FINAL DESIGN REPORT
AMOLE DEL NORTE
STORM DIVERSION FACILITIES
TIERRA BAYITA DRAINAGE FACILITIES
PHASE III

CITY PROJECT NO. 4970.03
March, 1998

Greiner Job No. E30000114 & E30000115

Prepared for:

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FINAL DRAINAGE REPORT
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TIERRA BAYITA DRAINAGE FACILITIES

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GENERAL INFORMATION

The Tierra Bayita Drainage Facilities is the third phase of the Amole Del Norte Storm Diversion Facilities. The Phase III project was begun in 1990, for the City of Albuquerque (City), with a corridor study and has progressed to the design of a large comprehensive system with several pieces of the full system being constructed and operating. This final report documents the design decisions, calculations and reports that went into bringing the project to this stage and presenting the information that is necessary to complete it. A Location Map is shown Figure 1. A Drainage Basin Map is shown in the Map Pocket.

The initial corridor study is shown in the following report which also contains a listing of the previous reports contributing information pertinent to this project.

> "Preliminary Analysis Report for Amole Del Norte Storm Diversion Facilities Tierra Bayita Drainage Facilities," August 7, 1990 COA Project No. 4076-01 by Greiner, Inc.

Because the project is quite large, it was necessary to build it in phases. Phase IIIA, IIIB and IIIC have been constructed and the design information is presented in the following reports:

> "Preliminary Design Report for Amole Del Norte Storm Diversion Facilities Tierra Bayita Drainage Facilities," COA Project No. 4076-01, October 31, 1990 by Greiner, Inc.
>
> "Calculations for Amole Del Norte Storm Diversion Facilities Phase IIIA & B," COA Project No. 4076-01, January 15, 1993 by Greiner, Inc.
>
> "Design Report for Amole Del Norte Storm Diversion Facilities Tierra Bayita Drainage Facilities Phase IIIC," COA Project No. 4076-92, June 7, 1994 by Greiner, Inc.

PROGRESSION OF HYDROLOGY AND DESIGN

The initial hydrology covering the area was presented in the "Investigation Phase Report for the Re-Evaluation Study of the Amole Del Norte Storm Diversion Facility" by Boyle Engineering Corporation in July 1984. This report addresses the entire Amole Del Norte system of which the Tierra Bayita is a part. The method used in the Boyle report to determine hydrology was the computer model HYMO. Based on

direction from the City, URS Greiner continued using the HYMO model for Phases IIIA & B. A ten percent bulking factor was added to all flows.

When the time came to design and construct Phase IIIC, AHYMO had become the accepted hydrology model for use in Albuquerque, and it was necessary to revise the hydrology model. The bulking factor was dropped to 2 percent for the final design. Final AHYMO printouts and summaries are included in the appendix for the system as currently designed and/or constructed.

Phase IIIA –

This, the first phase to be constructed with the Tierra Bayita project, consists of a concrete channel and an outfall structure as shown in the Location Map. HYMO was used to determine flows and the design calculations are presented in the previously mentioned "Calculations" report dated January 15, 1993. Record drawings are available under City Project No. 4076.90.

Even though HYMO was used initially, the channel is capable of carrying the increased flows generated by AHYMO due to the freeboard requirements dictated by the DPM.

Phase IIIB

In late 1992 Phase IIIB plans were submitted to the City and approved. This plan set consisted of the entire Tierra Bayita project except for the Phase IIIA channel which had been constructed. Phase IIIB was subsequently broken into individual projects to match available construction funding.

The portion actually constructed under the Phase IIIB title consists of a storm drain line, varying in size from 96-inch to 42-inch, extending north up Unser Boulevard from the Phase IIIA channel to the SAD 214 pond which is north of Sarricino Place. Design calculations are shown in the "Calculations" report dated January 15, 1993. HYMO was used to determine the runoff and to do pond routing. Ultimate inflow to the system was taken from the "Master Drainage Plan for the Atrisco Business Park" dated October 1993. Record drawings are available under City Project No. 4076.91.

Part of the storm drain runs through an undeveloped section of Unser Right of Way between Bridge Boulevard and Central Avenue. Rundown inlets were placed along this stretch of storm drain to collect flow and sediment now. In the future, when Unser Boulevard is extended south of Central, the rundown portion of these inlets can be removed and the structures can be converted to standard manholes and inlets.

The SAD 214 pond connection is made with a 42-inch pipe. Currently flow upstream of the pond from Atrisco Business Park is directed to the SAD 214 pond where it is released into the storm drain system. A 48-inch stub out is constructed from the most upstream point in the Unser storm drain to the west for a future connection. The "Master Drainage Plan for the Atrisco Business Park," mentioned above describes the future runoff intended for the line.

Phase IIIC

Two interconnected ponds were built in Phase IIIC at the northwest corner of 98th Street and Central Avenue. Record drawings are available under City Project No. 4076.92. A detailed analysis is presented in the Phase IIIC Design Report mentioned above, dated June 7, 1994.

This phase required the conversion to AHYMO and it actually was a very good point in the project for the change over. Although the runoff generated from the basins upstream of the ponds increased with the use of AHYMO, the pond system could be (and was) designed to handle the flow and release it at a smaller rate than planned in the original report. Pond outflow went from a planned 342 cfs to 97 cfs(ultimate) or 13 cfs (current) in the 100-year event. An orifice plate was installed on the outlet pipe to keep the current outflow at 13 cfs. The orifice plate should be removed when the ultimate storm drain is constructed providing a piped outlet to the Phase IIIA channel.

The two ponds were large enough to require State Engineer involvement. Design and construction were monitored and approved by the State.

Phase IIID and III-Future

Phase IIID plans are currently being revised for bidding and construction under City Project No. 4076.93. Originally IIID was part of the initial Phase IIIB. The rest of the project is to be done in the future, as construction funding permits.

Phase III D consists of the portion of 90-inch/84-inch pipe extending from the Phase IIIA channel west along Bridge Boulevard to just west of 82nd Street, or possibly if the Additive Alternate is chosen, to just west of 86th Street.

AHYMO modeling is of course required and even with the flow reductions mentioned in the previous section, addition of the basins downstream of the 98th/Central ponds causes a significant increase in flow to Bridge Boulevard. The resulting modifications to the system and the model have been made.

The sediment bulking factor has been dropped from 10 percent to 2 percent since all basins are considered fully developed. The Land Treatments were also reduced to more correctly reflect how development is actually occurring. The current Land Treatment values are identified on the input and output printouts included in the Appendix.

The Mountain View Mobile Home Park at the southwest corner of Central and 98th has been modeled to load on the Amole IIID system. This Park was built in 1986 and currently uses a retention pond. The approved drainage report shows a future connection to a future (Tierra Bayita) storm drain on the south side of Central Avenue. Based on the August 7, 1990 study, the Tierra Bayita system will cross Central at 90th Street and run along the north side of Central.

The ultimate routing of flow from the Park is beyond the scope of this study, however, two alternatives exist, both of which work with the design of the Phase IIID improvements.

The current AHYMO model assumes the Park runoff drains, along with the runoff from the property fronting onto Central between 98th and 94th, into the system at 90th Street and Bridge. The other possibility is to extend a pipe north across Central at 94th Street to the future extension of the Tierra Bayita system. This issue should be revisited during design of future (Phase IIIE, etc.) extensions of the Tierra Bayita system.

A pond is assumed at 90th Street and Volcano Road. This detention facility is at a very conceptual stage and no design data are available at this time. It has been modeled in AHYMO by splitting the hydrograph and with flow entering the system limited to a peak flow of 315 cfs.

The final AHYMO analysis has been modified to mesh with analysis for various developments in the south portion of the Tierra Bayita basin. Specifically the "Design Analysis Report for Sunset Gardens/Unser Boulevard Storm Drain," dated December 5, 1997, by Ryals Engineering and Construction Services has compiled all the data for the individual developments into one AHYMO model. This study has been approved by the City and it has been incorporated into our model. Based on this report, the area west of 94th Street and south of Sunset Gardens was eliminated from the project watershed. Basin 16 was also modified to allow more flow to drain to the Bridge Boulevard storm drain rather than the Sunset Gardens storm drain as was originally planned.

Figure 2 shows the internal drainage basins from the Sunset Gardens/Unser Boulevard report which are now incorporated in the attached AHYMO analysis.

PHASE IIID HYDRAULICS

The City performed a new Hydraulic Grade Line analysis on the Tierra Bayita system using the AHYMO flow rates, and the results are shown in the Appendix and the HGL is shown on the plans. The Phase IIID system is designed for pressure conditions with some flow draining in Bridge Boulevard. The flow beyond the capacity of the storm drain will flow overland in Bridge to the rundowns provided in the Phase IIIA channel. Calculations attached in the Appendix identify a street capacity of 74 cfs with the flow at the top of curb and the tailwater at 1 foot.

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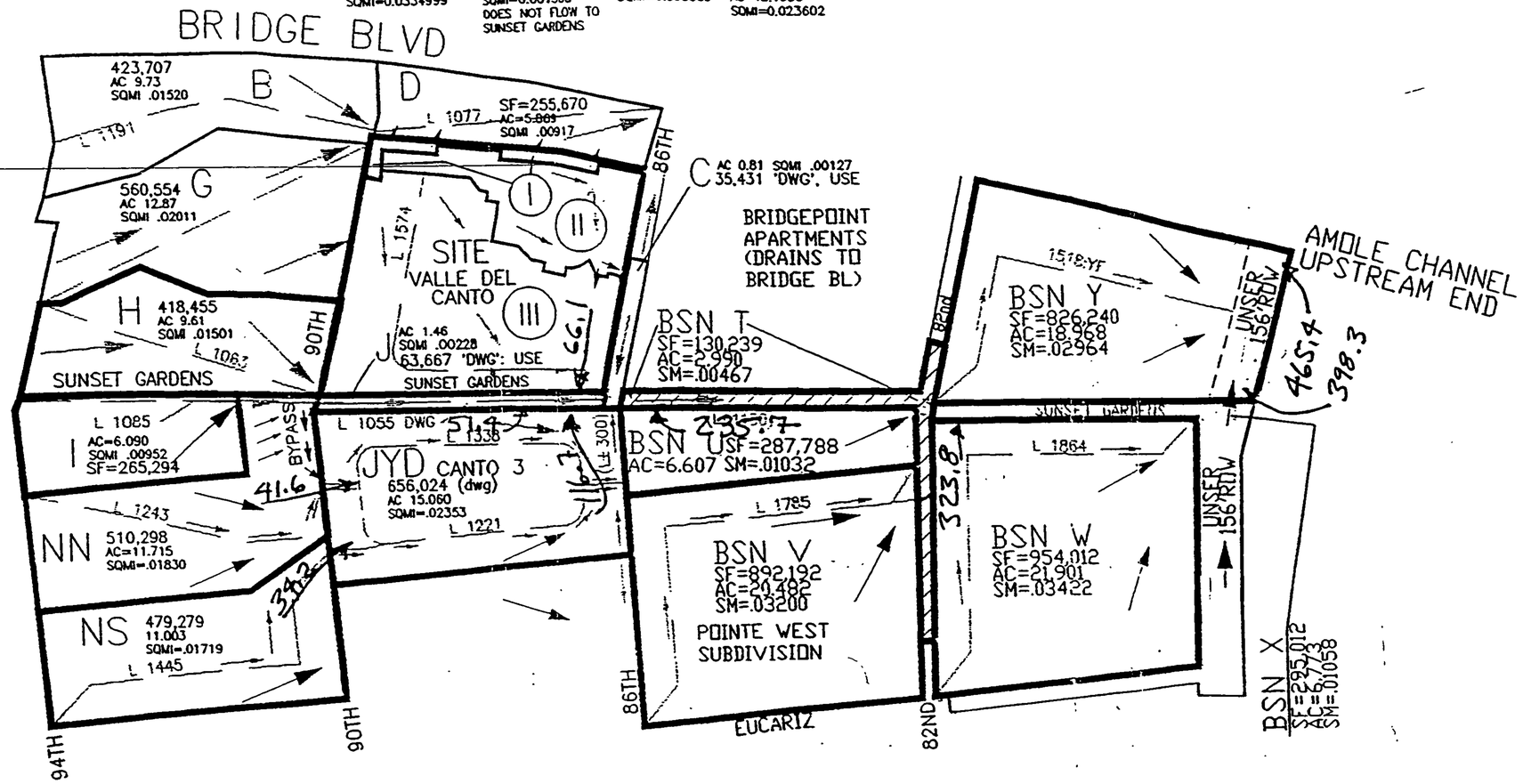
VALLE DEL CANTO SITE (PH'S I & II)

ENTIRE (ALL) SITE	BASIN SITE-1	BASIN SITE-2	BASIN SITE-3
SF=933,903	SF=42,044	SF=233,858	(ALL SITE – (1&2))
AC=21.4395	AC=0.9652	AC=5.3686	SF=658,001±
SQMI=0.0334999	SQMI=0.001508	SQMI=0.008389	AC=15.1056
	DOES NOT FLOW TO SUNSET GARDENS		SQMI=0.023602



DWG: VCOFF7 DATE: 11/20/97 TIME: 22:36 T. GREEN

0 500 1000 1500

"FUTURE" BASINS FOR SUNSET/UNSER STORM SEWER

ALL BASINS IN FUTURE DEVELOPMENT CONDITION, INCLUDING Y. SG (SUNSET GARDENS) SD (STORM DRAIN) COMPLETE TO UNSER THEN NORTH TO AMOLE. NO FLOW FROM WEST OF 94th ST; SOUTH OF SG, 94th DRAINS SOUTH PER DESIGN BY ANDREWS, ASBURY, AND ROBERT. NORTH OF SG, 94TH DRAINS TO CENTRAL/BRIDGE (TIERRA BAYITA) SD PER GRADES APPROVED WITH MOBILE HOME PARK. SG SD COMPLETE TO UNSER THEN TO AMOLE. HIGH POINT IN 90th 1 LOT N OF EUCARIZ ASSUMED PER SAD 222 & TOWER/UNSER DMP. FLOW INTO WEST END OF ALLEY AT 90th TO BE HELD TO EXISTING CONDITIONS OR LESS. PROBABLY BY STORM DRAIN TO BRIDGE BLVD. FLOW FROM BASINS B, G, & D SHOWN FOR INFO ONLY: NO FLOW TO SG SD.

MAP TAKEN FROM: SUNSET GARDENS/UNSER BOULEVARD STORM DRAIN

BY: RYALS ENGINEERING & CONSTRUCTION SERVICES

DATED 12/5/97

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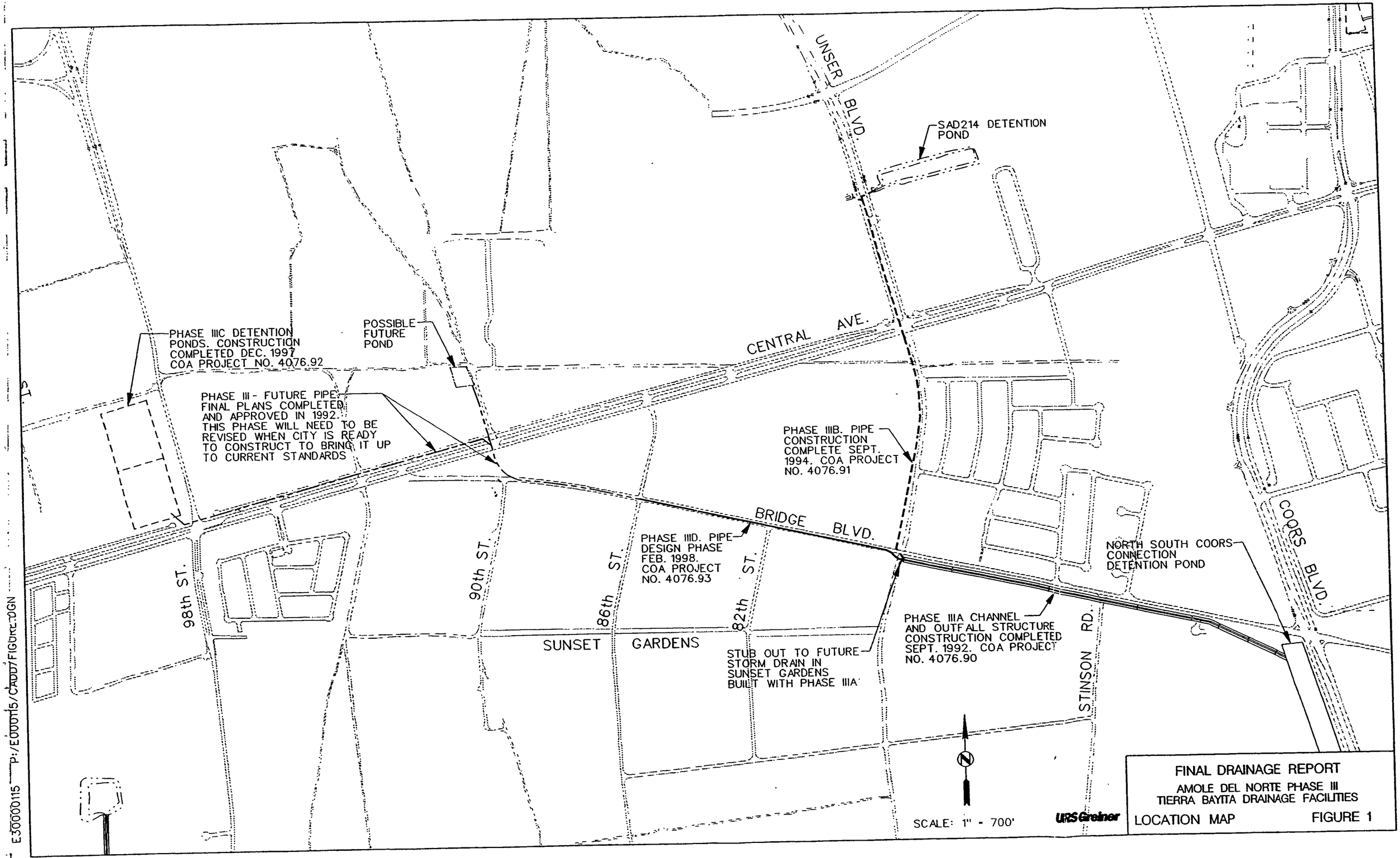
TIERRA BAYITA DRAINAGE FACILITIES

SUNSET GARDENS/UNSER BOULEVARD STORM DRAIN

URS Greiner

DRAINAGE BASINS FIGURE 2



E30000115 P:/E00015/CADD/FIGURE.DGN

APPENDIX

AHYMO SUMMARIES
AHYMO INPUT
AHYMO OUTPUT

FILENAMES:

AMOLE.DAT - Drainage basins downstream of 98th/Central ponds
AB100.DAT - Drainage basins to 98th/Central ponds

HYDRAULIC GRADE LINE ANALYSIS

BRIDGE BOULEVARD STREET CAPACITY

The following AHYMO summaries and output files assume:

Ultimate Developed conditions

100 year flow

2% bulking factor

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =02/26/1998
INPUT FILE = AMOLE.DAT USER NO.= GREINRNM.STE

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	PAGE = 1
*S 100 YEAR, 6 HOUR STORM											
RAINFALL TYPE= 1										RAIN6=	2.210
*S ALL FLOWS INCLUDE A 2% BULKING FACTOR											
SEDIMENT BULK										PK BF =	1.02
COMPUTE NM HYD	11D	-	11	.02500	21.77	.615	.46095	1.533	1.361	PER IMP=	.00
COMPUTE NM HYD	10D	-	10	.03360	36.63	1.108	.61847	1.533	1.703	PER IMP=	8.00
ADD HYD	10.10	10&11	1	.05860	58.40	1.723	.55127	1.533	1.557		
ROUTE	R1	1	2	.05860	42.04	1.723	.55127	1.600	1.121		
COMPUTE NM HYD	12D	-	12	.24070	462.31	20.498	1.59678	1.567	3.001	PER IMP=	65.00
ADD HYD	R12	12& 2	4	.29930	501.92	22.221	1.39208	1.567	2.620		
DIVIDE HYD	PIPE	4	3	.26269	315.00	19.503	1.39208	1.500	1.874		
	POND	AND	5	.03661	186.92	2.718	1.39207	1.567	7.978		
ROUTE	RR12	3	4	.26269	315.00	19.503	1.39208	1.667	1.874		
*s RECALL FLOW FROM AMOLE DEL NORTE PHASE IIIC - DETENTION BASINS											
RECALL HYD	501.00	-	10	1.06120	97.00	101.925	1.80088	2.950	.143		
COMPUTE NM HYD	19D	-	19	.08970	202.80	8.212	1.71647	1.533	3.533	PER IMP=	75.00
ADD HYD	19.10	19&10	5	1.15090	239.79	102.748	1.67393	1.567	.326		
ROUTE	R19.1	5	6	1.15090	236.32	102.630	1.67200	1.567	.321		
ADD HYD	19.20	6& 4	7	1.41359	551.30	122.133	1.61998	1.567	.609		
ROUTE	19.30	7	8	1.41359	551.28	122.090	1.61941	1.600	.609		
COMPUTE NM HYD	16A	-	1	.01282	34.51	1.253	1.83290	1.500	4.206	PER IMP=	85.00
COMPUTE NM HYD	16F	-	2	.03493	80.83	2.847	1.52798	1.500	3.616	PER IMP=	63.00
ADD HYD	16F.1	1& 2	3	.04775	115.33	4.100	1.60983	1.500	3.774		
ROUTE	16F.2	3	4	.04775	112.16	4.100	1.60984	1.533	3.670		
COMPUTE NM HYD	16B	-	1	.01520	40.91	1.486	1.83290	1.500	4.205	PER IMP=	85.00
ADD HYD	16B.1	1& 4	3	.06295	151.18	5.586	1.66369	1.533	3.753		
COMPUTE NM HYD	16G	-	2	.02011	49.99	1.770	1.65010	1.500	3.884	PER IMP=	70.00
ADD HYD	16G.1	2& 3	16	.08306	199.09	7.355	1.66040	1.533	3.745		
ADD HYD	16.10	16& 8	9	1.49665	730.13	129.445	1.62169	1.533	.762		
ROUTE	16.20	9	1	1.49665	730.06	129.412	1.62127	1.567	.762		
COMPUTE NM HYD	16D	-	10	.01119	30.12	1.094	1.83290	1.500	4.206	PER IMP=	85.00
ADD HYD	16D.1	1&10	1	1.50784	754.97	130.506	1.62285	1.567	.782		
COMPUTE NM HYD	17W	-	17	.08020	173.01	7.342	1.71647	1.567	3.371	PER IMP=	75.00
DIVIDE HYD	86TH	17	17	.06327	82.00	5.792	1.71646	1.433	2.025		
	82TH	AND	18	.01693	91.01	1.550	1.71646	1.567	8.398		
ADD HYD	17.10	17& 1	2	1.57111	836.97	136.298	1.62662	1.567	.832		
ROUTE	17.20	2	3	1.57111	835.00	136.233	1.62584	1.567	.830		
ROUTE	17.30	3	4	1.57111	834.48	136.215	1.62562	1.567	.830		
ADD HYD	17.40	4&18	5	1.58804	925.49	137.765	1.62659	1.567	.911		
COMPUTE NM HYD	BPD	-	6	.03420	77.22	2.615	1.43350	1.500	3.528	PER IMP=	50.00
ADD HYD	6.10	6& 5	7	1.62224	991.01	140.380	1.62252	1.567	.955		
ROUTE	6.20	7	8	1.62224	978.45	140.302	1.62162	1.600	.942		
COMPUTE NM HYD	21D	-	21	.01010	24.83	.881	1.63469	1.500	3.841	PER IMP=	70.00
ADD HYD	21.10	21& 8	6	1.63234	995.91	141.182	1.62170	1.600	.953		
*s UNSER BOULEVARD FLOWS TO CHANNEL - FLOW FROM NORTH OF BRIDGE BLVD											
*s THE FOLLOWING HYDROGRAPH IS TAKEN FROM THE MASTER DRAINAGE PLAN FOR THE											
*s ATRISCO BUSINESS PARK - SEPTEMBER 1992 & REVISED MARCH 1993 & SEPT 1993											
*s by Easterling and Associates & REPRESENTS THE ENTIRE UNSER DIVERSION											
RECALL HYD	180.16	-	2	.67890	248.30	73.770	2.03740	1.550	.571		

