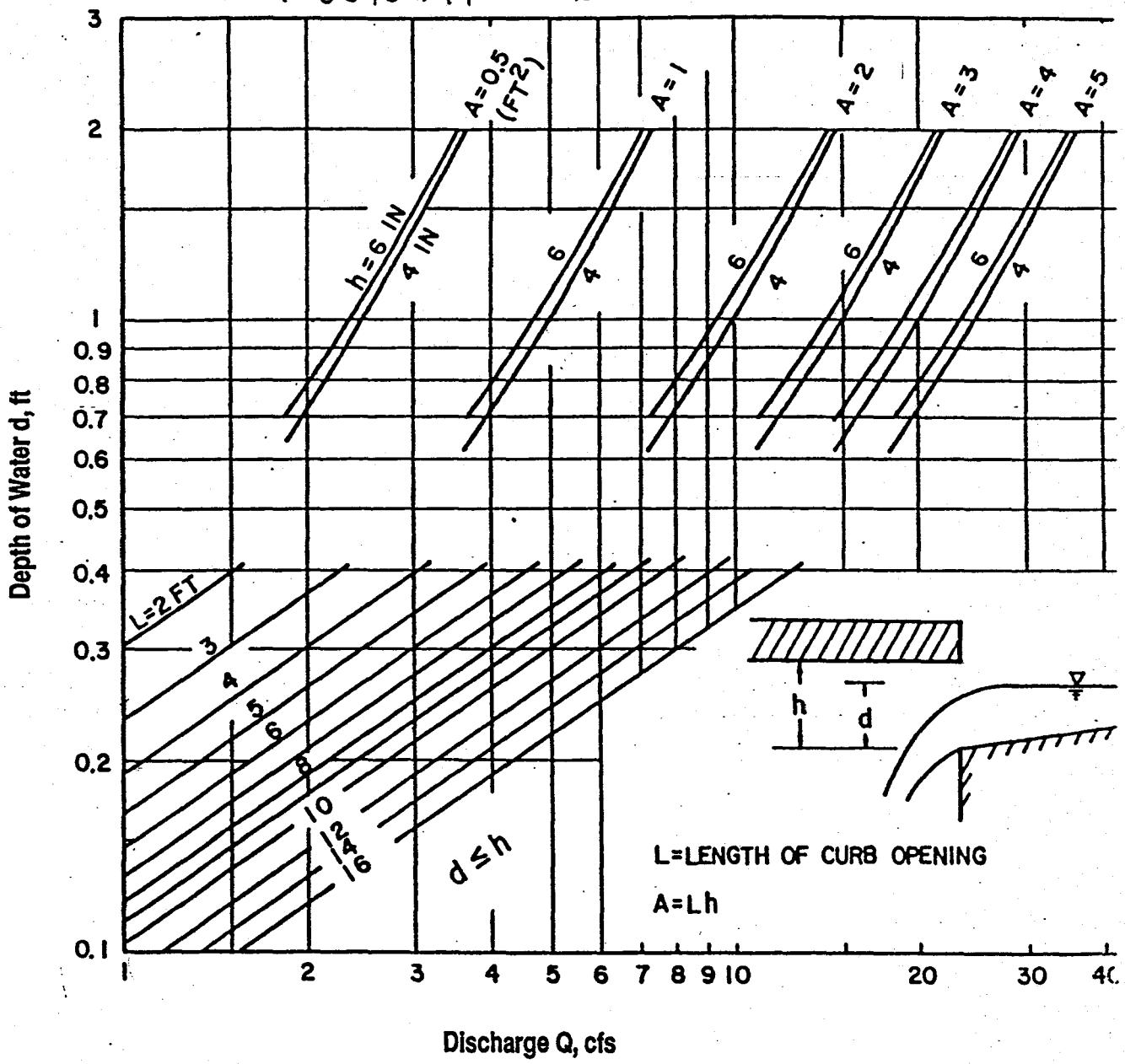


Figure 3.25
Curb Opening Inlet Capacity In Sump Locations
(source: FHWA, 1984, HEC-12)

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: RJE Date: 01-19-1995

LOCATION DATA

Location: Camelback Road

Project Name: Camelback Road Subarea id: sta 86+35.41 to sta 89+45.10

Drainage Area Cover: Roadway

Catch basin @ 89+45.10

DESIGN DATA

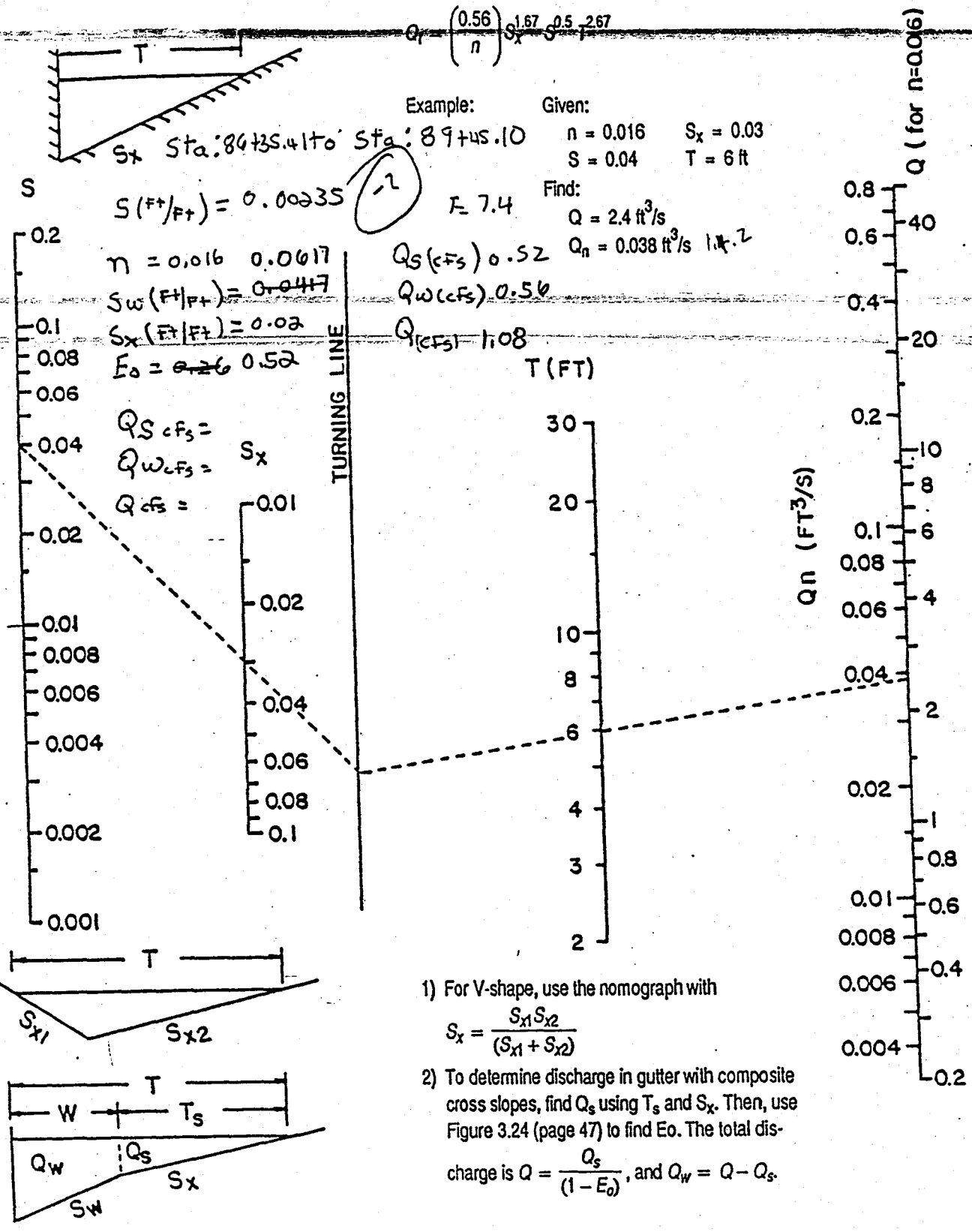
Drainage Area	0.28 acres
Watercourse Length	310.0 feet
Top Elevation	43.2 feet
Bottom Elevation	42.5 feet
Slope	.00235 feet/feet
Roughness Coefficient (Kb)	.04341
10-Year, 6-Hour Rainfall	1.99 inches

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	1	1	1	1	2	2
C	0.800	0.800	0.800	0.880	0.950	0.950
Tc (min)	10.0	8.8	8.4	7.6	7.2	6.8
i (in/hr)	2.8	3.9	4.5	5.9	6.8	7.8

Camelback Road Date 1/4/95
CBA # 241729-01

$$Q_T = \left(\frac{0.56}{n}\right) S_x^{1.67} S^{0.5} T^{2.67}$$



Example:
Sta: 84+35.41 to Sta: 89+45.10

Given:
n = 0.016 Sx = 0.03
S = 0.04 T = 6 ft

Find:
Q = 2.4 ft³/s
Qn = 0.038 ft³/s 14.2

S (ft/ft) = 0.00235 -2 F = 7.4

n = 0.016 0.0617
Sw (ft/ft) = ~~0.0417~~
Sx (ft/ft) = 0.02
Eo = ~~0.26~~ 0.52

Qs (cfs) 0.52
Qw (cfs) 0.56
Q (cfs) 1.08

Qs cfs =
Qw cfs =
Q cfs =

1) For V-shape, use the nomograph with

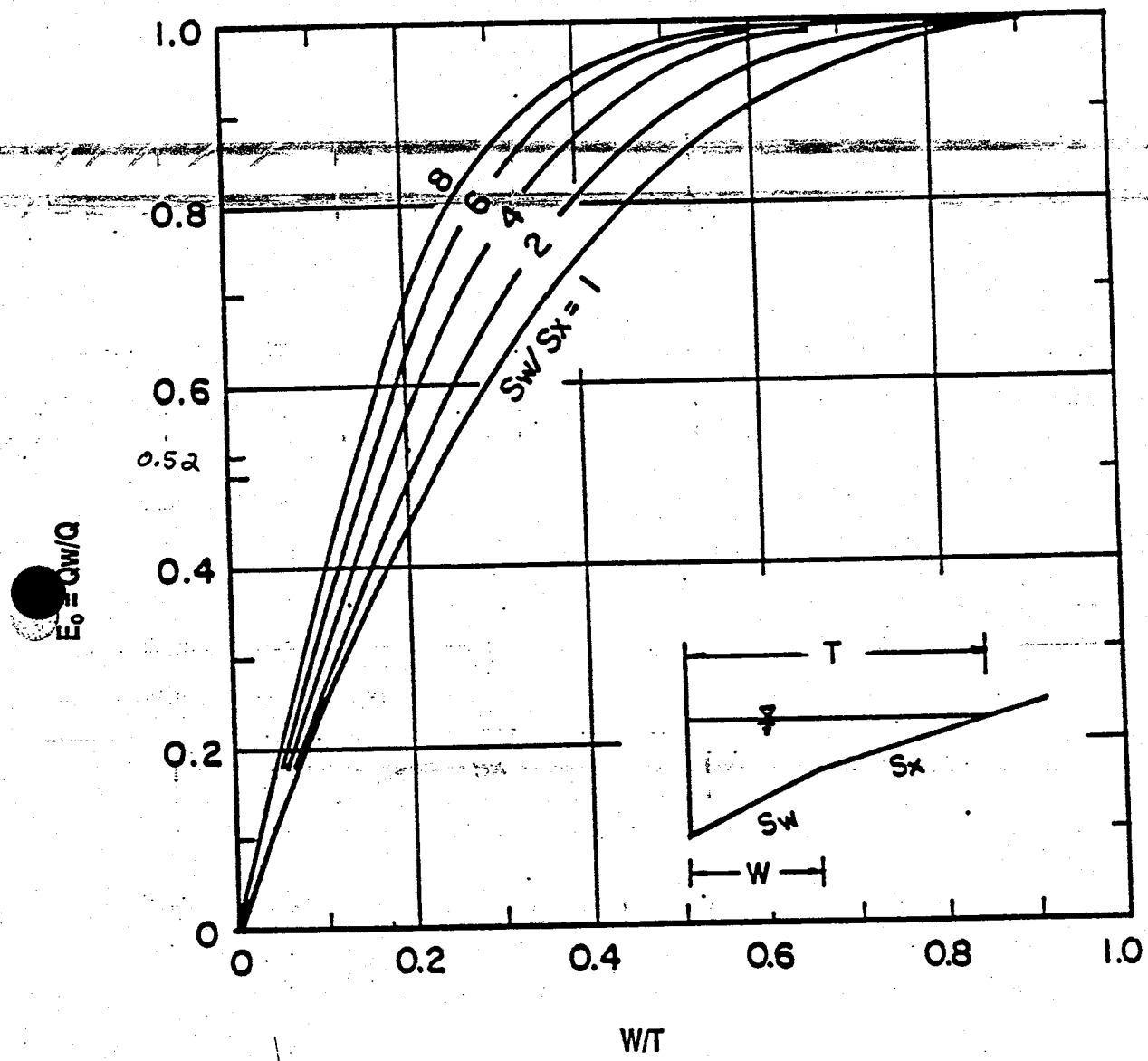
$$S_x = \frac{S_{x1} S_{x2}}{(S_{x1} + S_{x2})}$$

2) To determine discharge in gutter with composite cross slopes, find Q_s using T_s and S_x. Then, use Figure 3.24 (page 47) to find Eo. The total discharge is $Q = \frac{Q_s}{(1 - E_o)}$, and $Q_w = Q - Q_s$.

By: PJE
Checked: [illegible] Date: 5/2/95

Figure 3.2
Nomograph for Triangular Gutters
(source: FHWA, 1984, HEC-12)

Sta: 89+45.10



T = 9.4

w = 1.42

w/T = 0.28

Sw/Sx = 1

Figure 3.23
Ratio of Frontal Flow to Total Gutter Flow
(source: FHWA, 1984, HEC-12)

Sta 89+45.10

(.6) (.163) 80.43

$L_T = 0.6Q^{0.42}S^{0.3}(1/nS_x)^{0.6}$ = 7.8 × 1.2 (Reduction Factor) 9.43

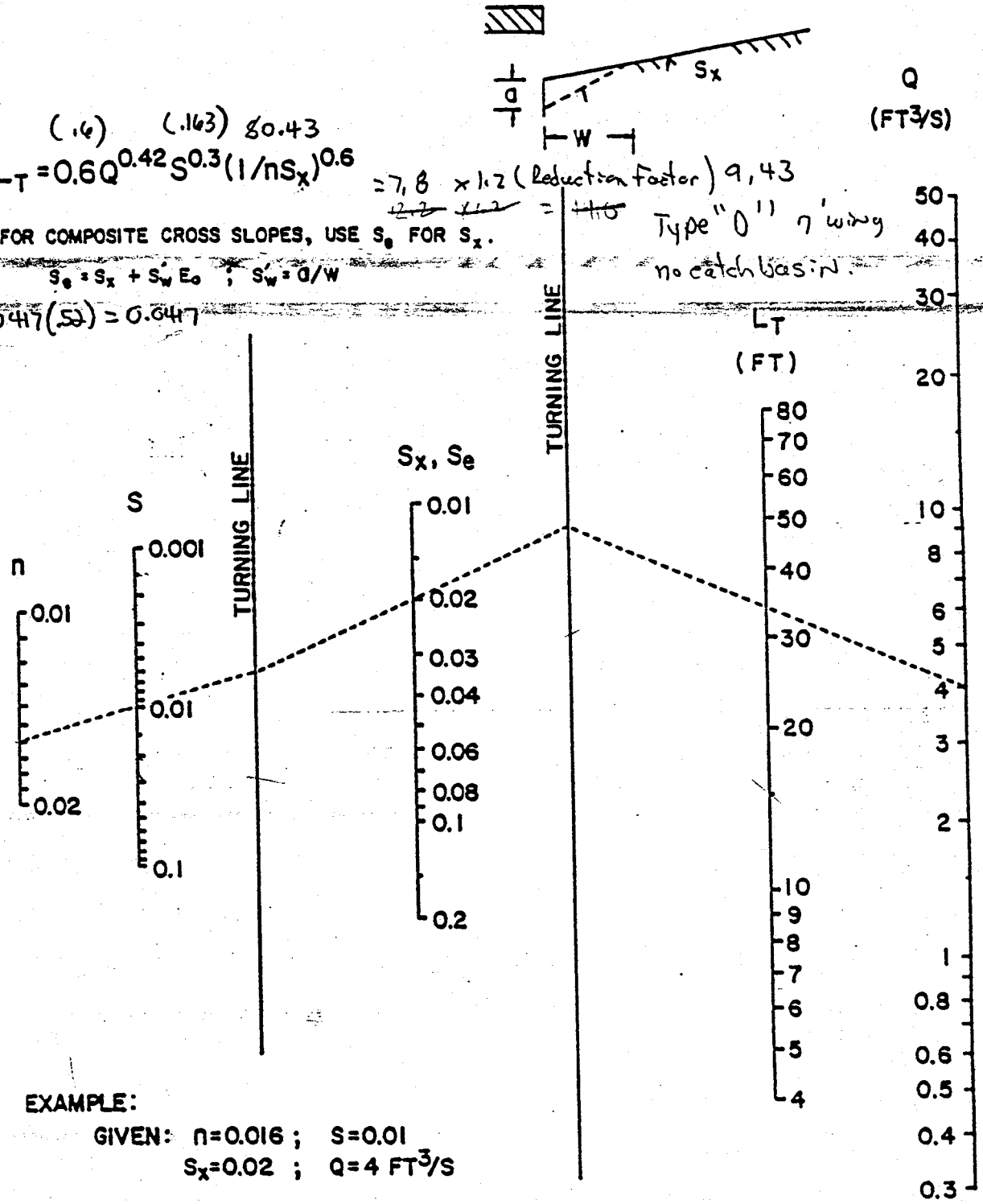
~~12.2~~ ~~×1.2~~ = ~~14.6~~

Type "D" 7' wing no catch basin.

