

DRAINAGE REPORT
FOR
MESA DEL SOL AMPHITHEATER
PHASE 1B

October 1999

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PHASE 1B

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INTRODUCTION AND SITE LOCATION

The proposed Mesa del Sol Amphitheater is located in the Mesa del Sol Regional Recreation Park. The 48 acre site lies along the escarpment within the northwest portion of the Regional Park. This report addresses Phase 1B of the Recreational Park as addressed in the approved "Master Drainage Management Plan and Phase 1 Grading and Drainage Plan for the Regional Recreation and Entertainment Complex at Mesa del Sol" prepared by Parsons Brinckerhoff, Inc., dated 10-26-98. The amphitheater site is located within Basin 10 of the Master Drainage Management Plan (see Plate 4). This report summarizes the grading and drainage plan for Phase 1B of the Regional Recreation and Entertainment Complex, which is the amphitheater site. Included with this report is a mass grading plan for the entire property that will be used to rough grade the site.

METHODOLOGY

The hydrologic and hydraulic criteria in Section 22 of the City of Albuquerque Development Process Manual (DPM), entitled "Drainage, Flood Control, and Erosion Control," was followed to perform the analyses given in this report. The design storm used for both the existing undeveloped and fully developed conditions of Mesa del Sol Amphitheater is the 100-year, 24-hour storm event for peak flow computations and for ponding volume calculations. Also, the 100-year, 10-day storm event was used to determine the volume of the interim retention pond.

A hydrologic computer model using AHYMO 97 was developed for both existing and fully developed conditions to determine both the peak flows and peak volume expected for the development. A detailed sediment analysis was performed for both existing conditions and fully developed conditions following the methods described in Section 3.3 of the "Sediment and Erosion Design Guide" by AMAFCA. Finally, a hydraulic analysis of the entire storm sewer collection system was performed to assist in the sizing of the infrastructure.

EXISTING DRAINAGE CONDITIONS

INTRODUCTION

The site is located on the western escarpment of the Mesa del Sol Regional Recreation Park. The site is part of Basin 10 in the Master Drainage Management Plan (see Plate 4). In that report, the amphitheater site was proposed to be developed with a detention pond at the downstream end of the site to detain flows leaving the site at or below the existing flow rates. The site has an average slope of about 10%. The site slopes from east to west and eventually drains into the Tijeras Arroyo located north of the site. The site has several minor arroyos traversing it (see Plate 1). The site is sparsely vegetated.

OFF-SITE FLOWS

There are no offsite flows that reach the amphitheater site. The top of the escarpment is the basin divide. As discussed in the Mesa del Sol Regional Recreation Park Drainage Master Plan, directly east of the site, the runoff drains through the parking lot for the Phase 1A soccer fields and the amphitheater to temporary ponds located on the east side of University Boulevard.

ON-SITE FLOWS

For the existing conditions hydrologic analysis, land treatment types A, B, and C were used to determine peak flows and peak volumes. The on-site drainage basins, A-1 through A-11, are shown on Plate 1. Basins A-1, A-7, and A-11 drain to the north about 49.89 cfs. Basins A-2, A-3, A-4, and A-10 drain directly to the west of the site about 41.43 cfs. Basins A-5, A-6, and A-9 drain to the west at the south end of the site about 11.92 cfs. Table 1 shows the peak flows and volumes for each basin under existing conditions. All peak flows include sediment bulking.

Table 1 Existing Drainage Conditions

BASINS	Area (acres)	100yr- 24hr Peak Flow (cfs)	100yr- 24hr Runoff Volume (acre-ft)	Sediment Bulking Factor	Land Treatment
A-1	3.38	10.39	0.300	1.16	10%A,30%B,60%C
A-2	8.08	20.70	0.591	1.16	20%A,60%B,20%C
A-3	3.21	7.94	0.226	1.12	20%A,60%B,20%C
A-4	4.33	10.81	0.308	1.12	10%A,80%B,10%C
A-5	4.56	9.38	0.268	1.09	50%A,40%B,10%C
A-6	3.07	6.59	0.188	1.09	50%A,30%B,20%C
A-7	2.65	10.00	0.289	1.44	50%B,50%C
A-8	4.21	11.92	0.340	1.18	80%B,20%C
A-9	3.18	8.71	0.248	1.18	90%B,10%C
A-10	1.08	2.41	0.069	1.12	30%A,70%B
A-11	8.53	29.71	0.858	1.32	50%B, 50%C

SEDIMENT ANALYSIS

A detailed sediment analysis was performed for existing conditions following the methods described in Section 3.3 of the "Sediment and Erosion Design Guide" by AMAFCA. First, the sediment wash load was computed for each basin using the Modified Universal Soil Loss Equation (MUSLE) as shown in the AMAFCA Sediment Guide. Input parameters of the MUSLE equation were determined for each basin following the procedure given in Appendix B of the AMAFCA Sediment Guide. Next, the coefficients and exponents for the unit bed load power function equation (equation 3.41 in the AMAFCA Sediment Guide) were determined using Figure 3.10 in the AMAFCA

Sediment Guide inputting an average D_{50} for the site. Table 1 shows the results of the sediment analysis under existing conditions. Peak bulking factors range from 1.09 to 1.44 under existing conditions. Basin A-7 bulking factor is high because the basin average slope is over 21%.

The FEMA Flood Insurance Rate Map Number 35001C0535, effective date September 20, 1996, shown in Figure 1, does not indicate the presence of any floodplains on or near the site.

DEVELOPED DRAINAGE CONDITIONS

DRAINAGE BASIN DELINEATION

Plate 2 shows that the site is divided into three major drainage basins, a north basin (100 Series Basins), a middle basin (200 Series Basins), and a south basin (300, 400 and 600 Series Basins). Each of the major basins drains to the temporary retention pond at the west end of the site. One other minor basin, basin 511, drains directly to the north. The peak flow discharge from the site under developed conditions is less than undeveloped conditions. Flows from each major basin are collected in a storm sewer system that discharges to the temporary retention pond at the west end of the site.

HYDROLOGIC ANALYSIS

To determine the peak flows and runoff volumes of each subbasin a hydrologic analysis was performed in accordance to section 22.2 of the Development Process Manual (DPM) using AHYMO 97. The analysis included the 100-year 24-hour storm and the 100-year, 10-day storm. The 100-year 24-hour storm was the basis for determining peak flows to size the storm sewer collection system and was used to determine the required capacity of the detention ponds. The 100-year, 10-day storm was used to determine the required capacity of the temporary retention pond. The design storm values are based on Tables C-1, C-2, and C-3 of the DPM's section 22.2. The Mesa del Sol Amphitheater site is contained within section R-15 of the City of Albuquerque Zone Atlas Map. The location of the site results in the following design storms:

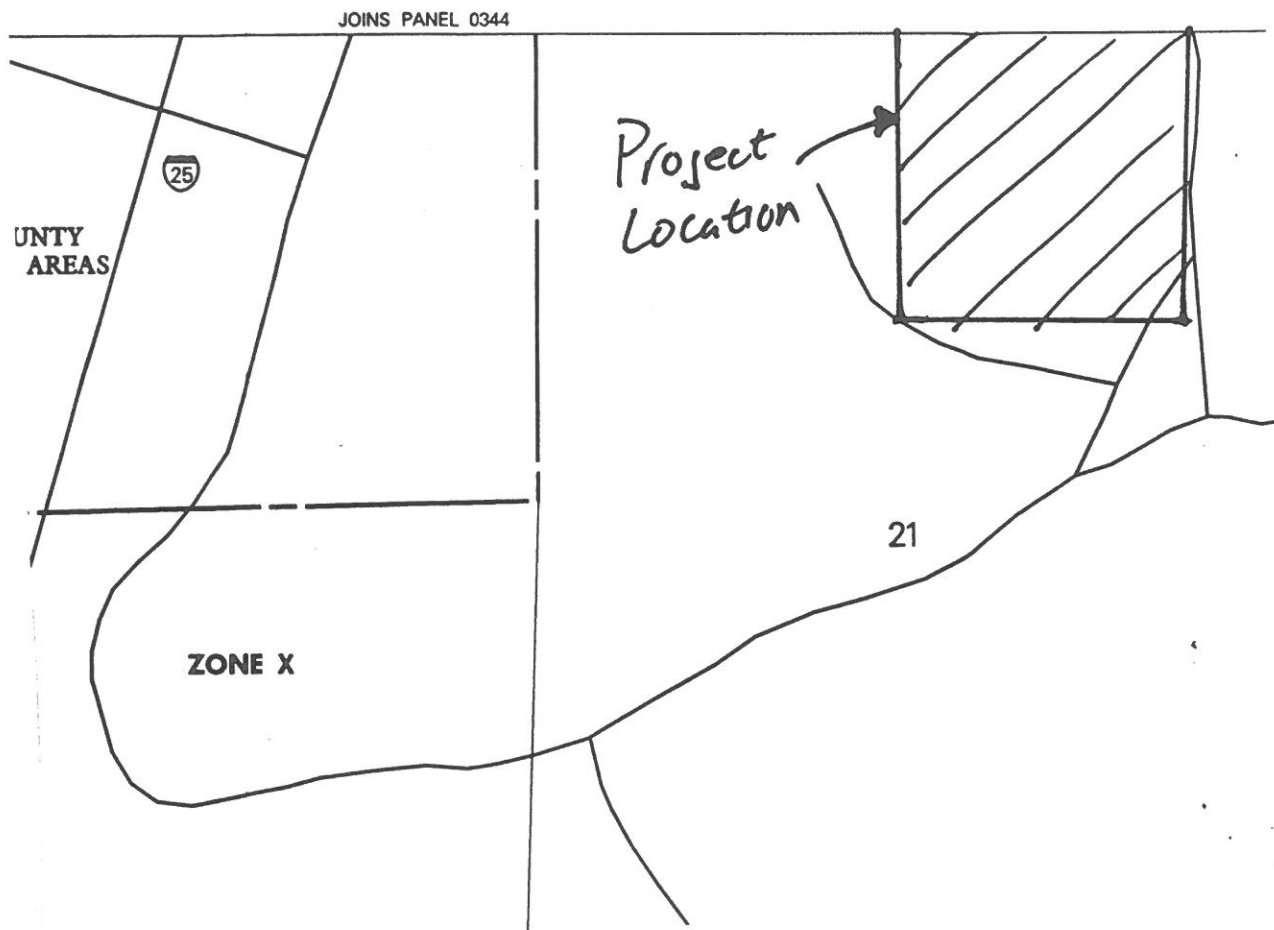
100-year 1-hour event	--	2.00 inches,
100-year 6-hour event	--	2.30 inches,
100-year 24-hour event	--	2.80 inches.
100-year 10-day event	--	3.95 inches.

Basins were assigned land treatment values in accordance with Tables A-4 and A-5 of the DPM's section 22.2. Table 2 shows the land treatments and areas for each basin within the major basins. The time of concentration for all basins was calculated using the SCS

Upland Method Calculated outlined in subsection B.2 of DPM section 22.2 within the AHYMO 97 model.

SEDIMENT ANALYSIS

After the basin peak flows were calculated a sediment analysis in accordance with AMAFCA's Sediment and Erosion Design Guide was performed for each basin. The same procedure that was described earlier for existing conditions was followed for the developed conditions. The bulking factor applied to the site basin peak flows (shown in Table 2) ranged from 1.00 for the basins within the concrete seating area to a high of 1.25 on a larger steeper basin. The calculations leading to these bulking factors are in Appendix A.



FIRM Panel 535

Figure 1 FEMA Flood Insurance Rate Map

Table 2 Developed Drainage Conditions

BASINS	Area (acres)	100yr- 24hr Peak Flow (cfs)	100yr- 24hr Runoff Volume (acre-ft)	Sediment Bulking Factor	Land Treatment
100 Series Basin	---	---	---	---	---
111	0.49	1.36	0.046	1.01	77%B, 4%C, 19%D
112	1.56	6.62	0.297	1.01	17%B, 83%D
113	1.22	4.19	0.139	1.04	86%C, 14%D
121	1.07	4.56	0.202	1.01	11%B, 8%C, 81%D
122	0.22	1.01	0.047	1.00	100%D
123	0.42	1.99	0.092	1.02	100%D
124	1.30	4.58	0.152	1.07	86%C, 14%D
131	3.36	10.83	0.336	1.14	20%A, 73%C, 7%D
132	2.94	9.26	0.275	1.14	19%A, 79%C, 2%D
133	0.88	3.11	0.107	1.04	80%C, 20%D
134	2.55	9.01	0.313	1.08	15%B, 63%C, 22%D
200 Series Basin	---	---	---	---	---
211	0.53	1.72	0.067	1.00	58%B, 42%D
212	1.09	4.44	0.195	1.01	24%B, 76%D
221	0.39	1.37	0.055	1.01	49%B, 51%D
222	0.40	1.21	0.042	1.01	59%B, 18%C, 23%D
231	1.05	4.66	0.209	1.05	16%B, 84%D
232	0.21	0.99	0.046	1.01	100%D
233	0.42	1.99	0.092	1.02	100%D
234	1.29	4.45	0.143	1.07	91%B, 9%D
300, 400 & 600 Series Basins	---	---	---	---	---
312	3.29	9.78	0.290	1.15	31%A, 66%C, 3%D
313	0.72	2.57	0.089	1.04	78%C, 22%D
314	4.09	12.11	0.395	1.05	26%A, 61%C, 13%D
411	2.05	5.50	0.165	1.15	25%A, 43%B, 28%C, 4%D
412	1.41	4.80	0.149	1.14	20%B, 74%C, 6%D
413	1.99	4.92	0.150	1.12	55%A, 40%C, 5%D
611	2.08	6.72	0.197	1.16	16%A, 83%C, 1%D
Other Basins	---	---	---	---	---
511	9.51	35.54	1.101	1.25	96%C, 4%D

DRAINAGE CONCEPT

Introduction

This drainage report addresses the drainage concept for the fully developed condition of the Mesa del Sol Amphitheater site. As mentioned previously, plate 2 shows that the site is divided into three major drainage basins, a north basin (100 Series Basins), a middle basin (200 Series Basins), and a south basin (300, 400 and 600 Series Basins). Each of the major basins drain to the temporary retention pond at the west end of the site. The onsite detention ponds and the temporary retention pond will be maintained by both the developer, SFX Entertainment, and the Bernalillo County Public Works Department. A drainage maintenance covenant will be prepared and submitted to the City for review and approval. One other minor basin, basin 511, drains directly to the north. The peak flow discharge from the site under developed conditions is less than undeveloped conditions. Flows from each major basin are collected in a storm sewer system that discharges to the temporary retention pond at the west end of the site. The following discusses the drainage system for each major basin.

100 Series Basins

Runoff from basins 131, 132, 133, and 134, which are within the site, but upstream of the amphitheater improvements, is collected and conveyed in ditches along pedestrian paths. The average slope of the pedestrian paths is 5%. In order to reduce erosion within these ditches, small 1-foot drop structures will be constructed across the ditches to effectively reduce the ditch slope to an average 1% slope. These small drop structures can be constructed of concrete, vertical timbers, or rocks. In Basin 131, upstream of the handicapped parking lot, a small detention basin collects the flow from the upstream basins. A standpipe will allow the flows to be discharged to a 24" storm sewer running under the parking lot. The small detention pond has a volume of 0.202 acre-feet and a depth of 2.52 feet. This pond will also collect any sediment that may be transported by the ditches adjacent to the pedestrian path before discharging to the storm sewer.

Basins 122, 123, and 124 are all located within the seating area of the amphitheater. Each basin drains through special inlets called Lower Crosswalk Storm Inlets shown at the end of the report to 12" storm sewers. The storm sewers from each basin are collected at a manhole within the north plaza area of the site. The flows are carried through the plaza area by a 18" storm sewer. Flows from the plaza area (basin 121) are collected by Type D inlets and into the storm sewer. These flows are routed through the handicapped parking area in a 24" pipe to the 24" pipe in the parking area. At this point the flows are combined with the flows from the 130 series basins. The flows are routed to the west end of the parking lot through a 24" storm drain.

Flows from basin 112, adjacent to the service road, are collected in a Type D inlet and conveyed through a 12" pipe to a manhole in basin 113. At this location flows from basin

113, the handicapped parking area are collected and carried to the manhole west of basin 113 in a 18" storm sewer. At this location the flows are combined with the flows from the upstream basins (120 and 130 series basins). These flows are then routed through basin 111 to a manhole. Flows from basin 111 are collected at this location. These flows are then discharged in a 24" pipe to the temporary retention pond west of the improvements. A total of 45.4 cfs is discharged to the pond. —

200 Series Basins

Similar to the 100 Series Basins, basins 232, 233, and 234 are within the seating area of the amphitheater. Each basin drains through special inlets called Lower Crosswalk Storm Inlets shown at the end of the report to 12" storm sewers. The storm sewers from each basin are collected at a manhole within the west plaza area of the site. The flows are carried through the plaza area by a 18" storm sewer. Flows from the plaza area (basin 231) are collected by Type D inlets and into the storm sewer. These flows are routed through basin 222 area in a 18" pipe to a manhole. Runoff from basins 221 and 222 is collected in storm inlets and discharged to the 18" pipe. These flows are then routed through basin 211 in a 18" storm drain to a manhole. At the manhole flows from basins 211 and 212 are collected and combined with the upstream flows. From the manhole, the flows are discharged into the detention pond through an 18" storm sewer. A total of 20.9 cfs is discharged to the temporary retention facility. ✓

300, 400 and 600 Series Basins

Similar to the 100 Series Basins, runoff from basins 312, 313, and 314, which are within the site, but upstream of the amphitheater improvements, is collected and conveyed in ditches along pedestrian paths. The average slope of the pedestrian paths is 5%. In order to reduce erosion within these ditches, small 1-foot drop structures will be constructed across the ditches to effectively reduce the ditch slope to an average 1% slope. These small drop structures can be constructed of concrete, vertical timbers, or rocks. In Basin 312, upstream of the VIP Tent area, a small detention basin collects the flow from the upstream basins. A standpipe will allow the flows to be discharged to a 18" storm sewer. The small detention pond has a volume of 0.248 acre-feet and a depth of 3.54 feet. This pond will also collect any sediment that may be transported by the ditches adjacent to the pedestrian path before discharging to the storm sewer.

The flows from the small detention pond will be discharged into the temporary retention pond through a 18" storm drain. The total flow discharging to the pond is 17.21 cfs. The detention facility is located in basins 411, 412 and 413, so the pond will receive all runoff from these basins directly. Basin 611 will discharge to the temporary retention pond through an existing natural drainage ditch. Runoff from Basin 611 is 6.72 cfs.

Other Basins

Onsite basin 511 does not drain to the temporary retention pond. It drains off site following historic drainage patterns. Basin 511, which is located on the north portion of the site, drains to the north in an existing arroyo. The developed flows draining to the north from the site are less than the flows during existing conditions because the majority of the basins under existing conditions are diverted to the temporary retention pond.

Storm Sewer Hydraulics Analysis

Once the hydrologic and sediment analysis were completed, a hydraulics analysis was performed to size the proposed storm sewer pipes. Since the detention pond on the west side of the site is about 30 feet lower in elevation than the site improvements, the flows in the storm sewers are relatively minor and the slopes are steep, all of the storm sewers were sized by the gravity flow method. The hydraulics analysis is shown in Appendix B.

Temporary Retention Pond Analysis

The next step was to analyze the temporary retention pond that all three storm sewer systems drain into. At the end of each storm drain entering the detention pond will be an energy dissipator to reduce the erosion caused by the flows entering the pond. The method described in the "Denver Urban Storm Drainage Criter Manual" Volume 2, Section 5, was used to size the energy dissipators for each storm drain. The methodology and calculations are shown in Appendix B. The 100 Series Basins discharges 45.4 cfs at a velocity of 31 fps because the slope of the 24" pipe is steep. According to the Denver method, a riprap blanket that is 15 feet wide by 20 feet long will be required. The riprap will have a D50 of 12 inches. The 200 Series Basins discharges 20.9 cfs at a velocity of 25 fps through the 18" pipe. The riprap energy dissipator will be 15 feet wide by 15 feet long with a D50 of 9 inches. And the 300 and 400 Series Basins 18" storm sewer discharges 17.2 cfs at a velocity of 18 fps. The riprap dissipator will be 15 feet wide by 15 feet long with a D50 of 9 inches.

The temporary retention pond located west of the amphitheater improvements will retain the 100-year, 10-day storm runoff. A total of 5.088 acre-feet will be contained in the pond. The 100-year water surface elevation is 5285.00 (see Plates 2 & 3). The retention pond will have a 12-foot maintenance road at the top of the berm. A concrete emergency spillway, sized to pass the 100-year peak flow of 87.2 cfs, is located on the northwest berm of the pond. Table 3 shows the calculations to obtain the 100-year 10-day storm volume for the temporary retention pond.

Grading Plan

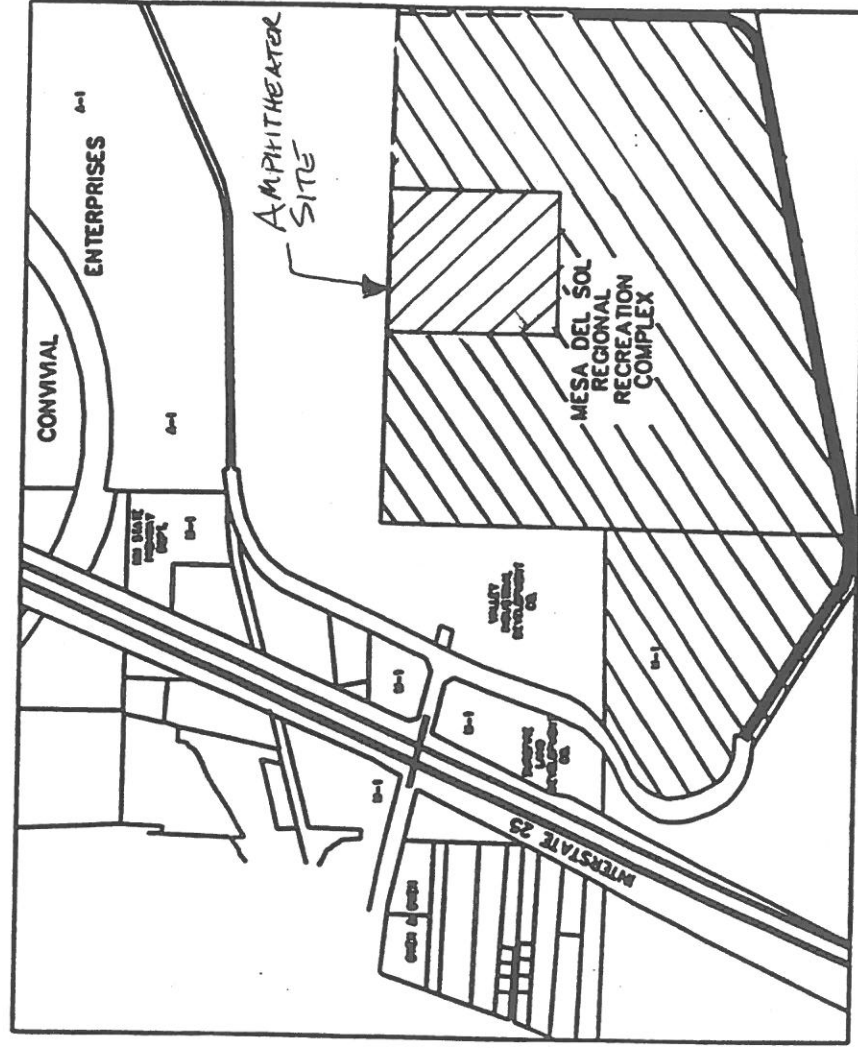
Plate 3 shows the grading plan for the site. Within the amphitheater complex one-foot contours are shown on the grading plan. For clarity, outside of the amphitheater complex five-foot contours are shown on the grading plan. Maximum slope outside of the amphitheater complex is 3:1. All disturbed areas shown on the grading plan outside of the amphitheater complex will be vegetated to help stabilize the slopes. The service road plan and profiles are shown on Plates 7 & 8.

Table 3 100-year, 10-day Storm Volume

BASINS	Area (acres)	%D Land Treatment	100yr- 24hr Runoff Volume (acre-ft)	100yr-10day Runoff Volume (acre-ft)
100 Series Basin	---	---	---	---
111	0.49	19	0.046	0.055
112	1.56	83	0.297	0.421
113	1.22	14	0.139	0.155
121	1.07	81	0.202	0.285
122	0.22	100	0.047	0.068
123	0.42	100	0.092	0.132
124	1.30	14	0.152	0.169
131	3.36	7	0.336	0.359
132	2.94	2	0.275	0.281
133	0.88	20	0.107	0.124
134	2.55	22	0.313	0.367
200 Series Basin	---	---	---	---
211	0.53	42	0.067	0.088
212	1.09	76	0.195	0.274
221	0.39	51	0.055	0.074
222	0.40	23	0.042	0.051
231	1.05	84	0.209	0.294
232	0.21	100	0.046	0.066
233	0.42	100	0.092	0.132
234	1.29	9	0.143	0.154
300, 400 & 600 Series Basins	---	---	---	---
312	3.29	3	0.290	0.299
313	0.72	22	0.089	0.104
314	4.09	13	0.395	0.446
411	2.05	4	0.165	0.173
412	1.41	6	0.149	0.157
413	1.99	5	0.150	0.160
611	2.08	1	0.197	0.199
Total			4.290	5.088

EXHIBIT A

MESA DEL SOL REGIONAL RECREATION COMPLEX MASTER DRAINAGE PLAN



VICINITY MAP

ZONE ATLAS MAPS R-14-Z & R-15-Z

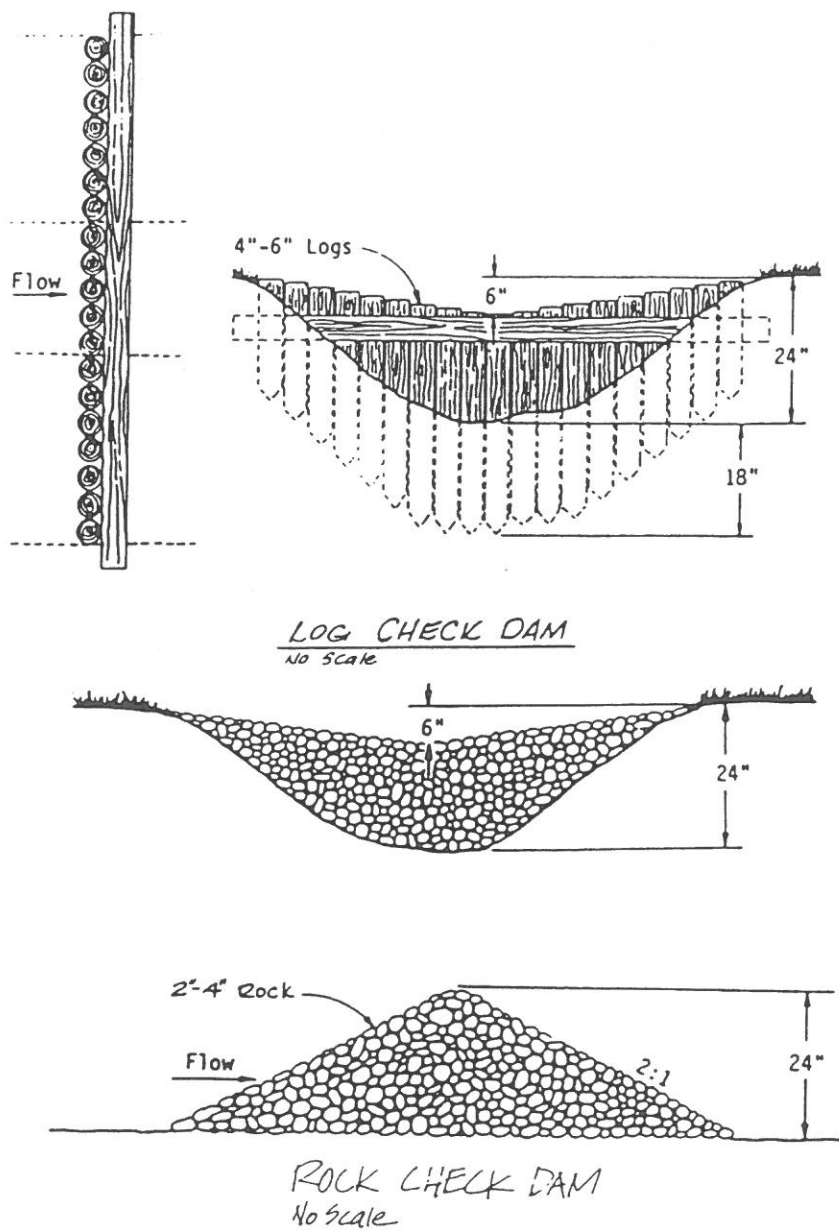
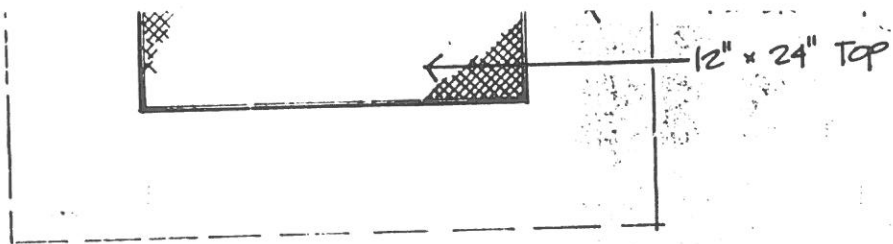
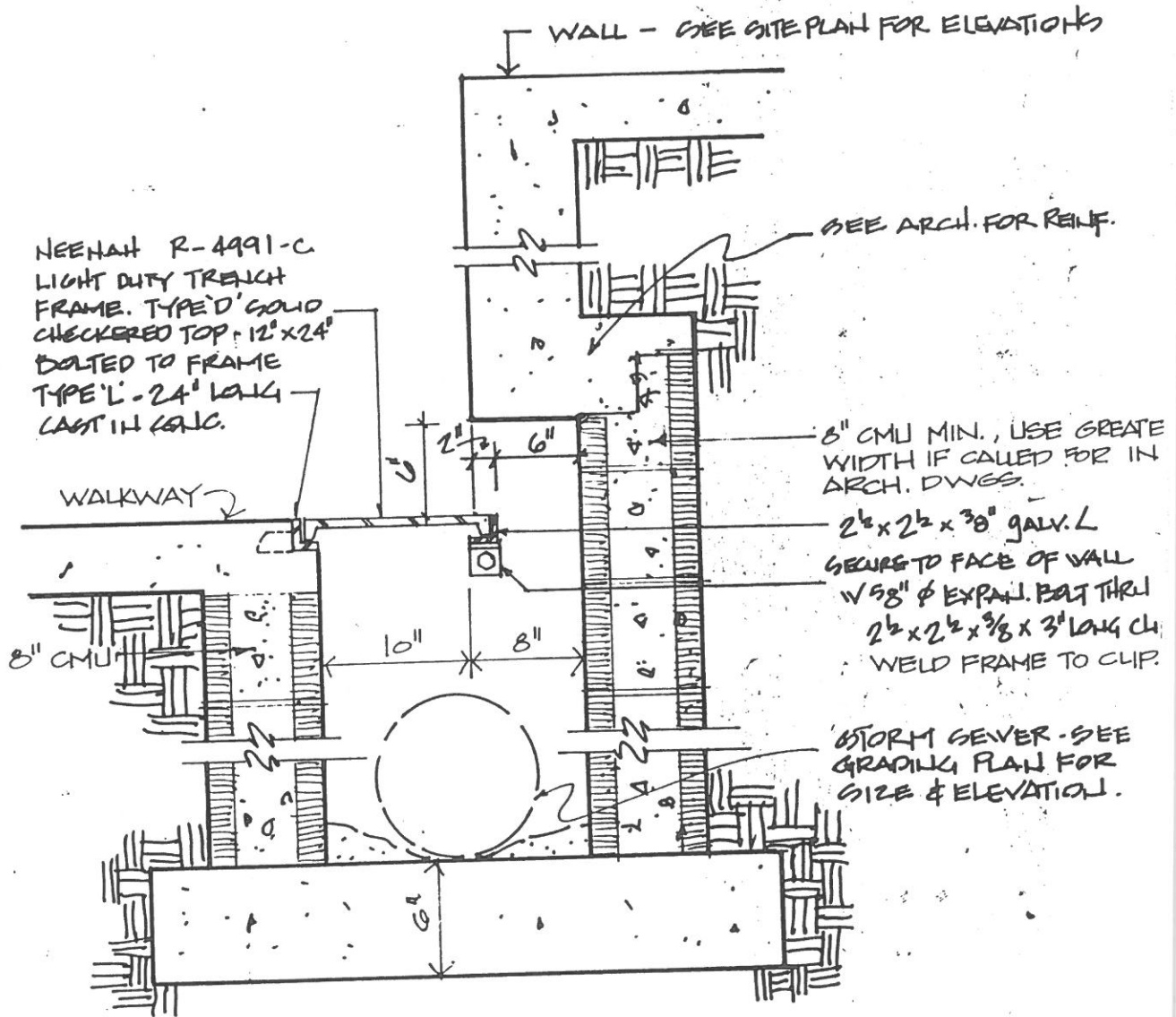


Figure 2 Roadside Check Structure Sections

DO NOT MIN.