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ROUTE	R2	2	3	.67890	247.01	73.770	2.03740	1.600	.568	
ROUTE	R3	3	4	.67890	247.54	73.770	2.03740	1.600	.570	
COMPUTE NM HYD	13D	-	13	.16640	342.65	15.680	1.76677	1.567	3.217	PER IMP= 80.00
ROUTE	R13	13	5	.16640	336.38	15.680	1.76678	1.600	3.159	
ADD HYD	13.10	5& 4	5	.84530	583.91	86.967	1.92905	1.600	1.079	
COMPUTE NM HYD	17E	-	17	.06510	171.89	6.190	1.78282	1.500	4.126	PER IMP= 80.00
ADD HYD	17.10	17& 5	7	.91040	703.48	93.157	1.91859	1.567	1.207	
ROUTE	R6	7	8	.91040	688.34	93.079	1.91700	1.633	1.181	
*S FLOW FROM NORTH ON UNSER TO CHANNEL - ADD TO FLOW FROM BRIDGE										
ADD HYD	CHANNEL	8& 6	9	2.54274	1682.47	234.261	1.72743	1.600	1.034	
*s UNSER BLVD - FLOW FROM SOUTH OF BRIDGE EMPTYING TO THE CHANNEL										
*s THE FOLLOWING IS TAKEN FROM SUNSET GARDENS/UNSER BLVD STORM DRAIN										
*s DESIGN ANALYSIS REPORT, DATED 12/5/97 BY RYALS ENGINEERING AND										
*s CONSTRUCTION SERVICES AS REVISED BY TUCKER GREEN, PER SE ENGENEERING										
COMPUTE NM HYD	I	-	1	.00952	18.97	.626	1.23320	1.500	3.113	PER IMP= 38.00
COMPUTE NM HYD	H	-	2	.01501	37.31	1.321	1.65010	1.500	3.884	PER IMP= 70.00
ADD HYD	208.00	1& 2	3	.02453	56.28	1.947	1.48828	1.500	3.585	
*s DIVIDE SO 1ST 8.6 CFS (ID=6) S ON 90TH (ON HOLD): ID=4 E ON SUNSET GARDENS										
DIVIDE HYD	90.S.PAST.SG	3	6	.01035	8.60	.821	1.48828	1.333	1.298	
	SG.E.OF.90	AND	4	.01418	47.68	1.126	1.48828	1.500	5.253	
ROUTE MCUNGE	209.00	4	5	.01418	47.57	1.119	1.47973	1.567	5.241	CCODE = .2
COMPUTE NM HYD	J	-	1	.00228	6.09	.221	1.81798	1.500	4.172	PER IMP= 85.00
ADD HYD	210.00	1& 5	3	.01646	53.08	1.340	1.52653	1.533	5.038	
COMPUTE NM HYD	SITE.II	-	1	.00839	19.75	.696	1.55434	1.500	3.679	PER IMP= 65.00
*S PARTIAL WATERBLOCK ==> FLOW > 11.6cfs TO 86TH										
DIVIDE HYD	S2.TO.S3	1	2	.00732	11.60	.607	1.55431	1.433	2.475	
	S2.TO.86TH	AND	7	.00107	8.15	.088	1.55431	1.500	11.934	
COMPUTE NM HYD	SITE.III	-	1	.02360	55.53	1.956	1.55434	1.500	3.677	PER IMP= 65.00
ADD HYD	SITE.OUT	1& 2	16	.03092	67.13	2.563	1.55433	1.500	3.392	
*S TOTAL FLOW SUNSET GARDENS WEST OF 86TH										
ADD HYD	SG.W.OF.86	3&16	5	.04738	118.05	3.904	1.54467	1.533	3.893	
COMPUTE NM HYD	C	-	1	.00127	3.50	.128	1.88389	1.500	4.301	PER IMP= 90.00
ADD HYD	218.00	1& 7	3	.00234	11.65	.216	1.73326	1.500	7.787	
ADD HYD	86&SG.N&W	3& 5	7	.04972	128.76	4.120	1.55353	1.533	4.046	
COMPUTE NM HYD	NN	-	1	.01830	33.56	1.116	1.14350	1.500	2.865	PER IMP= 36.40
ADD HYD	INTO.JYDN	1& 6	3	.02865	42.16	1.937	1.26804	1.500	2.299	
ROUTE MCUNGE	300.00	3	5	.02865	40.55	1.927	1.26109	1.600	2.211	CCODE = .1
COMPUTE NM HYD	NS	-	1	.01719	34.79	1.185	1.29219	1.500	3.162	PER IMP= 46.60
ROUTE MCUNGE	302.00	1	2	.01719	34.26	1.185	1.29208	1.567	3.114	CCODE = .2
ADD HYD	304.00	2& 5	3	.04584	73.97	3.111	1.27270	1.600	2.521	
COMPUTE NM HYD	JYD	-	17	.02353	55.37	1.951	1.55434	1.500	3.677	PER IMP= 65.00
ADD HYD	JYD.E.AT.86	3&17	4	.06937	118.68	5.062	1.36823	1.533	2.673	
ROUTE MCUNGE	86.S.OF.SG	4	5	.06937	118.57	5.060	1.36766	1.567	2.671	CCODE = .1
ADD HYD	TOT.SG&86	5& 7	6	.11909	240.79	9.180	1.44526	1.533	3.159	
ROUTE	308.00	6	5	.11909	238.77	9.180	1.44527	1.567	3.133	
COMPUTE NM HYD	T	-	1	.00467	12.45	.453	1.81798	1.500	4.166	PER IMP= 85.00
ADD HYD	310.00	1& 5	3	.12376	249.07	9.632	1.45932	1.567	3.145	
COMPUTE NM HYD	U	-	1	.01032	25.09	.892	1.62025	1.500	3.799	PER IMP= 70.00
ADD HYD	312.00	1& 3	19	.13408	270.07	10.524	1.47171	1.567	3.147	
COMPUTE NM HYD	V	-	11	.03200	67.84	2.315	1.35662	1.500	3.313	PER IMP= 50.00
ADD HYD	SG.AT.82ND	11&19	3	.16608	330.10	12.839	1.44953	1.533	3.106	
ROUTE	314.00	3	5	.16608	328.29	12.839	1.44953	1.567	3.089	

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
COMPUTE NM HYD	W	-	12	.03422	77.86	2.716	1.48844	1.500	3.555	PER IMP= 60.00
ADD HYD	316.00	12& 5	3	.20030	394.29	15.556	1.45618	1.533	3.076	
COMPUTE NM HYD	X	-	13	.01058	27.37	.989	1.75207	1.500	4.042	PER IMP= 80.00
ADD HYD	SG.AT.UNSER	13& 3	4	.21088	420.45	16.544	1.47102	1.533	3.115	
ROUTE	318.00	4	5	.21088	418.41	16.544	1.47102	1.567	3.100	
COMPUTE NM HYD	Y	-	14	.01954	52.58	1.910	1.83290	1.500	4.205	PER IMP= 85.00
*s TOTAL FLOW FROM UNSER APROX 300' S OF AMOLE CHANNEL										
ADD HYD	FUT.TO.AMOLE	14& 5	7	.23042	468.17	18.455	1.50171	1.533	3.175	
*S TOTAL FLOW TO HEAD OF CONCRETE CHANNEL										
ADD HYD	CHANNEL	7& 9	5	2.77316	2112.30	252.716	1.70867	1.600	1.190	
ROUTE	R5	5	6	2.77316	2113.42	252.546	1.70752	1.600	1.191	
COMPUTE NM HYD	18W	-	18	.11220	231.19	9.624	1.60831	1.567	3.220	PER IMP= 68.00
ADD HYD	18.10	18& 6	7	2.88536	2330.57	262.170	1.70366	1.600	1.262	
ROUTE	R7	7	8	2.88536	2333.99	262.092	1.70316	1.600	1.264	
COMPUTE NM HYD	21E	-	21	.06560	170.43	6.024	1.72180	1.500	4.059	PER IMP= 70.00
ADD HYD	21.10	21& 8	9	2.95096	2453.09	268.116	1.70357	1.600	1.299	
ROUTE	R9	9	10	2.95096	2457.37	268.063	1.70324	1.600	1.301	
COMPUTE NM HYD	18E	-	18	.00750	17.13	.620	1.54928	1.500	3.569	PER IMP= 70.00
ADD HYD	18.10	18&10	11	2.95846	2469.38	268.683	1.70285	1.600	1.304	
ROUTE	R11	11	12	2.95846	2473.55	268.617	1.70243	1.600	1.306	
FINISH										

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =02/23/1998
INPUT FILE = P:\AHYMO\AB100.DAT USER NO.= GREINRNM.STE

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
										TIME= .00
START										RAIN24= 2.700
RAINFALL TYPE= 2										
*s DIVIDE HYD IS USED TO SIMULATE A BULKING FACTOR										
COMPUTE NM HYD	108.40	-	5	.14260	363.67	15.466	2.03361	1.500	3.985	PER IMP= 70.00
DIVIDE HYD	108.40	5	5	.14260	381.85	16.240	2.13528.	1.500	4.184	
	.00	AND	16	.14260	18.18	.773	.10168	1.500	.199	
COMPUTE NM HYD	101.00	-	1	.02600	34.91	.977	.70476	1.500	2.098	PER IMP= .00
DIVIDE HYD	101.00	1	1	.02600	38.40	1.075	.77523	1.500	2.308	
	.00	AND	16	.02600	3.49	.098	.07048	1.500	.210	
ROUTE	101.80	1	2	.02600	36.46	1.075	.77528	1.550	2.191	
COMPUTE NM HYD	108.30	-	1	.14780	312.33	14.570	1.84830	1.550	3.302	PER IMP= 57.00
DIVIDE HYD	108.30	1	1	.14780	327.95	15.298	1.94071	1.550	3.467	
	.00	AND	16	.14780	15.62	.728	.09241	1.550	.165	
ADD HYD	108.39	1& 2	3	.17380	364.41	16.373	1.76636	1.550	3.276	
ROUTE	108.38	3	2	.17380	357.91	16.373	1.76637	1.550	3.218	
COMPUTE NM HYD	108.20	-	7	.17100	376.60	17.296	1.89651	1.500	3.441	PER IMP= 61.17
DIVIDE HYD	108.20	7	7	.17100	395.43	18.161	1.99133	1.500	3.613	
	.00	AND	16	.17100	18.83	.865	.09483	1.500	.172	
*S COMBINE HYD'S 108.38 AND 108.2										
ADD HYD	108.29	7& 2	7	.34480	752.47	34.534	1.87793	1.550	3.410	
COMPUTE NM HYD	102.00	-	2	.28100	370.96	17.592	1.17382	1.550	2.063	PER IMP= 31.00
DIVIDE HYD	102.00	2	2	.28100	389.50	18.471	1.23250	1.550	2.166	
	.00	AND	16	.28100	18.55	.880	.05869	1.550	.103	
ROUTE	102.80	2	3	.28100	391.90	18.471	1.23251	1.600	2.179	
COMPUTE NM HYD	108.10	-	4	.17130	431.18	18.153	1.98693	1.500	3.933	PER IMP= 67.00
DIVIDE HYD	108.10	4	4	.17130	452.74	19.060	2.08627	1.500	4.130	
	.00	AND	16	.17130	21.56	.908	.09935	1.500	.197	
ADD HYD	108.17	4& 3	2	.45230	753.68	37.531	1.55585	1.550	2.604	
ROUTE	108.18	2	8	.45230	743.28	37.531	1.55585	1.550	2.568	
ADD HYD	108.90	7& 8	9	.79710	1495.75	72.065	1.69518	1.550	2.932	
ROUTE RESERVOIR	502.00	9	10	.79710	308.18	72.060	1.69506	2.100	.604	AC-FT= 46.636
COMPUTE NM HYD	109.00	-	1	.07200	188.50	8.466	2.20466	1.500	4.091	PER IMP= 82.00
DIVIDE HYD	109.00	1	1	.07200	197.93	8.889	2.31489	1.500	4.295	
	.00	AND	16	.07200	9.43	.423	.11023	1.500	.205	
ROUTE	109.19	1	6	.07200	194.20	8.889	2.31490	1.500	4.214	
COMPUTE NM HYD	109.10	-	1	.04950	134.34	5.954	2.25532	1.500	4.241	PER IMP= 85.00
DIVIDE HYD	109.10	1	1	.04950	141.06	6.252	2.36808	1.500	4.453	
	.00	AND	16	.04950	6.72	.298	.11277	1.500	.212	
ADD HYD	109.39	6& 1	6	.12150	335.26	15.141	2.33656	1.500	4.311	
ADD HYD	109.49	6& 5	6	.26410	717.11	31.380	2.22788	1.500	4.243	
ADD HYD	109.59	6&10	6	1.06120	765.45	103.441	1.82766	1.500	1.127	
ROUTE RESERVOIR	501.00	6	10	1.06120	100.43	101.931	1.80099	2.800	.148	AC-FT= 31.562
FINISH										

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*  AMOLE DEL NORTE STORM DRAIN FACILITIES PHASE III D MODEL - DECEMBER 1995
*    FULLY DEVELOPED CONDITIONS  100 YEAR, 6 HOUR STORM
*  GREINER JN E30000114
*  COA PROJECT 4076.92
*  This model is an update of the previous HYMO model for the Amole Del
*    Norte drainage system.  The HYMO was done in 1990.  Basin
*    areas have been revised somewhat due to the current condition changing
*    from 1990 and incorporation of newer Master Drainage Reports for
*    the area
*  ------------------------------------------------------------------
*  Developed conditions are to be modeled.  This was done by assuming
*    concrete trapazoidal channels for routing purposes using the
*    existing slopes and lengths.  channels - 10'bottom w/ 2:1 ss
*  ------------------------------------------------------------------
*  Station references are from Amole Del Norte Storm Diversion Facilities
*  Tierra Bayita Drainage Facilities Phases IIIB or IIIA
*******************************************************************
*S  100 YEAR, 6 HOUR STORM
RAINFALL              TYPE=1   QUARTER HR = 0  ONE HR RAIN=1.90
                      SIX HR RAIN=2.21   TWENTYFOUR HR RAIN=2.70
*
*S ALL FLOWS INCLUDE A 2% BULKING FACTOR
SEDIMENT BULK         CODE=1  BULKING FACTOR = 1.02
*
COMPUTE NM HYD        ID=11  HYD=11D  AREA=0.0250   PER A=100  PER B=0
                      PER C=0   PER D=0   TP=0.1333  MASS RAIN=-1
PRINT HYD             ID=11  CODE=1
*
COMPUTE NM HYD        ID=10  HYD=10D  AREA=0.0336   PER A=84  PER B=0
                      PER C=8   PER D=8  TP=0.1333  MASS RAIN=-1
PRINT HYD             ID=10  CODE=1
*
*ADD FLOW FROM 10D AND 11D
*    EXISTING CONDITION - THESE FLOWS ENTER 12D NEAR EACH OTHER AND CROSS
*     12D TO A POINT WHERE THEY CQMBINE. - FOR DEVELOPED MODEL ADD
*     HYDROGRAPHS THEN ROUTE THROUGH 12D IN AN ASSUMED CONCRETE CHANNEL
*     TO SIMULATE DEVELOPED CONDITIONS
ADD HYD               ID=1   HYD=10.1  ID=10  ID=11
PRINT HYD             ID=1  CODE=1
*
*ROUTE COMBINED 11/10 FLOW THROUGH 12D - USE 10 FT BOTTOM/ 2:1 SIDE SLOPE
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=0
                      MAX ELEV=6  CH SLOPE=0.0255  FP SLOPE=0.0255
                      N=0.013   DIST=34
                      DIST ELEV
                       0    6
                       12   0
                       22   0
                       34   6
COMPUTE TRAVEL TIME ID=2  REACH NO=1  NOVS=1  L=4000  SLP=0.0255
ROUTE               ID=2  HYD=R1  INFLOW ID=1  DT=0.0
PRINT HYD           ID=2  CODE=1
*
COMPUTE NM HYD      ID=12  HYD=12D  AREA=0.2407   PER A=1  PER B=19
                    PER C=15   PER D=65  TP=0.2051  MASS RAIN=-1
PRINT HYD           ID=12  CODE=1
*
*ADD 12D AND ROUTED 11&10
ADD HYD             ID=4  HYD=R12  ID=12  ID=2
PRINT HYD           ID=4  CODE=1
*
*ADD A DIVIDE HYD HERE TO SIMULATE LIMITING THE FLOW TO THE DOWNSTREAM
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*  SYSTEM TO 331 CFS - WHICH WAS THE ORIGINAL DESIGN FLOW
*  IN THE FUTURE COA IS PLANNING ON PROBABLY BUILDING A POND TO LIMIT FLOW
DIVIDE HYD          ID=4  Q=315   ID=3  HYD=PIPE
                                  ID=5  HYD=POND
PRINT HYD           ID=3  CODE=1
PRINT HYD           ID=5  CODE=1
*
*ROUTE THROUGH 66INCH STORM DRAIN - USE FRICTION SLOPE INSTEAD OF PIPE SLOPE
COMPUTE RATING CURVE CID=1  VSNO=1  CODE= -1  SLP=0.0038
                     DIA=66    N=0.013
COMPUTE TRAVEL TIME ID=4  REACH NO=1  NOVS=1  L=630  SLP=0.0038
ROUTE               ID=4  HYD=RR12  INFLOW ID=3  DT=0.0
PRINT HYD           ID=4  CODE=1
*
*s RECALL FLOW FROM AMOLE DEL NORTE PHASE IIIC - DETENTION BASINS
RECALL HYD          ID=10 HYD=      501.00 DT=  .050000 HRS DA=   1.0612 SM
                    PEAK=     97.003CFS  RO= 1.8009 INCHES  NO PTS=600
                    FLOW RATES
                        .000       .000       .000       .000       .000
                        .000       .000       .000       .000       .000
                        .000       .000       .000       .000       .000
                        .000       .000       .000       .000       .000
                        .000       .000       .000       .000       .039
                        .443      2.000      5.064      5.630     15.910
                      30.855     38.966     45.067     48.996     52.226
                      55.002     56.732     58.292     59.709     61.000
                      62.177     63.386     64.835     66.377     67.693
                      68.710     69.473     70.043     70.466     70.776
                      71.001     71.185     71.357     71.517     71.669
                      71.812     71.948     84.498     95.031     97.003
                      96.932     96.408     95.844     95.338     94.890
                      94.505     94.183     93.910     93.656     93.401
                      93.163     92.971     92.815     92.661     92.507
                      92.378     92.252     92.103     91.946     91.786
                      91.644     91.513     91.377     91.236     91.110
                      91.008     90.895     90.778     90.678     90.584
                      90.495     90.402     90.295     90.194     90.007
                      89.662     89.252     88.838     88.416     87.976
                      87.540     87.121     86.705     86.294     85.898
                      85.515     85.125     84.716     84.307     83.916
                      83.546     83.190     82.834     82.451     82.042
                      81.649     81.281     80.908     80.512     80.117
                      79.752     79.413     79.223     79.268     79.370
                      79.363     79.227     78.998     78.712     78.380
                      78.026     77.678     77.316     76.932     76.541
                      76.135     75.722     75.319     74.945     74.584
                      74.190     73.772     73.377     73.009     72.646
                      72.268     71.999     71.996     71.992     71.985
                      71.977     71.967     71.955     71.942     71.925
                      71.907     71.885     71.861     71.835     71.806
                      71.775     71.741     71.705     71.667     71.626
                      71.583     71.538     71.491     71.442     71.390
                      71.336     71.281     71.223     71.164     71.102
                      71.039     70.973     70.906     70.837     70.767
                      70.695     70.621     70.547     70.470     70.392
                      70.312     70.232     70.149     70.065     69.980
                      69.894     69.806     69.717     69.627     69.535
                      69.442     69.348     69.253     69.157     69.059
                      68.960     68.860     68.759     68.657     68.554
                      68.450     68.343     68.234     68.124     68.011
                      67.896     67.779     67.660     67.539     67.417
                      67.292     67.166     67.038     66.909     66.778
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66.645	66.511	66.375	66.238	66.099
65.959	65.818	65.676	65.532	65.387
65.241	65.093	64.945	64.795	64.645
64.493	64.341	64.187	64.033	63.853
63.666	63.479	63.290	63.101	62.911
62.720	62.529	62.336	62.142	61.946
61.749	61.551	61.352	61.152	60.951
60.749	60.546	60.342	60.137	59.932
59.726	59.520	59.313	59.105	58.897
58.688	58.479	58.270	58.060	57.850
57.640	57.430	57.219	57.008	56.797
56.586	56.375	56.164	55.953	55.742
55.531	55.320	55.109	54.856	54.557
54.259	53.962	53.666	53.371	53.077
52.784	52.492	52.201	51.911	51.621
51.333	51.046	50.759	50.474	50.190
49.906	49.625	49.344	49.064	48.785
48.508	48.232	47.957	47.683	47.410
47.139	46.870	46.601	46.334	46.068
45.804	45.541	45.280	45.019	44.760
44.502	44.246	43.991	43.738	43.486
43.235	42.980	42.627	42.278	41.931
41.588	41.248	40.911	40.577	40.247
39.919	39.595	39.273	38.955	38.639
38.327	38.017	37.711	37.407	37.106
36.808	36.513	36.221	35.933	35.646
35.363	35.082	34.803	34.528	34.255
33.984	33.716	33.451	33.189	32.929
32.672	32.417	32.165	31.915	31.668
31.423	31.180	30.941	30.703	30.468
30.235	30.004	29.776	29.550	29.326
29.104	28.885	28.668	28.453	28.240
28.030	27.821	27.614	27.410	27.207
27.007	26.477	25.950	25.438	24.942
24.461	23.995	23.542	23.102	22.676
22.263	21.863	21.474	21.096	20.729
20.373	20.028	19.693	19.368	19.052
18.746	18.449	18.160	17.878	17.605
17.341	17.085	16.837	16.595	16.360
16.131	15.910	15.696	15.486	15.284
15.086	14.895	14.709	14.529	14.353
14.182	14.016	13.855	13.700	13.548
13.400	13.257	13.117	12.981	12.848
12.719	12.594	12.473	12.356	12.241
12.130	12.021	11.916	11.813	11.712
11.614	11.519	11.427	11.337	11.249
11.164	11.082	11.001	10.922	10.844
10.768	10.695	10.624	10.556	10.489
10.424	10.360	10.298	10.237	10.177
10.120	10.063	10.007	9.952	9.897
9.845	9.795	9.746	9.699	9.653
9.607	9.562	9.517	9.475	9.434
9.393	9.351	9.301	9.234	9.149
9.052	8.948	8.839	8.728	8.615
8.499	8.383	8.265	8.146	8.026
7.906	7.786	7.665	7.544	7.423
7.302	7.182	7.061	6.942	6.823
6.704	6.586	6.468	6.349	6.231
6.113	6.000	5.993	5.987	5.980
5.973	5.967	5.960	5.952	5.945
5.938	5.930	5.923	5.915	5.907
5.899	5.891	5.883	5.875	5.867