FOR COMPOSITE CROSS SLOPES, USE S_e FOR S_x.

$S_e = S_x + S'_w E_o$; $S'_w = a/W$

Se = 0.02 + 0.0417(.52) = 0.0417



EXAMPLE:

GIVEN: n=0.016 ; S=0.01

S_x=0.02 ; Q=4 FT^3/S

FIND: L_T = 34 FT

Figure 3.20
Curb Opening and Slotted Drain Inlet Length for Total Interception
(source: FHWA, 1984, HEC-12)

Computed by: PJE Date: 01-19-1995

LOCATION DATA

Location: Camelback Road

Project Name: Camelback Road Subarea id: Sta 93+65 to 95+54.79

Drainage Area Cover: Roadway

Catch Basin @ 95+54.79

DESIGN DATA

Drainage Area	0.17 acres
Watercourse Length	189.8 feet
Top Elevation	41.2 feet
Bottom Elevation	40.6 feet
Slope	.00321 feet/feet
Roughness Coefficient (Kb)	.04474
10-Year, 6-Hour Rainfall	1.99 inches

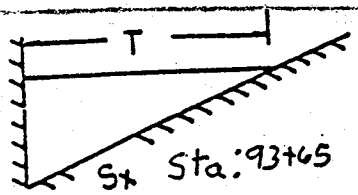
Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	0	1	1	1	1	1
C	0.800	0.800	0.800	0.880	0.950	0.950
Tc (min)	6.8	6.0	5.6	5.2	5.0	5.0
i (in/hr)	3.3	4.5	5.4	6.6	7.7	8.7

Date 1/14/95

Camelback Road
CBA # 241729-01

$$Q_t = \left(\frac{0.56}{n}\right) S_x^{1.67} S^{0.5} T^{2.67}$$



Example: Sta: 93+65 to Sta: 95+54.79

Given:
n = 0.016 S_x = 0.03
S = 0.04 T = 6 ft

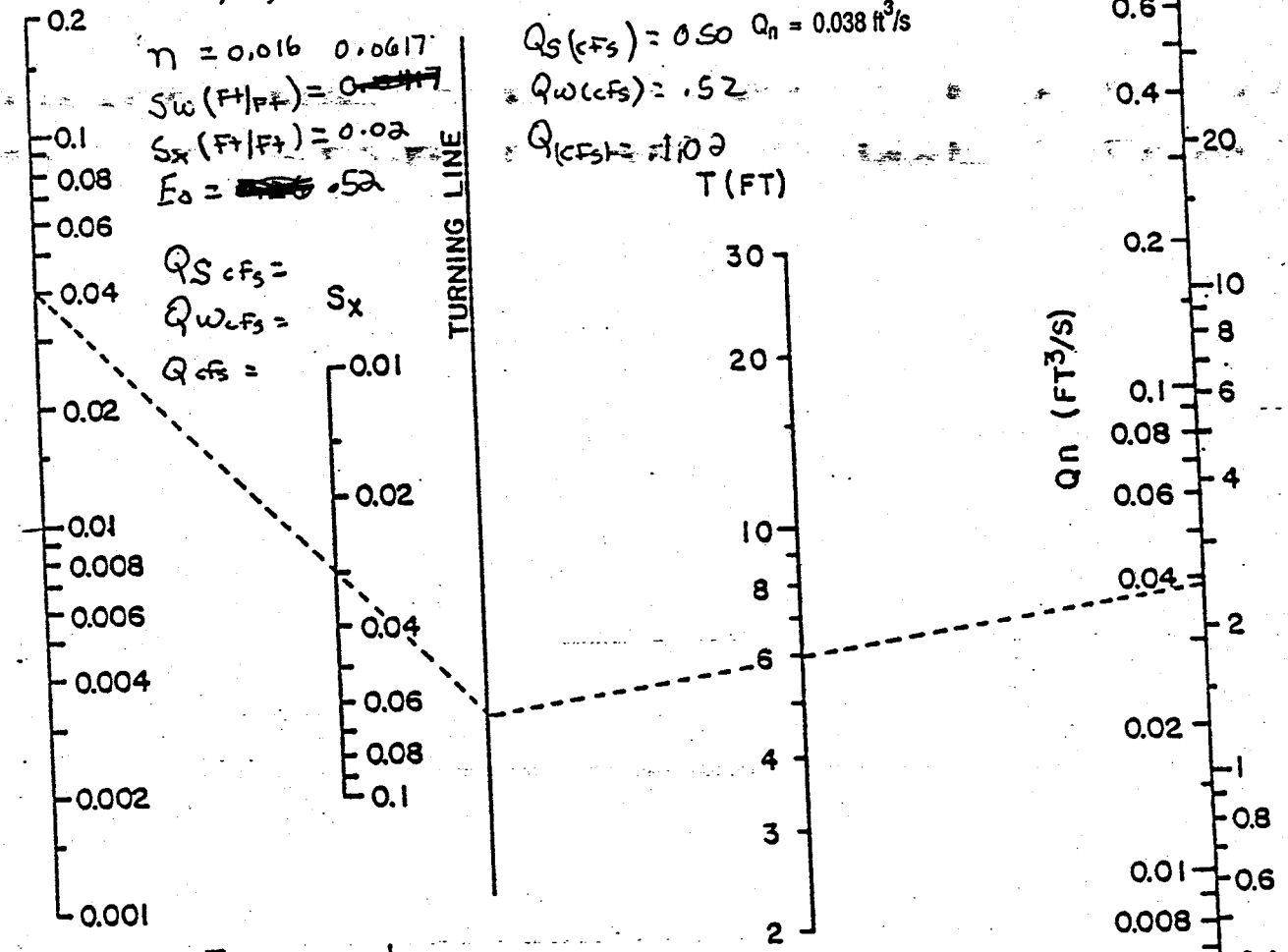
Find:
Q = 2.4 ft^3/s
Q_n = 0.038 ft^3/s

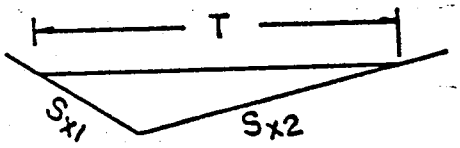
$S(ft/ft) = 0.0032$ $T_s = 6.9$

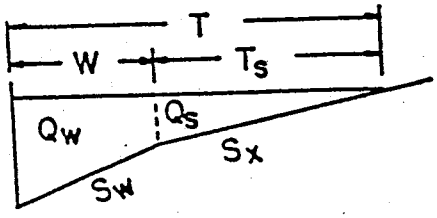
$n = 0.016$ 0.0617
$S_w(ft/ft) =$ ~~0.0417~~
$S_x(ft/ft) = 0.02$
$E_o =$ .52

$Q_s(cfs) = 0.50$
$Q_w(cfs) = .52$
$Q(cfs) = 1.02$

Q_s cfs =
Q_w cfs =
Q cfs =







1) For V-shape, use the nomograph with

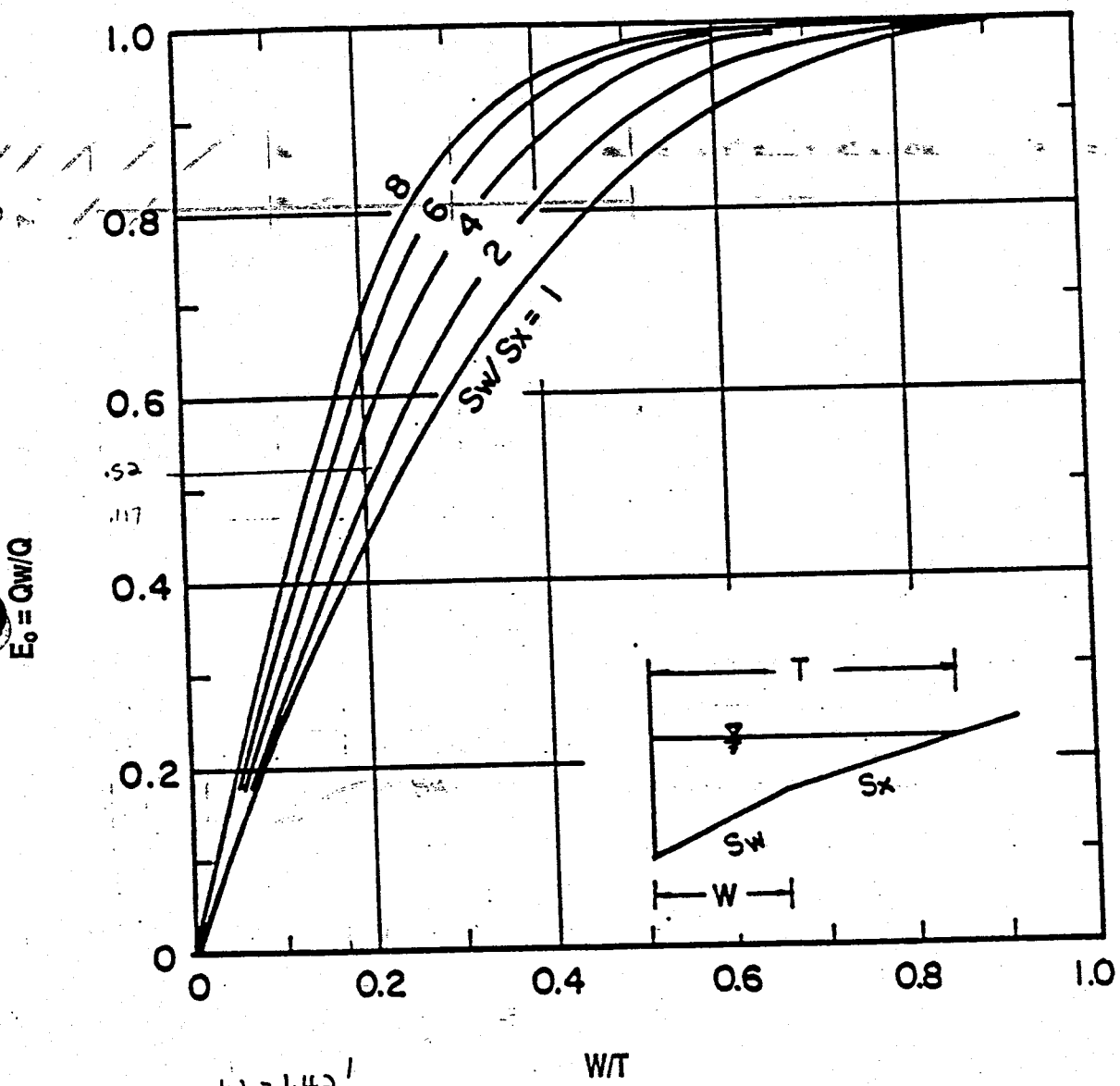
$$S_x = \frac{S_{x1} S_{x2}}{(S_{x1} + S_{x2})}$$

2) To determine discharge in gutter with composite cross slopes, find Q_s using T_s and S_x. Then, use Figure 3.24 (page 47) to find Eo. The total discharge is $Q = \frac{Q_s}{(1 - E_o)}$, and $Q_w = Q - Q_s$.

By: PJE
Checked: Date.

Figure 3.2
Nomograph for Triangular Gutters
(source: FHWA, 1984, HEC-12)

Sta 95+54.79



W = 1.42'
T = 6.9'
Sw/Sx = 0.30
W/T = 0.20

Figure 3.23
Ratio of Frontal Flow to Total Gutter Flow
(source: FHWA, 1984, HEC-12)

Sta 95+54.79

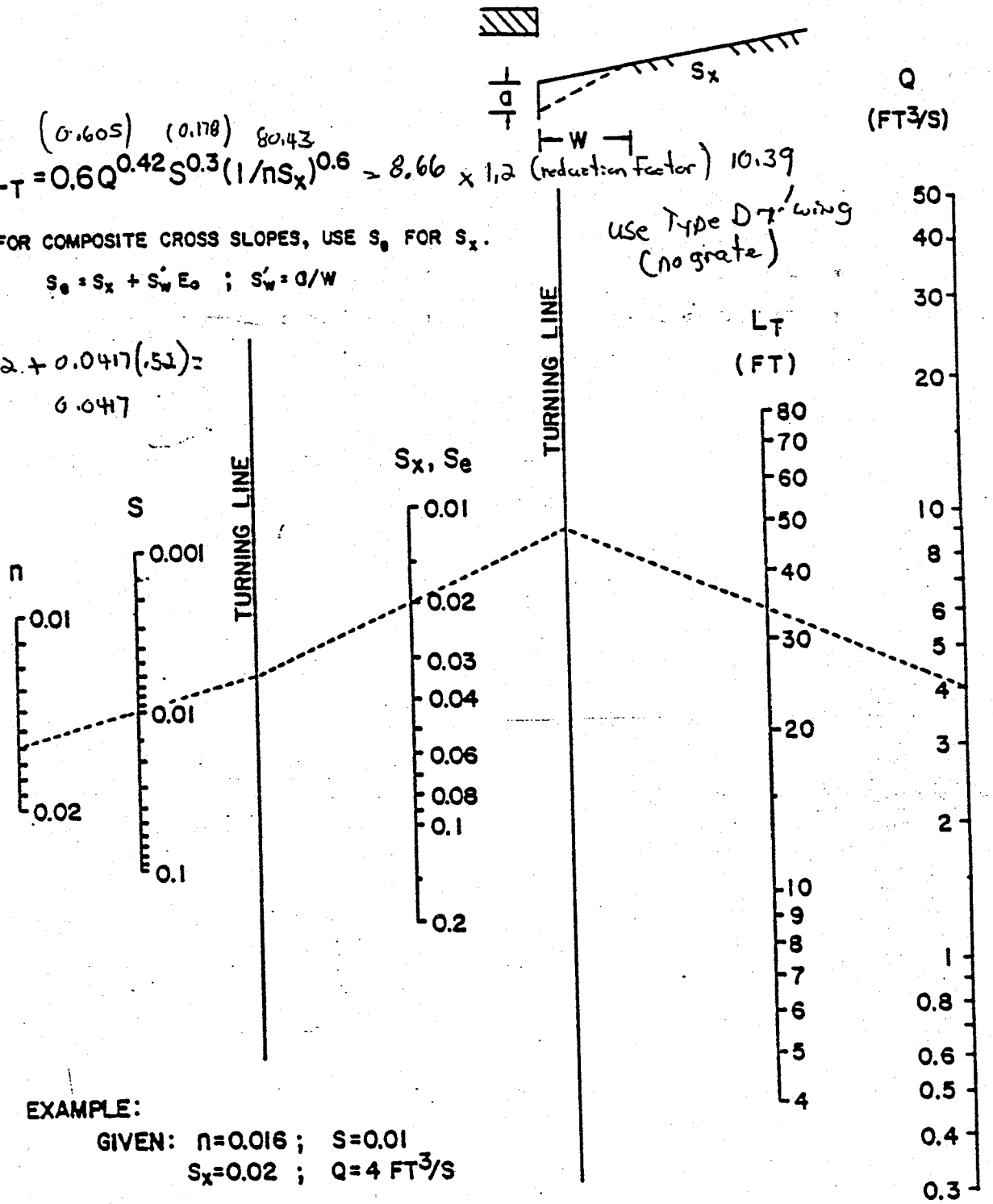
$$L_T = 0.6 Q^{0.42} S^{0.3} (1/nS_x)^{0.6}$$ (0.605) (0.178) 80.43 → 8.66 × 1.2 (reduction factor) 10.39

use Type D 7' wing (no grate)

FOR COMPOSITE CROSS SLOPES, USE S_e FOR S_x.