PLAN VIEW OF INLET



USES 6\"
VERIFY
ARGE BOX
PER
RT FRAMES

7

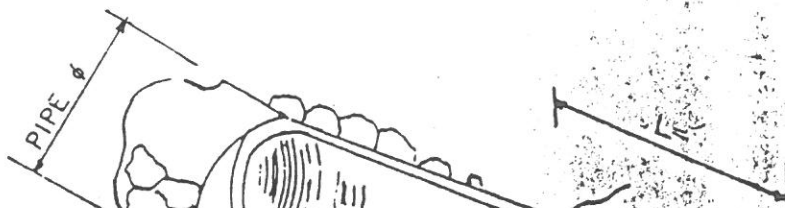
L15

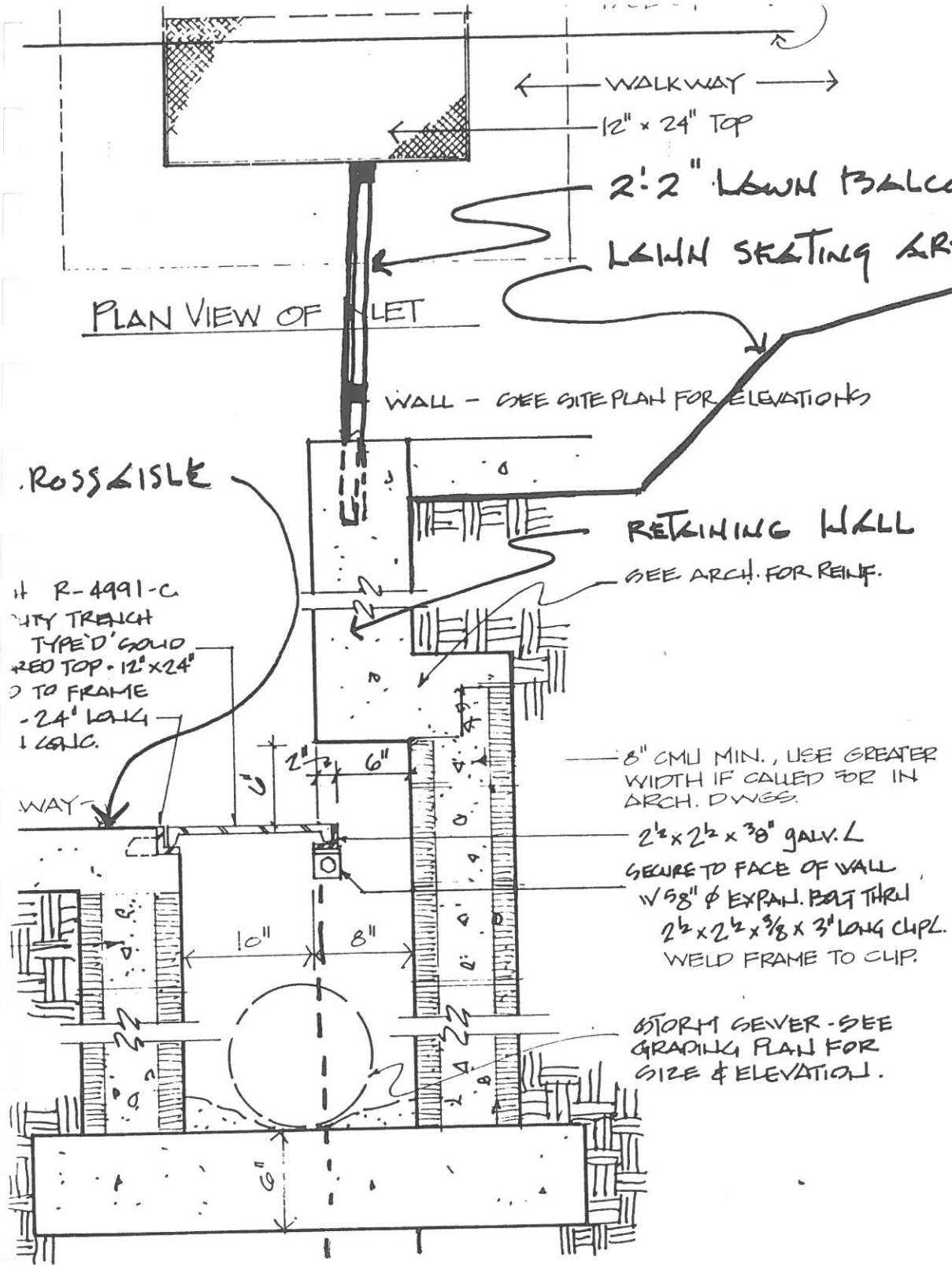
Lower Crosswalk Storm Inlet

Scale: 1\" = 1'-0\"

LOOK, BLUE CHROME

HT LINK CHAIN, BLUE
PLATED





NOTE:
ALL CONTRACTORS
FOR REVIEWING ALL
DRAWINGS AND SPECIFICATIONS
DETERMINE SCOPE

CONSTRUCTION OF
AERIAL TOPOGRAPHY
RALEIGH.

NO CONSTRUCTION
KIND PERMITTED
GOVERNMENT OF
JURISDICTIONAL
UNLESS OTHERWISE
NOTED.

CONTRACTOR RES
CONSTRUCTION ST
LEVEL OF INFORM
CONSTRUCTION D

BOUNDARY SURV
MURPHY YELLE A
PARTIAL FIELD TO

THE CONTRACTOR
AND ALL DISCREP
DRAWINGS AND SI
OWNER'S REPRESENTATION
CONSTRUCTION.

BENCH MARK ON

Project

**WALNUT
AMPHITHEATRE
Raleigh,**

RETAINING WALL FOOTING

Lower Crosswalk Storm Inlet

REVISED
SKETCH

Scale: 1" = 1'-0"

MESK DEL SOL 8/2/99

Client

APPENDIX A
HYDROLOGIC CALCULATIONS

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = 2	NOTATION	
SEDIMENT BULK												
COMPUTE NM HYD	A10 -	6		.00170	2.41	.069	.75561	1.500	2.219	PK BF =	1.12	
*S COMBINE BASIN A-3/A-4 WITH A-10										PER IMP=	.00	
ADD HYD	A10.1 5& 6	7		.01350	20.73	.603	.83701	1.500	2.400			

*S BASIN A-5												

SEDIMENT BULK												
COMPUTE NM HYD	A5 -	1		.00710	9.38	.268	.70681	1.500	2.065	PK BF =	1.09	
*S COMBINE BASIN A-5 WITH A-6										PER IMP=	.00	
ADD HYD	A6.1 1& 2	3		.01190	15.98	.456	.71832	1.500	2.098			
*S ROUTE A-5/A-6 TO A-9												
ROUTE	A6.2 3 4	4		.01190	15.77	.456	.71839	1.550	2.070			

*S BASIN A-9												

SEDIMENT BULK												
COMPUTE NM HYD	A9 -	5		.00500	8.71	.248	.92931	1.500	2.721	PK BF =	1.18	
*S COMBINE BASIN A-5/A-6 WITH A-9										PER IMP=	.00	
ADD HYD	A9.1 4& 5 6	6		.01690	24.07	.704	.78073	1.500	2.226			

*S BASIN A-8												

SEDIMENT BULK												
COMPUTE NM HYD	A8 -	1		.00660	11.92	.340	.96553	1.500	2.823	PK BF =	1.18	
*S COMBINE BASIN A-8 WITH A-9										PER IMP=	.00	
ADD HYD	A8.1 1& 2	2		.01190	15.98	.456	.71832	1.500	2.098			
*S ROUTE A-8/A-9 TO A-10												
ROUTE	A8.2 3 4	4		.01190	15.77	.456	.71839	1.550	2.070			

*S BASIN A-7												

SEDIMENT BULK												
COMPUTE NM HYD	A7 -	1		.00710	9.38	.268	.70681	1.500	2.065	PK BF =	1.09	
*S COMBINE BASIN A-7 WITH A-8										PER IMP=	.00	
ADD HYD	A7.1 1& 2	2		.01190	15.98	.456	.71832	1.500	2.098			
*S ROUTE A-7/A-8 TO A-9												
ROUTE	A7.2 3 4	4		.01190	15.77	.456	.71839	1.550	2.070			

*S BASIN A-6												

SEDIMENT BULK												
COMPUTE NM HYD	A6 -	1		.00710	9.38	.268	.70681	1.500	2.065	PK BF =	1.09	
*S COMBINE BASIN A-6 WITH A-7										PER IMP=	.00	
ADD HYD	A6.1 1& 2	2		.01190	15.98	.456	.71832	1.500	2.098			
*S ROUTE A-6/A-7 TO A-8												
ROUTE	A6.2 3 4	4		.01190	15.77	.456	.71839	1.550	2.070			

*S BASIN A-4												

SEDIMENT BULK												
COMPUTE NM HYD	A4 -	1		.00710	9.38	.268	.70681	1.500	2.065	PK BF =	1.09	
*S COMBINE BASIN A-4 WITH A-5										PER IMP=	.00	
ADD HYD	A4.1 1& 2	2		.01190	15.98	.456	.71832	1.500	2.098			
*S ROUTE A-4/A-5 TO A-6												
ROUTE	A4.2 3 4	4		.01190	15.77	.456	.71839	1.550	2.070			

*S BASIN A-3												

SEDIMENT BULK												
COMPUTE NM HYD	A3 -	1		.00710	9.38	.268	.70681	1.500	2.065	PK BF =	1.09	
*S COMBINE BASIN A-3 WITH A-4										PER IMP=	.00	
ADD HYD	A3.1 1& 2	2		.01190	15.98	.456	.71832	1.500	2.098			
*S ROUTE A-3/A-4 TO A-5												
ROUTE	A3.2 3 4	4		.01190	15.77	.456	.71839	1.550	2.070			

*S BASIN A-2												

SEDIMENT BULK												
COMPUTE NM HYD	A2 -	1		.00710	9.38	.268	.70681	1.500	2.065	PK BF =	1.09	
*S COMBINE BASIN A-2 WITH A-3										PER IMP=	.00	
ADD HYD	A2.1 1& 2	2		.01190	15.98	.456	.71832	1.500	2.098			
*S ROUTE A-2/A-3 TO A-4												
ROUTE	A2.2 3 4	4		.01190	15.77	.456	.71839	1.550	2.070			

*S BASIN A-1												

SEDIMENT BULK												
COMPUTE NM HYD	A1 -	1		.00710	9.38	.268	.70681	1.500	2.065	PK BF =	1.09	
*S COMBINE BASIN A-1 WITH A-2										PER IMP=	.00	
ADD HYD	A1.1 1& 2	2		.01190	15.98	.456	.71832	1.500	2.098			
*S ROUTE A-1/A-2 TO A-3												
ROUTE	A1.2 3 4	4		.01190	15.77	.456	.71839	1.550	2.070			

*S BASIN A-0												

SEDIMENT BULK												
COMPUTE NM HYD	A0 -	1		.00710	9.38	.268	.70681	1.500	2.065	PK BF =	1.09	
*S COMBINE BASIN A-0 WITH A-1										PER IMP=	.00	
ADD HYD	A0.1 1& 2	2		.01190	15.98	.456	.71832	1.500	2.098			
*S ROUTE A-0/A-1 TO A-2												
ROUTE	A0.2 3 4	4		.01190	15.77	.456	.71839	1.550	2.070			

FINISH												

AHYMO PROGRAM SUMMARY TABLE (AHYMO 97) -
INPUT FILE = D:\PROJECTS\WDSAMP~1\WDS24DEV.txt

- VERSION: 1997.02c

RUN DATE (MON/DAY/YR) = 08/02/1999
USER NO. = AHYMO-I-9702a01000K21-AH

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = 1	NOTATION
---------	---------------------------	-------------	-----------	--------------	----------------------	-----------------------	-----------------	----------------------	--------------	----------	----------

START
RAINFALL TYPE= 2
TIME= .00
RAIN24= 2.800

*S START OF SERIES 100 BASINS

*S*****
*S BASIN 134
*S*****
SEDIMENT BULK
COMPUTE NM HYD 134.00 - 1 .00398 9.01 .313 1.47563 1.500 3.538 PER IMP= 1.08
*S ROUTE 134 THRU 132 - CHANNEL
ROUTE 134.10 1 11 .00398 8.91 .313 1.47576 1.500 3.499
*S*****
*S BASIN 133
*S*****

SEDIMENT BULK
COMPUTE NM HYD 133.00 - 2 .00138 3.11 .107 1.45325 1.500 3.525 PER IMP= 1.04
*S ROUTE 133 THRU 132 - CHANNEL
ROUTE 133.10 2 12 .00138 3.10 .107 1.45385 1.500 3.514
*S COMBINE BASIN 134.1 WITH 133.1
ADD HYD 133.50 11&12 13 .00536 12.02 .420 1.46984 1.500 3.503
*S*****
*S BASIN 132
*S*****

SEDIMENT BULK
COMPUTE NM HYD 132.00 - 3 .00459 9.26 .275 1.12537 1.500 3.154 PER IMP= 1.14
*S COMBINE BASIN 133.5 WITH 132
ADD HYD 132.50 13& 3 14 .00995 21.28 .696 1.31092 1.500 3.342
*S ROUTE 132.5 THRU 131 - CHANNEL
ROUTE 132.90 14 15 .00995 21.18 .696 1.31099 1.500 3.326
*S*****
*S BASIN 131
*S*****

SEDIMENT BULK
COMPUTE NM HYD 131.00 - 4 .00525 10.83 .336 1.20153 1.500 3.222 PER IMP= 1.14
*S COMBINE BASIN 132.9 WITH 131
ADD HYD 131.50 15& 4 16 .01520 32.01 1.032 1.27312 1.500 3.290
*S ROUTE 130 BASINS THRU RESERVOIR
ROUTE RESERVOIR 131.60 16 50 .01520 25.20 1.032 1.27312 1.600 2.590 AC-FT= .202
*S ROUTE 131.6 TO JUNCTION - 36" PIPE SECTION
ROUTE 131.90 50 17 .01520 25.26 1.032 1.27315 1.600 2.597
*S*****
*S*****

*S BASIN 122
*S*****
SEDIMENT BULK
COMPUTE NM HYD 122.00 - 5 .00034 1.01 .047 2.56833 1.500 4.629 PER IMP= 1.00
*S ROUTE 122 TO JUNCTION - 24" PIPE SECTION
ROUTE 122.10 5 18 .00034 1.01 .047 2.56990 1.500 4.629
*S*****
*S BASIN 123

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE =	6
										NOTATION	
ADD HYD		150.90	40&35	41							
*S ROUTE ONSITE BASINS THRU RESERVOIR					87.22	3.953	1.38499	1.550	2.546		
ROUTE RESERVOIR		160.10	41	42							
*S ROUTE 160.1 TO LOS PICAROS ROAD - 24" PIPE SECTION					28.02	3.953	1.38499	2.000	.818	AC-FT=	1.918
ROUTE		160.50	42	43							
*S*****					27.99	3.953	1.38499	2.000	.817		
*S BASIN 1000 - SUNSET MEMORIAL											
*S*****											
SEDIMENT BULK											
COMPUTE NM HYD		1000.00	-	44							
*S COMBINE BASIN 160.5 WITH 1000					175.83	6.294	1.60989	1.500	3.748	PER IMP=	25.00
ADD HYD		1000.50	43&44	45							
*S ROUTE 1000.5 TO TIJERAS ARROYO - 48" PIPE SECTION					183.03	10.247	1.51497	1.500	2.255		
ROUTE		1000.50	45	46							
FINISH					183.01	10.247	1.51498	1.500	2.255		

AHYMO PROGRAM (AHYMO_97) - - Version: 1997.02c
 RUN DATE (MON/DAY/YR) = 08/08/1999
 START TIME (HR:MIN:SEC) = 10:28:48 USER NO.= AHYMO-I-9702a01000K21-AH
 INPUT FILE = D:\PROJECTS\MDSAMP~1\DRAINAGE\MDS24DEV.txt

MESA DEL SOL AMPHITHEATER
 HYDROLOGIC MODEL--DEVELOPED CONDITIONS
 1 AUGUST 1999

HYDROLOGIC MODEL FOR BASINS 111 THROUGH 511
 100-YEAR, 24-HOUR STORM:

PRECIPITATION:

P60 = 2.00"
 P360 = 2.30"
 P1440 = 2.80"

START TIME=0.0 HR PUNCH CODE=0

24-Hour rainfall distribution based on DPM section 22.2
 Figures C-1,C-2, & C-3

RAINFALL TYPE=2 RAIN QUARTER=0.0 IN
 RAIN ONE=2.00 IN RAIN SIX=2.30 IN
 RAIN DAY=2.80 IN DT=0.0500 HRS

COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
 DT = .050000 HOURS END TIME = 24.000000 HOURS

.0000	.0019	.0039	.0059	.0080	.0102	.0125
.0148	.0173	.0198	.0225	.0253	.0282	.0313
.0346	.0380	.0417	.0456	.0499	.0544	.0594
.0678	.0771	.1041	.1679	.2776	.4472	.6914
1.0254	1.2888	1.4078	1.5072	1.5942	1.6720	1.7425
1.8068	1.8658	1.9201	1.9702	2.0165	2.0594	2.0683
2.0765	2.0841	2.0912	2.0978	2.1041	2.1100	2.1157
2.1210	2.1262	2.1311	2.1358	2.1404	2.1448	2.1490
2.1531	2.1571	2.1609	2.1646	2.1683	2.1718	2.1752
2.1786	2.1819	2.1851	2.1882	2.1912	2.1942	2.1972
2.2000	2.2028	2.2056	2.2083	2.2109	2.2135	2.2161
2.2186	2.2211	2.2235	2.2259	2.2282	2.2306	2.2328
2.2351	2.2373	2.2395	2.2416	2.2438	2.2458	2.2479
2.2500	2.2520	2.2539	2.2559	2.2578	2.2598	2.2616
2.2635	2.2654	2.2672	2.2690	2.2708	2.2725	2.2743
2.2760	2.2777	2.2794	2.2811	2.2828	2.2844	2.2860
2.2876	2.2892	2.2908	2.2924	2.2939	2.2955	2.2970
2.2985	2.3000	2.3021	2.3042	2.3064	2.3085	2.3106
2.3126	2.3147	2.3168	2.3189	2.3209	2.3230	2.3250
2.3271	2.3291	2.3311	2.3331	2.3351	2.3371	2.3391
2.3411	2.3431	2.3451	2.3471	2.3490	2.3510	2.3529
2.3549	2.3568	2.3588	2.3607	2.3626	2.3645	2.3664
2.3683	2.3702	2.3721	2.3740	2.3759	2.3778	2.3796
2.3815	2.3834	2.3852	2.3871	2.3889	2.3907	2.3926
2.3944	2.3962	2.3980	2.3998	2.4016	2.4034	2.4052
2.4070	2.4088	2.4105	2.4123	2.4141	2.4158	2.4176
2.4194	2.4211	2.4228	2.4246	2.4263	2.4280	2.4298
2.4315	2.4332	2.4349	2.4366	2.4383	2.4400	2.4417
2.4434	2.4450	2.4467	2.4484	2.4500	2.4517	2.4534
2.4550	2.4567	2.4583	2.4599	2.4616	2.4632	2.4648
2.4665	2.4681	2.4697	2.4713	2.4729	2.4745	2.4761
2.4777	2.4793	2.4809	2.4824	2.4840	2.4856	2.4872
2.4887	2.4903	2.4918	2.4934	2.4950	2.4965	2.4980
2.4996	2.5011	2.5026	2.5042	2.5057	2.5072	2.5087
2.5102	2.5118	2.5133	2.5148	2.5163	2.5178	2.5192
2.5207	2.5222	2.5237	2.5252	2.5266	2.5281	2.5296
2.5310	2.5325	2.5340	2.5354	2.5369	2.5383	2.5398
2.5412	2.5426	2.5441	2.5455	2.5469	2.5483	2.5498
2.5512	2.5526	2.5540	2.5554	2.5568	2.5582	2.5596
2.5610	2.5624	2.5638	2.5652	2.5666	2.5680	2.5693
2.5707	2.5721	2.5735	2.5748	2.5762	2.5775	2.5789
2.5803	2.5816	2.5830	2.5843	2.5856	2.5870	2.5883
2.5897	2.5910	2.5923	2.5936	2.5950	2.5963	2.5976
2.5989	2.6002	2.6015	2.6029	2.6042	2.6055	2.6068
2.6081	2.6094	2.6106	2.6119	2.6132	2.6145	2.6158
2.6171	2.6183	2.6196	2.6209	2.6222	2.6234	2.6247

2.6260	2.6272	2.6285	2.6297	2.6310	2.6322	2.6335
2.6347	2.6360	2.6372	2.6384	2.6397	2.6409	2.6421
2.6434	2.6446	2.6458	2.6470	2.6483	2.6495	2.6507
2.6519	2.6531	2.6543	2.6555	2.6567	2.6579	2.6591
2.6603	2.6615	2.6627	2.6639	2.6651	2.6663	2.6675
2.6686	2.6698	2.6710	2.6722	2.6734	2.6745	2.6757
2.6769	2.6780	2.6792	2.6804	2.6815	2.6827	2.6838
2.6850	2.6861	2.6873	2.6884	2.6896	2.6907	2.6919
2.6930	2.6941	2.6953	2.6964	2.6975	2.6987	2.6998
2.7009	2.7020	2.7032	2.7043	2.7054	2.7065	2.7076
2.7087	2.7098	2.7110	2.7121	2.7132	2.7143	2.7154
2.7165	2.7176	2.7187	2.7198	2.7208	2.7219	2.7230
2.7241	2.7252	2.7263	2.7274	2.7284	2.7295	2.7306
2.7317	2.7327	2.7338	2.7349	2.7360	2.7370	2.7381
2.7391	2.7402	2.7413	2.7423	2.7434	2.7444	2.7455
2.7465	2.7476	2.7486	2.7497	2.7507	2.7518	2.7528
2.7538	2.7549	2.7559	2.7570	2.7580	2.7590	2.7600
2.7611	2.7621	2.7631	2.7642	2.7652	2.7662	2.7672
2.7682	2.7692	2.7703	2.7713	2.7723	2.7733	2.7743
2.7753	2.7763	2.7773	2.7783	2.7793	2.7803	2.7813
2.7823	2.7833	2.7843	2.7853	2.7863	2.7873	2.7883
2.7892	2.7902	2.7912	2.7922	2.7932	2.7942	2.7951
2.7961	2.7971	2.7981	2.7990	2.8000		

*
*

*S START OF SERIES 100 BASINS

*S*****
*S BASIN 134

*S*****

*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME

COMPUTE LT TP LCODE=1 NK=1 ISLOPE=1
LENGTH=800 FT SLOPE=0.0688 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	ADJUSTED SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	800.0	.054354	3.0000
TOTAL BASIN	800.0	.054354	3.0000

TIME OF CONCENTRATION (HRS)= .0318 TIME TO PEAK (HRS)= .0212 LAG TIME (HRS)= .0238

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

.1500 REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

*
SEDIMENT BULK CODE=1 BULK FACTOR=1.08
COMPUTE NM HYD ID=1 HYD NO=134 DA=.00398 SQ MI
%A=0 %B=15 %C=63 %D=22
TP=0.0 HR
MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 3.4561 CFS UNIT VOLUME = .9959 B = 526.28 P60 = 2.0000
AREA = .000876 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .112098HR TP = .133333HR K/TP RATIO = .840738 SHAPE CONSTANT, N = 4.238266
UNIT PEAK = 8.6323 CFS UNIT VOLUME = 1.000 B = 370.75 P60 = 2.0000
AREA = .003104 SQ MI IA = .37885 INCHES INF = .91077 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.08000 AT PEAK FLOW.

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 134.00

RUNOFF VOLUME = 1.47563 INCHES = .3132 ACRE-FEET

PEAK DISCHARGE RATE = 9.01 CFS AT 1.500 HOURS BASIN AREA = .0040 SQ. MI.

*
*S ROUTE 134 THRU 132 - CHANNEL
*

COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=3
MIN ELEV=0.0 FT MAX ELEV=3.0 FT
CH SLP=0.0476 FP SLP=0.0476 N=0.05
DIST=9 FT N=0.04 DIST=10 FT N=0.05
DIST=19
DIST ELEV DIST ELEV DIST ELEV
0 3.0 9 0.0 10 0.0
19 3.0

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	1.00
.16	.23	.46	1.95
.32	.61	1.73	2.89
.47	1.15	3.95	3.84
.63	1.83	7.24	4.79
.79	2.66	11.76	5.74
.95	3.64	17.65	6.68
1.11	4.77	25.03	7.63
1.26	6.05	34.02	8.58
1.42	7.48	44.76	9.53
1.58	9.06	57.35	10.47
1.74	10.79	71.91	11.42
1.89	12.66	88.55	12.37
2.05	14.69	107.38	13.32
2.21	16.87	128.51	14.26
2.37	19.20	152.03	15.21
2.53	21.67	178.05	16.16
2.68	24.30	206.66	17.11
2.84	27.07	237.97	18.05
3.00	30.00	272.07	19.00

*
COMPUTE TRAVEL TIME ID=11 REACH NO=1 NO VS=1 L=210 FT
SLP=.0476

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.158	.233	.46	.0295
.316	.615	1.73	.0207
.474	1.147	3.95	.0170
.632	1.828	7.24	.0147
.789	2.659	11.76	.0132
.947	3.640	17.65	.0120
1.105	4.770	25.03	.0111
1.263	6.050	34.02	.0104
1.421	7.479	44.76	.0097
1.579	9.058	57.35	.0092
1.737	10.787	71.91	.0088
1.895	12.665	88.55	.0083
2.053	14.693	107.38	.0080
2.211	16.870	128.51	.0077
2.368	19.197	152.03	.0074
2.526	21.673	178.05	.0071
2.684	24.299	206.66	.0069
2.842	27.075	237.97	.0066
3.000	30.000	272.07	.0064

*
ROUTE ID=11 HYD NO=134.1 INFLOW ID=1 DT=0.0
*

*S*****
*S BASIN 133
*S*****
*

*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME
*

COMPUTE LT TP LCODE=1 NK=1 ISLOPE=0
LENGTH=600 FT SLOPE=0.0533 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	ADJUSTED SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	600.0	.049310	3.0000
TOTAL BASIN	600.0	.049310	3.0000

TIME OF CONCENTRATION (HRS)= .0250 TIME TO PEAK (HRS)= .0167 LAG TIME (HRS)= .0188

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

.1500

*

SEDIMENT BULK CODE=1 BULK FACTOR=1.04
 COMPUTE NM HYD ID=2 HYD NO=133 DA=.00138 SQ MI
 %A=0 %B=0 %C=80 %D=20
 TP=0.0 HR
 MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 1.0894 CFS UNIT VOLUME = .9890 B = 526.28 P60 = 2.0000
 AREA = .000276 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .107360HR TP = .133333HR K/TP RATIO = .805200 SHAPE CONSTANT, N = 4.445615
 UNIT PEAK = 3.1784 CFS UNIT VOLUME = .9981 B = 383.86 P60 = 2.0000
 AREA = .001104 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.04000 AT PEAK FLOW.

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 133.00

RUNOFF VOLUME = 1.45325 INCHES = .1070 ACRE-FEET
 PEAK DISCHARGE RATE = 3.11 CFS AT 1.500 HOURS BASIN AREA = .0014 SQ. MI.