5.859	5.851	5.842	5.834	5.826
5.817	5.809	5.800	5.791	5.783
5.774	5.765	5.757	5.748	5.739
5.730	5.721	5.712	5.703	5.695
5.686	5.677	5.668	5.659	5.650
5.641	5.632	5.623	5.614	5.604
5.595	5.586	5.577	5.568	5.559
5.550	5.541	5.532	5.523	5.514
5.505	5.496	5.487	5.478	5.468
5.459	5.450	5.441	5.432	5.423
5.414	5.405	5.396	5.387	5.378
5.369	5.360	5.351	5.342	5.333
5.324	5.315	5.306	5.298	5.289
5.280	5.271	5.262	5.253	5.244

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COMPUTE NM HYD        ID=19  HYD=19D  AREA=0.0897   PER A=0 PER B=15
                      PER C=10   PER D=75  TP=0.1714  MASS RAIN=-1
PRINT HYD             ID=19  CODE=1
*
*ADD 19D AND OUTFLOW FROM DETENTION BASINS
ADD HYD               ID=5  HYD=19.1  ID=19  ID=10
PRINT HYD             ID=5  CODE=1
*
*ROUTE FLOW ALONG CENTRAL FROM 98TH ST TO 90TH ST IN 66INCH STORM DRAIN
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.024
                      DIA=66    N=0.013
COMPUTE TRAVEL TIME ID=6  REACH NO=1  NOVS=1  L=2550  SLP=.024
ROUTE                 ID=6  HYD=R19.1  INFLOW ID=5  DT=0.0
PRINT HYD             ID=6  CODE=1
*
*ADD ROUTED FLOW FROM 12D, 10D and 11D
ADD HYD               ID=7  HYD=19.2   ID=6  ID=4
PRINT HYD             ID=7  CODE=1
*
*ROUTE FLOW TO STA 69+71 IN 84INCH STORM DRAIN
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.017
                      DIA=84    N=0.013
COMPUTE TRAVEL TIME ID=8  REACH NO=1  NOVS=1  L=813  SLP=0.017
ROUTE                 ID=8  HYD=19.3  INFLOW ID=7  DT=0.0
PRINT HYD             ID=8  CODE=1
*
*REVISE BASIN 16 NORTH TO BRING FLOW FROM MOBILE HOMES BTWN 98TH AND 94TH
*   TO THE BRIDGE STORM DRAIN & REVISE AREA BTWN 94TH AND 90TH
*   PER SUNSET GARDENS/UNSER BLVD SD REPORT (AREA PREVIOUSLY IN 16SOUTH)
*AREA NORTH OF MOBILE HOMES FRONTING ON CENTRAL AVENUE
COMPUTE NM HYD        ID=1  HYD=16A  AREA=0.01282  PER A=0  PER B=10
                      PER C=5  PER D=85  TP=0.1333  MASS RAIN=-1
PRINT HYD             ID=1  CODE=1
*
*  MOUNTAIN VIEW MOBILE HOME PARK
COMPUTE NM HYD        ID=2  HYD=16F  AREA=0.03493  PER A=2  PER B=33
                      PER C=2  PER D=63  TP=0.134  MASS RAIN=-1
PRINT HYD             ID=2  CODE=1
*
*ADD BASINS 16A AND 16F
ADD HYD               ID=3  HYD=16F.1  ID=1  ID=2
PRINT HYD             ID=3  CODE=1
*
*ROUTE THIS FLOW DOWN BRIDGE TO BRING IT TO THE PROJECT THROUGH 16B
*    ASSUME IN A PIPE
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLOPE=0.01
                      DIA= 48  N=0.013
```

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COMPUTE TRAVEL TIME ID=4  REACH NO=1  NOVS=1  L=1300  SLP=0.01
ROUTE               ID=4  HYD=16F.2  INFLOW ID=3  DT=0.0
PRINT HYD           ID=4  CODE=1
*
COMPUTE NM HYD      ID=1  HYD=16B  AREA=0.01520   PER A=0  PER B=10
                    PER C=5  PER D=85   TP=0.1333  MASS RAIN=-1
PRINT HYD           ID=1  CODE=1
*
*ADD ROUTED 16A/16F FLOW TO 16B
ADD HYD             ID=3  HYD=16B.1  ID=1  ID=4
PRINT HYD           ID=3  CODE=1
*
COMPUTE NM HYD      ID=2  HYD=16G  AREA=0.02011   PER A=0  PER B=20
                    PER C=10  PER D=70  TP=0.1333  MASS RAIN=-1
PRINT HYD           ID=2  CODE=1
*
*ADD 16G FLOW
ADD HYD             ID=16  HYD=16G.1  ID=2  ID=3
PRINT HYD           ID=16  CODE=1
*
*ADD 16 FLOW TO STORM DRAIN
ADD HYD             ID=9  HYD=16.1  ID=16  ID=8
PRINT HYD           ID=9  CODE=1
*
*ROUTE STORM DRAIN FLOW TO 86TH STREET (STA 64+34)
*  USE FRICTION SLOPE IN THE PIPE
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.012
                     DIA=84    N=0.013
COMPUTE TRAVEL TIME ID=1  REACH NO=1  NOVS=1  L=537  SLP=0.012
ROUTE               ID=1  HYD=16.2  INFLOW ID=9  DT=0.0
PRINT HYD           ID=1  CODE=1
*
*BASIN ADJACENT TO BRIDGE BLVD INCLUDING HALF OF BRIDGE ROW
COMPUTE NM HYD      ID=10  HYD=16D  AREA=0.01119   PER A=0  PER B=10
                    PER C=5  PER D=85   TP=0.1333  MASS RAIN=-1
PRINT HYD           ID=10  CODE=1
*
*ADD THIS FLOW TO THE STORM DRAIN - SOUTH SIDE
ADD HYD             ID=1  HYD=16D.1  ID=1  ID=10
PRINT HYD           ID=1  CODE=1
*
COMPUTE NM HYD      ID=17  HYD=17W  AREA=0.0802   PER A=0  PER B=15
                    PER C=10  PER D=75  TP=0.1881  MASS RAIN=-1
PRINT HYD           ID=17  CODE=1
*
*DIVIDE FLOW FOR PORTION ENTERING SD AT 86TH AND PART ENTERING NEAR 82ND
DIVIDE HYD          ID=17  Q=82  ID=17  HYD=86TH
                                 ID=18 HYD=82TH
*ADD 17W TO STORM DRAIN FLOW - NORTH SIDE
ADD HYD             ID=2  HYD=17.1  ID=17  ID=1
PRINT HYD           ID=2  CODE=1
*
*ROUTE 84INCH STORM DRAIN FLOW STA 56+75 WHERE LINE IS UPSIZED TO 90INCH
*  USE FRICTION SLOPE
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.0045
                     DIA=84    N=0.013
COMPUTE TRAVEL TIME ID=3  REACH NO=1  NOVS=1  L=759  SLP=0.0045
ROUTE               ID=3  HYD=17.2  INFLOW ID=2  DT=0.0
PRINT HYD           ID=3  CODE=1
*
*ROUTE STORM DRAIN FLOW TO 82ND STREET (STA 53+70) IN 90INCH
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.012
```

```
                        DIA=90    N=0.013
COMPUTE TRAVEL TIME ID=4  REACH NO=1  NOVS=1  L=305  SLP=0.012
ROUTE               ID=4  HYD=17.3  INFLOW ID=3  DT=0.0
PRINT HYD           ID=4  CODE=1
*
*ADD FLOW FROM 17W AT 82ND STEET LOCATION (STA 53+70)
ADD HYD             ID=5  HYD=17.4  ID=4  ID=18
PRINT HYD           ID=5  CODE=1
*
*ADD FLOW FROM BRIDGEPOINT APARTMENTS (AREA BOUNDED BY 86TH, BRIDGE, 82ND
*   & SUNSET GARDENS - BASIN INFORMATION FROM CONCEPTUAL GRADING & DRAINAGE
*   PLAN FOR BRIDGEPOINT APARTMENTS MARCH 1995 BY COMMUNITY SCIENCES
COMPUTE NM HYD      ID=6  HYD=BPD  AREA=0.0342   PER A=0 PER B=25
                    PER C=25  PER D=50  TP=0.1333  MASS RAIN=-1
PRINT HYD           ID=6  CODE=1
*
*ADD TO FLOW IN STORM DRAIN
ADD HYD             ID=7  HYD=6.1  ID=6  ID=5
PRINT HYD           ID=7  CODE=1
*
*ROUTE STORM DRAIN FLOW TO UNSER BLVD. (STA 41+06)
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.012
                        DIA=90    N=0.013
COMPUTE TRAVEL TIME ID=8  REACH NO=1  NOVS=1  L=1264  SLP=0.012
ROUTE               ID=8  HYD=6.2  INFLOW ID=7  DT=0.0
PRINT HYD           ID=8  CODE=1
*
COMPUTE NM HYD      ID=21  HYD=21D  AREA=0.0101   PER A=0 PER B=25
                    PER C=5  PER D=70  TP=0.1333  MASS RAIN=-1
PRINT HYD           ID=21  CODE=1
*ADD 21D NORTH FLOW TO STORM DRAIN
ADD HYD             ID=6  HYD=21.1  ID=21  ID=8
PRINT HYD           ID=6  CODE=1
*   ------------------------------------------------------------
*s UNSER BOULEVARD FLOWS TO CHANNEL - FLOW FROM NORTH OF BRIDGE BLVD
*
*s THE FOLLOWING HYDROGRAPH IS TAKEN FROM THE MASTER DRAINAGE PLAN FOR THE
*s  ATRISCO BUSINESS PARK - SEPTEMBER 1992 & REVISED MARCH 1993 & SEPT 1993
*s  by Easterling and Associates  & REPRESENTS THE ENTIRE UNSER DIVERSION
*
RECALL HYD          ID= 2 HYD= 180.16 DT=  .050000 HRS DA=    .6789 SQ MI
                    PEAK=    248.301CFS  RO= 2.0374 INCHES  NO PTS=561
                    FLOW RATES
                          .000       .000       .000       .000       .000
                          .000       .000       .000       .000       .000
                          .000       .000       .000       .000       .000
                          .000       .000       .000       .000       .000
                          .000       .000       .000       .190      2.607
                        15.681     52.706     94.629    130.751    179.000
                       222.374    248.301    242.350    233.146    229.654
                       226.551    222.642    219.306    216.954    214.894
                       213.362    212.455    209.391    203.507    198.669
                       199.114    200.160    201.946    205.697    211.556
                       217.013    220.800    223.673    225.619    226.601
                       226.804    226.312    225.212    223.520    221.330
                       218.733    215.818    212.634    209.194    205.557
                       201.783    197.931    194.053    190.261    186.446
                       182.991    180.488    178.390    176.122    173.838
                       171.586    169.319    166.424    163.146    160.027
                       156.929    153.920    150.945    148.040    145.123
                       134.843     92.294     88.602     91.040     87.107
                        88.199     85.848     85.857     84.316     83.861
```

82.657	81.833	80.707	79.841	78.850
77.971	77.036	76.136	75.215	74.326
73.422	72.442	71.302	70.095	68.924
67.761	66.560	65.360	64.175	62.986
61.779	60.276	58.142	55.697	53.376
51.113	48.896	46.831	44.865	42.875
40.778	38.632	36.589	34.670	32.782
30.939	29.100	27.213	25.383	23.739
22.102	19.794	16.958	14.696	13.463
12.935	12.693	12.561	12.490	12.435
12.393	12.364	12.340	12.313	12.284
12.253	12.210	12.163	12.136	12.110
12.070	12.032	11.999	11.969	11.941
11.913	11.874	11.828	11.789	11.753
11.717	11.682	11.645	11.610	11.579
11.552	11.515	11.476	11.455	11.434
11.397	11.360	11.315	11.276	11.250
11.212	11.176	11.153	11.120	11.077
11.044	11.016	10.990	10.963	10.935
10.906	10.866	10.824	10.799	10.774
10.736	10.700	10.666	10.635	10.606
10.579	10.555	10.531	10.499	10.461
10.443	10.435	10.410	10.372	10.340
10.313	10.289	10.264	10.225	10.180
10.153	10.137	10.105	10.063	10.038
10.018	9.987	9.961	9.938	9.916
9.896	9.874	9.843	9.816	9.802
9.776	9.741	9.723	9.715	9.694
9.661	9.634	9.612	9.593	9.574
9.553	9.531	9.497	9.458	9.438
9.428	9.402	9.366	9.346	9.328
9.301	9.276	9.255	9.236	9.217
9.196	9.165	9.139	9.126	9.102
9.080	9.070	9.047	9.016	8.990
8.967	8.947	8.939	8.937	8.918
8.876	8.837	8.820	8.817	8.808
8.791	8.769	8.740	8.707	8.694
8.684	8.660	8.646	8.632	8.604
8.580	8.560	8.543	8.527	8.510
8.494	8.478	8.453	8.433	8.425
8.406	8.388	8.381	8.361	8.331
8.308	8.289	8.282	8.282	8.266
8.237	8.217	8.204	8.194	8.184
8.170	8.141	8.107	8.088	8.081
8.068	8.041	8.007	7.992	7.992
7.979	7.955	7.946	7.938	7.918
7.901	7.885	7.869	7.854	7.837
7.822	7.807	7.793	7.780	7.760
7.742	7.736	7.720	7.691	7.677
7.674	7.657	7.629	7.617	7.618
7.609	7.586	7.566	7.553	7.540
7.527	7.512	7.495	7.479	7.465
7.452	7.440	7.431	7.423	7.403
7.375	7.364	7.368	7.364	7.340
7.310	7.298	7.287	7.268	7.260
7.252	7.232	7.224	7.218	7.201
7.185	7.173	7.161	7.151	7.141
7.128	7.116	7.107	7.096	7.075
7.058	7.055	7.041	7.025	7.021
7.004	6.977	6.967	6.971	6.957
6.931	6.912	6.909	6.916	6.909
6.886	6.867	6.856	6.847	6.836

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                    6.824     6.810     6.796     6.782     6.771
                    6.763     6.754     6.746     6.742     6.737
                    6.719     6.694     6.686     6.689     6.684
                    6.664     6.635     6.623     6.627     6.616
                    6.595     6.587     6.581     6.565     6.560
                    6.555     6.539     6.532     6.530     6.515
                    6.499     6.489     6.482     6.473     6.460
                    6.448     6.437     6.428     6.419     6.397
                    6.381     6.382     6.382     6.372     6.353
                    6.338     6.337     6.329     6.320     6.321
                    6.306     6.282     6.276     6.282     6.273
                    6.248     6.227     6.214     6.215     6.224
                    6.214     6.189     6.171     6.164     6.158
                    6.150     6.140     6.129     6.114     6.102
                    6.092     6.083     6.078     6.070     6.065
                    6.063     6.044     5.886     5.529     5.147
                    4.835     4.520     4.142     3.718     3.300
                    2.917     2.568     2.250     1.966     1.715
                    1.500     1.316     1.156     1.014      .890
                     .782      .689      .609      .539      .479
                     .426      .380      .339      .304      .272
                     .244      .220      .198      .178      .161
                     .145      .130      .117      .106      .095
                     .086      .077      .070      .063      .057
                     .051      .046      .042      .038      .034
                     .031      .027      .025      .022      .019
                     .017      .015      .014      .012      .011
                     .010      .009      .007      .007      .006
                     .006      .005      .005      .004      .004
                     .003      .003      .003      .002      .002
                     .002      .002      .002      .001      .001
                     .001
*
*ROUTE FLOW SOUTH IN UNSER BLVD - 72INCH STORM DRAIN
*
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.0100
                     DIA=72    N=0.013
COMPUTE TRAVEL TIME ID=3  REACH NO=1  NOVS=1  L=1225  SLP=0.01
ROUTE               ID=3  HYD=R2  INFLOW ID=2  DT=0.0
PRINT HYD           ID=3  CODE=1
*
*ROUTE FLOW TO LOCATION WHERE BASIN 13 TIES IN - PIPE IS UPSIZED TO 78INCH
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.004
                     DIA=78    N=0.013
COMPUTE TRAVEL TIME ID=4  REACH NO=1  NOVS=1  L=209  SLP=0.004
ROUTE               ID=4  HYD=R3  INFLOW ID=3  DT=0.0
PRINT HYD           ID=4  CODE=1
*
COMPUTE NM HYD      ID=13  HYD=13D  AREA=0.1664   PER A=0  PER B=15
                    PER C=5  PER D=80  TP=0.2098  MASS RAIN=-1
PRINT HYD           ID=13  CODE=1
*
*ROUTE BASIN 13 FLOWS THROUGH EARTHEN CHANNEL TO UNSER STORM DRAIN
*
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=5089
                    MAX ELEV=5090  CH SLOPE=0.007  FP SLOPE=0.007
                    N=0.03   DIST=15
                    DIST ELEV
                     0   5090
                     3   5089
                     12  5089
                     15  5090
```

```
COMPUTE TRAVEL TIME ID=5  REACH NO=1  NOVS=1  L=230  SLP=0.007
ROUTE               ID=5  HYD=R13  INFLOW ID=13  DT=0.0
PRINT HYD           ID=5  CODE=1
*
*ADD BASIN 13 TO FLOWS IN UNSER STORM DRAIN
ADD HYD             ID=5  HYD=13.1  ID=5  ID=4
PRINT HYD           ID=5  CODE=1
*
COMPUTE NM HYD      ID=17  HYD=17E  AREA=0.0651   PER A=0  PER B=10
                    PER C=10  PER D=80  TP=0.1333  MASS RAIN=-1
PRINT HYD           ID=17  CODE=1
*
*ADD 17E FLOW TO STORM DRAIN FLOW
ADD HYD             ID=7  HYD=17.1  ID=17  ID=5
PRINT HYD           ID=7  CODE=1
*
*ROUTE FLOWS IN 96INCH UNSER STORM DRAIN
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.004
                     DIA=96    N=0.013
COMPUTE TRAVEL TIME ID=8  REACH NO=1  NOVS=1  L=1711  SLP=0.004
ROUTE               ID=8  HYD=R6  INFLOW ID=7  DT=0.0
PRINT HYD           ID=8  CODE=1
*
*S FLOW FROM NORTH ON UNSER TO CHANNEL - ADD TO FLOW FROM BRIDGE
ADD HYD             ID=9  HYD=CHANNEL  ID=8  ID=6
PRINT HYD           ID=9  CODE=1
*
*    ____________________________________________________
*
*s UNSER BLVD - FLOW FROM SOUTH OF BRIDGE EMPTYING TO THE CHANNEL
*
*s THE FOLLOWING IS TAKEN FROM SUNSET GARDENS/UNSER BLVD STORM DRAIN
*s   DESIGN ANALYSIS REPORT, DATED 12/5/97  BY RYALS ENGINEERING AND
*s   CONSTRUCTION SERVICES AS REVISED BY TUCKER GREEN, PER SE ENGENEERING
*****************************************************************************
*
* URS GREINER RECEIVED file (tg386) csgif00d.dat    1-7-98   T. Green
       ON 20 FEBRUARY, 1998 TO INCORPORATE IN THIS MODEL - ONLY THE FUTURE
       FULLY-DEVELOPED CONDITION WAS USED
* THE SUNSET GARDENS STORM DRAIN RUNS ALONG SUNSET GARDENS, THEN TO UNSER
*  THEN NORTH TO THE HEAD OF THE AMOLE CHANNEL. A FULLY DEVELOPED BASIN Y
*  CONTRIBUTES TO THIS FLOW, AS DO BASINS V (POINTE WEST), W, & X.
*
* CONDITONS BASED ON CURRENT ZONING & DEVELOPMENT, CURRENT DEVELOPMENT PLANS,
* AND ON ENGINEERING JUDGMENT.
*C REVISION NOTES: BASED ON FILES VCF4100 & SGU100.DAT BY TUCKER GREEN P.E.
*C                 REVISED 10-15-97 TO REFLECT NEW BASIN BOUNDARIES BASED ON
*C                 DISCUSSION WITH THE CITY, THE ENGINEERS FOR SAD 222, AND
*C                 DEVELOPERS OF NEARBY PROPERTIES, ESPECIALLY BASINS V & W.
*C                 IN PARTICULAR: (1) BASIN M (S OF SUNSET GARDENS, BETWEEN
*C                 94TH & 98TH) IS REMOVED FROM INTERIM & FUTURE CONDTION
CASES
*C                 BY PROPOSED CONSTRUCTION OF 94TH ST; AND (2) THE HIGH
POINT
*C                 IN 86 ST IS MOVED NORTH TO THE SOUTH PROPERTY LINE OF THE
*C                 CANTO III SITE (BASIN JYD).
*C               :
*C               : REVISED 1-7-98 FOR MORE IMPERVIOUS BASIN W (WHISPER
POINTE)
*C                 & LARGER BASIN X (ADD ECUARIZ & MORE UNSER R.O.W.)
*C               : REVISED 1-22-98 TO ADD 'INFO ONLY' HYD U+V, AND TO
*C                 PROVIDE DETAILED OUTPUT FOR BASINS T-Y, U.PLUS.V,
```

