TABLE OF CONTENTS

I. INTRODUCTION 1
Purpose of Study 1
Approach 2
Authorization 2
II. BACKGROUND INFORMATION 3
Location 3
Topography 3
Water Bodies 3
Field Information 3
Study Level 4
III. HYDROLOGIC ANALYSIS 5
Drainage Areas 5
Curve Numbers 6
Lag Time 6
Rainfall Data 7
Time Distribution of Rainfall 8
Rainfall Extraction 8
Hydrologic Analysis Results 8
IV. RUNOFF MITIGATION ANALYSIS 11
Approach 11
Methodology 11
Depth-Volume Relations 11
Flow Rating 11
Results 12
Mitigation Structure Dimensions and Accessories 15
Pond Discharge 16
V. HYDRAULIC ANALYSIS 17
Roughness 17
Contraction and Expansion Coefficients 17

Starting Water Surface Elevation 18
Hydraulics for Existing Condition 18
Hydraulics for Proposed Condition 19
Results 20
V. CONCLUSIONS AND RECOMMENDATIONS 21
Study Limits 22
BIBLIOGRAPHY 23
LIST OF FIGURES iii
LIST OF APPENDIXES iv

LIST OF FIGURES

FIGURE 1. Location Map

FIGURE 2. Proposed Development Layout

FIGURE 3. Topography for Existing Condition

FIGURE 4. Existing Condition Drainage Areas

FIGURE 5. Proposed Condition Drainage Areas

FIGURE 6. Soils Map

FIGURE 7. FEMA's Flood Map

FIGURE 8. Layout of Proposed Structures

FIGURE 9. Schematics of the Detention Pond P1

FIGURE 10. Schematics of the Detention Pond P2

FIGURE 11. Schematics of the Detention Pond P4

FIGURE 12. Location of Cross Sections

FIGURE 13. 100-year Flood Footprint

FIGURE 14. Proposed Bridge 1

FIGURE 15. Proposed Bridge 2

FIGURE 16. Proposed Bridge 3

FIGURE 17. Proposed Bridge 4

LIST OF APPENDIXES

APPENDIX A. Hydrologic Parameters Estimation

APPENDIX B. HEC-1 Results for Existing Condition

APPENDIX C. HEC-1 Results for Proposed Condition

APPENDIX D. Detention Structure Volume and Discharge to Depth Relations

APPENDIX E. HEC-1 Results for Proposed Condition with Mitigation

APPENDIX F. HECRAS Results for Existing Condition

APPENDIX G. HECRAS Results for Proposed Condition

APPENDIX H. Field Work

HYDROLOGIC-HYDRAULIC STUDY
FOR MONTE ARENAS
VEGA BAJA, PUERTO RICO

Casiano Ancalle, P.E.

January, 2005

I. INTRODUCTION

A housing development project named Monte Arenas is to be constructed in the Municipality of Vega Baja. The site is located at PR-155 and can be accessed from highway PR-645. The project consists on housing units, recreational facilities, and green areas.

According to the regulatory flood maps the area of the project is non-floodable. Three storm runoff watercourses run across the site. The development of the project will not affect neither of these watercourses but for roadway crossings.

It is expected that the development of the site will increase runoff. This increase has to be mitigated in compliance with the requirements of the Puerto Rico Planning Board Regulation No. 3.

Purpose of Study

The purpose of the study is to determine the flood levels and footprint for the watercourses crossing the site, and to size the watercourse crossing structures from which two are located at the project access road. In addition, as the development of the site will increase the peak runoff discharge, the study will quantify the increase and provide means for mitigating it according to the Puerto Rico's Planning Board Regulation No. 3.

Approach

The following steps have been undertaken throughout the study:

Hydrologic Analysis: The following parameters were determined for the hydrologic analysis: drainage areas, average soil curve number and runoff lag time. Based on these parameters, discharge for 100-years frequency storm was determined for existing and proposed condition. HEC-1 model was used. Discharges for more recurrent storm events such as: 2-, 10-, 25-, 50- and 100-years, were also determined.

Hydraulic Analysis: A hydraulic analysis was performed in order to estimate the water surface elevations for the three storm watercourses. Existing condition's water levels were determined first. Water levels considering the crossing structures were determined. Comparison of water elevations for both conditions would fall within the limits established by Regulation No. 13. The US Army Corps of Engineer's HECRAS computer model was used.

Mitigation Analysis: A mitigation analysis was made in order to counteract the impact of the proposed development. A mitigation pond was employed as a detention structure. HEC-1 model was used for the mitigation analysis. 2-, 10-, 25-, 50- and 100 frequency discharges were analyzed for mitigation.

Conclusions and recommendations were elaborated.

Authorization

Eng Luis Franqui on behalf Rio Piedras Housing Corp. authorized this study, under a contract signed with Eng. Casiano Ancalle, principal of CA Engineering.

II. BACKGROUND INFORMATION

Location

The project site is located at both sides of road PR-645 that branches to the south from state road PR-155, in Quebrada Arenas Ward, Municipality of Vega Baja. The approximate total area of the project is 172 acres. Figure 1 illustrates the project site location on the USGS Quadrangle. Figure 2 shows the development layout.

Topography

The topography of the site is uneven; and is characterized by sloping to several directions, mainly to the north and to the east and in direction to the watercourses. The eastern side of the site slopes toward the east. Ground elevations range from 200 to 115 meters (m.s.l.). See Figure 3.

Water Bodies

Two water bodies are related to the site. No flow records are available from them. The majority of the project's runoff discharges to these watercourses. The remaining runoff discharges to the watercourse located at the east of the site

Former Studies

No hydrologic-hydraulic studies for the area of the project have found during the information research. This study is original in its conception, and the results found are correspondent to the parameters adopted during the hydrologic and hydraulic simulation.

Field Information

Field data used in this study was taken from the topographic information provided by Eng. Luis

Franqui. Results obtained in this study are strictly based on this information. The topography is tied to mean sea level reference. This fieldwork is included in the pocket attached to the back cover of this study as Appendix H.

Study Level

This study is intended as an aid to the design engineer in the preparation of the construction drawings for the recommended structures. Figures, schematics and drawings must not be used as construction drawings. The design engineer must elaborate the construction drawings in agreements with the recommendations of this study.

III. HYDROLOGIC ANALYSIS

The computer program entitled Flood Hydrograph Package (HEC-1), developed by the U.S. Army Corps of Engineers [1990], was used for the performance of the hydrologic analysis. Using this program, the Unit Hydrograph method and the Runoff Curve Number (CN) method, both developed by the Soil Conservation Service (SCS), were applied to determine the design hydrograph. This was computed by a process of translating the rainfall excess into a runoff hydrograph known as convolution.

Peak discharges for 2-, 10-, 25-, 50- and 100-year storm frequency were estimated for the existing condition and proposed condition.

Drainage Areas

Seven drainage areas have been identified for the existing condition at the project site; they were labeled P1, P2, P3, P4, P5, P6 and P7, with six offsite areas E1, E2, E3A, E3B E4 and E5 as shown in Figure 4. At proposed condition, the runoff pattern has been kept by maintaining the drainage areas close to that of the existing condition; with the exception of area P4, which has been subdivided in P4A, P4B and P4C, as shown in Figure 5. The total area of the project site is approximately 171.82 acres.

Table 1 shows the drainage areas taken into account for the hydrologic analysis, for both existing and proposed condition.

Table 1
Drainage Areas

	Name	Area, acres	
		Existing	Proposed
Project Areas	P1	51.57	--
	P1A	--	31.63

	P1B	--	19.00
	P2	25.70	30.22
	P3	8.94	6.96
	P4	36.67	--
	P4A	--	14.46
	P4B	--	15.70
	P4C	--	9.50
	P5	14.31	11.36
	P6	16.91	11.57
	P7	17.72	21.41
Offsite Areas	E1	110.13	110.13
	E2	555.45	55.45
	E3A	20.63	20.63
	E3B	15.04	15.04
	E4	9.15	9.15
	E5	14.01	14.01

Curve Numbers

Curve numbers were estimated from the the SCS's Soil Maps, the project area and the offsite basins are mainly classified in 8 types: Colinas clay, Santa Clara clay, Juncal clay, Naranjo clay, Moca clay, Vega Alta sandy clay. Weighted curve numbers were found for each individual drainage area. A CN value of 95 was assumed for the developed project site.

Appendix A includes the Curve Number computations for existing and proposed condition. Figure 6 shows the soil map corresponding to the project site and offsite areas.

Lag Time

The Lag Time (T_{Lag}) was estimated using the SCS method defined as:

$$T_{Lag} = \frac{L^{0.8}(S+1)^{0.7}}{1900\ Y^{0.5}}$$

where : L = channel length (ft)

S = 1000/CN - 10

Y = average watershed slope

Detailed Lag Time calculations are shown in Appendix A.

Rainfall Data

The variation of rainfall volume with time was required as part of the storm input for the SCS Curve Number method. Therefore, the development of a design storm with a rainfall frequency and duration was necessary to compute the design hydrograph for the watershed. Rainfall data used in this study was obtained from the Technical Paper No. 42 (TP-42) [National Weather Service, 1961].

The rainfall event of 100-, 50-, 25-, 10 and 2-years frequency for many durations was used and are shown in Table 2. Rainfall for 5 and 15 minutes were estimated by regression analysis, details of these calculations are shown in Appendix A.

Table 2
Rainfall for 2, 10, 25, 50 y 100 years

Duration *Hrs.*	**Precipitation** *Inches*				
	2-yr	***10-yr***	***25-yr***	***50-yr***	***100-yr***
0.083	0.47	0.55	0.61	0.64	0.99
0.25	1.02	1.26	1.47	1.55	2.15
1	2.10	3.00	3.50	3.80	4.40
2	2.50	3.70	4.50	5.00	5.20
3	2.70	4.10	5.10	5.20	6.10
6	3.30	5.40	6.30	7.00	8.00
12	4.00	6.60	7.70	8.70	9.70
24	4.60	7.60	9.40	10.50	11.50

Depth-Area Adjustment

Point rainfall estimates obtained from the TP-42 represent values for areas up to 10 mi^2; therefore, a depth-area adjustment should be applied to the rainfall data when the watershed area is greater. In this case, the largest watershed consists of 0.868 mi^2. Hence, this adjustment was not applied.

Time Distribution of Rainfall

The triangular type methodology was used to distribute the rainfall depth in time. This method is considered acceptable for small areas.

Rainfall Extraction

Rainfall extraction such as vegetative interception, depressional storage, and infiltration were estimated using the SCS's Runoff Curve Number method. Though this method is used to predict runoff volume directly, the rainfall extraction is incorporated in the model as function of the curve number of the watershed.

Hydrologic Analysis Results

Hydrologic analysis was made for all the drainage areas. Individual and composite runoff hydrographs were obtained using HEC-1 methodology. Table 3 shows the summary of the results for this analysis. Input and output data for the HEC-1 model for existing and proposed condition are included in Appendix B and C, respectively.

Table 3
Peak Discharges

AREA		Peak Discharge, cfs				
		2-yr	10-yr	25-yr	50-yr	100-yr
Existing	EA3	52	87	106	116	165
	P3	31	45	53	57	85
	COMB1	83	132	159	173	250

	E3B	51	76	90	97	144
	COMB2	134	208	249	270	394
	E2	512	965	1231	1382	1607
	P2	67	106	127	138	194
	E1	175	323	404	449	585
	P1	84	147	182	202	253
	P7	48	75	89	97	138
	COMB3	106	189	235	261	320
	P4	94	154	187	204	285
	P5	47	71	85	91	138
	P6	40	66	79	87	119
	E4	23	39	48	52	79
	E5	31	53	65	71	99
Proposed	E3A	52	87	106	116	165
	P3	29	38	43	45	62
	COMB1	81	125	149	161	227
	E3B	51	76	90	97	144
	COMB2	132	201	238	258	371
	E2	512	965	1231	1382	1607
	P2	100	134	154	164	214
	E1	175	323	404	449	585
	P1A	75	106	124	134	161
	P7	77	103	117	125	167
	COMB3	127	178	207	223	275
	P1B	47	67	78	84	102
	COMB4	103	187	224	242	309
	P4A	48	65	74	79	104
	P4B	56	74	85	91	120
	P4C	34	45	51	55	73
	COMB5	94	142	173	189	247
	P5	47	62	70	74	102

P6	39	52	59	63	83
E4	23	39	48	52	79
E5	31	53	65	71	99

IV. RUNOFF MITIGATION ANALYSIS

The development of the site will increase the runoff discharge. The Puerto Rico Planning Board Regulation No. 3 requires a flow mitigation structure wherever an increase in discharge is produced. Therefore, detention structures that will mitigate the overall increase in runoff discharge were used.

Approach

The discharge from areas P1, P2, P4 and P7 has shown increase. They will be provided by detention ponds. These ponds will reduce the combined peak discharge of the project drainage areas to magnitudes below the discharge at existing condition. Three detention ponds were evaluated in the study. Areas P1 and P7 will be combined and mitigated in one single detention pond. Pond-2 will be located to the east of Area P2. Pond-1 which serves P7 and part of P1 will be located to the west of area P7 and Pond-4 to the south east of area P4. See Figure 8.

Methodology

The computer program HEC-1 provides means for routing a hydrograph through detention structures. The purpose of detention is that the proposed condition peak discharge does not exceed the existing condition peak discharge.

Depth-Volume Relations

Volume-depth relations were developed for the ponds. Pond-1 which serves areas P1 and P7 is provided with a 3,010 -square meter base area; Pond-2 with a 1,228-square-meter base area and Pond-4 with a 1124-square-meter base area. Bank slopes for both ponds area 2H:1V. Volume-Depth curve computations are included in Appendix D.

Flow Rating

Flow-Depth relation for the detention Pond-1 was estimated considering the discharge through

two (2) 2.5'-diameter orifices located at the bottom of the pond, two (2) 3.5'- diameter orifice located at the 1.5m above the bottom of the pond, and a 6.10-meter long weir at 2.70 meters above the pond bottom. For the detention Pond-2, flow was estimated considering the discharge through a 3.0' -diameter orifice located at the bottom of the pond and a 9.14-meter long weir at 2.80 meter above the pond bottom . Flow for Pond-4 was rated considering the discharge through one (1) 0.8' -diameter orifice located at the bottom of the pond, one (1) 3'- diameter orifice located at the 1.5 m bottom, and a 7.92-meter long weir at 2.70 meter abover the pond bottom. Flow through the orifices was computed using Torrecelli's formula. Appendix D shows the computations for the flow-depth relationship and the curves.

Results

The results of the detention analysis show that the proposed detention ponds provide appropriate runoff mitigation for the 100-year frequency discharges. Routing the discharge through the detention Pond-1, the 100-year discharge was reduced from 326 cfs to 289 cfs, which is less than the discharge computed for existing condition, 320 cfs. At Pond 2, the 100-year discharge was reduced from 214 cfs to 159 cfs, which is less than the discharge computed for existing condition, 194 cfs. At Pond 4, the 100-year discharge was reduced from 291 cfs to 247 cfs., which is less than the discharge computed for existing condition, 285 cfs; thus complying with the Puerto Rico Planning Board Regulation No.3. Mitigation for more recurrent discharges was also verified.

Input and output data for the HEC-1 mitigation model are included in Appendix E. Table 4 shows the comparison of the discharges for existing, proposed and mitigation condition.

Table 4
Peak Discharges results for Existing, Proposed and Mitigation

	AREA	Peak Discharge, cfs				
		2-yr	10-yr	25-yr	50-yr	100-yr
Existing	EA3	52	87	106	116	165
	P3	31	45	53	57	85
	COMB1	83	132	159	173	250
	E3B	51	76	90	97	144
	COMB2	134	208	249	270	394
	E2	512	965	1231	1382	1607
	P2	67	106	127	138	194
	E1	175	323	404	449	585
	P1	84	147	182	202	253
	P7	48	75	89	97	138
	COMB3	106	189	235	261	320
	P4	94	154	187	204	285
	P5	47	71	85	91	138
	P6	40	66	79	87	119
	E4	23	39	48	52	79
	E5	31	53	65	71	99
Proposed	E3A	52	87	106	116	165
	P3	29	38	43	45	62
	COMB1	81	125	149	161	227
	E3B	51	76	90	97	144
	COMB2	132	201	238	258	371
	E2	512	965	1231	1382	1607
	P2	100	134	154	164	214
	E1	175	323	404	449	585
	P1A	75	106	124	134	161
	P7	77	103	117	125	167
	COMB3	127	178	207	223	275
	P1B	47	67	78	84	102
	COMB4	103	187	224	242	309

	P4A	48	65	74	79	104
	P4B	56	74	85	91	120
	P4C	34	45	51	55	73
	COMB5	94	142	173	189	247
	P5	47	62	70	74	102
	P6	39	52	59	63	83
	E4	23	39	48	52	79
	E5	31	53	65	71	99
Proposed w/ Mitigation	E3A	52	87	106	116	165
	P3	29	38	43	45	62
	COMB1	81	125	149	161	227
	E3B	51	76	90	97	144
	COMB2	132	201	238	258	371
	E2	512	965	1231	1382	1607
	P2	100	134	154	164	214
	POND	66	83	92	113	159
	E1	175	323	404	449	585
	P1A	75	106	124	134	161
	P7	77	103	117	125	167
	COMB3	127	178	207	223	275
	POND	68	127	153	166	214
	P1B	47	67	78	84	102
	COMB4	103	187	224	242	309
	P4A	48	65	74	79	104
	POND	16	42	53	60	76
	P4B	56	74	85	91	120
	P4C	34	45	51	55	73
	COMB4	94	142	173	189	247
	P5	47	62	70	74	102
	P6	39	52	59	63	83
	E4	23	39	48	52	79
	E5	31	53	65	71	99

Mitigation Structure Dimensions and Accessories

Final dimensions for the detention pond will include a minimum free board of 0.60 meters. The detention pond will have the characteristics shown in Table 5.

Table 5
Retention Pond Characteristics

Pond1	Dimensions	Bottom Area	3010 m^2
		Height	3.48 m
	Outlet Control	Orifice @ bottom	Two-2.5'Diameter
		Orifice @ 1.5 m bottom	Two-2.8'Diameter
		Weir Length @ 2.70m	6.09 m
Pond2	Dimensions	Bottom Area	1229 m^2
		Height	3.62 m
	Outlet Control	Orifice @ bottom	One-3.0'Diameter
		Weir Length @ 2.8m	9.14 m
Pond4	Dimensions	Bottom Area	1124 m^2

		Height	3.36 m
	Outlet Control	Orifice @ bottom	One-0.8'Diameter
		Orifice @ 1.50m bottom	One-3.0'Diameter
		Weir Length @ 2.70m	7.92 m

Schematic layout of the detention system is presented in Figures 9, 10 and 11 for Pond 1, Pond 2, and Pond 4, respectively.

Pond Discharge

The pond outlet must be able to take the total discharge from the pond. Two-60"-diameter pipe was estimated for Pond-1, a 66"-diameter pipe for Pond-2, a 48"-diameter pipe for Pond-4. Both ponds will discharge over the 100-year water surface elevation.

V. HYDRAULIC ANALYSIS

A hydraulic analysis was made for the three watercourses running across the site. None of them will be affected by the development except to the extent needed for the road crossing structures. The main watercourse is Quebrada Hicatea (WC-1). The second watercourse (WC-2) is a tributary to the main, to which it merges just at its exit from the site. The third watercourse (WC-3) is located at the west of the site and runs across drainage area P3.

The hydraulic analysis was made in order to find the 100-year water surface elevation; so that the development is constructed above this elevation and outside of the 100-year flood footprint.

The hydraulic analysis was made using the mathematical model HEC-RAS developed by the US Corps of Engineers. For this model, the hydraulic regime is steady, uniform, and one-dimensional. The model accepts changes in the geometry of the watercourse, bank-bed-overbank friction coefficient and shapes of hydraulic structures.

The friction coefficient used in the modeling was obtained from visual inspection of the watercourses bed and banks; and crosschecked with the typical values provided by Barnes (1967) and Chow (1959).

Cross sections for the creek were taken from the fieldwork provided. This fieldwork is shown in Appendix H. Figure 12 depicts the location of the cross sections.

Roughness

Manning coefficients estimated for the model are 0.013 for concrete, 0.045 for the channel. These values reflect the changes in direction and the irregular shape of the channel bed, and the vegetation present in the courses.

Contraction and Expansion Coefficients

Coefficients of contraction and expansion used are those recommended by the HEC-RAS user's manual. Thus, coefficients of 0.1 and 0.3 respectively were used for gradual transitions.

Starting Water Surface Elevation

Slope area method was applied for starting the subcritical run. For the supercritical run, critical depth was adopted.

Hydraulics for Existing Condition

The existing condition corresponds to the water courses as they presently are, without any modification. The location of them is shown in Figure 12, where the cross sections are located.

The hydraulic analysis was based on discharges obtained by the hydrologic analysis. Flow regime at the existing condition as well as for the proposed condition was assumed to be mixed: subcritical in some segments and supercritical in others.

The computer output for the existing condition is included in Appendix F. The following Table 6 includes the summary of the results for watercourse.

Table 6
Existing Condition Hydraulics 100-yr flow

River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
						WC-1					
8.5	100y	45.51	127.50	128.27	128.09	128.42	0.010290	1.75	26.07	38.12	0.67
8	100y	45.51	126.50	127.69		127.79	0.006695	1.40	32.50	47.92	0.54
7.8	100y	45.51	126.50	127.53	127.43	127.70	0.015069	1.84	24.76	44.61	0.79
7	100y	45.51	124.85	125.98	125.96	126.18	0.023509	1.99	22.91	51.35	0.95
6	100y	45.51	123.00	125.33		125.42	0.002262	1.33	34.19	23.59	0.35
5	100y	74.73	122.50	125.16	123.90	125.24	0.001464	1.27	59.58	37.82	0.30
4.8	100y	74.73	122.50	125.14		125.22	0.001498	1.28	59.02	37.59	0.30
4	100y	85.89	122.00	124.74	124.17	124.93	0.005394	1.93	44.49	34.03	0.54
3	100y	87.79	121.50	124.28		124.44	0.003822	1.79	48.99	32.26	0.46
2	100y	90.59	120.91	122.98	122.98	123.53	0.019799	3.29	27.58	25.12	1.00

1	100y	90.59	118.00	121.00	120.45	121.40	0.008005	2.78	32.60	18.49	0.67
						WC-2					
11	100y	16.56	134.50	135.44	135.44	135.70	0.023311	2.30	7.44	14.41	0.98
10	100y	16.56	129.50	130.07	130.17	130.41	0.151544	2.60	6.37	38.64	2.04
9.2	100y	16.56	127.50	128.74	128.47	128.83	0.006755	1.32	12.53	20.19	0.54
9	100y	16.56	127.50	128.47	128.47	128.71	0.025697	2.18	7.59	15.71	1.00
						WC-3					
14	100y	4.67	140.00	140.61	140.61	140.77	0.030972	1.76	2.66	8.68	1.01
13	100y	7.08	134.37	134.64	134.79	135.21	0.255759	3.35	2.12	13.00	2.65
12	100y	7.08	133.00	133.74	133.58	133.80	0.008001	1.09	6.52	16.05	0.54

Hydraulics for Proposed Condition

No major alterations onto the watercourses are projected at proposed condition. The geometry of these watercourses is kept the same as that of the existing condition except at the road crossings, in which minor modifications are necessary for the bridge abutments. Four (4) crossing structures are considered. Bridge-1 and Bridge-2, with 11-meter span each, will be located at the Quebrada Hicatea (WC-1). A 10-meter span Bridge-3 is proposed for WC-2, and 3.65-meter span Bridge-4 for WC-3. Figures 14 to 17 show the dimensions of these bridges.

The computer output for the hydraulics analysis is included in Appendix G. The following Tables 7 include the summary of the results for watercourse

Table 7
Proposed Condition Hydraulics 100-yr

River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
						WC-1					
8.5	100y	45.51	127.50	128.09	128.09	128.37	0.024772	2.32	19.63	36.27	1.01
8	100y	45.51	125.90	127.89	127.20	127.93	0.001576	0.89	51.19	50.23	0.28
7.9		Bridge									
7.8	100y	45.51	125.90	126.90	127.20	127.82	0.070200	4.25	10.70	17.27	1.72
7	100y	45.51	124.85	125.97	125.96	126.18	0.024238	2.01	22.67	51.17	0.96
6	100y	45.51	123.00	125.39		125.47	0.002018	1.28	35.61	23.95	0.33
5	100y	69.46	122.50	125.26	123.85	125.32	0.001073	1.11	63.64	39.46	0.25
4.9		Bridge									
4.8	100y	69.46	122.50	125.08		125.16	0.001425	1.23	56.79	36.65	0.29
4	100y	79.97	122.00	124.71	124.12	124.88	0.004995	1.84	43.42	33.65	0.52
3	100y	85.83	121.50	124.26		124.42	0.003802	1.78	48.27	32.03	0.46
2	100y	88.72	120.91	122.97	122.97	123.51	0.019854	3.27	27.12	24.91	1.00

1	100y	88.72	118.00	120.97	120.43	121.36	0.008006	2.77	32.07	18.31	0.67
						WC-2					
11	100y	16.56	134.50	135.44	135.44	135.73	0.024366	2.36	7.03	12.39	1.00
10	100y	19.45	129.50	130.10	130.20	130.43	0.114553	2.54	7.66	38.94	1.83
9.2	100y	19.45	127.50	128.85	128.53	128.94	0.006015	1.32	14.76	21.91	0.51
9.1		Bridge									
9	100y	19.45	127.50	128.37	128.53	128.87	0.060373	3.13	6.22	14.22	1.51
						WC-3					
14	100y	4.67	140.00	140.61	140.61	140.77	0.030972	1.76	2.66	8.68	1.01
13	100y	6.42	134.37	134.62	134.77	135.21	0.299062	3.41	1.88	12.67	2.82
12.5	100y	6.42	133.00	133.83	133.56	133.86	0.003771	0.81	7.91	17.14	0.38
12.3		Bridge									
12	100y	6.42	133.00	133.38	133.56	134.05	0.240767	3.61	1.78	9.28	2.64

Results

The maximum increase in floodwater levels due to a hydraulic structure allowed by the Puerto Rico Planning Board Regulation No. 13 for rural areas is 0.30 meters. There is no increase in water level at the cross section located in the immediate upstream of the project site. The water level increase caused by the bridges is bellow the limit established by Regulation No. 13.

Using the results of the hydraulics analysis, the 100-year floodplain was delineated, as shown in Figure 13. No construction will take place in the floodplain.

Local Storm Sewer System

The design engineer must convey the discharge form all areas though pipes and surface runoff over the roadways to the watercourses.

V. CONCLUSIONS AND RECOMMENDATIONS

The following are the conclusions of this study:

1. The development of the site increases the peak discharge at drainage areas P1, P2, P4 and P7. Runoff mitigation structures are needed as per the PR Planning Board Regulation No. 3.

2. The proposed mitigation structures reduce the increment in discharge due to the development to levels lower that those of the existing condition.

3. The 100-year floodplain footprint determined for the three storm watercourses will not be affected by the development. The development will be erected outside of this floodplain.

The following are the recommendations of this study:

1. The project site's roadway elevation must be at least 2 ft above the local flood water levels as determined in this study. But the minimum roadway elevation at the road crossing structure will be determined taking into consideration that the bridge low cord will be at least 0.60 meters above the 100-year water elevation. An in the vicinity of the detention ponds, the minimum roadway elevation will be 0.60 meters above the 100-year water elevation at the pond.

2. The size, location and point of discharge of the runoff mitigation structures will be as indicated in this study. The ponds will have an outlet control as described in the Table 5 of this study.

3. The engineer will make sure that the site be graded in a way that the magnitude of the drainage areas be as assumed in this study.

4. Collection discharge pipes for cloistered drainage areas must be designed for a 100-year discharge.

5. The minimum free board for the bridges will be of 0.60 meters.

6. The engineer will include protection from erosion at the discharge of the detention ponds. Protection may be by rip-rap or gabions.