$S_e = S_x + S'_w E_o$; $S'_w = a/W$

$S_e = 0.02 + 0.0417(.52) = 0.0417$



EXAMPLE:

GIVEN: $n = 0.016$; $S = 0.01$

$S_x = 0.02$; $Q = 4\ FT^3/S$

FIND: $L_T = 34$ FT

Figure 3.20
Curb Opening and Slotted Drain Inlet Length for Total Interception
(source: FHWA, 1984, HEC-12)

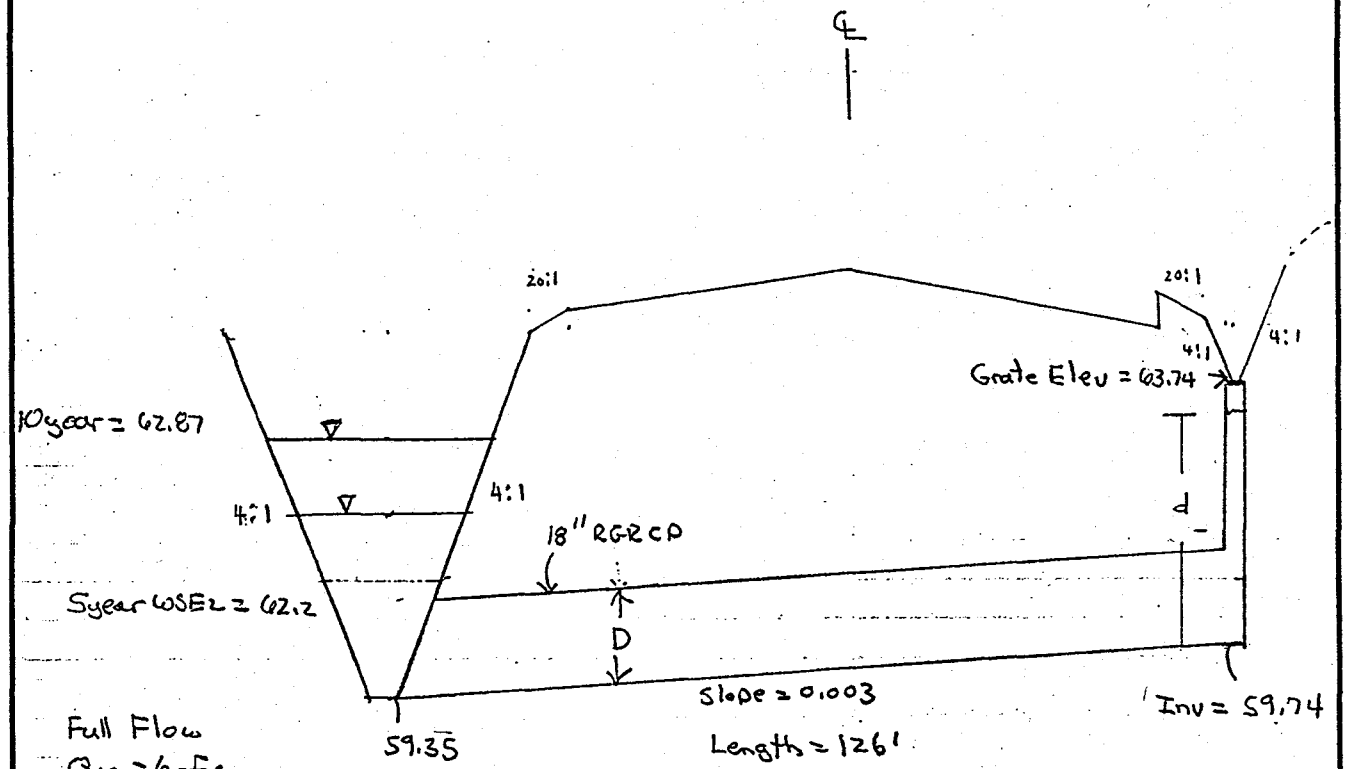
Lateral Profile Calculation Sheets

DESIGN NOTES AND COMPUTATIONS

SUBJECT: Camelback Road

JOB NO.: 241729-01-0301

Sta = 29+23



Full Flow
$Q_{10} = 6$ cfs
D = 18"
Pipe Area = 1.767 Ft^2
Pipe Length = 126'
Velocity = 3.4 Fps
Hydraulic radius = 0.375

Friction Slope = $SF = \left(\frac{Qn}{1.486 \times A \times R^{0.667}}\right)^2 = 0.0033$ ft/ft

hf = 0.42
grate elevation = 63.74
Inlet bottom elevation = 59.74
Outfall velocity head = 0.179 = $v^2/2g$
Pressure Elevation downstream = 62.62
Estimate d/D 2.38 — Water depth over catchbasin = d = 3.6'
Figure 4.7 Kg = 3.9
Rise = $K_g v^2/2g$ = 0.70

water surface Elev = 63.33
Clearence (grate to water) = 0.41' gutterelevation = 64.64
Clearence (gutter to water) = 0.90'

PREPARED BY: DATE: 5/2/95 CHECKED BY: SSS SHEET NO.: OF

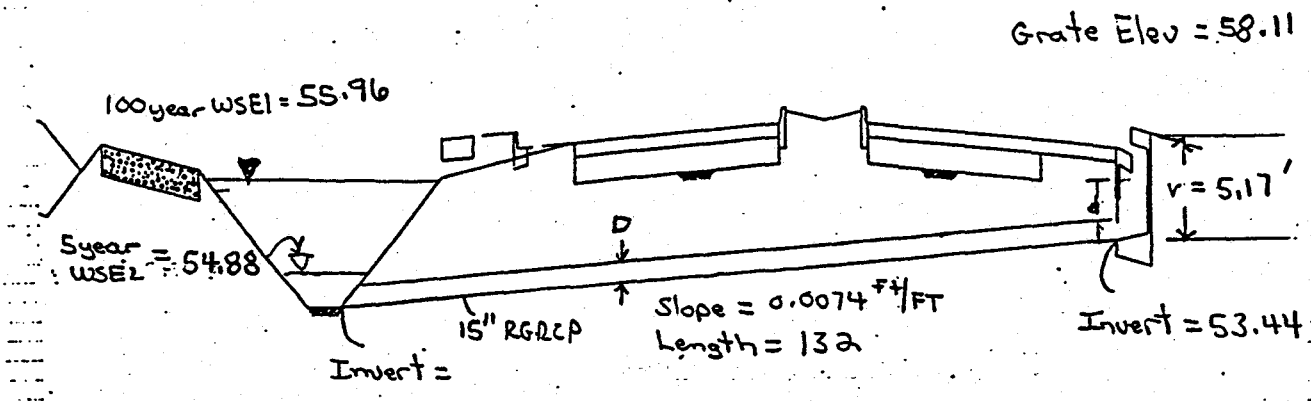
CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

DESIGN NOTES AND COMPUTATIONS

SUBJECT: Camelback Road

JOB NO.: 241729-01-0301

Station = 39+65.67-47RT



NTS

Q_{10} = 4 cfs
D = 15"
Pipe Area = 0.80 Ft^2
Pipe length = 132'
Velocity = 5 Fps

Hydraulic Radius = R = 0.388

Friction Slope = $SF = \left(\frac{Qn}{1.486 \times A \times R^{.667}}\right)^2$ = ~~0.0077~~ .0068 Ft/Ft

hF = ~~Not~~ 0.90

Gutter elevation = 58.11

Intet Bottom elevation = 53.44

Out Fall velocity head = $v^2/2g$ = 0.388 (Downstream)

Estimated water depth 3.60 over catch basin = d = 3.67

Pressure Elevation ~~above bottom, Ft~~ = ~~X~~ = ~~55.89~~ 55.8

Estimated d/D = ~~2.93~~ 2.98

Figure 4.7 Kg = ~~3.15~~ 3.2

Rise Kg x $v^2/2g$ = ~~1.22~~ 1.24

Watersurface Elev = ~~57.11~~ 57.04

Clearance (Gutter to water) Ft = ~~Not~~ 7.07

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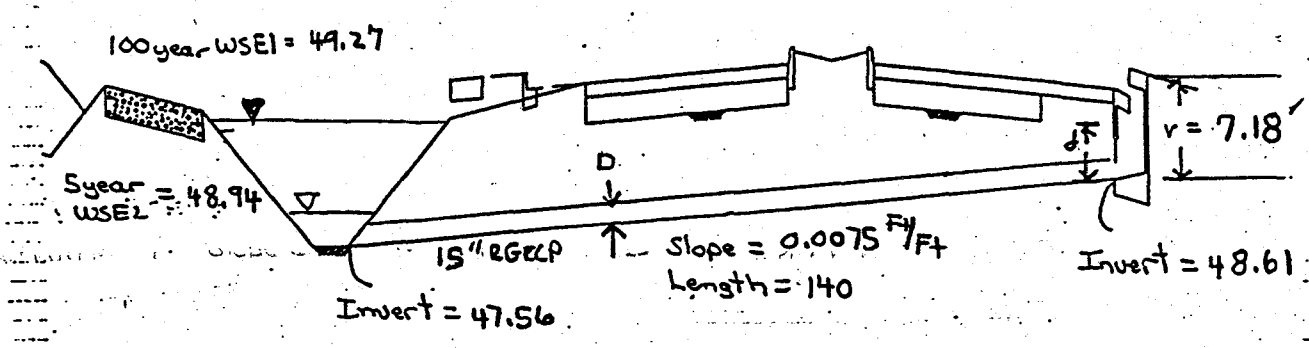
CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

DESIGN NOTES AND COMPUTATIONS

SUBJECT: Camelback Road

JOB NO.: 241729-01-0301

Station = 50+65.67 - 47' RT



NTS

Q_{10} = 4
D = 15"
Pipe Area = 0.769 Ft^2
Pipe length = 140'
Velocity = 5.2 Fps

Hydraulic Radius = R = 0.3470

Friction Slope = $Sf = \left(\frac{Qn}{1.486 \times A \times R^{.667}}\right)^2 = 0.0084$ Ft/Ft

hF = 1.19'

Gutter elevation = 55.29

Inlet Bottom elevation = 48.61

Out Fall velocity head = $v^2/2g$ = 0.420 (Downstream)

Estimated water depth over Catch basin = 3.09'

Pressure Elevation ~~above bottom, Ft~~ = ~~d~~ = 50.13

Estimated d/D = 2.47

Figure 4.7 Kg = 3.75

Rise $Kg \times v^2/2g$ = 1.57'

Watersurface Elev = 51.70

Clearance (Gutter to water), Ft = 3.58

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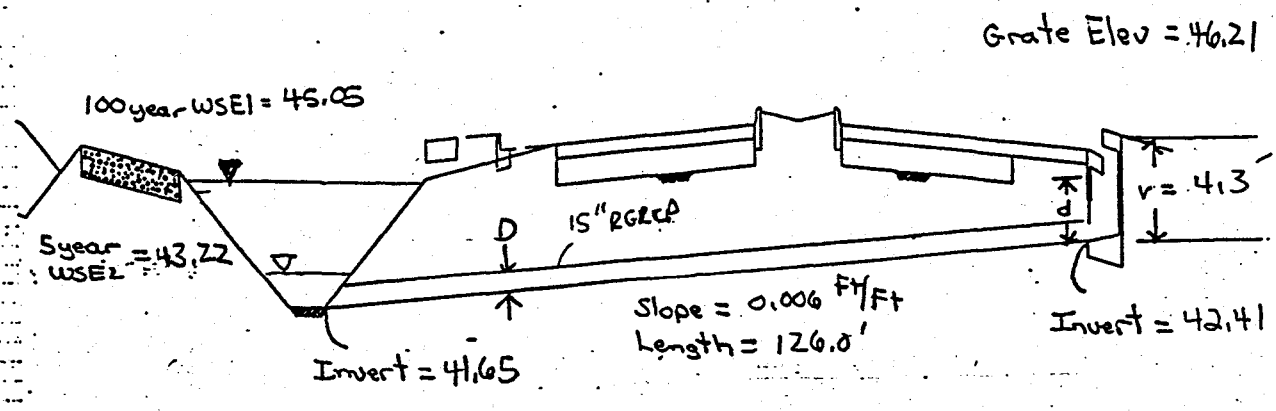
CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

DESIGN NOTES AND COMPUTATIONS

SUBJECT: Camelback Road

JOB NO.: 241729-01-0301

Station = 58+87-47 RT



NTS

Q_{10} = 3 cfs
D = 15"
Pipe Area = 0.676 Ft^2
Pipe length = 126.0'
Velocity = 4.43 Fps

Hydraulic Radius = R = 0.3276

Friction Slope = $SF = \left(\frac{Qn}{1.486 \times A \times R^{.667}}\right)^2 = 0.00668$ Ft/Ft

hF = 0.84'

Gutter elevation = 46.21
Inlet Bottom elevation = 42.42
Outfall velocity head = $v^2/2g$ = 0.305 (Downstream)
Pressure Elevation ~~above bottom, Ft~~ = ~~d~~ = 44.06
Estimated d/D = 2.46
Figure 4.7 Kg = ~~4.7~~ 3.75
Rise Kg x $v^2/2g$ = ~~1.43~~ 1.14
Watersurface Elev = ~~48.49~~ 45.20
Clearance (Gutter to water) Ft = ~~0.72~~ 1.01

Estimated water depth over catch basin = 3.08

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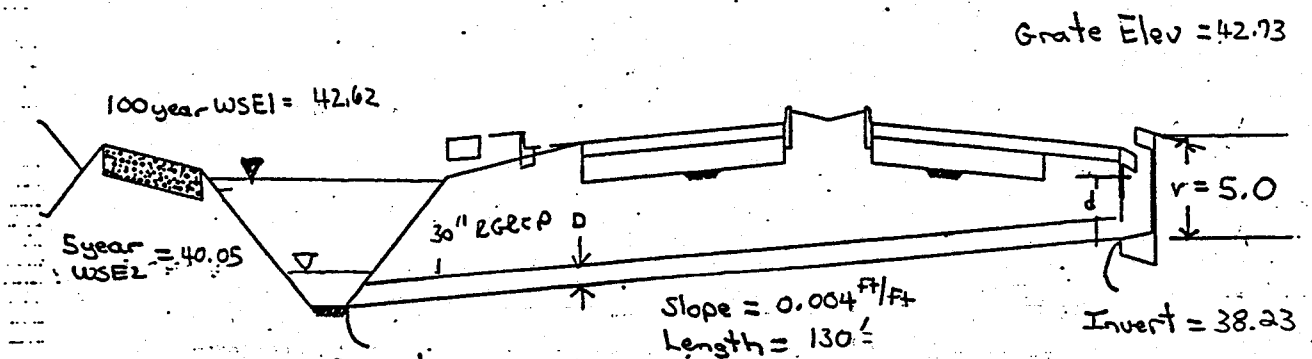
CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

DESIGN NOTES AND COMPUTATIONS

SUBJECT: Camelback Road

JOB NO.: 241729-01-0301

Station = 64 +45.45 — 47 RT



NTS

$Q_{10} = 3$

D = 30"

Pipe Area = 0.8 ft²

Pipe length = 130'

Velocity = 3.75 fps

Hydraulic Radius = R = 0.3015

Friction Slope = $SF = \left(\frac{Qn}{1.486 \times A \times R^{.667}}\right)^2 = 0.0053$

hF = 0.69

Gutter elevation = 42.73

Inlet Bottom elevation = 38.23

Estimated water depth over catch basin = d = 3.88'

Out Fall velocity head = $v^2/2g$ = 0.21802 (Downstream)

Pressure Elevation ~~above bottom, ft~~ = d = 40.74

Estimated d/D = 1.55

Figure 4.7 Kg = 6.3

Rise Kg x $v^2/2g$ = 1.37

Watersurface Elev = 42.11

Clearance (Gutter to water), ft = 0.62'

PREPARED BY:	DATE:	CHECKED BY:	SHEET NO.:	OF
PJE	4/95	[illegible]		

CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

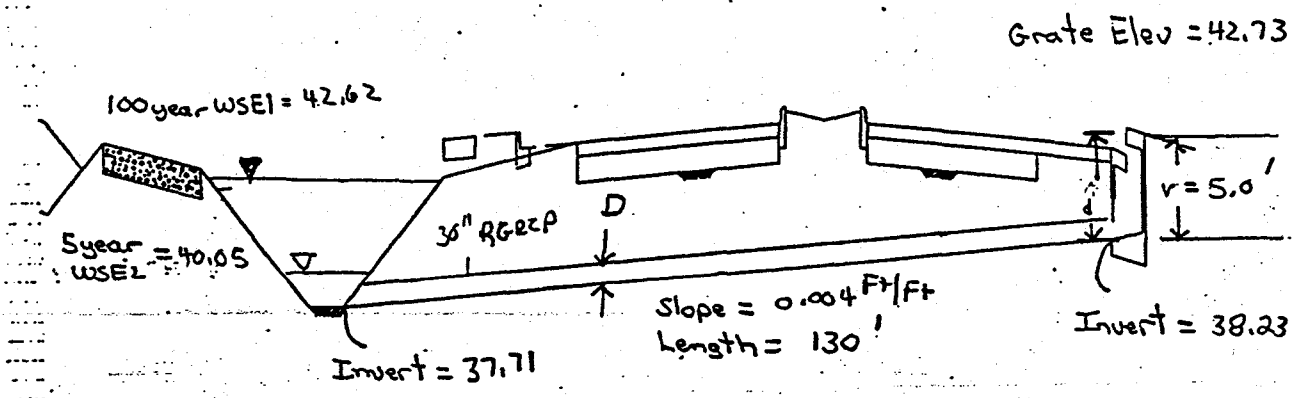
DESIGN NOTES AND COMPUTATIONS

SUBJECT: Camelback Road

JOB NO.: 241729-01-0301

Station = 64 +45.45

Catch baisu in a sump condition
check 100year Q



NTS

Q_{100}
Q_{100} = 12cfs
D = 30"
Pipe Area = 4.909 ft^2
Pipe length = 136'
Velocity = 2.44 fps

Hydraulic Radius = R = 0.625

Friction Slope = $Sf = \left(\frac{Qn}{1.486 \times A \times R^{.667}}\right)^2 = 0.0008$ Ft/Ft

hF = 0.111 ✓

Gutter elevation = 42.73
Intet Bottom elevation = 38.23
Outfall velocity head = $v^2/2g$ = 0.092
(Downstream)
Pressure Elevation ~~above bottom, Ft~~ = d = 42.73
Estimated d/D = 1.98
Figure 4.7 Kg = 4.9
Rise Kg x $v^2/2g$ = 0.45
Watersurface Elev = 43.18
Clearance (Gutter to water) Ft = (−0.45) = OK

Estimated water depth over catch basin = d = 4.95

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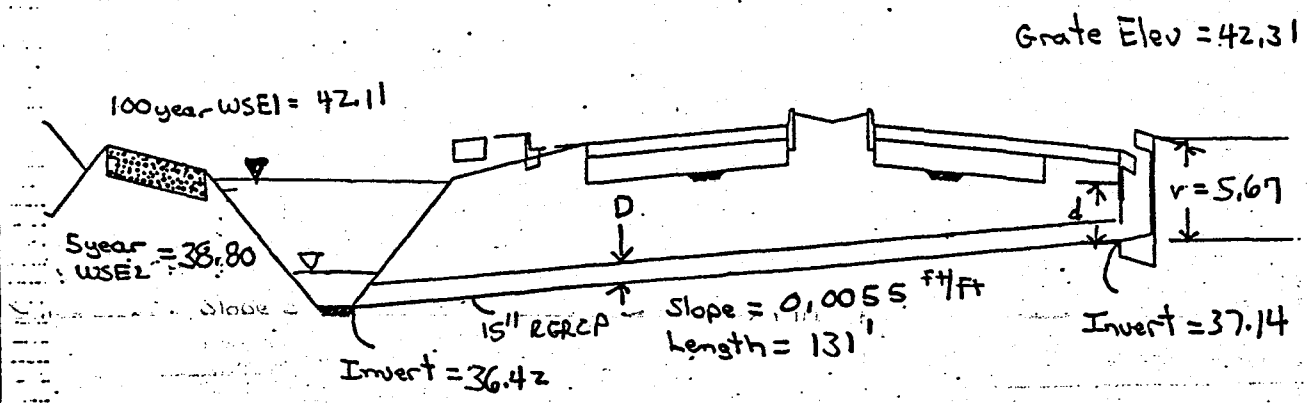
CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

DESIGN NOTES AND COMPUTATIONS

SUBJECT: Camelback Road

JOB NO.: 241729-01-0301

Station = 73+00 - 47 RT



NTS

Q_{10} = 2 cfs
D = 15"
Pipe Area = 0.52 ft^2
Pipe length = 131'
Velocity = 3.8 fps

Hydraulic Radius = R = 0.2822

Friction Slope = $SF = \left(\frac{Qn}{1.486 \times A \times R^{.667}}\right)^2 = 0.0061$

hF = 0.795'

Gutter elevation = 42.31

Intet Bottom elevation = 37.14

Out Fall velocity head = $v^2/2g$ = 0.229 (Downstream)

Pressure Elevation ~~above bottom, Ft~~ = d = 39.60

Estimated d/D = 2.61

Figure 4.7 Kg = 3.5

Rise $Kg \times v^2/2g$ = 0.80

Watersurface Elev = 40.40

Clearance (Gutter to water) Ft = 1.91'

Estimated water depth over catch basin d = 3.26'

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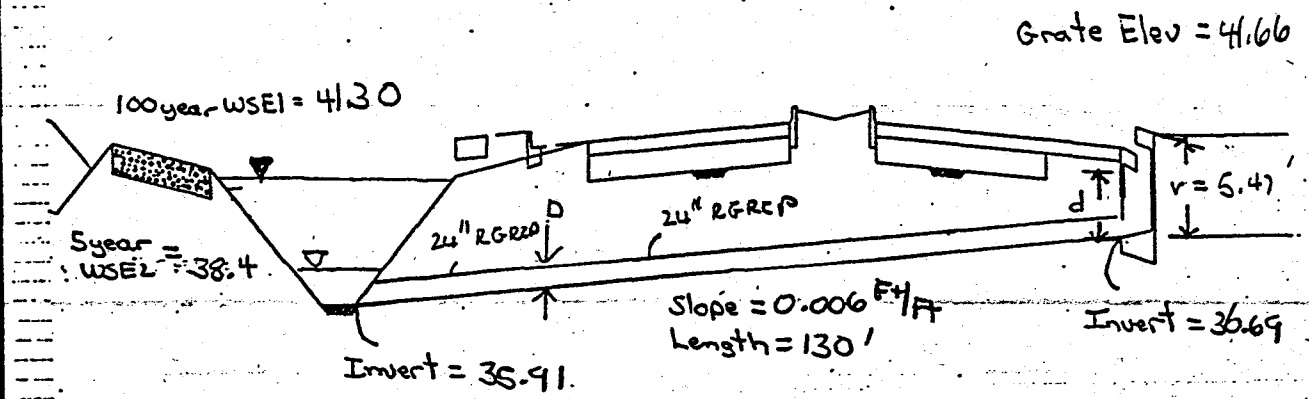
CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

DESIGN NOTES AND COMPUTATIONS

SUBJECT: Camelback Road

JOB NO.: 241729-01-0301

Station = 76+45-47' RT



NTS

Q_{10} = 3 cfs
D = 24"
Pipe Area = 0.684 Ft^2
Pipe length = 130'
Velocity = 4.38 fps

Hydraulic Radius = R = 0.3132
Friction Slope = $SF = \left(\frac{Qn}{1.486 \times A \times R^{.667}}\right)^2 = 0.0069$ Ft/Ft
hF = 0.879' .90
Gutter elevation = 41.66
Inlet Bottom elevation = 30.69
Out Fall velocity head = $v^2/2g$ = 0.2983 (Downstream)
Pressure Elevation ~~above bottom, Ft~~ = ~~d~~ = 39.30
Estimated d/D = 2.00
Figure 4.7 Kg = 4.7
Rise $Kg \times v^2/2g$ = 1.40
Watersurface Elev = 40.70
Clearance (Gutter to water) Ft = 0.96

Estimated water depth over catch basin bottom = d = 4.012

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CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

DESIGN NOTES AND COMPUTATIONS

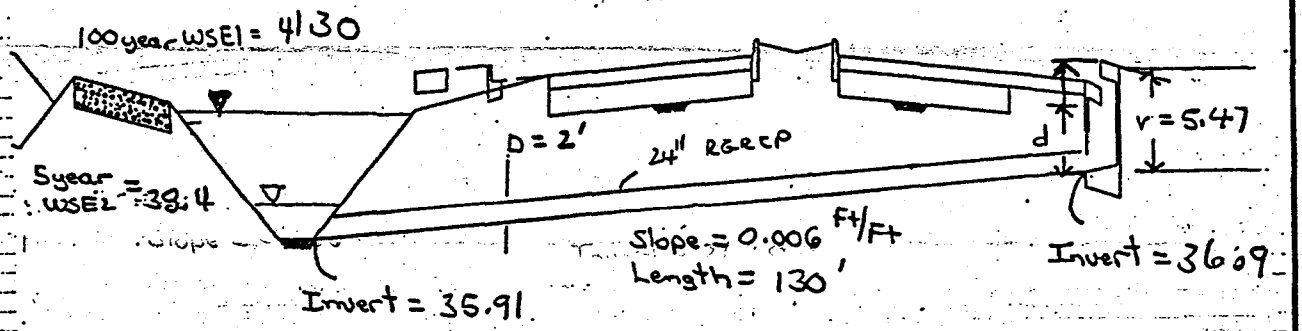
SUBJECT: Camelback Road

JOB NO.: 241729-01-0301

Station = 76+45-47' RT*

* Catch basin in a sump condition
Check 100 year Q

Grate Elev = 41.66



NTS

Q_{100}

Q_{10} = 8 cfs

D = 24"

Pipe Area = 3.142 Ft^2

Pipe length = 130'

Velocity = 2.55 Fps

Hydraulic Radius = R = 0.50

Friction Slope = $Sf = \left(\frac{Qn}{1.486 \times A \times R^{.667}}\right)^2 = 0.001251$

hF = 0.162

Gutter elevation = 41.66

Intet Bottom elevation = 36.69

Out Fall velocity head = $v^2/2g$ = ~~0.362~~ 0.100 (Downstream)

Estimated water depth over catch basin bottom = d = 5.13

Pressure Elevation ~~above bottom, Ft~~ = d = 41.46

Estimated d/D = 2.56

Figure 4.7 Kg = 3.6

Rise $Kg \times v^2/2g$ = 0.362'

Watersurface Elev = 41.82

Clearance (Gutter to water), Ft = (-0.53) - OK

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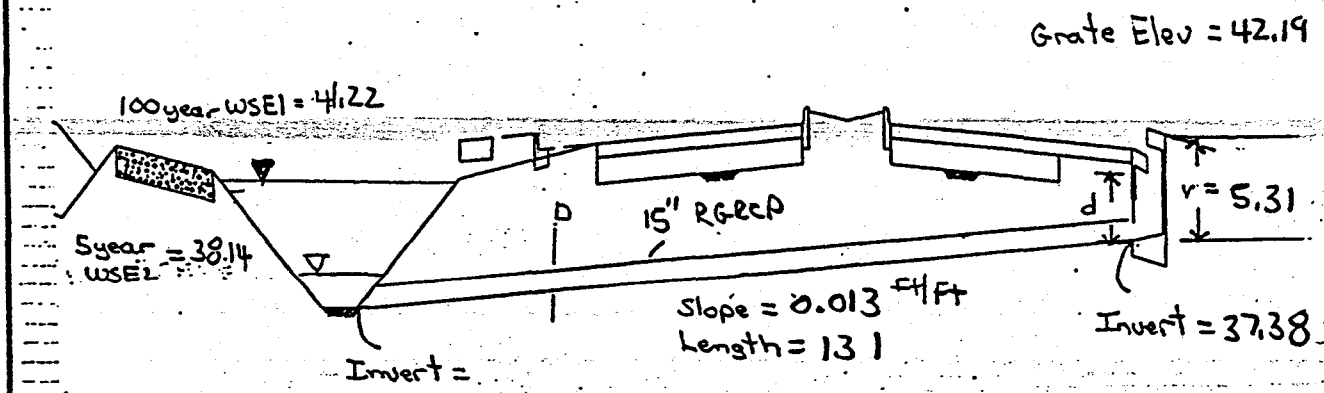
CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
(602) 242-2999
FAX (602) 246-7247

DESIGN NOTES AND COMPUTATIONS

SUBJECT: Camelback Road

JOB NO.: 241729-01-0301

Station = 78+00-47 RT



NTS

Q_{10} = 1cfs

D = 15

Pipe Area = 0.2265 Ft^2

Pipe length = 131

Velocity = 4.41 Fps

Hydraulic Radius = R = 0.177

Friction Slope = $Sf = \left(\frac{Qn}{1.486 \times A \times R^{.667}}\right)^2 = 0.015$ Ft/Ft

hF = 1.96'

Gutter elevation = 42.19

Inlet Bottom elevation = 37.38

Estimated water depth over catch basin bottom = d = 3.88

Out Fall velocity head = $v^2/2g$ = 0.3029 (Downstream)

Pressure Elevation ~~above bottom, Ft~~ = ~~d~~ = ~~40.36~~ 40.10

Estimated d/D = 3.11

Figure 4.7 Kg = 3.0

Rise Kg x $v^2/2g$ = 0.909

Watersurface Elev = ~~41.27~~ 41.01

Clearance (Gutter to water), Ft = ~~0.92~~ 1.18

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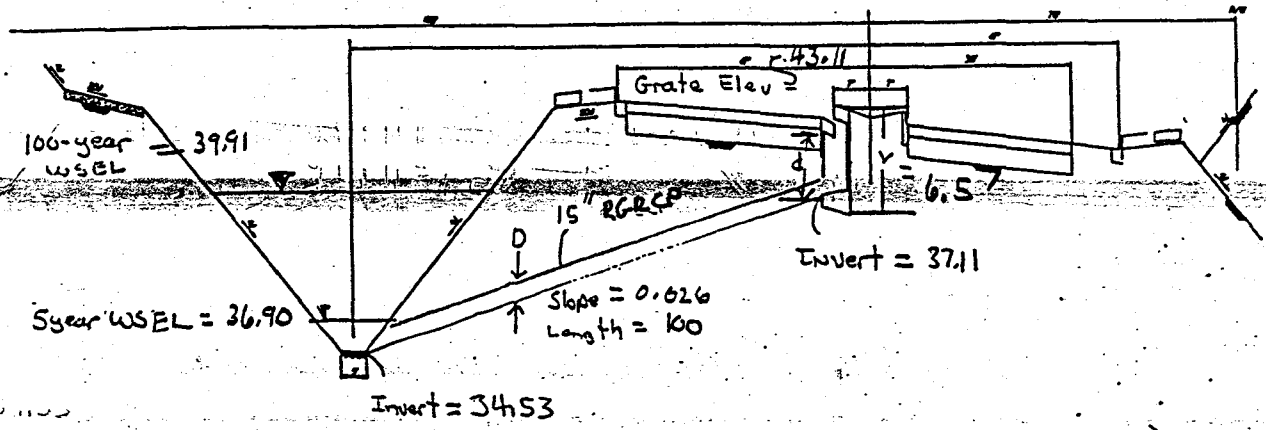
CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

DESIGN NOTES AND COMPUTATIONS

SUBJECT: Camelback Road

JOB NO.: 241729-01-0301

Station = 85+69.41 -7LT



NTS

$Q_{10} = 15$ cfs

D = 15"

Pipe Area = 0.175 Ft^2

Pipe length = 100

Velocity = 5.72 FPS

Hydraulic Radius = R = 0.151

Friction Slope = $Sf = \left(\frac{Qn}{1.486 \times A \times R^{.667}}\right)^2 = 0.0311$ ft/ft

hF = 3.11

Gutter elevation = 43.11

Inlet Bottom elevation = 37.11

Out Fall velocity head = $v^2/2g$ = 0.508 (Downstream)

Estimated water depth over catch basin bottom = d = 4.32

Pressure Elevation ~~above bottom, ft~~ = d = 40.01

Estimated d/D = 3.45

Figure 4.7 Kg = 2.8

Rise $Kg \times v^2/2g$ = 1.42'