*

*S ROUTE 133 THRU 132 - CHANNEL

*

COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=3
 MIN ELEV=0.0 FT MAX ELEV=3.0 FT
 CH SLP=0.0476 FP SLP=0.0476 N=0.05
 DIST=9 FT N=0.04 DIST=10 FT N=0.05
 DIST=19
 DIST ELEV DIST ELEV DIST ELEV
 0 3.0 9 0.0 10 0.0
 19 3.0

RATING CURVE VALLEY SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	1.00
.16	.23	.46	1.95
.32	.61	1.73	2.89
.47	1.15	3.95	3.84
.63	1.83	7.24	4.79
.79	2.66	11.76	5.74
.95	3.64	17.65	6.68
1.11	4.77	25.03	7.63
1.26	6.05	34.02	8.58
1.42	7.48	44.76	9.53
1.58	9.06	57.35	10.47
1.74	10.79	71.91	11.42
1.89	12.66	88.55	12.37
2.05	14.69	107.38	13.32
2.21	16.87	128.51	14.26
2.37	19.20	152.03	15.21
2.53	21.67	178.05	16.16
2.68	24.30	206.66	17.11
2.84	27.07	237.97	18.05
3.00	30.00	272.07	19.00

*

COMPUTE TRAVEL TIME ID=12 REACH NO=1 NO VS=1 L=120 FT

SLP=.0476

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.158	.233	.46	.0169
.316	.615	1.73	.0118
.474	1.147	3.95	.0097
.632	1.828	7.24	.0084
.789	2.659	11.76	.0075
.947	3.640	17.65	.0069
1.105	4.770	25.03	.0064
1.263	6.050	34.02	.0059
1.421	7.479	44.76	.0056
1.579	9.058	57.35	.0053
1.737	10.787	71.91	.0050
1.895	12.665	88.55	.0048
2.053	14.693	107.38	.0046
2.211	16.870	128.51	.0044
2.368	19.197	152.03	.0042
2.526	21.673	178.05	.0041
2.684	24.299	206.66	.0039
2.842	27.075	237.97	.0038
3.000	30.000	272.07	.0037

*
ROUTE ID=12 HYD NO=133.1 INFLOW ID=2 DT=0.0
*

*S COMBINE BASIN 134.1 WITH 133.1
*

ADD HYD ID=13 HYD=133.5 ID I=11 ID II=12
PRINT HYD ID=13 CODE=1

PARTIAL HYDROGRAPH 133.50

RUNOFF VOLUME = 1.46984 INCHES = .4202 ACRE-FEET
PEAK DISCHARGE RATE = 12.02 CFS AT 1.500 HOURS BASIN AREA = .0054 SQ. MI.

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*S*****
*S BASIN 132
*S*****
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*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME
*

COMPUTE LT TP LCODE=1 NK=1 ISLOPE=1
LENGTH=600 FT SLOPE=0.1033 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	ADJUSTED SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	600.0	.058750	3.0000
TOTAL BASIN	600.0	.058750	3.0000

TIME OF CONCENTRATION (HRS)= .0229 TIME TO PEAK (HRS)= .0153 LAG TIME (HRS)= .0172

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

.1500

*
SEDIMENT BULK CODE=1 BULK FACTOR=1.14
COMPUTE NM HYD ID=3 HYD NO=132 DA=.00459 SQ MI
%A=19 %B=0 %C=79 %D=2
TP=0.0 HR
MASS RAINFALL=-1
TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = .36234 CFS UNIT VOLUME = .9674 B = 526.28 P60 = 2.0000

AREA = .000092 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .117652HR TP = .133333HR K/TP RATIO = .882392 SHAPE CONSTANT, N = 4.021801
UNIT PEAK = 12.031 CFS UNIT VOLUME = 1.000 B = 356.62 P60 = 2.0000
AREA = .004498 SQ MI IA = .40816 INCHES INF = .99286 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.14000 AT PEAK FLOW.

PRINT HYD

ID=3 CODE=1

PARTIAL HYDROGRAPH 132.00

RUNOFF VOLUME = 1.12537 INCHES = .2755 ACRE-FEET
PEAK DISCHARGE RATE = 9.26 CFS AT 1.500 HOURS BASIN AREA = .0046 SQ. MI.

*
*S COMBINE BASIN 133.5 WITH 132
*

ADD HYD ID=14 HYD=132.5 ID I=13 ID II=3
PRINT HYD ID=14 CODE=1

PARTIAL HYDROGRAPH 132.50

RUNOFF VOLUME = 1.31092 INCHES = .6957 ACRE-FEET
PEAK DISCHARGE RATE = 21.28 CFS AT 1.500 HOURS BASIN AREA = .0100 SQ. MI.

*
*
*S ROUTE 132.5 THRU 131 - CHANNEL
*

COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=3
MIN ELEV=0.0 FT MAX ELEV=3.0 FT
CH SLP=0.0462 FP SLP=0.0462 N=0.05
DIST=9 FT N=0.04 DIST=10 FT N=0.05
DIST=19
DIST ELEV DIST ELEV DIST ELEV
0 3.0 9 0.0 10 0.0
19 3.0

RATING CURVE VALLEY SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	1.00
.16	.23	.45	1.95
.32	.61	1.71	2.89
.47	1.15	3.89	3.84
.63	1.83	7.14	4.79
.79	2.66	11.59	5.74
.95	3.64	17.39	6.68
1.11	4.77	24.66	7.63
1.26	6.05	33.52	8.58
1.42	7.48	44.09	9.53
1.58	9.06	56.50	10.47
1.74	10.79	70.84	11.42
1.89	12.66	87.24	12.37
2.05	14.69	105.79	13.32
2.21	16.87	126.60	14.26
2.37	19.20	149.78	15.21
2.53	21.67	175.41	16.16
2.68	24.30	203.60	17.11
2.84	27.07	234.45	18.05
3.00	30.00	268.04	19.00

*
COMPUTE TRAVEL TIME ID=15 REACH NO=1 NO VS=1 L=130 FT
SLP=.0462

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.158	.233	.45	.0185
.316	.615	1.71	.0130

ADD HYD ID=16 HYD=131.5 ID I=15 ID II=4

PRINT HYD

ID=16 CODE=1

PARTIAL HYDROGRAPH 131.50

RUNOFF VOLUME = 1.27312 INCHES = 1.0321 ACRE-FEET
 PEAK DISCHARGE RATE = 32.01 CFS AT 1.500 HOURS BASIN AREA = .0152 SQ. MI.

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*S ROUTE 130 BASINS THRU RESERVOIR

*

ROUTE RESERVOIR

ID=50 HYD=131.6 INFLOW ID=16 CODE=5

OUTFLOW (CFS) STORAGE (AC FT) ELEV (FT)

0	0	100
10	0.08	101
20	0.16	102
30	0.24	103
40	0.32	104

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
.25	.00	100.00	.000	.00
.50	.00	100.00	.000	.00
.75	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
1.25	.24	100.01	.000	.06
1.50	32.01	101.80	.144	18.02
1.75	12.09	101.81	.145	18.14
2.00	4.58	100.72	.058	7.20
2.25	1.66	100.27	.022	2.71
2.50	.79	100.11	.009	1.13
2.75	.39	100.05	.004	.54
3.00	.20	100.03	.002	.27
3.25	.11	100.01	.001	.14
3.50	.06	100.01	.001	.08
3.75	.03	100.00	.000	.04
4.00	.03	100.00	.000	.03
4.25	.02	100.00	.000	.03
4.50	.02	100.00	.000	.02
4.75	.02	100.00	.000	.02
5.00	.03	100.00	.000	.03
5.25	.03	100.00	.000	.03
5.50	.03	100.00	.000	.03
5.75	.03	100.00	.000	.03
6.00	.03	100.00	.000	.03
6.25	.04	100.00	.000	.04
6.50	.05	100.00	.000	.05
6.75	.05	100.00	.000	.05
7.00	.05	100.00	.000	.05
7.25	.05	100.00	.000	.05
7.50	.04	100.00	.000	.04
7.75	.04	100.00	.000	.04
8.00	.04	100.00	.000	.04
8.25	.04	100.00	.000	.04
8.50	.04	100.00	.000	.04
8.75	.04	100.00	.000	.04
9.00	.04	100.00	.000	.04
9.25	.04	100.00	.000	.04
9.50	.04	100.00	.000	.04
9.75	.04	100.00	.000	.04
10.00	.04	100.00	.000	.04
10.25	.04	100.00	.000	.04
10.50	.04	100.00	.000	.04
10.75	.04	100.00	.000	.04
11.00	.04	100.00	.000	.04
11.25	.04	100.00	.000	.04
11.50	.04	100.00	.000	.04
11.75	.03	100.00	.000	.03
12.00	.03	100.00	.000	.03
12.25	.03	100.00	.000	.03
12.50	.03	100.00	.000	.03
12.75	.03	100.00	.000	.03
13.00	.03	100.00	.000	.03
13.25	.03	100.00	.000	.03
13.50	.03	100.00	.000	.03
13.75	.03	100.00	.000	.03

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
14.00	.03	100.00	.000	.03
14.25	.03	100.00	.000	.03
14.50	.03	100.00	.000	.03
14.75	.03	100.00	.000	.03
15.00	.03	100.00	.000	.03
15.25	.03	100.00	.000	.03
15.50	.03	100.00	.000	.03
15.75	.03	100.00	.000	.03
16.00	.03	100.00	.000	.03
16.25	.03	100.00	.000	.03
16.50	.03	100.00	.000	.03
16.75	.03	100.00	.000	.03
17.00	.03	100.00	.000	.03
17.25	.03	100.00	.000	.03
17.50	.03	100.00	.000	.03
17.75	.03	100.00	.000	.03
18.00	.03	100.00	.000	.03
18.25	.03	100.00	.000	.03
18.50	.03	100.00	.000	.03
18.75	.03	100.00	.000	.03
19.00	.03	100.00	.000	.03
19.25	.03	100.00	.000	.03
19.50	.03	100.00	.000	.03
19.75	.03	100.00	.000	.03
20.00	.03	100.00	.000	.03
20.25	.02	100.00	.000	.02
20.50	.02	100.00	.000	.02
20.75	.02	100.00	.000	.02
21.00	.02	100.00	.000	.02
21.25	.02	100.00	.000	.02
21.50	.02	100.00	.000	.02
21.75	.02	100.00	.000	.02
22.00	.02	100.00	.000	.02
22.25	.02	100.00	.000	.02
22.50	.02	100.00	.000	.02
22.75	.02	100.00	.000	.02
23.00	.02	100.00	.000	.02
23.25	.02	100.00	.000	.02
23.50	.02	100.00	.000	.02
23.75	.02	100.00	.000	.02
24.00	.02	100.00	.000	.02
24.25	.00	100.00	.000	.01
24.50	.00	100.00	.000	.00

PEAK DISCHARGE = 25.197 CFS - PEAK OCCURS AT HOUR 1.60
 MAXIMUM WATER SURFACE ELEVATION = 102.520
 MAXIMUM STORAGE = .2016 AC-FT INCREMENTAL TIME= .050000HRS

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*S ROUTE 131.6 TO JUNCTION - 36" PIPE SECTION

COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLP=0.0183
 DIA=3.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.16	.14	.47	1.33
.31	.39	2.05	1.83
.47	.71	4.78	2.18
.63	1.07	8.59	2.44
.78	1.46	13.41	2.63
.94	1.89	19.14	2.78
1.09	2.33	25.64	2.89
1.25	2.79	32.78	2.96
1.41	3.26	40.41	2.99
1.56	3.72	48.36	3.00
1.72	4.19	56.46	3.00
1.88	4.65	64.51	3.00
2.03	5.10	72.31	3.00
2.19	5.53	79.61	3.00
2.35	5.93	86.14	3.00
2.50	6.30	91.57	3.00
2.66	6.62	95.46	3.00
2.81	6.89	97.06	3.00
3.00	7.07	97.06	3.00

*
 COMPUTE TRAVEL TIME ID=17 REACH NO=1 NO VS=1 L=300 FT
 SLP=.0183

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ. FT.	FLOW RATE CFS	TRAVEL TIME HRS
.156	.140	.47	.0247
.313	.391	2.05	.0159
.469	.706	4.78	.0123
.625	1.068	8.59	.0104
.782	1.465	13.41	.0091
.938	1.889	19.14	.0082
1.094	2.332	25.64	.0076
1.251	2.790	32.78	.0071
1.407	3.255	40.41	.0067
1.563	3.724	48.36	.0064
1.720	4.191	56.46	.0062
1.876	4.650	64.51	.0060
2.032	5.097	72.31	.0059
2.189	5.525	79.61	.0058
2.345	5.928	86.14	.0057
2.501	6.297	91.57	.0057
2.658	6.622	95.46	.0058
2.814	6.887	97.06	.0059
3.000	7.069	97.06	.0061

*
ROUTE ID=17 HYD NO=131.9 INFLOW ID=50 DT=0.0
*

*S*****

*S*****
*S BASIN 122

*S*****
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*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME
*

COMPUTE LT TP LCODE=1 NK=1 ISLOPE=0
LENGTH=140 FT SLOPE=0.0214 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	140.0	.021400	3.0000
TOTAL BASIN	140.0	.021400	3.0000

TIME OF CONCENTRATION (HRS)= .0089 TIME TO PEAK (HRS)= .0059 LAG TIME (HRS)= .0066

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

.1500 REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

*
SEDIMENT BULK CODE=1 BULK FACTOR=1.00
COMPUTE NM HYD ID=5 HYD NO=122 DA=.00034 SQ MI
%A=0 %B=0 %C=0 %D=100
TP=0.0 HR
MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 1.3420 CFS UNIT VOLUME = .9911 B = 526.28 P60 = 2.0000
AREA = .000340 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 122.00

RUNOFF VOLUME = 2.56833 INCHES = .0466 ACRE-Feet
PEAK DISCHARGE RATE = 1.01 CFS AT 1.500 HOURS BASIN AREA = .0003 SQ. MI.

*
*S ROUTE 122 TO JUNCTION - 24" PIPE SECTION

*
 COMPUTE RATING CURVE CID=1 VS NO=1 CODE =-1 SLP=0.01
 DIA=2.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.10	.06	.12	.89
.21	.17	.52	1.22
.31	.31	1.20	1.45
.42	.47	2.15	1.62
.52	.65	3.36	1.76
.63	.84	4.80	1.85
.73	1.04	6.43	1.93
.83	1.24	8.22	1.97
.94	1.45	10.13	2.00
1.04	1.66	12.13	2.00
1.15	1.86	14.16	2.00
1.25	2.07	16.18	2.00
1.35	2.27	18.13	2.00
1.46	2.46	19.96	2.00
1.56	2.63	21.60	2.00
1.67	2.80	22.96	2.00
1.77	2.94	23.93	2.00
1.88	3.06	24.34	2.00
2.00	3.14	24.34	2.00

*
 COMPUTE TRAVEL TIME ID=18 REACH NO=1 NO VS=1 L=120 FT
 SLP=.01

TRAVEL TIME TABLE
 REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.104	.062	.12	.0175
.208	.174	.52	.0112
.313	.314	1.20	.0087
.417	.475	2.15	.0073
.521	.651	3.36	.0065
.625	.839	4.80	.0058
.730	1.037	6.43	.0054
.834	1.240	8.22	.0050
.938	1.447	10.13	.0048
1.042	1.655	12.13	.0046
1.146	1.863	14.16	.0044
1.251	2.067	16.18	.0043
1.355	2.265	18.13	.0042
1.459	2.456	19.96	.0041
1.563	2.635	21.60	.0041
1.668	2.799	22.96	.0041
1.772	2.943	23.93	.0041
1.876	3.061	24.34	.0042
2.000	3.142	24.34	.0043

*
 ROUTE ID=18 HYD NO=122.1 INFLOW ID=5 DT=0.0
 *

*S*****
 *S BASIN 123
 *S*****
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*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME
 *

COMPUTE LT TP LCODE=1 NK=1 ISLOPE=0
 LENGTH=230 FT SLOPE=0.0391 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS	LENGTH (FT)	SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	230.0	.039100	3.0000
TOTAL BASIN	230.0	.039100	3.0000

TIME OF CONCENTRATION (HRS)= .0108 TIME TO PEAK (HRS)= .0072 LAG TIME (HRS)= .0081

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

.1500

*

SEDIMENT BULK CODE=1 BULK FACTOR=1.02
COMPUTE NM HYD ID=6 HYD NO=123 DA=.00066 SQ MI
%A=0 %B=0 %C=0 %D=100
TP=0.0 HR
MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 2.6051 CFS UNIT VOLUME = .9951 B = 526.28 P60 = 2.0000
AREA = .000660 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.02000 AT PEAK FLOW.

PRINT HYD ID=6 CODE=1

PARTIAL HYDROGRAPH 123.00

RUNOFF VOLUME = 2.61970 INCHES = .0922 ACRE-FEET
PEAK DISCHARGE RATE = 1.99 CFS AT 1.500 HOURS BASIN AREA = .0007 SQ. MI.

*

*S ROUTE 123 TO JUNCTION - 24" PIPE SECTION

*

COMPUTE RATING CURVE CID=1 VS NO=1 CODE =-1 SLP=0.02
DIA=2.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.10	.06	.17	.89
.21	.17	.73	1.22
.31	.31	1.69	1.45
.42	.47	3.05	1.62
.52	.65	4.76	1.76
.63	.84	6.79	1.85
.73	1.04	9.09	1.93
.83	1.24	11.62	1.97
.94	1.45	14.33	2.00
1.04	1.66	17.15	2.00
1.15	1.86	20.02	2.00
1.25	2.07	22.88	2.00
1.35	2.27	25.64	2.00
1.46	2.46	28.23	2.00
1.56	2.63	30.54	2.00
1.67	2.80	32.47	2.00
1.77	2.94	33.85	2.00
1.88	3.06	34.41	2.00
2.00	3.14	34.42	2.00

*

COMPUTE TRAVEL TIME ID=19 REACH NO=1 NO VS=1 L=130 FT
SLP=.02

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ. FT.	FLOW RATE CFS	TRAVEL TIME HRS
.104	.062	.17	.0134
.208	.174	.73	.0086
.313	.314	1.69	.0067
.417	.475	3.05	.0056
.521	.651	4.76	.0049
.625	.839	6.79	.0045
.730	1.037	9.09	.0041
.834	1.240	11.62	.0039
.938	1.447	14.33	.0036
1.042	1.655	17.15	.0035
1.146	1.863	20.02	.0034
1.251	2.067	22.88	.0033
1.355	2.265	25.64	.0032
1.459	2.456	28.23	.0031
1.563	2.635	30.54	.0031

1.668	2.799	32.47	.0031
1.772	2.943	33.85	.0031
1.876	3.061	34.41	.0032
2.000	3.142	34.42	.0033

*
 ROUTE ID=19 HYD NO=123.1 INFLOW ID=6 DT=0.0
 *

*S COMBINE BASIN 122.1 WITH 123.1
 *

ADD HYD ID=20 HYD=122.5 ID I=18 ID II=19
 PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 131.00

RUNOFF VOLUME = 1.20153 INCHES = .3364 ACRE-FEET
 PEAK DISCHARGE RATE = 10.83 CFS AT 1.500 HOURS BASIN AREA = .0053 SQ. MI.

*
 *S*****
 *S BASIN 124
 *S*****
 *

*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME
 *

COMPUTE LT TP LCODE=1 NK=1 ISLOPE=0
 LENGTH=415 FT SLOPE=0.0795 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	ADJUSTED SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	415.0	.056248	3.0000
TOTAL BASIN	415.0	.056248	3.0000

TIME OF CONCENTRATION (HRS)= .0162 TIME TO PEAK (HRS)= .0108 LAG TIME (HRS)= .0122

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

.1500 REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

*
 SEDIMENT BULK CODE=1 BULK FACTOR=1.07
 COMPUTE NM HYD ID=7 HYD NO=124 DA=.00203 SQ MI
 %A=0 %B=0 %C=86 %D=14
 TP=0.0 HR
 MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 1.1218 CFS UNIT VOLUME = .9890 B = 526.28 P60 = 2.0000
 AREA = .000284 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .107360HR TP = .133333HR K/TP RATIO = .805200 SHAPE CONSTANT, N = 4.445615
 UNIT PEAK = 5.0261 CFS UNIT VOLUME = .9995 B = 383.86 P60 = 2.0000
 AREA = .001746 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.07000 AT PEAK FLOW.

PRINT HYD ID=7 CODE=1

PARTIAL HYDROGRAPH 124.00

RUNOFF VOLUME = 1.40120 INCHES = .1517 ACRE-FEET
 PEAK DISCHARGE RATE = 4.58 CFS AT 1.500 HOURS BASIN AREA = .0020 SQ. MI.

*
 *S ROUTE 124 TO JUNCTION - 24" PIPE SECTION
 *
 COMPUTE RATING CURVE CID=1 VS NQ=1 CODE =-1 SLP=0.03

DIA=2.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.10	.06	.21	.89
.21	.17	.89	1.22
.31	.31	2.07	1.45
.42	.47	3.73	1.62
.52	.65	5.82	1.76
.63	.84	8.31	1.85
.73	1.04	11.13	1.93
.83	1.24	14.24	1.97
.94	1.45	17.55	2.00
1.04	1.66	21.00	2.00
1.15	1.86	24.52	2.00
1.25	2.07	28.02	2.00
1.35	2.27	31.40	2.00
1.46	2.46	34.57	2.00
1.56	2.63	37.41	2.00
1.67	2.80	39.77	2.00
1.77	2.94	41.46	2.00
1.88	3.06	42.15	2.00
2.00	3.14	42.15	2.00

*
COMPUTE TRAVEL TIME ID=21 REACH NO=1 NO VS=1 L=290 FT
SLP=.03

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.104	.062	.21	.0245
.208	.174	.89	.0157
.313	.314	2.07	.0122
.417	.475	3.73	.0102
.521	.651	5.82	.0090
.625	.839	8.31	.0081
.730	1.037	11.13	.0075
.834	1.240	14.24	.0070
.938	1.447	17.55	.0066
1.042	1.655	21.00	.0063
1.146	1.863	24.52	.0061
1.251	2.067	28.02	.0059
1.355	2.265	31.40	.0058
1.459	2.456	34.57	.0057
1.563	2.635	37.41	.0057
1.668	2.799	39.77	.0057
1.772	2.943	41.46	.0057
1.876	3.061	42.15	.0058
2.000	3.142	42.15	.0060

*
ROUTE ID=21 HYD NO=124.1 INFLOW ID=7 DT=0.0
*

*S COMBINE BASIN 124.1 WITH 122.5
*

ADD HYD ID=22 HYD=124.5 ID I=20 ID II=21
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 131.00

RUNOFF VOLUME = 1.20153 INCHES = .3364 ACRE-FEET
PEAK DISCHARGE RATE = 10.83 CFS AT 1.500 HOURS BASIN AREA = .0053 SQ. MI.

*
*
*S ROUTE 124.5 TO END OF 121 - 36" PIPE SECTION
*

COMPUTE RATING CURVE CID=1 VS NO=1 CODE =-1 SLP=0.01
DIA=3.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00

.16	.14	.35	1.33
.31	.39	1.52	1.83
.47	.71	3.53	2.18
.63	1.07	6.35	2.44
.78	1.46	9.92	2.63
.94	1.89	14.15	2.78
1.09	2.33	18.95	2.89
1.25	2.79	24.23	2.96
1.41	3.26	29.87	2.99
1.56	3.72	35.75	3.00
1.72	4.19	41.74	3.00
1.88	4.65	47.69	3.00
2.03	5.10	53.45	3.00
2.19	5.53	58.85	3.00
2.35	5.93	63.68	3.00
2.50	6.30	67.69	3.00
2.66	6.62	70.57	3.00
2.81	6.89	71.75	3.00
3.00	7.07	71.75	3.00

*
 COMPUTE TRAVEL TIME ID=23 REACH NO=1 NO VS=1 L=100 FT
 SLP=.01

TRAVEL TIME TABLE
 REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.156	.140	.35	.0112
.313	.391	1.52	.0071
.469	.706	3.53	.0056
.625	1.068	6.35	.0047
.782	1.465	9.92	.0041
.938	1.889	14.15	.0037
1.094	2.332	18.95	.0034
1.251	2.790	24.23	.0032
1.407	3.255	29.87	.0030
1.563	3.724	35.75	.0029
1.720	4.191	41.74	.0028
1.876	4.650	47.69	.0027
2.032	5.097	53.45	.0026
2.189	5.525	58.85	.0026
2.345	5.928	63.68	.0026
2.501	6.297	67.69	.0026
2.658	6.622	70.57	.0026
2.814	6.887	71.75	.0027
3.000	7.069	71.75	.0027

*
 ROUTE ID=23 HYD NO=124.9 INFLOW ID=22 DT=0.0

*S*****
 *S BASIN 121
 *S*****

*
 *COMPUTE TIME TO PEAK USING UPLAND/LAG TIME

*
 COMPUTE LT TP LCODE=1 NK=1 ISLOPE=0
 LENGTH=320 FT SLOPE=0.0250 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	320.0	.025000	3.0000
TOTAL BASIN	320.0	.025000	3.0000

TIME OF CONCENTRATION (HRS)= .0187 TIME TO PEAK (HRS)= .0125 LAG TIME (HRS)= .0141

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

.1500

*
 SEDIMENT BULK CODE=1 BULK FACTOR=1.01
 COMPUTE NM HYD ID=8 HYD NO=121 DA=.00167 SQ MI
 %A=0 %B=11 %C=8 %D=81
 TP=0.0 HR
 MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 5.3392 CFS UNIT VOLUME = .9971 B = 526.28 P60 = 2.0000
AREA = .001353 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .121625HR TP = .133333HR K/TP RATIO = .912189 SHAPE CONSTANT, N = 3.882111
UNIT PEAK = .82633 CFS UNIT VOLUME = .9866 B = 347.23 P60 = 2.0000
AREA = .000317 SQ MI IA = .43684 INCHES INF = 1.07316 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.01000 AT PEAK FLOW.

PRINT HYD

ID=8 CODE=1

PARTIAL HYDROGRAPH 121.00

RUNOFF VOLUME = 2.27190 INCHES = .2023 ACRE-FEET
PEAK DISCHARGE RATE = 4.56 CFS AT 1.500 HOURS BASIN AREA = .0017 SQ. MI.

*
*S COMBINE BASIN 124.9 WITH 121
*

ADD HYD
PRINT HYD

ID=24 HYD=121.5 ID I=23 ID II=8
ID=24 CODE=1

PARTIAL HYDROGRAPH 121.50

RUNOFF VOLUME = 1.96596 INCHES = .4928 ACRE-FEET
PEAK DISCHARGE RATE = 12.14 CFS AT 1.500 HOURS BASIN AREA = .0047 SQ. MI.

*
*S ROUTE 121.5 TO JUNCTION - 36" PIPE SECTION
*

COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLP=0.01
DIA=3.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.16	.14	.35	1.33
.31	.39	1.52	1.83
.47	.71	3.53	2.18
.63	1.07	6.35	2.44
.78	1.46	9.92	2.63
.94	1.89	14.15	2.78
1.09	2.33	18.95	2.89
1.25	2.79	24.23	2.96
1.41	3.26	29.87	2.99
1.56	3.72	35.75	3.00
1.72	4.19	41.74	3.00
1.88	4.65	47.69	3.00
2.03	5.10	53.45	3.00
2.19	5.53	58.85	3.00
2.35	5.93	63.68	3.00
2.50	6.30	67.69	3.00
2.66	6.62	70.57	3.00
2.81	6.89	71.75	3.00
3.00	7.07	71.75	3.00

*
COMPUTE TRAVEL TIME ID=25 REACH NO=1 NO VS=1 L=120 FT
SLP=.01

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.156	.140	.35	.0134
.313	.391	1.52	.0086
.469	.706	3.53	.0067
.625	1.068	6.35	.0056
.782	1.465	9.92	.0049

.938	1.889	14.15	.0045
1.094	2.332	18.95	.0041
1.251	2.790	24.23	.0038
1.407	3.255	29.87	.0036
1.563	3.724	35.75	.0035
1.720	4.191	41.74	.0033
1.876	4.650	47.69	.0033
2.032	5.097	53.45	.0032
2.189	5.525	58.85	.0031
2.345	5.928	63.68	.0031
2.501	6.297	67.69	.0031
2.658	6.622	70.57	.0031
2.814	6.887	71.75	.0032
3.000	7.069	71.75	.0033

*
 ROUTE ID=25 HYD NO=121.8 INFLOW ID=24 DT=0.0
 *

*S*****
 *

*S COMBINE BASIN 131.9 WITH 121.8
 *

ADD HYD ID=26 HYD=121.9 ID I=17 ID II=25
 PRINT HYD ID=26 CODE=1

PARTIAL HYDROGRAPH 121.90

RUNOFF VOLUME = 1.43675 INCHES = 1.5249 ACRE-FEET
 PEAK DISCHARGE RATE = 34.39 CFS AT 1.550 HOURS BASIN AREA = .0199 SQ. MI.