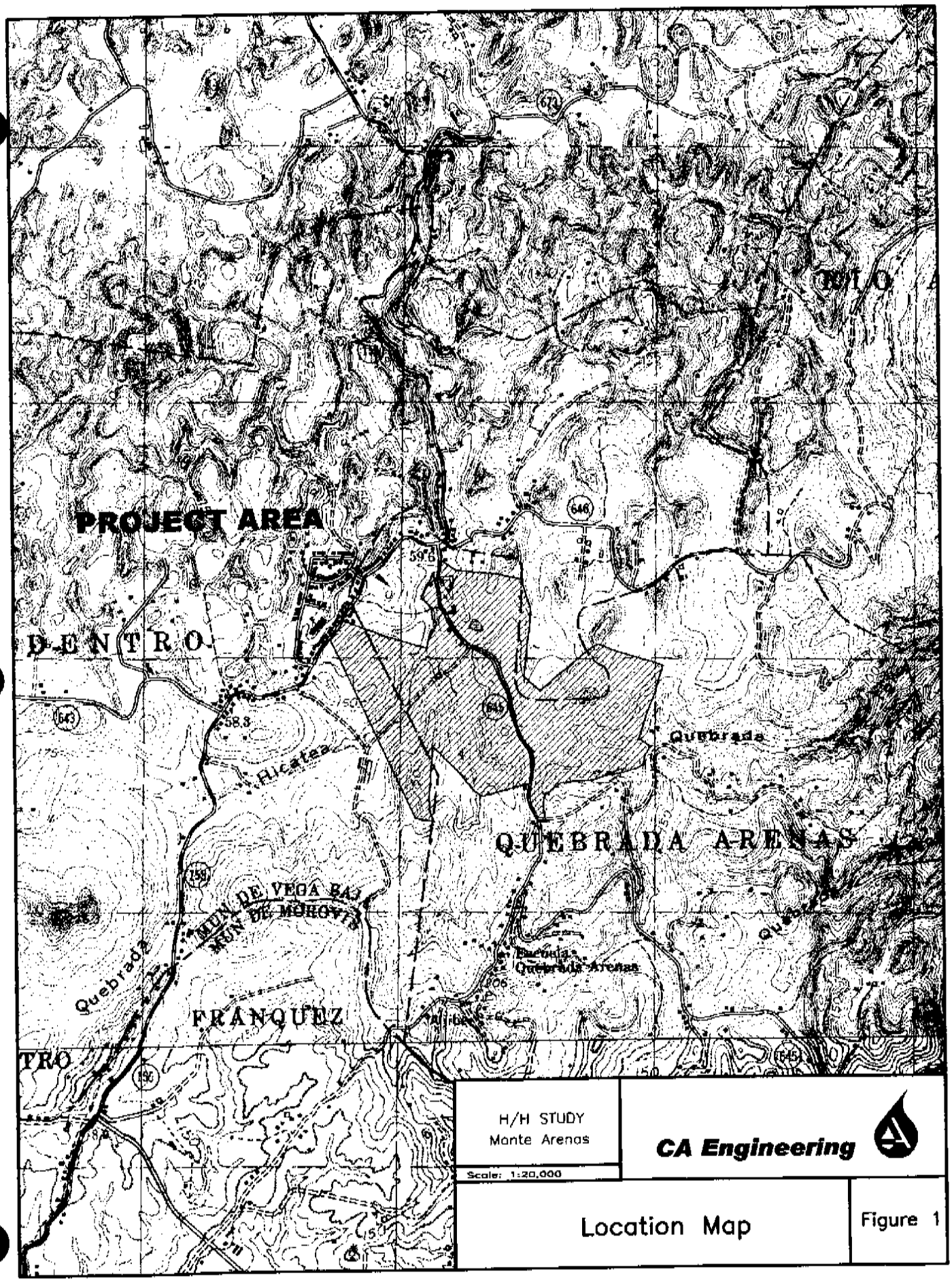
7. Maintenance of the road crossing culverts and mitigation pond outlet is necessary during operation. Maintenance shall consist on keeping the entrance free from clogging debris or vegetation.

Study Limits

All the recommendations specified in this study must be considered to assure the optimum performance of the proposed structures operation. The design engineer will be responsible for elaborating the drawings in conformance with the recommendations of this study.

The results of this study are based on free flow conditions through the hydraulic structures. Proper maintenance must be developed to assure this condition. On the event of the occurrence of any severe obstruction to the flow, the results and recommendations may be impaired. Finally, the design engineer must use results and recommendations included in this report only and exclusively for the intended purposes as indicated in this study.

FIGURES



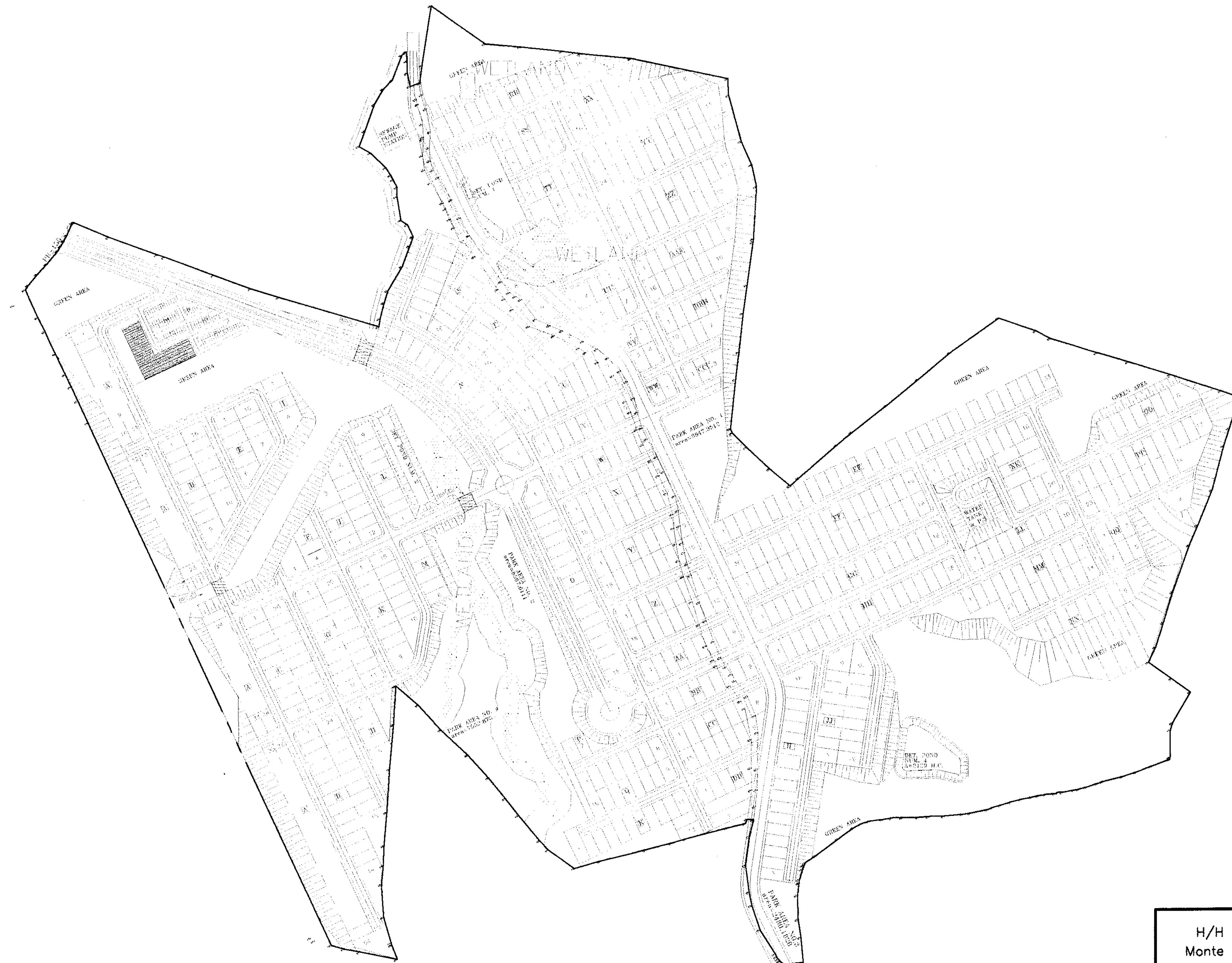
H/H STUDY
Monte Arenas

Scale: 1:20,000

CA Engineering

Location Map

Figure 1



H/H STUDY
Monte Arenas

Scale: 1:5,000

CA Engineering

Proposed Development Layout

Figure 2

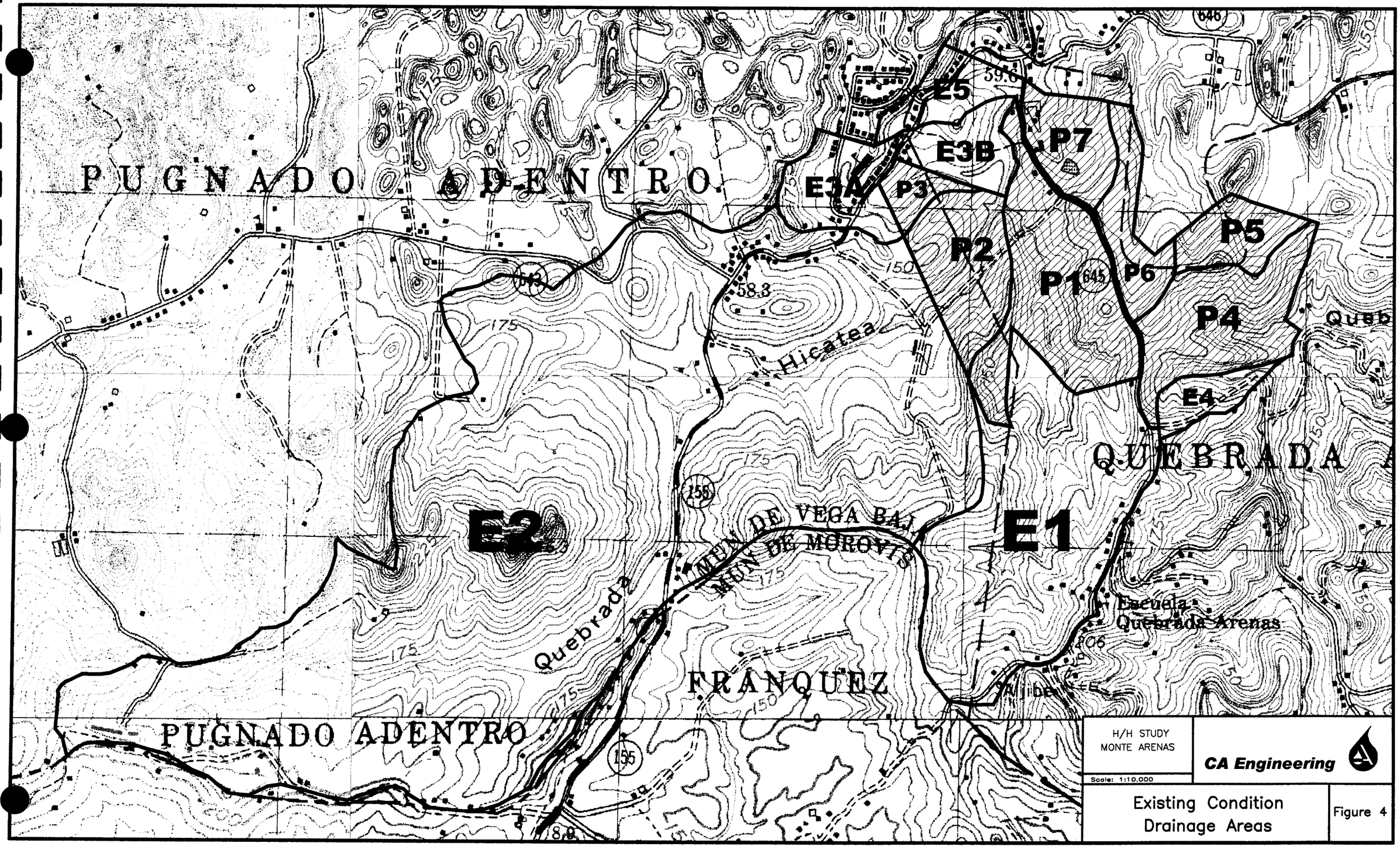
H/H STUDY
MONTE ARENAS

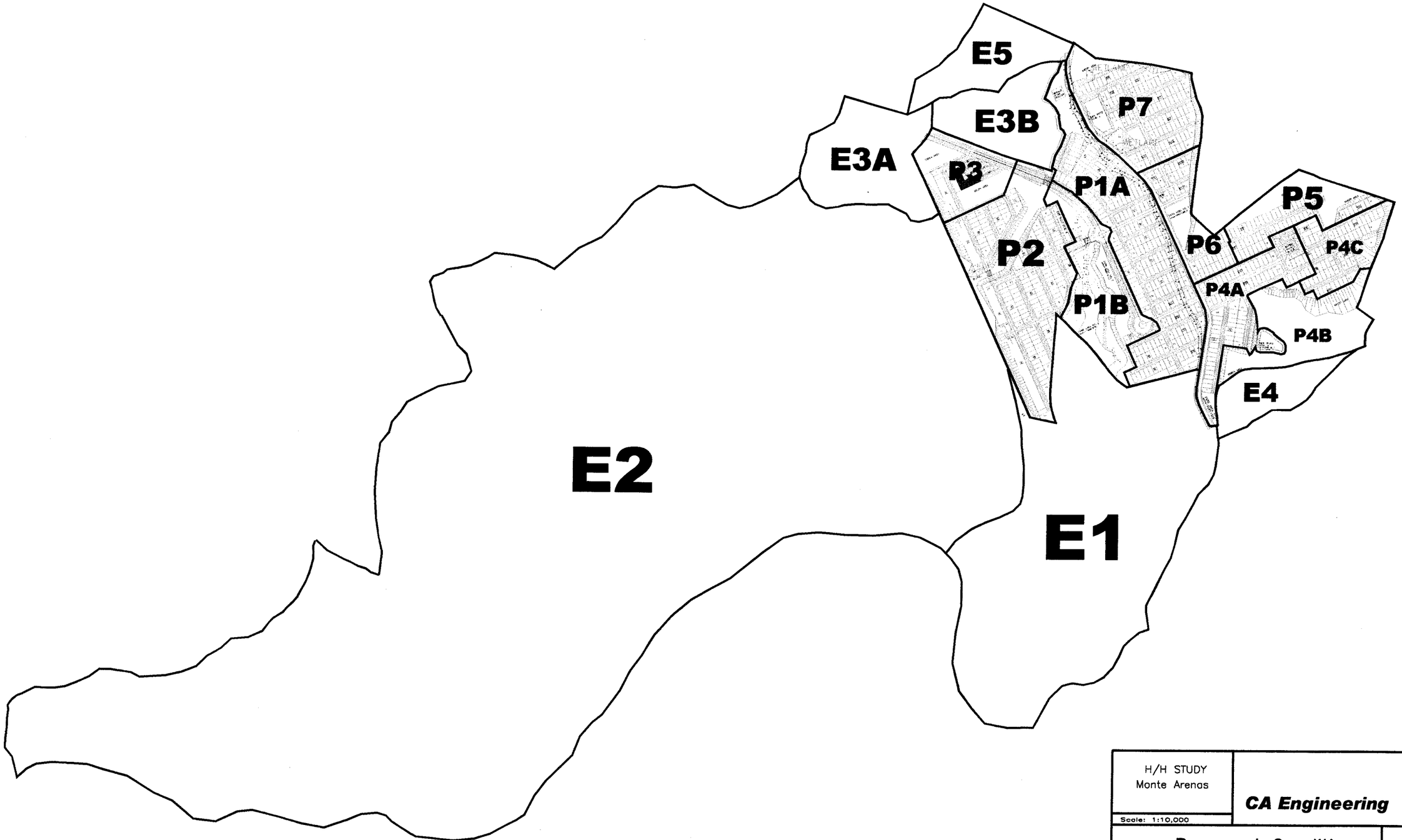
Scale: 1:5,000

CA Engineering

Topography for Existing Condition

Figure 3


PUGNADO ADENTRO
E5
E3B
P7
E3A
P3
P2
P5
P1
P6
P4
E4
Hicatea
Quebrada
QUEBRADA
E2
E1
MUN. DE VEGA BAJA
MUN. DE MOROVIS
Escuela
Quebrada Arenas
FRANQUEZ
PUGNADO ADENTRO
H/H STUDY
MONTE ARENAS
Scale: 1:10,000
CA Engineering
Existing Condition
Drainage Areas
Figure 4



H/H STUDY
Monte Arenas

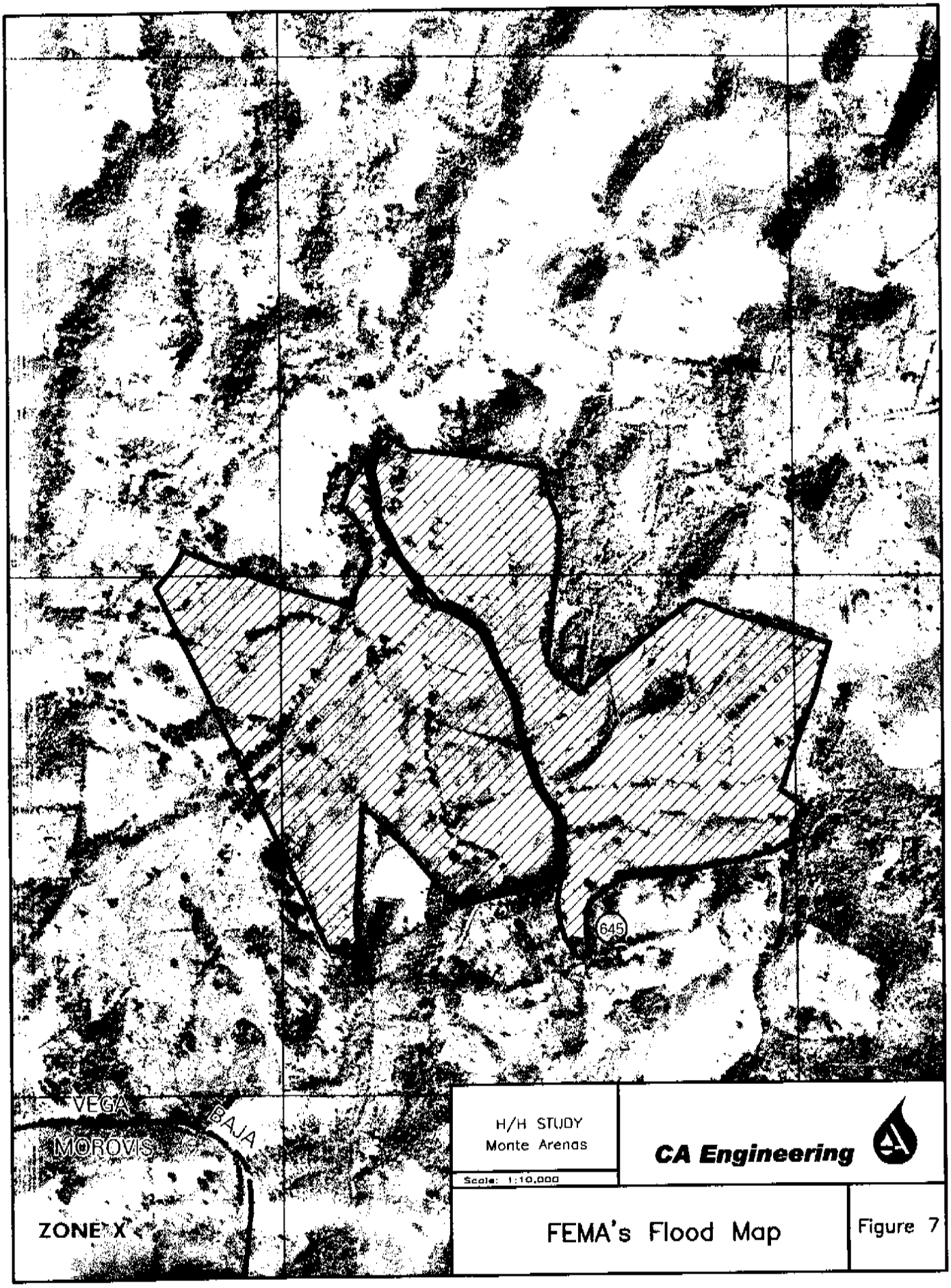
Scale: 1:10,000

CA Engineering

Proposed Condition
Drainage Areas

Figure 5

VeB
VaB
VcB
VaC2
NaD
AlB
CIF2
CIE2
JuD2
VcC2
CID2
NaE
Hicteo
PUGNADO
ADENTRO
Quebra
UNICIPIO
MoC2
P4
H/H STUDY
MONTE ARENAS
Scale: 1:10,000
CA Engineering
Soils Map
Figure 6



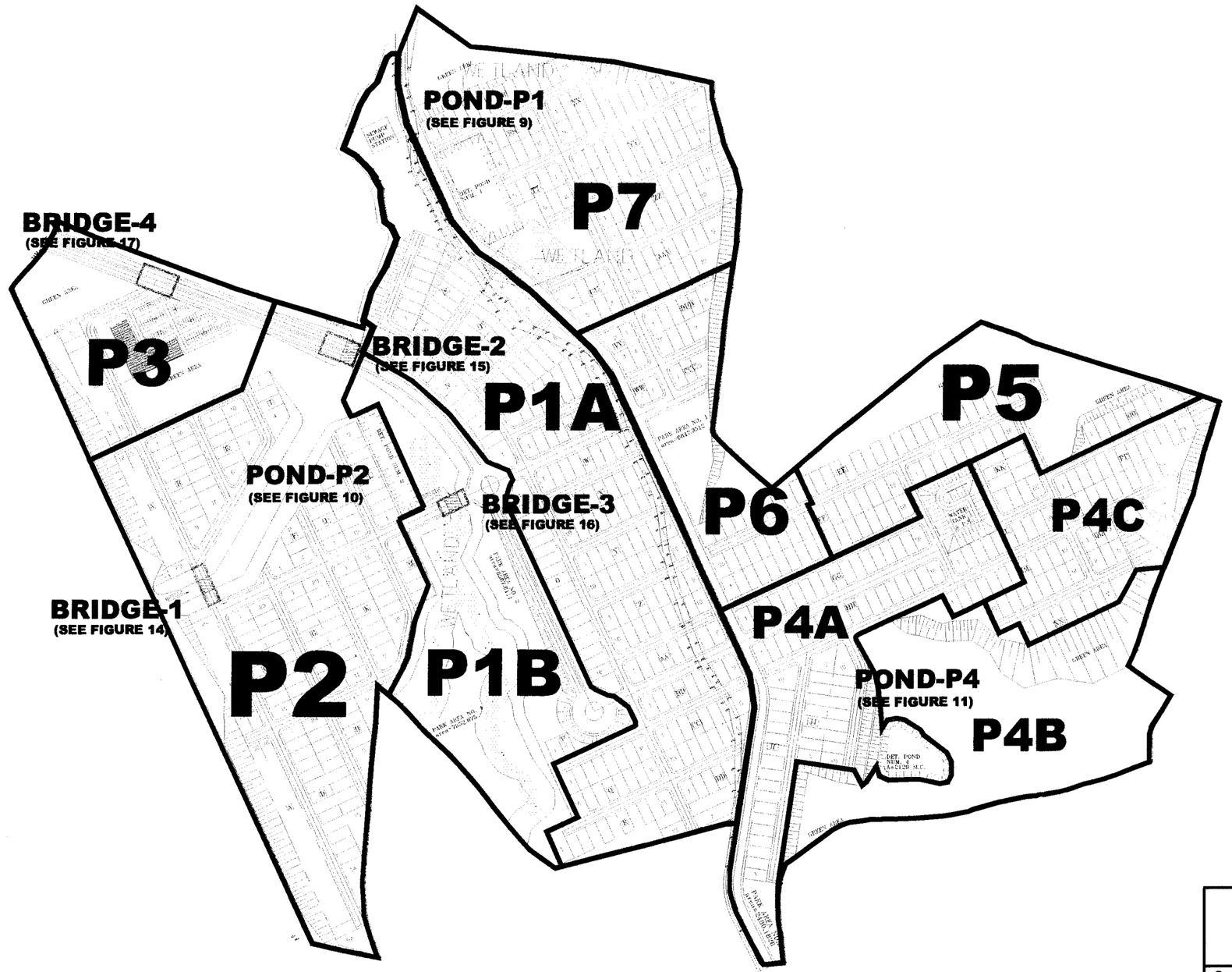
H/H STUDY
Monte Arenas

Scale: 1:10,000

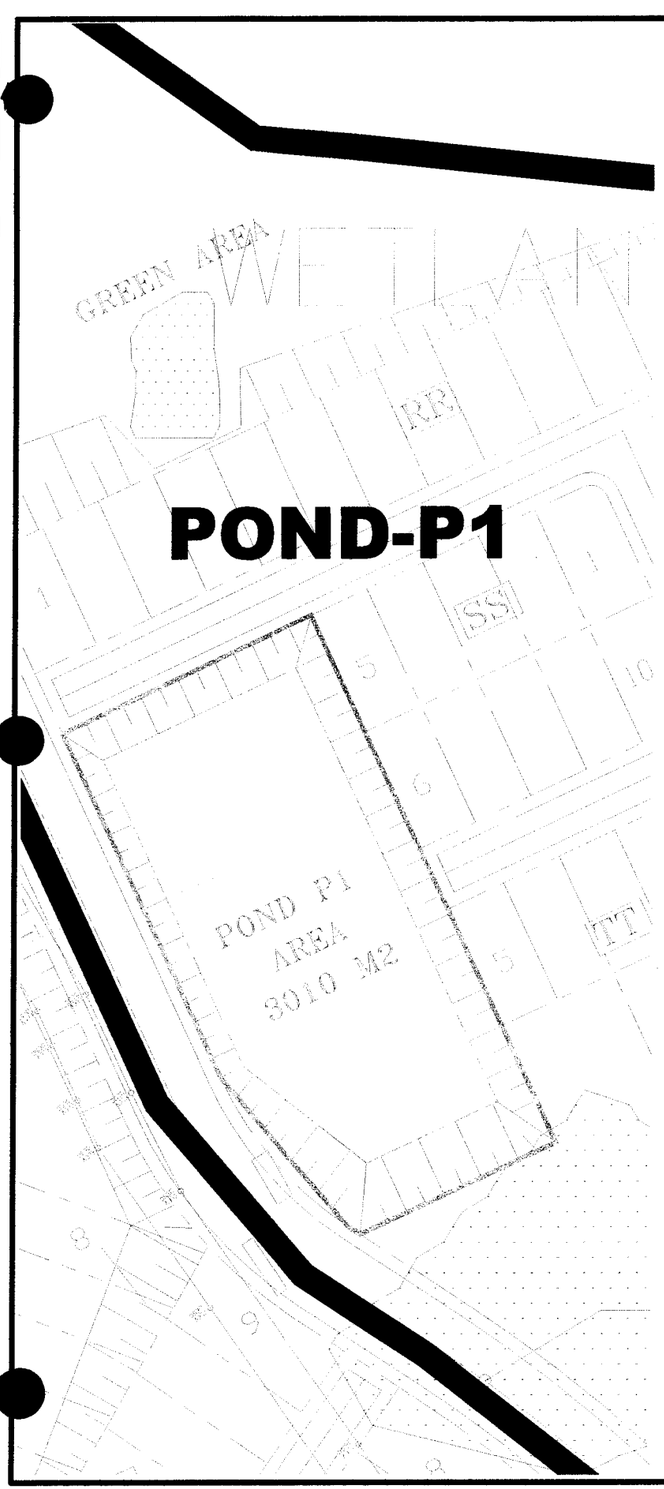
CA Engineering

FEMA's Flood Map

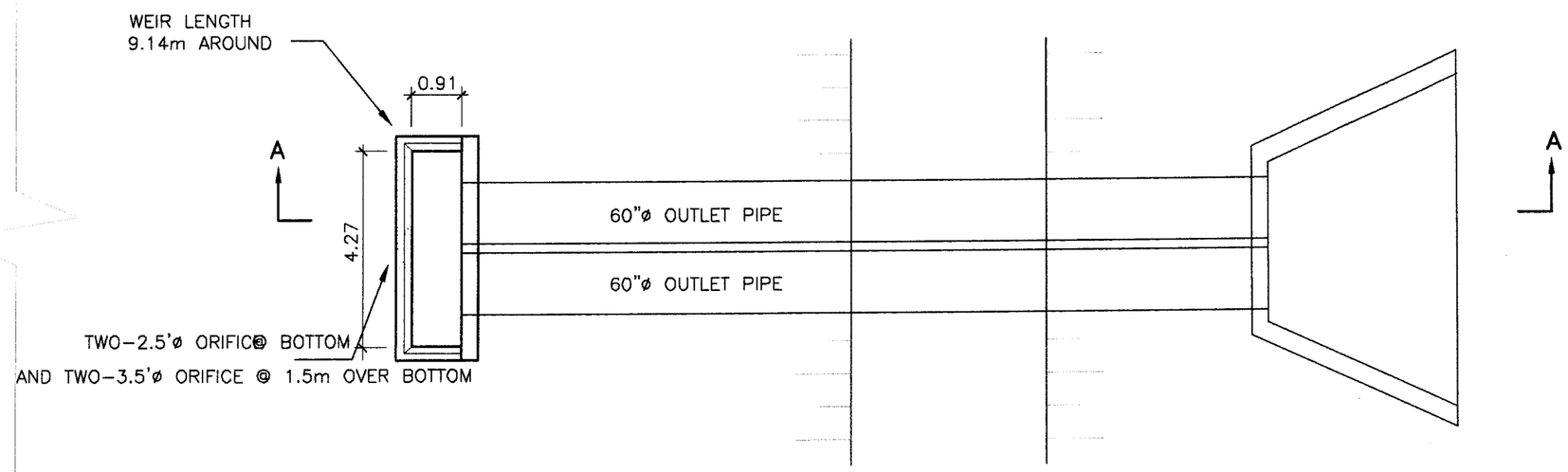
Figure 7



H/H STUDY Monte Arenas	CA Engineering
Scale: 1:5,000	
Layout of Proposed Structures	Figure 8