```
*C                    SG.AT.82ND, AND 314 (SG.AT.82ND ROUTED TO UNSER)
*C
*************************************************************************
*
COMPUTE NM HYD        ID= 1    HYD= I                DA=0.00952  SQ MI
                      PER A= 12      B= 26       C= 24       D= 38
                      TP= -0.13333 HRS   RAIN= -1
PRINT HYD             ID= 1   CODE= 1
*
*************************************************************************
*
COMPUTE NM HYD        ID= 2    HYD= H                DA=0.01501  SQ MI
                      PER A= 0       B= 20       C= 10       D= 70
                      TP= -0.13333 HRS   RAIN= -1
PRINT HYD             ID= 2   CODE= 1
*
*************************************************************************
*
* E PLUS H PLUS I AT SUNSET GARDENS & 90TH FOLLOWS
ADD HYD               ID OUT= 3   HYD= 208            IDIN I= 1   IDIN II= 2
PRINT HYD             ID= 3   CODE= 1
*
*************************************************************************
*
*s DIVIDE SO 1ST 8.6 CFS (ID=6) S ON 90TH (ON HOLD): ID=4 E ON SUNSET GARDENS
DIVIDE HYD            ID=3  Q=8.6 ID=6 HYD= 90.S.PAST.SG  ID=4 HYD= SG.E.OF.90
PRINT HYD             ID= 4   CODE= 1
PRINT HYD             ID= 6   CODE= 1
*
*************************************************************************
*
* ROUTE MAIN FLOW EAST DOWN SG FROM 90TH, FOLLOW IT TO 86TH ST
*C APPROX AS 40' F-F STREET, ASSUME APX 2.35% SLOPE
*C ASSUME AS IF BOTH SIDES PAVED, EST n AS .017
COMPUTE RATING CURVE CID= -1   VS NO= 1    NO SEGS FOR MANNING n= 1
                      ELMIN= 0 ELMAX= 4  FT  CHSLP= .0235  FPSLP= .0235  FT/FT
                      n .017  DIST 40
                      DIST  ELEV     DIST  ELEV    DIST  ELEV    DIST  ELEV
                      0      4       .01    0      20     .40    39.99    0
                      40     4
ROUTE MCUNGE          ID= 5   HYD= 209          INFLOW HYD ID= 4   DT= 0.0 HR
                      LENGTH= 1055     NSUBRCH= 0     SLOPE= .0235
                      MATCODE= 0       REGCODE= 0     CCODE= 0
PRINT HYD             ID= 5   CODE= 1
*
*************************************************************************
*
COMPUTE NM HYD        ID= 1    HYD= J                DA=0.00228 SQ MI
                      PER A= 0       B= 15       C= 0        D= 85
                      TP= -0.13333 HRS   RAIN= -1
PRINT HYD             ID= 1   CODE= 1
*
*************************************************************************
*
ADD HYD               ID OUT= 3  HYD= 210             IDIN I= 1   IDIN II= 5
PRINT HYD             ID= 3   CODE= 1
*
*************************************************************************
*
* CALC CONTRIBUTING PART OF CANTO SITE; THEN ADD TO HYD 210
COMPUTE NM HYD        ID= 1   HYD=SITE.II        DA=0.00839 SQ MI
                      PER A= 0       B= 35       C= 0        D= 65
```

```
                        TP= -0.13333 HRS   RAIN= -1
PRINT HYD               ID= 1   CODE= 1
*
*****************************************************************************
*
*S PARTIAL WATERBLOCK ==> FLOW > 11.6cfs TO 86TH
DIVIDE HYD              ID=1  Q=11.6  ID=2 HYD=S2.TO.S3   ID=7 HYD=S2.TO.86TH
PRINT HYD               ID= 2   CODE= 1
PRINT HYD               ID= 7   CODE= 1
*
*****************************************************************************
*
COMPUTE NM HYD          ID= 1   HYD=SITE.III        DA=0.02360 SQ MI
                        PER A= 0      B= 35      C= 0       D= 65
                        TP= -0.13333 HRS   RAIN= -1
PRINT HYD               ID= 1   CODE= 1
*
*****************************************************************************
*
* TOTAL FLOW LEAVING CANTO NORTH OF SUNSET GARDENS
ADD HYD                 ID OUT= 16  HYD=SITE.OUT      IDIN I= 1   IDIN II= 2
PRINT HYD               ID= 16   CODE= 1
*
*****************************************************************************
*
*S TOTAL FLOW SUNSET GARDENS WEST OF 86TH
ADD HYD                 ID OUT= 5  HYD= SG.W.OF.86     IDIN I= 3   IDIN II= 16
PRINT HYD               ID= 5   CODE= 1
*
*****************************************************************************
*
COMPUTE NM HYD          ID= 1    HYD= C               DA=0.00127 SQ MI
                        PER A= 0      B= 10      C= 0       D= 90
                        TP= -0.13333 HRS   RAIN= -1
PRINT HYD               ID= 1   CODE= 1
*
*****************************************************************************
*
* ADD SPILL FROM S2 TO ROAD FLOW IN 86TH N OF SUNSET GARDENS
ADD HYD                 ID OUT= 3  HYD=   218          IDIN I= 1   IDIN II= 7
PRINT HYD               ID= 3   CODE= 1
*
*****************************************************************************
*
* COMBINED FLOW TO 86TH & SUNSET GARDENS FROM NORTH & WEST; HOLD FOR LATER
ADD HYD                 ID OUT= 7  HYD= 86&SG.N&W      IDIN I= 3   IDIN II= 5
PRINT HYD               ID= 7   CODE= 1
*
*****************************************************************************
*
*
*C BASIN NN (N North): CURRENTLY PARTLY DEVELOPED
COMPUTE NM HYD          ID= 1    HYD= NN              DA=0.01830  SQ MI
                        PER A= 28.0   B= 20.2    C= 15.4    D= 36.4
                        TP= -0.13333 HRS   RAIN= -1
PRINT HYD               ID= 1   CODE= 1
*
*****************************************************************************
*
* ADD IN HYD 90.S.PAST.SG, ('HELD' SPILL SOUTH OF SUNSET GDNS INTERSECTION)
ADD HYD                 ID OUT= 3  HYD= INTO.JYDN   IDIN I= 1   IDIN II= 6
PRINT HYD               ID= 3   CODE= 1
```

```
*
*****************************************************************************
*
* ROUTE NORTH PART OF OFFSITE THROUGH NORTH STREET IN JYD
* APPROX AS 28' F-F STREET, ASSUME APX 1.8% SLOPE
* ASSUME PAVED ROAD, EST n AS .017
COMPUTE RATING CURVE CID= -1   VS NO= 1    NO SEGS FOR MANNING n= 1
                     ELMIN= 0 ELMAX= 4  FT   CHSLP= .018   FPSLP= .018  FT/FT
                     n .017  DIST 28
                     DIST  ELEV     DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0      4       .01    0      14    .28    27.99    0
                     28     4
ROUTE MCUNGE         ID= 5   HYD= 300          INFLOW HYD ID= 3   DT= 0.0 HR
                     LENGTH= 1338     NSUBRCH= 0     SLOPE= .018
                     MATCODE= 0       REGCODE= 0     CCODE= 0
PRINT HYD            ID= 5 CODE= 1
*
*****************************************************************************
*
* BASIN NS (N South): CURRENTLY PARTLY DEVELOPED
COMPUTE NM HYD       ID= 1    HYD= NS                DA=0.01719  SQ MI
                     PER A= 16.0    B= 28.6    C= 8.8    D= 46.6
                     TP= -0.13333 HRS   RAIN= -1
PRINT HYD            ID= 1   CODE= 1
*
*****************************************************************************
*
* ROUTE SOUTH PART OF OFFSITE THROUGH SOUTH STREET IN JYD
*C APPROX AS 28' F-F STREET, ASSUME APX 2.0% SLOPE (STEEPER THAN NORTH)
*C ASSUME PAVED ROAD, EST n AS .017
COMPUTE RATING CURVE CID= -1   VS NO= 1    NO SEGS FOR MANNING n= 1
                     ELMIN= 0 ELMAX= 4  FT   CHSLP= .020   FPSLP= .020  FT/FT
                     n .017  DIST 28
                     DIST  ELEV     DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0      4       .01    0      14    .28    27.99    0
                     28     4
ROUTE MCUNGE         ID= 2   HYD= 302          INFLOW HYD ID= 1   DT= 0.0 HR
                     LENGTH= 1221     NSUBRCH= 0     SLOPE= .020
                     MATCODE= 0       REGCODE= 0     CCODE= 0
PRINT HYD            ID= 2 CODE= 1
*
*****************************************************************************
*
*C ADD NORTH & SOUTH ROUTED OFFSITE, THEN COMPUTE & ADD JYD
ADD HYD              ID OUT= 3  HYD= 304          IDIN I= 2   IDIN II= 5
PRINT HYD            ID= 3   CODE= 1
*
*****************************************************************************
*
COMPUTE NM HYD       ID= 17    HYD= JYD             DA=0.02353 SQ MI
                     PER A= 0      B= 35      C= 0       D= 65
                     TP= -0.13333 HRS   RAIN= -1
PRINT HYD            ID= 17   CODE= 1
*
*****************************************************************************
*
* TOTAL FLOW LEAVING JYD (CANTO III), INCLUDING 86TH ST ROW EAST OF JYD
ADD HYD              ID OUT= 4  HYD= JYD.E.AT.86   IDIN I= 3   IDIN II= 17
PRINT HYD            ID= 4   CODE= 1
*
*****************************************************************************
*
```

```
* ROUTE TO 86TH & SG INTERSECTION, ASSUME 48" PIPE W/ 1% FRICTION SLOPE
COMPUTE RATING CURVE CID= -1 VSN= 1  CODE= -1  S= .010   D= 4 FT   n= 0.013
ROUTE MCUNGE         ID= 5   HYD= 86.S.OF.SG   INFLOW HYD ID= 4   DT= 0.0 HR
                     LENGTH= 300      NSUBRCH= 0     SLOPE= .010
                     MATCODE= 0       REGCODE= 0     CCODE= 0
PRINT HYD            ID= 5 CODE= 1
*
*****************************************************************************
*
* COMBINED FLOWS AT 86TH & SUNSET GARDENS: RETRIEVE 'ON-HOLD' ID=7
ADD HYD              ID OUT= 6  HYD= TOT.SG&86     IDIN I= 5   IDIN II= 7
PRINT HYD            ID= 6   CODE= 1
*
*****************************************************************************
*
* ROUTE 86TH TO 82ND IN SUNSET GARDENS: CONC PIPE; Sf=.01 APX
* IF EST DIAM SMALL => TRAVEL FASTER => DNSTR PEAK HIGHER => CONSERVATIVE
* VALLEY SEGMENT & REACH NUMBERS ARE USER ID'S NOT USED BY PROG; DUMMIES HERE
COMPUTE RATING CURVE CID= -1   VS NO= 11   NO SEGS FOR MANNING n= -1
                     SLOPE= .01   DIAM= 5.0 FT   n= .013
COMPUTE TRAVEL TIME  ID= 5   REACH= 11   NO VS= 1   L= 1100 FT   S= .01
ROUTE                ID= 5   HYD= 308    IN ID= 6   DT= 0.0
PRINT HYD            ID= 5  CODE= 1
*****************************************************************************
*
* BASIN T
COMPUTE NM HYD       ID= 1    HYD= T              DA= .00467 SQ MI
                     PER A= 0      B= 15      C=  0      D= 85
                     TP= -0.13333 HRS   RAIN= -1
PRINT HYD            ID= 1   CODE= 1
*
*****************************************************************************
*
ADD HYD              ID OUT= 3  HYD= 310     IDIN I= 1   IDIN II= 5
PRINT HYD            ID= 3   CODE= 1
*
*****************************************************************************
*
* BASIN U
COMPUTE NM HYD       ID= 1    HYD= U              DA= .01032 SQ MI
                     PER A= 0      B= 30      C=  0      D= 70
                     TP= -0.13333 HRS   RAIN= -1
PRINT HYD            ID= 1   CODE= 1
*
*****************************************************************************
*
*
ADD HYD              ID OUT= 19   HYD= 312     IDIN I= 1   IDIN II= 3
PRINT HYD            ID= 19  CODE= 1
*
*****************************************************************************
*
* BASIN V: % IMPERV A LA POINTE WEST DESIGN & DENSITY
COMPUTE NM HYD       ID= 11    HYD= V              DA= .03200 SQ MI
                     PER A= 0      B= 50      C=  0      D= 50
                     TP= -0.13333 HRS   RAIN= -1
PRINT HYD            ID= 11   CODE= 1
*
*****************************************************************************
*
ADD HYD              ID OUT= 3  HYD= SG.AT.82ND    IDIN I= 11   IDIN II= 19
PRINT HYD            ID= 3   CODE= 1
```

```
*
*****************************************************************************
*
*  ROUTE TO UNSER IN CONC PIPE; Sf=.01 APX AVG
*  IF EST DIAM SMALL => TRAVEL FASTER => DNSTR PEAK HIGHER => CONSERVATIVE
*  VALLEY SEGMENT & REACH NUMBERS ARE USER ID'S ONLY; DUMMIES HERE
*  AVAIL SLOPE BTW UNSER/AMOLE & SG/82 APX .01 AVG.
COMPUTE RATING CURVE CID= -1   VS NO= 11   NO SEGS FOR MANNING n= -1
                     SLOPE= .01   DIAM= 5.5 FT   n= .013
COMPUTE TRAVEL TIME  ID= 5   REACH= 11   NO VS= 1   L= 1100 FT   S= .01
ROUTE                ID= 5   HYD= 314    IN ID= 3   DT= 0.0
PRINT HYD            ID= 5  CODE= 1
*****************************************************************************
*
*C BASIN W: WHISPER POINTE SUBDIVISION UNDER DESIGN MARK GOODWIN & ASSOC
*C % IMPERV (PER D) REVISED 1-7-98 PER GOODWIN LETTER OF 11-29-97: Qp APX 77
*C BASIN W IS ONLY BASIN W Tp (&Tc) > REGULATORY MINIMUM
COMPUTE NM HYD       ID= 12    HYD= W              DA= .03422 SQ MI
                     PER A= 0      B= 40      C=  0      D= 60
                     TP= -0.13333 HRS   RAIN= -1
*C                     TP= -0.16325 HRS   RAIN= -1
PRINT HYD            ID= 12   CODE= 1
*
*****************************************************************************
*
ADD HYD              ID OUT= 3  HYD= 316     IDIN I= 12   IDIN II= 5
PRINT HYD            ID= 3   CODE= 1
*
*****************************************************************************
*
* BASIN X: R.O.W. FOR SUNSET GARDENS AND (LIMITED ACCESS) UNSER & EUCARIZ
*C BASIN BOUNDARY REVISED 1-7-98; OLD AREA WAS 0.00674 SQ MI
COMPUTE NM HYD       ID= 13    HYD= X              DA= .01058 SQ MI
                     PER A= 0      B= 20      C=  0      D= 80
                     TP= -0.13333 HRS   RAIN= -1
PRINT HYD            ID= 13   CODE= 1
*
*****************************************************************************
*
ADD HYD              ID OUT= 4  HYD= SG.AT.UNSER   IDIN I= 13   IDIN II= 3
PRINT HYD            ID= 4   CODE= 1
*
*****************************************************************************
*
* ROUTE TO UNSER 340 FT N OF SG (APX HALF DIST TO AMOLE CHAN); Sf=.01 APX
* EST DIAM SMALL => TRAVEL FASTER => DNSTR PEAK HIGHER => CONSERVATIVE
* VALLEY SEGMENT & REACH NUMBERS ARE USER ID'S ONLY; DUMMIES HERE
COMPUTE RATING CURVE CID= -1   VS NO= 11   NO SEGS FOR MANNING n= -1
                     SLOPE= .01   DIAM= 6.0 FT   n= .013
COMPUTE TRAVEL TIME  ID= 5   REACH= 11   NO VS= 1   L= 340  FT   S= .01
ROUTE                ID= 5   HYD= 318    IN ID= 4   DT= 0.0
PRINT HYD            ID= 5  CODE= 1
*****************************************************************************
*
* BASIN Y DEVELOPED: EST ENTIRE SITE; ZONING = O-1; USE % IMPERV AS FOR C-2
* WHEN BUILT, N APX 200' POSS DRAIN TO BRIDGE PER GREINER FOR BRIDGE BLVD SD
*  REV ORIGINAL AREA OF .02964 2/26/98 URS GREINER -  ASSUME 0.0101 SM
* WILL DRAIN TO BRIDGE BLVD SD- BASIN 21D ALONG BRIDGE FRONTAGE
COMPUTE NM HYD       ID= 14    HYD= Y              DA= .01954 SQ MI
                     PER A= 0      B= 10      C= 5      D= 85
                     TP= -0.13333 HRS   RAIN= -1
PRINT HYD            ID= 14   CODE= 1
```

```
*
*****************************************************************************
*
*s TOTAL FLOW FROM UNSER APROX 300' S OF AMOLE CHANNEL
*   ADD TO FLOW FROM BRIDGE & UNSER NORTH
ADD HYD              ID OUT= 7  HYD= FUT.TO.AMOLE   IDIN I= 14   IDIN II= 5
PRINT HYD            ID= 7   CODE= 1
*
*****************************************************************************
*
*S  TOTAL FLOW TO HEAD OF CONCRETE CHANNEL
*ADD SUNSET GARDENS/UNSER BLVD FLOW TO CHANNEL
ADD HYD              ID=5  HYD=CHANNEL  ID=7  ID=9
PRINT HYD            ID=5  CODE=1
*_____________________________________________________________
* ROUTE FLOW DOWN CONCRETE TRAPAZOIDAL CHANNEL PARALLEL TO BRIDGE BLVD.
*   STA 41+06 TO STA 30+25
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=0
                     MAX ELEV=7.5  CH SLOPE=0.004  FP SLOPE=0.004
                     N=0.013   DIST=40
                     DIST  ELEV
                     0      7.5
                     15     0
                     25     0
                     40     7.5
COMPUTE TRAVEL TIME ID=6  REACH NO=1  NOVS=1  L=1081  SLP=0.004
ROUTE                ID=6  HYD=R5  INFLOW ID=5  DT=0.0
PRINT HYD            ID=6  CODE=1
*
COMPUTE NM HYD       ID=18  HYD=18W  AREA=0.1122   PER A=0   PER B=27
                     PER C=5  PER D=68  TP=0.1817  MASS RAIN=-1
PRINT HYD            ID=18  CODE=1
*
*ADD BASIN 18W TO CHANNEL FLOW
ADD HYD              ID=7  HYD=18.1  ID=18   ID=6
PRINT HYD            ID=7  CODE=1
*
*ROUTE FLOW DOWN CHANNEL STA 31+25 TO 23+50
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=0
                     MAX ELEV=6.5  CH SLOPE=0.0144  FP SLOPE=0.0144
                     N=0.013   DIST=36
                     DIST  ELEV
                     0      6.5
                     13     0
                     23     0
                     36     6.5
COMPUTE TRAVEL TIME ID=8  REACH NO=1  NOVS=1  L=775   SLP=0.0144
ROUTE                ID=8  HYD=R7  INFLOW ID=7  DT=0.0
PRINT HYD            ID=8  CODE=1
*
COMPUTE NM HYD       ID=21  HYD=21E  AREA=0.0656   PER A=0   PER B=0
                     PER C=30  PER D=70   TP=0.1333  MASS RAIN=-1
PRINT HYD            ID=21  CODE=1
*
*ADD 21E FLOW TO CHANNEL AT THE 42" STORM DRAIN TIE AT STINSON ST
ADD HYD              ID=9  HYD=21.1   ID=21  ID=8
PRINT HYD            ID=9  CODE=1
*
*ROUTE FLOW DOWN CHANNEL - STA 23+50 TO 17+30
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=0
                     MAX ELEV=6.5  CH SLOPE=0.022   FP SLOPE=0.022
                     N=0.013   DIST=26.1
```

```
                        DIST   ELEV
                        0       6.5
                        0.1     4
                        8       0
                        18      0
                        26      4
                        26.1    6.5
COMPUTE TRAVEL TIME ID=10 REACH NO=1  NOVS=1  L=620   SLP=0.022
ROUTE               ID=10 HYD=R9  INFLOW ID=9  DT=0.0
PRINT HYD           ID=10 CODE=1
*
COMPUTE NM HYD      ID=18  HYD=18E  AREA=0.0075  PER A=30 PER B=0
                    PER C=0  PER D=70   TP=0.1333  MASS RAIN=-1
PRINT HYD           ID=18  CODE=1
*
*ADD 18E TO CHANNEL FLOW
ADD HYD             ID=11  HYD=18.1  ID=18  ID=10
PRINT HYD           ID=11  CODE=1
*
*ROUTE FLOW TO END OF CHANNEL - STA 17+30 TO 9+55
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=0
                    MAX ELEV=6.5  CH SLOPE=0.022  FP SLOPE=0.022
                    N=0.013   DIST=36
                    DIST ELEV
                    0       6.5
                    13      0
                    23      0
                    36      6.5
COMPUTE TRAVEL TIME ID=12  REACH NO=1  NOVS=1  L=775  SLP=0.022
ROUTE               ID=12  HYD=R11  INFLOW ID=11  DT=0.0
PRINT HYD           ID=12  CODE=1
*
*FLOW EMPTIES INTO NORTH/SOUTH COORS CONNECTION POND
FINISH
```

```
START                    0.0 HRS
* AHYMO MODEL FOR AMOLE PHASE III C
* MODEL CREATED BY GREINER AUG 1993 - BASED ON FILE AB100MKR FROM
*     FROM FEMA RESTUDY (AREAS A (#2) AND B (#3)) BY RTI
*
* TIERRA BAYITA ARROYO
* ULTIMATE DEVELOPMENT CONDITIONS 100-YR. 24-HR. STORM
*
*
*   FILE NAME - AB100.DAT
*
* THIS FILE COMPUTES THE HYDROLOGY FOR
*
*      AREA A (#2) - TIERRA BAYITA ARROYO, MIREHAVEN ARROYO
*
*     ASSUMPTIONS -
*       1. USE THE AHYMO991 VERSION OF HYMO AS DEVELOPED BY AMAFCA
*       2. MODEL THE 24-HOUR RAINFALL PER FEMA CRITERIA
*       3. USE THE draft REVISION OF SECTION 22.2, DPM by the DEVELOPMENT
*          PROCESS MANUAL DRAINAGE DESIGN CRITERIA COMMITTEE, AUGUST 1991
*       4. USE THE NM HYDROGRAPH COMPUTATIONAL METHOD IN AHYMO391
*       5. COMPUTATIONAL INTERVAL = 3 MINUTES = .05 hrs
*       6. PERCENTAGE OF EXISTING LAND USE WITHIN TREATMENT TYPES A,B,C AND D
*          WAS ESTIMATED FOR ULTIMATE DEVELOPMENT BASED ON LAND PLANNING
*          DOCUMENTS
*
* % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % %
*
*
RAINFALL                 TYPE=2  RAIN QUARTER=0.0   RAIN ONE=1.95
                         RAIN SIX=2.2     RAIN DAY=2.7     DT=0.05
*
*s  DIVIDE HYD IS USED TO SIMULATE A BULKING FACTOR
COMPUTE NM HYD           ID=5   HYD=108.4    DA= .1426  SQ MI
                         PER A=0  B=2  C=28  D=70
                         TP= .1333  HRS  RAIN=-1
PRINT HYD                ID=5  CODE=1
*DIVIDE HYD NO  108.4
DIVIDE HYD               ID=5   PER=-105  ID I=5 HYD=108.4
                                          ID II=16  HYD II=000
PRINT HYD                ID=5  CODE=1
*
*
COMPUTE NM HYD           ID=1    HYD= 101        DA=0.026    SQ MI
                         PER A=0    B=100  C=0      D=0
                         TP=.133    HRS        RAIN=-1
*
DIVIDE HYD               ID=1    PER=-110    ID=1  HYD=101
                                             ID=16  HYD=000
*
*ROUTE BULKED 101 THROUGH BASIN 108.3 - ASSUME A CONCRETE TRAPAZOIDAL
*            CHANNEL TO SIMULATE DEVELOPED CONDITIONS
*            USE:  10FT BOTTOM  W/2H:1V SIDE SLOPES AT EXISTING SLOPE
COMPUTE RATING CURVE CID=1   VS NO=1   NO SEG = 1
                         MIN ELEV=0  MAX ELEV= 6  CH SLP= 0.0375
                         FP SLP=0.375    N=.013  DIST=34
                         DIST  ELEV
                          0     6
                          12    0
                          22    0
                          34    6
COMPUTE TRAVEL TIME  ID=2   REACH=1  NO VS=1  L=4000   SLOPE= 0.0375
```