*
 *
 *S ROUTE 121.9 TO JUNCTION - 48" PIPE SECTION
 *

COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLP=0.0183
 DIA=4.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.21	.25	1.02	1.78
.42	.69	4.42	2.44
.63	1.25	10.29	2.91
.83	1.90	18.50	3.25
1.04	2.60	28.89	3.51
1.25	3.36	41.21	3.71
1.46	4.15	55.22	3.85
1.67	4.96	70.60	3.94
1.88	5.79	87.03	3.99
2.08	6.62	104.16	4.00
2.29	7.45	121.60	4.00
2.50	8.27	138.94	4.00
2.71	9.06	155.72	4.00
2.92	9.82	171.44	4.00
3.13	10.54	185.51	4.00
3.34	11.20	197.21	4.00
3.54	11.77	205.59	4.00
3.75	12.24	209.03	4.00
4.00	12.57	209.03	4.00

*
 COMPUTE TRAVEL TIME ID=27 REACH NO=1 NO VS=1 L=150 FT
 SLP=.0183

TRAVEL TIME TABLE
 REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	1.02	.0102
.417	.695	4.42	.0065
.625	1.255	10.29	.0051
.834	1.898	18.50	.0043
1.042	2.604	28.89	.0038
1.251	3.358	41.21	.0034
1.459	4.146	55.22	.0031
1.668	4.960	70.60	.0029
1.876	5.788	87.03	.0028

2.084	6.621	104.16	.0026
2.293	7.451	121.60	.0026
2.501	8.267	138.94	.0025
2.710	9.062	155.72	.0024
2.918	9.823	171.44	.0024
3.127	10.539	185.51	.0024
3.335	11.195	197.21	.0024
3.544	11.773	205.59	.0024
3.752	12.243	209.03	.0024
4.000	12.566	209.03	.0025

*
 ROUTE ID=27 HYD NO=121.95 INFLOW ID=26 DT=0.0
 *

*S*****
 *S BASIN 113
 *S*****
 *

*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME
 *

COMPUTE LT TP LCODE=1 NK=1 ISLOPE=1
 LENGTH=530 FT SLOPE=0.0491 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	ADJUSTED SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	530.0	.047081	3.0000
TOTAL BASIN	530.0	.047081	3.0000

TIME OF CONCENTRATION (HRS)= .0226 TIME TO PEAK (HRS)= .0151 LAG TIME (HRS)= .0170

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

.1500 REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

*
 SEDIMENT BULK CODE=1 BULK FACTOR=1.04
 COMPUTE NM HYD ID=9 HYD NO=113 DA=.00191 SQ MI
 %A=0 %B=0 %C=86 %D=14
 TP=0.0 HR
 MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 1.0554 CFS UNIT VOLUME = .9890 B = 526.28 P60 = 2.0000
 AREA = .000267 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .107360HR TP = .133333HR K/TP RATIO = .805200 SHAPE CONSTANT, N = 4.445615
 UNIT PEAK = 4.7290 CFS UNIT VOLUME = .9991 B = 383.86 P60 = 2.0000
 AREA = .001643 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.04000 AT PEAK FLOW.

PRINT HYD ID=9 CODE=1

PARTIAL HYDROGRAPH 113.00

RUNOFF VOLUME = 1.36192 INCHES = .1387 ACRE-FEET
 PEAK DISCHARGE RATE = 4.19 CFS AT 1.500 HOURS BASIN AREA = .0019 SQ. MI.

*
 *
 *S ROUTE 113 TO JUNCTION - 24" PIPE SECTION
 *

COMPUTE RATING CURVE CID=1 VS NO=1 CODE =-1 SLP=0.01
 DIA=2.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER	FLOW	FLOW	MAX
SURFACE	AREA	RATE	WIDTH
ELEV	SQ FT	CFS	FT
.00	.00	.00	.00

.10	.06	.12	.89
.21	.17	.52	1.22
.31	.31	1.20	1.45
.42	.47	2.15	1.62
.52	.65	3.36	1.76
.63	.84	4.80	1.85
.73	1.04	6.43	1.93
.83	1.24	8.22	1.97
.94	1.45	10.13	2.00
1.04	1.66	12.13	2.00
1.15	1.86	14.16	2.00
1.25	2.07	16.18	2.00
1.35	2.27	18.13	2.00
1.46	2.46	19.96	2.00
1.56	2.63	21.60	2.00
1.67	2.80	22.96	2.00
1.77	2.94	23.93	2.00
1.88	3.06	24.34	2.00
2.00	3.14	24.34	2.00

*

COMPUTE TRAVEL TIME ID=28 REACH NO=1 NO VS=1 L=110 FT
SLP=.01

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.104	.062	.12	.0161
.208	.174	.52	.0103
.313	.314	1.20	.0080
.417	.475	2.15	.0067
.521	.651	3.36	.0059
.625	.839	4.80	.0053
.730	1.037	6.43	.0049
.834	1.240	8.22	.0046
.938	1.447	10.13	.0044
1.042	1.655	12.13	.0042
1.146	1.863	14.16	.0040
1.251	2.067	16.18	.0039
1.355	2.265	18.13	.0038
1.459	2.456	19.96	.0038
1.563	2.635	21.60	.0037
1.668	2.799	22.96	.0037
1.772	2.943	23.93	.0038
1.876	3.061	24.34	.0038
2.000	3.142	24.34	.0039

*

ROUTE ID=28 HYD NO=113.5 INFLOW ID=9 DT=0.0

*

*

*S COMBINE BASIN 121.95 WITH 113.5

*

ADD HYD ID=29 HYD=113.9 ID I=27 ID II=28
PRINT HYD ID=29 CODE=1

PARTIAL HYDROGRAPH 113.90

RUNOFF VOLUME = 1.43021 INCHES = 1.6636 ACRE-FEET
PEAK DISCHARGE RATE = 38.15 CFS AT 1.550 HOURS BASIN AREA = .0218 SQ. MI.

*

*

*

*S*****

*S BASIN 112

*S*****

*

*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME

*

COMPUTE LT TP LCODE=1 NK=1 ISLOPE=1
LENGTH=580 FT SLOPE=0.0155 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	580.0	.015500	3.0000

TOTAL BASIN 580.0 .015500 3.0000

TIME OF CONCENTRATION (HRS)= .0431 TIME TO PEAK (HRS)= .0288 LAG TIME (HRS)= .0324

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

REVISD VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)= .1500

*
SEDIMENT BULK CODE=1 BULK FACTOR=1.01
COMPUTE NM HYD ID=10 HYD NO=112 DA=.00244 SQ MI
%A=0 %B=17 %C=0 %D=83
TP=0.0 HR
MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 7.9936 CFS UNIT VOLUME = .9978 B = 526.28 P60 = 2.0000
AREA = .002025 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .132000HR TP = .133333HR K/TP RATIO = .990000 SHAPE CONSTANT, N = 3.566429
UNIT PEAK = 1.0115 CFS UNIT VOLUME = .9880 B = 325.15 P60 = 2.0000
AREA = .000415 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.01000 AT PEAK FLOW.

PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 112.00

RUNOFF VOLUME = 2.28315 INCHES = .2971 ACRE-FEET
PEAK DISCHARGE RATE = 6.62 CFS AT 1.500 HOURS BASIN AREA = .0024 SQ. MI.

*
*S COMBINE BASIN 113.9 WITH 112
*

ADD HYD ID=30 HYD=112.5 ID I=29 ID II=10
PRINT HYD ID=30 CODE=1

PARTIAL HYDROGRAPH 112.50

RUNOFF VOLUME = 1.51602 INCHES = 1.9607 ACRE-FEET
PEAK DISCHARGE RATE = 43.96 CFS AT 1.550 HOURS BASIN AREA = .0243 SQ. MI.

*
*
*S ROUTE 112.5 THRU 111 - 48" PIPE SECTION
*

COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLP=0.02
DIA=4.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.21	.25	1.07	1.78
.42	.69	4.63	2.44
.63	1.25	10.75	2.91
.83	1.90	19.34	3.25
1.04	2.60	30.20	3.51
1.25	3.36	43.09	3.71
1.46	4.15	57.73	3.85
1.67	4.96	73.80	3.94
1.88	5.79	90.98	3.99
2.08	6.62	108.89	4.00
2.29	7.45	127.12	4.00
2.50	8.27	145.25	4.00
2.71	9.06	162.80	4.00
2.92	9.82	179.23	4.00
3.13	10.54	193.93	4.00
3.34	11.20	206.17	4.00

	3.54	11.77	214.92	4.00
	3.75	12.24	218.52	4.00
*	4.00	12.57	218.52	4.00

COMPUTE TRAVEL TIME ID=31 REACH NO=1 NO VS=1 L=150 FT
SLP=.02

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	1.07	.0098
.417	.695	4.63	.0063
.625	1.255	10.75	.0049
.834	1.898	19.34	.0041
1.042	2.604	30.20	.0036
1.251	3.358	43.09	.0032
1.459	4.146	57.73	.0030
1.668	4.960	73.80	.0028
1.876	5.788	90.98	.0027
2.084	6.621	108.89	.0025
2.293	7.451	127.12	.0024
2.501	8.267	145.25	.0024
2.710	9.062	162.80	.0023
2.918	9.823	179.23	.0023
3.127	10.539	193.93	.0023
3.335	11.195	206.17	.0023
3.544	11.773	214.92	.0023
3.752	12.243	218.52	.0023
4.000	12.566	218.52	.0024

*
ROUTE

ID=31 HYD NO=112.9 INFLOW ID=30 DT=0.0

*S*****
*S BASIN 111
*S*****

*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME

COMPUTE LT TP

LCODE=1 NK=1 ISLOPE=1
LENGTH=275 FT SLOPE=0.0146 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	275.0	.014600	3.0000
TOTAL BASIN	275.0	.014600	3.0000

TIME OF CONCENTRATION (HRS)= .0211 TIME TO PEAK (HRS)= .0140 LAG TIME (HRS)= .0158

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.
REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000

.1500 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

*
SEDIMENT BULK
COMPUTE NM HYD

CODE=1 BULK FACTOR=1.01
ID=11 HYD NO=111 DA=.00077 SQ MI
%A=0 %B=77 %C=4 %D=19
TP=0.0 HR
MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = .57746 CFS UNIT VOLUME = .9791 B = 526.28 P60 = 2.0000
AREA = .000146 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .130783HR TP = .133333HR K/TP RATIO = .980874 SHAPE CONSTANT, N = 3.600224
UNIT PEAK = 1.5323 CFS UNIT VOLUME = .9926 B = 327.57 P60 = 2.0000
AREA = .000624 SQ MI IA = .49259 INCHES INF = 1.22926 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.01000 AT PEAK FLOW.

PRINT HYD

ID=11 CODE=1

PARTIAL HYDROGRAPH 111.00

RUNOFF VOLUME = 1.12482 INCHES = .0462 ACRE-FEET
PEAK DISCHARGE RATE = 1.36 CFS AT 1.500 HOURS BASIN AREA = .0008 SQ. MI.

*

*S COMBINE BASIN 112.9 WITH 111

*

ADD HYD ID=32 HYD=111.5 ID I=31 ID II=11
PRINT HYD ID=32 CODE=1

PARTIAL HYDROGRAPH 111.50

RUNOFF VOLUME = 1.50397 INCHES = 2.0069 ACRE-FEET
PEAK DISCHARGE RATE = 45.29 CFS AT 1.550 HOURS BASIN AREA = .0250 SQ. MI.

*

*

*S ROUTE 111.5 TO POND - 48" PIPE SECTION

*

COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLP=0.05
DIA=4.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.21	.25	1.68	1.78
.42	.69	7.31	2.44
.63	1.25	17.00	2.91
.83	1.90	30.58	3.25
1.04	2.60	47.75	3.51
1.25	3.36	68.13	3.71
1.46	4.15	91.27	3.85
1.67	4.96	116.70	3.94
1.88	5.79	143.86	3.99
2.08	6.62	172.17	4.00
2.29	7.45	201.00	4.00
2.50	8.27	229.66	4.00
2.71	9.06	257.40	4.00
2.92	9.82	283.38	4.00
3.13	10.54	306.64	4.00
3.34	11.20	325.98	4.00
3.54	11.77	339.82	4.00
3.75	12.24	345.51	4.00
4.00	12.57	345.51	4.00

*

COMPUTE TRAVEL TIME ID=33 REACH NO=1 NO VS=1 L=180 FT
SLP=.05

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ. FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	1.68	.0074
.417	.695	7.31	.0048
.625	1.255	17.00	.0037
.834	1.898	30.58	.0031
1.042	2.604	47.75	.0027
1.251	3.358	68.13	.0025
1.459	4.146	91.27	.0023
1.668	4.960	116.70	.0021
1.876	5.788	143.86	.0020
2.084	6.621	172.17	.0019
2.293	7.451	201.00	.0019
2.501	8.267	229.66	.0018
2.710	9.062	257.40	.0018
2.918	9.823	283.38	.0017
3.127	10.539	306.64	.0017
3.335	11.195	325.98	.0017
3.544	11.773	339.82	.0017
3.752	12.243	345.51	.0018

4.000 12.566 345.51 .0018

*
ROUTE ID=33 HYD NO=111.9 INFLOW ID=32 DT=0.0
*

*S END OF 100 SERIES BASINS AT POND
*

*S*****

*S START OF SERIES 200 BASINS
*

*S*****

*S BASIN 234

*S*****
*

*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME
*

COMPUTE LT TP LCODE=1 NK=1 ISLOPE=1
LENGTH=415 FT SLOPE=0.0795 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	ADJUSTED SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	415.0	.056248	3.0000
TOTAL BASIN	415.0	.056248	3.0000

TIME OF CONCENTRATION (HRS)= .0162 TIME TO PEAK (HRS)= .0108 LAG TIME (HRS)= .0122

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

.1500

*
SEDIMENT BULK CODE=1 BULK FACTOR=1.07
COMPUTE NM HYD ID=1 HYD NO=234 DA=.00202 SQ MI
%A=0 %B=0 %C=91 %D=9
TP=0.0 HR
MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = .71758 CFS UNIT VOLUME = .9832 B = 526.28 P60 = 2.0000
AREA = .000182 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .107360HR TP = .133333HR K/TP RATIO = .805200 SHAPE CONSTANT, N = 4.445615
UNIT PEAK = 5.2921 CFS UNIT VOLUME = .9995 B = 383.86 P60 = 2.0000
AREA = .001838 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.07000 AT PEAK FLOW.

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 234.00

RUNOFF VOLUME = 1.32289 INCHES = .1425 ACRE-FEET
PEAK DISCHARGE RATE = 4.45 CFS AT 1.500 HOURS BASIN AREA = .0020 SQ. MI.

*
*S ROUTE 234 TO JUNCTION - 24" PIPE SECTION
*

COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLP=0.03
DIA=2.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.10	.06	.21	.89
.21	.17	.89	1.22
.31	.31	2.07	1.45
.42	.47	3.73	1.62
.52	.65	5.82	1.76

.63	.84	8.31	1.85
.73	1.04	11.13	1.93
.83	1.24	14.24	1.97
.94	1.45	17.55	2.00
1.04	1.66	21.00	2.00
1.15	1.86	24.52	2.00
1.25	2.07	28.02	2.00
1.35	2.27	31.40	2.00
1.46	2.46	34.57	2.00
1.56	2.63	37.41	2.00
1.67	2.80	39.77	2.00
1.77	2.94	41.46	2.00
1.88	3.06	42.15	2.00
2.00	3.14	42.15	2.00

*
 COMPUTE TRAVEL TIME ID=10 REACH NO=1 NO VS=1 L=180 FT
 SLP=.03

TRAVEL TIME TABLE
 REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ. FT.	FLOW RATE CFS	TRAVEL TIME HRS
.104	.062	.21	.0152
.208	.174	.89	.0097
.313	.314	2.07	.0076
.417	.475	3.73	.0064
.521	.651	5.82	.0056
.625	.839	8.31	.0050
.730	1.037	11.13	.0047
.834	1.240	14.24	.0044
.938	1.447	17.55	.0041
1.042	1.655	21.00	.0039
1.146	1.863	24.52	.0038
1.251	2.067	28.02	.0037
1.355	2.265	31.40	.0036
1.459	2.456	34.57	.0036
1.563	2.635	37.41	.0035
1.668	2.799	39.77	.0035
1.772	2.943	41.46	.0035
1.876	3.061	42.15	.0036
2.000	3.142	42.15	.0037

*
 ROUTE ID=10 HYD NO=234.5 INFLOW ID=1 DT=0.0

*
 *S*****
 *S BASIN 233
 *S*****

*
 *COMPUTE TIME TO PEAK USING UPLAND/LAG TIME

*
 COMPUTE LT TP LCODE=1 NK=1 ISLOPE=1
 LENGTH=230 FT SLOPE=0.0391 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS	LENGTH (FT)	SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	230.0	.039100	3.0000
TOTAL BASIN	230.0	.039100	3.0000

TIME OF CONCENTRATION (HRS)= .0108 TIME TO PEAK (HRS)= .0072 LAG TIME (HRS)= .0081

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.
 REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

.1500

*
 SEDIMENT BULK CODE=1 BULK FACTOR=1.02
 COMPUTE NM HYD ID=2 HYD NO=233 DA=.00066 SQ MI
 %A=0 %B=0 %C=0 %D=100
 TP=0.0 HR
 MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 2.6051 CFS UNIT VOLUME = .9951 B = 526.28 P60 = 2.0000

AREA = .000660 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.02000 AT PEAK FLOW.

PRINT HYD

ID=2 CODE=1

PARTIAL HYDROGRAPH 233.00

RUNOFF VOLUME = 2.61970 INCHES = .0922 ACRE-FEET
PEAK DISCHARGE RATE = 1.99 CFS AT 1.500 HOURS BASIN AREA = .0007 SQ. MI.

*

*S ROUTE 233 TO JUNCTION - 24" PIPE SECTION

*

COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLP=0.02
DIA=2.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.10	.06	.17	.89
.21	.17	.73	1.22
.31	.31	1.69	1.45
.42	.47	3.05	1.62
.52	.65	4.76	1.76
.63	.84	6.79	1.85
.73	1.04	9.09	1.93
.83	1.24	11.62	1.97
.94	1.45	14.33	2.00
1.04	1.66	17.15	2.00
1.15	1.86	20.02	2.00
1.25	2.07	22.88	2.00
1.35	2.27	25.64	2.00
1.46	2.46	28.23	2.00
1.56	2.63	30.54	2.00
1.67	2.80	32.47	2.00
1.77	2.94	33.85	2.00
1.88	3.06	34.41	2.00
2.00	3.14	34.42	2.00

*

COMPUTE TRAVEL TIME ID=11 REACH NO=1 NO VS=1 L=130 FT
SLP=.02

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.104	.062	.17	.0134
.208	.174	.73	.0086
.313	.314	1.69	.0067
.417	.475	3.05	.0056
.521	.651	4.76	.0049
.625	.839	6.79	.0045
.730	1.037	9.09	.0041
.834	1.240	11.62	.0039
.938	1.447	14.33	.0036
1.042	1.655	17.15	.0035
1.146	1.863	20.02	.0034
1.251	2.067	22.88	.0033
1.355	2.265	25.64	.0032
1.459	2.456	28.23	.0031
1.563	2.635	30.54	.0031
1.668	2.799	32.47	.0031
1.772	2.943	33.85	.0031
1.876	3.061	34.41	.0032
2.000	3.142	34.42	.0033

*

ROUTE ID=11 HYD NO=233.5 INFLOW ID=2 DT=0.0

*

*S COMBINE BASIN 234.5 WITH 233.5

*

ADD HYD ID=12 HYD=233.9 ID I=10 ID II=11
PRINT HYD ID=12 CODE=1

PARTIAL HYDROGRAPH 233.90

RUNOFF VOLUME = 1.64209 INCHES = .2347 ACRE-FEET
PEAK DISCHARGE RATE = 6.45 CFS AT 1.500 HOURS BASIN AREA = .0027 SQ. MI.

*
*S*****
*S BASIN 232
*S*****

*
*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME

*
COMPUTE LT TP LCODE=1 NK=1 ISLOPE=1
LENGTH=140 FT SLOPE=0.0214 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	140.0	.021400	3.0000
TOTAL BASIN	140.0	.021400	3.0000

TIME OF CONCENTRATION (HRS)= .0089 TIME TO PEAK (HRS)= .0059 LAG TIME (HRS)= .0066

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

.1500 REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

*
SEDIMENT BULK CODE=1 BULK FACTOR=1.01
COMPUTE NM HYD ID=3 HYD NO=232 DA=.00033 SQ MI
%A=0 %B=0 %C=0 %D=100
TP=0.0 HR
MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 1.3025 CFS UNIT VOLUME = .9911 B = 526.28 P60 = 2.0000
AREA = .000330 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.01000 AT PEAK FLOW.

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 232.00

RUNOFF VOLUME = 2.59402 INCHES = .0457 ACRE-FEET
PEAK DISCHARGE RATE = .99 CFS AT 1.500 HOURS BASIN AREA = .0003 SQ. MI.

*
*S ROUTE 232 TO JUNCTION - 24" PIPE SECTION
*

COMPUTE RATING CURVE CID=1 VS NO=1 CODE =-1 SLP=0.01
DIA=2.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.10	.06	.12	.89
.21	.17	.52	1.22
.31	.31	1.20	1.45
.42	.47	2.15	1.62
.52	.65	3.36	1.76
.63	.84	4.80	1.85
.73	1.04	6.43	1.93
.83	1.24	8.22	1.97
.94	1.45	10.13	2.00
1.04	1.66	12.13	2.00
1.15	1.86	14.16	2.00
1.25	2.07	16.18	2.00
1.35	2.27	18.13	2.00
1.46	2.46	19.96	2.00

1.56	2.63	21.60	2.00
1.67	2.80	22.96	2.00
1.77	2.94	23.93	2.00
1.88	3.06	24.34	2.00
2.00	3.14	24.34	2.00

*
 COMPUTE TRAVEL TIME ID=13 REACH NO=1 NO VS=1 L=120 FT
 SLP=.01

TRAVEL TIME TABLE
 REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.104	.062	.12	.0175
.208	.174	.52	.0112
.313	.314	1.20	.0087
.417	.475	2.15	.0073
.521	.651	3.36	.0065
.625	.839	4.80	.0058
.730	1.037	6.43	.0054
.834	1.240	8.22	.0050
.938	1.447	10.13	.0048
1.042	1.655	12.13	.0046
1.146	1.863	14.16	.0044
1.251	2.067	16.18	.0043
1.355	2.265	18.13	.0042
1.459	2.456	19.96	.0041
1.563	2.635	21.60	.0041
1.668	2.799	22.96	.0041
1.772	2.943	23.93	.0041
1.876	3.061	24.34	.0042
2.000	3.142	24.34	.0043

*
 ROUTE ID=13 HYD NO=232.5 INFLOW ID=3 DT=0.0

*
 *S COMBINE BASIN 233.9 WITH 232.5

*
 ADD HYD ID=14 HYD=232.6 ID I=12 ID II=13
 PRINT HYD ID=14 CODE=1

PARTIAL HYDROGRAPH 232.60

RUNOFF VOLUME = 1.74637 INCHES = .2803 ACRE-FEET
 PEAK DISCHARGE RATE = 7.44 CFS AT 1.500 HOURS BASIN AREA = .0030 SQ. MI.

*
 *S ROUTE 232.6 THRU 231 - 36" PIPE SECTION

*
 COMPUTE RATING CURVE CID=1 VS NO=1 CODE =-1 SLP=0.01
 DIA=3.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.16	.14	.35	1.33
.31	.39	1.52	1.83
.47	.71	3.53	2.18
.63	1.07	6.35	2.44
.78	1.46	9.92	2.63
.94	1.89	14.15	2.78
1.09	2.33	18.95	2.89
1.25	2.79	24.23	2.96
1.41	3.26	29.87	2.99
1.56	3.72	35.75	3.00
1.72	4.19	41.74	3.00
1.88	4.65	47.69	3.00
2.03	5.10	53.45	3.00
2.19	5.53	58.85	3.00
2.35	5.93	63.68	3.00
2.50	6.30	67.69	3.00
2.66	6.62	70.57	3.00
2.81	6.89	71.75	3.00
3.00	7.07	71.75	3.00

*
 COMPUTE TRAVEL TIME ID=15 REACH NO=1 NO VS=1 L=50 FT
 SLP=.01

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.156	.140	.35	.0056
.313	.391	1.52	.0036
.469	.706	3.53	.0028
.625	1.068	6.35	.0023
.782	1.465	9.92	.0021
.938	1.889	14.15	.0019
1.094	2.332	18.95	.0017
1.251	2.790	24.23	.0016
1.407	3.255	29.87	.0015
1.563	3.724	35.75	.0014
1.720	4.191	41.74	.0014
1.876	4.650	47.69	.0014
2.032	5.097	53.45	.0013
2.189	5.525	58.85	.0013
2.345	5.928	63.68	.0013
2.501	6.297	67.69	.0013
2.658	6.622	70.57	.0013
2.814	6.887	71.75	.0013
3.000	7.069	71.75	.0014

*

ROUTE ID=15 HYD NO=232.9 INFLOW ID=14 DT=0.0

*

*S*****

*S BASIN 231

*S*****

*

*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME

*

COMPUTE LT TP LCODE=1 NK=1 ISLOPE=1
LENGTH=400 FT SLOPE=0.0700 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	ADJUSTED SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	400.0	.054610	3.0000
TOTAL BASIN	400.0	.054610	3.0000

TIME OF CONCENTRATION (HRS)= .0158 TIME TO PEAK (HRS)= .0106 LAG TIME (HRS)= .0119

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

.1500

*

SEDIMENT BULK CODE=1 BULK FACTOR=1.05
COMPUTE NM HYD ID=4 HYD NO=231 DA=.00164 SQ MI
%A=0 %B=16 %C=0 %D=84
TP=0.0 HR
MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 5.4375 CFS UNIT VOLUME = .9971 B = 526.28 P60 = 2.0000
AREA = .001378 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000K = .132000HR TP = .133333HR K/TP RATIO = .990000 SHAPE CONSTANT, N = 3.566429
UNIT PEAK = .63989 CFS UNIT VOLUME = .9795 B = 325.15 P60 = 2.0000
AREA = .000262 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.05000 AT PEAK FLOW.

PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 231.00

RUNOFF VOLUME = 2.39258 INCHES = .2093 ACRE-FEET
PEAK DISCHARGE RATE = 4.66 CFS AT 1.500 HOURS BASIN AREA = .0016 SQ. MI.

*
*
*S COMBINE BASIN 232.9 WITH 231

ADD HYD ID=16 HYD=231.5 ID I=15 ID II=4
PRINT HYD ID=16 CODE=1

PARTIAL HYDROGRAPH 231.50

RUNOFF VOLUME = 1.97424 INCHES = .4896 ACRE-FEET
PEAK DISCHARGE RATE = 12.11 CFS AT 1.500 HOURS BASIN AREA = .0047 SQ. MI.

*
*
*S ROUTE 231.5 THRU 222 - 36" PIPE SECTION
*

COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLP=0.01
DIA=3.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.16	.14	.35	1.33
.31	.39	1.52	1.83
.47	.71	3.53	2.18
.63	1.07	6.35	2.44
.78	1.46	9.92	2.63
.94	1.89	14.15	2.78
1.09	2.33	18.95	2.89
1.25	2.79	24.23	2.96
1.41	3.26	29.87	2.99
1.56	3.72	35.75	3.00
1.72	4.19	41.74	3.00
1.88	4.65	47.69	3.00
2.03	5.10	53.45	3.00
2.19	5.53	58.85	3.00
2.35	5.93	63.68	3.00
2.50	6.30	67.69	3.00
2.66	6.62	70.57	3.00
2.81	6.89	71.75	3.00
3.00	7.07	71.75	3.00

*
COMPUTE TRAVEL TIME ID=17 REACH NO=1 NO VS=1 L=110 FT
SLP=.01

TRAVEL TIME TABLE REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.156	.140	.35	.0123
.313	.391	1.52	.0079
.469	.706	3.53	.0061
.625	1.068	6.35	.0051
.782	1.465	9.92	.0045
.938	1.889	14.15	.0041
1.094	2.332	18.95	.0038
1.251	2.790	24.23	.0035
1.407	3.255	29.87	.0033
1.563	3.724	35.75	.0032
1.720	4.191	41.74	.0031
1.876	4.650	47.69	.0030
2.032	5.097	53.45	.0029
2.189	5.525	58.85	.0029
2.345	5.928	63.68	.0028
2.501	6.297	67.69	.0028
2.658	6.622	70.57	.0029
2.814	6.887	71.75	.0029
3.000	7.069	71.75	.0030

*
ROUTE ID=17 HYD NO=231.9 INFLOW ID=16 DT=0.0
*

*S*****
*S BASIN 222
*S*****
*

*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME

*

COMPUTE LT TP LCODE=1 NK=1 ISLOPE=1
 LENGTH=250 FT SLOPE=0.0240 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	250.0	.024000	3.0000
TOTAL BASIN	250.0	.024000	3.0000

TIME OF CONCENTRATION (HRS)= .0149 TIME TO PEAK (HRS)= .0100 LAG TIME (HRS)= .0112

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

.1500

*

SEDIMENT BULK CODE=1 BULK FACTOR=1.01
COMPUTE NM HYD ID=5 HYD NO=222 DA=.00063 SQ MI
 %A=0 %B=59 %C=18 %D=23
 TP=0.0 HR
 MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = .57193 CFS UNIT VOLUME = .9791 B = 526.28 P60 = 2.0000
AREA = .000145 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .126240HR TP = .133333HR K/TP RATIO = .946800 SHAPE CONSTANT, N = 3.733631
UNIT PEAK = 1.2261 CFS UNIT VOLUME = .9902 B = 337.00 P60 = 2.0000
AREA = .000485 SQ MI IA = .46494 INCHES INF = 1.15182 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.01000 AT PEAK FLOW.

PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 222.00

RUNOFF VOLUME = 1.24145 INCHES = .0417 ACRE-FEET
PEAK DISCHARGE RATE = 1.21 CFS AT 1.500 HOURS BASIN AREA = .0006 SQ. MI.

*

*

*S COMBINE BASIN 231.9 WITH 222

*

ADD HYD ID=18 HYD=222.5 ID I=17 ID II=5
PRINT HYD ID=18 CODE=1

PARTIAL HYDROGRAPH 222.50

RUNOFF VOLUME = 1.88678 INCHES = .5313 ACRE-FEET
PEAK DISCHARGE RATE = 13.30 CFS AT 1.500 HOURS BASIN AREA = .0053 SQ. MI.