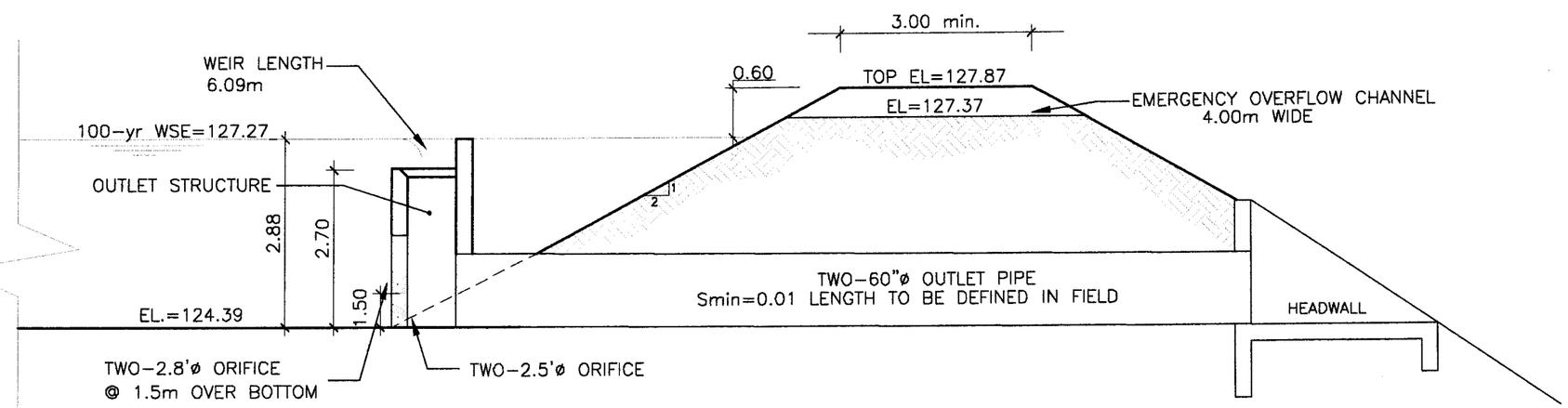


POND-P1



PLAN VIEW

NTS



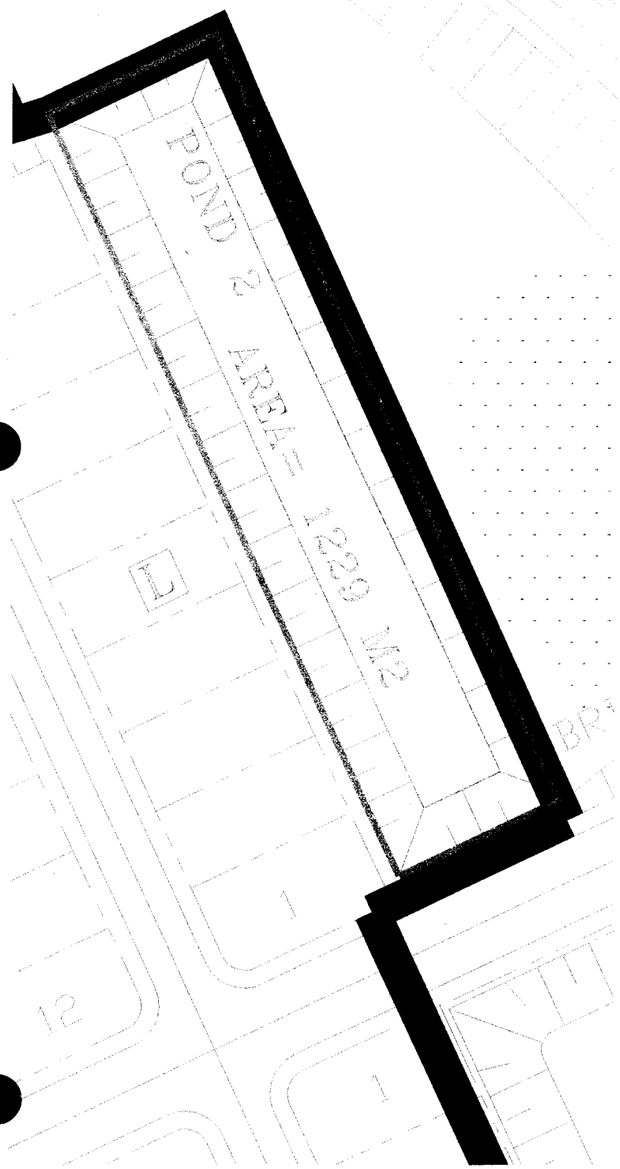
SECTION A–A

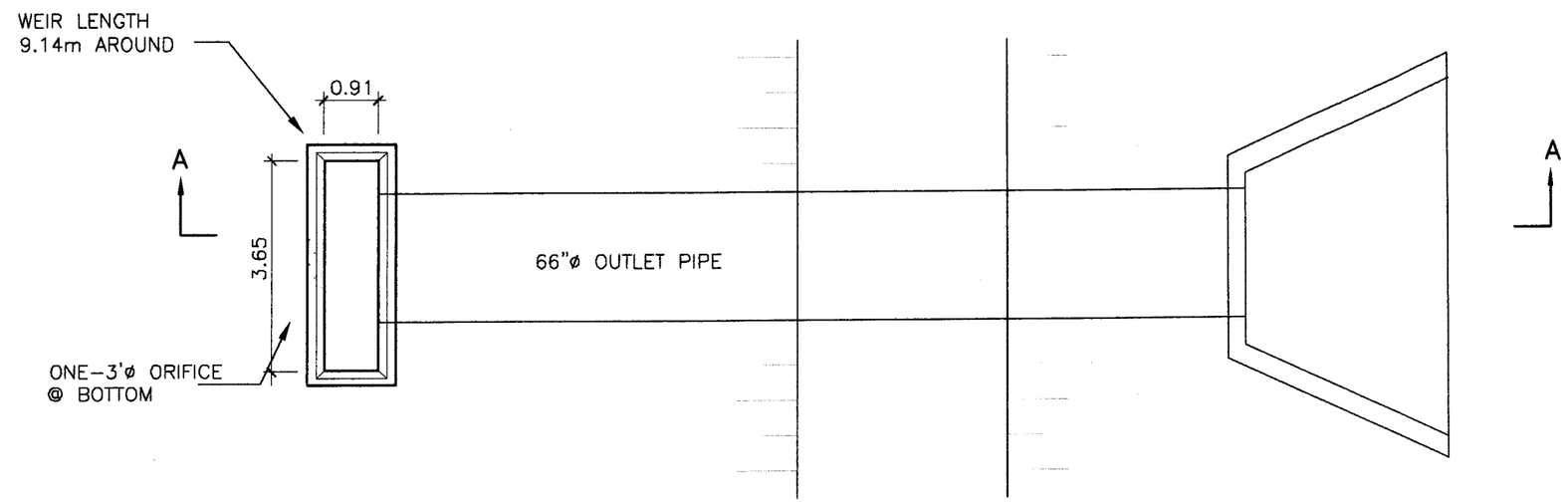
NTS

OUTLET STRUCTURE

H/H STUDY Monte Arenas	CA Engineering
Scale: NTS	
Schematics of the Detention Pond P1	Figure 9

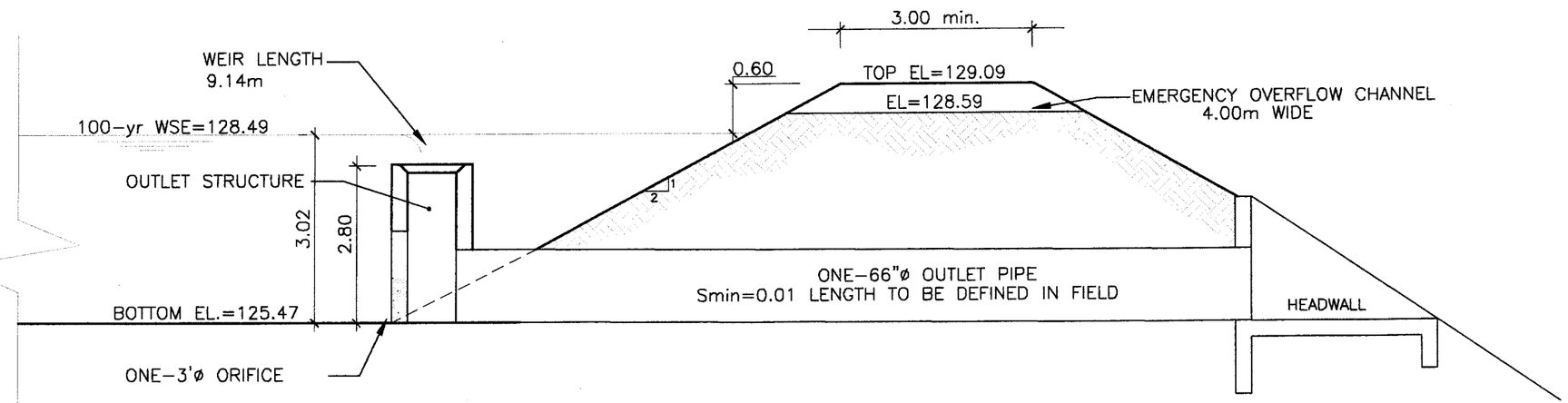
POND-P2





PLAN VIEW

NTS

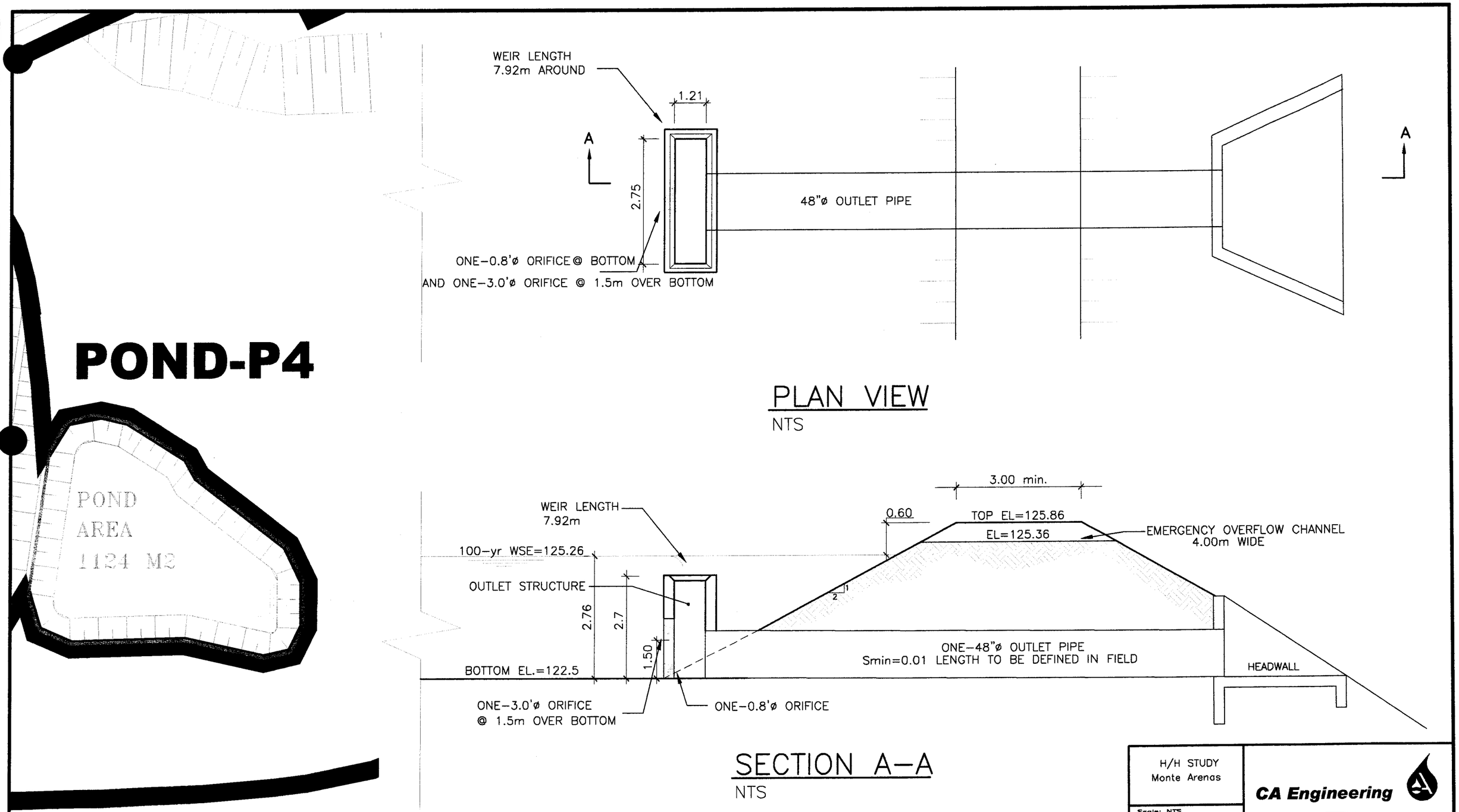


SECTION A-A

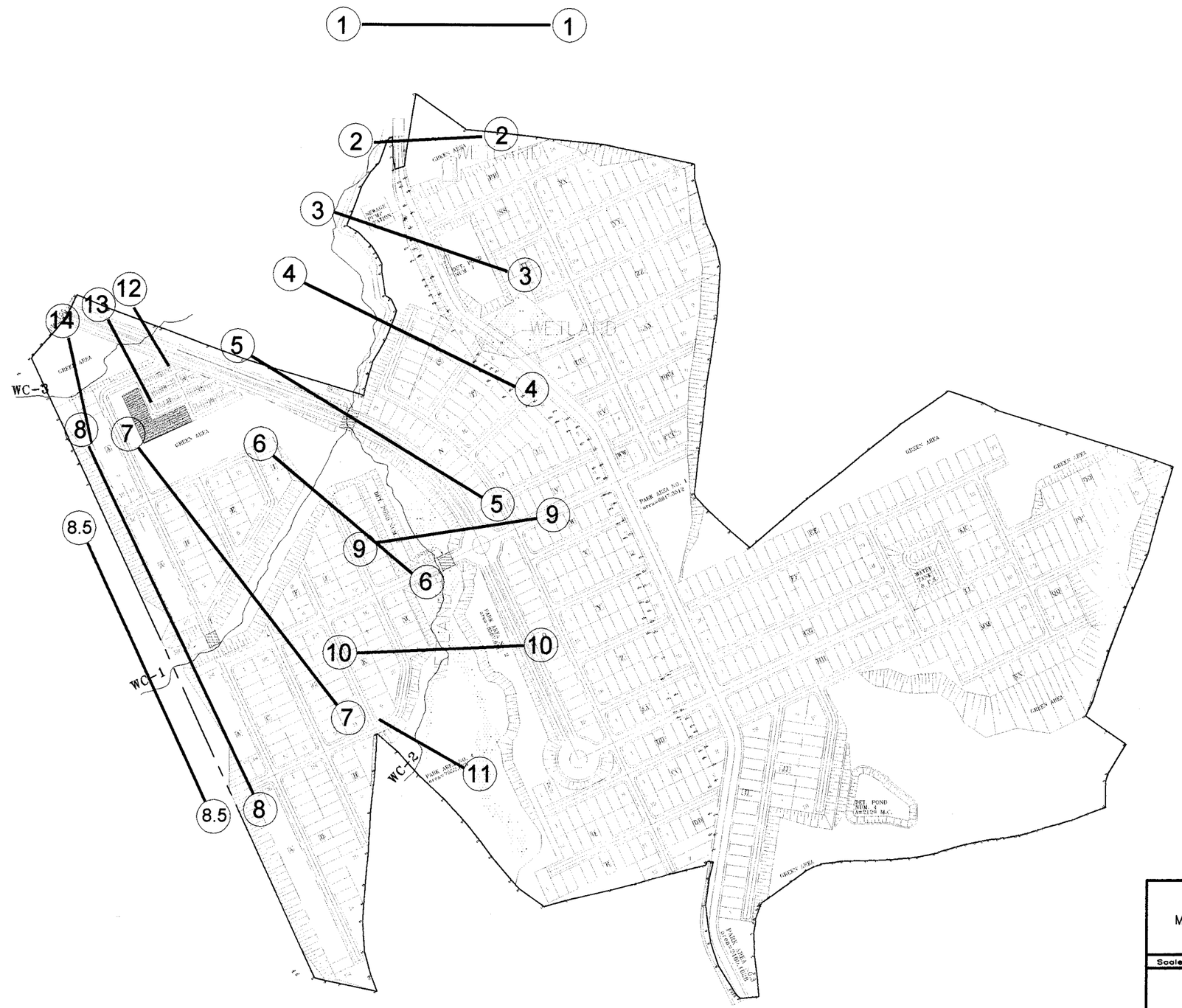
NTS

OUTLET STRUCTURE

H/H STUDY Monte Arenas	CA Engineering
Scale: NTS	
Schematics of the Detention Pond P2	Figure 10



H/H STUDY Monte Arenas	CA Engineering
Scale: NTS	
Schematics of the Detention Pond P4	Figure 11



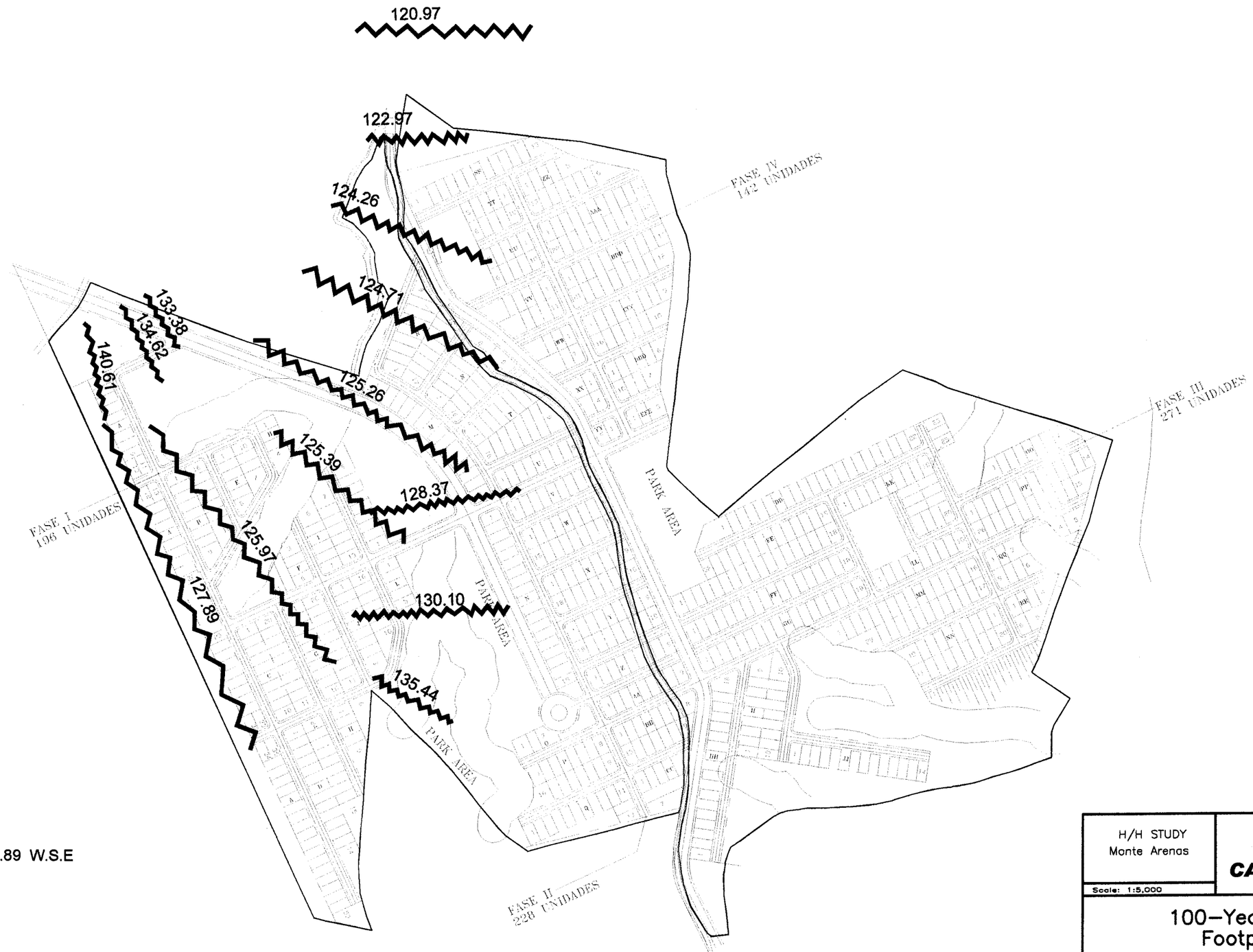
H/H STUDY
Monte Arenas

Scale: 1:5,000

CA Engineering

Location of Cross Sections

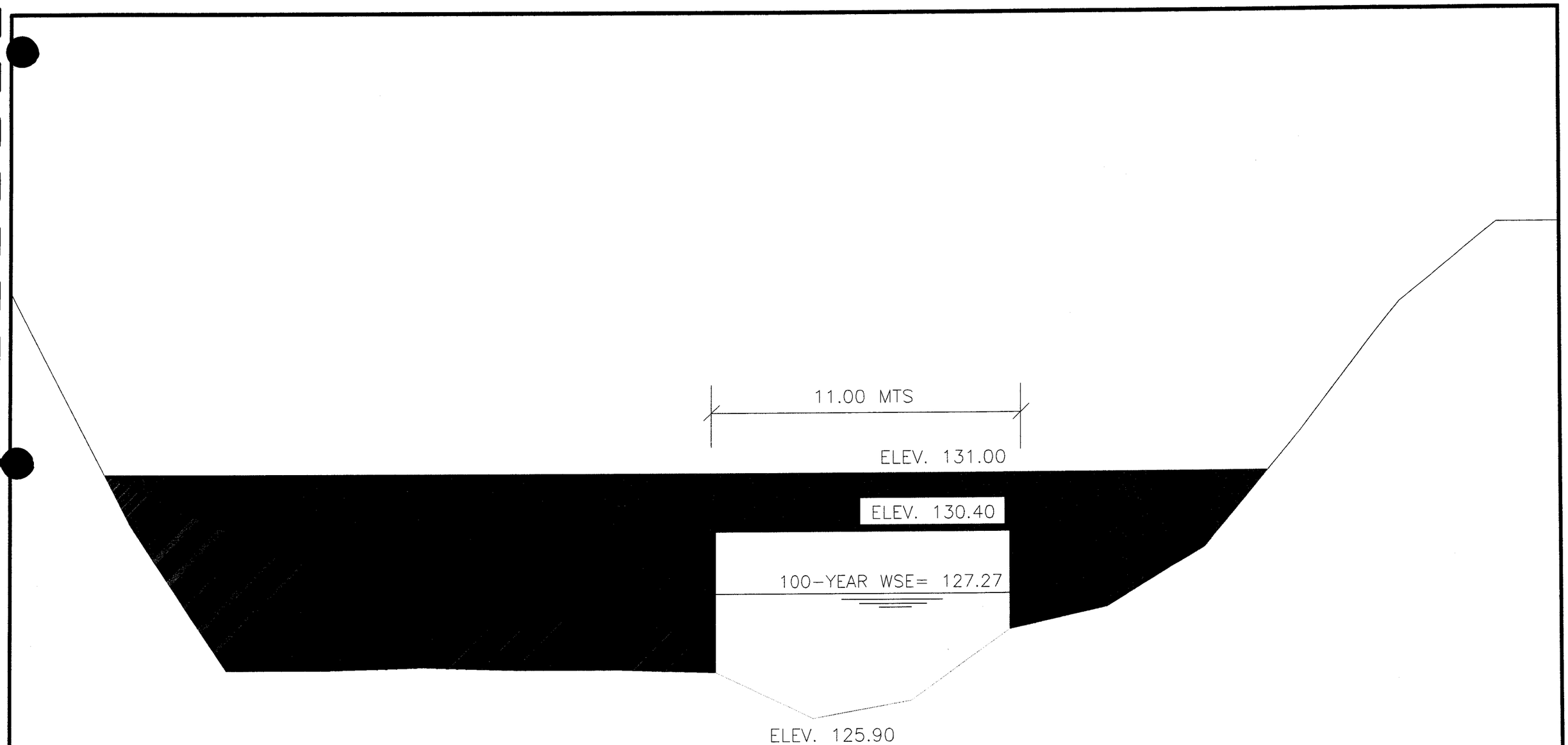
Figure 12



LEGEND

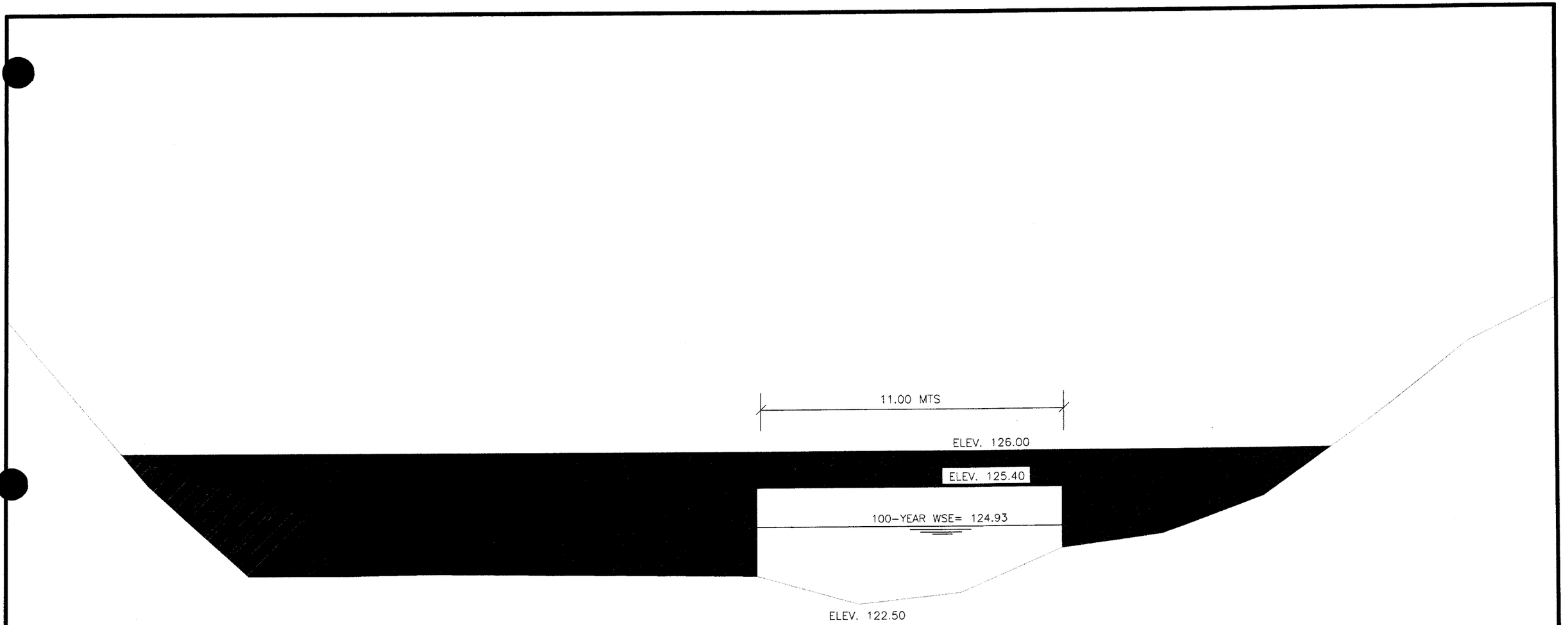
127.89 W.S.E

H/H STUDY Monte Arenas	CA Engineering
Scale: 1:5,000	
100–Year Flood Footprint	Figure 13