Watersurface Elev = 41.43

Clearance (Gutter to water), Ft = 1.68

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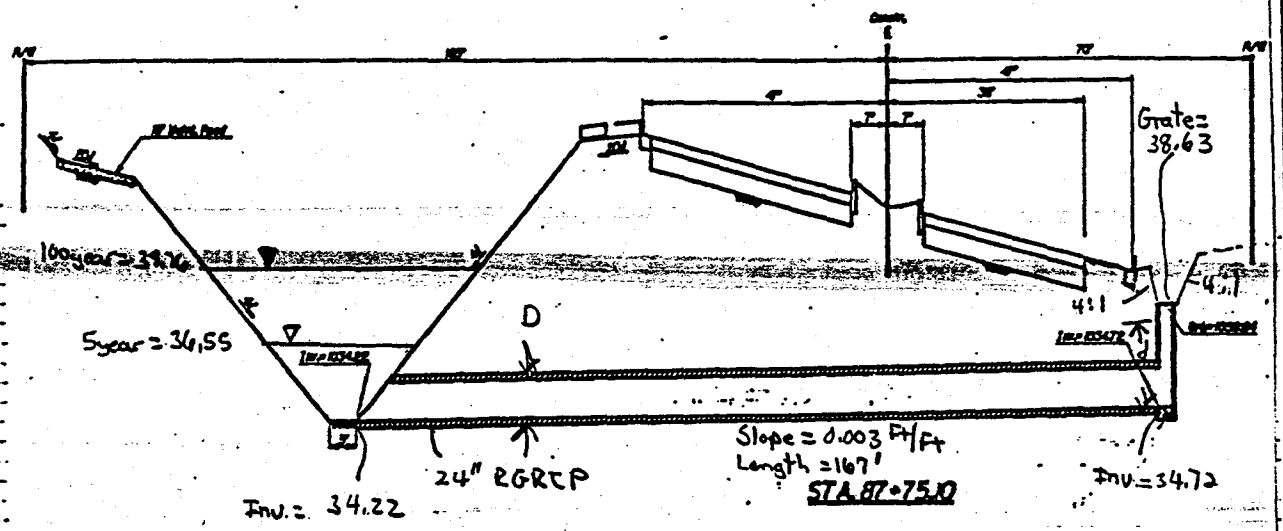
CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

DESIGN NOTES AND COMPUTATIONS

SUBJECT: Camelback Road

JOB NO.: 241729-01-0301

Station = 87+75.10 - 65 RT



NTS

Q_{10} = 3cfs
D = 24"
Pipe Area = 0.8668 Ft^2
Pipe length = 167'
Velocity = 3.46 Fps

Hydraulic Radius = R = 0.3604

Friction Slope = $Sf = \left(\frac{Qn}{1.486 \times A \times R^{.667}}\right)^2$ = 0.0035 Ft/Ft

hF = 0.58'

Gutter elevation = 38.63
Inlet Bottom elevation = 34.72
Outfall velocity head = $v^2/2g$ = 0.18

Estimated water depth over catch basin bottom = d = 3.44

Pressure Elevation (Downstream) = 37.13
Estimated d/D = 1.72
Figure 4.7 Kg = 5.7
Rise $Kg \times v^2/2g$ = 1.03
Watersurface Elev = 38.15
Clearance (Gutter to water) ft = 0.48

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CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

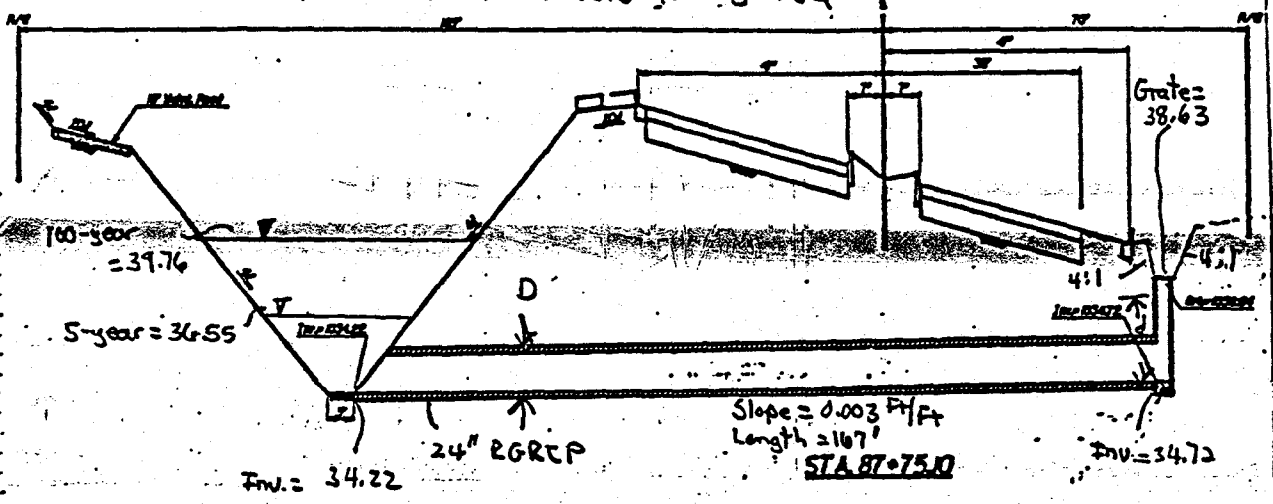
DESIGN NOTES AND COMPUTATIONS

SUBJECT: Camelback Road

JOB NO.: 241729-01-0301

Station = 87+75.10 - 65 RT

CB in a Sump Condition check 100-year Q



NTS

Q100 6cfs

Q_{10} =

D = 2 ft

Pipe Area = 3.142

Pipe length = 167

Velocity = 1.91

Hydraulic Radius = R = 0.50

Friction Slope = $SF = \left(\frac{Qn}{1.486 \times A \times R^{.667}}\right)^2 = 0.0007$ Ft/Ft

hF = 0.11'

Gutter elevation = 38.63

Inlet Bottom elevation = 34.72

Outfall velocity head = $v^2/2g$ = 0.056

Estimated water depth over catch basin bottom = d = 5.03'

Pressure Elevation (Downstream) = 39.87

Estimated d/D = 2.51

Figure 4.7 Kg = 3.6

Rise $Kg \times v^2/2g$ = 0.20

Watersurface Elev = 40.07

Clearance (Gutter to water) ft = Watersurface elevation above grate but within R/W.

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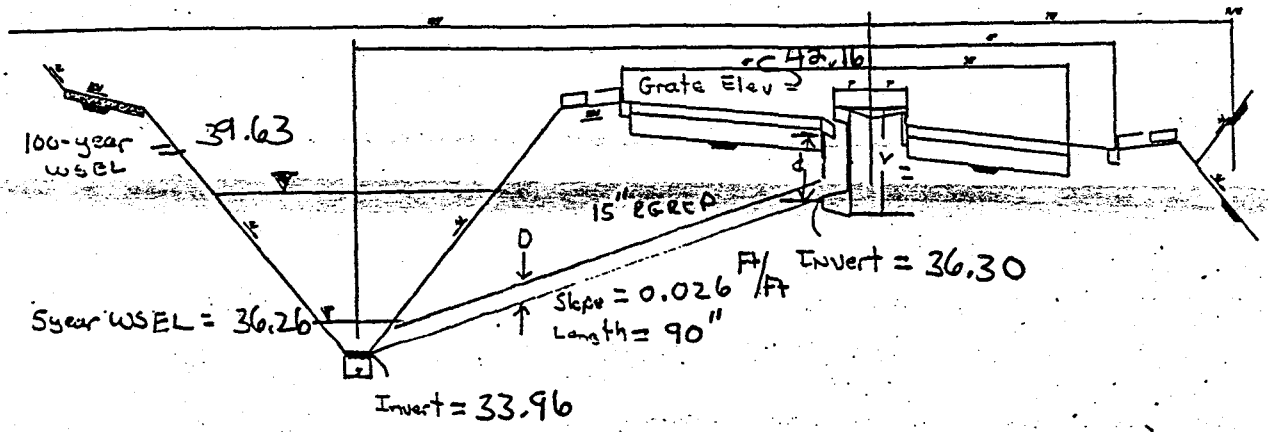
CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

DESIGN NOTES AND COMPUTATIONS

SUBJECT: Camelback Road

JOB NO.: 241729-01-0301

Station = 89+45.10 - 7LT



NTS

Q_{10} = 1 cFS
D = 15" (1.25')
Pipe Area = 6.175 Ft^2
Pipe length = 90'
Velocity = 5.72 FpS

Hydraulic Radius = R = 0.151
Friction Slope = $SF = \left(\frac{Qn}{1.486 \times A \times R^{.667}}\right)^2 = 0.0311$ Ft/Ft
hF = 2.8'
Gutter elevation = 42.16
Inlet Bottom elevation = 36.30
Out Fall velocity head = $v^2/2g$ = 0.508 (Downstream)
Pressure Elevation ~~above bottom, Ft~~ = ~~X~~ = 39.06
Estimated d/D = 3.38
Figure 4.7 Kg = 2.9
Rise Kg x $v^2/2g$ = 1.47
Watersurface Elev = 40.53
Clearance (Gutter to water) Ft = 1.62

Estimated water depth over catch basin bottom = d = 4.23

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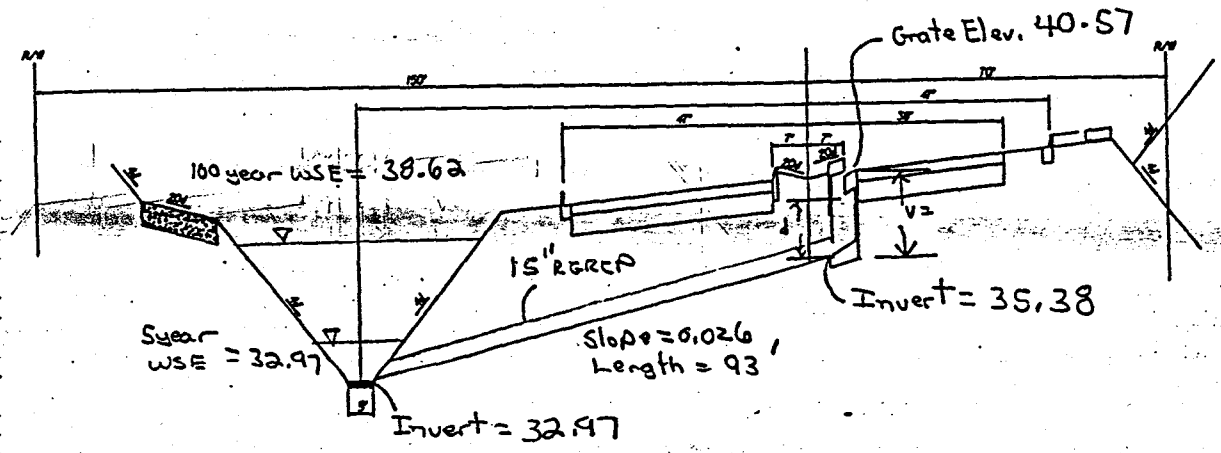
CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

DESIGN NOTES AND COMPUTATIONS

SUBJECT: Camelback Road

JOB NO.: 241729-01-0301

Station = 95+54.79 - 7RT



NTS

Q_{10} = 1 cfs
D = 15"
Pipe Area = 0.175 ft^2
Pipe length = 93
Velocity = 5.72 FPS

Hydraulic Radius = R = 0.151
Friction Slope = $SF = \left(\frac{Qn}{1.486 \times A \times R^{.667}}\right)^2$ = 0.0311
hF = 2.89
Gutter elevation = 40.57
Inlet Bottom elevation = 35.38
Outfall velocity head = $v^2/2g$ = 0.508
Pressure Elevation ~~above bottom, ft~~ (Downstream) = ~~[illegible]~~ 35.96 = 38.3
Estimated d/D = ~~3.47~~ 2.13
Figure 4.7 Kg = ~~[illegible]~~ 4.4
Rise Kg x $v^2/2g$ = ~~1.432~~ 2.23
Watersurface Elev = ~~39.42~~ 38.04
Clearance (Gutter to water) ft = ~~0.85~~ 2.53

Estimated water depth over catch basin bottom = d = 2.66 4.34

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CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
(602) 242-2999
FAX (602) 246-7247

DESIGN NOTES AND COMPUTATIONS

JOB NO.:

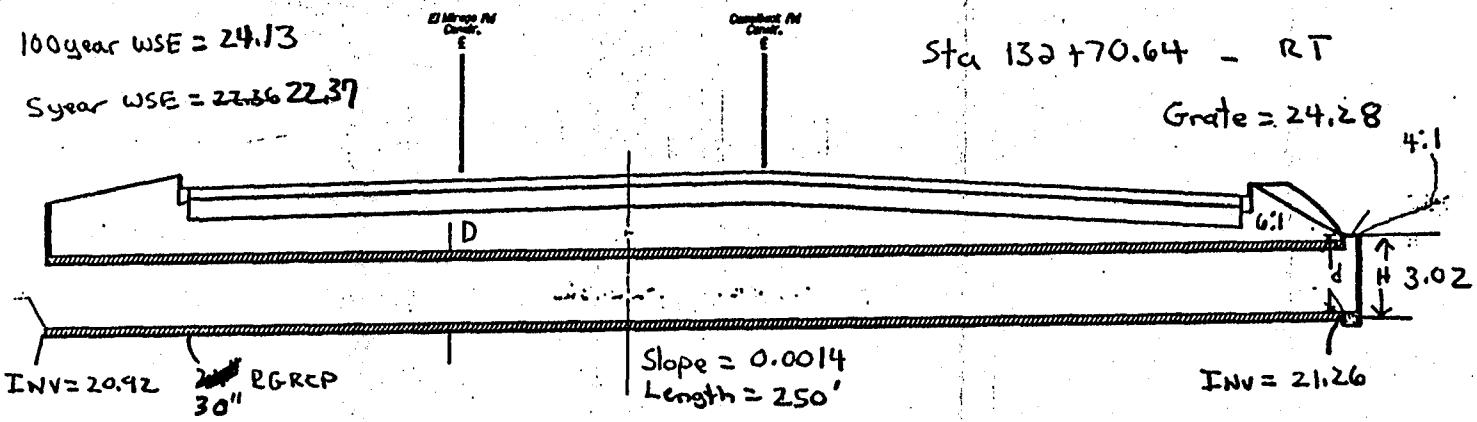
SUBJECT:

100year WSE = 24.13

5year WSE = ~~22.36~~ 22.37

Sta 132+70.64 – RT

Grate = 24.28



NTS

Q_{10} = 11cfs

D = 30"

Pipe Area = 3.07'

Pipe Length = 250'

Velocity = 3.6 Fps

Hydraulic Radius = 0.694

23.18 22.37

1.2 4

1.5 1.5

24.28 24.27

Friction Slope = SF = $\left(\frac{Qn}{1.486 \times A \times R^{0.667}}\right)^2$ = 0.0016 Ft/Ft

hf = 0.40

0.2

Gutter elevation = 24.28

Inlet Bottom elevation = 21.26

Pressure Elevation (Downstream) = 22.77

Estimated waterdepth over Catch basin = d = 3.01

Estimated d/D 1.2

Figure 4.7 K = 7.5

Rise = $Kg \times \frac{v^2}{2g}$ = 1.5

Watersurface Elev = 24.27

Clearance (Gutter to water), ft =

0.01 feet below grate, approximately

1.53 feet below gutter grade

PREPARED BY: DVE

DATE: 4/95

CHECKED BY: SSS

SHEET NO.: OF

CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
(602) 242-2999

APPENDIX E

Drainage Swale/Collector Swale Calculation Sheets

Drainage Swale Calculation Sheets

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION
U-Shaped Drainage Swale
RT May 3, 1995
Reach Sta 20+44 To Sta 29+23 RT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0081
Manning's Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	0.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.5	1.6	2.05	0.721	0.065	0.565	0.8	3.0
0.6	2.5	2.32	0.743	0.083	0.683	1.1	3.6
0.7	3.8	2.56	0.762	0.102	0.802	1.5	4.2
0.8	5.4	2.80	0.779	0.122	0.922	1.9	4.8
0.83	6.0	2.87	0.784	0.128	0.958	2.1	5.0
0.9	7.4	3.03	0.794	0.143	1.043	2.4	5.4
1.0	9.8	3.25	0.809	0.164	1.164	3.0	6.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986 Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069 (713) 440-3787. A manual with equations & flow chart is available.

Drainage swale slope varies from 0.0081 Ft/Ft To 0.022 Ft/Ft

Maximum Q_{10} = 6FS

Depth range From 1' To 2'

Maximum depth of Flow @ Minimum slope = 0.83'

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION
V-Shaped Drainage Swale
May 3, 1995

Reach 21+45 Lt To Sta 25+67 LT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0140
Manning's Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	0.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.3	0.5	1.92	0.871	0.058	0.358	0.3	1.8
0.4	1.1	2.33	0.913	0.084	0.484	0.5	2.4
0.5	2.1	2.70	0.948	0.113	0.613	0.8	3.0
~~0.6~~ 0.57	2.9	2.94	0.968	0.134	0.704	1.0	3.4
~~0.6~~ 0.58	3.0	2.98	0.971	0.138	0.718	1.0	3.5
0.6	3.3	3.04	0.977	0.144	0.744	1.1	3.6
0.7	5.0	3.37	1.002	0.176	0.876	1.5	4.2

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 198
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 7706
(713) 440-3787. A manual with equations & flow chart is available.