*

*

*S ROUTE 222.5 TO JUNCTION - 36" PIPE SECTION

*

COMPUTE RATING CURVE CID=1 VS NO=1 CODE =-1 SLP=0.01
 DIA=3.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.16	.14	.35	1.33
.31	.39	1.52	1.83
.47	.71	3.53	2.18

.63	1.07	6.35	2.44
.78	1.46	9.92	2.63
.94	1.89	14.15	2.78
1.09	2.33	18.95	2.89
1.25	2.79	24.23	2.96
1.41	3.26	29.87	2.99
1.56	3.72	35.75	3.00
1.72	4.19	41.74	3.00
1.88	4.65	47.69	3.00
2.03	5.10	53.45	3.00
2.19	5.53	58.85	3.00
2.35	5.93	63.68	3.00
2.50	6.30	67.69	3.00
2.66	6.62	70.57	3.00
2.81	6.89	71.75	3.00
3.00	7.07	71.75	3.00

*

COMPUTE TRAVEL TIME ID=19 REACH NO=1 NO VS=1 L=20 FT
SLP=.01

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.156	.140	.35	.0022
.313	.391	1.52	.0014
.469	.706	3.53	.0011
.625	1.068	6.35	.0009
.782	1.465	9.92	.0008
.938	1.889	14.15	.0007
1.094	2.332	18.95	.0007
1.251	2.790	24.23	.0006
1.407	3.255	29.87	.0006
1.563	3.724	35.75	.0006
1.720	4.191	41.74	.0006
1.876	4.650	47.69	.0005
2.032	5.097	53.45	.0005
2.189	5.525	58.85	.0005
2.345	5.928	63.68	.0005
2.501	6.297	67.69	.0005
2.658	6.622	70.57	.0005
2.814	6.887	71.75	.0005
3.000	7.069	71.75	.0005

*

ROUTE ID=19 HYD NO=222.9 INFLOW ID=18 DT=0.0

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*S*****

*S BASIN 221

*S*****

*

*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME

*

COMPUTE LT TP LCODE=1 NK=1 ISLOPE=1
LENGTH=330 FT SLOPE=0.0364 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	330.0	.036400	3.0000
TOTAL BASIN	330.0	.036400	3.0000

TIME OF CONCENTRATION (HRS)= .0160 TIME TO PEAK (HRS)= .0107 LAG TIME (HRS)= .0120

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

.1500

*

SEDIMENT BULK
COMPUTE NM HYD

CODE=1 BULK FACTOR=1.01
ID=6 HYD NO=221 DA=.00061 SQ MI
%A=0 %B=49 %C=0 %D=51
TP=0.0 HR
MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 1.2279 CFS UNIT VOLUME = .9911 B = 526.28 P60 = 2.0000
 AREA = .000311 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .132000HR TP = .133333HR K/TP RATIO = .990000 SHAPE CONSTANT, N = 3.566429
 UNIT PEAK = .72890 CFS UNIT VOLUME = .9820 B = 325.15 P60 = 2.0000
 AREA = .000299 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.01000 AT PEAK FLOW.

PRINT HYD ID=6 CODE=1

PARTIAL HYDROGRAPH 221.00

RUNOFF VOLUME = 1.69799 INCHES = .0552 ACRE-FEET
 PEAK DISCHARGE RATE = 1.37 CFS AT 1.500 HOURS BASIN AREA = .0006 SQ. MI.

*
 *S ROUTE 221 TO JUNCTION - 24" PIPE SECTION
 *
 COMPUTE RATING CURVE CID=1 VS NO=1 CODE =-1 SLP=0.01
 DIA=2.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.10	.06	.12	.89
.21	.17	.52	1.22
.31	.31	1.20	1.45
.42	.47	2.15	1.62
.52	.65	3.36	1.76
.63	.84	4.80	1.85
.73	1.04	6.43	1.93
.83	1.24	8.22	1.97
.94	1.45	10.13	2.00
1.04	1.66	12.13	2.00
1.15	1.86	14.16	2.00
1.25	2.07	16.18	2.00
1.35	2.27	18.13	2.00
1.46	2.46	19.96	2.00
1.56	2.63	21.60	2.00
1.67	2.80	22.96	2.00
1.77	2.94	23.93	2.00
1.88	3.06	24.34	2.00
2.00	3.14	24.34	2.00

*
 COMPUTE TRAVEL TIME ID=20 REACH NO=1 NO VS=1 L=20 FT
 SLP=.01

TRAVEL TIME TABLE
 REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.104	.062	.12	.0029
.208	.174	.52	.0019
.313	.314	1.20	.0015
.417	.475	2.15	.0012
.521	.651	3.36	.0011
.625	.839	4.80	.0010
.730	1.037	6.43	.0009
.834	1.240	8.22	.0008
.938	1.447	10.13	.0008
1.042	1.655	12.13	.0008
1.146	1.863	14.16	.0007
1.251	2.067	16.18	.0007
1.355	2.265	18.13	.0007
1.459	2.456	19.96	.0007
1.563	2.635	21.60	.0007
1.668	2.799	22.96	.0007
1.772	2.943	23.93	.0007
1.876	3.061	24.34	.0007
2.000	3.142	24.34	.0007

*
 ROUTE ID=20 HYD NO=221.5 INFLOW ID=6 DT=0.0

*
 *S COMBINE BASIN 222.9 WITH 221.5
 *

ADD HYD ID=21 HYD=221.6 ID I=19 ID II=20
 PRINT HYD ID=21 CODE=1

PARTIAL HYDROGRAPH 221.60

RUNOFF VOLUME = 1.86725 INCHES = .5866 ACRE-FEET
 PEAK DISCHARGE RATE = 14.67 CFS AT 1.500 HOURS BASIN AREA = .0059 SQ. MI.

*
 *
 *S ROUTE 221.6 THRU 211 - 36" PIPE SECTION
 *

COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLP=0.01
 DIA=3.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.16	.14	.35	1.33
.31	.39	1.52	1.83
.47	.71	3.53	2.18
.63	1.07	6.35	2.44
.78	1.46	9.92	2.63
.94	1.89	14.15	2.78
1.09	2.33	18.95	2.89
1.25	2.79	24.23	2.96
1.41	3.26	29.87	2.99
1.56	3.72	35.75	3.00
1.72	4.19	41.74	3.00
1.88	4.65	47.69	3.00
2.03	5.10	53.45	3.00
2.19	5.53	58.85	3.00
2.35	5.93	63.68	3.00
2.50	6.30	67.69	3.00
2.66	6.62	70.57	3.00
2.81	6.89	71.75	3.00
3.00	7.07	71.75	3.00

*
 COMPUTE TRAVEL TIME ID=22 REACH NO=1 NO VS=1 L=150 FT
 SLP=.01

TRAVEL TIME TABLE
 REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.156	.140	.35	.0167
.313	.391	1.52	.0107
.469	.706	3.53	.0083
.625	1.068	6.35	.0070
.782	1.465	9.92	.0062
.938	1.889	14.15	.0056
1.094	2.332	18.95	.0051
1.251	2.790	24.23	.0048
1.407	3.255	29.87	.0045
1.563	3.724	35.75	.0043
1.720	4.191	41.74	.0042
1.876	4.650	47.69	.0041
2.032	5.097	53.45	.0040
2.189	5.525	58.85	.0039
2.345	5.928	63.68	.0039
2.501	6.297	67.69	.0039
2.658	6.622	70.57	.0039
2.814	6.887	71.75	.0040
3.000	7.069	71.75	.0041

*
 ROUTE ID=22 HYD NO=221.9 INFLOW ID=21 DT=0.0
 *

*S*****
 *S BASIN 212
 *S*****
 *

*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME
 *

COMPUTE LT TP LCODE=1 NK=1 ISLOPE=1

LENGTH=300 FT SLOPE=0.0200 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	300.0	.020000	3.0000
TOTAL BASIN	300.0	.020000	3.0000

TIME OF CONCENTRATION (HRS)= .0196 TIME TO PEAK (HRS)= .0131 LAG TIME (HRS)= .0147

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

REVISD VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)= .1500

*
SEDIMENT BULK CODE=1 BULK FACTOR=1.01
COMPUTE NM HYD ID=7 HYD NO=212 DA=.00170 SQ MI
%A=0 %B=24 %C=0 %D=76
TP=0.0 HR
MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 5.0996 CFS UNIT VOLUME = .9971 B = 526.28 P60 = 2.0000
AREA = .001292 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .132000HR TP = .133333HR K/TP RATIO = .990000 SHAPE CONSTANT, N = 3.566429
UNIT PEAK = .99495 CFS UNIT VOLUME = .9880 B = 325.15 P60 = 2.0000
AREA = .000408 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.01000 AT PEAK FLOW.

PRINT HYD ID=7 CODE=1

PARTIAL HYDROGRAPH 212.00

RUNOFF VOLUME = 2.15515 INCHES = .1954 ACRE-FEET
PEAK DISCHARGE RATE = 4.44 CFS AT 1.500 HOURS BASIN AREA = .0017 SQ. MI.

*
*S ROUTE 212 THRU 211 - 24" PIPE SECTION
*

COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLP=0.01
DIA=2.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.10	.06	.12	.89
.21	.17	.52	1.22
.31	.31	1.20	1.45
.42	.47	2.15	1.62
.52	.65	3.36	1.76
.63	.84	4.80	1.85
.73	1.04	6.43	1.93
.83	1.24	8.22	1.97
.94	1.45	10.13	2.00
1.04	1.66	12.13	2.00
1.15	1.86	14.16	2.00
1.25	2.07	16.18	2.00
1.35	2.27	18.13	2.00
1.46	2.46	19.96	2.00
1.56	2.63	21.60	2.00
1.67	2.80	22.96	2.00
1.77	2.94	23.93	2.00
1.88	3.06	24.34	2.00
2.00	3.14	24.34	2.00

*
COMPUTE TRAVEL TIME ID=23 REACH NO=1 NO VS=1 L=40 FT
SLP=.01

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ. FT.	FLOW RATE CFS	TRAVEL TIME HRS
.104	.062	.12	.0058
.208	.174	.52	.0037
.313	.314	1.20	.0029
.417	.475	2.15	.0024
.521	.651	3.36	.0022
.625	.839	4.80	.0019
.730	1.037	6.43	.0018
.834	1.240	8.22	.0017
.938	1.447	10.13	.0016
1.042	1.655	12.13	.0015
1.146	1.863	14.16	.0015
1.251	2.067	16.18	.0014
1.355	2.265	18.13	.0014
1.459	2.456	19.96	.0014
1.563	2.635	21.60	.0014
1.668	2.799	22.96	.0014
1.772	2.943	23.93	.0014
1.876	3.061	24.34	.0014
2.000	3.142	24.34	.0014

*

ROUTE

ID=23 HYD NO=212.5 INFLOW ID=7 DT=0.0

*

*S*****

*S BASIN 211

*S*****

*

*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME

*

COMPUTE LT TP

LCODE=1 NK=1 ISLOPE=1

LENGTH=300 FT SLOPE=0.0067 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	300.0	.006700	3.0000
TOTAL BASIN	300.0	.006700	3.0000

TIME OF CONCENTRATION (HRS)= .0339 TIME TO PEAK (HRS)= .0226 LAG TIME (HRS)= .0255

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

.1500

*

SEDIMENT BULK

CODE=1 BULK FACTOR=1.00

COMPUTE NM HYD

ID=8 HYD NO=211 DA=.00083 SQ MI

%A=0 %B=58 %C=0 %D=42

TP=0.0 HR

MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 1.3760 CFS UNIT VOLUME = .9911 B = 526.28 P60 = 2.0000
 AREA = .000349 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .132000HR TP = .133333HR K/TP RATIO = .990000 SHAPE CONSTANT, N = 3.566429
 UNIT PEAK = 1.1739 CFS UNIT VOLUME = .9896 B = 325.15 P60 = 2.0000
 AREA = .000481 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD

ID=8 CODE=1

PARTIAL HYDROGRAPH 211.00

RUNOFF VOLUME = 1.51823 INCHES = .0672 ACRE-FEET
 PEAK DISCHARGE RATE = 1.72 CFS AT 1.500 HOURS BASIN AREA = .0008 SQ. MI.

*
*S COMBINE BASIN 212.5 WITH 211

ADD HYD ID=24 HYD=211.5 ID I=23 ID II=8
PRINT HYD ID=24 CODE=1

PARTIAL HYDROGRAPH 211.50

RUNOFF VOLUME = 1.94601 INCHES = .2626 ACRE-FEET
PEAK DISCHARGE RATE = 6.17 CFS AT 1.500 HOURS BASIN AREA = .0025 SQ. MI.

*
*S COMBINE BASIN 221.9 WITH 211.5

ADD HYD ID=25 HYD=211.6 ID I=22 ID II=24
PRINT HYD ID=25 CODE=1

PARTIAL HYDROGRAPH 211.60

RUNOFF VOLUME = 1.89091 INCHES = .8491 ACRE-FEET
PEAK DISCHARGE RATE = 20.85 CFS AT 1.500 HOURS BASIN AREA = .0084 SQ. MI.

*
*S ROUTE 211.6 TO POND - 42" PIPE SECTION

COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLP=0.05
DIA=3.5 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.18	.19	1.18	1.56
.36	.53	5.12	2.14
.55	.96	11.91	2.54
.73	1.45	21.42	2.84
.91	1.99	33.44	3.07
1.09	2.57	47.72	3.25
1.28	3.17	63.93	3.37
1.46	3.80	81.74	3.45
1.64	4.43	100.76	3.49
1.82	5.07	120.59	3.50
2.01	5.70	140.78	3.50
2.19	6.33	160.86	3.50
2.37	6.94	180.29	3.50
2.55	7.52	198.49	3.50
2.74	8.07	214.77	3.50
2.92	8.57	228.32	3.50
3.10	9.01	238.02	3.50
3.28	9.37	242.00	3.50
3.50	9.62	242.00	3.50

*
COMPUTE TRAVEL TIME ID=34 REACH NO=1 NO VS=1 L=160 FT
SLP=.05

TRAVEL TIME TABLE REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.182	.191	1.18	.0072
.365	.532	5.12	.0046
.547	.961	11.91	.0036
.730	1.453	21.42	.0030
.912	1.994	33.44	.0026
1.094	2.571	47.72	.0024
1.277	3.175	63.93	.0022
1.459	3.797	81.74	.0021
1.641	4.431	100.76	.0020
1.824	5.069	120.59	.0019
2.006	5.704	140.78	.0018
2.189	6.330	160.86	.0017
2.371	6.938	180.29	.0017
2.553	7.520	198.49	.0017
2.736	8.069	214.77	.0017

2.918	8.571	228.32	.0017
3.101	9.014	238.02	.0017
3.283	9.374	242.00	.0017
3.500	9.621	242.00	.0018

*
ROUTE ID=34 HYD NO=211.9 INFLOW ID=25 DT=0.0
*

*S END OF 200 SERIES BASINS AT POND

*S*****

*S START OF 300 AND 400 SERIES BASINS

*S*****

*S BASIN 314

*S*****

*

*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME

*

COMPUTE LT TP LCODE=1 NK=1 ISLOPE=1
LENGTH=880 FT SLOPE=0.0455 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	ADJUSTED SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	880.0	.044710	3.0000
TOTAL BASIN	880.0	.044710	3.0000

TIME OF CONCENTRATION (HRS)= .0385 TIME TO PEAK (HRS)= .0257 LAG TIME (HRS)= .0289

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

.1500 REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

*
SEDIMENT BULK CODE=1 BULK FACTOR=1.05
COMPUTE NM HYD ID=1 HYD NO=314 DA=.00639 SQ MI
%A=26 %B=0 %C=61 %D=13
TP=0.0 HR
MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 3.2788 CFS UNIT VOLUME = .9959 B = 526.28 P60 = 2.0000
AREA = .000831 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .123225HR TP = .133333HR K/TP RATIO = .924187 SHAPE CONSTANT, N = 3.829047
UNIT PEAK = 14.327 CFS UNIT VOLUME = 1.000 B = 343.61 P60 = 2.0000
AREA = .005559 SQ MI IA = .43966 INCHES INF = 1.08103 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.05000 AT PEAK FLOW.

PRINT HYD ID=1 CODE=1

HYDROGRAPH FROM AREA 314.00

RUNOFF VOLUME = 1.15763 INCHES = .3945 ACRE-Feet
PEAK DISCHARGE RATE = 12.11 CFS AT 1.500 HOURS BASIN AREA = .0064 SQ. MI.

*
*S ROUTE 314 THRU 312 - CHANNEL
*

COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=3
MIN ELEV=0.0 FT MAX ELEV=3.0 FT
CH SLP=0.0588 FP SLP=0.0588 N=0.05
DIST=9 FT N=0.04 DIST=10 FT N=0.05
DIST=19
DIST ELEV DIST ELEV DIST ELEV
0 3.0 9 0.0 10 0.0
19 3.0

RATING CURVE VALLEY SECTION 1.0
WATER FLOW FLOW TOP
SURFACE AREA RATE WIDTH

ELEV	SQ FT	CFS	FT
.00	.00	.00	1.00
.16	.23	.51	1.95
.32	.61	1.93	2.89
.47	1.15	4.39	3.84
.63	1.83	8.05	4.79
.79	2.66	13.08	5.74
.95	3.64	19.62	6.68
1.11	4.77	27.82	7.63
1.26	6.05	37.81	8.58
1.42	7.48	49.75	9.53
1.58	9.06	63.74	10.47
1.74	10.79	79.92	11.42
1.89	12.66	98.42	12.37
2.05	14.69	119.35	13.32
2.21	16.87	142.83	14.26
2.37	19.20	168.97	15.21
2.53	21.67	197.89	16.16
2.68	24.30	229.69	17.11
2.84	27.07	264.49	18.05
3.00	30.00	302.39	19.00

*
 COMPUTE TRAVEL TIME ID=10 REACH NO=1 NO VS=1 L=340 FT
 SLP=.0588

TRAVEL TIME TABLE
 REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.158	.233	.51	.0430
.316	.615	1.93	.0301
.474	1.147	4.39	.0247
.632	1.828	8.05	.0215
.789	2.659	13.08	.0192
.947	3.640	19.62	.0175
1.105	4.770	27.82	.0162
1.263	6.050	37.81	.0151
1.421	7.479	49.75	.0142
1.579	9.058	63.74	.0134
1.737	10.787	79.92	.0127
1.895	12.665	98.42	.0122
2.053	14.693	119.35	.0116
2.211	16.870	142.83	.0112
2.368	19.197	168.97	.0107
2.526	21.673	197.89	.0103
2.684	24.299	229.69	.0100
2.842	27.075	264.49	.0097
3.000	30.000	302.39	.0094

*
 ROUTE
 * ID=10 HYD NO=314.5 INFLOW ID=1 DT=0.0

*S*****
 *S BASIN 313
 *S*****
 *

*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME
 *

COMPUTE LT TP LCODE=1 NK=1 ISLOPE=1
 LENGTH=460 FT SLOPE=0.0696 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	ADJUSTED SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	460.0	.054526	3.0000
TOTAL BASIN	460.0	.054526	3.0000

TIME OF CONCENTRATION (HRS)= .0182 TIME TO PEAK (HRS)= .0122 LAG TIME (HRS)= .0137

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.
 REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000

.1500 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

*
 SEDIMENT BULK
 COMPUTE NM HYD CODE=1 BULK FACTOR=1.04
 ID=2 HYD NO=313 DA=.00113 SQ MI
 %A=0 %B=0 %C=78 %D=22

TP=0.0 HR
MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = .98124 CFS UNIT VOLUME = .9890 B = 526.28 P60 = 2.0000
AREA = .000249 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .107360HR TP = .133333HR K/TP RATIO = .805200 SHAPE CONSTANT, N = 4.445615
UNIT PEAK = 2.5375 CFS UNIT VOLUME = .9968 B = 383.86 P60 = 2.0000
AREA = .000881 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.04000 AT PEAK FLOW.

PRINT HYD ID=2 CODE=1

HYDROGRAPH FROM AREA 313.00

RUNOFF VOLUME = 1.48370 INCHES = .0894 ACRE-FEET
PEAK DISCHARGE RATE = 2.57 CFS AT 1.500 HOURS BASIN AREA = .0011 SQ. MI.

*
*S ROUTE 313 THRU 312 - 24" PIPE SECTION
*
COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLP=0.02
DIA=2.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.10	.06	.17	.89
.21	.17	.73	1.22
.31	.31	1.69	1.45
.42	.47	3.05	1.62
.52	.65	4.76	1.76
.63	.84	6.79	1.85
.73	1.04	9.09	1.93
.83	1.24	11.62	1.97
.94	1.45	14.33	2.00
1.04	1.66	17.15	2.00
1.15	1.86	20.02	2.00
1.25	2.07	22.88	2.00
1.35	2.27	25.64	2.00
1.46	2.46	28.23	2.00
1.56	2.63	30.54	2.00
1.67	2.80	32.47	2.00
1.77	2.94	33.85	2.00
1.88	3.06	34.41	2.00
2.00	3.14	34.42	2.00

*
COMPUTE TRAVEL TIME ID=11 REACH NO=1 NO VS=1 L=60 FT
SLP=.02

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.104	.062	.17	.0062
.208	.174	.73	.0040
.313	.314	1.69	.0031
.417	.475	3.05	.0026
.521	.651	4.76	.0023
.625	.839	6.79	.0021
.730	1.037	9.09	.0019
.834	1.240	11.62	.0018
.938	1.447	14.33	.0017
1.042	1.655	17.15	.0016
1.146	1.863	20.02	.0016
1.251	2.067	22.88	.0015
1.355	2.265	25.64	.0015
1.459	2.456	28.23	.0014
1.563	2.635	30.54	.0014
1.668	2.799	32.47	.0014
1.772	2.943	33.85	.0014

1.876 3.061 34.41 .0015
2.000 3.142 34.42 .0015

*
ROUTE ID=11 HYD NO=313.5 INFLOW ID=2 DT=0.0
*
*

*S COMBINE BASIN 314.5 WITH 313.5
*

ADD HYD ID=12 HYD=313.9 ID I=10 ID II=11
PRINT HYD ID=12 CODE=1

HYDROGRAPH FROM AREA 313.90

RUNOFF VOLUME = 1.20658 INCHES = .4839 ACRE-FEET
PEAK DISCHARGE RATE = 14.39 CFS AT 1.500 HOURS BASIN AREA = .0075 SQ. MI.

*
*S*****
*S BASIN 312
*S*****
*
*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME
*

COMPUTE LT TP LCODE=1 NK=1 ISLOPE=1
LENGTH=910 FT SLOPE=0.0824 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	ADJUSTED SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	910.0	.056644	3.0000
TOTAL BASIN	910.0	.056644	3.0000

TIME OF CONCENTRATION (HRS)= .0354 TIME TO PEAK (HRS)= .0236 LAG TIME (HRS)= .0266

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

.1500

*
SEDIMENT BULK CODE=1 BULK FACTOR=1.15
COMPUTE NM HYD ID=3 HYD NO=312 DA=.00514 SQ MI
%A=31 %B=0 %C=66 %D=3
TP=0.0 HR
MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = .60864 CFS UNIT VOLUME = .9832 B = 526.28 P60 = 2.0000
AREA = .000154 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .124326HR TP = .133333HR K/TP RATIO = .932444 SHAPE CONSTANT, N = 3.793540
UNIT PEAK = 12.757 CFS UNIT VOLUME = 1.000 B = 341.16 P60 = 2.0000
AREA = .004986 SQ MI IA = .44588 INCHES INF = 1.09845 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.15000 AT PEAK FLOW.

PRINT HYD ID=3 CODE=1

HYDROGRAPH FROM AREA 312.00

RUNOFF VOLUME = 1.05939 INCHES = .2904 ACRE-FEET
PEAK DISCHARGE RATE = 9.78 CFS AT 1.500 HOURS BASIN AREA = .0051 SQ. MI.

*
*S COMBINE BASIN 313.9 WITH 312
*

ADD HYD ID=13 HYD=312.5 ID I=12 ID II=3
PRINT HYD ID=13 CODE=1

HYDROGRAPH FROM AREA 312.50

RUNOFF VOLUME = 1.14681 INCHES = .7743 ACRE-FEET
 PEAK DISCHARGE RATE = 24.17 CFS AT 1.500 HOURS BASIN AREA = .0127 SQ. MI.

*
 *

*S ROUTE 300 BASINS THRU RESERVOIR

*

ROUTE RESERVOIR	ID=50	HYD=312.6	INFLOW ID=13	CODE=5	
		OUTFLOW (CFS)	STORAGE (AC FT)	ELEV (FT)	
		0	0		100
		4	0.07		101
		8	0.14		102
		12	0.21		103
		16	0.28		104
		20	0.35		105

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
.25	.00	100.00	.000	.00
.50	.00	100.00	.000	.00
.75	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
1.25	.20	100.01	.000	.03
1.50	24.17	102.00	.140	7.99
1.75	9.20	103.31	.232	13.25
2.00	3.24	101.89	.132	7.55
2.25	1.28	100.91	.064	3.66
2.50	.63	100.43	.030	1.71
2.75	.32	100.20	.014	.82
3.00	.16	100.10	.007	.40
3.25	.09	100.05	.004	.20
3.50	.06	100.03	.002	.11
3.75	.03	100.01	.001	.06
4.00	.02	100.01	.001	.03
4.25	.02	100.01	.000	.02
4.50	.02	100.00	.000	.02
4.75	.02	100.00	.000	.02
5.00	.02	100.00	.000	.02
5.25	.02	100.00	.000	.02
5.50	.02	100.01	.000	.02
5.75	.02	100.01	.000	.02
6.00	.02	100.01	.000	.02
6.25	.03	100.01	.000	.03
6.50	.03	100.01	.001	.03
6.75	.03	100.01	.001	.03
7.00	.03	100.01	.001	.03
7.25	.03	100.01	.001	.03
7.50	.03	100.01	.001	.03
7.75	.03	100.01	.001	.03
8.00	.03	100.01	.001	.03
8.25	.03	100.01	.001	.03
8.50	.03	100.01	.001	.03
8.75	.03	100.01	.001	.03
9.00	.03	100.01	.001	.03
9.25	.03	100.01	.001	.03
9.50	.03	100.01	.001	.03
9.75	.03	100.01	.001	.03
10.00	.03	100.01	.001	.03
10.25	.03	100.01	.000	.03
10.50	.03	100.01	.000	.03
10.75	.03	100.01	.000	.03
11.00	.03	100.01	.000	.03
11.25	.03	100.01	.000	.03
11.50	.03	100.01	.000	.03
11.75	.03	100.01	.000	.03
12.00	.03	100.01	.000	.03
12.25	.03	100.01	.000	.03
12.50	.03	100.01	.000	.03
12.75	.02	100.01	.000	.02
13.00	.02	100.01	.000	.02
13.25	.02	100.01	.000	.02
13.50	.02	100.01	.000	.02
13.75	.02	100.01	.000	.02

TIME INFLOW ELEV VOLUME OUTFLOW

(HRS)	(CFS)	(FEET)	(AC-FT)	(CFS)
14.00	.02	100.01	.000	.02
14.25	.02	100.01	.000	.02
14.50	.02	100.01	.000	.02
14.75	.02	100.01	.000	.02
15.00	.02	100.01	.000	.02
15.25	.02	100.01	.000	.02
15.50	.02	100.01	.000	.02
15.75	.02	100.01	.000	.02
16.00	.02	100.01	.000	.02
16.25	.02	100.01	.000	.02
16.50	.02	100.01	.000	.02
16.75	.02	100.01	.000	.02
17.00	.02	100.01	.000	.02
17.25	.02	100.01	.000	.02
17.50	.02	100.01	.000	.02
17.75	.02	100.01	.000	.02
18.00	.02	100.01	.000	.02
18.25	.02	100.00	.000	.02
18.50	.02	100.00	.000	.02
18.75	.02	100.00	.000	.02
19.00	.02	100.00	.000	.02
19.25	.02	100.00	.000	.02
19.50	.02	100.00	.000	.02
19.75	.02	100.00	.000	.02
20.00	.02	100.00	.000	.02
20.25	.02	100.00	.000	.02
20.50	.02	100.00	.000	.02
20.75	.02	100.00	.000	.02
21.00	.02	100.00	.000	.02
21.25	.02	100.00	.000	.02
21.50	.02	100.00	.000	.02
21.75	.02	100.00	.000	.02
22.00	.02	100.00	.000	.02
22.25	.02	100.00	.000	.02
22.50	.02	100.00	.000	.02
22.75	.02	100.00	.000	.02
23.00	.02	100.00	.000	.02
23.25	.02	100.00	.000	.02
23.50	.02	100.00	.000	.02
23.75	.02	100.00	.000	.02
24.00	.02	100.00	.000	.02
24.25	.00	100.00	.000	.01
24.50	.00	100.00	.000	.00

PEAK DISCHARGE = 14.167 CFS - PEAK OCCURS AT HOUR 1.65
 MAXIMUM WATER SURFACE ELEVATION = 103.542
 MAXIMUM STORAGE = .2479 AC-FT INCREMENTAL TIME= .050000HRS

*
*

*S ROUTE 312.5 THRU 413 - 24" PIPE SECTION

*

COMPUTE RATING CURVE CID=1 VS NO=1 CODE =-1 SLP=0.075
 DIA=2.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.10	.06	.32	.89
.21	.17	1.41	1.22
.31	.31	3.28	1.45
.42	.47	5.90	1.62
.52	.65	9.21	1.76
.63	.84	13.14	1.85
.73	1.04	17.61	1.93
.83	1.24	22.51	1.97
.94	1.45	27.75	2.00
1.04	1.66	33.21	2.00
1.15	1.86	38.77	2.00
1.25	2.07	44.30	2.00
1.35	2.27	49.65	2.00
1.46	2.46	54.66	2.00
1.56	2.63	59.15	2.00
1.67	2.80	62.88	2.00
1.77	2.94	65.55	2.00
1.88	3.06	66.64	2.00
2.00	3.14	66.64	2.00

*

COMPUTE TRAVEL TIME ID=14 REACH NO=1 NO VS=1 L=530 FT
 SLP=.075

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.104	.062	.32	.0283
.208	.174	1.41	.0181
.313	.314	3.28	.0141
.417	.475	5.90	.0118
.521	.651	9.21	.0104
.625	.839	13.14	.0094
.730	1.037	17.61	.0087
.834	1.240	22.51	.0081
.938	1.447	27.75	.0077
1.042	1.655	33.21	.0073
1.146	1.863	38.77	.0071
1.251	2.067	44.30	.0069
1.355	2.265	49.65	.0067
1.459	2.456	54.66	.0066
1.563	2.635	59.15	.0066
1.668	2.799	62.88	.0066
1.772	2.943	65.55	.0066
1.876	3.061	66.64	.0068
2.000	3.142	66.64	.0069

*
ROUTE ID=14 HYD NO=312.9 INFLOW ID=50 DT=0.0

*

*S BASIN 413

*
*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME

*
COMPUTE LT TP LCODE=1 NK=1 ISLOPE=1
LENGTH=320 FT SLOPE=0.0469 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	ADJUSTED SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	320.0	.045690	3.0000
TOTAL BASIN	320.0	.045690	3.0000

TIME OF CONCENTRATION (HRS)= .0139 TIME TO PEAK (HRS)= .0092 LAG TIME (HRS)= .0104

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

.1500

*
SEDIMENT BULK CODE=1 BULK FACTOR=1.12
COMPUTE NM HYD ID=4 HYD NO=413 DA=.00311 SQ MI
%A=55 %B=0 %C=40 %D=5
TP=0.0 HR
MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = .61377 CFS UNIT VOLUME = .9832 B = 526.28 P60 = 2.0000
AREA = .000156 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .138094HR TP = .133333HR K/TP RATIO = 1.035708 SHAPE CONSTANT, N = 3.408373
UNIT PEAK = 6.9486 CFS UNIT VOLUME = .9984 B = 313.58 P60 = 2.0000
AREA = .002955 SQ MI IA = .52368 INCHES INF = 1.31632 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.12000 AT PEAK FLOW.