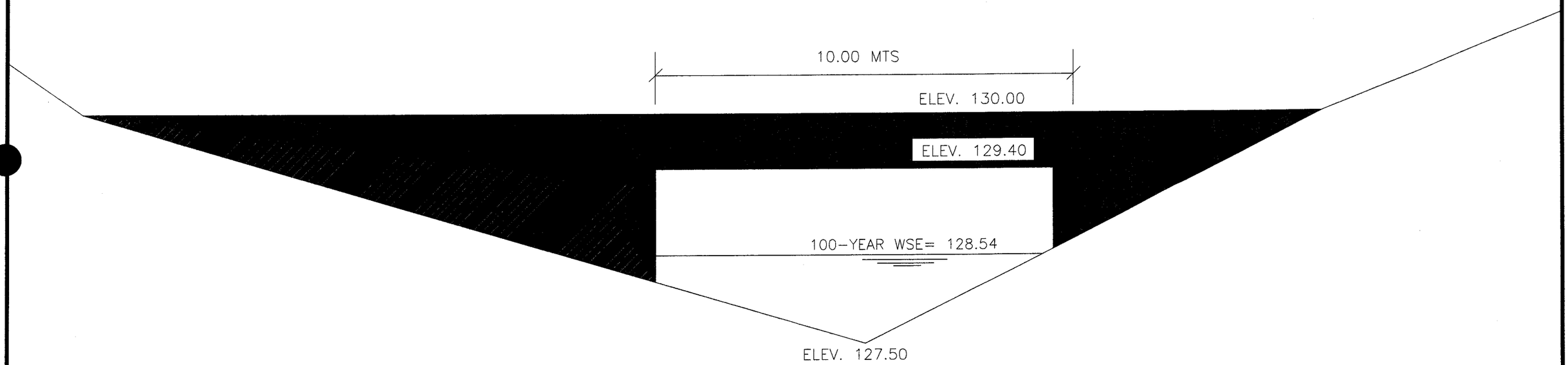
BRIDGE 1

H/H STUDY Monte Arenas	CA Engineering
Scale: NTS	
Proposed Bridge 1	Figure 14



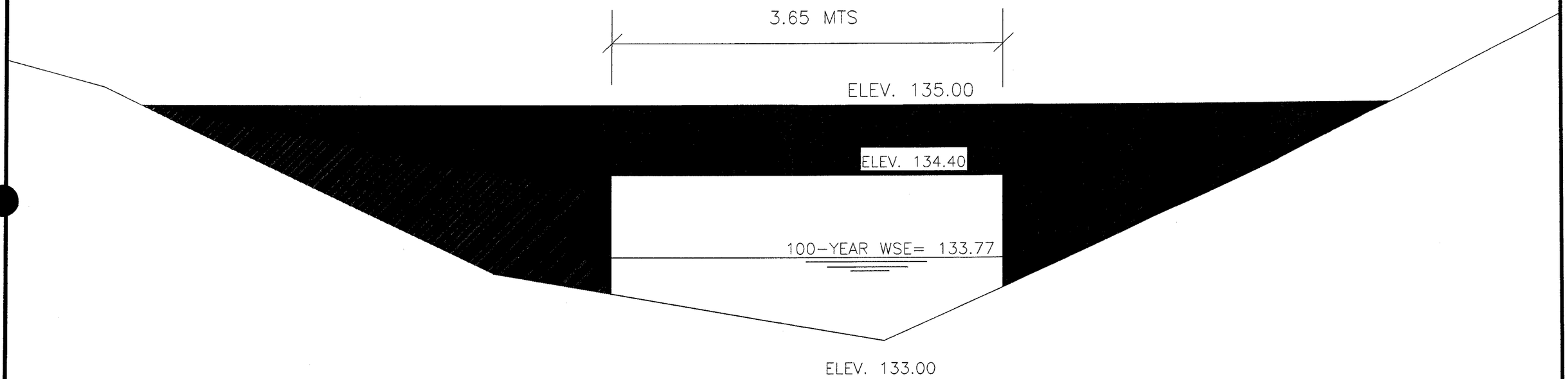
BRIDGE 2

H/H STUDY Monte Arenas	CA Engineering
Scale: NTS	
Proposed Bridge 2	Figure 15



BRIDGE 3

H/H STUDY Monte Arenas	CA Engineering
Scale: NTS	
Proposed Bridge 3	Figure 16



BRIDGE 4

H/H STUDY Monte Arenas	CA Engineering
Scale: NTS	
Proposed Bridge 4	Figure 17

APPENDIXES

APPENDIX A

HYDROLOGIC PARAMETERS ESTIMATION

Project : Monte Arenas Development
Location : Vega Baja, Puerto Rico
REGRESSION CURVES FOR LOW DURATION STORMS

100 -Years				
Duration (Hs)	Prec. (inch)	Intensity (inch/hour) y=bo/(b1+X)^0.73	Regression Parameters	
			bo	bi
0.083	0.99	**11.92**	4.90	0.2128
0.25	2.15	**8.60**	4.90	0.2128
1	4.40 **	4.40	R^2= 0.9954	
2	5.20 **	2.60		
3	6.10 **	2.03		
6	8.00 **	1.33		
12	9.70 **	0.81		
24	11.50 **	0.48		

50 -Years				
Duration (Hs)	Prec. (inch)	Intensity (inch/hour) y=bo/(b1+X)^0.73	Regression Parameters	
			bo	bi
0.083	0.64	**7.74**	4.50	0.393
0.25	1.55	**6.21**	4.50	0.393
1	3.80 **	3.80	R^2= 0.9880	
2	5.00 **	2.50		
3	5.20 **	1.73		
6	7.00 **	1.17		
12	8.70 **	0.73		
24	10.50 **	0.44		

25 -Years				
Duration (Hs)	Prec. (inch)	Intensity (inch/hour) y=bo/(b1+X)^0.75	Regression Parameters	
			bo	bi
0.083	0.61	**7.35**	4.30	0.406
0.25	1.47	**5.90**	4.30	0.406
1	3.50 **	3.50	R^2= 0.9935	
2	4.50 **	2.25		
3	5.10 **	1.70		
6	6.30 **	1.05		
12	7.70 **	0.64		
24	9.40 **	0.39		

10 -Years				
Duration (Hs)	Prec. (inch)	Intensity (inch/hour) y=bo/(b1+X)^0.76	Regression Parameters	
			bo	bi
0.083	0.55	**6.67**	3.60	0.361
0.25	1.31	**5.23**	3.60	0.361
1	3.00 **	3.00	R^2= 0.9950	
2	3.70 **	1.85		
3	4.10 **	1.37		
6	5.40 **	0.90		
12	6.60 **	0.55		
24	7.60 **	0.32		

2 -Years				
Duration (Hs)	Prec. (inch)	Intensity (inch/hour) y=bo/(b1+X)^0.79	Regression Parameters	
			bo	bi
0.083	0.47	**5.71**	2.40	0.251
0.25	1.04	**4.14**	2.40	0.251
1	2.10 **	2.10	R^2= 0.9930	
2	2.50 **	1.25		
3	2.70 **	0.90		
6	3.30 **	0.55		
12	4.00 **	0.33		
24	4.60 **	0.19		

* Bold values were estimated by Regression Analysis from Duration Vs Intensity curve
** Precipitation values from Tech. Paper No 42

Project: Monte Arenas Development.
Vega Baja, Puerto Rico

EXISTING CONDITION

PHYSIOGRAFIC INFORMATION: PROJECT AREA P1

Soil	HSG	Existing Conditions Curve Number	Area (acre)
CiE2	B	69	8.11
SnC	C	79	2.49
JuD2	C	79	15.78
NaD	C	79	10.96
NaE	C	79	8.35
MoC2	D	84	5.88
Total (acres)			51.57
Total (km2)			0.209
Total (mi2)			0.0806
Weighted CN			78.00

PHYSIOGRAFIC INFORMATION: PROJECT AREA P2

Soil	HSG	Existing Conditions Curve Number	Area (acre)
NaE	C	79	5.01
NaD	C	79	5.19
MoC2	D	84	8.01
SnC	C	79	3.57
CiE2	B	69	3.92
Total (acres)			25.70
Total (km2)			0.104
Total (mi2)			0.0402
Weighted CN			79.03

PHYSIOGRAFIC INFORMATION: PROJECT AREA P3

Soil	HSG	Existing Conditions Curve Number	Area (acre)
VaC2	C	79	2.32
MoC2	D	84	3.70
NaD	C	79	1.63
NaE	C	79	1.29
Total (acres)			8.94
Total (km2)			0.036
Total (mi2)			0.0140
Weighted CN			81.07

PHYSIOGRAFIC INFORMATION: PROJECT AREA P4

Soil	HSG	Existing Conditions Curve Number	Area (acre)
NaD	C	79	26.64
CiE2	B	69	6.68
MoC2	D	84	3.35
Total (acres)			36.67
Total (km2)			0.148
Total (mi2)			0.0573
Weighted CN			77.64

PROPOSED CONDITION

PHYSIOGRAFIC INFORMATION: PROJECT AREA P1A

Soil	HSG	Proposed Condition Curve Number	Area (acre)
Development	-	95	31.63
Total (acres)			31.63
Total (km2)			0.128
Total (mi2)			0.0494
Weighted CN			95.00

PHYSIOGRAFIC INFORMATION: PROJECT AREA P1B

Soil	HSG	Proposed Condition Curve Number	Area (acre)
Development	-	95	19.00
Total (acres)			19.00
Total (km2)			0.077
Total (mi2)			0.0297
Weighted CN			95.00

PHYSIOGRAFIC INFORMATION: PROJECT AREA P2

Soil	HSG	Proposed Condition Curve Number	Area (acre)
Development	-	95	30.22
Total (acres)			30.22
Total (km2)			0.122
Total (mi2)			0.0472
Weighted CN			95.00

PHYSIOGRAFIC INFORMATION: PROJECT AREA P3

Soil	HSG	Proposed Condition Curve Number	Area (acre)
Development	-	95	6.96
Total (acres)			6.96
Total (km2)			0.028
Total (mi2)			0.0109
Weighted CN			95.00

PHYSIOGRAFIC INFORMATION: PROJECT AREA P4A

Soil	HSG	Proposed Condition Curve Number	Area (acre)
Development	-	95	14.46
Total (acres)			14.46
Total (km2)			0.059
Total (mi2)			0.0226
Weighted CN			95.00

PHYSIOGRAFIC INFORMATION: PROJECT AREA P4B

Soil	HSG	Proposed Condition Curve Number	Area (acre)
Development	-	95	15.70
Total (acres)			15.70
Total (km2)			0.064
Total (mi2)			0.0245
Weighted CN			95.00

PHYSIOGRAFIC INFORMATION: PROJECT AREA P5

		Existing Conditions	
Soil	HSG	Curve Number	Area (acre)
MoC2	D	84	4.7
VaC2	C	79	1.08
CiE2	B	69	2.80
NaD	C	79	5.73
Total (acres)			14.31
Total (km2)			0.058
Total (mi2)			0.0224
Weighted CN			78.69

PHYSIOGRAFIC INFORMATION: BASIN AREA P6

		Existing Conditions	
Soil	HSG	Curve Number	Area (acre)
CiE2	B	69	0.39
NaD	C	79	7.22
JuD2	C	79	4.81
NaE	C	79	3.44
VaC2	C	79	1.05
Total (acres)			16.91
Total (km2)			0.068
Total (mi2)			0.026
Weighted CN			78.77

PHYSIOGRAFIC INFORMATION: BASIN AREA P7

		Existing Conditions	
Soil	HSG	Curve Number	Area (acre)
VaC2	C	79	2.11
NaE	C	79	4.25
NaD	C	79	5.71
VaC2	C	79	5.65
Total (acres)			17.72
Total (km2)			0.072
Total (mi2)			0.028
Weighted CN			79.00

PHYSIOGRAFIC INFORMATION: BASIN AREA E1

		Existing Conditions	
Soil	HSG	Curve Number	Area (acre)
CiE2	B	69	57.55
SnC	C	79	4.18
NaD	C	79	4.74
JuD2	C	79	4.40
NaE	C	79	39.26
Total (acres)			110.13
Total (km2)			0.446
Total (mi2)			0.172
Weighted CN			73.77

PHYSIOGRAFIC INFORMATION: PROJECT AREA P4C

		Proposed Condition	
Soil	HSG	Curve Number	Area (acre)
Development	-	95	9.50
Total (Acres)			9.50
Total (km2)			0.038
Total (mi2)			0.0148
Weighted CN			95.00

PHYSIOGRAFIC INFORMATION: PROJECT AREA P5

		Proposed Condition	
Soil	HSG	Curve Number	Area (acre)
Development	-	95	11.36
Total (acres)			11.36
Total (km2)			0.046
Total (mi2)			0.0178
Weighted CN			95.00

PHYSIOGRAFIC INFORMATION: BASIN AREA P6

		Existing Conditions	
Soil	HSG	Curve Number	Area (acre)
Development	-	95	11.57
Total (acres)			11.57
Total (km2)			0.047
Total (mi2)			0.018
Weighted CN			95.00

PHYSIOGRAFIC INFORMATION: BASIN AREA P7

		Proposed Condition	
Soil	HSG	Curve Number	Area (acre)
Devepment	-	95	21.41
Total (acres)			21.41
Total (km2)			0.087
Total (mi2)			0.033
Weighted CN			95.00

PHYSIOGRAFIC INFORMATION: BASIN AREA E1

		Existing Conditions	
Soil	HSG	Curve Number	Area (acre)
CiE2	B	69	57.55
SnC	C	79	4.18
NaD	C	79	4.74
JuD2	C	79	4.40
NaE	C	79	39.3
Total (acres)			110.13
Total (km2)			0.446
Total (mi2)			0.172
Weighted CN			0.00

PHYSIOGRAFIC INFORMATION: BASIN AREA E2

Existing Conditions			
Soil	HSG	Curve Number	Area (acre)
CiF2	B	69	39.71
JuD2	C	79	178.44
NaF	C	79	45.54
NaD	C	79	100.51
CmF2	B	69	41.82
VcB	C	79	13.4
MoD2	D	84	5.18
CiD2	B	69	0.85
VcC2	C	79	5.66
SmF	B	69	5.94
Ga	D	84	5.68
NaE	C	79	60.56
VaB	C	79	12.34
VaC2	C	79	1.36
MoC2	D	84	18.14
CiE2	B	69	19.56
SnC	C	79	0.76
Total (acres)			555.45
Total (km2)			2.248
Total (mi2)			0.868
Weighted CN			77.32

PHYSIOGRAFIC INFORMATION: BASIN AREA E3A

Existing Conditions			
Soil	HSG	Curve Number	Area (acre)
SmF	B	69	5.64
VaC2	C	79	11.52
NaD	C	79	1.65
NaE	C	79	1.82
Total (acres)			20.63
Total (km2)			0.083
Total (mi2)			0.032
Weighted CN			76.27

PHYSIOGRAFIC INFORMATION: BASIN AREA E3B

Existing Conditions			
Soil	HSG	Curve Number	Area (acre)
VaC2	C	79	4.79
MoC2	D	84	6.05
NaD	C	79	2.50
CiE2	B	69	1.70
Total (acres)			15.04
Total (km2)			0.061
Total (mi2)			0.024
Weighted CN			79.88

PHYSIOGRAFIC INFORMATION: BASIN AREA E4

Existing Conditions			
Soil	HSG	Curve Number	Area (acre)
NaD	C	79	3.19
CiE2	B	69	5.96
Total (acres)			9.15
Total (km2)			0.037
Total (mi2)			0.014
Weighted CN			72.49

PHYSIOGRAFIC INFORMATION: BASIN AREA E5

Existing Conditions			
Soil	HSG	Curve Number	Area (acre)
SmF	B	69	3.07
VaC2	C	79	6.82
NaD	C	79	2.38
CiD2	B	69	1.19
CiE2	B	69	0.55
Total (acres)			14.01
Total (km2)			0.057
Total (mi2)			0.022
Weighted CN			75.57

PHYSIOGRAFIC INFORMATION: BASIN AREA E2

Existing Conditions			
Soil	HSG	Curve Number	Area (acre)
CiF2	B	69	39.71
JuD2	C	79	178.44
NaF	C	79	45.54
NaD	C	79	100.51
CmF2	B	69	41.82
VcB	C	79	13.4
MoD2	D	84	5.18
CiD2	B	69	0.85
VcC2	C	79	5.66
SmF	B	69	5.94
Ga	D	84	5.68
NaE	C	79	60.56
VaB	C	79	12.34
VaC2	C	79	1.36
MoC2	D	84	18.14
CiE2	B	69	19.56
SnC	C	79	0.76
Total (acres)			555.45
Total (km2)			2.248
Total (mi2)			0.868
Weighted CN			12.11

PHYSIOGRAFIC INFORMATION: BASIN AREA E3A

Existing Conditions			
Soil	HSG	Curve Number	Area (acre)
SmF	B	69	5.64
VaC2	C	79	11.52
NaD	C	79	1.65
NaE	C	79	1.82
Total (acres)			20.63
Total (km2)			0.083
Total (mi2)			0.032
Weighted CN			76.27

PHYSIOGRAFIC INFORMATION: BASIN AREA E3B

Existing Conditions			
Soil	HSG	Curve Number	Area (acre)
VaC2	C	79	4.79
MoC2	D	84	6.05
NaD	C	79	2.50
CiE2	B	69	1.70
Total (acres)			15.04
Total (km2)			0.061
Total (mi2)			0.024
Weighted CN			53.75

PHYSIOGRAFIC INFORMATION: BASIN AREA E4

Existing Conditions			
Soil	HSG	Curve Number	Area (acre)
NaD	C	79	3.19
CiE2	B	69	5.96
Total (acres)			9.15
Total (km2)			0.037
Total (mi2)			0.014
Weighted CN			79.00

PHYSIOGRAFIC INFORMATION: BASIN AREA E5

Existing Conditions			
Soil	HSG	Curve Number	Area (acre)
SmF	B	69	3.07
VaC2	C	79	6.82
NaD	C	79	2.38
CiD2	B	69	1.19
CiE2	B	69	0.55
Total (acres)			14.01
Total (km2)			0.057
Total (mi2)			0.022
Weighted CN			77.48

Project: Monte Arenas Development, Vega Baja, PR
LAG TIME COMPUTATIONS - SCS

SCS's Method Lag = {L^0.8 * (S+1)^0.7} / (1900 * Y^0.5)

	AREA	Length		High Elevation	Low Elevation	DH		Slope	[L^0.8]	[CN]	[S]	[(S+1)^0.7]	[Y^0.5]	Lag
		[m]	[ft]	[m]	[m]	[m]	[ft]							[hrs]
Existing	P1	650.0	2,133	135.00	125.00	10.0	32.8	0.0154	460.4004	78.00	1.4706	1.8835	1.2403	0.37
	P2	391.8	1,286	150.00	125.00	25.0	82.0	0.0638	307.1086	79.03	1.4486	1.8718	2.5259	0.12
	P3	175.7	576	150.00	130.00	20.0	65.6	0.1138	161.6674	81.07	1.4071	1.8494	3.3739	0.05
	P4	391.3	1,284	170.00	115.00	55.0	180.5	0.1405	306.7825	77.64	1.4784	1.8877	3.7490	0.08
	P5	165.0	541	180.00	150.00	30.0	98.4	0.1818	153.7419	78.69	1.4556	1.8756	4.2640	0.04
	P6	437.8	1,437	170.00	145.00	25.0	82.0	0.0571	335.6273	78.77	1.4541	1.8747	2.3895	0.14
	P7	351.3	1,153	150.00	125.00	25.0	82.0	0.0712	281.4152	79.00	1.4493	1.8721	2.6677	0.10
	E1	1,004.9	3,297	200.00	140.00	60.0	196.9	0.0597	652.3943	73.77	1.5681	1.9352	2.4435	0.27
	E2	3,201.2	10,503	225.00	125.00	100.0	328.1	0.0312	1648.3679	77.32	1.4854	1.8914	1.7674	0.93
	E3A	292.2	959	175.00	140.00	35.0	114.8	0.1198	242.8628	76.27	1.5090	1.9039	3.4609	0.07
	E3B	201.0	659	150.00	125.00	25.0	82.0	0.1244	180.0370	79.88	1.4310	1.8623	3.5267	0.05
	E4	168.8	554	175.00	130.00	45.0	147.6	0.2666	156.5457	72.49	1.6003	1.9521	5.1637	0.03
	E5	422.0	1,385	150.00	125.00	25.0	82.0	0.0592	325.8841	75.57	1.5251	1.9125	2.4339	0.13
Proposed	P1A	769.0	2,523	145.00	136.50	8.5	27.9	0.0111	526.6791	95.00	1.1765	1.7236	1.0513	0.45
	P1B	605.0	1,985	141.00	135.00	6.0	19.7	0.0099	434.7197	95.00	1.1765	1.7236	0.9959	0.40
	P2	684.7	2,247	160.00	130.00	30.0	98.4	0.0438	479.9714	95.00	1.1765	1.7236	2.0932	0.21
	P3	218.0	709	145.00	135.00	10.0	32.8	0.0463	190.7076	95.00	1.1765	1.7236	2.1517	0.08
	P4A	411.0	1,348	165.00	156.00	9.0	29.5	0.0219	319.0645	95.00	1.1765	1.7236	1.4798	0.20
	P4B	252.0	827	162.00	158.00	4.0	13.1	0.0159	215.7374	95.00	1.1765	1.7236	1.2599	0.16
	P4C	305.0	1,001	149.00	143.00	6.0	19.7	0.0197	251.3303	95.00	1.1765	1.7236	1.4026	0.16
	P5	225.0	738	170.00	160.00	10.0	32.8	0.0444	197.0385	95.00	1.1765	1.7236	2.1082	0.08
	P6	515.1	1,690	160.00	145.00	15.0	49.2	0.0291	382.2361	95.00	1.1765	1.7236	1.7054	0.20
	P7	300.0	984	132.00	125.00	7.0	23.0	0.0233	248.0287	95.00	1.1765	1.7236	1.5275	0.15
	E1	1,004.9	3,297	200.00	140.00	60.0	196.9	0.0597	652.3943	73.77	1.5681	1.9352	2.4435	0.27
	E2	3,201.2	10,503	225.00	125.00	100.0	328.1	0.0312	1648.3679	77.32	1.4854	1.8914	1.7674	0.93
	E3A	292.2	959	175.00	140.00	35.0	114.8	0.1198	242.8628	76.27	1.5090	1.9039	3.4609	0.07
	E3B	201.0	659	150.00	125.00	25.0	82.0	0.1244	180.0370	79.88	1.4310	1.8623	3.5267	0.05
	E4	168.8	554	175.00	130.00	45.0	147.6	0.2666	156.5457	72.49	1.6003	1.9521	5.1637	0.03
	E5	422.0	1,385	150.00	125.00	25.0	82.0	0.0592	325.8841	75.57	1.5251	1.9125	2.4339	0.13

APPENDIX B

HEC-1 RESULTS FOR EXISTING CONDITION

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN   1998                *
*           VERSION 4.1                 *
*  RGMHEC2000              HEC-1.COM    *
*  RUN DATE   20JAN06  TIME  08:23:08   *
*                                       *
*****************************************
```

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

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

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

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

HEC-1 INPUT

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

  1           ID        HYDROLOGIC ANALYSIS
  2           ID        PROJECT:MONTE ARENAS DEVELOPMENT, VEGA BAJA
  3           ID        TRIANGULAR DISTRIBUTION
  4           ID        FREQUENCY OF OCCURRENCE:2-, 10-, 25-, 50- & 100-YEARS
  5           ID        CA ENGINEERING, OCTOBER 2003
  6           ID        EXISTING CONDITION
  7           IT      5                    300
  8           IO      3
  9           JP      5

 10           KK     E3A
 11           KP       1
 12           BA   0.032
 13           LS       0   76.27
 14           UD    0.07
 15           IN      15
 16           KM        TRIANGULAR DISTRIBUTION 2-YRS STORM
 17           PH                  0.47    1.04    2.10    2.50    2.70    3.30    4.00    4.60
 18           KP       2
 19           KM        TRIANGULAR DISTRIBUTION 10-YRS STORM
 20           PH                  0.55    1.31    3.00    3.70    4.10    5.40    6.60    7.60
 21           KP       3
 22           KM        TRIANGULAR DISTRIBUTION 25-YRS STORM
 23           PH                  0.61    1.47    3.50    4.50    5.10    6.30    7.70    9.40
 24           KP       4
 25           KM        TRIANGULAR DISTRIBUTION 50-YRS STORM
 26           PH                  0.64    1.55    3.80    5.00    5.20    7.00    8.70   10.50
 27           KP       5
 28           KM        TRIANGULAR DISTRIBUTION 100-YRS STORM
 29           PH                  0.99    2.15    4.40    5.20    6.10    8.00    9.70   11.50

 30           KK      P3
 31           KP       1
 32           BA  0.0140
 33           LS       0   81.07
 34           UD    0.05
 35           IN      15
 36           KM        TRIANGULAR DISTRIBUTION 2-YRS STORM
 37           PH                  0.47    1.04    2.10    2.50    2.70    3.30    4.00    4.60
 38           KP       2
 39           KM        TRIANGULAR DISTRIBUTION 10-YRS STORM
 40           PH                  0.55    1.31    3.00    3.70    4.10    5.40    6.60    7.60
 41           KP       3
 42           KM        TRIANGULAR DISTRIBUTION 25-YRS STORM
 43           PH                  0.61    1.47    3.50    4.50    5.10    6.30    7.70    9.40
 44           KP       4
 45           KM        TRIANGULAR DISTRIBUTION 50-YRS STORM
 46           PH                  0.64    1.55    3.80    5.00    5.20    7.00    8.70   10.50
 47           KP       5
 48           KM        TRIANGULAR DISTRIBUTION 100-YRS STORM
 49           PH                  0.99    2.15    4.40    5.20    6.10    8.00    9.70   11.50
```


HEC-1 INPUT

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

 50           KK   COMB1
 51           KM  E3A+P3
 52           HC       2

 53           KK     E3B
 54           KP       1
 55           BA   0.024
 56           LS       0   79.88
 57           UD    0.05
 58           IN      15
 59           KM        TRIANGULAR DISTRIBUTION 2-YRS STORM
 60           PH                  0.47    1.04    2.10    2.50    2.70    3.30    4.00    4.60
 61           KP       2
 62           KM        TRIANGULAR DISTRIBUTION 10-YRS STORM
 63           PH                  0.55    1.31    3.00    3.70    4.10    5.40    6.60    7.60
 64           KP       3
 65           KM        TRIANGULAR DISTRIBUTION 25-YRS STORM
 66           PH                  0.61    1.47    3.50    4.50    5.10    6.30    7.70    9.40
 67           KP       4
 68           KM        TRIANGULAR DISTRIBUTION 50-YRS STORM
 69           PH                  0.64    1.55    3.80    5.00    5.20    7.00    8.70   10.50
```

```
70          KP        5
71          KM          TRIANGULAR DISTRIBUTION 100-YRS STORM
72                          0.99     2.15     4.40     5.20     6.10     8.00     9.70    11.50
            PH