Depth of channel = 2.0'
Depth of Flow = 0.58'

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION
V-Shaped Drainage Swale
May 3, 1995

Reach Sta 25+67 Lt Sta 29+28 Lt

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0140
Manning's Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	0.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.3	0.5	1.92	0.871	0.058	0.358	0.3	1.8
0.4	1.1	2.33	0.913	0.084	0.484	0.5	2.4
0.5	2.1	2.70	0.948	0.113	0.613	0.8	3.0
~~0.6~~ 0.57	2.9	2.94	0.968	0.134	0.704	1.0	3.4
0.6 0.58	3.0	2.98	0.971	0.138	0.718	1.0	3.5
0.6	3.3	3.04	0.977	0.144	0.744	1.1	3.6
0.7	5.0	3.37	1.002	0.176	0.876	1.5	4.2

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986 Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069 (713) 440-3787. A manual with equations & flow chart is available.

Drainage swale slope varies from 0.014 Ft/Ft To 0.022 Ft/Ft

Maximum Q_{10} = 5 cfs

Depth of channel = 2'

Maximum depth of Flow @ Minimum slope = 0.7'

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 20, 1995
CAMELBACK ROAD
REACH 83+15.16-RT TO 86+35.41-RT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0144
Manning`s Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.1	0.0	0.96	0.748	0.014	0.114	0.0	0.8
0.2	0.2	1.51	0.839	0.035	0.235	0.2	1.6
0.3	0.7	1.98	0.897	0.061	0.361	0.4	2.4
0.4	1.5	2.39	0.941	0.089	0.489	0.6	3.2
0.5	2.8	2.77	0.977	0.120	0.620	1.0	4.0
0.6	4.5	3.13	1.007	0.152	0.752	1.4	4.8
0.7	6.8	3.47	1.033	0.187	0.887	2.0	5.6
0.8	9.7	3.79	1.056	0.223	1.023	2.6	6.4
0.9	13.3	4.10	1.077	0.261	1.161	3.2	7.2
1.0	17.6	4.40	1.096	0.301	1.301	4.0	8.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 20, 1995
CAMELBACK ROAD
REACH 86+35.41-RT TO 87+75.10-RT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0026
Manning`s Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.1	0.0	0.41	0.318	0.003	0.103	0.0	0.8
0.2	0.1	0.64	0.357	0.006	0.206	0.2	1.6
0.3	0.3	0.84	0.381	0.011	0.311	0.4	2.4
0.4	0.7	1.02	0.400	0.016	0.416	0.6	3.2
0.5	1.2	1.18	0.415	0.022	0.522	1.0	4.0
0.5	1.5	1.26	0.422	0.025	0.575	1.2	4.4
0.6	1.9	1.33	0.428	0.028	0.628	1.4	4.8
0.7	2.9	1.47	0.439	0.034	0.734	2.0	5.6
0.8	4.1	1.61	0.449	0.040	0.840	2.6	6.4
0.9	5.7	1.74	0.458	0.047	0.947	3.2	7.2

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 20, 1995
CAMELBACK ROAD
REACH 87+75.10-RT TO 92+75.10-RT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0092
Manning`s Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.2	0.2	1.21	0.670	0.023	0.223	0.2	1.6
0.3	0.6	1.58	0.717	0.039	0.339	0.4	2.4
0.4	1.2	1.91	0.752	0.057	0.457	0.6	3.2
0.4	1.7	2.07	0.767	0.066	0.516	0.8	3.6
0.5	2.2	2.22	0.780	0.076	0.576	1.0	4.0
0.6	3.6	2.50	0.804	0.097	0.697	1.4	4.8
0.7	5.5	2.77	0.825	0.119	0.819	2.0	5.6
0.8	7.8	3.03	0.844	0.143	0.943	2.6	6.4
0.9	10.6	3.28	0.860	0.167	1.067	3.2	7.2
1.0	14.1	3.52	0.875	0.192	1.192	4.0	8.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 20, 1995
CAMELBACK ROAD
REACH 97+50-~~LT~~ RT TO 125+00-~~LT~~ RT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0026
Manning`s Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	6.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.1	0.0	0.41	0.322	0.003	0.103	0.1	1.0
0.5	1.5	1.19	0.420	0.022	0.522	1.3	5.0
0.6	2.4	1.35	0.433	0.028	0.628	1.8	6.0
0.7	3.7	1.49	0.444	0.035	0.735	2.5	7.0
0.8	5.2	1.63	0.454	0.041	0.841	3.2	8.0
0.9	7.2	1.76	0.463	0.048	0.948	4.1	9.0
1.0	9.5	1.89	0.471	0.056	1.056	5.0	10.0
1.1	12.2	2.02	0.479	0.063	1.163	6.1	11.0
1.2	15.4	2.14	0.486	0.071	1.271	7.2	12.0
1.3	19.1	2.25	0.492	0.079	1.379	8.5	13.0
1.4	23.2	2.37	0.498	0.087	1.487	9.8	14.0
1.5	27.9	2.48	0.504	0.095	1.595	11.3	15.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 20, 1995
CAMELBACK ROAD
REACH 125+00-RT TO 132+70.64-RT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0088
Manning`s Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	6.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.8	9.6	2.98	0.831	0.138	0.938	3.2	8.0
0.8	11.2	3.11	0.839	0.150	1.000	3.6	8.5
0.9	13.1	3.23	0.847	0.162	1.062	4.1	9.0
1.0	17.3	3.46	0.862	0.186	1.186	5.0	10.0
1.5	51.1	4.54	0.923	0.319	1.819	11.3	15.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

Collector Swale Calculation Sheets

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 18, 1995
CAMELBACK ROAD
REACH 61+50-LT TO 63+43-LT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0020
Manning`s Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.1	0.0	0.36	0.279	0.002	0.102	0.0	0.8
0.2	0.1	0.56	0.313	0.005	0.205	0.2	1.6
0.3	0.3	0.74	0.335	0.008	0.308	0.4	2.4
0.4	0.6	0.89	0.351	0.012	0.412	0.6	3.2
0.5	1.0	1.04	0.365	0.017	0.517	1.0	4.0
0.6	1.7	1.17	0.376	0.021	0.621	1.4	4.8
0.7	2.5	1.30	0.386	0.026	0.726	2.0	5.6
0.8	3.6	1.42	0.394	0.031	0.831	2.6	6.4
0.9	5.0	1.53	0.402	0.036	0.936	3.2	7.2
1.0	6.6	1.64	0.409	0.042	1.042	4.0	8.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 18, 1995
CAMELBACK ROAD
REACH 64+39.42-LT TO 74+45-LT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0015
Manning's Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.5	0.9	0.90	0.316	0.012	0.512	1.0	4.0
0.6	1.5	1.01	0.325	0.016	0.616	1.4	4.8
0.7	2.2	1.12	0.334	0.020	0.720	2.0	5.6
0.8	3.1	1.23	0.341	0.023	0.823	2.6	6.4
0.9	4.3	1.33	0.348	0.027	0.927	3.2	7.2
1.0	5.7	1.42	0.354	0.031	1.031	4.0	8.0
1.1	7.4	1.52	0.360	0.036	1.136	4.9	8.8
1.2	9.3	1.61	0.365	0.040	1.240	5.8	9.6
1.3	11.5	1.69	0.370	0.045	1.345	6.8	10.4
1.4	14.0	1.78	0.375	0.049	1.449	7.9	11.2
1.5	16.8	1.86	0.379	0.054	1.554	9.0	12.0
1.6	20.0	1.95	0.383	0.059	1.659	10.3	12.8
1.7	23.4	2.03	0.387	0.064	1.764	11.6	13.6
1.8	27.3	2.10	0.391	0.069	1.869	13.0	14.4
1.9	31.5	2.18	0.394	0.074	1.974	14.5	15.2
2.0	36.2	2.26	0.398	0.079	2.079	16.0	16.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 18, 1995
CAMELBACK ROAD
REACH 76+53.5-LT TO 81+97.43-LT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0015
Manning`s Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.8	3.1	1.23	0.341	0.023	0.823	2.6	6.4
0.9	4.3	1.33	0.348	0.027	0.927	3.2	7.2
1.0	5.7	1.42	0.354	0.031	1.031	4.0	8.0
1.1	7.4	1.52	0.360	0.036	1.136	4.9	8.8
1.2	9.3	1.61	0.365	0.040	1.240	5.8	9.6
1.3	11.5	1.69	0.370	0.045	1.345	6.8	10.4
1.4	14.0	1.78	0.375	0.049	1.449	7.9	11.2
1.5	16.8	1.86	0.379	0.054	1.554	9.0	12.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 18, 1995
CAMELBACK ROAD
REACH 83+00-LT TO 84+32.5-LT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0099
Manning`s Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.5	2.3	2.30	0.811	0.082	0.582	1.0	4.0
0.6	3.8	2.60	0.836	0.105	0.705	1.4	4.8
0.7	5.7	2.88	0.858	0.129	0.829	2.0	5.6
0.8	8.1	3.15	0.877	0.154	0.954	2.6	6.4
0.9	11.1	3.41	0.894	0.180	1.080	3.2	7.2
1.0	14.7	3.65	0.910	0.207	1.207	4.0	8.0
1.1	18.9	3.89	0.925	0.235	1.335	4.9	8.8
1.2	23.8	4.13	0.938	0.264	1.464	5.8	9.6
1.3	29.5	4.35	0.951	0.294	1.594	6.8	10.4
1.4	35.9	4.57	0.963	0.325	1.725	7.9	11.2
1.5	43.2	4.79	0.974	0.356	1.856	9.0	12.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 19, 1995
CAMELBACK ROAD
REACH 100+00-LT TO 105+10-LT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0026
Manning`s Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.1	0.0	0.41	0.320	0.003	0.103	0.0	0.8
0.2	0.1	0.65	0.358	0.006	0.206	0.2	1.6
0.3	0.3	0.84	0.383	0.011	0.311	0.4	2.4
0.4	0.7	1.02	0.402	0.016	0.416	0.6	3.2
0.5	1.2	1.19	0.417	0.022	0.522	1.0	4.0
0.6	1.9	1.34	0.430	0.028	0.628	1.4	4.8
0.7	2.9	1.48	0.441	0.034	0.734	2.0	5.6
0.8	4.2	1.62	0.451	0.041	0.841	2.6	6.4
0.9	5.7	1.75	0.460	0.048	0.948	3.2	7.2
1.0	7.5	1.88	0.468	0.055	1.055	4.0	8.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 19, 1995
CAMELBACK ROAD
REACH 106+05-LT TO 108+00-LT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0026
Manning`s Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.5	1.2	1.19	0.417	0.022	0.522	1.0	4.0
0.6	1.9	1.34	0.430	0.028	0.628	1.4	4.8
0.7	2.9	1.48	0.441	0.034	0.734	2.0	5.6
0.8	4.2	1.62	0.451	0.041	0.841	2.6	6.4
0.9	5.7	1.75	0.460	0.048	0.948	3.2	7.2
1.0	7.5	1.88	0.468	0.055	1.055	4.0	8.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 19, 1995
CAMELBACK ROAD
REACH 108+00-LT TO 109+00-LT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0077
Manning`s Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.6	3.3	2.29	0.737	0.082	0.682	1.4	4.8
0.7	5.0	2.54	0.756	0.100	0.800	2.0	5.6

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 19, 1995
CAMELBACK ROAD
REACH 109+00-LT TO 113+00-LT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0026
Manning`s Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
1.0	7.5	1.88	0.468	0.055	1.055	4.0	8.0
1.1	9.7	2.00	0.476	0.062	1.162	4.9	8.8
1.2	12.3	2.12	0.483	0.070	1.270	5.8	9.6
1.3	15.2	2.24	0.489	0.078	1.378	6.8	10.4
1.4	18.5	2.35	0.495	0.086	1.486	7.9	11.2
1.5	22.2	2.46	0.501	0.094	1.594	9.0	12.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 19, 1995
CAMELBACK ROAD
REACH 113+00-LT TO 114+00-LT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0077
Manning`s Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.6	3.3	2.29	0.737	0.082	0.682	1.4	4.8
0.7	5.0	2.54	0.756	0.100	0.800	2.0	5.6
0.8	7.1	2.78	0.773	0.120	0.920	2.6	6.4
0.9	9.8	3.00	0.789	0.140	1.040	3.2	7.2
1.0	12.9	3.22	0.803	0.161	1.161	4.0	8.0
1.5	38.1	4.22	0.859	0.277	1.777	9.0	12.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 19, 1995
CAMELBACK ROAD
REACH 114+00-LT TO 116+80-LT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0026
Manning`s Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
1.0	7.5	1.88	0.468	0.055	1.055	4.0	8.0
1.2	12.3	2.12	0.483	0.070	1.270	5.8	9.6
1.3	15.2	2.24	0.489	0.078	1.378	6.8	10.4
1.4	18.5	2.35	0.495	0.086	1.486	7.9	11.2
1.5	22.2	2.46	0.501	0.094	1.594	9.0	12.0
1.6	26.4	2.57	0.506	0.103	1.703	10.3	12.8
1.7	31.0	2.68	0.511	0.111	1.811	11.6	13.6
1.8	36.1	2.78	0.516	0.120	1.920	13.0	14.4
1.9	41.7	2.88	0.521	0.129	2.029	14.5	15.2
2.0	47.8	2.98	0.526	0.138	2.138	16.0	16.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 19, 1995
CAMELBACK ROAD
REACH 117+14-LT TO 121+00-LT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0026
Manning`s Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.1

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.4	0.7	1.04	0.404	0.017	0.417	0.7	3.3
0.5	1.3	1.20	0.419	0.022	0.522	1.0	4.1
0.6	2.0	1.35	0.432	0.029	0.629	1.5	4.9
0.7	3.0	1.50	0.443	0.035	0.735	2.0	5.7
0.8	4.3	1.64	0.452	0.042	0.842	2.6	6.5
0.9	5.9	1.77	0.461	0.049	0.949	3.3	7.3
1.0	7.8	1.89	0.469	0.056	1.056	4.1	8.1

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 19, 1995
CAMELBACK ROAD
REACH 121+00-LT TO 126+00-LT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0080
Manning`s Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.1

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.4	1.2	1.82	0.706	0.051	0.451	0.7	3.3
0.5	2.2	2.10	0.732	0.069	0.569	1.0	4.1
0.6	3.6	2.37	0.754	0.087	0.687	1.5	4.9
0.7	5.3	2.62	0.773	0.106	0.806	2.0	5.7
0.8	7.5	2.86	0.790	0.127	0.927	2.6	6.5
0.9	10.3	3.09	0.806	0.148	1.048	3.3	7.3
1.0	13.6	3.31	0.820	0.170	1.170	4.1	8.1

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 19, 1995
CAMELBACK ROAD
REACH 126+00-LT TO 127+00-LT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0096
Manning`s Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.1

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.5	2.4	2.30	0.802	0.082	0.582	1.0	4.1
0.6	3.9	2.59	0.826	0.104	0.704	1.5	4.9
0.7	5.8	2.87	0.847	0.128	0.828	2.0	5.7
0.8	8.3	3.13	0.866	0.152	0.952	2.6	6.5
0.9	11.3	3.38	0.883	0.178	1.078	3.3	7.3
1.0	14.9	3.63	0.898	0.204	1.204	4.1	8.1
1.2	24.0	4.09	0.925	0.260	1.460	5.9	9.7
1.3	29.7	4.31	0.938	0.289	1.589	6.9	10.5
1.4	36.1	4.53	0.949	0.318	1.718	8.0	11.3
1.5	43.4	4.74	0.960	0.349	1.849	9.1	12.1

==========

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TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 19, 1995
CAMELBACK ROAD
REACH 127+00-LT TO 131+00-LT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0046
Manning's Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.1

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.5	1.7	1.59	0.555	0.039	0.539	1.0	4.1
0.6	2.7	1.80	0.572	0.050	0.650	1.5	4.9
0.7	4.0	1.99	0.586	0.061	0.761	2.0	5.7
0.8	5.7	2.17	0.599	0.073	0.873	2.6	6.5
0.9	7.8	2.34	0.611	0.085	0.985	3.3	7.3
1.0	10.3	2.51	0.622	0.098	1.098	4.1	8.1
1.1	13.2	2.67	0.632	0.111	1.211	4.9	8.9
1.2	16.6	2.83	0.641	0.124	1.324	5.9	9.7
1.3	20.6	2.98	0.649	0.138	1.438	6.9	10.5
1.4	25.0	3.13	0.657	0.152	1.552	8.0	11.3
1.5	30.0	3.28	0.665	0.167	1.667	9.1	12.1

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 19, 1995
CAMELBACK ROAD
REACH 131+00-LT TO 132+60-LT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0095
Manning`s Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.1

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.6	3.9	2.58	0.822	0.103	0.703	1.5	4.9
0.7	5.8	2.85	0.843	0.126	0.826	2.0	5.7
0.8	8.2	3.11	0.861	0.151	0.951	2.6	6.5
0.9	11.2	3.37	0.878	0.176	1.076	3.3	7.3
1.0	14.8	3.61	0.893	0.202	1.202	4.1	8.1
2.0	92.4	5.70	1.002	0.505	2.505	16.2	16.1

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 19, 1995
CAMELBACK ROAD
REACH 132+70 TO 133+62.05-LT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0015
Manning`s Roughness Coefficient (n-value).....	0.0250
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	0.1

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
1.5	17.1	1.87	0.380	0.054	1.554	9.1	12.1
1.6	20.3	1.95	0.384	0.059	1.659	10.4	12.9
1.7	23.9	2.03	0.387	0.064	1.764	11.7	13.7
1.8	27.8	2.11	0.391	0.069	1.869	13.1	14.5
1.9	32.0	2.19	0.395	0.074	1.974	14.6	15.3
2.0	36.7	2.27	0.398	0.080	2.080	16.2	16.1

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 5629 FM 1960 W., #314, Houston, TX 77069
(713) 440-3787. A manual with equations & flow chart is available.