PRINT HYD ID=4 CODE=1

HYDROGRAPH FROM AREA 413.00

RUNOFF VOLUME = .90235 INCHES = .1497 ACRE-Feet
PEAK DISCHARGE RATE = 4.92 CFS AT 1.500 HOURS BASIN AREA = .0031 SQ. MI.

*
*S COMBINE BASIN 312.9 WITH 413
*

ADD HYD ID=15 HYD=413.5 ID I=14 ID II=4
PRINT HYD ID=15 CODE=1

HYDROGRAPH FROM AREA 413.50

RUNOFF VOLUME = 1.09856 INCHES = .9240 ACRE-FEET
PEAK DISCHARGE RATE = 17.15 CFS AT 1.650 HOURS BASIN AREA = .0158 SQ. MI.

*
*S ROUTE 413.5 TO POND - 30" PIPE SECTION
*

COMPUTE RATING CURVE CID=1 VS NO=1 CODE =-1 SLP=0.0625
DIA=2.5 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.13	.10	.54	1.11
.26	.27	2.34	1.53
.39	.49	5.43	1.82
.52	.74	9.76	2.03
.65	1.02	15.24	2.19
.78	1.31	21.75	2.32
.91	1.62	29.14	2.41
1.04	1.94	37.26	2.47
1.17	2.26	45.93	2.50
1.30	2.59	54.96	2.50
1.43	2.91	64.17	2.50
1.56	3.23	73.32	2.50
1.69	3.54	82.18	2.50
1.82	3.84	90.47	2.50
1.95	4.12	97.89	2.50
2.08	4.37	104.07	2.50
2.21	4.60	108.49	2.50
2.35	4.78	110.31	2.50
2.50	4.91	110.31	2.50

*
COMPUTE TRAVEL TIME ID=16 REACH NO=1 NO VS=1 L=240 FT
SLP=.0625

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.130	.098	.54	.0121
.261	.271	2.34	.0077
.391	.490	5.43	.0060
.521	.741	9.76	.0051
.651	1.017	15.24	.0044
.782	1.312	21.75	.0040
.912	1.620	29.14	.0037
1.042	1.937	37.26	.0035
1.173	2.261	45.93	.0033
1.303	2.586	54.96	.0031
1.433	2.910	64.17	.0030
1.563	3.229	73.32	.0029
1.694	3.540	82.18	.0029
1.824	3.837	90.47	.0028
1.954	4.117	97.89	.0028
2.084	4.373	104.07	.0028
2.215	4.599	108.49	.0028
2.345	4.783	110.31	.0029
2.500	4.909	110.31	.0030

*
ROUTE ID=16 HYD NO=413.9 INFLOW ID=15 DT=0.0
*

*S*****
*S BASIN 412
*S*****
*

*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME
*

COMPUTE LT TP LCODE=1 NK=1 ISLOPE=1
LENGTH=430 FT SLOPE=0.1279 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	ADJUSTED SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	430.0	.060542	3.0000
TOTAL BASIN	430.0	.060542	3.0000

TIME OF CONCENTRATION (HRS)= .0162 TIME TO PEAK (HRS)= .0108 LAG TIME (HRS)= .0121

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

*
SEDIMENT BULK CODE=1 BULK FACTOR=1.14
COMPUTE NM HYD ID=5 HYD NO=412 DA=.00220 SQ MI
%A=0 %B=20 %C=74 %D=6
TP=0.0 HR
MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = .52101 CFS UNIT VOLUME = .9791 B = 526.28 P60 = 2.0000
AREA = .000132 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .112602HR TP = .133333HR K/TP RATIO = .844519 SHAPE CONSTANT, N = 4.217498
UNIT PEAK = 5.7297 CFS UNIT VOLUME = .9996 B = 369.42 P60 = 2.0000
AREA = .002068 SQ MI IA = .38191 INCHES INF = .91936 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.14000 AT PEAK FLOW.

PRINT HYD ID=5 CODE=1

HYDROGRAPH FROM AREA 412.00

RUNOFF VOLUME = 1.26796 INCHES = .1488 ACRE-FEET
PEAK DISCHARGE RATE = 4.80 CFS AT 1.500 HOURS BASIN AREA = .0022 SQ. MI.

*
*S COMBINE BASIN 413.9 WITH 412
*

ADD HYD ID=17 HYD=412.5 ID I=16 ID II=5
PRINT HYD ID=17 CODE=1

HYDROGRAPH FROM AREA 412.50

RUNOFF VOLUME = 1.11930 INCHES = 1.0727 ACRE-FEET
PEAK DISCHARGE RATE = 20.60 CFS AT 1.600 HOURS BASIN AREA = .0180 SQ. MI.

*
*S*****
*S BASIN 411
*S*****
*

*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME
*

COMPUTE LT TP LCODE=1 NK=1 ISLOPE=1
LENGTH=600 FT SLOPE=0.1250 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	ADJUSTED SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	600.0	.060346	3.0000
TOTAL BASIN	600.0	.060346	3.0000

TIME OF CONCENTRATION (HRS)= .0226 TIME TO PEAK (HRS)= .0151 LAG TIME (HRS)= .0170

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

.1500

*
SEDIMENT BULK CODE=1 BULK FACTOR=1.15
COMPUTE NM HYD ID=6 HYD NO=411 DA=.00320 SQ MI
 %A=25 %B=43 %C=28 %D=4
 TP=0.0 HR
 MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = .50523 CFS UNIT VOLUME = .9791 B = 526.28 P60 = 2.0000
AREA = .000128 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .132221HR TP = .133333HR K/TP RATIO = .991660 SHAPE CONSTANT, N = 3.560377
UNIT PEAK = 7.4813 CFS UNIT VOLUME = .9993 B = 324.71 P60 = 2.0000
AREA = .003072 SQ MI IA = .49531 INCHES INF = 1.23687 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.15000 AT PEAK FLOW.

PRINT HYD ID=6 CODE=1

HYDROGRAPH FROM AREA 411.00

RUNOFF VOLUME = .96500 INCHES = .1647 ACRE-FEET
PEAK DISCHARGE RATE = 5.50 CFS AT 1.500 HOURS BASIN AREA = .0032 SQ. MI.

*
*S COMBINE BASIN 412.5 WITH 411

*
ADD HYD ID=35 HYD=411.5 ID I=17 ID II=6
PRINT HYD ID=35 CODE=1

HYDROGRAPH FROM AREA 411.50

RUNOFF VOLUME = 1.09597 INCHES = 1.2374 ACRE-FEET
PEAK DISCHARGE RATE = 25.10 CFS AT 1.550 HOURS BASIN AREA = .0212 SQ. MI.

*
*S END OF 300 AND 400 SERIES BASINS
*S*****

*
*S START OF 500 AND 600 BASINS

*
*S*****
*S BASIN 511
*S*****

*
*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME

*
COMPUTE LT TP LCODE=1 NK=1 ISLOPE=1
 LENGTH=1520 FT SLOPE=0.1020 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	ADJUSTED SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	1520.0	.058643	3.0000
TOTAL BASIN	1520.0	.058643	3.0000

TIME OF CONCENTRATION (HRS)= .0581 TIME TO PEAK (HRS)= .0387 LAG TIME (HRS)= .0436

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

.1500

*

SEDIMENT BULK CODE=1 BULK FACTOR=1.25
COMPUTE NM HYD ID=1 HYD NO=511 DA=.01420 SQ MI
%A=0 %B=0 %C=96 %D=4
TP=0.0 HR
MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 2.2419 CFS UNIT VOLUME = .9941 B = 526.28 P60 = 2.0000
AREA = .000568 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .107360HR TP = .133333HR K/TP RATIO = .805200 SHAPE CONSTANT, N = 4.445615
UNIT PEAK = 39.246 CFS UNIT VOLUME = 1.002 B = 383.86 P60 = 2.0000
AREA = .013632 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.25000 AT PEAK FLOW.

PRINT HYD ID=1 CODE=1

OUTFLOW HYDROGRAPH RESERVOIR 511.00

RUNOFF VOLUME = 1.45395 INCHES = 1.1011 ACRE-FEET
PEAK DISCHARGE RATE = 35.54 CFS AT 1.500 HOURS BASIN AREA = .0142 SQ. MI.

*

*S*****
*S BASIN 611
*S*****

*

*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME

*

COMPUTE LT TP LCODE=1 NK=1 ISLOPE=1
LENGTH=730 FT SLOPE=0.1160 K=3

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	ADJUSTED SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	.0	.000000	.0000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	730.0	.059717	3.0000
TOTAL BASIN	730.0	.059717	3.0000

TIME OF CONCENTRATION (HRS)= .0277 TIME TO PEAK (HRS)= .0184 LAG TIME (HRS)= .0207

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

.1500

*

SEDIMENT BULK CODE=1 BULK FACTOR=1.16
COMPUTE NM HYD ID=2 HYD NO=611 DA=.00325 SQ MI
%A=16 %B=0 %C=84 %D=0
TP=0.0 HR
MASS RAINFALL=-1

TIME TO PEAK (hrs)= .1333

K = .115854HR TP = .133333HR K/TP RATIO = .868904 SHAPE CONSTANT, N = 4.089022
UNIT PEAK = 8.8009 CFS UNIT VOLUME = 1.000 B = 361.06 P60 = 2.0000
AREA = .003250 SQ MI IA = .39800 INCHES INF = .96440 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.16000 AT PEAK FLOW.

PRINT HYD ID=2 CODE=1

HYDROGRAPH FROM AREA 611.00

RUNOFF VOLUME = 1.13630 INCHES = .1970 ACRE-FEET

PEAK DISCHARGE RATE = 6.72 CFS AT 1.500 HOURS BASIN AREA = .0033 SQ. MI.

*
*
*S END OF 500 AND 600 BASINS
*S*****
*
*S ROUTE ALL 100, 200, 300, AND 400 BASINS THRU POND
*
*S COMBINE BASIN 111.9 WITH 211.9
*
ADD HYD ID=40 HYD=150.5 ID I=33 ID II=34
PRINT HYD ID=40 CODE=1

PARTIAL HYDROGRAPH 150.50

RUNOFF VOLUME = 1.60140 INCHES = 2.8560 ACRE-FEET
PEAK DISCHARGE RATE = 64.83 CFS AT 1.550 HOURS BASIN AREA = .0334 SQ. MI.

*
*S COMBINE BASIN 150.5 WITH 411.5
*
ADD HYD ID=41 HYD=150.9 ID I=40 ID II=35
PRINT HYD ID=41 CODE=1

PARTIAL HYDROGRAPH 150.90

RUNOFF VOLUME = 1.40546 INCHES = 4.0934 ACRE-FEET
PEAK DISCHARGE RATE = 89.93 CFS AT 1.550 HOURS BASIN AREA = .0546 SQ. MI.

*
*S ROUTE ONSITE BASINS THRU RESERVOIR
*
ROUTE RESERVOIR ID=42 HYD=160.1 INFLOW ID=41 CODE=5

OUTFLOW (CFS)	STORAGE (AC FT)	ELEV (FT)
0	0	100
7	0.23	101
12	0.69	102
18	1.15	103
24	1.61	104
30	2.07	105
36	2.53	106

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
.25	.00	100.00	.000	.00
.50	.00	100.00	.000	.00
.75	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
1.25	1.31	100.01	.003	.10
1.50	83.94	101.71	.559	10.57
1.75	55.74	104.29	1.742	25.72
2.00	26.83	104.80	1.980	28.82
2.25	10.42	104.36	1.776	26.16
2.50	4.72	103.61	1.429	21.64
2.75	2.32	102.88	1.097	17.31
3.00	1.20	102.27	.814	13.62
3.25	.66	101.77	.582	10.83
3.50	.41	101.35	.391	8.75
3.75	.27	101.01	.235	7.06
4.00	.22	100.56	.129	3.93
4.25	.20	100.31	.072	2.19
4.50	.19	100.18	.041	1.26
4.75	.19	100.11	.025	.76
5.00	.20	100.07	.016	.50
5.25	.21	100.05	.012	.36
5.50	.22	100.04	.010	.29
5.75	.23	100.04	.009	.26
6.00	.25	100.04	.008	.25
6.25	.33	100.04	.009	.27
6.50	.35	100.04	.010	.30
6.75	.35	100.05	.011	.33

7.00	.35	100.05	.011	.34
7.25	.35	100.05	.011	.34
7.50	.34	100.05	.011	.34
7.75	.33	100.05	.011	.34
8.00	.33	100.05	.011	.34
8.25	.32	100.05	.011	.33
8.50	.32	100.05	.011	.33
8.75	.31	100.05	.011	.32
9.00	.31	100.05	.010	.32
9.25	.31	100.04	.010	.31
9.50	.30	100.04	.010	.31
9.75	.30	100.04	.010	.30
10.00	.29	100.04	.010	.30
10.25	.29	100.04	.010	.30
10.50	.28	100.04	.010	.29
10.75	.28	100.04	.009	.29
11.00	.28	100.04	.009	.28
11.25	.27	100.04	.009	.28
11.50	.27	100.04	.009	.28
11.75	.27	100.04	.009	.27
12.00	.26	100.04	.009	.27
12.25	.26	100.04	.009	.27
12.50	.26	100.04	.009	.26
12.75	.26	100.04	.009	.26
13.00	.25	100.04	.008	.26
13.25	.25	100.04	.008	.25
13.50	.25	100.04	.008	.25
13.75	.24	100.04	.008	.25

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
---------------	-----------------	----------------	-------------------	------------------

14.00	.24	100.04	.008	.25
14.25	.24	100.03	.008	.24
14.50	.24	100.03	.008	.24
14.75	.23	100.03	.008	.24
15.00	.23	100.03	.008	.23
15.25	.23	100.03	.008	.23
15.50	.23	100.03	.008	.23
15.75	.22	100.03	.007	.23
16.00	.22	100.03	.007	.23
16.25	.22	100.03	.007	.22
16.50	.22	100.03	.007	.22
16.75	.22	100.03	.007	.22
17.00	.21	100.03	.007	.22
17.25	.21	100.03	.007	.21
17.50	.21	100.03	.007	.21
17.75	.21	100.03	.007	.21
18.00	.20	100.03	.007	.21
18.25	.20	100.03	.007	.21
18.50	.20	100.03	.007	.21
18.75	.20	100.03	.007	.20
19.00	.20	100.03	.007	.20
19.25	.20	100.03	.007	.20
19.50	.20	100.03	.007	.20
19.75	.19	100.03	.006	.20
20.00	.19	100.03	.006	.19
20.25	.19	100.03	.006	.19
20.50	.19	100.03	.006	.19
20.75	.19	100.03	.006	.19
21.00	.19	100.03	.006	.19
21.25	.18	100.03	.006	.19
21.50	.18	100.03	.006	.18
21.75	.18	100.03	.006	.18
22.00	.18	100.03	.006	.18
22.25	.18	100.03	.006	.18
22.50	.18	100.03	.006	.18
22.75	.18	100.03	.006	.18
23.00	.17	100.03	.006	.18
23.25	.17	100.03	.006	.18
23.50	.17	100.02	.006	.17
23.75	.17	100.02	.006	.17
24.00	.17	100.02	.006	.17
24.25	.06	100.02	.005	.15
24.50	.01	100.01	.003	.09
24.75	.00	100.01	.002	.05
25.00	.00	100.00	.001	.03
25.25	.00	100.00	.000	.01
25.50	.00	100.00	.000	.01
25.75	.00	100.00	.000	.00

PEAK DISCHARGE = 28.822 CFS - PEAK OCCURS AT HOUR 2.00

MAXIMUM WATER SURFACE ELEVATION = 104.804

MAXIMUM STORAGE = 1.9797 AC-FT INCREMENTAL TIME= .050000HRS

*
*
*S ROUTE 160.1 TO LOS PICAROS ROAD - 24" PIPE SECTION
*

COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLP=0.047
DIA=2.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.10	.06	.26	.89
.21	.17	1.12	1.22
.31	.31	2.60	1.45
.42	.47	4.67	1.62
.52	.65	7.29	1.76
.63	.84	10.40	1.85
.73	1.04	13.94	1.93
.83	1.24	17.82	1.97
.94	1.45	21.97	2.00
1.04	1.66	26.29	2.00
1.15	1.86	30.69	2.00
1.25	2.07	35.07	2.00
1.35	2.27	39.30	2.00
1.46	2.46	43.27	2.00
1.56	2.63	46.82	2.00
1.67	2.80	49.77	2.00
1.77	2.94	51.89	2.00
1.88	3.06	52.76	2.00
2.00	3.14	52.76	2.00

*
COMPUTE TRAVEL TIME ID=43 REACH NO=1 NO VS=1 L=2540 FT
SLP=0.047

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.104	.062	.26	.1713
.208	.174	1.12	.1098
.313	.314	2.60	.0853
.417	.475	4.67	.0717
.521	.651	7.29	.0630
.625	.839	10.40	.0569
.730	1.037	13.94	.0525
.834	1.240	17.82	.0491
.938	1.447	21.97	.0465
1.042	1.655	26.29	.0444
1.146	1.863	30.69	.0428
1.251	2.067	35.07	.0416
1.355	2.265	39.30	.0407
1.459	2.456	43.27	.0400
1.563	2.635	46.82	.0397
1.668	2.799	49.77	.0397
1.772	2.943	51.89	.0400
1.876	3.061	52.76	.0409
2.000	3.142	52.76	.0420

*
ROUTE ID=43 HYD NO=160.5 INFLOW ID=42 DT=0.0
*

*S*****
*S BASIN 1000 - SUNSET MEMORIAL
*S*****
*

*COMPUTE TIME TO PEAK USING UPLAND/LAG TIME
*

COMPUTE LT TP LCODE=1 NK=3 ISLOPE=1
LENGTH=400 FT SLOPE=0.0788 K=0.7
LENGTH=1600 FT SLOPE=0.0788 K=2.0
LENGTH=900 FT SLOPE=0.0788 K=3.0

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	ADJUSTED SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	400.0	.056146	.7000
SHALLOW FLOW PORTION	1600.0	.056146	2.0000
CHANNEL FLOW PORTION	900.0	.056146	3.0000
TOTAL BASIN	2900.0	.056146	1.7350

TIME OF CONCENTRATION (HRS)= .1959 TIME TO PEAK (HRS)= .1306 LAG TIME (HRS)= .1470

TIME TO PEAK COMPUTED TO BE LESS THAN 0.133333 HOUR MINIMUM VALUE.

REVISED VALUES: TIME OF CONCENTRATION (HRS)= .2000 TIME TO PEAK (HRS)= .1333 LAG TIME (HRS)=

.1500

*
SEDIMENT BULK CODE=1 BULK FACTOR=1.35
COMPUTE NM HYD ID=44 HYD NO=1000 DA=.0733 SQ MI
 %A=100 %B=0 %C=0 %D=0
 TP=0.0 HR
 MASS RAINFALL=-1
TIME TO PEAK (hrs)= .1333

K = .159137HR TP = .133333HR K/TP RATIO = 1.193533 SHAPE CONSTANT, N = 2.975942
UNIT PEAK = 153.85 CFS UNIT VOLUME = .9986 B = 279.85 P60 = 2.0000
AREA = .073300 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.35000 AT PEAK FLOW.

PRINT HYD ID=44 CODE=1

HYDROGRAPH FROM AREA 1000.00

RUNOFF VOLUME = .69193 INCHES = 2.7050 ACRE-FEET
PEAK DISCHARGE RATE = 94.45 CFS AT 1.500 HOURS BASIN AREA = .0733 SQ. MI.

*
*S COMBINE BASIN 160.5 WITH 1000
*

ADD HYD ID=45 HYD=1000.5 ID I=43 ID II=44
PRINT HYD ID=45 CODE=1

HYDROGRAPH FROM AREA 1000.50

RUNOFF VOLUME = .99656 INCHES = 6.7984 ACRE-FEET
PEAK DISCHARGE RATE = 103.34 CFS AT 1.550 HOURS BASIN AREA = .1279 SQ. MI.

*
*S ROUTE 1000.5 TO TIJERAS ARROYO - 48" PIPE SECTION
*

COMPUTE RATING CURVE CID=1 VS NO=1 CODE =-1 SLP=0.047
 DIA=4.0 N=0.013

RATING CURVE PIPE SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.21	.25	1.63	1.78
.42	.69	7.09	2.44
.63	1.25	16.49	2.91
.83	1.90	29.65	3.25
1.04	2.60	46.29	3.51
1.25	3.36	66.05	3.71
1.46	4.15	88.49	3.85
1.67	4.96	113.14	3.94
1.88	5.79	139.47	3.99
2.08	6.62	166.92	4.00
2.29	7.45	194.87	4.00
2.50	8.27	222.66	4.00
2.71	9.06	249.56	4.00
2.92	9.82	274.75	4.00
3.13	10.54	297.30	4.00
3.34	11.20	316.05	4.00
3.54	11.77	329.47	4.00
3.75	12.24	334.99	4.00
4.00	12.57	334.99	4.00

*
COMPUTE TRAVEL TIME ID=46 REACH NO=1 NO VS=1 L=180 FT
 SLP=0.047

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ. FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	1.63	.0076
.417	.695	7.09	.0049
.625	1.255	16.49	.0038
.834	1.898	29.65	.0032
1.042	2.604	46.29	.0028
1.251	3.358	66.05	.0025
1.459	4.146	88.49	.0023
1.668	4.960	113.14	.0022
1.876	5.788	139.47	.0021
2.084	6.621	166.92	.0020
2.293	7.451	194.87	.0019
2.501	8.267	222.66	.0019
2.710	9.062	249.56	.0018
2.918	9.823	274.75	.0018
3.127	10.539	297.30	.0018
3.335	11.195	316.05	.0018
3.544	11.773	329.47	.0018
3.752	12.243	334.99	.0018
4.000	12.566	334.99	.0019

*

ROUTE

*

*

*

FINISH

ID=46 HYD NO=1000.5 INFLOW ID=45 DT=0.0

NORMAL PROGRAM FINISH

END TIME (HR:MIN:SEC) = 10:28:49

MESA DEL SOL AMPHITHEATER
10 DAY STORM CALCULATION

BASIN	AREA ACRES	% D LAND TREATMENT	IMPERVIOUS AREA ACRES	100 YR, 24HR VOLUME AC-FT	100 YR, 10 DAY VOLUME AC-FT
111	0.49	19	0.09	0.046	0.055
112	1.56	83	1.29	0.297	0.421
113	1.22	14	0.17	0.139	0.155
121	1.07	81	0.87	0.202	0.285
122	0.22	100	0.22	0.047	0.068
123	0.42	100	0.42	0.092	0.132
124	1.30	14	0.18	0.152	0.169
131	3.36	7	0.24	0.336	0.359
132	2.94	2	0.06	0.275	0.281
133	0.88	20	0.18	0.107	0.124
134	2.55	22	0.56	0.313	0.367
211	0.53	42	0.22	0.067	0.088
212	1.09	76	0.83	0.195	0.274
221	0.39	51	0.20	0.055	0.074
222	0.40	23	0.09	0.042	0.051
231	1.05	84	0.88	0.209	0.294
232	0.21	100	0.21	0.046	0.066
233	0.42	100	0.42	0.092	0.132
234	1.29	9	0.12	0.143	0.154
312	3.29	3	0.10	0.290	0.299
313	0.72	22	0.16	0.089	0.104
314	4.09	13	0.53	0.395	0.446
411	2.05	4	0.08	0.165	0.173
412	1.41	6	0.08	0.149	0.157
413	1.99	5	0.10	0.150	0.160
SUBTOTAL				4.093	4.889
511	9.51	4	0.38	1.101	1.137
611	2.08	1	0.02	0.197	0.199
TOTAL				5.391	6.225
TOTAL -511				4.290	5.088

TABLE 1

MESA DEL SOL AMPHITHEATER EXISTING CONDITIONS

BASIN	AREA SQ. M.	PERCENT IMPERV.	QF CFS	VOL AC-FT	WGHTD K	C	GAMMA	SLOPE %	N	ES	YS TONS	YS TONS	CS PPM	QF8 WASH LOAD
A-1	0.0053		9.00	0.259	0.100	0.24	350	10	0.5	2.57	28.20	28.20	74173	0.27
A-2	0.0126	0%	18.00	0.510	0.100	0.24	400	8	0.5	1.98	46.91	46.91	63387	0.46
A-3	0.0050	0%	7.10	0.202	0.100	0.24	400	9	0.5	2.35	19.65	19.65	68785	0.19
A-4	0.0068	0%	9.70	0.275	0.100	0.24	400	8	0.5	1.98	23.48	23.48	59108	0.23
A-5	0.0071	0%	8.80	0.247	0.100	0.24	400	7	0.5	1.65	17.39	17.39	49257	0.17
A-6	0.0048	0%	6.20	0.173	0.100	0.24	350	8	0.5	1.85	13.19	13.19	53104	0.13
A-7	0.0041	0%	7.00	0.200	0.100	0.24	250	21	0.5	7.21	59.53	59.53	179673	0.58
A-8	0.0066	0%	10.10	0.288	0.100	0.24	400	11	0.5	3.17	39.44	39.44	91536	0.38
A-9	0.0050	0%	7.40	0.210	0.100	0.24	350	12	0.5	3.39	29.72	29.72	84300	0.29
A-10	0.0017	0%	2.20	0.061	0.100	0.24	200	14	0.5	3.28	7.28	7.28	80723	0.07
A-11	0.0133	0%	22.51	0.650	0.100	0.24	400	10	0.5	2.74	84.33	84.33	87145	0.81

BED MATERIAL AND TOTAL SEDIMENT YIELD ANALYSIS

a = 2.10E-04
b = 4.20
c = 0.20
d = -2.60

n = 0.042

BASIN	AREA SQ. M.	QF CFS	VOL AC-FT	YS TONS	SED VOL AC-FT	CS PPM	QF8 WASH LOAD	QF8 WASH LOAD	QF8 WASH LOAD	QF8 WASH LOAD	QF8 WASH LOAD	QF8 WASH LOAD	QF8 WASH LOAD	QF8 WASH LOAD
A-1	0.0053	9.00	0.259	28.20	0.0129	74173	0.0129	0.0129	0.0129	0.0129	0.0129	0.0129	0.0129	0.0129
A-2	0.0126	18.00	0.510	46.91	0.0215	63387	0.0215	0.0215	0.0215	0.0215	0.0215	0.0215	0.0215	0.0215
A-3	0.0050	7.10	0.202	19.65	0.0090	68785	0.0090	0.0090	0.0090	0.0090	0.0090	0.0090	0.0090	0.0090
A-4	0.0068	9.70	0.275	23.48	0.0108	59108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108
A-5	0.0071	8.80	0.247	17.39	0.0080	49257	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080
A-6	0.0048	6.20	0.173	13.19	0.0061	53104	0.0061	0.0061	0.0061	0.0061	0.0061	0.0061	0.0061	0.0061
A-7	0.0041	7.00	0.200	59.53	0.0273	179673	0.0273	0.0273	0.0273	0.0273	0.0273	0.0273	0.0273	0.0273
A-8	0.0066	10.10	0.288	39.44	0.0181	91536	0.0181	0.0181	0.0181	0.0181	0.0181	0.0181	0.0181	0.0181
A-9	0.0050	7.40	0.210	29.72	0.0136	84300	0.0136	0.0136	0.0136	0.0136	0.0136	0.0136	0.0136	0.0136
A-10	0.0017	2.20	0.061	7.28	0.0033	80723	0.0033	0.0033	0.0033	0.0033	0.0033	0.0033	0.0033	0.0033
A-11	0.0133	22.51	0.650	84.33	0.0387	87145	0.0387	0.0387	0.0387	0.0387	0.0387	0.0387	0.0387	0.0387
TOTAL	0.0723	108.01	3.075	369.12	0.1695	899201	0.1695	0.1695	0.1695	0.1695	0.1695	0.1695	0.1695	0.1695