73          KK   COMB2
74          KM  E3+P3
75          HC        2

76          KK       E2
77          KP        1
78          BA    0.868
79          LS        0    77.32
80          UD     0.93
81          IN       15
82          KM          TRIANGULAR DISTRIBUTION 2-YRS STORM
83                          0.47     1.04     2.10     2.50     2.70     3.30     4.00     4.60
            PH
84          KP        2
85          KM          TRIANGULAR DISTRIBUTION 10-YRS STORM
86                          0.55     1.31     3.00     3.70     4.10     5.40     6.60     7.60
            PH
87          KP        3
88          KM          TRIANGULAR DISTRIBUTION 25-YRS STORM
89                          0.61     1.47     3.50     4.50     5.10     6.30     7.70     9.40
            PH
90          KP        4
91          KM          TRIANGULAR DISTRIBUTION 50-YRS STORM
92                          0.64     1.55     3.80     5.00     5.20     7.00     8.70    10.50
            PH
93          KP        5
94          KM          TRIANGULAR DISTRIBUTION 100-YRS STORM
95                          0.99     2.15     4.40     5.20     6.10     8.00     9.70    11.50
            PH
```


HEC-1 INPUT

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

96          KK       P2
97          KP        1
98          BA    0.0402
99          LS        0    79.03
100         UD     0.12
101         IN       15
102         KM          TRIANGULAR DISTRIBUTION 2-YRS STORM
103                         0.47     1.04     2.10     2.50     2.70     3.30     4.00     4.60
            PH
104         KP        2
105         KM          TRIANGULAR DISTRIBUTION 10-YRS STORM
106                         0.55     1.31     3.00     3.70     4.10     5.40     6.60     7.60
            PH
107         KP        3
108         KM          TRIANGULAR DISTRIBUTION 25-YRS STORM
109                         0.61     1.47     3.50     4.50     5.10     6.30     7.70     9.40
            PH
110         KP        4
111         KM          TRIANGULAR DISTRIBUTION 50-YRS STORM
112                         0.64     1.55     3.80     5.00     5.20     7.00     8.70    10.50
            PH
113         KP        5
114         KM          TRIANGULAR DISTRIBUTION 100-YRS STORM
115                         0.99     2.15     4.40     5.20     6.10     8.00     9.70    11.50
            PH

116         KK       E1
117         KP        1
118         BA    0.172
119         LS        0    73.77
120         UD     0.27
121         IN       15
122         KM          TRIANGULAR DISTRIBUTION 2-YRS STORM
123                         0.47     1.04     2.10     2.50     2.70     3.30     4.00     4.60
            PH
124         KP        2
125         KM          TRIANGULAR DISTRIBUTION 10-YRS STORM
126                         0.55     1.31     3.00     3.70     4.10     5.40     6.60     7.60
            PH
127         KP        3
128         KM          TRIANGULAR DISTRIBUTION 25-YRS STORM
129                         0.61     1.47     3.50     4.50     5.10     6.30     7.70     9.40
            PH
130         KP        4
131         KM          TRIANGULAR DISTRIBUTION 50-YRS STORM
132                         0.64     1.55     3.80     5.00     5.20     7.00     8.70    10.50
            PH
133         KP        5
134         KM          TRIANGULAR DISTRIBUTION 100-YRS STORM
135                         0.99     2.15     4.40     5.20     6.10     8.00     9.70    11.50
            PH

136         KK       P1
137         KP        1
138         BA    0.0806
139         LS        0       78
140         UD     0.37
141         IN       15
```

```
142          KM        TRIANGULAR DISTRIBUTION 2-YRS STORM
143                         0.47     1.04     2.10     2.50     2.70     3.30     4.00     4.60
144          PH
145          KP        2
146          KM        TRIANGULAR DISTRIBUTION 10-YRS STORM
147                         0.55     1.31     3.00     3.70     4.10     5.40     6.60     7.60
148          PH                                                                                          PAGE  4
149          KP        3
                                          HEC-1 INPUT
1
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
150          KM        TRIANGULAR DISTRIBUTION 25-YRS STORM
151                         0.61     1.47     3.50     4.50     5.10     6.30     7.70     9.40
152          PH
153          KP        4
154          KM        TRIANGULAR DISTRIBUTION 50-YRS STORM
155                         0.64     1.55     3.80     5.00     5.20     7.00     8.70    10.50
156          PH
157          KP        5
158          KM        TRIANGULAR DISTRIBUTION 100-YRS STORM
159                         0.99     2.15     4.40     5.20     6.10     8.00     9.70    11.50
160          PH
161
162          KK      P7
163          KP       1
164          BA   0.020
165          LS       0    79.00
166          UD    0.10
167          IN      15
168          KM        TRIANGULAR DISTRIBUTION 2-YRS STORM
169                         0.47     1.04     2.10     2.50     2.70     3.30     4.00     4.60
170          PH
171          KP        2
172          KM        TRIANGULAR DISTRIBUTION 10-YRS STORM
173                         0.55     1.31     3.00     3.70     4.10     5.40     6.60     7.60
174          PH
175          KP        3
176          KM        TRIANGULAR DISTRIBUTION 25-YRS STORM
177                         0.61     1.47     3.50     4.50     5.10     6.30     7.70     9.40
178          PH
179          KP        4
180          KM        TRIANGULAR DISTRIBUTION 50-YRS STORM
181                         0.64     1.55     3.80     5.00     5.20     7.00     8.70    10.50
182          PH
183          KP        5
184          KM        TRIANGULAR DISTRIBUTION 100-YRS STORM
185                         0.99     2.15     4.40     5.20     6.10     8.00     9.70    11.50
186          PH
187
188          KK    COMB3
189          KM   P1+P7
190          HC       2
191
192          KK      P4
193          KP       1
194          BA   0.0573
195          LS       0    77.64
196          UD    0.08
197          IN      15
198          KM        TRIANGULAR DISTRIBUTION 2-YRS STORM
                            0.47     1.04     2.10     2.50     2.70     3.30     4.00     4.60
PH
KP        2
KM        TRIANGULAR DISTRIBUTION 10-YRS STORM
                            0.55     1.31     3.00     3.70     4.10     5.40     6.60     7.60
PH
KP        3
KM        TRIANGULAR DISTRIBUTION 25-YRS STORM
                            0.61     1.47     3.50     4.50     5.10     6.30     7.70     9.40
PH
KP        4
KM        TRIANGULAR DISTRIBUTION 50-YRS STORM
                            0.64     1.55     3.80     5.00     5.20     7.00     8.70    10.50
PH
KP        5
KM        TRIANGULAR DISTRIBUTION 100-YRS STORM
                            0.99     2.15     4.40     5.20     6.10     8.00     9.70    11.50
PH                                        HEC-1 INPUT                                                   PAGE  5
1
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
KK      P5
KP       1
BA   0.0224
LS       0    78.69
UD    0.04
IN      15
KM        TRIANGULAR DISTRIBUTION 2-YRS STORM
                            0.47     1.04     2.10     2.50     2.70     3.30     4.00     4.60
PH
KP        2
KM        TRIANGULAR DISTRIBUTION 10-YRS STORM
                            0.55     1.31     3.00     3.70     4.10     5.40     6.60     7.60
PH
KP        3
```

```
211   KM      TRIANGULAR DISTRIBUTION 25-YRS STORM
212   PH                0.61    1.47    3.50    4.50    5.10    6.30    7.70    9.40
213   KP      4
214   KM      TRIANGULAR DISTRIBUTION 50-YRS STORM
215   PH                0.64    1.55    3.80    5.00    5.20    7.00    8.70   10.50
216   KP      5
217   KM      TRIANGULAR DISTRIBUTION 100-YRS STORM
218   PH                0.99    2.15    4.40    5.20    6.10    8.00    9.70   11.50

219   KK      F6
220   KP       1
221   BA   0.026
222   LS       0   78.77
223   UD    0.14
224   IN      15
225   KM      TRIANGULAR DISTRIBUTION 2-YRS STORM
226   PH                0.47    1.04    2.10    2.50    2.70    3.30    4.00    4.60
227   KP      2
228   KM      TRIANGULAR DISTRIBUTION 10-YRS STORM
229   PH                0.55    1.31    3.00    3.70    4.10    5.40    6.60    7.60
230   KP      3
231   KM      TRIANGULAR DISTRIBUTION 25-YRS STORM
232   PH                0.61    1.47    3.50    4.50    5.10    6.30    7.70    9.40
233   KP      4
234   KM      TRIANGULAR DISTRIBUTION 50-YRS STORM
235   PH                0.64    1.55    3.80    5.00    5.20    7.00    8.70   10.50
236   KP      5
237   KM      TRIANGULAR DISTRIBUTION 100-YRS STORM
238   PH                0.99    2.15    4.40    5.20    6.10    8.00    9.70   11.50

239   KK      E4
240   KP       1
241   BA   0.014
242   LS       0   72.49
243   UD    0.03
244   IN      15
245   KM      TRIANGULAR DISTRIBUTION 2-YRS STORM
246   PH                0.47    1.04    2.10    2.50    2.70    3.30    4.00    4.60
247   KP      2
248   KM      TRIANGULAR DISTRIBUTION 10-YRS STORM
249   PH                0.55    1.31    3.00    3.70    4.10    5.40    6.60    7.60
250   KP      3
```


HEC-1 INPUT

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

251   KM      TRIANGULAR DISTRIBUTION 25-YRS STORM
252   PH                0.61    1.47    3.50    4.50    5.10    6.30    7.70    9.40
253   KP      4
254   KM      TRIANGULAR DISTRIBUTION 50-YRS STORM
255   PH                0.64    1.55    3.80    5.00    5.20    7.00    8.70   10.50
256   KP      5
257   KM      TRIANGULAR DISTRIBUTION 100-YRS STORM
258   PH                0.99    2.15    4.40    5.20    6.10    8.00    9.70   11.50

259   KK      E5
260   KP       1
261   BA   0.022
262   LS       0   75.57
263   UD    0.13
264   IN      15
265   KM      TRIANGULAR DISTRIBUTION 2-YRS STORM
266   PH                0.47    1.04    2.10    2.50    2.70    3.30    4.00    4.60
267   KP      2
268   KM      TRIANGULAR DISTRIBUTION 10-YRS STORM
269   PH                0.55    1.31    3.00    3.70    4.10    5.40    6.60    7.60
270   KP      3
271   KM      TRIANGULAR DISTRIBUTION 25-YRS STORM
272   PH                0.61    1.47    3.50    4.50    5.10    6.30    7.70    9.40
273   KP      4
274   KM      TRIANGULAR DISTRIBUTION 50-YRS STORM
275   PH                0.64    1.55    3.80    5.00    5.20    7.00    8.70   10.50
276   KP      5
277   KM      TRIANGULAR DISTRIBUTION 100-YRS STORM
278   PH                0.99    2.15    4.40    5.20    6.10    8.00    9.70   11.50
279   ZZ
```

```
1*************************************                  ***************************************
*                                   *                  *                                     *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)*                  *  U.S. ARMY CORPS OF ENGINEERS       *
*            JUN  1998              *                  *  HYDROLOGIC ENGINEERING CENTER      *
*          VERSION 4.1              *                  *        609 SECOND STREET            *
*                                   *                  *                                     *
*************************************                  ***************************************
```

```
*                                                                  *
*       DAVIS, CALIFORNIA 95616                                    *
*           (916) 756-1104                                         *
*                                                                  *
**********************************************************

* RGMHEC2000                    HEC-1.COM    *
* RUN DATE    20JAN06   TIME  08:23:18         *
*                                              *
************************************************

                    HYDROLOGIC ANALYSIS
                    PROJECT:MONTE ARENAS DEVELOPMENT, VEGA BAJA
                    TRIANGULAR DISTRIBUTION
                    FREQUENCY OF OCCURRENCE:2-, 10-, 25-, 50- & 100-YEARS
                    CA ENGINEERING, OCTOBER 2003
                    EXISTING CONDITION

  8 IO        OUTPUT CONTROL VARIABLES
                 IPRNT          3  PRINT CONTROL
                 IPLOT          0  PLOT CONTROL
                 QSCAL         0.  HYDROGRAPH PLOT SCALE

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

              COMPUTATION INTERVAL     .08 HOURS
                   TOTAL TIME BASE   24.92 HOURS

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

 JP           MULTI-PLAN OPTION
                 NPLAN          5  NUMBER OF PLANS

 JR           MULTI-RATIO OPTION
                 RATIOS OF RUNOFF
                 1.00

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
 10 KK      *    E3A     *
            *            *
            **************

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

 11 KP        PLAN  1 FOR STATION      E3A
                         TRIANGULAR DISTRIBUTION 2-YRS STORM

              SUBBASIN RUNOFF DATA

 12 BA          SUBBASIN CHARACTERISTICS
                    TAREA          .03  SUBBASIN AREA

                PRECIPITATION DATA
                                   DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                                                          ..... TP-49 .....
 17 PH                                  ..... TP-40 .....
                  ..... HYDRO-35 .....  ..... ..... ..... ..... ..... ..... ..... .....
                  5-MIN  15-MIN  60-MIN  2-HR   3-HR   6-HR   12-HR  24-HR  2-DAY  4-DAY  7-DAY  10-DAY
                   .47    1.04   2.10   2.50   2.70   3.30   4.00   4.60    .00    .00    .00    .00

                                                STORM AREA =      .03

 13 LS          SCS LOSS RATE
```

```
                STRTL          .62  INITIAL ABSTRACTION
                CRVNBR       76.27  CURVE NUMBER
                RTIMP          .00  PERCENT IMPERVIOUS AREA

14 UD       SCS DIMENSIONLESS UNITGRAPH
                TLAG           .07  LAG
                                                         ***

                                              UNIT HYDROGRAPH
                                          6 END-OF-PERIOD ORDINATES
        118.        93.        26.        8.        2.        1.
                                                   ***          ***         ***
     ***        ***

                  HYDROGRAPH AT STATION        E3A
                   FOR PLAN 1, RATIO = 1.00

   TOTAL RAINFALL =     4.60, TOTAL LOSS =    2.37, TOTAL EXCESS =     2.23

                                              MAXIMUM AVERAGE FLOW
  PEAK FLOW      TIME                  6-HR        24-HR        72-HR       24.92-HR

+   (CFS)        (HR)
                               (CFS)
+      52.      12.08                    6.           2.           2.           2.
                            (INCHES)   1.864        2.232        2.232        2.232
                             (AC-FT)     3.           4.           4.           4.

                         CUMULATIVE AREA =      .03 SQ MI
                                                         ***          ***         ***
     ***        ***

                  HYDROGRAPH AT STATION        E3A
                   FOR PLAN 1, RATIO = 1.00

                                              MAXIMUM AVERAGE FLOW
  PEAK FLOW      TIME                  6-HR        24-HR        72-HR       24.92-HR

+   (CFS)        (HR)
                               (CFS)
+      52.      12.08                    6.           2.           2.           2.
                            (INCHES)   1.864        2.232        2.232        2.232
                             (AC-FT)     3.           4.           4.           4.

                         CUMULATIVE AREA =      .03 SQ MI

***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***

18 KP       PLAN  2 FOR STATION       E3A
                    TRIANGULAR DISTRIBUTION 10-YRS STORM

            SUBBASIN RUNOFF DATA

12 BA        SUBBASIN CHARACTERISTICS
                TAREA           .03  SUBBASIN AREA

            PRECIPITATION DATA

20 PH                       DEPTHS FOR    0-PERCENT HYPOTHETICAL STORM
         ..... HYDRO-35 ......  .............. TP-40 ..............  ........... TP-49 ...........
         5-MIN  15-MIN  60-MIN   2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
           .55    1.31    3.00   3.70    4.10    5.40    6.60    7.60     .00     .00     .00     .00
                                           STORM AREA =      .03

13 LS       SCS LOSS RATE
                STRTL          .62  INITIAL ABSTRACTION
                CRVNBR       76.27  CURVE NUMBER
                RTIMP          .00  PERCENT IMPERVIOUS AREA

14 UD       SCS DIMENSIONLESS UNITGRAPH
                TLAG           .07  LAG
                                                         ***

                                              UNIT HYDROGRAPH
                                          6 END-OF-PERIOD ORDINATES
        118.        93.        26.        8.        2.        1.
```

```
***          ***          ***          ***          ***

                HYDROGRAPH AT STATION      E3A
                  FOR PLAN 2, RATIO = 1.00

TOTAL RAINFALL =     7.60, TOTAL LOSS =     2.77, TOTAL EXCESS =     4.83

                                    MAXIMUM AVERAGE FLOW
PEAK FLOW     TIME                 6-HR       24-HR      72-HR     24.92-HR

+  (CFS)      (HR)      (CFS)       13.         4.         4.         4.
+   87.       12.08   (INCHES)    3.856      4.826      4.826      4.826
                      (AC-FT)       7.          8.         8.         8.

                CUMULATIVE AREA =      .03 SQ MI

***          ***          ***          ***          ***

                HYDROGRAPH AT STATION      E3A
                  FOR PLAN 2, RATIO = 1.00

                                    MAXIMUM AVERAGE FLOW
PEAK FLOW     TIME                 6-HR       24-HR      72-HR     24.92-HR

+  (CFS)      (HR)      (CFS)       13.         4.         4.         4.
+   87.       12.08   (INCHES)    3.856      4.826      4.826      4.826
                      (AC-FT)       7.          8.         8.         8.

                CUMULATIVE AREA =      .03 SQ MI

***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***

21 KP        PLAN  3 FOR STATION      E3A
                  TRIANGULAR DISTRIBUTION 25-YRS STORM

             SUBBASIN RUNOFF DATA

12 BA          SUBBASIN CHARACTERISTICS
                 TAREA          .03  SUBBASIN AREA

               PRECIPITATION DATA

                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                                  TP-40                          TP-49
23 PH          ..... HYDRO-35 .....  ..............  ..............  ..........  ..........
               5-MIN  15-MIN  60-MIN   2-HR   3-HR   6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .61    1.47    3.50   4.50   5.10   6.30    7.70    9.40     .00     .00     .00     .00

                                                STORM AREA =      .03

13 LS          SCS LOSS RATE
                 STRTL          .62  INITIAL ABSTRACTION
                 CRVNBR       76.27  CURVE NUMBER
                 RTIMP          .00  PERCENT IMPERVIOUS AREA

14 UD          SCS DIMENSIONLESS UNITGRAPH
                 TLAG           .07  LAG

                                                                  ***

                                                          UNIT HYDROGRAPH
                                                       6 END-OF-PERIOD ORDINATES
                 118.      93.      26.       8.        2.        1.

***          ***          ***          ***          ***

                HYDROGRAPH AT STATION      E3A
                  FOR PLAN 3, RATIO = 1.00

TOTAL RAINFALL =     9.40, TOTAL LOSS =     2.92, TOTAL EXCESS =     6.48

                                    MAXIMUM AVERAGE FLOW
PEAK FLOW     TIME                 6-HR       24-HR      72-HR     24.92-HR

+  (CFS)      (HR)      (CFS)       17.         6.         5.         5.
+   106.      12.08   (INCHES)    4.922      6.480      6.480      6.480
```

```
                    (AC-FT)          8.          11.          11.          11.

                    CUMULATIVE AREA =      .03 SQ MI

                                                  ***          ***
      ***          ***          ***
                    HYDROGRAPH AT STATION        E3A
                      FOR PLAN 3, RATIO = 1.00

                                                 MAXIMUM AVERAGE FLOW
  PEAK FLOW      TIME                    6-HR        24-HR        72-HR      24.92-HR

+   (CFS)        (HR)        (CFS)        17.          6.           5.           5.
+     106.       12.08     (INCHES)     4.922       6.480        6.480        6.480
                           (AC-FT)        8.          11.          11.          11.

                    CUMULATIVE AREA =      .03 SQ MI

***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

  24 KP          PLAN  4 FOR STATION        E3A
                          TRIANGULAR DISTRIBUTION 50-YRS STORM

                 SUBBASIN RUNOFF DATA

  12 BA            SUBBASIN CHARACTERISTICS
                        TAREA          .03  SUBBASIN AREA

                   PRECIPITATION DATA
                                        DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
  26 PH                                                  ..... TP-40 .....  ..... TP-49 .....
                   ..... HYDRO-35 .....  ..... TP-40 .....  ..... TP-49 .....
                   5-MIN  15-MIN  60-MIN   2-HR   3-HR   6-HR  12-HR  24-HR  2-DAY  4-DAY  7-DAY  10-DAY
                     .64    1.55   3.80   5.00   5.20   7.00   8.70  10.50    .00    .00    .00    .00
                                                   STORM AREA =      .03

  13 LS            SCS LOSS RATE
                        STRTL          .62  INITIAL ABSTRACTION
                        CRVNBR       76.27  CURVE NUMBER
                        RTIMP          .00  PERCENT IMPERVIOUS AREA

  14 UD            SCS DIMENSIONLESS UNITGRAPH
                        TLAG           .07  LAG
                                                  ***
                                                 UNIT HYDROGRAPH
                                             6 END-OF-PERIOD ORDINATES
                   118.      93.      26.       8.       2.       1.
                                                  ***
      ***          ***          ***
                    HYDROGRAPH AT STATION        E3A
                      FOR PLAN 4, RATIO = 1.00

    TOTAL RAINFALL =   10.50, TOTAL LOSS =    2.99, TOTAL EXCESS =    7.51

                                                 MAXIMUM AVERAGE FLOW
  PEAK FLOW      TIME                    6-HR        24-HR        72-HR      24.92-HR

+   (CFS)        (HR)        (CFS)        19.          6.           6.           6.
+     116.       12.08     (INCHES)     5.607       7.511        7.511        7.511
                           (AC-FT)       10.          13.          13.          13.

                    CUMULATIVE AREA =      .03 SQ MI

                                                  ***          ***
      ***          ***          ***
                    HYDROGRAPH AT STATION        E3A
                      FOR PLAN 4, RATIO = 1.00

                                                 MAXIMUM AVERAGE FLOW
  PEAK FLOW      TIME                    6-HR        24-HR        72-HR      24.92-HR

+   (CFS)        (HR)
```

```
                                                                        6.
                        (CFS)                        6.        6.
                                        19.                               7.511
+   116.     12.08                                7.511     7.511        13.
                       (INCHES)      5.607       13.        13.
                       (AC-FT)         10.

                       CUMULATIVE AREA =      .03 SQ MI

                                                                   ***      ***      ***      ***      ***      ***      ***      ***
***      ***      ***      ***      ***      ***      ***      ***      ***      ***

 27 KP          PLAN  5 FOR STATION       E3A
                                   TRIANGULAR DISTRIBUTION 100-YRS STORM

                SUBBASIN RUNOFF DATA

 12 BA            SUBBASIN CHARACTERISTICS
                       TAREA              .03  SUBBASIN AREA

                  PRECIPITATION DATA
                                             DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                                                                      ............ TP-49 ...........
 29 PH                                             ............... TP-40 ...............   2-DAY    4-DAY    7-DAY   10-DAY
                  ..... HYDRO-35 ......        2-HR     3-HR     6-HR     12-HR    24-HR      .00      .00      .00      .00
                 5-MIN  15-MIN  60-MIN        5.20     6.10     8.00      9.70    11.50
                   .99    2.15    4.40
                                                           STORM AREA =        .03

 13 LS             SCS LOSS RATE
                       STRTL              .62  INITIAL ABSTRACTION
                      CRVNBR            76.27  CURVE NUMBER
                       RTIMP              .00  PERCENT IMPERVIOUS AREA

 14 UD             SCS DIMENSIONLESS UNITGRAPH
                        TLAG              .07  LAG
                                                                     ***

                                                              UNIT HYDROGRAPH
                                                          6 END-OF-PERIOD ORDINATES
                118.        93.        26.        8.           2.         1.
                                                                     ***         ***
         ***            ***            ***

                           HYDROGRAPH AT STATION       E3A
                             FOR PLAN 5, RATIO = 1.00

 TOTAL RAINFALL =     11.50, TOTAL LOSS =     3.04, TOTAL EXCESS =     8.46

                                                   MAXIMUM AVERAGE FLOW
  PEAK FLOW      TIME                     6-HR          24-HR          72-HR        24.92-HR

+   (CFS)        (HR)
                               (CFS)
+    165.       12.08                      22.            7.             7.            7.
                            (INCHES)     6.534         8.458          8.458         8.458
                            (AC-FT)        11.           14.            14.           14.

                            CUMULATIVE AREA =      .03 SQ MI

                                                                     ***         ***
         ***            ***            ***

                           HYDROGRAPH AT STATION       E3A
                             FOR PLAN 5, RATIO = 1.00

                                                   MAXIMUM AVERAGE FLOW
  PEAK FLOW      TIME                     6-HR          24-HR          72-HR        24.92-HR

+   (CFS)        (HR)
                               (CFS)
+    165.       12.08                      22.            7.             7.            7.
                            (INCHES)     6.534         8.458          8.458         8.458
                            (AC-FT)        11.           14.            14.           14.

                            CUMULATIVE AREA =      .03 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***
```

```
                **************
                *            *
30 KK           *     P3     *
                *            *
                **************

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

31 KP        PLAN  1 FOR STATION        P3
                        TRIANGULAR DISTRIBUTION 2-YRS STORM

             SUBBASIN RUNOFF DATA

32 BA          SUBBASIN CHARACTERISTICS
                    TAREA          .01  SUBBASIN AREA

               PRECIPITATION DATA
                                   DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                                ..............  TP-40 ..............  ........... TP-49 ...........
37 PH          ..... HYDRO-35 ......            2-HR     3-HR     6-HR    12-HR    24-HR    2-DAY    4-DAY    7-DAY   10-DAY
               5-MIN   15-MIN   60-MIN          2.50     2.70     3.30     4.00     4.60      .00      .00      .00      .00
                 .47     1.04     2.10
                                                        STORM AREA =       .01

33 LS          SCS LOSS RATE
                    STRTL           .47  INITIAL ABSTRACTION
                    CRVNBR        81.07  CURVE NUMBER
                    RTIMP           .00  PERCENT IMPERVIOUS AREA

34 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG            .05  LAG
                                                                  ***
                                                        UNIT HYDROGRAPH
                                                     5 END-OF-PERIOD ORDINATES
                                                              0.
                 72.       28.       6.        1.
                                                  ***                  ***
                 ***                ***
        ***
                        HYDROGRAPH AT STATION        P3
                          FOR PLAN 1, RATIO = 1.00

        TOTAL RAINFALL =     4.60, TOTAL LOSS =     1.96, TOTAL EXCESS =     2.64

                                                MAXIMUM AVERAGE FLOW
        PEAK FLOW     TIME                 6-HR      24-HR      72-HR     24.92-HR
+       (CFS)         (HR)      (CFS)       3.         1.         1.         1.
+         31.        12.08    (INCHES)   2.181      2.641      2.641      2.641
                              (AC-FT)      2.         2.         2.         2.

                        CUMULATIVE AREA =      .01 SQ MI
                                                  ***                  ***
                 ***                ***
        ***
                        HYDROGRAPH AT STATION        P3
                          FOR PLAN 1, RATIO = 1.00

                                                MAXIMUM AVERAGE FLOW
        PEAK FLOW     TIME                 6-HR      24-HR      72-HR     24.92-HR
+       (CFS)         (HR)      (CFS)       3.         1.         1.         1.
+         31.        12.08    (INCHES)   2.181      2.641      2.641      2.641
                              (AC-FT)      2.         2.         2.         2.

                        CUMULATIVE AREA =      .01 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

38 KP        PLAN  2 FOR STATION        P3
                        TRIANGULAR DISTRIBUTION 10-YRS STORM

             SUBBASIN RUNOFF DATA
```

```
32 BA          SUBBASIN CHARACTERISTICS
                    TAREA          .01  SUBBASIN AREA

               PRECIPITATION DATA
                                   DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                   ............... TP-40 ...............  ........... TP-49 ...........
40 PH          ..... HYDRO-35 ......  ..............  2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                5-MIN  15-MIN  60-MIN   2-HR    3-HR    6-HR   12-HR   24-HR    .00     .00     .00     .00
                  .55    1.31    3.00   3.70    4.10    5.40    6.60    7.60
                                                STORM AREA =      .01

33 LS          SCS LOSS RATE
                    STRTL          .47  INITIAL ABSTRACTION
                    CRVNBR       81.07  CURVE NUMBER
                    RTIMP          .00  PERCENT IMPERVIOUS AREA

34 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG           .05  LAG
                                                    ***
                                                UNIT HYDROGRAPH
                                            5 END-OF-PERIOD ORDINATES
                                                     0.
                 72.      28.      6.       1.
                                                    ***          ***
                 ***      ***      ***      ***
                          HYDROGRAPH AT STATION        P3
                            FOR PLAN 2, RATIO = 1.00

          TOTAL RAINFALL =    7.60, TOTAL LOSS =    2.23, TOTAL EXCESS =    5.37
                                          MAXIMUM AVERAGE FLOW
          PEAK FLOW     TIME                 6-HR      24-HR      72-HR     24.92-HR
            (CFS)       (HR)     (CFS)        6.         2.         2.         2.
+            45.       12.08   (INCHES)     4.253      5.374      5.374      5.374
                                 (AC-FT)       3.         4.         4.         4.
                          CUMULATIVE AREA =      .01 SQ MI
                                                    ***          ***
                 ***      ***      ***      ***
                          HYDROGRAPH AT STATION        P3
                            FOR PLAN 2, RATIO = 1.00
                                          MAXIMUM AVERAGE FLOW
          PEAK FLOW     TIME                 6-HR      24-HR      72-HR     24.92-HR
+           (CFS)       (HR)     (CFS)        6.         2.         2.         2.
+            45.       12.08   (INCHES)     4.253      5.374      5.374      5.374
                                 (AC-FT)       3.         4.         4.         4.
                          CUMULATIVE AREA =      .01 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

41 KP          PLAN  3 FOR STATION        P3
                          TRIANGULAR DISTRIBUTION 25-YRS STORM

               SUBBASIN RUNOFF DATA

32 BA          SUBBASIN CHARACTERISTICS
                    TAREA          .01  SUBBASIN AREA

               PRECIPITATION DATA
                                   DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                   ............... TP-40 ...............  ........... TP-49 ...........
43 PH          ..... HYDRO-35 ......  ..............  2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                5-MIN  15-MIN  60-MIN   2-HR    3-HR    6-HR   12-HR   24-HR    .00     .00     .00     .00
                  .61    1.47    3.50   4.50    5.10    6.30    7.70    9.40
                                                STORM AREA =      .01
```

```
33 LS          SCS LOSS RATE
                    STRTL          .47  INITIAL ABSTRACTION
                    CRVNBR       91.07  CURVE NUMBER
                    RTIMP          .00  PERCENT IMPERVIOUS AREA

34 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG           .05  LAG
                                                        ***

                                                  UNIT HYDROGRAPH
                                               5 END-OF-PERIOD ORDINATES
          72.        28.        6.        1.        0.