```
ROUTE                    ID=2      HYD= 101.80    INFLOW HYD ID=1    DT=0.0
PRINT HYD                ID=2    CODE=1
*
COMPUTE NM HYD           ID=1    HYD= 108.3     DA= .1478   SQ MI
                         PER A=0    B=2    C=41    D=57
                         TP=.175    HRS        RAIN=-1
*
PRINT HYD                ID=1    CODE=1
*
*       DIVIDE HYD NO.        108.3
DIVIDE HYD               ID=1     PER=-105      ID  I=1   HYD  I=108.3
                                             ID II=16   HYD II=000
PRINT HYD                ID=1  CODE=1
*
*ADD ROUTED 101 AND 108.3
ADD HYD                  ID=3   HYD=108.39  ID=1  ID=2
PRINT HYD                ID=3  CODE=1
*
*ROUTE COMBINED 101 AND 108.3 TO NORTH POND INFLOW
*             ASSUME A CONCRETE TRAPAZOIDAL
*             CHANNEL TO SIMULATE DEVELOPED CONDITIONS
*             USE:  10FT BOTTOM  W/2H:1V SIDE SLOPES AT EXISTING SLOPE
COMPUTE RATING CURVE CID=1   VS NO=1   NO SEG = 1
                         MIN ELEV=0  MAX ELEV= 6  CH SLP= 0.02
                         FP SLP=0.02    N=.013  DIST=34
                         DIST  ELEV
                          0     6
                          12    0
                          22    0
                          34    6
COMPUTE TRAVEL TIME      ID=2      REACH=1  NO VS=1
                         L=2150       SLP=.015
ROUTE                    ID=2      HYD= 108.38    INFLOW ID=3    DT=0.0
PRINT HYD                ID=2    CODE=1
*
COMPUTE NM HYD           ID=7    HYD=108.2      DA= .1710   SQ MI
                         PER A=0    B=5    C=35    D=63
                         TP=.158    HRS        RAIN=-1
PRINT HYD                ID=7    CODE=1
*
*       DIVIDE HYD NO.        108.2
DIVIDE HYD               ID=7     PER=-105      ID  I=7   HYD  I=108.2
                                             ID II=16   HYD II=000
PRINT HYD                ID=7  CODE=1
*
*S COMBINE HYD'S 108.38 AND 108.2
ADD HYD                  ID=7  HYD=108.29  ID=7  ID=2
PRINT HYD                ID=7  CODE=1
*
*
COMPUTE NM HYD           ID=2    HYD= 102    DA=0.281    SQ MI
                         PER A=40   B=19   C=10     D=31
                         TP=.20   RAIN=-1
PRINT HYD                ID=2    CODE=1
*
DIVIDE HYD               ID=2     PER=-105  ID  I=2   HYD  I=102
                                             ID II=16   HYD II=000
PRINT HYD                ID=2  CODE=1
*
*ROUTE BASIN 102 THROUGH BASIN 108.1
*             ASSUME A CONCRETE TRAPAZOIDAL
*             CHANNEL TO SIMULATE DEVELOPED CONDITIONS
```

```
*            USE:  10FT BOTTOM  W/2H:1V SIDE SLOPES AT EXISTING SLOPE
COMPUTE RATING CURVE CID=1   VS NO=1   NO SEG = 1
                     MIN ELEV=0  MAX ELEV= 6  CH SLP= 0.03
                     FP SLP=0.03    N=.013  DIST=34
                     DIST  ELEV
                      0     6
                      12    0
                      22    0
                      34    6
COMPUTE TRAVEL TIME  ID=3      REACH=1  NO VS=1
                     L=3100       SLP=.03
ROUTE                ID=3      HYD= 102.80    INFLOW ID=2    DT=0.0
PRINT HYD            ID=3    CODE=1
*
COMPUTE NM HYD       ID=4    HYD= 108.1     DA= .1713   SQ MI
                     PER A=0    B=3    C=30    D=67
                     TP=.133    HRS        RAIN=-1
PRINT HYD            ID=4    CODE=1
*
DIVIDE HYD           ID=4     PER=-105      ID  I=4   HYD  I=108.1
                                          ID II=16   HYD II=000
PRINT HYD            ID=4  CODE=1
*
*ADD ROUTED 102 TO 108.1 FLOW
ADD HYD              ID=2  HYD=108.17  ID=4  ID=3
PRINT HYD            ID=2  CODE=1
*
*
*ROUTE FLOW SOUTH ON 102ND THRU 72" PIPE TO NORTH POND
COMPUTE RATING CURVE RC=1   VS NO=1   CODE=-1
                     SLP=0.013     DIA= 72 IN  N=.013
COMPUTE TRAVEL TIME  ID=8 REACH=1  NO VS=1    L=1200     SLP=.013
ROUTE                ID=8      HYD= 108.18    INFLOW HYD ID=2    DT=0.0
PRINT HYD            ID=8    CODE=1
*
* COMBINE FLOW FROM 108.18 & 108.29
ADD HYD              ID=9  HYD=108.9  ID=7  ID=8
PRINT HYD            ID=9  CODE=1
*
*
******THE FOLLOWING POND IS WHAT WAS APPROVED BY THE STATE ENGINEER &
*       COA - DURING CONSTRUCTION ACCESS RAMPS WERE ADDED REDUCING THE
*       VOLUME -- REVISED STORAGE VOLUMES
*ROUTE FLOW THROUGH NORTH POND
*ROUTE RESERVOIR      ID=10  HYD=502  INFLOW ID=9  CODE=5
*                     OUTFLOW  STORAGE  ELEV
*                        0        0     5204.21
*                        3      0.287   5205
*                       13      1.582   5206
*                       25      3.486   5207
*                       42      7.543   5209
*                       52     11.939   5211
*                       64     16.689   5213
*                       72     21.805   5215
*                       80     27.301   5217
*                       88     33.189   5219
*                       90     39.483   5221
*                       91     46.197   5223
*                      968     49.715   5224
*                     2615     53.343   5225
*                     4809     57.082   5226
*
```

```
*ROUTE FLOW THROUGH NORTH POND - REVISED FOR ACCESS RAMP
ROUTE RESERVOIR        ID=10  HYD=502  INFLOW ID=9  CODE=5
                       OUTFLOW  STORAGE  ELEV
                          0        0     5204.21
                          3      0.287   5205
                         13      1.565   5206
                         25      3.402   5207
                         42      7.394   5209
                         52     11.731   5211
                         64     16.428   5213
                         72     21.498   5215
                         80     26.955   5217
                         88     32.809   5219
                         90     39.075   5221
                         91     45.767   5223
                        968     49.276   5224
                       2615     52.896   5225
                       4809     56.628   5226
*
*
COMPUTE NM HYD         ID=1    HYD=109      DA= .0720   SQ MI
                       PER A=0    B=2    C=16    D=82
                       TP=.140    HRS        RAIN=-1
*
PRINT HYD              ID=1    CODE=1
*
DIVIDE HYD             ID=1     PER=-105      ID  I=1   HYD  I=109
                                            ID II=16   HYD II=000
PRINT HYD              ID=1  CODE=1
*
*ROUTE SOUTH ALONG 98TH IN PIPE - FROM AVALON TO VOLCANO
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.02
                       DIA= 66  N=.013
COMPUTE TRAVEL TIME    ID=6  REACH NO=1  NOVS=1  LEN=1150  SLP=0.02
ROUTE                  ID=6  HYD=109.19  INFLOW ID=1  DT=0.0
PRINT HYD              ID=6  CODE=1
*
COMPUTE NM HYD         ID=1  HYD=109.1  DA= 0.0495  SQ MI
                       PER A= 0  B=0  C=15  D=85
                       TP= 0.1333  RAIN=-1
PRINT HYD              ID=1  CODE=1
*
DIVIDE HYD             ID=1  PER=-105  IDI=1  HYD=109.1
                                       IDII=16  HYD=000
PRINT HYD              ID=1  CODE=1
*
*ADD TO FLOW FROM 109 (HYD109.19)
ADD HYD                ID=6  HYD=109.39  ID=6  ID=1
PRINT HYD              ID=6  CODE=1
*
* ADD HYD 109.39 TO BASIN 108.4
ADD HYD                ID=6  HYD=109.49  ID=6  ID=5
PRINT HYD              ID=6  CODE=1
*
*ADD ABOVE TO NORTH POND OUTFLOW
ADD HYD                ID=6  HYD=109.59  ID=6  ID=10
PRINT HYD              ID=6  CODE=1
*
*ROUTE THROUGH SOUTH POND
ROUTE RESERVOIR        ID=10 HYD=501  IN ID=6  CODE=5
                       OUTFLOW  STORAGE   ELEV
                          0        0      5201
```

```
                    5       0.934     5202
                    6       3.359     5203
                    27      6.080     5204
                    43     11.813     5206
                    55     17.946     5208
                    64     24.492     5210
                    72     31.465     5212
                    1137   35.115     5213
                    3122   38.877     5214
                    7217   44.733     5215.5
*
PUNCH HYD           ID=10
FINISH
```

```
AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 03/02/1998
     START TIME (HR:MIN:SEC) = 14:44:24      USER NO.= GREINRNM.STE
     INPUT FILE = AMOLE.DAT

*  AMOLE DEL NORTE STORM DRAIN FACILITIES PHASE III D MODEL - DECEMBER 1995
*    FULLY DEVELOPED CONDITIONS  100 YEAR, 6 HOUR STORM
*  GREINER JN E30000114
* COA PROJECT 4076.92
*  This model is an update of the previous HYMO model for the Amole Del
*    Norte drainage system.  The HYMO was done in 1990.  Basin
*    areas have been revised somewhat due to the current condition changing
*    from 1990 and incorporation of newer Master Drainage Reports for
*    the area
*  ------------------------------------------------------------------
*  Developed conditions are to be modeled.  This was done by assuming
*    concrete trapazoidal channels for routing purposes using the
*    existing slopes and lengths.  channels - 10'bottom w/ 2:1 ss
*  ------------------------------------------------------------------
*  Station references are from Amole Del Norte Storm Diversion Facilities
*  Tierra Bayita Drainage Facilities Phases IIIB or IIIA
*********************************************************************
*S  100 YEAR, 6 HOUR STORM
RAINFALL              TYPE=1   QUARTER HR = 0  ONE HR RAIN=1.90
                      SIX HR RAIN=2.21   TWENTYFOUR HR RAIN=2.70

                      COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40
HR.

                      DT =     .033333 HOURS        END TIME =     5.999940 HOURS
                         .0000    .0014    .0029    .0043    .0059    .0074    .0090
                         .0106    .0123    .0140    .0157    .0175    .0193    .0212
                         .0232    .0252    .0272    .0294    .0316    .0339    .0362
                         .0387    .0412    .0439    .0466    .0495    .0525    .0557
                         .0590    .0625    .0663    .0715    .0771    .0831    .0961
                         .1249    .1694    .2331    .3202    .4347    .5806    .7622
                         .9839   1.1890   1.2748   1.3472   1.4117   1.4703   1.5243
                        1.5745   1.6213   1.6652   1.7065   1.7455   1.7824   1.8172
                        1.8502   1.8816   1.9113   1.9395   1.9662   1.9722   1.9779
                        1.9832   1.9883   1.9932   1.9978   2.0023   2.0066   2.0107
                        2.0147   2.0185   2.0223   2.0259   2.0294   2.0328   2.0361
                        2.0393   2.0425   2.0455   2.0485   2.0515   2.0543   2.0571
                        2.0599   2.0625   2.0652   2.0678   2.0703   2.0728   2.0752
                        2.0776   2.0800   2.0823   2.0845   2.0868   2.0890   2.0912
                        2.0933   2.0954   2.0975   2.0995   2.1015   2.1035   2.1055
                        2.1074   2.1093   2.1112   2.1131   2.1149   2.1167   2.1185
                        2.1203   2.1221   2.1238   2.1255   2.1272   2.1289   2.1305
                        2.1322   2.1338   2.1354   2.1370   2.1386   2.1401   2.1417
                        2.1432   2.1447   2.1462   2.1477   2.1492   2.1506   2.1521
                        2.1535   2.1549   2.1564   2.1577   2.1591   2.1605   2.1619
                        2.1632   2.1646   2.1659   2.1672   2.1685   2.1698   2.1711
                        2.1724   2.1736   2.1749   2.1762   2.1774   2.1786   2.1799
                        2.1811   2.1823   2.1835   2.1847   2.1858   2.1870   2.1882
                        2.1893   2.1905   2.1916   2.1928   2.1939   2.1950   2.1961
                        2.1972   2.1983   2.1994   2.2005   2.2016   2.2027   2.2037
                        2.2048   2.2058   2.2069   2.2079   2.2090   2.2100

*
*S ALL FLOWS INCLUDE A 2% BULKING FACTOR
SEDIMENT BULK         CODE=1  BULKING FACTOR = 1.02
*
COMPUTE NM HYD        ID=11  HYD=11D  AREA=0.0250   PER A=100  PER B=0
                      PER C=0   PER D=0   TP=0.1333  MASS RAIN=-1

     K =    .162928HR     TP =    .133300HR     K/TP RATIO =  1.222262      SHAPE CONSTANT, N =
2.911962
     UNIT PEAK =    51.494     CFS    UNIT VOLUME =     .9994        B =    274.56       P60 =
1.9000
```

```
AREA =       .025000 SQ MI    IA =     .65000 INCHES    INF =   1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

PRINT HYD            ID=11  CODE=1

                                        HYDROGRAPH FROM AREA 11D

RUNOFF VOLUME =       .46095 INCHES     =         .6146 ACRE-FEET
PEAK DISCHARGE RATE =      21.77 CFS  AT   1.533 HOURS   BASIN AREA =   .0250 SQ. MI.

*
COMPUTE NM HYD       ID=10  HYD=10D  AREA=0.0336   PER A=84  PER B=0
                     PER C=8   PER D=8  TP=0.1333  MASS RAIN=-1

K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
UNIT PEAK =   10.612    CFS   UNIT VOLUME =    .9982       B =   526.28      P60 =
1.9000
AREA =       .002688 SQ MI    IA =     .10000 INCHES    INF =     .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

K =    .157995HR    TP =    .133300HR    K/TP RATIO =  1.185260     SHAPE CONSTANT, N =
2.995080
UNIT PEAK =   65.261    CFS   UNIT VOLUME =    .9996       B =   281.42      P60 =
1.9000
AREA =       .030912 SQ MI    IA =     .62391 INCHES    INF =   1.59696 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

PRINT HYD            ID=10  CODE=1

                                        HYDROGRAPH FROM AREA 10D

RUNOFF VOLUME =       .61847 INCHES     =        1.1083 ACRE-FEET
PEAK DISCHARGE RATE =      36.63 CFS  AT   1.533 HOURS   BASIN AREA =   .0336 SQ. MI.

*
*ADD FLOW FROM 10D AND 11D
*     EXISTING CONDITION - THESE FLOWS ENTER 12D NEAR EACH OTHER AND CROSS
*      12D TO A POINT WHERE THEY COMBINE. - FOR DEVELOPED MODEL ADD
*      HYDROGRAPHS THEN ROUTE THROUGH 12D IN AN ASSUMED CONCRETE CHANNEL
*      TO SIMULATE DEVELOPED CONDITIONS
ADD HYD              ID=1   HYD=10.1  ID=10  ID=11
PRINT HYD            ID=1  CODE=1

                                        OUTFLOW HYDROGRAPH REACH    10.10

RUNOFF VOLUME =       .55127 INCHES     =        1.7229 ACRE-FEET
PEAK DISCHARGE RATE =      58.40 CFS  AT   1.533 HOURS   BASIN AREA =   .0586 SQ. MI.

*
*ROUTE COMBINED 11/10 FLOW THROUGH 12D - USE 10 FT BOTTOM/ 2:1 SIDE SLOPE
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=0
                     MAX ELEV=6  CH SLOPE=0.0255  FP SLOPE=0.0255
                     N=0.013   DIST=34
                     DIST ELEV
```

```
0     6
12    0
22    0
34    6
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.32	3.36	27.11	11.26
.63	7.11	87.66	12.53
.95	11.27	176.01	13.79
1.26	15.82	290.95	15.05
1.58	20.78	432.44	16.32
1.89	26.13	600.91	17.58
2.21	31.88	797.03	18.84
2.53	38.03	1021.61	20.11
2.84	44.58	1275.57	21.37
3.16	51.52	1559.82	22.63
3.47	58.87	1875.34	23.89
3.79	66.61	2223.10	25.16
4.11	74.76	2604.09	26.42
4.42	83.30	3019.29	27.68
4.74	92.24	3469.68	28.95
5.05	101.58	3956.24	30.21
5.37	111.32	4479.94	31.47
5.68	121.46	5041.75	32.74
6.00	132.00	5642.61	34.00

```
COMPUTE TRAVEL TIME ID=2  REACH NO=1  NOVS=1  L=4000  SLP=0.0255
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.357	27.11	.1376
.632	7.114	87.66	.0902
.947	11.269	176.01	.0711
1.263	15.823	290.95	.0604
1.579	20.776	432.44	.0534
1.895	26.127	600.91	.0483
2.211	31.878	797.03	.0444
2.526	38.028	1021.61	.0414
2.842	44.576	1275.57	.0388
3.158	51.524	1559.82	.0367
3.474	58.870	1875.34	.0349
3.789	66.615	2223.10	.0333
4.105	74.759	2604.09	.0319
4.421	83.302	3019.29	.0307
4.737	92.244	3469.68	.0295
5.053	101.584	3956.24	.0285
5.368	111.324	4479.94	.0276
5.684	121.463	5041.75	.0268
6.000	132.000	5642.61	.0260

```
ROUTE                ID=2  HYD=R1  INFLOW ID=1  DT=0.0
PRINT HYD            ID=2  CODE=1
```

HYDROGRAPH FROM AREA R1

```
RUNOFF VOLUME =        .55127 INCHES     =        1.7229 ACRE-FEET
PEAK DISCHARGE RATE =       42.04 CFS  AT   1.600 HOURS   BASIN AREA =    .0586 SQ. MI.


*
COMPUTE NM HYD       ID=12  HYD=12D  AREA=0.2407   PER A=1  PER B=19
```

```
                    PER C=15   PER D=65  TP=0.2051  MASS RAIN=-1

        K =   .116105HR    TP =   .205100HR    K/TP RATIO =   .566089     SHAPE CONSTANT, N =
6.770819
        UNIT PEAK =   389.26    CFS   UNIT VOLUME =    1.000       B =   510.29      P60 =
1.9000
        AREA =       .156455 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

        K =   .176990HR    TP =   .205100HR    K/TP RATIO =   .862946     SHAPE CONSTANT, N =
4.119566
        UNIT PEAK =   149.13    CFS   UNIT VOLUME =    1.000       B =   363.06      P60 =
1.9000
        AREA =       .084245 SQ MI    IA =    .44000 INCHES    INF =   1.08200 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

    PRINT HYD           ID=12  CODE=1

                                        HYDROGRAPH FROM AREA 12D

        RUNOFF VOLUME =     1.59678 INCHES     =      20.4982 ACRE-FEET
        PEAK DISCHARGE RATE =     462.31 CFS  AT   1.567 HOURS   BASIN AREA =   .2407 SQ. MI.


    *
    *ADD 12D AND ROUTED 11&10
    ADD HYD             ID=4  HYD=R12  ID=12  ID=2
    PRINT HYD           ID=4  CODE=1

                                        HYDROGRAPH FROM AREA R12

        RUNOFF VOLUME =     1.39208 INCHES     =      22.2211 ACRE-FEET
        PEAK DISCHARGE RATE =     501.92 CFS  AT   1.567 HOURS   BASIN AREA =   .2993 SQ. MI.


    *
    *ADD A DIVIDE HYD HERE TO SIMULATE LIMITING THE FLOW TO THE DOWNSTREAM
    *  SYSTEM TO 331 CFS - WHICH WAS THE ORIGINAL DESIGN FLOW
    *  IN THE FUTURE COA IS PLANNING ON PROBABLY BUILDING A POND TO LIMIT FLOW
    DIVIDE HYD          ID=4  Q=315   ID=3  HYD=PIPE
                                      ID=5  HYD=POND
    PRINT HYD           ID=3  CODE=1

                                        HYDROGRAPH FROM AREA PIPE

        RUNOFF VOLUME =     1.39208 INCHES     =      19.5031 ACRE-FEET
        PEAK DISCHARGE RATE =     315.00 CFS  AT   1.500 HOURS   BASIN AREA =   .2627 SQ. MI.


    PRINT HYD           ID=5  CODE=1

                                        HYDROGRAPH FROM AREA POND

        RUNOFF VOLUME =     1.39207 INCHES     =       2.7180 ACRE-FEET
        PEAK DISCHARGE RATE =     186.92 CFS  AT   1.567 HOURS   BASIN AREA =   .0366 SQ. MI.