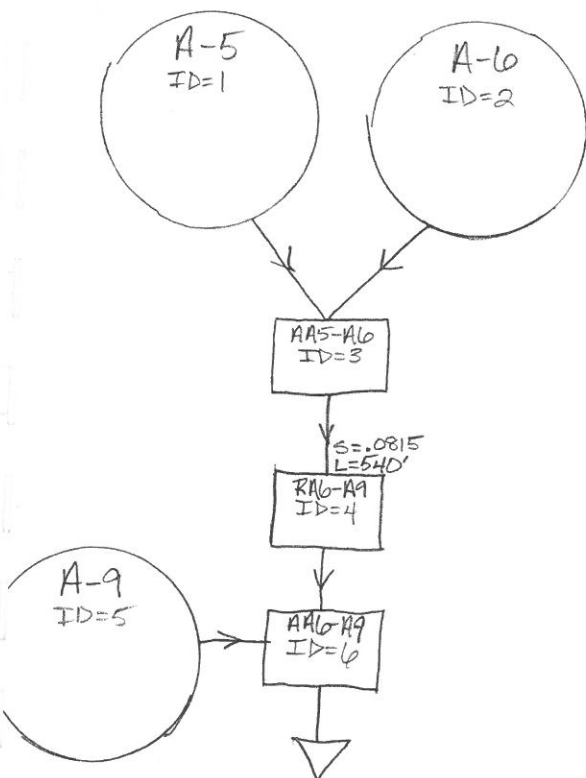
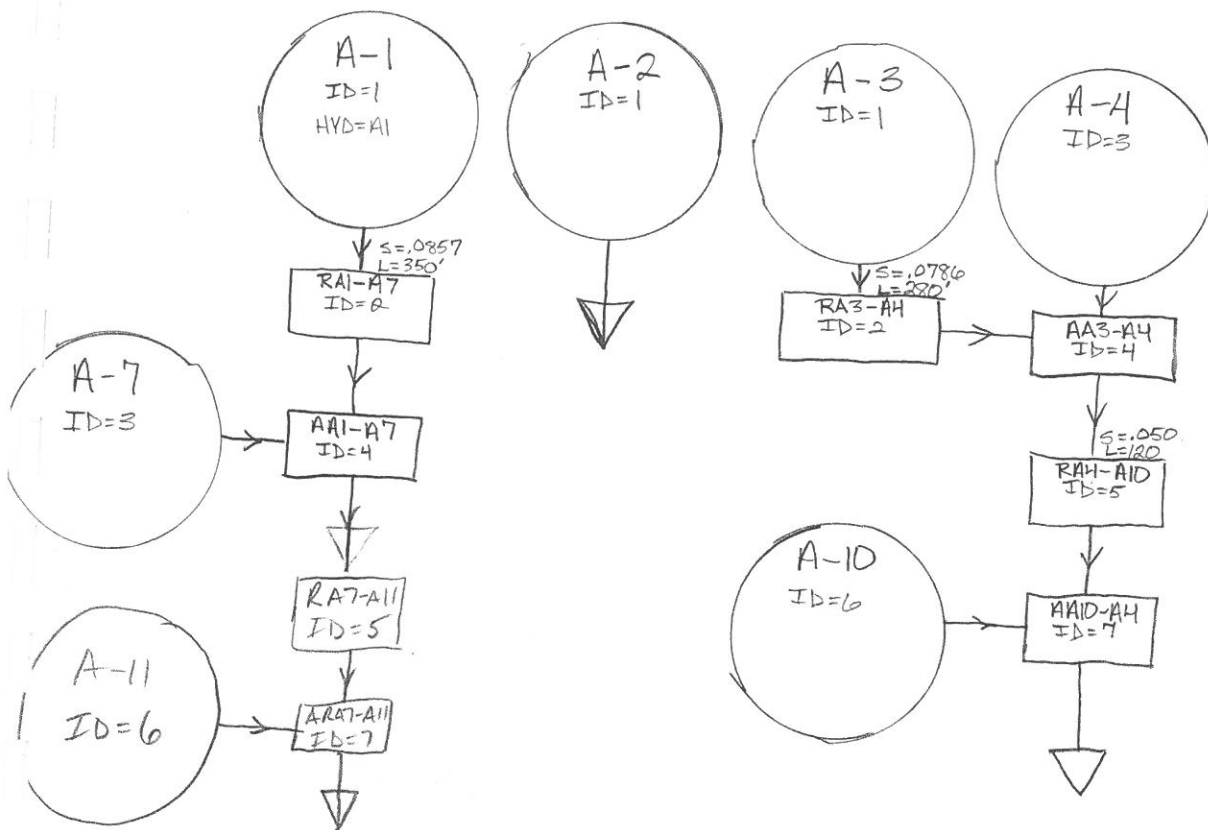
0.61

BED MATERIAL AND TOTAL SEDIMENT YIELD ANALYSIS

a = 2.10E-04
b = 4.20
c = 0.20
d = -2.60

n = 0.042

BASIN	AREA SQ. MI.	QP CFS	VOL AC-FT	VS TONS	SED VOL AC-FT	Cs PPM	Q unit width	AVG SLOPE	VEL	DEPTH	WD	qs (unit width bed load)	QS BED LOAD	QS TOTAL	BF	Q BULK	SED VOL AC-FT
111	0.00077	1.35	0.046	0.19	0.0001	3031	0.50	0.015	1.82	0.27	2.7	0.00	0.01	0.01	1.01	1.36	0.00
112	0.00244	6.56	0.294	0.47	0.0002	1168	1.28	0.016	2.71	0.47	5.1	0.01	0.06	0.06	1.01	6.62	0.00
113	0.00191	4.02	0.133	3.49	0.0016	18963	0.95	0.049	3.37	0.28	4.2	0.03	0.12	0.15	1.04	4.17	0.00
121	0.00167	4.52	0.200	0.40	0.0000	1457	1.02	0.025	2.84	0.38	4.4	0.01	0.06	0.06	1.01	4.58	0.00
122	0.00034	1.01	0.047	0.00	0.0000	0	0.42	0.039	1.85	0.22	2.4	0.00	0.01	0.01	1.00	1.02	0.00
123	0.00086	1.95	0.090	0.00	0.0000	0	0.62	0.039	2.65	0.23	3.2	0.01	0.03	0.03	1.02	1.88	0.00
124	0.00203	4.28	0.142	6.24	0.0029	31304	0.99	0.080	3.97	0.25	4.3	0.06	0.24	0.30	1.07	4.58	0.01
131	0.00525	9.50	0.295	26.92	0.0124	62919	1.60	0.100	5.14	0.31	5.9	0.17	1.13	1.37	1.14	10.87	0.04
132	0.00459	8.13	0.242	23.27	0.0107	66074	1.46	0.103	4.99	0.29	5.6	0.02	0.94	1.16	1.04	9.29	0.03
133	0.00138	2.99	0.103	2.61	0.0012	18333	1.48	0.069	3.22	0.25	3.7	0.00	0.08	0.11	1.04	3.10	0.00
134	0.00398	8.34	0.290	14.40	0.0066	35252	0.57	0.007	1.53	0.37	3.0	0.01	0.55	0.67	1.08	9.01	0.02
211	0.00170	1.72	0.087	0.17	0.0001	1885	1.01	0.020	2.63	0.38	4.4	0.01	0.04	0.05	1.01	1.72	0.00
221	0.00061	1.35	0.055	0.37	0.0002	1287	0.50	0.036	2.37	0.21	2.7	0.01	0.02	0.02	1.01	1.37	0.00
222	0.00063	1.19	0.041	0.19	0.0001	4875	0.46	0.024	2.03	0.23	2.6	0.00	0.01	0.01	1.01	1.20	0.00
231	0.00164	4.44	0.199	1.19	0.0005	4375	1.01	0.070	3.84	0.26	4.4	0.05	0.20	0.21	1.05	4.85	0.01
232	0.00033	0.98	0.045	0.00	0.0000	0	0.41	0.021	1.86	0.22	2.4	0.00	0.01	0.01	1.01	0.98	0.00
233	0.00066	1.95	0.090	0.00	0.0000	0	0.62	0.039	2.85	0.23	3.2	0.01	0.03	0.03	1.07	1.98	0.00
234	0.00202	4.16	0.133	6.26	0.0029	33478	0.97	0.080	3.94	0.25	4.3	0.05	0.24	0.29	1.07	4.45	0.01
312	0.00514	8.50	0.253	42.50	0.0195	110002	1.49	0.082	4.71	0.32	5.7	0.15	0.86	1.26	1.15	8.76	0.04
313	0.00113	2.48	0.086	2.61	0.0012	21876	0.71	0.070	3.34	0.21	3.5	0.03	0.09	0.11	1.04	2.59	0.00
314	0.00639	11.53	0.376	9.39	0.0043	18040	1.79	0.046	4.26	0.42	6.4	0.08	0.52	0.60	1.05	12.13	0.02
412	0.00320	4.79	0.143	16.69	0.0077	79101	1.06	0.125	4.66	0.23	4.5	0.12	0.56	0.72	1.15	5.51	0.02
413	0.00220	4.21	0.131	13.41	0.0062	70049	0.98	0.128	4.55	0.22	4.3	0.09	0.46	0.58	1.14	4.78	0.02
511	0.00311	4.39	0.134	12.10	0.0056	62312	1.01	0.111	4.40	0.23	4.4	0.09	0.41	0.52	1.12	4.91	0.02
611	0.01486	28.43	0.881	108.40	0.0502	83717	3.08	0.102	6.72	0.46	9.2	0.67	6.21	7.19	1.25	35.62	0.22
1000	0.00325	5.79	0.170	22.78	0.0105	89749	1.19	0.116	4.77	0.25	4.9	0.14	0.70	0.92	1.16	6.71	0.03
1000	0.07332	132.20	4.732	374.14	0.1718	54979	7.75	0.079	9.00	0.86	17.0	2.40	40.91	43.81	1.33	176.01	1.57
TOTAL	0.1460	275.15	9.611	689.54	0.3166	877700								60.25	1.22	335.40	2.08



22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS



134
ID=1
HYD=139

133
ID=2
HYD=133

124
ID=7
HYD=124

123
ID=6
HYD=123

122
ID=7.5
HYD=122

Route
thru
132
channel
R134-132
ID=11
HYD=139.1

Route
thru
132
PIPE
channel
R133-132
ID=12
HYD=133.1

Route
PIPE
Junction
R124-121
ID=18.2
HYD=124.1

R123-121
ID=19
HYD=123.1

R122-121
ID=20.1
HYD=122.1

ADD
R134+R132
ID=13
HYD=133.5

ADD
R133+132
ID=14
HYD=132.5

132
ID=3
HYD=132

ADD
R124+
124.1
ID=22
HYD=124.5

ADD
R123+
122.1
ID=21.2
HYD=123.5

Route
PIPE
R124.5-121
ID=23
HYD=124.9

ADD
R124.9
+121
ID=24
HYD=121.5

121
ID=8
HYD=121

Channel
Route
thru
131
R132.5-131
ID=15
HYD=131.5

ADD
R131.5
+131
ID=16
HYD=131.6

131
ID=4
HYD=131

Route
thru
Junction
w/121.5
R131.6
ID=17
HYD=131.9

ADD
R131.9
+121.8
ID=26
HYD=121.9

Route
PIPE
R121.9-112
ID=27
HYD=121.9.5

ADD
R121.9.5
+113.5
ID=29
HYD=113.9

113
ID=9
HYD=113

Route
PIPE
R113-112
ID=28
HYD=113.5

112
ID=10
HYD=112

ADD
R113.9+
112
ID=30
HYD=112.5

Route
PIPE
R112.5-111
ID=31
HYD=112.9

Route
PIPE
to Pond

R111.5 to Pond
ID=33
HYD=111.9

ADD
R112.9+
111
ID=32
HYD=111.5

111
ID=11
HYD=111



234
ID=1
HYD 234

233
ID=2
HYD 233

Route
to
Junction
R 234 to Junc
ID=10
HYD 234.5

R 233 to Junc
ID=11
HYD 233.5

ADD
ADD 234.5
+ 233.5
ID=12
HYD 233.9

ADD
ADD 233.9
+ 232.5
ID=14
HYD 232.6

Route
R 232 to
Junc
ID=13
HYD 232.5

232
ID=3
HYD 232

Route
Pipe
R 232.6-
231
ID=15
HYD 232.9

ADD
ADD 232.9
+ 231
ID=16
HYD 231.5

231
ID=4
HYD 231

Route
Pipe
R 231.5-
222
ID=17
HYD 231.9

ADD
ADD 231.9
+ 222
ID=18
HYD 222.5

222
ID=5
HYD 222

Route
to
Junction
R 222.5 to Junc
ID=19
HYD 222.9

ADD
ADD 222.9
+ 221.5
ID=21
HYD 221.6

Route
R 221.5 to Junc
ID=20
HYD 221.5

221
ID=6
HYD 221

212
ID=7
HYD 212

Route
R 221.6-
211
ID=22
HYD 221.9

Channel
Pipe
R 212-211
ID=23
HYD 212.5

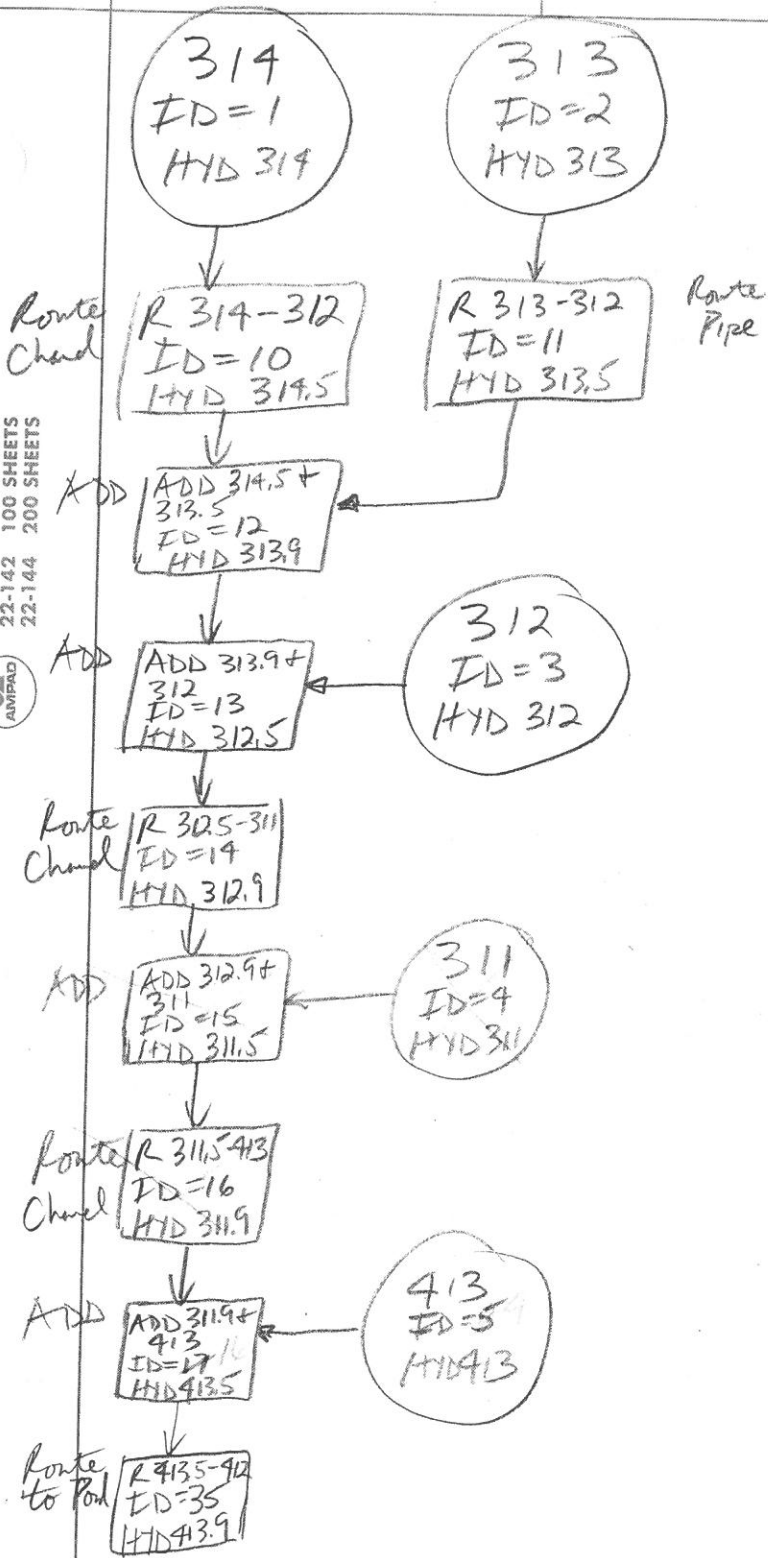
ADD
ADD 221.9
+ 211.5
ID=25
HYD 211.6

ADD 212.5
+ 211
ID=24
HYD 211.5

211
ID=8
HYD 211

Route
to
Pool
R 211.6 to Pool
ID=34
HYD=211.9

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS



Mesa del Sol Amphitheater

8-1-99

Drainage Proposed Conditions

BASIN	AREA		FLOWLINE		AVG Slope	LAND TREATMENT			
	AC	Sq. Mi.	Length	Δ Elev		%A	%B	%C	%D
111	0.49	0.00077	275'	4'	0.0146		77	4	19
112	1.56	0.00244	580'	9'	0.0155		17		83
113	1.22	0.00191	530'	26'	0.0491			86	14
121	1.07	0.00167	320	8'	0.0250		11	8	81
122	0.22	0.00034	140	3'	0.0214				100
123	0.42	0.00066	230	9'	0.0391				100
124	1.30	0.00203	415'	33'	0.0795			86	14
131	3.36	0.00525	650'	65'	0.1000	20		73	7
132	2.94	0.00459	600'	62'	0.1033	19		79	2
133	0.88	0.00138	600'	32'	0.0533			80	20
134	2.55	0.00398	800'	55'	0.0688		15	63	22
	16.01								

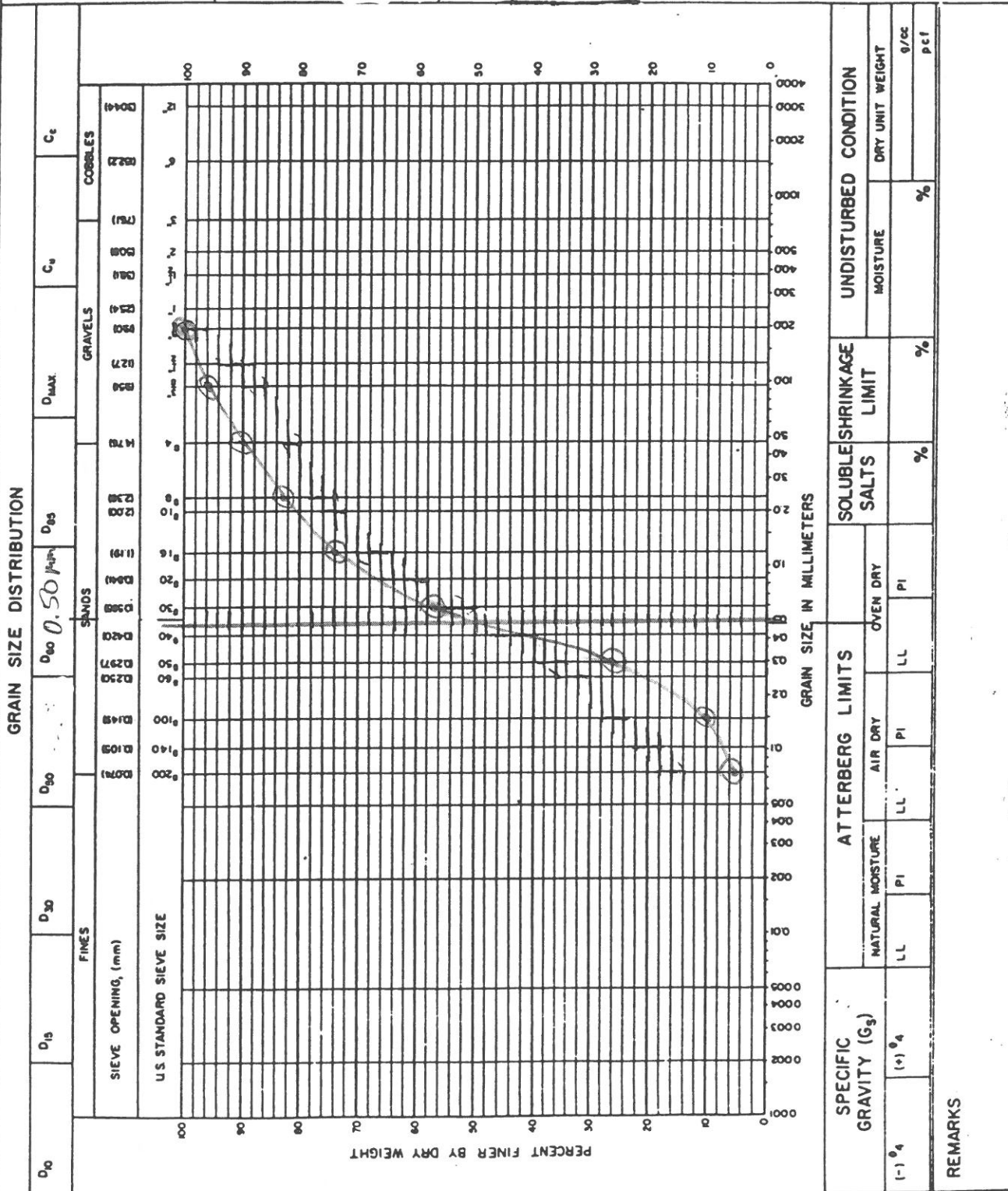
SUNSET MEMORIAL GARDENS	46.93	0.07332	2900	227	0.0788		75		25
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BASIN	AREA		FLOWLINE		AVG Slope	LAND TREATMENT			
	AC	Sq Mi	Length	Δ Elev		% A	% B	% C	% D
211	0.53	0.00083	300'	2'	0.0067		58		42
212	1.09	0.00170	300'	6'	0.0200		24		76
213	0.32	0.00050	220'	5.5'	0.0250		83		17
221	0.39	0.00061	330'	12'	0.0369		49		51
222	0.40	0.00063	250'	6'	0.0240		59	18	23
231	1.05	0.00169	400'	28'	0.0700		16		84
232	0.21	0.00033	140'	3'	0.0219				100
233	0.42	0.00066	230'	9'	0.0391				100
234	<u>1.29</u> 5.38	0.00202	415'	33'	0.0795			91	9
611	2.08	0.00325	730'	85'	0.1169	16		83	1
312	3.29	0.00514	910'	75'	0.0829	31		66	3
313	0.72	0.00113	460'	32'	0.0696			78	22
314	<u>4.09</u> 10.18	0.00639	880'	40'	0.0455	26		61	13
411	2.05	0.00320	600'	75'	0.1250	25	43	28	4
412	1.41	0.00220	430'	55'	0.1279		20	74	6
413	1.99	0.00311	540'	60'	0.1111	55		40	5
511	9.51	0.01486	1520'	155'	0.1020			96	4

UOP

MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		SOIL CLASSIFICATION	
PROJECT and STATE <i>Mesa del Sol Amphitheater</i>			SAMPLE LOCATION <i>TOP NEAR ENTRANCE</i>		
FIELD SAMPLE NO. <i>1</i>	DEPTH <i>2</i>	GEOLOGIC ORIGIN			
TYPE OF SAMPLE	TESTED AT	APPROVED BY		DATE	
SYMBOL		DESCRIPTION			



VON

SOIL CLASSIFICATION

Mesa del Sol

TOP near Pond

2

- 2'

GEOLOGIC ORIGIN

TESTED AT

APPROVED BY

DATE _____

SYMBOL

DESCRIPTION



SOIL CLASSIFICATION

Mesa del Sol

SAMPLE LOCATION

Stage

FIELD SAMPLE NO.

3

DEPTH

-2'

GEOLOGIC ORIGIN

TYPE OF SAMPLE

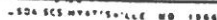
TESTED AT

APPROVED BY

DATE

SYMBOL

DESCRIPTION



MATERIALS TESTING REPORT **U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE** **SOIL CLASSIFICATION**

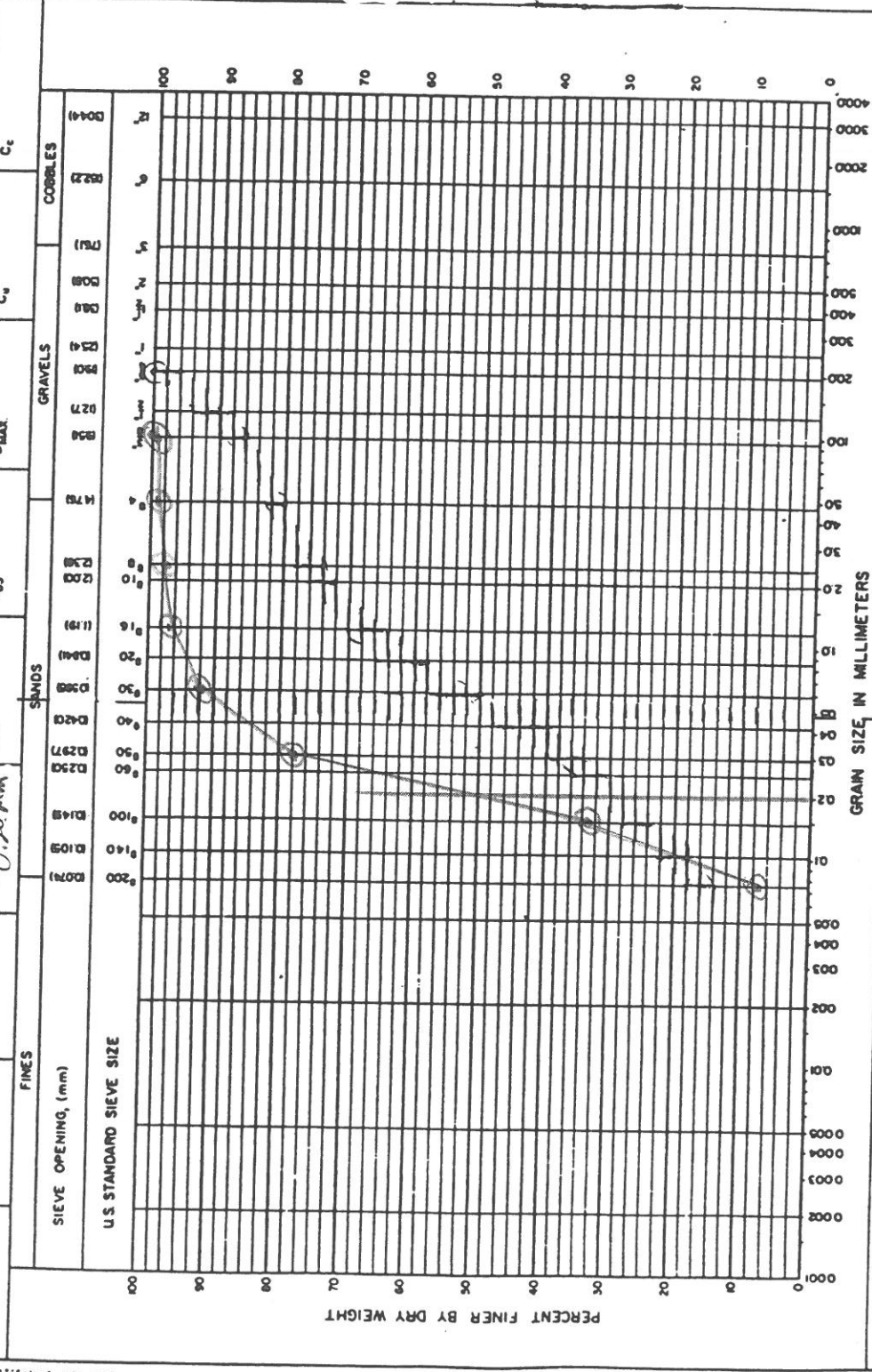
PROJECT and STATE: *Mesa del Sol* SAMPLE LOCATION: *Lower Seals*

FIELD SAMPLE NO. *4* DEPTH *-2* GEOLOGIC ORIGIN

TYPE OF SAMPLE TESTED AT APPROVED BY DATE

SYMBOL DESCRIPTION

GRAIN SIZE DISTRIBUTION



UNDISTURBED CONDITION

MOISTURE % SOLUBLE SALTS % SHRINKAGE LIMIT %

ATTERBERG LIMITS

NATURAL MOISTURE LL PI AIR DRY LL PI OVEN DRY LL PI

SPECIFIC GRAVITY (G_s)

(-1) G_s (+) G_s

REMARKS

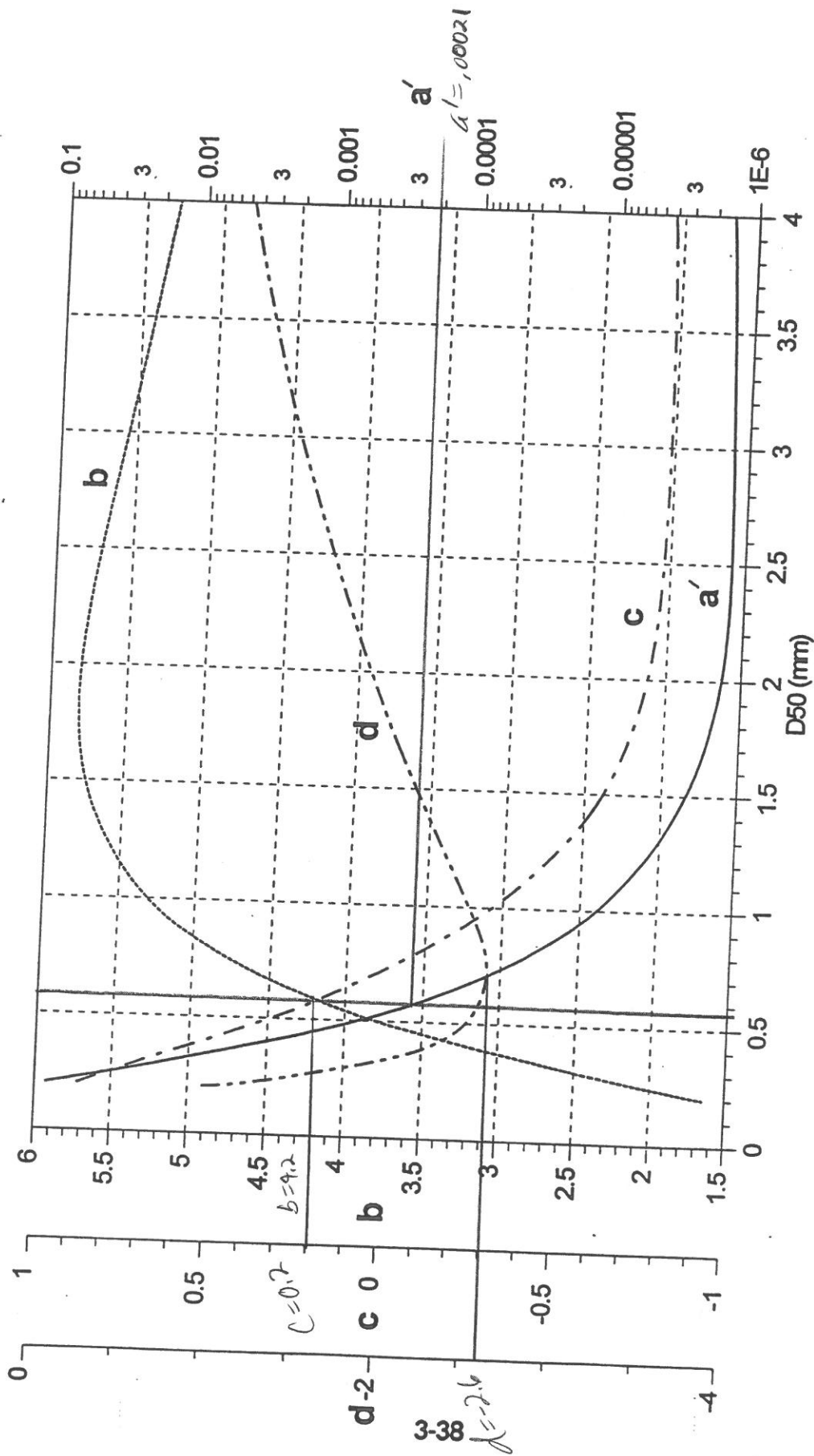


Figure 3.10. Coefficient and exponents for Equation 3.41, developed using MPM-Woo method.