    ***           ***           ***           ***           ***

                 HYDROGRAPH AT STATION         P3
                   FOR PLAN 3, RATIO = 1.00

 TOTAL RAINFALL =     9.40, TOTAL LOSS =     2.32, TOTAL EXCESS =     7.08

   PEAK FLOW       TIME                     MAXIMUM AVERAGE FLOW
                                       6-HR       24-HR      72-HR    24.92-HR
 +  (CFS)          (HR)
                              (CFS)
 +     53.        12.08                  8.          3.         3.         3.
                              (INCHES)   5.315       7.082      7.082      7.082
                              (AC-FT)    4.          5.         5.         5.

                  CUMULATIVE AREA =      .01 SQ MI

    ***           ***           ***           ***           ***

                 HYDROGRAPH AT STATION         P3
                   FOR PLAN 3, RATIO = 1.00

   PEAK FLOW       TIME                     MAXIMUM AVERAGE FLOW
                                       6-HR       24-HR      72-HR    24.92-HR
 +  (CFS)          (HR)
                              (CFS)
 +     53.        12.00                  8.          3.         3.         3.
                              (INCHES)   5.315       7.082      7.082      7.082
                              (AC-FT)    4.          5.         5.         5.

                  CUMULATIVE AREA =      .01 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

44 KP          PLAN  4 FOR STATION         P3
                    TRIANGULAR DISTRIBUTION 50-YRS STORM

               SUBBASIN RUNOFF DATA

32 BA          SUBBASIN CHARACTERISTICS
                    TAREA          .01  SUBBASIN AREA

               PRECIPITATION DATA

46 PH                   DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
           ..... HYDRO-35 ......  ............... TP-40 ...............  ........... TP-49 ...........
           5-MIN  15-MIN  60-MIN   2-HR   3-HR   6-HR  12-HR  24-HR   2-DAY  4-DAY  7-DAY  10-DAY
            .64    1.55    3.80    5.00   5.20   7.00   8.70  10.50    .00    .00    .00    .00
                                   STORM AREA =      .01

33 LS          SCS LOSS RATE
                    STRTL          .47  INITIAL ABSTRACTION
                    CRVNBR       91.07  CURVE NUMBER
                    RTIMP          .00  PERCENT IMPERVIOUS AREA

34 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG           .05  LAG
                                                        ***

                                                  UNIT HYDROGRAPH
                                               5 END-OF-PERIOD ORDINATES
          72.        28.        6.        1.        0.
```

```
***          ***          ***          ***          ***

                HYDROGRAPH AT STATION        P3
                  FOR PLAN 4, RATIO = 1.00

TOTAL RAINFALL =   10.50, TOTAL LOSS =    2.36, TOTAL EXCESS =    8.14

                                    MAXIMUM AVERAGE FLOW
PEAK FLOW     TIME                 6-HR      24-HR      72-HR     24.92-HR
+  (CFS)      (HR)     (CFS)        9.         3.         3.         3.
+    57.      12.08    (INCHES)   6.013      8.139      8.139      8.139
                       (AC-FT)      4.         6.         6.         6.

                CUMULATIVE AREA =      .01 SQ MI

***          ***          ***          ***          ***

                HYDROGRAPH AT STATION        P3
                  FOR PLAN 4, RATIO = 1.00

                                    MAXIMUM AVERAGE FLOW
PEAK FLOW     TIME                 6-HR      24-HR      72-HR     24.92-HR
+  (CFS)      (HR)     (CFS)        9.         3.         3.         3.
+    57.      12.08    (INCHES)   6.013      8.139      8.139      8.139
                       (AC-FT)      4.         6.         6.         6.

                CUMULATIVE AREA =      .01 SQ MI

***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***

47 KP        PLAN  5 FOR STATION        P3
                  TRIANGULAR DISTRIBUTION 100-YRS STORM

             SUBBASIN RUNOFF DATA

32 BA        SUBBASIN CHARACTERISTICS
                TAREA          .01  SUBBASIN AREA

             PRECIPITATION DATA
                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                                                          TP-49
49 PH        ..... HYDRO-35 .....  ..... TP-40 .....  .....
             5-MIN  15-MIN  60-MIN   2-HR   3-HR   6-HR  12-HR  24-HR  2-DAY  4-DAY  7-DAY  10-DAY
              .99    2.15    4.40   5.20   6.10   8.00   9.70  11.50    .00    .00    .00    .00
                                          STORM AREA =      .01

33 LS        SCS LOSS RATE
                STRTL          .47  INITIAL ABSTRACTION
                CRVNBR       81.07  CURVE NUMBER
                RTIMP          .00  PERCENT IMPERVIOUS AREA

34 UD        SCS DIMENSIONLESS UNITGRAPH
                TLAG           .05  LAG
                                                                  ***
                                                     UNIT HYDROGRAPH
                                                  5 END-OF-PERIOD ORDINATES
                                                        0.
                72.      28.      6.       1.
***          ***          ***          ***          ***

                HYDROGRAPH AT STATION        P3
                  FOR PLAN 5, RATIO = 1.00

TOTAL RAINFALL =   11.50, TOTAL LOSS =    2.39, TOTAL EXCESS =    9.11

                                    MAXIMUM AVERAGE FLOW
PEAK FLOW     TIME                 6-HR      24-HR      72-HR     24.92-HR
+  (CFS)      (HR)     (CFS)       10.         3.         3.         3.
+    85.      12.08
```

```
                    (INCHES)      6.967       9.106       9.106       9.106
                    (AC-FT)        5.          7.          7.          7.

                    CUMULATIVE AREA =     .01 SQ MI

                                                                  ***
                                                      ***
                                          ***
                              ***
     ***
                    HYDROGRAPH AT STATION        P3
                      FOR PLAN 5, RATIO - 1.00

                                                MAXIMUM AVERAGE FLOW
  PEAK FLOW      TIME                    6-HR       24-HR      72-HR      24.92-HR
+   (CFS)        (HR)        (CFS)                                                 3.
                                          10.         3.         3.         9.106
+     85.        12.08     (INCHES)     6.967      9.106      9.106          7.
                           (AC-FT)       5.          7.         7.

                    CUMULATIVE AREA =     .01 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

                  **************
                  *            *
   50 KK          *    COMB1   *
                  *            *
                  **************
                        E3A+P3

   52 HC                HYDROGRAPH COMBINATION
                          COMP          2  NUMBER OF HYDROGRAPHS TO COMBINE
                                                                  ***
                                                                          ***
                                                      ***
                                          ***
     ***
                              ***
                    HYDROGRAPH AT STATION     COMB1
                      FOR PLAN 1, RATIO - 1.00

                                                MAXIMUM AVERAGE FLOW
  PEAK FLOW      TIME                    6-HR       24-HR      72-HR      24.92-HR
+   (CFS)        (HR)        (CFS)                                                 3.
                                          10.         3.         3.         2.356
+     83.        12.08     (INCHES)     1.960      2.356      2.356          6.
                           (AC-FT)       5.          6.         6.

                    CUMULATIVE AREA =     .05 SQ MI

                                                                  ***
                                                      ***
                                          ***
                              ***
     ***
                    HYDROGRAPH AT STATION     COMB1
                      FOR PLAN 2, RATIO - 1.00

                                                MAXIMUM AVERAGE FLOW
  PEAK FLOW      TIME                    6-HR       24-HR      72-HR      24.92-HR
+   (CFS)        (HR)        (CFS)                                                 6.
                                          20.         6.         6.         4.992
+    132.        12.08     (INCHES)     3.925      4.992      4.992         12.
                           (AC-FT)      10.         12.        12.

                    CUMULATIVE AREA =     .05 SQ MI

                                                                  ***
                                                      ***
                                          ***
                              ***
     ***
                    HYDROGRAPH AT STATION     COMB1
                      FOR PLAN 3, RATIO - 1.00

                                                MAXIMUM AVERAGE FLOW
  PEAK FLOW      TIME                    6-HR       24-HR      72-HR      24.92-HR
+   (CFS)        (HR)        (CFS)                                                 8.
                                          25.         8.         8.
+    159.        12.08
```

```
 (INCHES)      5.040        6.663        6.663        6.663
 (AC-FT)         12.          16.          16.          16.

 CUMULATIVE AREA =       .05 SQ MI

     ***            ***            ***            ***            ***

              HYDROGRAPH AT STATION      COMB1
                FOR PLAN 4, RATIO = 1.00

                                          MAXIMUM AVERAGE FLOW
  PEAK FLOW      TIME                  6-HR       24-HR       72-HR      24.92-HR

+   (CFS)        (HR)
                            (CFS)
+     173.      12.08                   28.         10.          9.          9.
                            (INCHES)  5.729       7.702       7.702       7.702
                            (AC-FT)     14.         19.         19.         19.

                            CUMULATIVE AREA =       .05 SQ MI

     ***            ***            ***            ***            ***

              HYDROGRAPH AT STATION      COMB1
                FOR PLAN 5, RATIO = 1.00

                                          MAXIMUM AVERAGE FLOW
  PEAK FLOW      TIME                  6-HR       24-HR       72-HR      24.92-HR

+   (CFS)        (HR)
                            (CFS)
+     250.      12.08                   33.         11.         10.         10.
                            (INCHES)  6.663       8.655       8.655       8.655
                            (AC-FT)     16.         21.         21.         21.

                            CUMULATIVE AREA =       .05 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *            *
   53 KK      *    E3B     *
              *            *
              **************

 ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

   54 KP        PLAN  1 FOR STATION      E3B
                         TRIANGULAR DISTRIBUTION 2-YRS STORM

                SUBBASIN RUNOFF DATA

   55 BA          SUBBASIN CHARACTERISTICS
                     TAREA            .02  SUBBASIN AREA

                  PRECIPITATION DATA

   60 PH                       DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                                                         ............ TP-49 ...........
                               ............... TP-40 ...............   2-DAY   4-DAY   7-DAY  10-DAY
           ..... HYDRO-35 .....      2-HR    3-HR    6-HR   12-HR   24-HR     .00     .00     .00     .00
           5-MIN  15-MIN  60-MIN     2.50    2.70    3.30    4.00    4.60
             .47    1.04    2.10
                                          STORM AREA =       .02

   56 LS          SCS LOSS RATE
                     STRTL           .50  INITIAL ABSTRACTION
                     CRVNBR        79.88  CURVE NUMBER
                     RTIMP           .00  PERCENT IMPERVIOUS AREA

   57 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG            .05  LAG

                                                       ***

                                             UNIT HYDROGRAPH
                                         5 END-OF-PERIOD ORDINATES
```

```
                                                  1.
          124.      48.       11.       2.
                                                                  ***
                                   ***          ***
   ***          ***
                    HYDROGRAPH AT STATION        E3B
                      FOR PLAN 1, RATIO - 1.00

   TOTAL RAINFALL =     4.60, TOTAL LOSS =     2.06, TOTAL EXCESS =     2.54

                                                MAXIMUM AVERAGE FLOW
   PEAK FLOW      TIME                   6-HR       24-HR       72-HR      24.92-HR
                                                                                 2.
+  (CFS)          (HR)        (CFS)        5.          2.          2.        2.536
                                                                                 3.
+     51.       12.08      (INCHES)     2.102       2.536       2.536
                           (AC-FT)        3.          3.          3.

                    CUMULATIVE AREA =      .02 SQ MI

                                                                   ***
                                   ***          ***
   ***          ***
                    HYDROGRAPH AT STATION        E3B
                      FOR PLAN 1, RATIO - 1.00

                                                MAXIMUM AVERAGE FLOW
   PEAK FLOW      TIME                   6-HR       24-HR       72-HR      24.92-HR
                                                                                 2.
+  (CFS)          (HR)        (CFS)        5.          2.          2.        2.536
                                                                                 3.
+     51.       12.08      (INCHES)     2.102       2.536       2.536
                           (AC-FT)        3.          3.          3.

                    CUMULATIVE AREA =      .02 SQ MI

***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***

61 KP               PLAN  2 FOR STATION        E3B
                              TRIANGULAR DISTRIBUTION 10-YRS STORM

                    SUBBASIN RUNOFF DATA

55 BA                 SUBBASIN CHARACTERISTICS
                          TAREA          .02  SUBBASIN AREA

                    PRECIPITATION DATA
                                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                                                                                  TP-49
                                                                TP-40
63 PH                 ..... HYDRO-35 .....      2-HR       3-HR       6-HR      12-HR      24-HR     2-DAY      4-DAY      7-DAY     10-DAY
                      5-MIN    15-MIN    60-MIN    3.70       4.10       5.40       6.60       7.60       .00        .00        .00       .00
                       .55      1.31      3.00
                                                                  STORM AREA =       .02

56 LS                 SCS LOSS RATE
                          STRTL          .50  INITIAL ABSTRACTION
                          CRVNBR       79.88  CURVE NUMBER
                          RTIMP          .00  PERCENT IMPERVIOUS AREA

57 UD                 SCS DIMENSIONLESS UNITGRAPH
                          TLAG           .05  LAG
                                                                   ***
                                                                UNIT HYDROGRAPH
                                                             5 END-OF-PERIOD ORDINATES
                                                                  1.
          124.      48.       11.       2.
                                                                  ***
                                   ***          ***
   ***          ***
                    HYDROGRAPH AT STATION        E3B
                      FOR PLAN 2, RATIO - 1.00

   TOTAL RAINFALL =     4.60, TOTAL LOSS =     2.36, TOTAL EXCESS =     5.24

                                                MAXIMUM AVERAGE FLOW
   PEAK FLOW      TIME                   6-HR       24-HR       72-HR      24.92-HR
+  (CFS)          (HR)        (CFS)
```

```
                                                  3.          3.          3.
                                       11.      5.237       5.237       5.237
+    76.      12.08      (INCHES)     4.156       7.          7.          7.
                         (AC-FT)       5.

                CUMULATIVE AREA =        .02 SQ MI

     ***       ***       ***       ***       ***

                    HYDROGRAPH AT STATION        E3B
                      FOR PLAN 2, RATIO = 1.00

                                              MAXIMUM AVERAGE FLOW
   PEAK FLOW      TIME                   6-HR        24-HR       72-HR      24.92-HR

+   (CFS)         (HR)       (CFS)
                                                  3.          3.          3.
                                       11.      5.237       5.237       5.237
+    76.      12.08      (INCHES)     4.156       7.          7.          7.
                         (AC-FT)       5.

                CUMULATIVE AREA =        .02 SQ MI

 ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***

  64 KP         PLAN  3 FOR STATION        E3B
                       TRIANGULAR DISTRIBUTION 25-YRS STORM

               SUBBASIN RUNOFF DATA

  55 BA          SUBBASIN CHARACTERISTICS
                     TAREA            .02  SUBBASIN AREA

                 PRECIPITATION DATA

  66 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                 ..... HYDRO-35 ......  ............... TP-40 ...............  ............ TP-49 ...........
                 5-MIN  15-MIN  60-MIN   2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .61    1.47    3.50    4.50    5.10    6.30    7.70    9.40    .00     .00     .00     .00
                                                STORM AREA =       .02

  56 LS          SCS LOSS RATE
                     STRTL             .50  INITIAL ABSTRACTION
                     CRVNBR          79.88  CURVE NUMBER
                     RTIMP             .00  PERCENT IMPERVIOUS AREA

  57 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG              .05  LAG
                                                     ***

                                                UNIT HYDROGRAPH
                                             5 END-OF-PERIOD ORDINATES
             124.       48.       11.        2.        1.

     ***       ***       ***       ***       ***

                    HYDROGRAPH AT STATION        E3B
                      FOR PLAN 3, RATIO = 1.00

   TOTAL RAINFALL =     9.40, TOTAL LOSS =     2.47, TOTAL EXCESS =     6.93

                                              MAXIMUM AVERAGE FLOW
   PEAK FLOW      TIME                   6-HR        24-HR       72-HR      24.92-HR

+   (CFS)         (HR)       (CFS)
                                                  4.          4.          4.
                                       13.      6.933       6.933       6.933
+    90.      12.08      (INCHES)     5.220       9.          9.          9.
                         (AC-FT)       7.

                CUMULATIVE AREA =        .02 SQ MI

     ***       ***       ***       ***       ***

                    HYDROGRAPH AT STATION        E3B
                      FOR PLAN 3, RATIO = 1.00

                                              MAXIMUM AVERAGE FLOW
   PEAK FLOW      TIME
```

```
                                  6-HR        24-HR       72-HR      24.92-HR

+   (CFS)        (HR)        (CFS)        13.         4.          4.          4.
+    90.         12.08     (INCHES)     5.220       6.933       6.933       6.933
                           (AC-FT)        7.          9.          9.          9.

                           CUMULATIVE AREA =      .02 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

67 KP        PLAN  4 FOR STATION      E3B
                        TRIANGULAR DISTRIBUTION 50-YRS STORM

             SUBBASIN RUNOFF DATA

55 BA          SUBBASIN CHARACTERISTICS
                    TAREA          .02  SUBBASIN AREA

               PRECIPITATION DATA
                                   DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                  ..............  TP-40  ..............  ........... TP-49 ...........
69 PH          ..... HYDRO-35 ......  ..............  ..............  ..............  ..............  ..............  ..............
                5-MIN  15-MIN  60-MIN   2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .64    1.55    3.80   5.00    5.20    7.00    8.70   10.50     .00     .00     .00     .00
                                                   STORM AREA =      .02

56 LS          SCS LOSS RATE
                     STRTL          .50  INITIAL ABSTRACTION
                     CRVNBR       79.08  CURVE NUMBER
                     RTIMP          .00  PERCENT IMPERVIOUS AREA

57 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG           .05  LAG
                                                    ***
                                                   UNIT HYDROGRAPH
                                                 5 END-OF-PERIOD ORDINATES
                                                      1.
                                  2.
                     11.
                48.                                                  ***
             124.                          ***                 ***
                          ***
        ***
                      HYDROGRAPH AT STATION      E3B
                        FOR PLAN 4, RATIO = 1.00

        TOTAL RAINFALL =   10.50, TOTAL LOSS =    2.52, TOTAL EXCESS =    7.98

                                          MAXIMUM AVERAGE FLOW
        PEAK FLOW     TIME                  6-HR        24-HR       72-HR      24.92-HR

+       (CFS)         (HR)        (CFS)        15.         5.          5.          5.
+        97.          12.08     (INCHES)     5.915       7.984       7.984       7.984
                                (AC-FT)        8.         10.         10.         10.

                                CUMULATIVE AREA =      .02 SQ MI

                                                                   ***
                                                   ***
        ***                   ***
                      HYDROGRAPH AT STATION      E3B
                        FOR PLAN 4, RATIO = 1.00

                                          MAXIMUM AVERAGE FLOW
        PEAK FLOW     TIME                  6-HR        24-HR       72-HR      24.92-HR

+       (CFS)         (HR)        (CFS)        15.         5.          5.          5.
+        97.          12.08     (INCHES)     5.915       7.984       7.984       7.984
                                (AC-FT)        8.         10.         10.         10.

                                CUMULATIVE AREA =      .02 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***
```

```
70 KP     PLAN  5 FOR STATION        E3B
                    TRIANGULAR DISTRIBUTION 100-YRS STORM

          SUBBASIN RUNOFF DATA

55 BA       SUBBASIN CHARACTERISTICS
               TAREA              .02  SUBBASIN AREA

            PRECIPITATION DATA
                                  DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
72 PH                                                                         ........... TP-49 ...........
            ..... HYDRO-35 ......  ................ TP-40 ................   2-DAY   4-DAY   7-DAY  10-DAY
            5-MIN  15-MIN  60-MIN   2-HR    3-HR    6-HR   12-HR   24-HR     .00     .00     .00     .00
              .99    2.15    4.40   5.20    6.10    8.00    9.70   11.50
                                              STORM AREA =        .02

56 LS       SCS LOSS RATE
               STRTL              .50  INITIAL ABSTRACTION
               CRVNBR           79.88  CURVE NUMBER
               RTIMP              .00  PERCENT IMPERVIOUS AREA

57 UD       SCS DIMENSIONLESS UNITGRAPH
               TLAG               .05  LAG
                                                              ***

                                                        UNIT HYDROGRAPH
                                                    5 END-OF-PERIOD ORDINATES
          124.       48.       11.        2.        1.

    ***          ***          ***          ***          ***

                  HYDROGRAPH AT STATION        E3B
                    FOR PLAN 5, RATIO = 1.00

   TOTAL RAINFALL =    11.50, TOTAL LOSS =     2.55, TOTAL EXCESS =       8.95

   PEAK FLOW     TIME                         MAXIMUM AVERAGE FLOW
                                       6-HR        24-HR        72-HR      24.92-HR
 +  (CFS)        (HR)
                             (CFS)
 +    144.       12.08                  18.           6.           6.           6.
                             (INCHES)   6.863        8.947        8.947        8.947
                             (AC-FT)      9.          11.          11.          11.

                             CUMULATIVE AREA =      .02 SQ MI

    ***          ***          ***          ***          ***

                  HYDROGRAPH AT STATION        E3B
                    FOR PLAN 5, RATIO = 1.00

   PEAK FLOW     TIME                         MAXIMUM AVERAGE FLOW
                                       6-HR        24-HR        72-HR      24.92-HR
 +  (CFS)        (HR)
                             (CFS)
 +    144.       12.08                  18.           6.           6.           6.
                             (INCHES)   6.863        8.947        8.947        8.947
                             (AC-FT)      9.          11.          11.          11.

                             CUMULATIVE AREA =      .02 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

                  **************
                  *            *
73 KK             *   COMB2    *
                  *            *
                  **************
                               E3+P3

75 HC           HYDROGRAPH COMBINATION
                   ICOMP              2  NUMBER OF HYDROGRAPHS TO COMBINE
                                                              ***
```

*** *** *** *** ***

HYDROGRAPH AT STATION COMB2
FOR PLAN 1, RATIO = 1.00

	PEAK FLOW	TIME		6-HR	MAXIMUM AVERAGE FLOW 24-HR	72-HR	24.92-HR
+	(CFS)	(HR)	(CFS)	15.	5.	4.	4.
+	134.	12.08	(INCHES)	2.008	2.418	2.418	2.418
			(AC-FT)	7.	9.	9.	9.

CUMULATIVE AREA = .07 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION COMB2
FOR PLAN 2, RATIO = 1.00

	PEAK FLOW	TIME		6-HR	MAXIMUM AVERAGE FLOW 24-HR	72-HR	24.92-HR
+	(CFS)	(HR)	(CFS)	30.	10.	9.	9.
+	208.	12.08	(INCHES)	4.037	5.076	5.076	5.076
			(AC-FT)	15.	19.	19.	19.

CUMULATIVE AREA = .07 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION COMB2
FOR PLAN 3, RATIO = 1.00

	PEAK FLOW	TIME		6-HR	MAXIMUM AVERAGE FLOW 24-HR	72-HR	24.92-HR
+	(CFS)	(HR)	(CFS)	38.	13.	12.	12.
+	249.	12.08	(INCHES)	5.102	6.756	6.756	6.756
			(AC-FT)	19.	25.	25.	25.

CUMULATIVE AREA = .07 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION COMB2
FOR PLAN 4, RATIO = 1.00

	PEAK FLOW	TIME		6-HR	MAXIMUM AVERAGE FLOW 24-HR	72-HR	24.92-HR
+	(CFS)	(HR)	(CFS)	44.	15.	14.	14.
+	270.	12.08	(INCHES)	5.792	7.799	7.799	7.799
			(AC-FT)	22.	29.	29.	29.

CUMULATIVE AREA = .07 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION COMB2
FOR PLAN 5, RATIO = 1.00

	PEAK FLOW	TIME		6-HR	MAXIMUM AVERAGE FLOW 24-HR	72-HR	24.92-HR
+	(CFS)	(HR)	(CFS)	51.	16.	16.	16.
+	394.	12.08	(INCHES)	6.731	8.755	8.755	8.755
			(AC-FT)	25.	33.	33.	33.

CUMULATIVE AREA = .07 SQ MI

```
*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *            *
  76 KK       *     E2     *
              *            *
              **************

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

  77 KP       PLAN  1 FOR STATION        E2
                              TRIANGULAR DISTRIBUTION 2-YRS STORM

              SUBBASIN RUNOFF DATA

  78 BA         SUBBASIN CHARACTERISTICS
                     TAREA           .87  SUBBASIN AREA

                PRECIPITATION DATA
                                          DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                                                      ........... TP-49 ...........
                                    ............... TP-40 ...............
  83 PH         ..... HYDRO-35 ......                                  2-DAY   4-DAY   7-DAY  10-DAY
                5-MIN  15-MIN  60-MIN   2-HR    3-HR    6-HR   12-HR   24-HR
                  .47    1.04    2.10    2.50    2.70    3.30    4.00    4.60     .00     .00     .00     .00
                                               STORM AREA =       .87

  79 LS         SCS LOSS RATE
                     STRTL            .59  INITIAL ABSTRACTION
                     CRVNBR         77.32  CURVE NUMBER
                     RTIMP            .00  PERCENT IMPERVIOUS AREA

  80 UD         SCS DIMENSIONLESS UNITGRAPH
                     TLAG             .93  LAG
                                                                   ***

                                                         UNIT HYDROGRAPH
                                                58 END-OF-PERIOD ORDINATES
        11.        35.        65.       104.       154.       215.       285.       344.       388.       416.
       429.       430.       423.       401.       375.       346.       312.       271.       229.       194.
       168.       146.       127.       112.        98.        85.        74.        63.        56.        49.
        42.        37.        32.        28.        24.        21.        18.        16.        14.        12.
        11.         9.         8.         7.         6.         5.         5.         4.         4.         3.
         3.         2.         2.         2.         1.         1.         0.         0.

      ***        ***        ***        ***        ***

                          HYDROGRAPH AT STATION        E2
                            FOR PLAN 1, RATIO = 1.00

     TOTAL RAINFALL =      4.59, TOTAL LOSS =      2.28, TOTAL EXCESS =      2.31

     PEAK FLOW       TIME                        MAXIMUM AVERAGE FLOW
                                         6-HR        24-HR        72-HR       24.92-HR
  +   (CFS)          (HR)
                                (CFS)
  +     512.        13.08                 178.          54.          52.          52.
                               (INCHES)   1.902        2.301        2.301        2.301
                               (AC-FT)      88.         107.         107.         107.