APPENDIX F

Side Weir Calculation Sheets

DESIGN NOTES AND COMPUTATIONS

SUBJECT: Camelback Road

JOB NO.: 241729-01-301

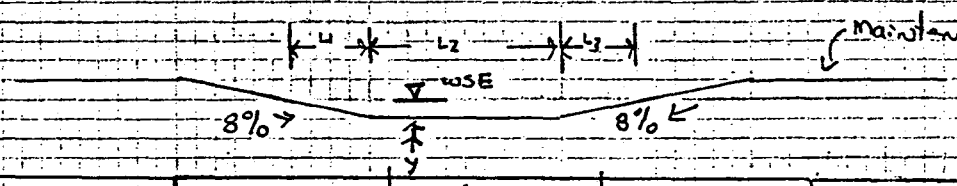
Evaluate: North Channel Side Weir Inlets

Given 1. $CLy^{1.5} = Q$

2. Discharge coefficient (C) varies from 3.02 To 3.05 (Fig 4.49 FCDMC Drainage Design manual)

3. L_T = Total Length Varies

4. For L_1 and L_3 hydraulic depth = ½ y



Weir Station	L_1 L (Ft)	L_1 C	L_1 y (Ft)	L_1 Q (cfs)	L_2 L	L_2 C	L_2 y (Ft)	L_2 Q cfs	L_3 L (Ft)	L_3 C	L_3 y Ft	L_3 Q cfs	Total Q intercept	Q_S cfs
Sta 59+13-Lt to Sta 60+55-Lt.	5	3.02	.36	1	132	3.02	0.36	86	5	3.02	0.36	1	88	86
Sta 63+38-Lt to Sta 68+53-Lt.	5	3.02	0.35	1	5	3.02	0.35	3	5	3.02	0.35	1	5	5
Sta 74+36-Lt to Sta 74+64-Lt.	9	3.05	0.69	5.3	10	3.05	0.69	17.5	9	3.05	0.69	5.3	28.16	28
Sta 76+41.5-Lt to Sta 76+58.5-LT	6	3.02	0.48	2.1	5	3.02	0.48	5	6	3.02	0.48	2.1	9.2	9
Sta 84+24.5-Lt to Sta 84+45.5	8	3.05	0.59	3.6	5	3.05	0.59	6.9	8	3.05	0.59	3.6	14.1	14
Sta 97+10-Lt to Sta 97+36-Lt	8	3.05	0.62	4.1	10	3.05	0.62	14.9	8	3.05	0.62	4.1	23.1	23
Sta 105+05-Lt to Sta 105+20-Lt	5	3.02	0.31	0.71	5	3.02	0.31	2.6	5	3.02	0.31	0.71	4.0	4
Sta 116+55-Lt to Sta 116+85-Lt.	10	3.05	0.79	7.5	10	3.05	0.79	21.4	10	3.05	0.79	7.5	36.4	36
Sta 132+50-Lt to Sta 132+80-Lt.	10	3.05	0.74	6.4	10	3.05	0.74	19.4	10	3.05	0.74	6.4	32.2	32

1. As per depth of Flow.

PREPARED BY: PJE **DATE:** 4/95 **CHECKED BY:** SBS **SHEET NO.:** **OF**

CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

DESIGN NOTES AND COMPUTATIONS

SUBJECT: Camelback Road

JOB NO.: 241729-01-301

Evaluate 100 year Q for Weir Section Sta 59+13-Lt to Sta 60+55-Lt.

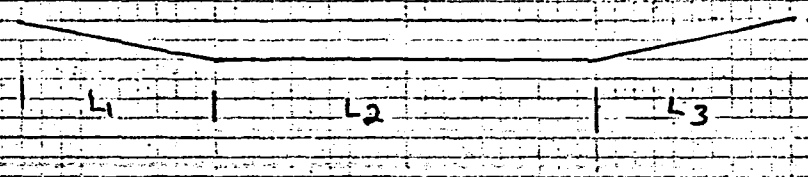
Given 1. $CLy^{1.5} = Q$

2. C = 3.05 (Fig 4.49 FCDMC Drainage Design Manual)

3. L = Length

4. y = depth

5. For L_1 and L_3 hydraulic depth = 1/2 y



100 year Q = 394 cfs

Try y = 9.5

L_1 and L_3 = 11.87

L_2 = 132'

$Q_1 = 3.05 \times 11.87 \times 0.475^{1.5} = 11.85$

$Q_2 = 3.05 \times 132 \times 0.95^{1.5} = 372.78$

$Q_3 = 3.05 \times 11.87 \times 0.475^{1.5} = 11.85$

$Q_{Total} = 396.5$

Weir elevation = 43.15

Ponding elevation upstream of weir section = 44.10

Ground elevation at Right of Way approximately 45± to 44±.

Between Sta 60+22-150Lt to Sta 60+35-150Lt ground elevation @ R/W is less than 44.00.

PREPARED BY: PJF DATE: 4/95 CHECKED BY: SSS SHEET NO.: OF

CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

APPENDIX G

Culvert Erosion Outlet Protection

SUBJECT: Camelback Road

JOB NO.: 241729-01-0301

Size Riprap Protection at 42" cmp culvert outlets.
sta. 30+00 and Sta. 56+58

Given: 1. $Q_5 = 36$ cfs

2. Brink depth $= y_c = \left(\frac{A}{2}\right)^{1/2} = 1.6'$

3. $A = 5.2\ ft^2$ (From HEC-2

4. $V_{ave} = \frac{36\ cfs}{5.2} = 6.9$ Fps

5. Froude Number $= \frac{V_{ave}}{\sqrt{32.2 \times y_c}} = 0.96$

Try $d_{50} = 0.5'$

1. $\frac{d_{50}}{y_c} = 0.312$

2. From Figure 6.20 (FCDMC Drainage Design Manual) $h_s/y_c = 0.06$

3. $h_s = 0.09'$

4. $h_s/d_{50} = 0.18$ - outside of $2 < h_s/d_{50} < 4$ range.

Try $d_{50} = 0.4'$

1. $\frac{d_{50}}{y_c} = 0.25$

2. From Figure 6.20 $h_s/y_c = 0.23$

3. $h_s = 0.37$

4. $h_s/d_{50} = 0.93$ outside of $2 < h_s/d_{50} < 4$ range

Try $d_{50} = 0.25'$

1. $\frac{d_{50}}{y_c} = 0.156$

2. From Figure 6.20 $h_s/y_c = 0.94$

3. $h_s = 1.5$

4. $h_s/d_{50} = 6.01$ outside of $2 < h_s/d_{50} < 4$ range

Range can not be statisfied use $d_{50} = 0.5'$

PREPARED BY: PJE DATE: 4/95 CHECKED BY: SS SHEET NO.: 1 OF 2

CBA CELLA BARR ASSOCIATES
5062 NORTH 19TH AVE.
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

DESIGN NOTES AND COMPUTATIONS

SUBJECT: Camelback Road

241729-01-03 1

JOB NO.:

Estimate length of lip rap at 42" cmp outlets
sta. 30+00 and sta 56+58

Use equation 4.22 $L_{sb} = D(8 - 55 \log F)$

$D = 3.5'$ Pipe diameter.

$F = 0.96$ Froude Number.

Length $\geq L_{sb} = 24.6$ say $25'$

PREPARED BY: PJE DATE: 4/95 CHECKED BY: 669 SHEET NO.: 2 OF 2

CBA
CELLA BARR ASSOCIATES
5062 NORTH 19TH AVE.
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

APPENDIX H

Channel Protection at Spillway Outlets

SUBJECT: Camelback Road

JOB NO.: 241729-01-0301

Evaluate Rip Rap Requirements for Spillway outlets.

1. Size for worst case condition

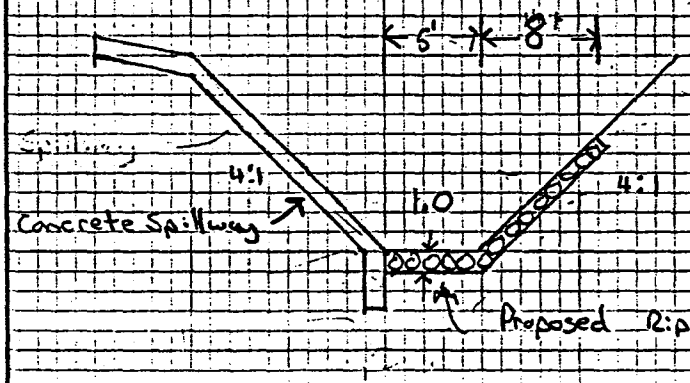
For 10 foot and 5 foot spillway bottom widths maximum depth of Flow = 0.19 feet (See page 4 of 4)

For 10 foot and 5 foot spillway bottom widths maximum velocity = 14.8 Fps. (See page 3 of 4)

Depth of Flow is relatively small compared to velocity - use d_{50} = 0.5' (Same size being proposed at 42" CMP outlets, keep rock size uniform).

Rip Rap Thickness = $2 D_{50}$

Rip Rap shall extend from the termination of the spillway of the channel invert across the channel bottom and up the 4:1 side slope. Total length of Rip Rap Blanket = 12 Feet. Length of Rip Rap blanket up 4:1 side slopes = hydraulic jump conjugate depth x 4. (see page 2 of 4)



PREPARED BY: DATE: CHECKED BY: SHEET NO.: 1 OF 4

CBA
CELLA BARR ASSOCIATES
5062 NORTH 19TH AVE.
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

SUBJECT: Camelback Road

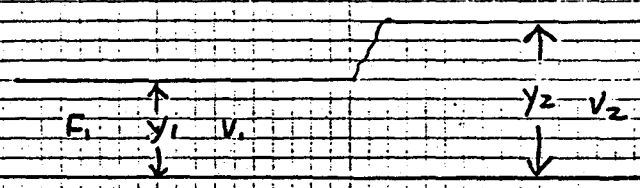
JOB NO.: 241729-01-0301

Find: The conjugate depth (y_2) of a hydraulic jump

Given $y_1 = 0.19$ ft

$V_1 = 14.8$ fps

$F_1 = 6.45$



$$\frac{y_2}{y_1} = \frac{1}{2}\left(\left(1+8F_1^2\right)^{1/2} - 1\right)$$

$$\frac{y_2}{y_1} = \frac{\sqrt{1+8(6.45)^2} - 1}{2} = \cancel{8.63}\ 8.13$$

$$y_2 = \cancel{8.63} \times .19 = \cancel{1.64}$$

8.13 X 1.54

Use y_2 depth to set limits of bank protection on 4:1 side slopes. Use a depth of 2 feet.

PREPARED BY: DATE: CHECKED BY: 1/89 SHEET NO.: 2 OF 4

CBA
CELLA BARR ASSOCIATES
5062 NORTH 19TH AVE.
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 21, 1995
CAMELBACK ROAD
~~WEIR~~ Spillway Flow Characteristic

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.2500
Manning's Roughness Coefficient (n-value).....	0.0150
Channel Side Slope - Left Side (horizontal/vertical)....	12.50
Channel Side Slope - Right Side (horizontal/vertical)...	12.50
Channel Bottom Width (feet).....	10.0

==========

PROGRAM RESULTS:

Spillway Location	Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
	0.1	11.2	9.94	5.841	1.535	1.635	1.1	12.5
	0.11	13.2	10.53	5.926	1.723	1.833	1.3	12.7
	0.12	15.3	11.10	6.004	1.913	2.033	1.4	13.0
	0.13	17.6	11.64	6.076	2.105	2.235	1.5	13.2
	0.14	20.0	12.17	6.143	2.299	2.439	1.6	13.5
Sta 97+10 - Lt to Sta 97+36 - Lt	0.15	22.6	12.67	6.206	2.494	2.644	1.8	13.7
	~~0.2~~ .152	23.1	12.77	6.218	2.534	2.686	1.8	13.8
Sta 74+36 - Lt to Sta 74+64 - Lt	~~0.2~~ .16	25.3	13.16	6.265	2.691	2.851	1.9	14.0
	~~0.2~~ .17	28.1	13.64	6.320	2.889	3.059	2.1	14.2
	~~0.2~~ .18	31.1	14.10	6.373	3.088	3.268	2.2	14.5
Sta 132+50 - Lt to Sta 132+80 - Lt	~~0.2~~ .182	31.7	14.19	6.383	3.128	3.310	2.2	14.5
	~~0.2~~ .183	32.0	14.24	6.388	3.148	3.331	2.2	14.6
Sta 116+55 - Lt to Sta 116+85 - Lt	~~0.2~~ .19	34.2	14.55	6.423	3.288	3.478	2.4	14.7
	~~0.2~~ .1955	36.0	14.79	6.450	3.399	3.594	2.4	14.9

==========

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TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 21, 1995
CAMELBACK ROAD
~~WEIR~~ Spillway Flow Characteristic

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.2500
Manning's Roughness Coefficient (n-value).....	0.0150
Channel Side Slope - Left Side (horizontal/vertical)....	12.50
Channel Side Slope - Right Side (horizontal/vertical)...	12.50
Channel Bottom Width (feet).....	5.0

==========

PROGRAM RESULTS:

Spillway Location	Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
Sta 105+05 -Lt to Sta 105+20-Lt	~~0.1~~ 0.08	4.0	8.29	5.581	1.068	1.148	0.5	7.0
[illegible] to Sta 68+53	~~0.1~~ 0.09	4.9	8.88	5.678	1.226	1.316	0.6	7.2
7[illegible]1.5-Lt to 7[illegible]+58.5	0.1	5.9	9.44	5.765	1.385	1.485	0.6	7.5
	0.127	9.1	10.83	5.965	1.821	1.948	0.8	8.2
	0.14	10.8	11.44	6.048	2.033	2.173	0.9	8.5
	0.15	12.3	11.90	6.107	2.197	2.347	1.0	8.7
Sta 84+24.5 to Sta 84+46.5	~~0.2~~ 0.16	13.8	12.33	6.162	2.363	2.523	1.1	9.0
	~~0.2~~ 0.161	14.0	12.38	6.167	2.379	2.540	1.1	9.0

==========

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APPENDIX I

Depth of Flow Calculation Sheets for the Intersection of 129th Avenue and Camelback Road

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 26, 1995
CAMELBACK ROAD
ESTIMATE DEPTH OF FLOW AT 129TH AVE CHANNEL BREAK

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0026
Manning's Roughness Coefficient (n-value).....	0.0150
Channel Side Slope - Left Side (horizontal/vertical)....	39.00
Channel Side Slope - Right Side (horizontal/vertical)...	20.00
Channel Bottom Width (feet).....	0.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
0.5	14.8	2.01	0.709	0.063	0.563	7.4	29.5
0.55	19.1	2.14	0.720	0.071	0.621	8.9	32.5
~~0.60~~ 0.56	20.1	2.17	0.723	0.073	0.633	9.3	33.0
~~0.60~~ 0.57	21.1	2.20	0.725	0.075	0.645	9.6	33.6
~~0.60~~ 0.58	22.1	2.22	0.727	0.077	0.657	9.9	34.2
~~0.60~~ 0.59	23.1	2.25	0.729	0.078	0.668	10.3	34.8