    *
```

```
*ROUTE THROUGH 66INCH STORM DRAIN - USE FRICTION SLOPE INSTEAD OF PIPE SLOPE
COMPUTE RATING CURVE CID=1  VSNO=1  CODE= -1  SLP=0.0038
                     DIA=66    N=0.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.29	.47	1.09	2.44
.57	1.31	4.71	3.36
.86	2.37	10.96	3.99
1.15	3.59	19.71	4.47
1.43	4.92	30.77	4.83
1.72	6.35	43.91	5.10
2.01	7.84	58.82	5.30
2.29	9.38	75.21	5.42
2.58	10.94	92.71	5.49
2.87	12.52	110.96	5.50
3.15	14.09	129.54	5.50
3.44	15.63	148.01	5.50
3.73	17.13	165.89	5.50
4.01	18.57	182.64	5.50
4.30	19.92	197.62	5.50
4.59	21.17	210.09	5.50
4.87	22.26	219.01	5.50
5.16	23.15	222.68	5.50
5.50	23.76	222.68	5.50

```
COMPUTE TRAVEL TIME ID=4  REACH NO=1  NOVS=1  L=630  SLP=0.0038
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.287	.472	1.09	.0761
.573	1.314	4.71	.0488
.860	2.373	10.96	.0379
1.146	3.589	19.71	.0319
1.433	4.923	30.77	.0280
1.720	6.348	43.91	.0253
2.006	7.839	58.82	.0233
2.293	9.377	75.21	.0218
2.579	10.942	92.71	.0207
2.866	12.518	110.96	.0197
3.153	14.086	129.54	.0190
3.439	15.630	148.01	.0185
3.726	17.132	165.89	.0181
4.013	18.571	182.64	.0178
4.299	19.925	197.62	.0176
4.586	21.166	210.09	.0176
4.872	22.258	219.01	.0178
5.159	23.147	222.68	.0182
5.500	23.758	222.68	.0187

```
    ROUTE                ID=4  HYD=RR12  INFLOW ID=3  DT=0.0
 TRAVEL TIME TABLE EXCEEDED
    PROBLEM FAILED TO CONVERGE AFTER 50 ITERATIONS. CONVERGENCE WAS FORCED.  OUTFLOW NUMBER =
58  RATE =    219.23
    PRINT HYD            ID=4  CODE=1
```

HYDROGRAPH FROM AREA RR12

```
RUNOFF VOLUME =      1.39208 INCHES      =      19.5031 ACRE-FEET
PEAK DISCHARGE RATE =     315.00 CFS  AT   1.667 HOURS   BASIN AREA =   .2627 SQ. MI.
```

```
*
*s RECALL FLOW FROM AMOLE DEL NORTE PHASE IIIC - DETENTION BASINS
RECALL HYD          ID=10 HYD=      501.00 DT=  .050000 HRS DA=   1.0612 SM
                    PEAK=     97.003CFS  RO= 1.8009 INCHES  NO PTS=600
                    FLOW RATES
                          .000       .000       .000       .000       .000
                          .000       .000       .000       .000       .000
                          .000       .000       .000       .000       .000
                          .000       .000       .000       .000       .000
                          .000       .000       .000       .000       .039
                          .443      2.000      5.064      5.630     15.910
                        30.855     38.966     45.067     48.996     52.226
                        55.002     56.732     58.292     59.709     61.000
                        62.177     63.386     64.835     66.377     67.693
                        68.710     69.473     70.043     70.466     70.776
                        71.001     71.185     71.357     71.517     71.669
                        71.812     71.948     84.498     95.031     97.003
                        96.932     96.408     95.844     95.338     94.890
                        94.505     94.183     93.910     93.656     93.401
                        93.163     92.971     92.815     92.661     92.507
                        92.378     92.252     92.103     91.946     91.786
                        91.644     91.513     91.377     91.236     91.110
                        91.008     90.895     90.778     90.678     90.584
                        90.495     90.402     90.295     90.194     90.007
                        89.662     89.252     88.838     88.416     87.976
                        87.540     87.121     86.705     86.294     85.898
                        85.515     85.125     84.716     84.307     83.916
                        83.546     83.190     82.834     82.451     82.042
                        81.649     81.281     80.908     80.512     80.117
                        79.752     79.413     79.223     79.268     79.370
                        79.363     79.227     78.998     78.712     78.380
                        78.026     77.678     77.316     76.932     76.541
                        76.135     75.722     75.319     74.945     74.584
                        74.190     73.772     73.377     73.009     72.646
                        72.268     71.999     71.996     71.992     71.985
                        71.977     71.967     71.955     71.942     71.925
                        71.907     71.885     71.861     71.835     71.806
                        71.775     71.741     71.705     71.667     71.626
                        71.583     71.538     71.491     71.442     71.390
                        71.336     71.281     71.223     71.164     71.102
                        71.039     70.973     70.906     70.837     70.767
                        70.695     70.621     70.547     70.470     70.392
                        70.312     70.232     70.149     70.065     69.980
                        69.894     69.806     69.717     69.627     69.535
                        69.442     69.348     69.253     69.157     69.059
                        68.960     68.860     68.759     68.657     68.554
                        68.450     68.343     68.234     68.124     68.011
                        67.896     67.779     67.660     67.539     67.417
                        67.292     67.166     67.038     66.909     66.778
                        66.645     66.511     66.375     66.238     66.099
                        65.959     65.818     65.676     65.532     65.387
                        65.241     65.093     64.945     64.795     64.645
                        64.493     64.341     64.187     64.033     63.853
                        63.666     63.479     63.290     63.101     62.911
                        62.720     62.529     62.336     62.142     61.946
                        61.749     61.551     61.352     61.152     60.951
                        60.749     60.546     60.342     60.137     59.932
                        59.726     59.520     59.313     59.105     58.897
                        58.688     58.479     58.270     58.060     57.850
                        57.640     57.430     57.219     57.008     56.797
                        56.586     56.375     56.164     55.953     55.742
                        55.531     55.320     55.109     54.856     54.557
                        54.259     53.962     53.666     53.371     53.077
                        52.784     52.492     52.201     51.911     51.621
                        51.333     51.046     50.759     50.474     50.190
                        49.906     49.625     49.344     49.064     48.785
                        48.508     48.232     47.957     47.683     47.410
                        47.139     46.870     46.601     46.334     46.068
                        45.804     45.541     45.280     45.019     44.760
```

44.502	44.246	43.991	43.738	43.486
43.235	42.980	42.627	42.278	41.931
41.588	41.248	40.911	40.577	40.247
39.919	39.595	39.273	38.955	38.639
38.327	38.017	37.711	37.407	37.106
36.808	36.513	36.221	35.933	35.646
35.363	35.082	34.803	34.528	34.255
33.984	33.716	33.451	33.189	32.929
32.672	32.417	32.165	31.915	31.668
31.423	31.180	30.941	30.703	30.468
30.235	30.004	29.776	29.550	29.326
29.104	28.885	28.668	28.453	28.240
28.030	27.821	27.614	27.410	27.207
27.007	26.477	25.950	25.438	24.942
24.461	23.995	23.542	23.102	22.676
22.263	21.863	21.474	21.096	20.729
20.373	20.028	19.693	19.368	19.052
18.746	18.449	18.160	17.878	17.605
17.341	17.085	16.837	16.595	16.360
16.131	15.910	15.696	15.486	15.284
15.086	14.895	14.709	14.529	14.353
14.182	14.016	13.855	13.700	13.548
13.400	13.257	13.117	12.981	12.848
12.719	12.594	12.473	12.356	12.241
12.130	12.021	11.916	11.813	11.712
11.614	11.519	11.427	11.337	11.249
11.164	11.082	11.001	10.922	10.844
10.768	10.695	10.624	10.556	10.489
10.424	10.360	10.298	10.237	10.177
10.120	10.063	10.007	9.952	9.897
9.845	9.795	9.746	9.699	9.653
9.607	9.562	9.517	9.475	9.434
9.393	9.351	9.301	9.234	9.149
9.052	8.948	8.839	8.728	8.615
8.499	8.383	8.265	8.146	8.026
7.906	7.786	7.665	7.544	7.423
7.302	7.182	7.061	6.942	6.823
6.704	6.586	6.468	6.349	6.231
6.113	6.000	5.993	5.987	5.980
5.973	5.967	5.960	5.952	5.945
5.938	5.930	5.923	5.915	5.907
5.899	5.891	5.883	5.875	5.867
5.859	5.851	5.842	5.834	5.826
5.817	5.809	5.800	5.791	5.783
5.774	5.765	5.757	5.748	5.739
5.730	5.721	5.712	5.703	5.695
5.686	5.677	5.668	5.659	5.650
5.641	5.632	5.623	5.614	5.604
5.595	5.586	5.577	5.568	5.559
5.550	5.541	5.532	5.523	5.514
5.505	5.496	5.487	5.478	5.468
5.459	5.450	5.441	5.432	5.423
5.414	5.405	5.396	5.387	5.378
5.369	5.360	5.351	5.342	5.333
5.324	5.315	5.306	5.298	5.289
5.280	5.271	5.262	5.253	5.244

COMPUTE NM HYD ID=19 HYD=19D AREA=0.0897 PER A=0 PER B=15
PER C=10 PER D=75 TP=0.1714 MASS RAIN=-1

K = .093965HR TP = .171400HR K/TP RATIO = .548219 SHAPE CONSTANT, N = 7.053046

UNIT PEAK = 205.58 CFS UNIT VOLUME = 1.000 B = 523.76 P60 = 1.9000

AREA = .067275 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

K = .154334HR TP = .171400HR K/TP RATIO = .900429 SHAPE CONSTANT, N =

3.935850

UNIT PEAK = 45.906 CFS UNIT VOLUME = .9999 B = 350.87 P60 =
1.9000

AREA = .022425 SQ MI IA = .44000 INCHES INF = 1.08200 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

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

PRINT HYD ID=19 CODE=1

HYDROGRAPH FROM AREA 19D

RUNOFF VOLUME = 1.71647 INCHES = 8.2115 ACRE-FEET
PEAK DISCHARGE RATE = 202.80 CFS AT 1.533 HOURS BASIN AREA = .0897 SQ. MI.

*
*ADD 19D AND OUTFLOW FROM DETENTION BASINS
ADD HYD ID=5 HYD=19.1 ID=19 ID=10
PRINT HYD ID=5 CODE=1

OUTFLOW HYDROGRAPH REACH 19.10

RUNOFF VOLUME = 1.67393 INCHES = 102.7471 ACRE-FEET
PEAK DISCHARGE RATE = 239.79 CFS AT 1.567 HOURS BASIN AREA = 1.1509 SQ. MI.

*
*ROUTE FLOW ALONG CENTRAL FROM 98TH ST TO 90TH ST IN 66INCH STORM DRAIN
COMPUTE RATING CURVE CID=1 VSNO=1 CODE=-1 SLP=0.024
DIA=66 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.29	.47	2.73	2.44
.57	1.31	11.85	3.36
.86	2.37	27.54	3.99
1.15	3.59	49.53	4.47
1.43	4.92	77.34	4.83
1.72	6.35	110.34	5.10
2.01	7.84	147.83	5.30
2.29	9.38	189.01	5.42
2.58	10.94	233.00	5.49
2.87	12.52	278.85	5.50
3.15	14.09	325.55	5.50
3.44	15.63	371.97	5.50
3.73	17.13	416.91	5.50
4.01	18.57	458.99	5.50
4.30	19.92	496.65	5.50
4.59	21.17	527.98	5.50
4.87	22.26	550.41	5.50
5.16	23.15	559.62	5.50
5.50	23.76	559.62	5.50

COMPUTE TRAVEL TIME ID=6 REACH NO=1 NOVS=1 L=2550 SLP=.024

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.287	.472	2.73	.1226

.573	1.314	11.85	.0786
.860	2.373	27.54	.0610
1.146	3.589	49.53	.0513
1.433	4.923	77.34	.0451
1.720	6.348	110.34	.0407
2.006	7.839	147.83	.0376
2.293	9.377	189.01	.0351
2.579	10.942	233.00	.0333
2.866	12.518	278.85	.0318
3.153	14.086	325.55	.0306
3.439	15.630	371.97	.0298
3.726	17.132	416.91	.0291
4.013	18.571	458.99	.0287
4.299	19.925	496.65	.0284
4.586	21.166	527.98	.0284
4.872	22.258	550.41	.0286
5.159	23.147	559.62	.0293
5.500	23.758	559.62	.0301

```
ROUTE                ID=6  HYD=R19.1  INFLOW ID=5  DT=0.0
PRINT HYD            ID=6  CODE=1
```

HYDROGRAPH FROM AREA R19.1

RUNOFF VOLUME = 1.67200 INCHES = 102.6290 ACRE-FEET
PEAK DISCHARGE RATE = 236.32 CFS AT 1.567 HOURS BASIN AREA = 1.1509 SQ. MI.

```
*
*ADD ROUTED FLOW FROM 12D, 10D and 11D
ADD HYD              ID=7  HYD=19.2   ID=6  ID=4
PRINT HYD            ID=7  CODE=1
```

OUTFLOW HYDROGRAPH REACH 19.20

RUNOFF VOLUME = 1.61998 INCHES = 122.1321 ACRE-FEET
PEAK DISCHARGE RATE = 551.30 CFS AT 1.567 HOURS BASIN AREA = 1.4136 SQ. MI.

```
*
*ROUTE FLOW TO STA 69+71 IN 84INCH STORM DRAIN
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.017
                     DIA=84    N=0.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.36	.76	4.37	3.11
.73	2.13	18.97	4.28
1.09	3.84	44.09	5.08
1.46	5.81	79.30	5.69
1.82	7.97	123.82	6.15
2.19	10.28	176.67	6.49
2.55	12.70	236.69	6.74
2.92	15.19	302.62	6.90
3.28	17.72	373.05	6.99
3.65	20.28	446.47	7.00
4.01	22.82	521.23	7.00
4.38	25.32	595.56	7.00
4.74	27.75	667.50	7.00
5.11	30.08	734.88	7.00
5.47	32.27	795.18	7.00
5.84	34.28	845.35	7.00
6.20	36.05	881.24	7.00

.573	1.314	11.85	.0786
.860	2.373	27.54	.0610
1.146	3.589	49.53	.0513
1.433	4.923	77.34	.0451
1.720	6.348	110.34	.0407
2.006	7.839	147.83	.0376
2.293	9.377	189.01	.0351
2.579	10.942	233.00	.0333
2.866	12.518	278.85	.0318
3.153	14.086	325.55	.0306
3.439	15.630	371.97	.0298
3.726	17.132	416.91	.0291
4.013	18.571	458.99	.0287
4.299	19.925	496.65	.0284
4.586	21.166	527.98	.0284
4.872	22.258	550.41	.0286
5.159	23.147	559.62	.0293
5.500	23.758	559.62	.0301

```
ROUTE                ID=6  HYD=R19.1  INFLOW ID=5  DT=0.0
PRINT HYD            ID=6  CODE=1
```

HYDROGRAPH FROM AREA R19.1

RUNOFF VOLUME = 1.67200 INCHES = 102.6290 ACRE-FEET
PEAK DISCHARGE RATE = 236.32 CFS AT 1.567 HOURS BASIN AREA = 1.1509 SQ. MI.

```
*
*ADD ROUTED FLOW FROM 12D, 10D and 11D
ADD HYD              ID=7  HYD=19.2   ID=6  ID=4
PRINT HYD            ID=7  CODE=1
```

OUTFLOW HYDROGRAPH REACH 19.20

RUNOFF VOLUME = 1.61998 INCHES = 122.1321 ACRE-FEET
PEAK DISCHARGE RATE = 551.30 CFS AT 1.567 HOURS BASIN AREA = 1.4136 SQ. MI.

```
*
*ROUTE FLOW TO STA 69+71 IN 84INCH STORM DRAIN
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.017
                     DIA=84    N=0.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.36	.76	4.37	3.11
.73	2.13	18.97	4.28
1.09	3.84	44.09	5.08
1.46	5.81	79.30	5.69
1.82	7.97	123.82	6.15
2.19	10.28	176.67	6.49
2.55	12.70	236.69	6.74
2.92	15.19	302.62	6.90
3.28	17.72	373.05	6.99
3.65	20.28	446.47	7.00
4.01	22.82	521.23	7.00
4.38	25.32	595.56	7.00
4.74	27.75	667.50	7.00
5.11	30.08	734.88	7.00
5.47	32.27	795.18	7.00
5.84	34.28	845.35	7.00
6.20	36.05	881.24	7.00

```
                                        6.57        37.49       895.99          7.00
                                        7.00        38.48       895.99          7.00
COMPUTE TRAVEL TIME ID=8  REACH NO=1  NOVS=1  L=813  SLP=0.017

                              TRAVEL TIME TABLE
                                          REACH=  1.0

                              WATER       AVERAGE     FLOW        TRAVEL
                              DEPTH       AREA        RATE        TIME
                              FEET        SQ.FT.      CFS         HRS
                                .365         .765       4.37       .0395
                                .730        2.128      18.97       .0253
                               1.094        3.843      44.09       .0197
                               1.459        5.813      79.30       .0166
                               1.824        7.975     123.82       .0145
                               2.189       10.282     176.67       .0131
                               2.553       12.698     236.69       .0121
                               2.918       15.189     302.62       .0113
                               3.283       17.724     373.05       .0107
                               3.648       20.276     446.47       .0103
                               4.013       22.817     521.23       .0099
                               4.377       25.319     595.56       .0096
                               4.742       27.751     667.50       .0094
                               5.107       30.082     734.88       .0092
                               5.472       32.275     795.18       .0092
                               5.836       34.285     845.35       .0092
                               6.201       36.054     881.24       .0092
                               6.566       37.495     895.99       .0095
                               7.000       38.485     895.99       .0097
ROUTE                 ID=8  HYD=19.3  INFLOW ID=7  DT=0.0
PRINT HYD             ID=8  CODE=1

                                     OUTFLOW HYDROGRAPH REACH    19.30


    RUNOFF VOLUME =      1.61941 INCHES      =      122.0891 ACRE-FEET
    PEAK DISCHARGE RATE =      551.28 CFS  AT   1.600 HOURS   BASIN AREA =  1.4136 SQ. MI.


*
*REVISE BASIN 16 NORTH TO BRING FLOW FROM MOBILE HOMES BTWN 98TH AND 94TH
*   TO THE BRIDGE STORM DRAIN & REVISE AREA BTWN 94TH AND 90TH
*   PER SUNSET GARDENS/UNSER BLVD SD REPORT (AREA PREVIOUSLY IN 16SOUTH)
*AREA NORTH OF MOBILE HOMES FRONTING ON CENTRAL AVENUE
COMPUTE NM HYD        ID=1  HYD=16A  AREA=0.01282  PER A=0  PER B=10
                      PER C=5  PER D=85  TP=0.1333  MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =   43.022    CFS   UNIT VOLUME =    .9991       B =   526.28      P60 =
1.9000
        AREA =       .010897 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


        K =    .122575HR    TP =    .133300HR    K/TP RATIO =    .919546     SHAPE CONSTANT, N =
3.849372
        UNIT PEAK =   4.9770    CFS   UNIT VOLUME =    .9978       B =   345.00      P60 =
1.9000
        AREA =       .001923 SQ MI    IA =    .45000 INCHES    INF =   1.11000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

    PRINT HYD             ID=1  CODE=1

                                     HYDROGRAPH FROM AREA 16A
```

```
RUNOFF VOLUME =      1.83290 INCHES      =        1.2532 ACRE-FEET
PEAK DISCHARGE RATE =       34.51 CFS  AT   1.500 HOURS   BASIN AREA =    .0128 SQ. MI.


*
*  MOUNTAIN VIEW MOBILE HOME PARK
COMPUTE NM HYD        ID=2  HYD=16F  AREA=0.03493  PER A=2  PER B=33
                      PER C=2  PER D=63  TP=0.134  MASS RAIN=-1

K =    .073030HR    TP =    .134000HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
UNIT PEAK =   86.427    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 =
1.9000
AREA =       .022006 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333


K =    .131861HR    TP =    .134000HR    K/TP RATIO =    .984037     SHAPE CONSTANT, N =
3.588426
UNIT PEAK =   31.512    CFS   UNIT VOLUME =    .9999       B =   326.73      P60 =
1.9000
AREA =       .012924 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

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

PRINT HYD             ID=2  CODE=1

                                        HYDROGRAPH FROM AREA 16F


RUNOFF VOLUME =      1.52798 INCHES      =        2.8465 ACRE-FEET
PEAK DISCHARGE RATE =       80.83 CFS  AT   1.500 HOURS   BASIN AREA =    .0349 SQ. MI.


*
*ADD BASINS 16A AND 16F
ADD HYD               ID=3  HYD=16F.1  ID=1  ID=2
PRINT HYD             ID=3  CODE=1

                                        HYDROGRAPH FROM AREA 16F.1


RUNOFF VOLUME =      1.60983 INCHES      =        4.0997 ACRE-FEET
PEAK DISCHARGE RATE =      115.33 CFS  AT   1.500 HOURS   BASIN AREA =    .0478 SQ. MI.


*
*ROUTE THIS FLOW DOWN BRIDGE TO BRING IT TO THE PROJECT THROUGH 16B
*    ASSUME IN A PIPE
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLOPE=0.01
                     DIA= 48  N=0.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.21	.25	.75	1.78
.42	.69	3.27	2.44
.63	1.25	7.60	2.91
.83	1.90	13.68	3.25
1.04	2.60	21.35	3.51
1.25	3.36	30.47	3.71
1.46	4.15	40.82	3.85
1.67	4.96	52.19	3.94

1.88	5.79	64.33	3.99
2.08	6.62	77.00	4.00
2.29	7.45	89.89	4.00
2.50	8.27	102.71	4.00
2.71	9.06	115.11	4.00
2.92	9.82	126.73	4.00
3.13	10.54	137.13	4.00
3.34	11.20	145.78	4.00
3.54	11.77	151.97	4.00
3.75	12.24	154.52	4.00
4.00	12.57	154.52	4.00

```
COMPUTE TRAVEL TIME ID=4  REACH NO=1  NOVS=1  L=1300  SLP=0.01
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	.75	.1197
.417	.695	3.27	.0767
.625	1.255	7.60	.0596
.834	1.898	13.68	.0501
1.042	2.604	21.35	.0440
1.251	3.358	30.47	.0398
1.459	4.146	40.82	.0367
1.668	4.960	52.19	.0343
1.876	5.788	64.33	.0325
2.084	6.621	77.00	.0311
2.293	7.451	89.89	.0299
2.501	8.267	102.71	.0291
2.710	9.062	115.11	.0284
2.918	9.823	126.73	.0280
3.127	10.539	137.13	.0278
3.335	11.195	145.78	.0277
3.544	11.773	151.97	.0280
3.752	12.243	154.52	.0286
4.000	12.566	154.52	.0294

```
ROUTE              ID=4  HYD=16F.2  INFLOW ID=3  DT=0.0
PRINT HYD          ID=4  CODE=1
```

HYDROGRAPH FROM AREA 16F.2

```
RUNOFF VOLUME =      1.60984 INCHES      =       4.0997 ACRE-FEET
PEAK DISCHARGE RATE =     112.16 CFS  AT   1.533 HOURS   BASIN AREA =    .0478 SQ. MI.