                           CUMULATIVE AREA =       .87 SQ MI

      ***        ***        ***        ***        ***

                          HYDROGRAPH AT STATION        E2
                            FOR PLAN 1, RATIO = 1.00

     PEAK FLOW       TIME                        MAXIMUM AVERAGE FLOW
                                         6-HR        24-HR        72-HR       24.92-HR
  +   (CFS)          (HR)
                                (CFS)
  +     512.        13.08                 178.          54.          52.          52.
                               (INCHES)   1.902        2.301        2.301        2.301
                               (AC-FT)      88.         107.         107.         107.
```

CUMULATIVE AREA = .87 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

84 KP PLAN 2 FOR STATION E2
TRIANGULAR DISTRIBUTION 10-YRS STORM

SUBBASIN RUNOFF DATA

78 BA SUBBASIN CHARACTERISTICS
TAREA .87 SUBBASIN AREA

86 PH PRECIPITATION DATA

DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

HYDRO-35			TP-40					TP-49		
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.55	1.31	3.00	3.70	4.10	5.40	6.60	7.60	.00	.00	.00	.00

STORM AREA = .87

79 LS SCS LOSS RATE
STRTL .59 INITIAL ABSTRACTION
CRVNBR 77.32 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

80 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .93 LAG

***

UNIT HYDROGRAPH
58 END-OF-PERIOD ORDINATES

11.	35.	65.	104.	154.	215.	285.	344.	388.	416.
429.	430.	423.	401.	375.	346.	312.	271.	229.	194.
168.	146.	127.	112.	98.	85.	74.	63.	56.	49.
42.	37.	32.	28.	24.	21.	18.	16.	14.	12.
11.	9.	8.	7.	6.	5.	5.	4.	4.	3.
3.	2.	2.	2.	1.	1.	0.	0.		

*** *** *** *** *** *** ***

HYDROGRAPH AT STATION E2
FOR PLAN 2, RATIO = 1.00

TOTAL RAINFALL = 7.59, TOTAL LOSS = 2.65, TOTAL EXCESS = 4.94

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)	(CFS)			
+	965.	13.00	365.	115.	110.	110.
			(INCHES) 3.906	4.912	4.912	4.912
			(AC-FT) 181.	227.	227.	227.

CUMULATIVE AREA = .87 SQ MI

*** *** *** *** *** *** ***

HYDROGRAPH AT STATION E2
FOR PLAN 2, RATIO = 1.00

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)	(CFS)			
+	965.	13.00	365.	115.	110.	110.
			(INCHES) 3.906	4.912	4.912	4.912
			(AC-FT) 181.	227.	227.	227.

CUMULATIVE AREA = .87 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

87 KP PLAN 3 FOR STATION E2
TRIANGULAR DISTRIBUTION 25-YRS STORM

SUBBASIN RUNOFF DATA

78 BA SUBBASIN CHARACTERISTICS
TAREA .87 SUBBASIN AREA

PRECIPITATION DATA

89 PH

			DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM							
..... HYDRO-35			..... TP-40				..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.61	1.47	3.50	4.50	5.10	6.30	7.70	9.40	.00	.00	.00	.00

STORM AREA = .87

79 LS SCS LOSS RATE
STRTL .59 INITIAL ABSTRACTION
CRVNBR 77.32 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

80 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .93 LAG

***

UNIT HYDROGRAPH
58 END-OF-PERIOD ORDINATES

11.	35.	65.	104.	154.	215.	285.	344.	388.	416.
429.	430.	423.	401.	375.	346.	312.	271.	229.	194.
168.	146.	127.	112.	98.	85.	74.	63.	56.	49.
42.	37.	32.	28.	24.	21.	18.	16.	14.	12.
11.	9.	8.	7.	6.	5.	5.	4.	4.	3.
3.	2.	2.	2.	1.	1.	0.	0.		

*** *** *** *** *** ***

HYDROGRAPH AT STATION E2
FOR PLAN 3, RATIO = 1.00

TOTAL RAINFALL = 9.39, TOTAL LOSS = 2.79, TOTAL EXCESS = 6.60

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)	(CFS)			
+	1231.	13.00	464.	153.	147.	147.
			(INCHES) 4.966	6.558	6.558	6.558
			(AC-FT) 230.	304.	304.	304.

CUMULATIVE AREA = .87 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION E2
FOR PLAN 3, RATIO = 1.00

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)	(CFS)			
+	1231.	13.00	464.	153.	147.	147.
			(INCHES) 4.966	6.558	6.558	6.558
			(AC-FT) 230.	304.	304.	304.

CUMULATIVE AREA = .87 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

90 KF PLAN 4 FOR STATION E2
TRIANGULAR DISTRIBUTION 50-YRS STORM

SUBBASIN RUNOFF DATA

78 BA SUBBASIN CHARACTERISTICS
TAREA .87 SUBBASIN AREA

PRECIPITATION DATA

```
                                           DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                           ............... TP-40 ...............  ........... TP-49 ...........
 92 PH     ..... HYDRO-35 ......           2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
           5-MIN  15-MIN  60-MIN           5.00    5.20    7.00    8.70   10.50     .00     .00     .00     .00
             .64    1.55    3.80
                                                 STORM AREA =       .87

 79 LS     SCS LOSS RATE
               STRTL            .59  INITIAL ABSTRACTION
              CRVNBR          77.32  CURVE NUMBER
               RTIMP            .00  PERCENT IMPERVIOUS AREA

 80 UD     SCS DIMENSIONLESS UNITGRAPH
                TLAG            .93  LAG

                                                        ***

                                                  UNIT HYDROGRAPH
                                             58 END-OF-PERIOD ORDINATES
              11.       35.       65.      104.      154.      215.      285.      344.      388.      416.
             429.      430.      423.      401.      375.      346.      312.      271.      229.      194.
             168.      146.      127.      112.       98.       85.       74.       63.       56.       49.
              42.       37.       32.       28.       24.       21.       18.       16.       14.       12.
              11.        9.        8.        7.        6.        5.        5.        4.        4.        3.
               3.        2.        2.        2.        1.        1.        0.        0.

                                  ***       ***       ***       ***
      ***       ***

                        HYDROGRAPH AT STATION         E2
                          FOR PLAN 4, RATIO = 1.00

      TOTAL RAINFALL =   10.49, TOTAL LOSS =    2.85, TOTAL EXCESS =      7.64

                                                   MAXIMUM AVERAGE FLOW
     PEAK FLOW    TIME                      6-HR        24-HR       72-HR      24.92-HR

       (CFS)      (HR)
                                  (CFS)
   +   1382.     13.00                       526.        177.        171.        171.
                               (INCHES)     5.632       7.591       7.591       7.591
                                (AC-FT)      261.        351.        351.        351.

                          CUMULATIVE AREA =      .87 SQ MI

                                  ***       ***       ***       ***
      ***       ***

                        HYDROGRAPH AT STATION         E2
                          FOR PLAN 4, RATIO = 1.00

                                                   MAXIMUM AVERAGE FLOW
     PEAK FLOW    TIME                      6-HR        24-HR       72-HR      24.92-HR

   +   (CFS)      (HR)
                                  (CFS)
   +   1382.     13.00                       526.        177.        171.        171.
                               (INCHES)     5.632       7.591       7.591       7.591
                                (AC-FT)      261.        351.        351.        351.

                          CUMULATIVE AREA =      .87 SQ MI

 ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***

 93 KP       PLAN  5 FOR STATION         E2
                                 TRIANGULAR DISTRIBUTION 100-YRS STORM

             SUBBASIN RUNOFF DATA

 78 BA        SUBBASIN CHARACTERISTICS
                TAREA            .87  SUBBASIN AREA

              PRECIPITATION DATA
                                           DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                           ............... TP-40 ...............  ........... TP-49 ...........
 95 PH     ..... HYDRO-35 ......           2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
           5-MIN  15-MIN  60-MIN           5.20    6.10    8.00    9.70   11.50     .00     .00     .00     .00
             .90    2.15    4.40
                                                 STORM AREA =       .87

 79 LS     SCS LOSS RATE
```

STRTL	.59	INITIAL ABSTRACTION
CRVNBR	77.32	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

80 UD SCS DIMENSIONLESS UNITGRAPH

TLAG .93 LAG

***

UNIT HYDROGRAPH
58 END-OF-PERIOD ORDINATES

11.	35.	65.	104.	154.	215.	285.	344.	388.	416.
429.	430.	423.	401.	375.	346.	312.	271.	229.	194.
160.	146.	127.	112.	98.	85.	74.	63.	56.	49.
42.	37.	32.	28.	24.	21.	18.	16.	14.	12.
11.	9.	8.	7.	6.	5.	5.	4.	4.	3.
3.	2.	2.	2.	1.	1.	0.	0.		

*** *** *** *** ***

HYDROGRAPH AT STATION E2
FOR PLAN 5, RATIO = 1.00

TOTAL RAINFALL = 11.49, TOTAL LOSS = 2.90, TOTAL EXCESS = 8.59

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)	612.	199.	192.	192.
+ 1607.	13.00	(INCHES)	6.552	8.542	8.542	8.542
		(AC-FT)	303.	395.	395.	395.

CUMULATIVE AREA = .87 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION E2
FOR PLAN 5, RATIO = 1.00

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)	612.	199.	192.	192.
+ 1607.	13.00	(INCHES)	6.552	8.542	8.542	8.542
		(AC-FT)	303.	395.	395.	395.

CUMULATIVE AREA = .87 SQ MI

*** ***

```
              **************
              *            *
96 KK         *     P2     *
              *            *
              **************
```

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

97 KP PLAN 1 FOR STATION P2
TRIANGULAR DISTRIBUTION 2-YRS STORM

SUBBASIN RUNOFF DATA

98 BA SUBBASIN CHARACTERISTICS

TAREA .04 SUBBASIN AREA

PRECIPITATION DATA

103 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			.... TP-40					.... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.47	1.04	2.10	2.50	2.70	3.30	4.00	4.60	.00	.00	.00	.00

STORM AREA = .04

99 LS SCS LOSS RATE
STRTL .53 INITIAL ABSTRACTION
CRVNBR 79.03 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

100 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .12 LAG

***

UNIT HYDROGRAPH
9 END-OF-PERIOD ORDINATES
60. 121. 76. 31. 14. 6. 3. 1. 0.

*** *** *** *** ***

HYDROGRAPH AT STATION P2
FOR PLAN 1, RATIO = 1.00

TOTAL RAINFALL = 4.60, TOTAL LOSS = 2.14, TOTAL EXCESS = 2.46

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)	9.	3.	3.	3.
+ 67.	12.17					
		(INCHES)	2.045	2.463	2.463	2.463
		(AC-FT)	4.	5.	5.	5.

CUMULATIVE AREA = .04 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION P2
FOR PLAN 1, RATIO = 1.00

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)	9.	3.	3.	3.
+ 67.	12.17					
		(INCHES)	2.045	2.463	2.463	2.463
		(AC-FT)	4.	5.	5.	5.

CUMULATIVE AREA = .04 SQ MI

*** ***

104 KP PLAN 2 FOR STATION P2
TRIANGULAR DISTRIBUTION 10-YRS STORM

SUBBASIN RUNOFF DATA

98 BA SUBBASIN CHARACTERISTICS
TAREA .04 SUBBASIN AREA

PRECIPITATION DATA

106 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			.... TP-40					.... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.55	1.31	3.00	3.70	4.10	5.40	6.60	7.60	.00	.00	.00	.00

STORM AREA = .04

99 LS SCS LOSS RATE
STRTL .53 INITIAL ABSTRACTION
CRVNBR 79.03 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

100 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .12 LAG

***

UNIT HYDROGRAPH

```
                                                  9 END-OF-PERIOD ORDINATES
                                                    14.        6.        3.        1.        0.
          60.      121.      76.      31.
                                                  ***                  ***
   ***          ***          ***
                    HYDROGRAPH AT STATION        P2
                      FOR PLAN 2, RATIO = 1.00

   TOTAL RAINFALL =    7.60, TOTAL LOSS =    2.46, TOTAL EXCESS =    5.14

                                                MAXIMUM AVERAGE FLOW
  PEAK FLOW     TIME                   6-HR       24-HR       72-HR     24.92-HR
+  (CFS)        (HR)        (CFS)      18.         6.          5.         5.
+   106.       12.17       (INCHES)   4.085      5.140       5.140      5.140
                           (AC-FT)     9.         11.         11.        11.

                    CUMULATIVE AREA =      .04 SQ MI

                                                  ***                  ***
   ***          ***          ***
                    HYDROGRAPH AT STATION        P2
                      FOR PLAN 2, RATIO = 1.00

                                                MAXIMUM AVERAGE FLOW
  PEAK FLOW     TIME                   6-HR       24-HR       72-HR     24.92-HR
+  (CFS)        (HR)        (CFS)      18.         6.          5.         5.
+   106.       12.17       (INCHES)   4.085      5.140       5.140      5.140
                           (AC-FT)     9.         11.         11.        11.

                    CUMULATIVE AREA =      .04 SQ MI

   ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***

  107 KP          PLAN  3 FOR STATION        P2
                          TRIANGULAR DISTRIBUTION 25-YRS STORM

                  SUBBASIN RUNOFF DATA

  98 BA             SUBBASIN CHARACTERISTICS
                        TAREA          .04  SUBBASIN AREA

                    PRECIPITATION DATA
                                          DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                                                                          ..........  TP-49  ..........
  109 PH            ..... HYDRO-35 .....  ..............  TP-40  ..............  ..........  ..........  ..........  ..........
                    5-MIN   15-MIN   60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                     .61     1.47     3.50    4.50    5.10    6.30    7.70    9.40     .00     .00     .00     .00
                                                      STORM AREA =      .04

  99 LS             SCS LOSS RATE
                        STRTL          .53  INITIAL ABSTRACTION
                        CRVNBR       79.03  CURVE NUMBER
                        RTIMP         .00  PERCENT IMPERVIOUS AREA

  100 UD            SCS DIMENSIONLESS UNITGRAPH
                        TLAG           .12  LAG
                                                  ***
                                                UNIT HYDROGRAPH
                                                  9 END-OF-PERIOD ORDINATES
                                                    14.        6.        3.        1.        0.
          60.      121.      76.      31.
                                                  ***                  ***
   ***          ***          ***
                    HYDROGRAPH AT STATION        P2
                      FOR PLAN 3, RATIO = 1.00

   TOTAL RAINFALL =    9.40, TOTAL LOSS =    2.57, TOTAL EXCESS =    6.83

                                                MAXIMUM AVERAGE FLOW
  PEAK FLOW     TIME                   6-HR       24-HR       72-HR     24.92-HR
+  (CFS)        (HR)
```

+	127.	12.17	(CFS)	22.	7.	7.	7.
			(INCHES)	5.151	6.826	6.826	6.826
			(AC-FT)	11.	15.	15.	15.

CUMULATIVE AREA = .04 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION P2
FOR PLAN 3, RATIO = 1.00

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)	22.	7.	7.	7.
+ 127.	12.17	(INCHES)	5.151	6.826	6.826	6.826
		(AC-FT)	11.	15.	15.	15.

CUMULATIVE AREA = .04 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

110 KP PLAN 4 FOR STATION P2
TRIANGULAR DISTRIBUTION 50-YRS STORM

SUBBASIN RUNOFF DATA

98 BA SUBBASIN CHARACTERISTICS
TAREA .04 SUBBASIN AREA

PRECIPITATION DATA

112 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			.... TP-40					.... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.64	1.55	3.80	5.00	5.20	7.00	8.70	10.50	.00	.00	.00	.00

STORM AREA = .04

99 LS SCS LOSS RATE
STRTL .53 INITIAL ABSTRACTION
CRVNBR 79.03 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

100 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .12 LAG

***

UNIT HYDROGRAPH
9 END-OF-PERIOD ORDINATES

60.	121.	76.	31.	14.	6.	3.	1.	0.

*** *** *** *** ***

HYDROGRAPH AT STATION P2
FOR PLAN 4, RATIO = 1.00

TOTAL RAINFALL = 10.50, TOTAL LOSS = 2.63, TOTAL EXCESS = 7.87

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)	25.	9.	8.	8.
+ 138.	12.17	(INCHES)	5.843	7.073	7.873	7.873
		(AC-FT)	13.	17.	17.	17.

CUMULATIVE AREA = .04 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION P2
FOR PLAN 4, RATIO = 1.00

```
                                        MAXIMUM AVERAGE FLOW
PEAK FLOW     TIME                 6-HR      24-HR      72-HR     24.92-HR
+  (CFS)      (HR)      (CFS)      25.        9.        8.         8.
+   138.      12.17   (INCHES)    5.843     7.873     7.873      7.873
                      (AC-FT)      13.       17.       17.        17.

                      CUMULATIVE AREA =     .04 SQ MI

***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***

113 KP        PLAN  5 FOR STATION      P2
                        TRIANGULAR DISTRIBUTION 100-YRS STORM

              SUBBASIN RUNOFF DATA

98 BA           SUBBASIN CHARACTERISTICS
                     TAREA        .04  SUBBASIN AREA

                PRECIPITATION DATA
                                   DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                  ..............  TP-40 ..............  ........... TP-49 ...........
115 PH          ..... HYDRO-35 ......  ..............  6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY   10-DAY
                5-MIN  15-MIN  60-MIN   2-HR   3-HR   8.00   9.70   11.50    .00     .00     .00     .00
                 .99    2.15    4.40   5.20   6.10
                                                STORM AREA =     .04

99 LS           SCS LOSS RATE
                     STRTL        .53  INITIAL ABSTRACTION
                    CRVNBR      79.03  CURVE NUMBER
                     RTIMP        .00  PERCENT IMPERVIOUS AREA

100 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG        .12  LAG
                                                    ***
                                                UNIT HYDROGRAPH
                                          9 END-OF-PERIOD ORDINATES
                                                14.       6.       3.       1.       0.
                 60.     121.     76.     31.
                                                    ***
                                   ***
                 ***     ***
                                   HYDROGRAPH AT STATION      P2
                                     FOR PLAN 5, RATIO = 1.00

                TOTAL RAINFALL =   11.50, TOTAL LOSS =    2.67, TOTAL EXCESS =    8.83

                                        MAXIMUM AVERAGE FLOW
PEAK FLOW     TIME                 6-HR      24-HR      72-HR     24.92-HR
+  (CFS)      (HR)      (CFS)      29.       10.        9.         9.
+   194.      12.17   (INCHES)    6.786     8.832     8.832      8.832
                      (AC-FT)      15.       19.       19.        19.

                      CUMULATIVE AREA =     .04 SQ MI
                                                    ***
                                   ***      ***
                 ***     ***
                                   HYDROGRAPH AT STATION      P2
                                     FOR PLAN 5, RATIO = 1.00

                                        MAXIMUM AVERAGE FLOW
PEAK FLOW     TIME                 6-HR      24-HR      72-HR     24.92-HR
+  (CFS)      (HR)      (CFS)      29.       10.        9.         9.
+   194.      12.17   (INCHES)    6.786     8.832     8.832      8.832
                      (AC-FT)      15.       19.       19.        19.

                      CUMULATIVE AREA =     .04 SQ MI
```

*** ***

```
               **************
               *            *
116 KK         *     E1     *
               *            *
               **************
```

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

```
117 KP     PLAN  1 FOR STATION       E1
                      TRIANGULAR DISTRIBUTION 2-YRS STORM

           SUBBASIN RUNOFF DATA

118 BA       SUBBASIN CHARACTERISTICS
                TAREA            .17  SUBBASIN AREA

             PRECIPITATION DATA
                                        DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                                                                ........... TP-49 ...........
                                      ............... TP-40 ...............      2-DAY   4-DAY   7-DAY  10-DAY
123 PH        ..... HYDRO-35 .....     2-HR    3-HR    6-HR   12-HR   24-HR      .00     .00     .00     .00
              5-MIN  15-MIN  60-MIN    2.50    2.70    3.30    4.00    4.60
                .47    1.04    2.10
                                                  STORM AREA =      .17

119 LS       SCS LOSS RATE
                STRTL           .71  INITIAL ABSTRACTION
                CRVNBR        73.77  CURVE NUMBER
                RTIMP           .00  PERCENT IMPERVIOUS AREA

120 UD       SCS DIMENSIONLESS UNITGRAPH
                TLAG            .27  LAG
```

***

```
                                  UNIT HYDROGRAPH
                             18 END-OF-PERIOD ORDINATES
      43.      143.      248.      265.      222.      148.       93.       61.       39.       26.
      16.       11.        7.        4.        3.        2.        1.        0.
```

*** *** *** *** *** ***

```
                HYDROGRAPH AT STATION          E1
                  FOR PLAN 1, RATIO = 1.00

TOTAL RAINFALL =      4.60, TOTAL LOSS =      2.57, TOTAL EXCESS =      2.03

   PEAK FLOW      TIME                      MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR       72-HR     24.92-HR
+   (CFS)         (HR)
                             (CFS)
+    175.        12.33                31.          9.          9.          9.
                           (INCHES)  1.699       2.031       2.031       2.031
                            (AC-FT)    16.         19.         19.         19.

                     CUMULATIVE AREA =      .17 SQ MI
```

*** *** *** *** *** ***

```
                HYDROGRAPH AT STATION          E1
                  FOR PLAN 1, RATIO = 1.00

   PEAK FLOW      TIME                      MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR       72-HR     24.92-HR
+   (CFS)         (HR)
                             (CFS)
+    175.        12.33                31.          9.          9.          9.
                           (INCHES)  1.699       2.031       2.031       2.031
                            (AC-FT)    16.         19.         19.         19.

                     CUMULATIVE AREA =      .17 SQ MI
```

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

```
124 KP        PLAN  2 FOR STATION        E1
                        TRIANGULAR DISTRIBUTION 10-YRS STORM

              SUBBASIN RUNOFF DATA

118 BA          SUBBASIN CHARACTERISTICS
                     TAREA          .17  SUBBASIN AREA

                PRECIPITATION DATA
                                         DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                                  ..............  TP-40  ..............  ........... TP-49 ...........
126 PH          ..... HYDRO-35 ......    ..............  TP-40  ..............  ..........  TP-49 ..........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR    12-HR   24-HR   2-DAY   4-DAY   7-DAY   10-DAY
                 .55    1.31    3.00    3.70    4.10    5.40    6.60    7.60     .00     .00     .00     .00
                                                  STORM AREA =       .17

119 LS          SCS LOSS RATE
                     STRTL          .71  INITIAL ABSTRACTION
                     CRVNBR       73.77  CURVE NUMBER
                     RTIMP          .00  PERCENT IMPERVIOUS AREA

120 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG           .27  LAG
                                                    ***
                                                UNIT HYDROGRAPH
                                            18 END-OF-PERIOD ORDINATES
                                                                                  61.      39.      26.
                                                                   93.
                                                   222.    148.     1.
                                     265.          3.      2.      0.
                 43.     143.    248.    4.
                 16.     11.      7.
                                                 ***     ***
                         ***     ***
        ***
                        HYDROGRAPH AT STATION        E1
                          FOR PLAN 2, RATIO = 1.00

        TOTAL RAINFALL =     7.60, TOTAL LOSS =     3.06, TOTAL EXCESS =     4.54

                                                MAXIMUM AVERAGE FLOW
        PEAK FLOW     TIME                 6-HR      24-HR      72-HR     24.92-HR
+       (CFS)         (HR)      (CFS)      67.       21.        20.       20.
+       323.          12.33     (INCHES)   3.643     4.542      4.542     4.542
                                (AC-FT)    33.       42.        42.       42.
                        CUMULATIVE AREA =      .17 SQ MI
                                                    ***     ***
        ***             ***     ***
                        HYDROGRAPH AT STATION        E1
                          FOR PLAN 2, RATIO = 1.00

                                                MAXIMUM AVERAGE FLOW
        PEAK FLOW     TIME                 6-HR      24-HR      72-HR     24.92-HR
+       (CFS)         (HR)      (CFS)      67.       21.        20.       20.
+       323.          12.33     (INCHES)   3.643     4.542      4.542     4.542
                                (AC-FT)    33.       42.        42.       42.
                        CUMULATIVE AREA =      .17 SQ MI
                                                                                                                  ***
                                                                                                          ***     ***
                                                                                                  ***     ***     ***
                                                                                          ***     ***     ***     ***
                                                                                  ***     ***     ***     ***     ***
                                                                          ***     ***     ***     ***     ***     ***
                                                                  ***     ***     ***     ***     ***     ***     ***
                                                          ***     ***     ***     ***     ***     ***     ***     ***
                                                  ***     ***     ***     ***     ***     ***     ***     ***     ***
                                          ***     ***     ***     ***     ***     ***     ***     ***     ***     ***
                                  ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***
                          ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***
                  ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***
127 KP          PLAN  3 FOR STATION        E1
                        TRIANGULAR DISTRIBUTION 25-YRS STORM

              SUBBASIN RUNOFF DATA

118 BA          SUBBASIN CHARACTERISTICS
                     TAREA          .17  SUBBASIN AREA

                PRECIPITATION DATA
                                         DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                                  ..............  TP-40  ..............  ........... TP-49 ...........
129 PH          ..... HYDRO-35 ......    ..............  TP-40  ..............  ..........  TP-49 ..........
```

```
                                                                                    2-DAY   4-DAY   7-DAY  10-DAY
5-MIN  15-MIN  60-MIN   2-HR    3-HR    6-HR   12-HR   24-HR     .00     .00     .00     .00
  .61    1.47    3.50   4.50    5.10    6.30    7.70    9.40
                                  STORM AREA =     .17

119 LS        SCS LOSS RATE               .71  INITIAL ABSTRACTION
                   STRTL                73.77  CURVE NUMBER
                  CRVNBR                  .00  PERCENT IMPERVIOUS AREA
                   RTIMP

120 UD        SCS DIMENSIONLESS UNITGRAPH
                   TLAG                   .27  LAG
                                                        ***

                                           UNIT HYDROGRAPH
                                    18 END-OF-PERIOD ORDINATES
      43.       143.       248.       265.       222.       148.        93.        61.        39.        26.
      16.        11.         7.         4.         3.         2.         1.         0.

 ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION       E1
                      FOR PLAN 3, RATIO = 1.00

   TOTAL RAINFALL =      9.40, TOTAL LOSS =     3.23, TOTAL EXCESS =     6.16

   PEAK FLOW      TIME                      MAXIMUM AVERAGE FLOW
                                          6-HR      24-HR      72-HR    24.92-HR
 +   (CFS)        (HR)
                               (CFS)
 +     404.       12.33                    87.        29.        27.        27.
                             (INCHES)    4.703      6.163      6.163      6.163
                             (AC-FT)       43.        57.        57.        57.

                    CUMULATIVE AREA =     .17 SQ MI

 ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION       E1
                      FOR PLAN 3, RATIO = 1.00

   PEAK FLOW      TIME                      MAXIMUM AVERAGE FLOW
                                          6-HR      24-HR      72-HR    24.92-HR
 +   (CFS)        (HR)
                               (CFS)
 +     404.       12.33                    87.        29.        27.        27.
                             (INCHES)    4.703      6.163      6.163      6.163
                             (AC-FT)       43.        57.        57.        57.

                    CUMULATIVE AREA =     .17 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

130 KP        PLAN  4 FOR STATION      E1
                      TRIANGULAR DISTRIBUTION 50-YRS STORM

              SUBBASIN RUNOFF DATA

118 BA          SUBBASIN CHARACTERISTICS
                   TAREA                  .17  SUBBASIN AREA

                PRECIPITATION DATA

132 PH                            DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                                                  ........... TP-49 ...........
               ..... HYDRO-35 ......  ............... TP-40 ..............  2-DAY   4-DAY   7-DAY  10-DAY
               5-MIN  15-MIN  60-MIN   2-HR    3-HR    6-HR   12-HR   24-HR     .00     .00     .00     .00
                 .64    1.55    3.80   5.00    5.20    7.00    8.70   10.50
                                              STORM AREA =     .17

119 LS          SCS LOSS RATE               .71  INITIAL ABSTRACTION
                     STRTL                73.77  CURVE NUMBER
                    CRVNBR                  .00  PERCENT IMPERVIOUS AREA
                     RTIMP

120 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG                   .27  LAG
```

***

UNIT HYDROGRAPH
18 END-OF-PERIOD ORDINATES

43.	143.	248.	265.	222.	148.	93.	61.	39.	26.
16.	11.	7.	4.	3.	2.	1.	0.		

*** *** *** *** ***

HYDROGRAPH AT STATION E1
FOR PLAN 4, RATIO = 1.00

TOTAL RAINFALL = 10.50, TOTAL LOSS = 3.32, TOTAL EXCESS = 7.18

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 449.	12.33		100.	33.	32.	32.
		(INCHES)	5.379	7.178	7.178	7.178
		(AC-FT)	49.	66.	66.	66.

CUMULATIVE AREA = .17 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION E1
FOR PLAN 4, RATIO = 1.00

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
449.	12.33		100.	33.	32.	32.
		(INCHES)	5.379	7.178	7.178	7.178
		(AC-FT)	49.	66.	66.	66.

CUMULATIVE AREA = .17 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

133 KP PLAN 5 FOR STATION E1
TRIANGULAR DISTRIBUTION 100-YRS STORM

SUBBASIN RUNOFF DATA

118 BA SUBBASIN CHARACTERISTICS
TAREA .17 SUBBASIN AREA

PRECIPITATION DATA

135 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			.... TP-40					.... TP-49		
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.99	2.15	4.40	5.20	6.10	8.00	9.70	11.50	.00	.00	.00	.00

STORM AREA = .17

119 LS SCS LOSS RATE
STRTL .71 INITIAL ABSTRACTION
CRVNBR 73.77 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

120 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .27 LAG

***

UNIT HYDROGRAPH
18 END-OF-PERIOD ORDINATES

43.	143.	248.	265.	222.	148.	93.	61.	39.	26.
16.	11.	7.	4.	3.	2.	1.	0.		

*** *** *** *** ***

HYDROGRAPH AT STATION E1
FOR PLAN 5, RATIO = 1.00

TOTAL RAINFALL = 11.50, TOTAL LOSS = 3.39, TOTAL EXCESS = 8.11

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)	116.	38.	36.	36.
+ 585.	12.33					
		(INCHES)	6.288	8.112	8.112	8.112
		(AC-FT)	58.	74.	74.	74.

CUMULATIVE AREA = .17 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION E1
FOR PLAN 5, RATIO = 1.00

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)	116.	38.	36.	36.
+ 585.	12.33					
		(INCHES)	6.288	8.112	8.112	8.112
		(AC-FT)	58.	74.	74.	74.

CUMULATIVE AREA = .17 SQ MI

*** ***

```
              **************
              *            *
136 KK        *     P1     *
              *            *
              **************
```

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

137 KP PLAN 1 FOR STATION P1
TRIANGULAR DISTRIBUTION 2-YRS STORM

SUBBASIN RUNOFF DATA

138 BA SUBBASIN CHARACTERISTICS
TAREA .08 SUBBASIN AREA

PRECIPITATION DATA

143 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			.... TP-40					.... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.47	1.04	2.10	2.50	2.70	3.30	4.00	4.60	.00	.00	.00	.00

STORM AREA = .08

139 LS SCS LOSS RATE
STRTL .56 INITIAL ABSTRACTION
CRVNBR 78.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

140 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .37 LAG

***

UNIT HYDROGRAPH
24 END-OF-PERIOD ORDINATES

10.	30.	64.	89.	95.	87.	72.	51.	36.	26.
19.	13.	10.	7.	5.	4.	3.	2.	1.	1.
1.	1.	0.	0.						

*** *** *** *** ***

HYDROGRAPH AT STATION P1
FOR PLAN 1, RATIO = 1.00

```
TOTAL RAINFALL =    4.60, TOTAL LOSS =    2.22, TOTAL EXCESS =    2.38

                                          MAXIMUM AVERAGE FLOW
PEAK FLOW    TIME                  6-HR      24-HR     72-HR     24.92-HR
+  (CFS)     (HR)     (CFS)        17.        5.        5.         5.
+   84.      12.42    (INCHES)     1.972     2.375     2.375      2.375
                      (AC-FT)      8.        10.       10.        10.