$D_{50} = 0.56$

Use $K = 0.10$

Table B.1. Soil Erodibility Factor K Based on USDA Texture.				
Estimated K Factor ¹				
USDA Texture	Normal ²	Gravelly ²	Very Gravelly ²	Extremely Gravelly ²
Coarse Sand	0.10	0.05	0.02	0.02
Sand	0.10	0.05	0.02	0.02
Fine Sand	0.17	0.10	0.05	0.02
Very Coarse Sand	0.10	0.05	0.02	0.02
Loamy Coarse Sand	0.15	0.10	0.05	0.02
Loamy Sand	0.17	0.10	0.05	0.02
Loamy Fine Sand	0.20	0.10	0.05	0.02
Loamy Very Fine Sand	0.49	0.28	0.15	0.05
Coarse Sandy Loam	0.20	0.10	0.05	0.02
Sandy Loam	0.24	0.15	0.10	0.05
Fine Sandy Loam	0.28	0.15	0.10	0.05
Very Fine Sandy Loam	0.55	0.28	0.17	0.10
Loam	0.37	0.20	0.10	0.05
Silt Loam	0.43	0.24	0.15	0.05
Silt	0.64	0.37	0.20	0.10
Sandy Clay Loam	0.32	0.15	0.10	0.05
Clay Loam	0.32	0.15	0.10	0.05
Silty Clay Loam	0.37	0.20	0.10	0.05
Sandy Clay	0.32	0.15	0.10	0.05
Silty Clay	0.24	0.15	0.10	0.05
Clay	0.20	0.10	0.05	0.02

¹Where a Soils Survey Interpretation Sheet, SOILS-5, is available for a soil, the K Factor listed will be more accurate than the factor provided by this table.

²Total rock fragments are included in these figures, not just gravel. Normal = 0-15 percent, gravelly = 15-35 percent, very gravelly = 35-60 percent, and extremely gravelly = over 60 percent.

USE G=0.24

Table B.2. Cover and Management Factor C for Permanent Pasture, Range, and Idle Land.¹

Vegetative Canopy		Cover that contacts the soil surface						
Type and Height ²	Percent Cover ³	Type ⁴	Percent ground cover					
No appreciable canopy		G	0	20	40	60	80	95+
			0.45	0.20	0.10	0.042	0.013	0.003
Tall weeds or short brush with average drop fall height of 20 inches	25	W	0.45	0.24	0.15	0.091	0.043	0.011
		G	0.36	0.17	0.09	0.038	0.013	0.003
		W	0.36	0.20	0.13	0.083	0.041	0.011
		G	0.26	0.13	0.07	0.035	0.012	0.003
Appreciable brush or brush with average drop fall height of 6-1/2 ft	25	W	0.26	0.16	0.11	0.076	0.039	0.011
		G	0.40	0.18	0.09	0.040	0.013	0.003
		W	0.40	0.22	0.14	0.087	0.042	0.011
		G	0.34	0.16	0.08	0.038	0.012	0.003
Trees, but no appreciable low brush. Average drop fall height of 13 ft	50	W	0.34	0.19	0.13	0.082	0.041	0.011
		G	0.28	0.14	0.08	0.036	0.012	0.003
		W	0.28	0.17	0.12	0.078	0.040	0.011
		G	0.42	0.19	0.10	0.041	0.013	0.003
	75	W	0.42	0.23	0.14	0.089	0.042	0.011
		G	0.39	0.18	0.09	0.040	0.013	0.003
		W	0.39	0.21	0.14	0.087	0.042	0.011
		G	0.36	0.17	0.09	0.039	0.012	0.003
		W	0.36	0.20	0.13	0.084	0.041	0.011

¹The listed C values assumes that the vegetation and mulch are randomly distributed over the entire area.

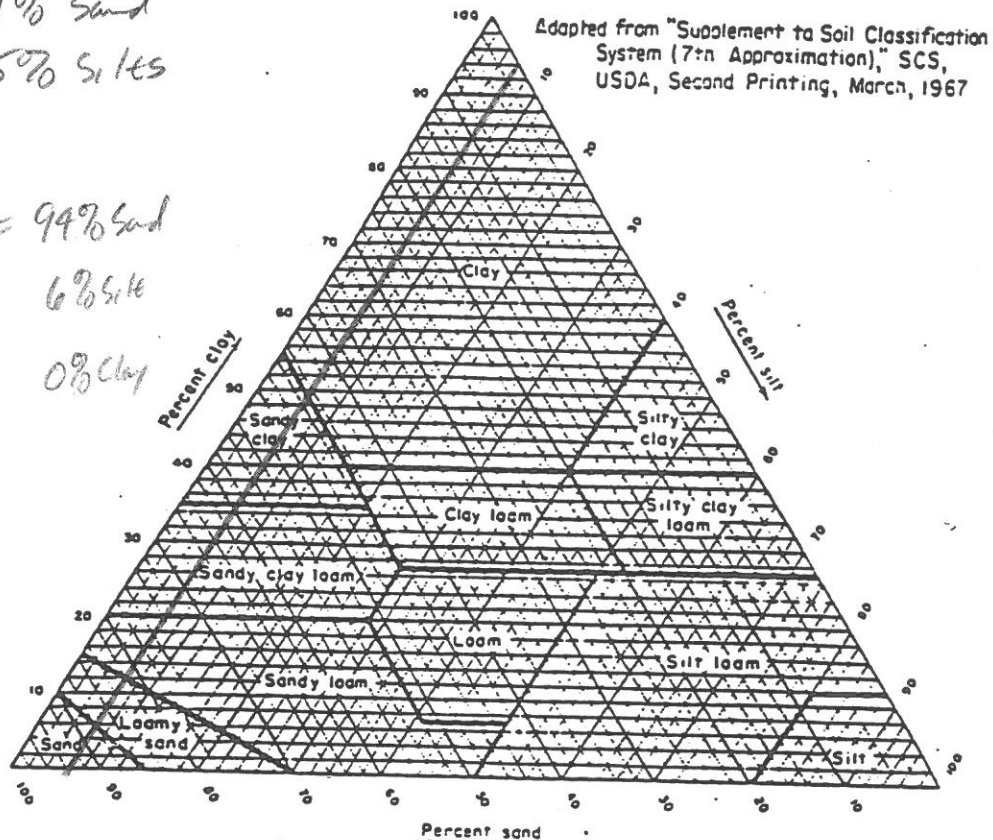
²Canopy height is measured as the average fall height of water drops falling from the canopy to the ground. Canopy effect is inversely proportional to drop fall height and is negligible if fall height exceeds 33 ft.

³Portion of total-area surface that would be hidden from view by canopy in a vertical projection (a bird's eye view).

⁴G = Cover at surface is grass, grasslike plants, decaying compacted duff, or litter 2 in. deep. W = Cover at surface is mostly broadleaf herbaceous plants (as weeds with little lateral-root network near the surface) or undecayed residues or both.

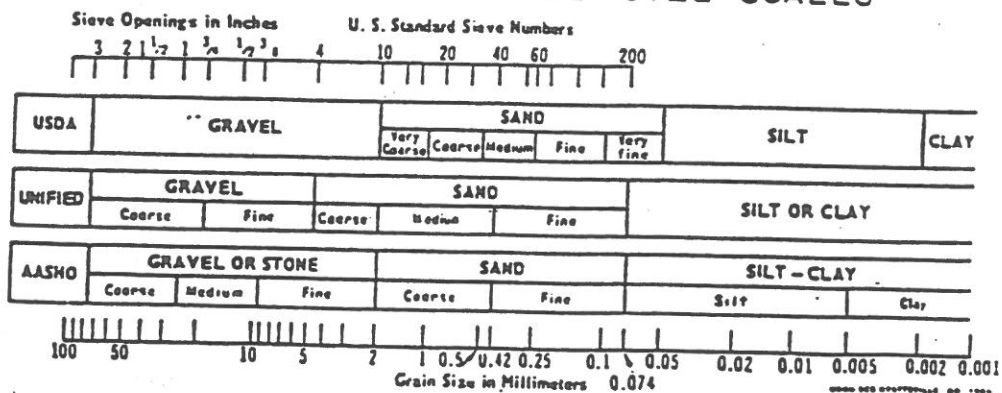
19% Gravel
81% Sand
5% Silts

$\frac{81}{86} = 94\% \text{ Sand}$
 $\frac{5}{86} = 6\% \text{ silt}$
 $\frac{0}{86} = 0\% \text{ clay}$



Use Sand

COMPARISON OF PARTICLE-SIZE SCALES



$$\text{Avg } D_{50} = \frac{0.50 + 0.75 + 0.80 + 0.20}{4} = 0.563 \text{ mm}$$

$$\% \text{ Sand} = \frac{85 + 66 + 81 + 91}{4} = 81\%$$

$$\% \text{ Silts} = \frac{5 + 4 + 4 + 8}{4} = 5\%$$

$$\% \text{ Gravel} = \frac{15 + 39 + 19 + 9}{4} = 19\%$$

APPENDIX B
HYDRAULIC CALCULATIONS

LINE A

Run	Q	DIA	SLOPE	Depth	Vel	Fr
-----	---	-----	-------	-------	-----	----

④

25.2 CFS

24"

2%

1.34

11.3

1.8

25.2 CFS

24"

3%

1.17

13.2

2.4

25.2 CFS

24"

1.5%

1.50

10.0

1.5

25.2

24"

4%

1.07

14.8

2.8

5%

1.00

16.1

3.2

7%

0.91

18.2

3.8

③

34.9 CFS

24"

2%

1.81

11.5

1.3

2.5%

1.58

13.0

1.8

3%

1.46

14.0

2.1

4%

1.31

15.8

2.6

5%

1.21

17.3

3.0

7%

1.09

19.7

3.7

②

44.0 CFS

24"

3.5%

1.73

15.2

1.8

24"

4%

1.59

16.4

2.2

5%

1.44

18.1

2.7

7%

1.27

20.8

3.5

30"

2%

1.63

13.0

1.9

30"

1.5%

1.81

11.5

1.6

①

45.4 CFS

24"

3.5%

1.83

15.1

1.6

5.0%

1.48

18.2

2.7

7.0%

1.30

21.0

3.5

30"

2%

1.66

13.1

1.9

↓

1.5%

1.86

11.6

1.5

LINE A CONTINUED

RUN	Q	DIA	SLOPE	DEPTH	VEL	FR
⑤	10.8 CFS	18"	1%	1.27	6.8	0.98
			1.5%	1.05	8.2	1.5
			2%	0.94	9.2	1.8
⑥	12.1 CFS	18"	1.5%	1.16	8.3	1.4
		24"	1%	1.04	7.3	1.4
		18"	2%	1.03	9.4	1.7
		18"	3%	0.90	11.0	2.2
⑦	7.58 CFS	12"	4%	0.90	10.2	1.6
		18"	1%	0.95	6.5	1.3
		18"	1.5%	0.83	7.6	1.6
		18"	2%	0.76	8.4	1.9
		18"	3%	0.67	9.8	2.4
⑧	1 CFS	6"	3%	0.42	5.6	1.4
		12"	1%	0.36	3.9	1.3
		12"	2%	0.30	5.0	1.9
⑨	2 CFS	12"	1%	0.59	4.7	1.3
		12"	1.5%	0.48	5.4	1.6
		12"	2%	0.44	6.1	1.8
		12"	3%	0.39	7.0	2.3
⑩	4.6 CFS	12"	1.5%	0.88	6.3	1.0
		12"	2%	0.75	7.3	1.5
		12"	3%	0.64	8.6	2.0

LINE B

RUN	Q	DIA	SLOPE	DEPTH	VEL	FK
①	20.90 CFS	24"	1%	1.52	8.2	1.2
			1.5%	1.30	9.6	1.6
			2%	1.18	10.9	1.9
			3%	1.09	12.6	2.4
②	14.70 CFS	18"	2%	1.21	9.6	1.5
		18"	3%	1.03	11.5	2.1
		18"	4%	0.93	12.9	2.6
		24"	1%	1.17	7.7	1.4
		24"	1.5%	1.04	9.0	1.7
③	13.30 CFS	18"	1.5%	1.28	8.3	1.2
		18"	2%	1.11	9.5	1.6
		18"	3%	0.95	11.2	2.2
		24"	1%	1.10	7.5	1.4
④	12.10 CFS	18"	1.5%	1.16	8.3	1.4
		18"	2%	1.03	9.4	1.7
		18"	3%	0.90	11.0	2.2
		24"	1%	1.04	7.3	1.4
⑤	7.45 CFS	12"	4%	0.87	10.3	1.7
		12"	5%	0.77	11.5	2.3
		18"	1%	0.93	6.5	1.3
		18"	2%	0.75	8.4	1.9
		18"	3%	0.67	9.8	2.4

LINE B CONTINUED

<u>RUN</u>	<u>Q</u>	<u>DIA</u>	<u>SLOPE</u>	<u>DEPTH</u>	<u>VEL</u>	<u>FR</u>
⑥	6.2 CFS	12"	3%	0.82	9.0	1.7
		18"	1%	0.83	6.2	1.3
		18"	2%	0.68	8.0	2.0
⑦	4.4 CFS	12"	2%	0.73	7.2	1.5
		12"	1.5%	0.84	6.3	1.1
		18"	1%	0.68	5.7	1.4
⑧	1.4 CFS	12"	1%	0.43	4.3	1.3
		12"	1.5%	0.39	5.0	1.6
		12"	2%	0.36	5.5	1.9
⑨	1 CFS	SEE LINE A ⑧				
⑩	2 CFS	SEE LINE A ⑨				
⑪	4.45 CFS	SEE LINE B ⑦				

Pond Inlet Pipes

Line A
24" 45.4 CFS 19.5% D=0.95' V=31 fps Fr=6.393

Line B
18" 20.9 CFS 19.5% D=0.70' V=25.6 fps Fr=6.120

Line C
18" 17.2 CFS 8.5% D=0.80' V=17.9 fps Fr=3.919

Tijeras Arroyo Inlet Pipe

With Developed Sunset Memorial Garden
(75% B, 25% D)

Q = 183 CFS S = 4.2%

42" D = 2.57 ft V = 29.2 Fr = 2.73

With Undeveloped Sunset Memorial Garden

Q = 146.5 CFS S = 4.2%

36" D = 2.75 V = 21.6 Fr = 1.87

Without Sunset Memorial Garden

Q = 28.8 CFS S = 4.2%

24" D = 1.15 V = 15.4 Fr = 2.8

DESIGN ENERGY DISSIPATOR

FOR OUTLETS INTO DETENTION POND
From Chapter 5 of the "Denver Urban Storm Drainage
Criteria Manual"LINE A24" pipe $Q = 45.4 \text{ CFS}$ $S = 19.5\%$ Depth = 0.95' $V = 31 \text{ fps}$ $Fr = 6.393$

for supercritical flows in circular pipes

$$D_a = \frac{1}{2}(D + Y_n)$$
$$= \frac{1}{2}(2 + 0.95)$$

$$D_a = 1.475$$

$$Q/D_a^{1.5} = 45.4 / 1.48^{1.5} = 25.2$$

$$Y_e/D_a = 0.95 / 1.48 = 0.64$$

from Figure 5-7

USE TYPE M Rip Rap $D_{50} = 12"$ Extent of protection

$$Q/D_a^{2.5} = 17.0 \neq \text{NOT ON Graph} \therefore \text{use maximum } 10D$$

Figure 5-9

$$Y_e/D_a = 0.64$$

$$10D = 20 \text{ ft}$$

Line B

$$18'' \text{ pipe } Q = 20.9 \text{ cfs } S = 19.5\%$$

$$\text{Depth} = 0.70 \text{ ft } V = 25.6 \text{ fps } Fr = 6.12$$

$$D_a = \frac{1}{2}(1.5 + 0.70)$$

$$D_a = 1.1$$

$$Q/D_a^{1.5} = 20.9 / 1.1^{1.5} = 18.1$$

$$V/D_a = 0.7 / 1.1 = 0.64$$

from figure 5-7

Use Type L riprap $D_{50} = 9''$

Extent of protection

$$Q/D_a^{2.5} = 16.4 \notin \text{Not on Figure 5-9 therefore}$$

Use maximum length 10Δ

$$\text{Length} = 15 \text{ feet}$$

LINE C

$$18'' \text{ pipe } Q = 17.2 \text{ cfs } S = 8.5\%$$

$$\text{Depth} = 0.80 \text{ ft } V = 17.9 \text{ fps } Fr = 3.919$$

$$D_a = \frac{1}{2}(1.5 + 0.80)$$

$$D_a = 1.15$$

$$Q/D_a^{1.5} = 17.2 / 1.15^{1.5} = 14.0$$

$$V/D_a = 0.8 / 1.15 = 0.70$$

from figure 5-7

Use Type L riprap $D_{50} = 9''$

Extent of protection

$$Q/D_a^{2.5} = 12.1 \notin \text{Not on Figure 5-9 therefore}$$

Use maximum length 10Δ

$$\text{Length} = 15 \text{ feet}$$

Tijeras Arroyo Outfall Options

- Option 1 - Without Sunset Memorial Gardens

$$24'' \text{ pipe } Q = 28.0 \text{ CFS } S = 4.2\%$$

$$D = 1.15 \text{ ft } V = 15.4 \text{ fps } Fr = 2.8$$

$$D_a = \frac{1}{2}(D + Y_n) \\ = \frac{1}{2}(2 + 1.15)$$

$$D_a = 1.75$$

$$Q/D_a^{1.5} = 12.4$$

$$Y_t/D_a = 1.15/1.75 = 0.66$$

from Figure 5-7 Use Type L riprap $D_{50} = 9''$

Length of protection

$$Q/D_a^{2.5} = 7.1 \notin \text{not on Figure 5-9, use maximum } 10 D$$

$$L = 20 \text{ ft}$$

- Option 2 - With Undeveloped Sunset Memorial Gardens

$$36'' \text{ pipe } Q = 146.5 \text{ CFS } S = 4.2\%$$

$$D = 2.75 \text{ ft } V = 21.6 \text{ Fr} = 1.87$$

USE A USBR TYPE VI CONCRETE STILLING BASIN

for $Q = 146.5 \text{ cfs}$ see Table 11, $W = 11.75' L = 15.67' H = 9.0'$

- Option 3 - With developed Sunset Memorial Gardens

$$42'' \text{ pipe } Q = 183 \text{ cfs } S = 4.2\%$$

$$D = 2.57 \text{ ft } V = 24.2 \text{ Fr} = 2.73$$

USE A USBR TYPE VI CONCRETE STILLING BASIN

for $Q = 183 \text{ cfs}$

$$W = 13.0 \text{ ft } L = 17.33 \text{ ft } H = 9.75 \text{ ft}$$

- Option 4 - Without Sunset flows, but size Storm Drain large enough to accept Sunset Flows in future

$$36" \text{ pipe } Q = 28.0 \text{ CFS } S = 4.2\%$$

$$D = 0.92 \text{ ft } V = 15.2 \text{ CFS } Fr = 3.3$$

$$D_a = \frac{1}{2}(D + Y_h) \\ = \frac{1}{2}(3 + 0.92)$$

$$D_a = 1.96$$

$$Q/D_a^{1.5} = 10.2$$

$$Y_h/D_a = 0.92/1.96 = 0.47$$

From Figure 5-7 use Type L rewrap $D_{50} = 9'$

Length of Protection

$$Q/D_a^{2.5} = 5.2 \text{ From Figure 5-9 Expansion Factor} = 2.7$$

$$\text{Length} = \left(\frac{1}{2} \tan \theta \right) (A_e/Y_h - W)$$

$$L = \overset{\text{expansion factor}}{2.7} \left(\frac{28}{15.2} / 0.92 - 3 \right) = -2.6 \text{ not feasible}$$

use $10D = 20 \text{ feet Length}$

Basin 312

1 ft check dam

$$L = \frac{1}{1055 - .01} = 22.2 \text{ 1 every 22 ft}$$

Drop Structures

330 ft

$$\frac{330}{22} = 14.9 \text{ use 15}$$

Urban Drainage and Flood Control District

URBAN STORM DRAINAGE

CRITERIA MANUAL volume 2

WRIGHT - McLAUGHLIN ENGINEERS
Denver, Colorado March, 1969

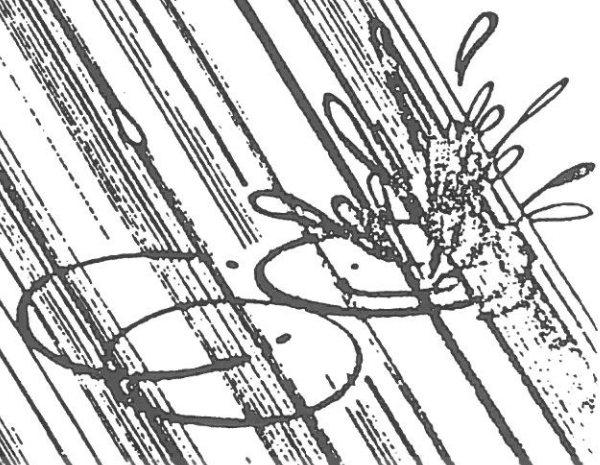


Table 5-1

CLASSIFICATION AND GRADATION OF ORDINARY RIPRAP

Riprap Designation	% Smaller Than Given Size By Weight	Intermediate Rock Dimension (Inches)	d_{50}^* (Inches)
Type VL	70-100	12	6**
	50-70	9	
	35-50	6	
	2-10	2	
Type L	70-100	15	9**
	50-70	12	
	35-50	9	
	2-10	3	
Type M	70-100	21	12
	50-70	18	
	35-50	12	
	2-10	4	
Type H	100	30	18
	50-70	24	
	35-50	18	
	2-10	6	
Type VH	100	42	24
	50-70	33	
	35-50	24	
	2-10	9	

* d_{50} = Mean particle size

** Bury types VL and L with native top soil and revegetate to protect from vandalism.

5.2 Wire Enclosed Rock

Wire enclosed rock refers to rocks that are bound together in a wire basket so that they act as a single unit. One of the major advantages of wire enclosed rock is that it provides an alternative in situations where available rock sizes are too small for ordinary riprap. Another advantage is the versatility that results from the regular geometric shapes of wire enclosed rock. The rectangular blocks and mats can be fashioned into almost any shape that can be

grouted riprap or wire encased riprap applications. The second utilizes a design procedure developed by Terzaghi, which is referred to as the T-V (Terzaghi-Vicksburg) design (7)(19). The T-V filter criteria establishes an optimum bedding gradation for a specific channel soil. The latter requires channel soil information, including a gradation curve, while the Type I and Type II bedding specifications given in Table 5-3 (and Figure 5-2) are applicable whether or not soil information is available.

Table 5-3
GRADATION FOR GRANULAR BEDDING

U. S. Standard Sieve Size	Percent Weight By Passing Type I	Square Mesh Sieves
		Type II
3"	-	90 - 100
1-1/2"	-	-
3/4"	-	20 - 90
3/8"	100	-
#4	95 - 100	0 - 20
#16	45 - 80	-
#50	10 - 30	-
#100	2 - 10	-
#200	0 - 2	0 - 3

Table 5-4
THICKNESS REQUIREMENTS FOR GRANULAR BEDDING

Riprap Designation	Minimum Bedding Thickness (Inches)		
	Fine Grained Soils*		Course Grained Soils**
	Type I	Type II	Type II
L, G, SM	4	4	6
M	4	4	6
H	4	6	8
VH	4	6	8

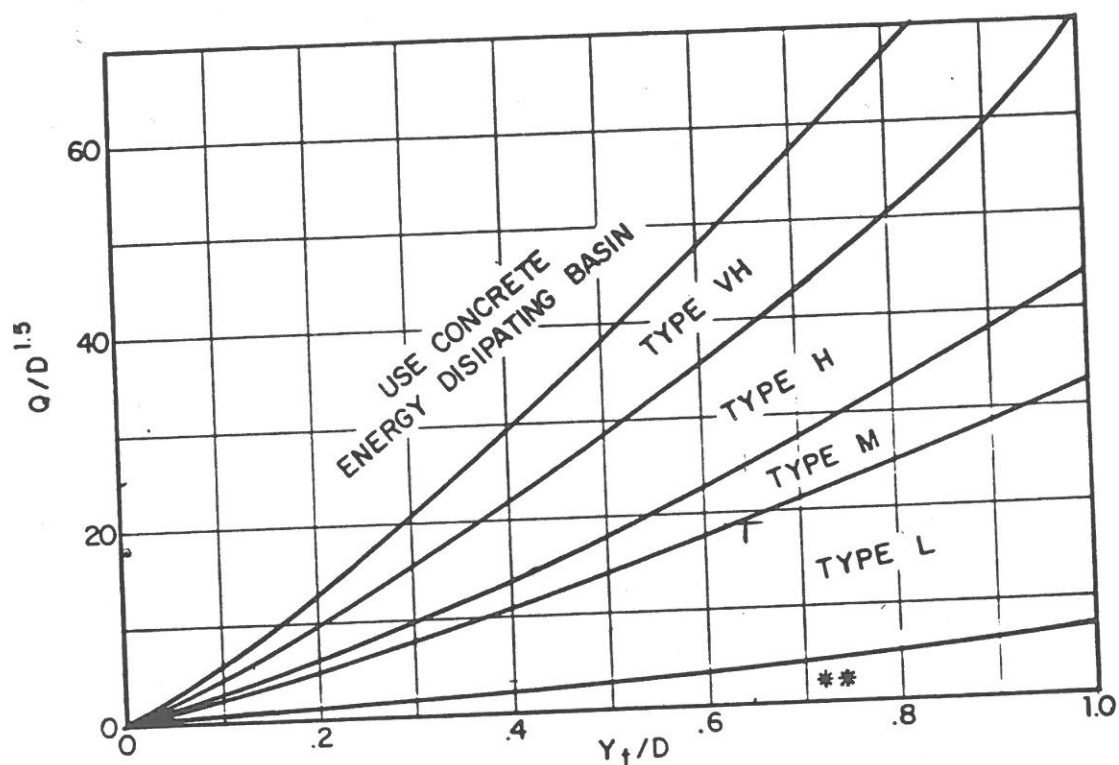
*May substitute one 12 inch layer of Type II bedding. Substitution of one layer of Type II bedding shall not be permitted at drop structures. Use of a combination of filter fabric and Type II bedding at drop structures is acceptable, see Section 5.3.2 for use of filter fabric at drop structures.

**Fifty percent or more by weight retained on the #40 sieve.

5.3.2 Filter Fabric

Filter fabric is not a complete substitute for granular bedding. Filter fabric provides filtering action only perpendicular to the fabric and has only a single equivalent pore opening between the channel bed and the riprap. Filter fabric has a relatively smooth surface which provides less resistance to stone movement. As a result, it is recommended the use of filter fabric be restricted to slopes no steeper than 2.5h to 1v. Tears in the fabric greatly reduce its effectiveness so that direct dumping of riprap on the filter fabric is not allowed and due care must be exercised during construction. Nonetheless, filter fabric has proven to be an adequate replacement for granular bedding in many instances. Filter fabric provides an adequate bedding for channel linings along uniform mild sloping channels where leaching forces are primarily perpendicular to the fabric.

At drop structures and sloped channel drops, where seepage forces may run parallel with the fabric and cause piping along the bottom surface of the fabric, special care is required in the use of filter



Use D_a instead of D whenever flow is supercritical in the barrel.
** Use Type L for a distance of $3D$ downstream.

FIGURE 5-7. RIPRAP EROSION PROTECTION AT CIRCULAR CONDUIT OUTLET.

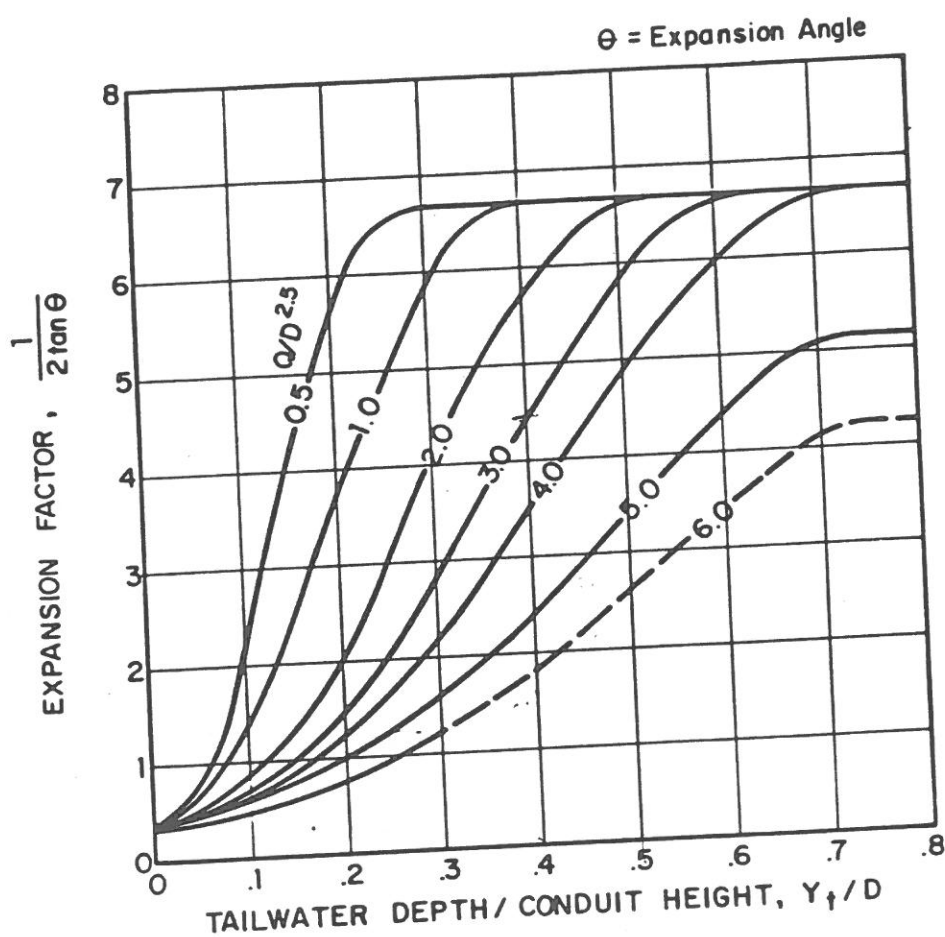


FIGURE 5-9. EXPANSION FACTOR FOR CIRCULAR CONDUITS