==========

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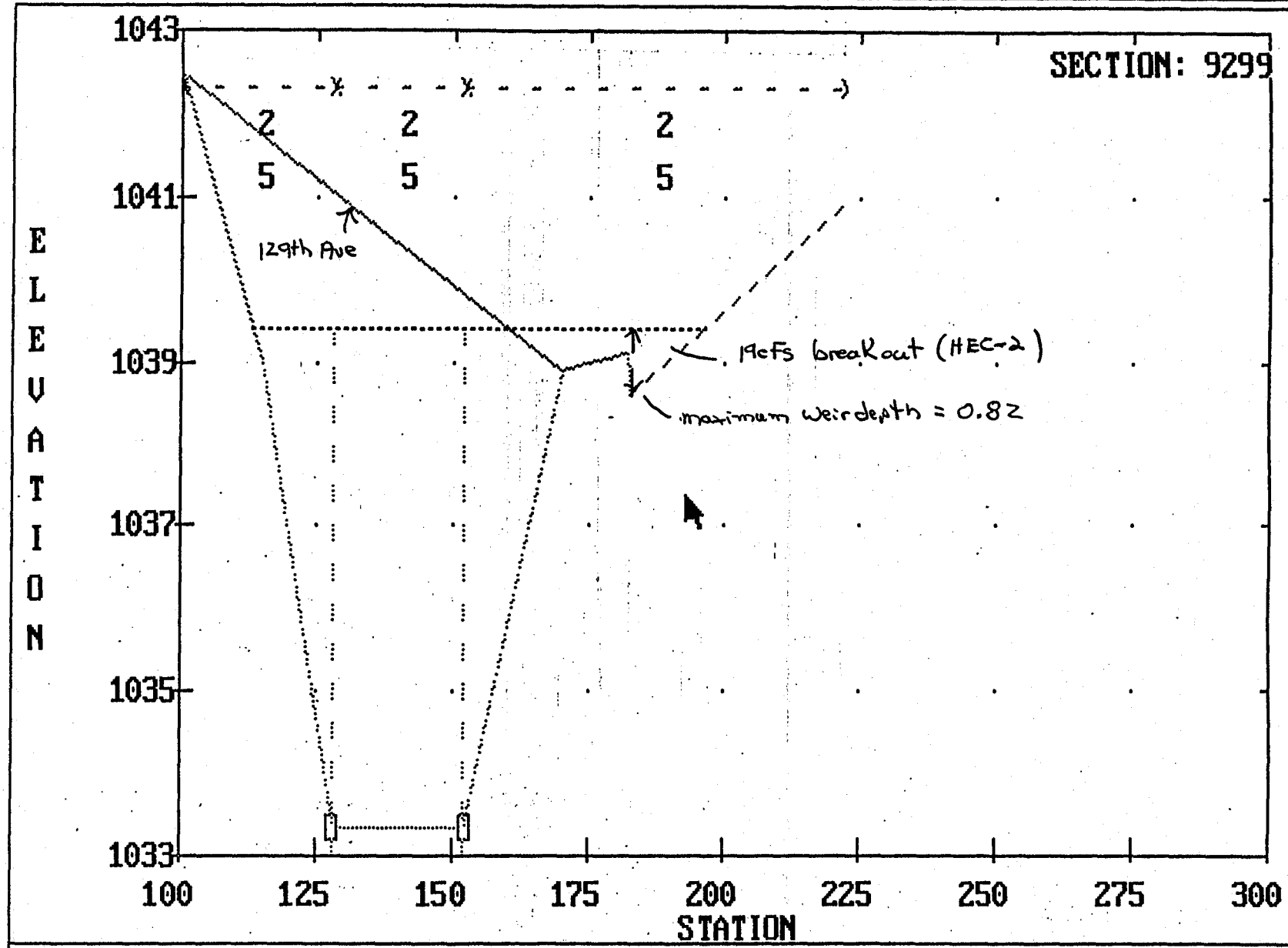
Estimate flow depth in Camelback Road at intersection with 129th Ave
Given = 19cfs breakout in the 100 year event from main channel.
Weir depth at breakout (immediately upstream of 129th Ave = 0.82'

Depth of flow across 129th Ave = 0.55 feet

By: PJE Date: 4/95



CBA
CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

APPENDIX J

Irrigation Siphon Calculation Sheets

DESIGN NOTES AND COMPUTATIONS

SUBJECT: Camelback Road Siphon Design

JOB NO.: 241729-01

Design a replacment siphon for the Airline Canal crossing of Camelback Road.

Given:

1. Use design procedures outlined in "Design of Small Canal Structures." (United States Department of Interior, 1978)
2. Existing siphon pipe size = 45" outside diameter = 54"
3. Existing upstream siphon invert = 37.95
4. Existing downstream siphon invert = 36.82
5. Canal upstream and downstream of siphon is concrete lined
6. Upstream canal invert = 40.3
7. Downstream canal invert = 40.2
8. Estimated siphon capacity per Fig 2-4 (page 5 of 5) = 48 to 55 cfs.
9. Siphon replacement will be like, in kind. Proposed siphon and canal inverts will be consistant with existing inverts.
10. Existing siphon inlet will remain

Estimate siphon head loss. Assume ungated outlet

Use a design Q of 52 cfs

1. upstream flow characteristics

depth = d_1 = 2.04'

velocity = V_1 = 3.14 fps, $\frac{V_1^2}{2g}$ = 0.15 = h_{v_1}

upstream watersurface elevation = 42.34

See page 4 of 5

2. Downstream Flow Characteristics

depth = d_2 = 2.04'

Velocity = V_2 = 3.14 fps, $\frac{V_2^2}{2g}$ = 0.15 = h_{v_2}

downstream watersurface elevation = 42.24

3. Canal bank freeboard (open flow conditions) estimated to be 1 foot

PREPARED BY: PJE DATE: 4/95 CHECKED BY: SSS SHEET NO.: 1 OF 5

CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

DESIGN NOTES AND COMPUTATIONS

SUBJECT: Camelback Road Siphon Design

JOB NO.: 241729-01

4. Siphon Friction loss estimate

Area of pipe = 11.044 ft^2

Velocity $= \frac{Q}{A} = \frac{52\ cfs}{11.044\ ft^2} = 4.7\ fps = V_p$

velocity head in pipe = $h_{vp} = V_p^2/2g = 0.34 = h_{vp}$

wetted perimeter = π dia = 11.78' = w_p

hydraulic radius $= \frac{A}{w_p} = 0.937 = r$

roughness = "n" = 0.013.

$SF = \frac{1}{2.2 r^{4/3}} \times n^2 \times V^2 = 0.00185\ ft/ft$ = Friction loss

Total length of pipe = 375'

hf = 0.69 = Friction head loss atributed to new design

Inlet hydraulic setting

Vertical height of opening at inlet = Ht = $\frac{D}{\cos\alpha}$

$\cos\alpha = \frac{2}{2.23} = \frac{2}{2.33} = 0.86$

$Ht = \frac{3.75}{0.86} = 4.36'$

hydraulic seal = $1.5(h_{vp} - h_{v1}) = 1.5(0.34 - 0.15) = 0.28'$

Up stream invert at a minimum should be

Up stream water surface elevation = (Ht + hydraulic seal) =

42.34 = (4.36 + 0.28) = 37.70 Existing invert = 47.95

Estimate Friction loss of Existing Siphon

Siphon length = 262 feet

use SF calculated for proposed condition.

SF = 0.00185 ft/ft

hf = 262 × 0.00185 ft/ft = 0.48

PREPARED BY: PJE DATE: 4/95 CHECKED BY: SHEET NO.: 2 OF 5

CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

DESIGN NOTES AND COMPUTATIONS

SUBJECT: Camelback Road Siphon Design

JOB NO.: 241729-01

Difference between friction head losses between existing and proposed Siphon = 0.69 - 0.48 = 0.21'

Assuming that entrance, exit and bend losses are equivalent for the existing and proposed Siphon design, the head losses associated with the proposed design are 0.21' higher than existing condition head losses. The available freeboard of 1' will accomodate the increase in head loss.

PREPARED BY: PJE DATE: 4/95 CHECKED BY: SSS SHEET NO.: 3 OF 3

CELLA BARR ASSOCIATES
5062 NORTH 19TH AVENUE
PHOENIX, ARIZONA 85015
[602] 242-2999
FAX [602] 246-7247

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

April 28, 1995
CAMELBACK ROAD
SIPHON CROSSING

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0007
Manning's Roughness Coefficient (n-value).....	0.0150
Channel Side Slope - Left Side (horizontal/vertical)...	1.50
Channel Side Slope - Right Side (horizontal/vertical)...	1.50
Channel Bottom Width (feet).....	5.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
1.8	40.8	2.94	0.449	0.134	1.934	13.9	10.4
2.0	49.7	3.11	0.454	0.150	2.150	16.0	11.0
2.04	51.6	3.14	0.455	0.153	2.193	16.4	11.1
2.6	82.5	3.56	0.467	0.197	2.797	23.1	12.8
2.7	88.8	3.64	0.469	0.205	2.905	24.4	13.1

==========

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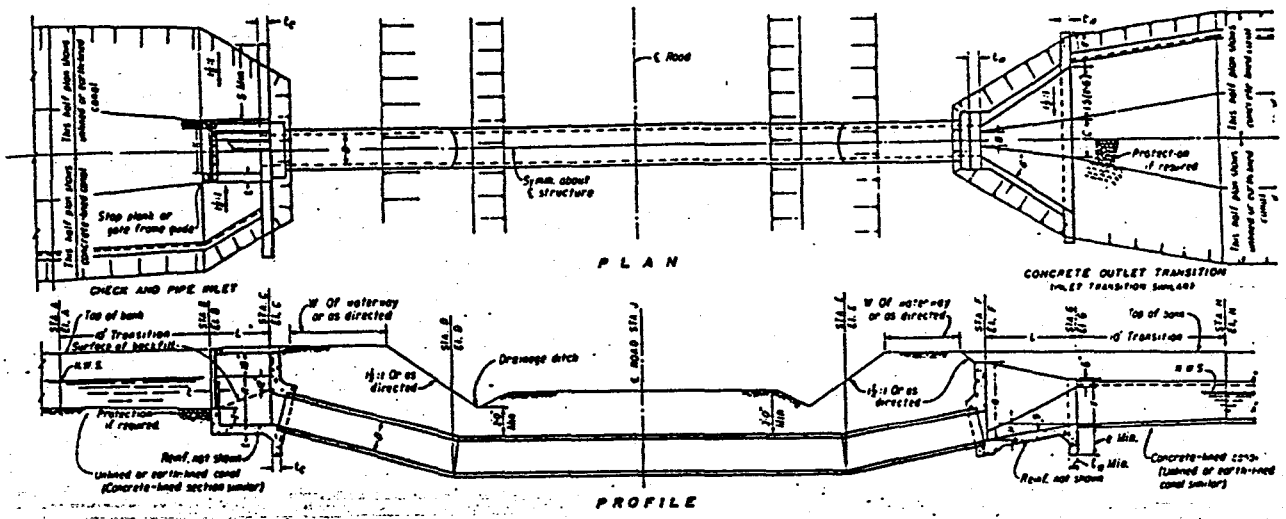
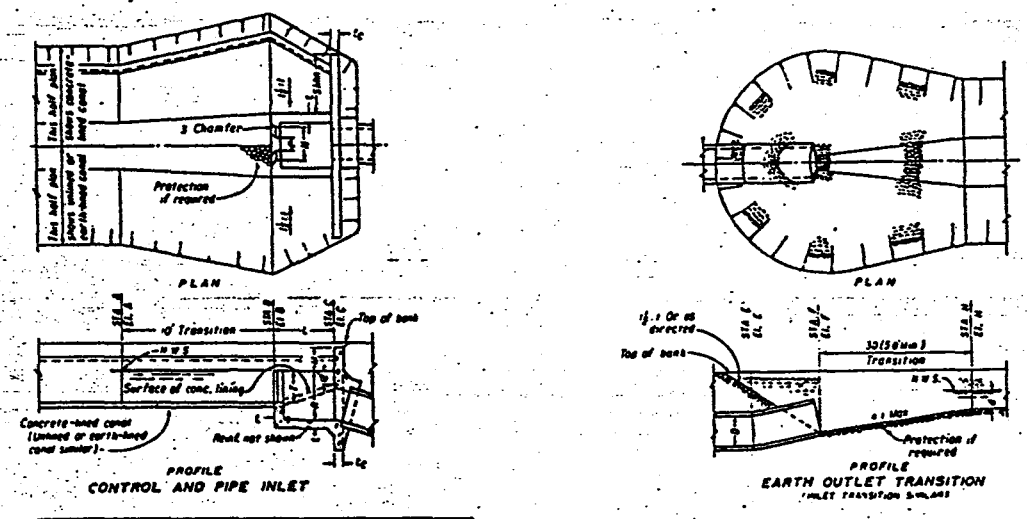
Rate canal upstream and downstream of Siphon. Estimated Siphon Capacity = 52cfs.





PIPE DIAMETER SELECTION DATA							
MAX. V=3.5 fps (EARTH TRANSITION)		MAX. V=5.0 fps (CONC. TRANSITION)		MAX. V=10.0 fps (CONC. TRANSITION)		PIPE	
Q (cfs)		Q (cfs)		Q (cfs)		DIA	AREA
FROM	INCLUDING	FROM	INCLUDING	FROM	INCLUDING	(INCHES)	(SQ. FT.)
0	2.2	0	3.9	0	7.9	12	0.785
2.2	4.3	3.9	6.1	7.9	12.3	15	1.227
4.3	6.2	6.1	8.8	12.3	17.7	18	1.768
6.2	8.4	8.8	12.0	17.7	24.1	21	2.405
8.4	11.0	12.0	15.7	24.1	31.4	24	3.142
11.0	13.9	15.7	19.9	31.4	39.8	27	3.976
13.9	17.2	19.9	24.5	39.8	49.1	30	4.909
17.2	20.8	24.5	29.2	49.1	59.4	33	5.940
20.8	24.7	29.2	35.3	59.4	70.7	36	7.069
24.7	29.0	35.3	41.5	70.7	83.0	39	8.296
29.0	33.7	41.5	48.1	83.0	96.2	42	9.621
33.7	38.7	48.1	55.2			45	11.045
38.7	44.0	55.2	62.8			48	12.566
44.0	49.7	62.8	70.9			51	14.186
49.7	55.7	70.9	79.5			54	15.904
55.7	62.0	79.5	88.6			57	17.721
62.0	68.7	88.6	98.2			60	19.635
68.7	75.8					63	21.648
75.8	83.2					66	23.758
83.2	90.9					69	25.967
90.9	99.0					72	28.274

NOTES

Locations of vertical P.I.'s at D and E are to be considered approximate only and may be adjusted to fit actual laying length of pipe.
Stations and elevations refer to invert unless otherwise shown.

Figure 2-4. Inverted siphon plan and section. 103-D-1254.

Page 5 of 5

APPENDIX K

HEC-2 Input Files

APPENDIX L

15" CMP Culvert Performance Calculations

PIPE CULVERT ANALYSIS
COMPUTATION OF CULVERT PERFORMANCE CURVE

May 4, 1995
CAMELBACK ROAD
PROPOSED 15"CMP AT STA. 25+87-46LT

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Culvert Diameter (feet).....	1.25
FHWA Chart Number (1,2 or 3).....	2
Scale Number on Chart (Type of Culvert Entrance).....	1
Manning`s Roughness Coefficient (n-value).....	0.0240
Entrance Loss Coefficient of Culvert Opening.....	0.50
Culvert Length (feet).....	55.0
Culvert Slope (feet per foot).....	0.0140

==========

PROGRAM RESULTS:

	Flow Rate (cfs)	Tailwater Depth (ft)	Headwater (ft) Inlet Control	Headwater (ft) Outlet Control	Normal Depth (ft)	Critical Depth (ft)	Depth at Outlet (ft)	Outlet Velocity (fps)
Q_{10} =	3.0	0.53	1.03	0.74	0.79	0.70	0.79	3.67
Q_{100} =	6.0	0.75	1.77	2.52	1.25	0.99	0.99	5.75

==========

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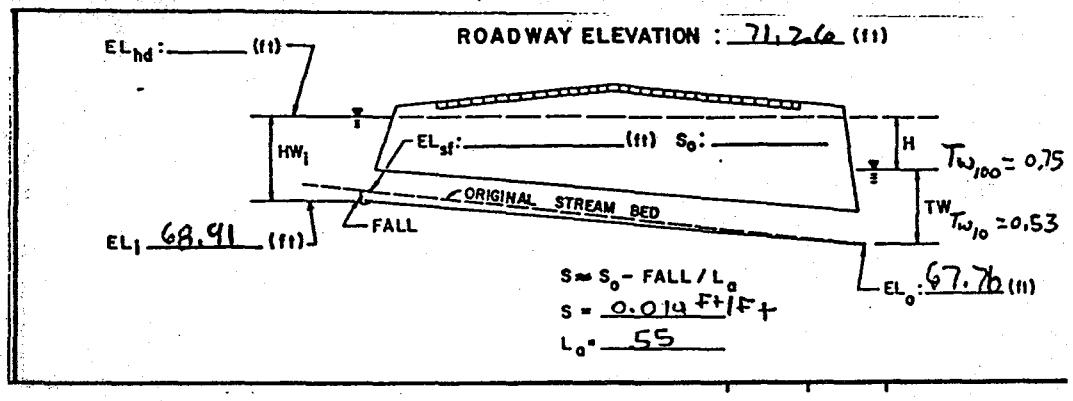

APPENDIX L

15" CMP Culvert Performance Calculations