*
COMPUTE NM HYD       ID=1  HYD=16B  AREA=0.01520   PER A=0  PER B=10
                     PER C=5  PER D=85   TP=0.1333  MASS RAIN=-1

        K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =   51.009    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 =
1.9000
        AREA =       .012920 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

        K =    .122575HR    TP =    .133300HR    K/TP RATIO =    .919546     SHAPE CONSTANT, N =
3.849372
        UNIT PEAK =   5.9010    CFS   UNIT VOLUME =    .9982       B =   345.00      P60 =
1.9000
        AREA =       .002280 SQ MI    IA =    .45000 INCHES    INF =   1.11000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

```
PRINT HYD            ID=1  CODE=1

                                        HYDROGRAPH FROM AREA 16B

    RUNOFF VOLUME =      1.83290 INCHES      =        1.4859 ACRE-FEET
    PEAK DISCHARGE RATE =       40.91 CFS  AT   1.500 HOURS   BASIN AREA =    .0152 SQ. MI.


*
*ADD ROUTED 16A/16F FLOW TO 16B
ADD HYD              ID=3  HYD=16B.1  ID=1  ID=4
PRINT HYD            ID=3  CODE=1

                                        HYDROGRAPH FROM AREA 16B.1

    RUNOFF VOLUME =      1.66369 INCHES      =        5.5855 ACRE-FEET
    PEAK DISCHARGE RATE =      151.18 CFS  AT   1.533 HOURS   BASIN AREA =    .0630 SQ. MI.

*
COMPUTE NM HYD       ID=2  HYD=16G  AREA=0.02011   PER A=0  PER B=20
                     PER C=10  PER D=70  TP=0.1333  MASS RAIN=-1

        K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =   55.577    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 =
1.9000
        AREA =       .014077 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333


        K =    .122575HR    TP =    .133300HR    K/TP RATIO =    .919546     SHAPE CONSTANT, N =
3.849372
        UNIT PEAK =   15.614    CFS   UNIT VOLUME =    .9995       B =   345.00      P60 =
1.9000
        AREA =       .006033 SQ MI    IA =    .45000 INCHES    INF =   1.11000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

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

    PRINT HYD            ID=2  CODE=1

                                        HYDROGRAPH FROM AREA 16G

    RUNOFF VOLUME =      1.65010 INCHES      =        1.7698 ACRE-FEET
    PEAK DISCHARGE RATE =       49.99 CFS  AT   1.500 HOURS   BASIN AREA =    .0201 SQ. MI.


*
*ADD 16G FLOW
ADD HYD              ID=16  HYD=16G.1  ID=2  ID=3
PRINT HYD            ID=16  CODE=1

                                        HYDROGRAPH FROM AREA 16G.1

    RUNOFF VOLUME =      1.66040 INCHES      =        7.3553 ACRE-FEET
    PEAK DISCHARGE RATE =      199.09 CFS  AT   1.533 HOURS   BASIN AREA =    .0831 SQ. MI.


*
*ADD 16 FLOW TO STORM DRAIN
```

```
ADD HYD              ID=9  HYD=16.1  ID=16  ID=8
PRINT HYD            ID=9  CODE=1

                                   OUTFLOW HYDROGRAPH REACH    16.10

    RUNOFF VOLUME =      1.62169 INCHES     =     129.4443 ACRE-FEET
    PEAK DISCHARGE RATE =     730.13 CFS  AT   1.533 HOURS   BASIN AREA =  1.4967 SQ. MI.


*
*ROUTE STORM DRAIN FLOW TO 86TH STREET (STA 64+34)
*  USE FRICTION SLOPE IN THE PIPE
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.012
                     DIA=84    N=0.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.36	.76	3.67	3.11
.73	2.13	15.94	4.28
1.09	3.84	37.05	5.08
1.46	5.81	66.63	5.69
1.82	7.97	104.03	6.15
2.19	10.28	148.43	6.49
2.55	12.70	198.86	6.74
2.92	15.19	254.25	6.90
3.28	17.72	313.42	6.99
3.65	20.28	375.11	7.00
4.01	22.82	437.92	7.00
4.38	25.32	500.37	7.00
4.74	27.75	560.81	7.00
5.11	30.08	617.42	7.00
5.47	32.27	668.09	7.00
5.84	34.28	710.23	7.00
6.20	36.05	740.39	7.00
6.57	37.49	752.78	7.00
7.00	38.48	752.78	7.00

```
COMPUTE TRAVEL TIME ID=1  REACH NO=1  NOVS=1  L=537  SLP=0.012
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.365	.765	3.67	.0311
.730	2.128	15.94	.0199
1.094	3.843	37.05	.0155
1.459	5.813	66.63	.0130
1.824	7.975	104.03	.0114
2.189	10.282	148.43	.0103
2.553	12.698	198.86	.0095
2.918	15.189	254.25	.0089
3.283	17.724	313.42	.0084
3.648	20.276	375.11	.0081
4.013	22.817	437.92	.0078
4.377	25.319	500.37	.0075
4.742	27.751	560.81	.0074
5.107	30.082	617.42	.0073
5.472	32.275	668.09	.0072
5.836	34.285	710.23	.0072
6.201	36.054	740.39	.0073
6.566	37.495	752.78	.0074
7.000	38.485	752.78	.0076

```
ROUTE                ID=1  HYD=16.2  INFLOW ID=9  DT=0.0
```

```
PRINT HYD            ID=1  CODE=1

                                        OUTFLOW HYDROGRAPH REACH    16.20

    RUNOFF VOLUME =      1.62127 INCHES      =     129.4115 ACRE-FEET
    PEAK DISCHARGE RATE =     730.06 CFS  AT   1.567 HOURS   BASIN AREA =  1.4967 SQ. MI.


*
*BASIN ADJACENT TO BRIDGE BLVD INCLUDING HALF OF BRIDGE ROW
COMPUTE NM HYD       ID=10  HYD=16D  AREA=0.01119   PER A=0  PER B=10
                     PER C=5  PER D=85   TP=0.1333  MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
    UNIT PEAK =   37.552    CFS   UNIT VOLUME =    .9991       B =   526.28      P60 =
1.9000
    AREA =       .009512 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

    K =    .122575HR    TP =    .133300HR    K/TP RATIO =    .919546     SHAPE CONSTANT, N =
3.849372
    UNIT PEAK =   4.3442    CFS   UNIT VOLUME =    .9972       B =   345.00      P60 =
1.9000
    AREA =       .001679 SQ MI    IA =    .45000 INCHES    INF =   1.11000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

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

PRINT HYD            ID=10  CODE=1

                                        HYDROGRAPH FROM AREA 16D

    RUNOFF VOLUME =      1.83290 INCHES      =       1.0939 ACRE-FEET
    PEAK DISCHARGE RATE =       30.12 CFS  AT   1.500 HOURS   BASIN AREA =    .0112 SQ. MI.


*
*ADD THIS FLOW TO THE STORM DRAIN - SOUTH SIDE
ADD HYD              ID=1  HYD=16D.1  ID=1  ID=10
PRINT HYD            ID=1  CODE=1

                                        HYDROGRAPH FROM AREA 16D.1

    RUNOFF VOLUME =      1.62285 INCHES      =     130.5054 ACRE-FEET
    PEAK DISCHARGE RATE =     754.97 CFS  AT   1.567 HOURS   BASIN AREA =  1.5078 SQ. MI.


*
COMPUTE NM HYD       ID=17  HYD=17W  AREA=0.0802   PER A=0  PER B=15
                     PER C=10  PER D=75  TP=0.1881  MASS RAIN=-1

    K =    .102909HR    TP =    .188100HR    K/TP RATIO =    .547095     SHAPE CONSTANT, N =
7.071606
    UNIT PEAK =   167.77    CFS   UNIT VOLUME =    .9998       B =   524.64      P60 =
1.9000
    AREA =       .060150 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

    K =    .169820HR    TP =    .188100HR    K/TP RATIO =    .902817     SHAPE CONSTANT, N =
3.924796
```

```
        UNIT PEAK =   37.320    CFS   UNIT VOLUME =    .9997        B =   350.12       P60 =
1.9000
        AREA =       .020050 SQ MI    IA =    .44000 INCHES    INF =   1.08200 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

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

    PRINT HYD            ID=17  CODE=1

                                          HYDROGRAPH FROM AREA 17W


        RUNOFF VOLUME =      1.71647 INCHES      =       7.3419 ACRE-FEET
        PEAK DISCHARGE RATE =     173.01 CFS  AT   1.567 HOURS   BASIN AREA =    .0802 SQ. MI.


    *
    *DIVIDE FLOW FOR PORTION ENTERING SD AT 86TH AND PART ENTERING NEAR 82ND
    DIVIDE HYD           ID=17  Q=82  ID=17  HYD=86TH
                                      ID=18 HYD=82TH
    *ADD 17W TO STORM DRAIN FLOW - NORTH SIDE
    ADD HYD              ID=2  HYD=17.1  ID=17  ID=1
    PRINT HYD            ID=2  CODE=1

                                         OUTFLOW HYDROGRAPH REACH    17.10


        RUNOFF VOLUME =      1.62662 INCHES      =     136.2971 ACRE-FEET
        PEAK DISCHARGE RATE =     836.97 CFS  AT   1.567 HOURS   BASIN AREA =  1.5711 SQ. MI.


    *
    *ROUTE 84INCH STORM DRAIN FLOW STA 56+75 WHERE LINE IS UPSIZED TO 90INCH
    *  USE FRICTION SLOPE
    COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.0045
                         DIA=84    N=0.013

                                       RATING CURVE PIPE SECTION  1.0
                                          WATER        FLOW        FLOW        MAX
                                         SURFACE       AREA        RATE       WIDTH
                                          ELEV        SQ FT        CFS         FT
                                           .00          .00         .00         .00
                                           .36          .76        2.25        3.11
                                           .73         2.13        9.76        4.28
                                          1.09         3.84       22.69        5.08
                                          1.46         5.81       40.80        5.69
                                          1.82         7.97       63.71        6.15
                                          2.19        10.28       90.89        6.49
                                          2.55        12.70      121.78        6.74
                                          2.92        15.19      155.70        6.90
                                          3.28        17.72      191.93        6.99
                                          3.65        20.28      229.71        7.00
                                          4.01        22.82      268.17        7.00
                                          4.38        25.32      306.41        7.00
                                          4.74        27.75      343.43        7.00
                                          5.11        30.08      378.09        7.00
                                          5.47        32.27      409.12        7.00
                                          5.84        34.28      434.93        7.00
                                          6.20        36.05      453.40        7.00
                                          6.57        37.49      460.98        7.00
                                          7.00        38.48      460.98        7.00
    COMPUTE TRAVEL TIME ID=3  REACH NO=1  NOVS=1  L=759  SLP=0.0045

                                   TRAVEL TIME TABLE
                                                   REACH=  1.0

                                   WATER       AVERAGE     FLOW        TRAVEL
```

DEPTH FEET	AREA SQ.FT.	RATE CFS	TIME HRS
.365	.765	2.25	.0717
.730	2.128	9.76	.0460
1.094	3.843	22.69	.0357
1.459	5.813	40.80	.0300
1.824	7.975	63.71	.0264
2.189	10.282	90.89	.0239
2.553	12.698	121.78	.0220
2.918	15.189	155.70	.0206
3.283	17.724	191.93	.0195
3.648	20.276	229.71	.0186
4.013	22.817	268.17	.0179
4.377	25.319	306.41	.0174
4.742	27.751	343.43	.0170
5.107	30.082	378.09	.0168
5.472	32.275	409.12	.0166
5.836	34.285	434.93	.0166
6.201	36.054	453.40	.0168
6.566	37.495	460.98	.0171
7.000	38.485	460.98	.0176

```
    ROUTE                ID=3  HYD=17.2  INFLOW ID=2  DT=0.0
TRAVEL TIME TABLE EXCEEDED
    PRINT HYD            ID=3  CODE=1
```

OUTFLOW HYDROGRAPH REACH 17.20

RUNOFF VOLUME = 1.62584 INCHES = 136.2325 ACRE-FEET
PEAK DISCHARGE RATE = 835.00 CFS AT 1.567 HOURS BASIN AREA = 1.5711 SQ. MI.

```
    *
    *ROUTE STORM DRAIN FLOW TO 82ND STREET (STA 53+70) IN 90INCH
    COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.012
                         DIA=90    N=0.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.39	.88	4.41	3.33
.78	2.44	19.15	4.58
1.17	4.41	44.53	5.45
1.56	6.67	80.09	6.09
1.95	9.15	125.04	6.58
2.35	11.80	178.41	6.95
2.74	14.58	239.03	7.22
3.13	17.44	305.61	7.40
3.52	20.35	376.73	7.49
3.91	23.28	450.88	7.50
4.30	26.19	526.38	7.50
4.69	29.06	601.44	7.50
5.08	31.86	674.10	7.50
5.47	34.53	742.14	7.50
5.86	37.05	803.03	7.50
6.25	39.36	853.69	7.50
6.64	41.39	889.95	7.50
7.04	43.04	904.84	7.50
7.50	44.18	904.84	7.50

```
COMPUTE TRAVEL TIME ID=4  REACH NO=1  NOVS=1  L=305  SLP=0.012
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH	AVERAGE AREA	FLOW RATE	TRAVEL TIME

FEET	SQ.FT.	CFS	HRS
.391	.878	4.41	.0169
.782	2.443	19.15	.0108
1.173	4.412	44.53	.0084
1.563	6.673	80.09	.0071
1.954	9.155	125.04	.0062
2.345	11.804	178.41	.0056
2.736	14.577	239.03	.0052
3.127	17.436	305.61	.0048
3.518	20.347	376.73	.0046
3.908	23.276	450.88	.0044
4.299	26.193	526.38	.0042
4.690	29.065	601.44	.0041
5.081	31.857	674.10	.0040
5.472	34.533	742.14	.0039
5.863	37.050	803.03	.0039
6.253	39.357	853.69	.0039
6.644	41.389	889.95	.0039
7.035	43.043	904.84	.0040
7.500	44.179	904.84	.0041

```
ROUTE                ID=4  HYD=17.3  INFLOW ID=3  DT=0.0
PRINT HYD            ID=4  CODE=1

                                   OUTFLOW HYDROGRAPH REACH    17.30

    RUNOFF VOLUME =      1.62562 INCHES      =     136.2138 ACRE-FEET
    PEAK DISCHARGE RATE =     834.48 CFS  AT   1.567 HOURS   BASIN AREA =  1.5711 SQ. MI.


*
*ADD FLOW FROM 17W AT 82ND STEET LOCATION (STA 53+70)
ADD HYD              ID=5  HYD=17.4  ID=4  ID=18
PRINT HYD            ID=5  CODE=1

                                   OUTFLOW HYDROGRAPH REACH    17.40

    RUNOFF VOLUME =      1.62659 INCHES      =     137.7640 ACRE-FEET
    PEAK DISCHARGE RATE =     925.49 CFS  AT   1.567 HOURS   BASIN AREA =  1.5880 SQ. MI.


*
*ADD FLOW FROM BRIDGEPOINT APARTMENTS (AREA BOUNDED BY 86TH, BRIDGE, 82ND
*   & SUNSET GARDENS - BASIN INFORMATION FROM CONCEPTUAL GRADING & DRAINAGE
*   PLAN FOR BRIDGEPOINT APARTMENTS MARCH 1995 BY COMMUNITY SCIENCES
COMPUTE NM HYD       ID=6  HYD=BPD  AREA=0.0342   PER A=0 PER B=25
                     PER C=25  PER D=50  TP=0.1333  MASS RAIN=-1

        K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =   67.512    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 =
1.9000
        AREA =       .017100 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


        K =   .118483HR    TP =   .133300HR    K/TP RATIO =   .888844     SHAPE CONSTANT, N =
3.990548
        UNIT PEAK =   45.481    CFS   UNIT VOLUME =    1.000       B =   354.54      P60 =
1.9000
        AREA =       .017100 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

    PRINT HYD            ID=6  CODE=1
```

HYDROGRAPH FROM AREA BPD

RUNOFF VOLUME = 1.43350 INCHES = 2.6147 ACRE-FEET
PEAK DISCHARGE RATE = 77.22 CFS AT 1.500 HOURS BASIN AREA = .0342 SQ. MI.

```
*
*ADD TO FLOW IN STORM DRAIN
ADD HYD          ID=7  HYD=6.1  ID=6  ID=5
PRINT HYD        ID=7  CODE=1
```

OUTFLOW HYDROGRAPH REACH 6.10

RUNOFF VOLUME = 1.62252 INCHES = 140.3787 ACRE-FEET
PEAK DISCHARGE RATE = 991.01 CFS AT 1.567 HOURS BASIN AREA = 1.6222 SQ. MI.

```
*
*ROUTE STORM DRAIN FLOW TO UNSER BLVD. (STA 41+06)
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.012
                     DIA=90    N=0.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.39	.88	4.41	3.33
.78	2.44	19.15	4.58
1.17	4.41	44.53	5.45
1.56	6.67	80.09	6.09
1.95	9.15	125.04	6.58
2.35	11.80	178.41	6.95
2.74	14.58	239.03	7.22
3.13	17.44	305.61	7.40
3.52	20.35	376.73	7.49
3.91	23.28	450.88	7.50
4.30	26.19	526.38	7.50
4.69	29.06	601.44	7.50
5.08	31.86	674.10	7.50
5.47	34.53	742.14	7.50
5.86	37.05	803.03	7.50
6.25	39.36	853.69	7.50
6.64	41.39	889.95	7.50
7.04	43.04	904.84	7.50
7.50	44.18	904.84	7.50

```
COMPUTE TRAVEL TIME ID=8  REACH NO=1  NOVS=1  L=1264  SLP=0.012
```

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.391	.878	4.41	.0699
.782	2.443	19.15	.0448
1.173	4.412	44.53	.0348
1.563	6.673	80.09	.0293
1.954	9.155	125.04	.0257
2.345	11.804	178.41	.0232
2.736	14.577	239.03	.0214
3.127	17.436	305.61	.0200
3.518	20.347	376.73	.0190
3.908	23.276	450.88	.0181
4.299	26.193	526.38	.0175

```
                                    4.690      29.065      601.44       .0170
                                    5.081      31.857      674.10       .0166
                                    5.472      34.533      742.14       .0163
                                    5.863      37.050      803.03       .0162
                                    6.253      39.357      853.69       .0162
                                    6.644      41.389      889.95       .0163
                                    7.035      43.043      904.84       .0167
                                    7.500      44.179      904.84       .0171
    ROUTE                ID=8  HYD=6.2  INFLOW ID=7  DT=0.0
TRAVEL TIME TABLE EXCEEDED
    PRINT HYD            ID=8  CODE=1

                                        OUTFLOW HYDROGRAPH REACH     6.20

        RUNOFF VOLUME =      1.62162 INCHES      =      140.3007 ACRE-FEET
        PEAK DISCHARGE RATE =      978.45 CFS  AT   1.600 HOURS   BASIN AREA =  1.6222 SQ. MI.


    *
    COMPUTE NM HYD       ID=21  HYD=21D  AREA=0.0101   PER A=0 PER B=25
                         PER C=5  PER D=70  TP=0.1333  MASS RAIN=-1

        K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =    27.913    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 =
1.9000
        AREA =       .007070 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


        K =    .126668HR    TP =    .133300HR    K/TP RATIO =    .950248     SHAPE CONSTANT, N =
3.719588
        UNIT PEAK =    7.6380    CFS   UNIT VOLUME =    .9983       B =   336.02      P60 =
1.9000
        AREA =       .003030 SQ MI    IA =    .47500 INCHES    INF =   1.18000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

    PRINT HYD            ID=21  CODE=1

                                        HYDROGRAPH FROM AREA 21D


        RUNOFF VOLUME =      1.63469 INCHES      =        .8805 ACRE-FEET
        PEAK DISCHARGE RATE =      24.83 CFS  AT   1.500 HOURS   BASIN AREA =   .0101 SQ. MI.


    *ADD 21D NORTH FLOW TO STORM DRAIN
    ADD HYD              ID=6  HYD=21.1  ID=21  ID=8
    PRINT HYD            ID=6  CODE=1

                                        OUTFLOW HYDROGRAPH REACH    21.10

        RUNOFF VOLUME =      1.62170 INCHES      =      141.1812 ACRE-FEET
        PEAK DISCHARGE RATE =      995.91 CFS  AT   1.600 HOURS   BASIN AREA =  1.6323 SQ. MI.