                      CUMULATIVE AREA =    .08 SQ MI

***          ***          ***          ***          ***

                HYDROGRAPH AT STATION      P1
                 FOR PLAN 1, RATIO = 1.00

                                          MAXIMUM AVERAGE FLOW
PEAK FLOW    TIME                  6-HR      24-HR     72-HR     24.92-HR
+  (CFS)     (HR)     (CFS)        17.        5.        5.         5.
+   84.      12.42    (INCHES)     1.972     2.375     2.375      2.375
                      (AC-FT)      8.        10.       10.        10.

                      CUMULATIVE AREA =    .08 SQ MI

***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***

144 KP        PLAN  2 FOR STATION      P1
                   TRIANGULAR DISTRIBUTION 10-YRS STORM

              SUBBASIN RUNOFF DATA

138 BA          SUBBASIN CHARACTERISTICS
                     TAREA        .08  SUBBASIN AREA

                PRECIPITATION DATA
                                   DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                                TP-40 ..............  ........... TP-49 ...........
146 PH          ..... HYDRO-35 ......  ..............  2-HR   3-HR   6-HR   12-HR  24-HR  2-DAY  4-DAY  7-DAY  10-DAY
                5-MIN  15-MIN  60-MIN   2-HR   3-HR   6-HR   12-HR  24-HR  .00    .00    .00    .00
                 .55    1.31    3.00    3.70   4.10   5.40   6.60   7.60
                                                STORM AREA =    .08

139 LS          SCS LOSS RATE
                     STRTL        .56  INITIAL ABSTRACTION
                    CRVNBR      78.00  CURVE NUMBER
                     RTIMP        .00  PERCENT IMPERVIOUS AREA

140 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG         .37  LAG

                                                    ***

                                                UNIT HYDROGRAPH
                                            24 END-OF-PERIOD ORDINATES
                                   89.      72.      51.      36.      26.
                          64.      7.       3.       2.       1.       1.
                 30.      10.      0.       4.       1.
                 13.      0.       5.
                 1.
                 10.
                 19.
                  1.
                          ***      ***      ***      ***
         ***      ***

                HYDROGRAPH AT STATION      P1
                 FOR PLAN 2, RATIO = 1.00

TOTAL RAINFALL =    7.60, TOTAL LOSS =    2.58, TOTAL EXCESS =    5.02

                                          MAXIMUM AVERAGE FLOW
PEAK FLOW    TIME                  6-HR      24-HR     72-HR     24.92-HR
+  (CFS)     (HR)     (CFS)        35.       11.       10.        10.
+   147.     12.42    (INCHES)     3.994     5.021     5.021      5.021
                      (AC-FT)      17.       22.       22.        22.
```

CUMULATIVE AREA = .08 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION P1
FOR PLAN 2, RATIO = 1.00

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
		(CFS)	35.	11.	10.	10.
147.	12.42	(INCHES)	3.994	5.021	5.021	5.021
		(AC-FT)	17.	22.	22.	22.

CUMULATIVE AREA = .08 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

147 KP PLAN 3 FOR STATION P1
TRIANGULAR DISTRIBUTION 25-YRS STORM

SUBBASIN RUNOFF DATA

138 BA SUBBASIN CHARACTERISTICS
TAREA .08 SUBBASIN AREA

PRECIPITATION DATA

149 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.61	1.47	3.50	4.50	5.10	6.30	7.70	9.40	.00	.00	.00	.00

STORM AREA = .08

[illegible]S SCS LOSS RATE
STRTL .56 INITIAL ABSTRACTION
CRVNBR 78.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

140 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .37 LAG

***

UNIT HYDROGRAPH
24 END-OF-PERIOD ORDINATES

10.	30.	64.	89.	95.	87.	72.	51.	36.	26.
19.	13.	10.	7.	5.	4.	3.	2.	1.	1.
1.	1.	0.	0.						

*** *** *** *** ***

HYDROGRAPH AT STATION P1
FOR PLAN 3, RATIO = 1.00

TOTAL RAINFALL = 9.40, TOTAL LOSS = 2.70, TOTAL EXCESS = 6.70

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
		(CFS)	44.	15.	14.	14.
182.	12.42	(INCHES)	5.061	6.695	6.695	6.695
		(AC-FT)	22.	29.	29.	29.

CUMULATIVE AREA = .08 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION P1
FOR PLAN 3, RATIO = 1.00

FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR

```
                    (CFS)
+   202.    12.42                  46.        15.        14.        14.
                  (INCHES)        5.061      6.695      6.695      6.695
                   (AC-FT)         22.        29.        29.        29.

                  CUMULATIVE AREA =      .08 SQ MI

***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***

150 KP      PLAN  4 FOR STATION       P1
                        TRIANGULAR DISTRIBUTION 50-YRS STORM

            SUBBASIN RUNOFF DATA

138 BA        SUBBASIN CHARACTERISTICS
                 TAREA          .08  SUBBASIN AREA

              PRECIPITATION DATA

152 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                                  TP-40 ...............  ........... TP-49 ...........
              ..... HYDRO-35 ......  ............... 
              5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                .64    1.55    3.80    5.00    5.20    7.00    8.70   10.50     .00     .00     .00     .00

                                                STORM AREA =      .08

139 LS        SCS LOSS RATE
                 STRTL          .56  INITIAL ABSTRACTION
                CRVNBR        78.00  CURVE NUMBER
                 RTIMP          .00  PERCENT IMPERVIOUS AREA

140 UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG          .37  LAG

                                          ***

                                                UNIT HYDROGRAPH
                                            24 END-OF-PERIOD ORDINATES
                 10.     30.     64.     89.     95.     87.     72.     51.     36.     26.
                 19.     13.     10.      7.      5.      4.      3.      2.      1.      1.
                  1.      1.      0.      0.

   ***          ***          ***          ***          ***

                  HYDROGRAPH AT STATION       P1
                    FOR PLAN 4, RATIO = 1.00

  TOTAL RAINFALL =   10.50, TOTAL LOSS =    2.76, TOTAL EXCESS =    7.74

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR      72-HR    24.92-HR
+  (CFS)      (HR)
                    (CFS)
   202.      12.42                  50.        17.        16.        16.
                  (INCHES)        5.747      7.736      7.736      7.736
                   (AC-FT)         25.        33.        33.        33.

                  CUMULATIVE AREA =      .08 SQ MI

   ***          ***          ***          ***          ***

                  HYDROGRAPH AT STATION       P1
                    FOR PLAN 4, RATIO = 1.00

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR      72-HR    24.92-HR
  (CFS)       (HR)
                    (CFS)
   202.      12.42                  50.        17.        16.        16.
                  (INCHES)        5.747      7.736      7.736      7.736
                   (AC-FT)         25.        33.        33.        33.

                  CUMULATIVE AREA =      .08 SQ MI

***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***
```

```
153 XP        PLAN  5 FOR STATION        P1
                        TRIANGULAR DISTRIBUTION 100-YRS STORM

              SUBBASIN RUNOFF DATA

138 BA          SUBBASIN CHARACTERISTICS
                      TAREA          .08  SUBBASIN AREA

                PRECIPITATION DATA

155 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 ......  ............... TP-40 ...............  ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .99    2.15    4.40    5.20    6.10    8.00    9.70   11.50     .00     .00     .00     .00

                                                STORM AREA =      .08

139 LS          SCS LOSS RATE
                      STRTL          .56  INITIAL ABSTRACTION
                     CRVNBR        78.00  CURVE NUMBER
                      RTIMP          .00  PERCENT IMPERVIOUS AREA

140 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .37  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                          24 END-OF-PERIOD ORDINATES
                  10.      30.      64.      89.      95.      87.      72.      51.      36.      26.
                  19.      13.      10.       7.       5.       4.       3.       2.       1.       1.
                   1.       1.       0.       0.

     ***          ***          ***          ***          ***

                     HYDROGRAPH AT STATION        P1
                       FOR PLAN 5, RATIO = 1.00

  TOTAL RAINFALL =   11.50, TOTAL LOSS =    2.81, TOTAL EXCESS =    8.69

  PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                                  (CFS)
    253.      12.42                 58.         19.         18.         18.
                                (INCHES)      6.682       8.690       8.690       8.690
                                 (AC-FT)       29.         37.         37.         37.

                     CUMULATIVE AREA =      .08 SQ MI

     ***          ***          ***          ***          ***

                     HYDROGRAPH AT STATION        P1
                       FOR PLAN 5, RATIO = 1.00

  PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                                  (CFS)
    253.      12.42                 58.         19.         18.         18.
                                (INCHES)      6.682       8.690       8.690       8.690
                                 (AC-FT)       29.         37.         37.         37.

                     CUMULATIVE AREA =      .08 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *            *
156 KK        *     P7     *
              *            *
              **************

     ***      ***      ***      ***      ***      ***      ***      ***      ***      ***      ***      ***      ***      ***      ***      ***
```

```
157 KP        PLAN  1 FOR STATION        P7
                        TRIANGULAR DISTRIBUTION 2-YRS STORM

              SUBBASIN RUNOFF DATA

158 BA          SUBBASIN CHARACTERISTICS
                      TAREA          .03  SUBBASIN AREA

                PRECIPITATION DATA

163 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .47    1.04    2.10    2.50    2.70    3.30    4.00    4.60     .00     .00     .00     .00

                                                STORM AREA =      .03

159 LS          SCS LOSS RATE
                      STRTL          .53  INITIAL ABSTRACTION
                     CRVNBR        79.00  CURVE NUMBER
                      RTIMP          .00  PERCENT IMPERVIOUS AREA

160 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG          .10  LAG

                                                        ***

                                                   UNIT HYDROGRAPH
                                               8 END-OF-PERIOD ORDINATES
                61.       91.       40.       15.        6.        2.        1.        0.

    ***          ***          ***          ***          ***

                     HYDROGRAPH AT STATION        P7
                       FOR PLAN 1, RATIO = 1.00

  TOTAL RAINFALL =    4.60, TOTAL LOSS =    2.14, TOTAL EXCESS =    2.46

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.92-HR
  (CFS)       (HR)
                          (CFS)
+    48.     12.17                 6.          2.          2.          2.
                         (INCHES)  2.043       2.460       2.460       2.460
                          (AC-FT)    3.          4.          4.          4.

                     CUMULATIVE AREA =      .03 SQ MI

    ***          ***          ***          ***          ***

                     HYDROGRAPH AT STATION        P7
                       FOR PLAN 1, RATIO = 1.00

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.92-HR
  (CFS)       (HR)
                          (CFS)
+    48.     12.17                 6.          2.          2.          2.
                         (INCHES)  2.043       2.460       2.460       2.460
                          (AC-FT)    3.          4.          4.          4.

                     CUMULATIVE AREA =      .03 SQ MI

***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***

164 KP        PLAN  2 FOR STATION        P7
                        TRIANGULAR DISTRIBUTION 10-YRS STORM

              SUBBASIN RUNOFF DATA

158 BA          SUBBASIN CHARACTERISTICS
                      TAREA          .03  SUBBASIN AREA

                PRECIPITATION DATA

PH                                    DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
```

```
.55    1.31    3.00    3.70    4.10    5.40    6.60    7.60     .00     .00     .00     .00

                                   STORM AREA =      .03

159 LS        SCS LOSS RATE
                 STRTL        .53  INITIAL ABSTRACTION
                CRVNBR      79.00  CURVE NUMBER
                 RTIMP        .00  PERCENT IMPERVIOUS AREA

160 UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG        .10  LAG

                                          ***

                                   UNIT HYDROGRAPH
                                 8 END-OF-PERIOD ORDINATES
61.      91.      40.      15.       6.       2.       1.       0.

***      ***      ***      ***      ***

              HYDROGRAPH AT STATION       P7
                FOR PLAN 2, RATIO - 1.00

TOTAL RAINFALL =    7.60, TOTAL LOSS =    2.46, TOTAL EXCESS =    5.14

PEAK FLOW     TIME                    MAXIMUM AVERAGE FLOW
                              6-HR       24-HR      72-HR     24.92-HR
+  (CFS)      (HR)
                 (CFS)
   75.      12.17              12.         4.         4.          4.
            (INCHES)         4.083      5.136      5.136       5.136
             (AC-FT)            6.         8.         8.          8.

            CUMULATIVE AREA =     .03 SQ MI

***      ***      ***      ***      ***

              HYDROGRAPH AT STATION       P7
                FOR PLAN 2, RATIO - 1.00

PEAK FLOW     TIME                    MAXIMUM AVERAGE FLOW
                              6-HR       24-HR      72-HR     24.92-HR
+  (CFS)      (HR)
                 (CFS)
   75.      12.17              12.         4.         4.          4.
            (INCHES)         4.083      5.136      5.136       5.136
             (AC-FT)            6.         8.         8.          8.

            CUMULATIVE AREA =     .03 SQ MI

***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***  ***

167 KP        PLAN  3 FOR STATION       P7
                   TRIANGULAR DISTRIBUTION 25-YRS STORM

              SUBBASIN RUNOFF DATA

158 BA        SUBBASIN CHARACTERISTICS
                 TAREA        .03  SUBBASIN AREA

              PRECIPITATION DATA

169 PH                   DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
              ..... HYDRO-35 .....  ............... TP-40 ...............  ........... TP-49 ...........
              5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR    3-DAY   4-DAY   7-DAY  10-DAY
                .61    1.47    3.50    4.50    5.10    6.30    7.70    9.40     .00     .00     .00     .00

                                   STORM AREA =      .03

159 LS        SCS LOSS RATE
                 STRTL        .53  INITIAL ABSTRACTION
                CRVNBR      79.00  CURVE NUMBER
                 RTIMP        .00  PERCENT IMPERVIOUS AREA

160 UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG        .10  LAG

                                          ***
```

```
                                                    UNIT HYDROGRAPH
                                                 8 END-OF-PERIOD ORDINATES
          61.       91.       40.       15.        6.        2.        1.        0.

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION        P7
                      FOR PLAN 3, RATIO = 1.00

  TOTAL RAINFALL =    9.40, TOTAL LOSS =    2.58, TOTAL EXCESS =    6.82

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.92-HR
+  (CFS)      (HR)
                          (CFS)
                                   16.         5.          5.          5.
+    89.      12.17
                       (INCHES)   5.149       6.823       6.823       6.823
                        (AC-FT)     8.         10.         10.         10.

                    CUMULATIVE AREA =     .03 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION        P7
                      FOR PLAN 3, RATIO = 1.00

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.92-HR
+  (CFS)      (HR)
                          (CFS)
                                   16.         5.          5.          5.
+    89.      12.17
                       (INCHES)   5.149       6.823       6.823       6.823
                        (AC-FT)     8.         10.         10.         10.

                    CUMULATIVE AREA =     .03 SQ MI

   ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***

170 KP        PLAN  4 FOR STATION        P7
                        TRIANGULAR DISTRIBUTION 50-YRS STORM

              SUBBASIN RUNOFF DATA

158 BA          SUBBASIN CHARACTERISTICS
                     TAREA          .03  SUBBASIN AREA

                PRECIPITATION DATA

172 PH                              DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                 5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR    2-DAY   4-DAY   7-DAY  10-DAY
                  .64    1.55    3.80    5.00    5.20    7.00    8.70   10.50     .00     .00     .00     .00

                                                STORM AREA =     .03

159 LS          SCS LOSS RATE
                     STRTL          .53  INITIAL ABSTRACTION
                    CRVNBR        79.00  CURVE NUMBER
                     RTIMP          .00  PERCENT IMPERVIOUS AREA

160 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG          .10  LAG

                                                   ***

                                                    UNIT HYDROGRAPH
                                                 8 END-OF-PERIOD ORDINATES
          61.       91.       40.       15.        6.        2.        1.        0.

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION        P7
                      FOR PLAN 4, RATIO = 1.00

  TOTAL RAINFALL =   10.50, TOTAL LOSS =    2.63, TOTAL EXCESS =    7.87

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
```

```
                                        6-HR        24-HR        72-HR      24.92-HR
+   6)        (HR)
                        (CFS)
                                        18.          6.           6.           6.
+   97.       12.17
                      (INCHES)        5.841        7.869        7.869        7.869
                       (AC-FT)          9.          12.          12.          12.

                      CUMULATIVE AREA =      .03 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION        P7
                        FOR PLAN 4, RATIO = 1.00

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.92-HR
+  (CFS)       (HR)
                        (CFS)
                                        18.          6.           6.           6.
+   97.       12.17
                      (INCHES)        5.841        7.869        7.869        7.869
                       (AC-FT)          9.          12.          12.          12.

                      CUMULATIVE AREA =      .03 SQ MI


***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***

173 KP        PLAN  5 FOR STATION        P7
                        TRIANGULAR DISTRIBUTION 100-YRS STORM

              SUBBASIN RUNOFF DATA

150 BA          SUBBASIN CHARACTERISTICS
                     TAREA          .03  SUBBASIN AREA

                PRECIPITATION DATA

PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .99    2.15    4.40    5.20    6.10    8.00    9.70   11.50     .00     .00     .00     .00

                                                STORM AREA =      .03

159 LS          SCS LOSS RATE
                     STRTL          .53  INITIAL ABSTRACTION
                    CRVNBR        79.00  CURVE NUMBER
                     RTIMP          .00  PERCENT IMPERVIOUS AREA

160 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG          .10  LAG

                                                  ***

                                              UNIT HYDROGRAPH
                                          8 END-OF-PERIOD ORDINATES
              61.       91.       40.       15.        6.        2.        1.        0.

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION        P7
                        FOR PLAN 5, RATIO = 1.00

   TOTAL RAINFALL =   11.50, TOTAL LOSS =    2.67, TOTAL EXCESS =    8.83

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.92-HR
+  (CFS)       (HR)
                        (CFS)
                                        20.          7.           6.           6.
+   138.      12.17
                      (INCHES)        6.784        8.828        8.828        8.828
                       (AC-FT)         10.          13.          13.          13.

                      CUMULATIVE AREA =      .03 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION        P7
```

FOR PLAN 5, RATIO = 1.00

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+		(CFS)	20.	7.	6.	6.
+ 138.	12.17	(INCHES)	6.794	8.828	8.828	8.828
		(AC-FT)	10.	13.	13.	13.

CUMULATIVE AREA = .03 SQ MI

*** ***

```
**************
*            *
*     COMB3  *
*            *
**************
```

176 KK

P1+P7

178 HC HYDROGRAPH COMBINATION
ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

*** *** *** *** ***

HYDROGRAPH AT STATION COMB3
FOR PLAN 1, RATIO = 1.00

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+		(CFS)	23.	7.	7.	7.
+ 106.	12.33	(INCHES)	1.988	2.397	2.397	2.397
		(AC-FT)	12.	14.	14.	14.

CUMULATIVE AREA = .11 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION COMB3
FOR PLAN 2, RATIO = 1.00

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+		(CFS)	47.	15.	14.	14.
+ 189.	12.33	(INCHES)	4.015	5.050	5.050	5.050
		(AC-FT)	23.	29.	29.	29.

CUMULATIVE AREA = .11 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION COMB3
FOR PLAN 3, RATIO = 1.00

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+		(CFS)	59.	20.	19.	19.
+ 235.	12.33	(INCHES)	5.081	6.728	6.728	6.728
		(AC-FT)	29.	39.	39.	39.

CUMULATIVE AREA = .11 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION COMB3

```
                    FOR PLAN 4, RATIO = 1.00

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR      24.92-HR
+ (CFS)        (HR)
                          (CFS)
+    261.      12.33                67.          23.          22.          22.
                       (INCHES)    5.768        7.770        7.770        7.770
                        (AC-FT)     33.          45.          45.          45.

                       CUMULATIVE AREA =      .11 SQ MI

   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION     COMB3
                       FOR PLAN 5, RATIO = 1.00

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR      24.92-HR
+ (CFS)        (HR)
                          (CFS)
+    320.      12.33                78.          25.          25.          25.
                       (INCHES)    6.704        8.726        8.726        8.726
                        (AC-FT)     39.          51.          51.          51.

                       CUMULATIVE AREA =      .11 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
179 KK      *        P4  *
            *            *
            **************

   ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

180 KP      PLAN  1 FOR STATION       P4
                        TRIANGULAR DISTRIBUTION 2-YRS STORM

            SUBBASIN RUNOFF DATA

181 BA        SUBBASIN CHARACTERISTICS
                 TAREA          .06  SUBBASIN AREA

              PRECIPITATION DATA

186 PH                          DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
              ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
              5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                .47    1.04    2.10    2.50    2.70    3.30    4.00    4.60     .00     .00     .00     .00

                                          STORM AREA =      .06

182 LS        SCS LOSS RATE
                 STRTL          .58  INITIAL ABSTRACTION
                CRVNBR        77.64  CURVE NUMBER
                 RTIMP          .00  PERCENT IMPERVIOUS AREA

183 UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG          .08  LAG

                                              ***

                                          UNIT HYDROGRAPH
                                       7 END-OF-PERIOD ORDINATES
            170.      180.       58.       19.        6.        2.        0.

   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       P4
                       FOR PLAN 1, RATIO = 1.00

 TOTAL RAINFALL =    4.60, TOTAL LOSS =    2.25, TOTAL EXCESS =    2.35
```

```
PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR      24.92-HR
+ (CFS)        (HR)
                          (CFS)
+   94.        12.17                12.          4.           3.           3.
                          (INCHES)  1.953       2.345        2.345        2.345
                          (AC-FT)     6.          7.           7.           7.

                          CUMULATIVE AREA =      .06 SQ MI

    ***            ***            ***            ***            ***

                          HYDROGRAPH AT STATION        P4
                            FOR PLAN 1, RATIO = 1.00

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR      24.92-HR
  (CFS)        (HR)
                          (CFS)
+   94.        12.17                12.          4.           3.           3.
                          (INCHES)  1.953       2.345        2.345        2.345
                          (AC-FT)     6.          7.           7.           7.

                          CUMULATIVE AREA =      .06 SQ MI

***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***

 187 KP        PLAN  2 FOR STATION        P4
                          TRIANGULAR DISTRIBUTION 10-YRS STORM

               SUBBASIN RUNOFF DATA

 181 BA          SUBBASIN CHARACTERISTICS
                       TAREA          .06  SUBBASIN AREA

                 PRECIPITATION DATA

                                   DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                 ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                 5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                   .55    1.31    3.00    3.70    4.10    5.40    6.60    7.60     .00     .00     .00     .00

                                              STORM AREA =      .06

 182 LS          SCS LOSS RATE
                       STRTL          .58  INITIAL ABSTRACTION
                      CRVNBR        77.64  CURVE NUMBER
                       RTIMP          .00  PERCENT IMPERVIOUS AREA

 183 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .08  LAG

                                                   ***

                                                UNIT HYDROGRAPH
                                             7 END-OF-PERIOD ORDINATES
               178.      180.       58.       19.        6.        2.        0.

    ***            ***            ***            ***            ***

                          HYDROGRAPH AT STATION        P4
                            FOR PLAN 2, RATIO = 1.00

  TOTAL RAINFALL =     7.60, TOTAL LOSS =     2.62, TOTAL EXCESS =     4.98

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR      24.92-HR
  (CFS)        (HR)
                          (CFS)
+  154.        12.08                24.          8.           7.           7.
                          (INCHES)  3.970       4.981        4.981        4.981
                          (AC-FT)    12.         15.          15.          15.

                          CUMULATIVE AREA =      .06 SQ MI

    ***            ***            ***            ***            ***
```

HYDROGRAPH AT STATION P4
FOR PLAN 2, RATIO - 1.00

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+		(CFS)	24.	8.	7.	7.
+ 154.	12.08	(INCHES)	3.970	4.981	4.981	4.981
		(AC-FT)	12.	15.	15.	15.

CUMULATIVE AREA = .06 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

190 KP PLAN 3 FOR STATION P4
TRIANGULAR DISTRIBUTION 25-YRS STORM

SUBBASIN RUNOFF DATA

181 BA SUBBASIN CHARACTERISTICS
TAREA .06 SUBBASIN AREA

PRECIPITATION DATA

192 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.61	1.47	3.50	4.50	5.10	6.30	7.70	9.40	.00	.00	.00	.00

STORM AREA = .06

182 LS SCS LOSS RATE
STRTL .58 INITIAL ABSTRACTION
CRVNBR 77.64 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

UD SCS DIMENSIONLESS UNITGRAPH
TLAG .08 LAG

***

UNIT HYDROGRAPH
7 END-OF-PERIOD ORDINATES

178. 180. 58. 19. 6. 2. 0.

*** *** *** *** ***

HYDROGRAPH AT STATION P4
FOR PLAN 3, RATIO - 1.00

TOTAL RAINFALL = 9.40, TOTAL LOSS = 2.75, TOTAL EXCESS = 6.65

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+		(CFS)	31.	10.	10.	10.
+ 187.	12.08	(INCHES)	5.037	6.652	6.652	6.652
		(AC-FT)	15.	20.	20.	20.

CUMULATIVE AREA = .06 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION P4
FOR PLAN 3, RATIO - 1.00

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+		(CFS)	31.	10.	10.	10.
+ 187.	12.08	(INCHES)	5.037	6.652	6.652	6.652
		(AC-FT)	15.	20.	20.	20.

CUMULATIVE AREA = .06 SQ MI

```
***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***

193 KP      PLAN  4 FOR STATION        P4
                        TRIANGULAR DISTRIBUTION 50-YRS STORM

            SUBBASIN RUNOFF DATA

181 BA        SUBBASIN CHARACTERISTICS
                TAREA          .06  SUBBASIN AREA

              PRECIPITATION DATA

195 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 .....  ............... TP-40 ...............  ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                    .64    1.55    3.80    5.00    5.20    7.00    8.70   10.50     .00     .00     .00     .00

                                                STORM AREA =      .06

182 LS        SCS LOSS RATE
                STRTL          .58  INITIAL ABSTRACTION
               CRVNBR        77.64  CURVE NUMBER
                RTIMP          .00  PERCENT IMPERVIOUS AREA

183 UD        SCS DIMENSIONLESS UNITGRAPH
                TLAG          .08  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                            7 END-OF-PERIOD ORDINATES
            178.      180.       58.       19.        6.        2.        0.

   ***          ***          ***          ***          ***

                HYDROGRAPH AT STATION        P4
                  FOR PLAN 4, RATIO = 1.00

TOTAL RAINFALL =   10.50, TOTAL LOSS =    2.81, TOTAL EXCESS =    7.69

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.92-HR
  (CFS)       (HR)
                          (CFS)
   204.      12.08                 35.         12.         11.         11.
                         (INCHES)  5.726      7.691       7.691       7.691
                          (AC-FT)   17.         24.         24.         24.

                CUMULATIVE AREA =      .06 SQ MI

   ***          ***          ***          ***          ***

                HYDROGRAPH AT STATION        P4
                  FOR PLAN 4, RATIO = 1.00

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.92-HR
  (CFS)       (HR)
                          (CFS)
   204.      12.08                 35.         12.         11.         11.
                         (INCHES)  5.726      7.691       7.691       7.691
                          (AC-FT)   17.         24.         24.         24.

                CUMULATIVE AREA =      .06 SQ MI

***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***

196 KP      PLAN  5 FOR STATION        P4
                        TRIANGULAR DISTRIBUTION 100-YRS STORM

            SUBBASIN RUNOFF DATA

181 BA        SUBBASIN CHARACTERISTICS
                TAREA          .06  SUBBASIN AREA

              PRECIPITATION DATA
```