    *   ------------------------------------------------------------
    *s UNSER BOULEVARD FLOWS TO CHANNEL - FLOW FROM NORTH OF BRIDGE BLVD
    *
    *s THE FOLLOWING HYDROGRAPH IS TAKEN FROM THE MASTER DRAINAGE PLAN FOR THE
    *s  ATRISCO BUSINESS PARK - SEPTEMBER 1992 & REVISED MARCH 1993 & SEPT 1993
    *s  by Easterling and Associates  & REPRESENTS THE ENTIRE UNSER DIVERSION
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*

RECALL HYD ID= 2 HYD= 180.16 DT= .050000 HRS DA= .6789 SQ MI

PEAK= 248.301CFS RO= 2.0374 INCHES NO PTS=561

FLOW RATES

.000	.000	.000	.000	.000
.000	.000	.000	.000	.000
.000	.000	.000	.000	.000
.000	.000	.000	.000	.000
.000	.000	.000	.190	2.607
15.681	52.706	94.629	130.751	179.000
222.374	248.301	242.350	233.146	229.654
226.551	222.642	219.306	216.954	214.894
213.362	212.455	209.391	203.507	198.669
199.114	200.160	201.946	205.697	211.556
217.013	220.800	223.673	225.619	226.601
226.804	226.312	225.212	223.520	221.330
218.733	215.818	212.634	209.194	205.557
201.783	197.931	194.053	190.261	186.446
182.991	180.488	178.390	176.122	173.838
171.586	169.319	166.424	163.146	160.027
156.929	153.920	150.945	148.040	145.123
134.843	92.294	88.602	91.040	87.107
88.199	85.848	85.857	84.316	83.861
82.657	81.833	80.707	79.841	78.850
77.971	77.036	76.136	75.215	74.326
73.422	72.442	71.302	70.095	68.924
67.761	66.560	65.360	64.175	62.986
61.779	60.276	58.142	55.697	53.376
51.113	48.896	46.831	44.865	42.875
40.778	38.632	36.589	34.670	32.782
30.939	29.100	27.213	25.383	23.739
22.102	19.794	16.958	14.696	13.463
12.935	12.693	12.561	12.490	12.435
12.393	12.364	12.340	12.313	12.284
12.253	12.210	12.163	12.136	12.110
12.070	12.032	11.999	11.969	11.941
11.913	11.874	11.828	11.789	11.753
11.717	11.682	11.645	11.610	11.579
11.552	11.515	11.476	11.455	11.434
11.397	11.360	11.315	11.276	11.250
11.212	11.176	11.153	11.120	11.077
11.044	11.016	10.990	10.963	10.935
10.906	10.866	10.824	10.799	10.774
10.736	10.700	10.666	10.635	10.606
10.579	10.555	10.531	10.499	10.461
10.443	10.435	10.410	10.372	10.340
10.313	10.289	10.264	10.225	10.180
10.153	10.137	10.105	10.063	10.038
10.018	9.987	9.961	9.938	9.916
9.896	9.874	9.843	9.816	9.802
9.776	9.741	9.723	9.715	9.694
9.661	9.634	9.612	9.593	9.574
9.553	9.531	9.497	9.458	9.438
9.428	9.402	9.366	9.346	9.328
9.301	9.276	9.255	9.236	9.217
9.196	9.165	9.139	9.126	9.102
9.080	9.070	9.047	9.016	8.990
8.967	8.947	8.939	8.937	8.918
8.876	8.837	8.820	8.817	8.808
8.791	8.769	8.740	8.707	8.694
8.684	8.660	8.646	8.632	8.604
8.580	8.560	8.543	8.527	8.510
8.494	8.478	8.453	8.433	8.425
8.406	8.388	8.381	8.361	8.331
8.308	8.289	8.282	8.282	8.266
8.237	8.217	8.204	8.194	8.184
8.170	8.141	8.107	8.088	8.081
8.068	8.041	8.007	7.992	7.992
7.979	7.955	7.946	7.938	7.918

7.901	7.885	7.869	7.854	7.837
7.822	7.807	7.793	7.780	7.760
7.742	7.736	7.720	7.691	7.677
7.674	7.657	7.629	7.617	7.618
7.609	7.586	7.566	7.553	7.540
7.527	7.512	7.495	7.479	7.465
7.452	7.440	7.431	7.423	7.403
7.375	7.364	7.368	7.364	7.340
7.310	7.298	7.287	7.268	7.260
7.252	7.232	7.224	7.218	7.201
7.185	7.173	7.161	7.151	7.141
7.128	7.116	7.107	7.096	7.075
7.058	7.055	7.041	7.025	7.021
7.004	6.977	6.967	6.971	6.957
6.931	6.912	6.909	6.916	6.909
6.886	6.867	6.856	6.847	6.836
6.824	6.810	6.796	6.782	6.771
6.763	6.754	6.746	6.742	6.737
6.719	6.694	6.686	6.689	6.684
6.664	6.635	6.623	6.627	6.616
6.595	6.587	6.581	6.565	6.560
6.555	6.539	6.532	6.530	6.515
6.499	6.489	6.482	6.473	6.460
6.448	6.437	6.428	6.419	6.397
6.381	6.382	6.382	6.372	6.353
6.338	6.337	6.329	6.320	6.321
6.306	6.282	6.276	6.282	6.273
6.248	6.227	6.214	6.215	6.224
6.214	6.189	6.171	6.164	6.158
6.150	6.140	6.129	6.114	6.102
6.092	6.083	6.078	6.070	6.065
6.063	6.044	5.886	5.529	5.147
4.835	4.520	4.142	3.718	3.300
2.917	2.568	2.250	1.966	1.715
1.500	1.316	1.156	1.014	.890
.782	.689	.609	.539	.479
.426	.380	.339	.304	.272
.244	.220	.198	.178	.161
.145	.130	.117	.106	.095
.086	.077	.070	.063	.057
.051	.046	.042	.038	.034
.031	.027	.025	.022	.019
.017	.015	.014	.012	.011
.010	.009	.007	.007	.006
.006	.005	.005	.004	.004
.003	.003	.003	.002	.002
.002	.002	.002	.001	.001
.001				

```
*
*ROUTE FLOW SOUTH IN UNSER BLVD - 72INCH STORM DRAIN
*
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.0100
                     DIA=72    N=0.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.31	.56	2.22	2.67
.63	1.56	9.64	3.67
.94	2.82	22.42	4.36
1.25	4.27	40.32	4.87
1.56	5.86	62.96	5.27
1.88	7.55	89.83	5.56
2.19	9.33	120.35	5.78
2.50	11.16	153.87	5.92
2.81	13.02	189.68	5.99
3.13	14.90	227.01	6.00

3.44	16.76	265.02	6.00
3.75	18.60	302.81	6.00
4.06	20.39	339.39	6.00
4.38	22.10	373.65	6.00
4.69	23.71	404.31	6.00
5.00	25.19	429.82	6.00
5.32	26.49	448.07	6.00
5.63	27.55	455.57	6.00
6.00	28.27	455.57	6.00

```
COMPUTE TRAVEL TIME ID=3  REACH NO=1  NOVS=1  L=1225  SLP=0.01
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.313	.562	2.22	.0861
.625	1.564	9.64	.0552
.938	2.824	22.42	.0429
1.251	4.271	40.32	.0360
1.563	5.859	62.96	.0317
1.876	7.554	89.83	.0286
2.189	9.329	120.35	.0264
2.501	11.159	153.87	.0247
2.814	13.022	189.68	.0234
3.127	14.897	227.01	.0223
3.439	16.764	265.02	.0215
3.752	18.601	302.81	.0209
4.065	20.388	339.39	.0204
4.377	22.101	373.65	.0201
4.690	23.712	404.31	.0200
5.003	25.189	429.82	.0199
5.315	26.489	448.07	.0201
5.628	27.547	455.57	.0206
6.000	28.274	455.57	.0211

```
ROUTE          ID=3  HYD=R2  INFLOW ID=2  DT=0.0
PRINT HYD      ID=3  CODE=1
```

HYDROGRAPH FROM AREA R2

```
RUNOFF VOLUME =      2.03740 INCHES      =      73.7698 ACRE-FEET
PEAK DISCHARGE RATE =     247.01 CFS  AT   1.600 HOURS   BASIN AREA =   .6789 SQ. MI.
```

```
*
*ROUTE FLOW TO LOCATION WHERE BASIN 13 TIES IN - PIPE IS UPSIZED TO 78INCH
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.004
DIA=78    N=0.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.34	.66	1.74	2.89
.68	1.84	7.55	3.97
1.02	3.31	17.55	4.72
1.35	5.01	31.57	5.28
1.69	6.88	49.29	5.71
2.03	8.87	70.33	6.03
2.37	10.95	94.22	6.26
2.71	13.10	120.47	6.41
3.05	15.28	148.51	6.49
3.39	17.48	177.73	6.50
3.73	19.67	207.50	6.50
4.06	21.83	237.09	6.50

4.40	23.93	265.73	6.50
4.74	25.94	292.55	6.50
5.08	27.83	316.55	6.50
5.42	29.56	336.52	6.50
5.76	31.09	350.81	6.50
6.10	32.33	356.68	6.50
6.50	33.18	356.68	6.50

COMPUTE TRAVEL TIME ID=4 REACH NO=1 NOVS=1 L=209 SLP=0.004

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.339	.660	1.74	.0220
.677	1.835	7.55	.0141
1.016	3.314	17.55	.0110
1.355	5.012	31.57	.0092
1.694	6.876	49.29	.0081
2.032	8.866	70.33	.0073
2.371	10.949	94.22	.0067
2.710	13.096	120.47	.0063
3.049	15.283	148.51	.0060
3.387	17.483	177.73	.0057
3.726	19.674	207.50	.0055
4.065	21.831	237.09	.0053
4.403	23.928	265.73	.0052
4.742	25.938	292.55	.0051
5.081	27.829	316.55	.0051
5.420	29.562	336.52	.0051
5.758	31.088	350.81	.0051
6.097	32.330	356.68	.0053
6.500	33.183	356.68	.0054

ROUTE ID=4 HYD=R3 INFLOW ID=3 DT=0.0
PRINT HYD ID=4 CODE=1

HYDROGRAPH FROM AREA R3

RUNOFF VOLUME = 2.03740 INCHES = 73.7698 ACRE-FEET
PEAK DISCHARGE RATE = 247.54 CFS AT 1.600 HOURS BASIN AREA = .6789 SQ. MI.

*
COMPUTE NM HYD ID=13 HYD=13D AREA=0.1664 PER A=0 PER B=15
PER C=5 PER D=80 TP=0.2098 MASS RAIN=-1

K = .116921HR TP = .209800HR K/TP RATIO = .557296 SHAPE CONSTANT, N = 6.906776
UNIT PEAK = 327.93 CFS UNIT VOLUME = .9999 B = 516.82 P60 = 1.9000
AREA = .133120 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

K = .189676HR TP = .209800HR K/TP RATIO = .904080 SHAPE CONSTANT, N = 3.918978
UNIT PEAK = 55.477 CFS UNIT VOLUME = .9999 B = 349.73 P60 = 1.9000
AREA = .033280 SQ MI IA = .46250 INCHES INF = 1.14500 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

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

PRINT HYD ID=13 CODE=1

HYDROGRAPH FROM AREA 13D

```
RUNOFF VOLUME =      1.76677 INCHES      =      15.6794 ACRE-FEET
PEAK DISCHARGE RATE =     342.65 CFS  AT   1.567 HOURS   BASIN AREA =   .1664 SQ. MI.


*
*ROUTE BASIN 13 FLOWS THROUGH EARTHEN CHANNEL TO UNSER STORM DRAIN
*
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=5089
                    MAX ELEV=5090  CH SLOPE=0.007  FP SLOPE=0.007
                    N=0.03   DIST=15
                    DIST ELEV
                     0   5090
                     3   5089
                     12  5089
                     15  5090
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
5089.00	.00	.00	.00
5089.05	.48	.28	9.32
5089.11	.98	.89	9.63
5089.16	1.50	1.75	9.95
5089.21	2.03	2.85	10.27
5089.26	2.58	4.15	10.58
5089.32	3.15	5.67	10.90
5089.37	3.73	7.37	11.21
5089.42	4.33	9.27	11.53
5089.47	4.95	11.36	11.85
5089.53	5.58	13.63	12.16
5089.58	6.23	16.09	12.48
5089.63	6.90	18.73	12.80
5089.69	7.58	21.55	13.11
5089.74	8.28	24.56	13.43
5089.79	9.00	27.76	13.75
5089.84	9.73	31.14	14.06
5089.90	10.48	34.70	14.38
5089.95	11.25	38.46	14.70
5090.00	12.03	42.42	15.00

```
COMPUTE TRAVEL TIME ID=5  REACH NO=1  NOVS=1  L=230  SLP=0.007
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.483	.28	.1110
.105	.983	.89	.0708
.158	1.499	1.75	.0546
.211	2.032	2.85	.0456
.264	2.582	4.15	.0397
.316	3.148	5.67	.0355
.369	3.731	7.37	.0323
.422	4.331	9.27	.0298
.475	4.947	11.36	.0278
.527	5.580	13.63	.0262
.580	6.230	16.09	.0247
.633	6.897	18.73	.0235
.686	7.580	21.55	.0225
.738	8.280	24.56	.0215
.791	8.996	27.76	.0207
.844	9.729	31.14	.0200
.896	10.479	34.70	.0193
.949	11.246	38.46	.0187
1.002	12.029	42.42	.0181

```
    ROUTE                ID=5  HYD=R13  INFLOW ID=13  DT=0.0
TRAVEL TIME TABLE EXCEEDED
    PRINT HYD            ID=5  CODE=1

                                        HYDROGRAPH FROM AREA R13

        RUNOFF VOLUME =     1.76678 INCHES     =      15.6795 ACRE-FEET
        PEAK DISCHARGE RATE =     336.38 CFS  AT   1.600 HOURS   BASIN AREA =   .1664 SQ. MI.


    *
    *ADD BASIN 13 TO FLOWS IN UNSER STORM DRAIN
    ADD HYD              ID=5  HYD=13.1  ID=5  ID=4
    PRINT HYD            ID=5  CODE=1

                                        OUTFLOW HYDROGRAPH REACH    13.10

        RUNOFF VOLUME =     1.92905 INCHES     =      86.9662 ACRE-FEET
        PEAK DISCHARGE RATE =     583.91 CFS  AT   1.600 HOURS   BASIN AREA =   .8453 SQ. MI.


    *
    COMPUTE NM HYD       ID=17  HYD=17E  AREA=0.0651   PER A=0  PER B=10
                         PER C=10  PER D=80  TP=0.1333  MASS RAIN=-1

        K =   .072690HR    TP =   .133300HR    K/TP RATIO =   .545308     SHAPE CONSTANT, N =
7.101310
        UNIT PEAK =   205.52    CFS   UNIT VOLUME =    .9993       B =   526.03      P60 =
1.9000
        AREA =      .052080 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


        K =   .118406HR    TP =   .133300HR    K/TP RATIO =   .888269     SHAPE CONSTANT, N =
3.993314
        UNIT PEAK =   34.647    CFS   UNIT VOLUME =    1.000       B =   354.72      P60 =
1.9000
        AREA =      .013020 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

    PRINT HYD            ID=17  CODE=1

                                        HYDROGRAPH FROM AREA 17E

        RUNOFF VOLUME =     1.78282 INCHES     =       6.1899 ACRE-FEET
        PEAK DISCHARGE RATE =     171.89 CFS  AT   1.500 HOURS   BASIN AREA =   .0651 SQ. MI.


    *
    *ADD 17E FLOW TO STORM DRAIN FLOW
    ADD HYD              ID=7  HYD=17.1  ID=17  ID=5
    PRINT HYD            ID=7  CODE=1

                                        OUTFLOW HYDROGRAPH REACH    17.10

        RUNOFF VOLUME =     1.91859 INCHES     =      93.1561 ACRE-FEET
        PEAK DISCHARGE RATE =     703.48 CFS  AT   1.567 HOURS   BASIN AREA =   .9104 SQ. MI.
```

```
*
*ROUTE FLOWS IN 96INCH UNSER STORM DRAIN
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.004
                     DIA=96    N=0.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.42	1.00	3.03	3.56
.83	2.78	13.14	4.89
1.25	5.02	30.54	5.81
1.67	7.59	54.92	6.50
2.08	10.42	85.75	7.02
2.50	13.43	122.35	7.42
2.92	16.59	163.92	7.70
3.34	19.84	209.58	7.89
3.75	23.15	258.36	7.98
4.17	26.48	309.20	8.00
4.59	29.80	360.98	8.00
5.00	33.07	412.46	8.00
5.42	36.25	462.28	8.00
5.84	39.29	508.94	8.00
6.25	42.15	550.70	8.00
6.67	44.78	585.44	8.00
7.09	47.09	610.30	8.00
7.50	48.97	620.52	8.00
8.00	50.27	620.52	8.00

```
COMPUTE TRAVEL TIME ID=8  REACH NO=1  NOVS=1  L=1711  SLP=0.004
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.417	.999	3.03	.1569
.834	2.780	13.14	.1006
1.251	5.020	30.54	.0781
1.668	7.592	54.92	.0657
2.084	10.416	85.75	.0577
2.501	13.430	122.35	.0522
2.918	16.585	163.92	.0481
3.335	19.838	209.58	.0450
3.752	23.150	258.36	.0426
4.169	26.483	309.20	.0407
4.586	29.802	360.98	.0392
5.003	33.069	412.46	.0381
5.420	36.246	462.28	.0373
5.836	39.290	508.94	.0367
6.253	42.154	550.70	.0364
6.670	44.780	585.44	.0364
7.087	47.091	610.30	.0367
7.504	48.973	620.52	.0375
8.000	50.265	620.52	.0385

```
    ROUTE                ID=8  HYD=R6  INFLOW ID=7  DT=0.0
TRAVEL TIME TABLE EXCEEDED
    PRINT HYD            ID=8  CODE=1
```

HYDROGRAPH FROM AREA R6

```
RUNOFF VOLUME =      1.91700 INCHES      =      93.0787 ACRE-FEET
PEAK DISCHARGE RATE =     688.34 CFS  AT   1.633 HOURS   BASIN AREA =    .9104 SQ. MI.

*
```

```
*S FLOW FROM NORTH ON UNSER TO CHANNEL - ADD TO FLOW FROM BRIDGE
ADD HYD              ID=9  HYD=CHANNEL  ID=8  ID=6
PRINT HYD            ID=9  CODE=1

                                        HYDROGRAPH FROM AREA CHANNEL

    RUNOFF VOLUME =      1.72743 INCHES      =      234.2600 ACRE-FEET
    PEAK DISCHARGE RATE =    1682.47 CFS  AT   1.600 HOURS   BASIN AREA =  2.5427 SQ. MI.


*
*   ____________________________________________________
*
*s UNSER BLVD - FLOW FROM SOUTH OF BRIDGE EMPTYING TO THE CHANNEL
*
*s THE FOLLOWING IS TAKEN FROM SUNSET GARDENS/UNSER BLVD STORM DRAIN
*s   DESIGN ANALYSIS REPORT, DATED 12/5/97  BY RYALS ENGINEERING AND
*s   CONSTRUCTION SERVICES AS REVISED BY TUCKER GREEN, PER SE ENGENEERING
*****************************************************************************
*
* URS GREINER RECEIVED file (tg386) csgif00d.dat    1-7-98   T. Green
      ON 20 FEBRUARY, 1998 TO INCORPORATE IN THIS MODEL - ONLY THE FUTURE
      FULLY-DEVELOPED CONDITION WAS USED
* THE SUNSET GARDENS STORM DRAIN RUNS ALONG SUNSET GARDENS, THEN TO UNSER
*  THEN NORTH TO THE HEAD OF THE AMOLE CHANNEL. A FULLY DEVELOPED BASIN Y
*  CONTRIBUTES TO THIS FLOW, AS DO BASINS V (POINTE WEST), W, & X.
*
* CONDITONS BASED ON CURRENT ZONING & DEVELOPMENT, CURRENT DEVELOPMENT PLANS,
* AND ON ENGINEERING JUDGMENT.
*C REVISION NOTES: BASED ON FILES VCF4100 & SGU100.DAT BY TUCKER GREEN P.E.
*C                 REVISED 10-15-97 TO REFLECT NEW BASIN BOUNDARIES BASED ON
*C                 DISCUSSION WITH THE CITY, THE ENGINEERS FOR SAD 222, AND
*C                 DEVELOPERS OF NEARBY PROPERTIES, ESPECIALLY BASINS V & W.
*C                 IN PARTICULAR: (1) BASIN M (S OF SUNSET GARDENS, BETWEEN
*C                 94TH & 98TH) IS REMOVED FROM INTERIM & FUTURE CONDTION CASES
*C                 BY PROPOSED CONSTRUCTION OF 94TH ST; AND (2) THE HIGH POINT
*C                 IN 86 ST IS MOVED NORTH TO THE SOUTH PROPERTY LINE OF THE
*C                 CANTO III SITE (BASIN JYD).
*C               :
*C               : REVISED 1-7-98 FOR MORE IMPERVIOUS BASIN W (WHISPER POINTE)
*C                 & LARGER BASIN X (ADD ECUARIZ & MORE UNSER R.O.W.)
*C               : REVISED 1-22-98 TO ADD 'INFO ONLY' HYD U+V, AND TO
*C                 PROVIDE DETAILED OUTPUT FOR BASINS T-Y, U.PLUS.V,
*C                 SG.AT.82ND, AND 314 (SG.AT.82ND ROUTED TO UNSER)
*C
*****************************************************************************
COMPUTE NM HYD       ID= 1    HYD= I              DA=0.00952  SQ MI
                     PER A= 12     B= 26      C= 24      D= 38
                     TP= -0.13333 HRS   RAIN= -1

        K =    .072665HR    TP =    .133330HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =   14.279    CFS   UNIT VOLUME =    .9985       B =   526.28      P60 =
1.9000
        AREA =       .003618 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333


        K =    .127510HR    TP =    .133330HR    K/TP RATIO =    .956348     SHAPE CONSTANT, N =
3.695043
        UNIT PEAK =   14.799    CFS   UNIT VOLUME =    .9993       B =   334.30      P60 =
1.9000
        AREA =       .005902 SQ MI    IA =    .47097 INCHES    INF =   1.16871 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

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

```
PRINT HYD              ID= 1   CODE= 1

                                        HYDROGRAPH FROM AREA I

    RUNOFF VOLUME =      1.23320 INCHES      =         .6261 ACRE-FEET
    PEAK DISCHARGE RATE =       18.97 CFS  AT   1.500 HOURS   BASIN AREA =   .0095 SQ. MI.


*
*****************************************************************************
COMPUTE NM HYD         ID= 2    HYD= H                DA=0.01501  SQ MI
                       PER A= 0       B= 20       C= 10       D= 70
                       TP= -0.13333 HRS   RAIN= -1

    K =    .072665HR    TP =    .133330HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
    UNIT PEAK =   41.473    CFS   UNIT VOLUME =    .9991       B =   526.28      P60 =
1.9000
    AREA =       .010507 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =    .122603HR    TP =    .133330HR    K/TP RATIO =    .919546     SHAPE CONSTANT, N =
3.849372
    UNIT PEAK =   11.652    CFS   UNIT VOLUME =    .9992       B =   345.00      P60 =
1.9000
    AREA =       .004503 SQ MI    IA =    .45000 INCHES    INF =   1.11000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

PRINT HYD              ID= 2   CODE= 1

                                        HYDROGRAPH FROM AREA H

    RUNOFF VOLUME =      1.65010 INCHES      =        1.3209 ACRE-FEET
    PEAK DISCHARGE RATE =       37.31 CFS  AT   1.500 HOURS   BASIN AREA =   .0150 SQ. MI.


*
*****************************************************************************
* E PLUS H PLUS I AT SUNSET GARDENS & 90TH FOLLOWS
ADD HYD                ID OUT= 3   HYD= 208          IDIN I= 1   IDIN II= 2
PRINT HYD              ID= 3   CODE= 1

                                     PARTIAL HYDROGRAPH   208.00

    RUNOFF VOLUME =      1.48828 INCHES      =        1.9471 ACRE-FEET
    PEAK DISCHARGE RATE =       56.28 CFS  AT   1.500 HOURS   BASIN AREA =   .0245 SQ. MI.


*
*****************************************************************************
*s DIVIDE SO 1ST 8.6 CFS (ID=6) S ON 90TH (ON HOLD): ID=4 E ON SUNSET GARDENS
DIVIDE HYD             ID=3  Q=8.6 ID=6 HYD= 90.S.PAST.SG  ID=4 HYD= SG.E.OF.90
PRINT HYD              ID= 4   CODE= 1

                                        HYDROGRAPH FROM AREA SG.E.OF.90

    RUNOFF VOLUME =      1.48828 INCHES      =        1.1256 ACRE-FEET
    PEAK DISCHARGE RATE =       47.68 CFS  AT   1.500 HOURS   BASIN AREA =   .0142 SQ. MI.
```

```
PRINT HYD              ID= 6   CODE= 1

                                        HYDROGRAPH FROM AREA 90.S.PAST.SG

    RUNOFF VOLUME =      1.48828 INCHES      =         .8214 ACRE-FEET
    PEAK DISCHARGE RATE =        8.60 CFS  AT   1.333 HOURS   BASIN AREA =   .0103 SQ. MI.


*
*****************************************************************************
* ROUTE MAIN FLOW EAST DOWN SG FROM 90TH, FOLLOW IT TO 86TH ST
*C APPROX AS 40' F-F STREET, ASSUME APX 2.35% SLOPE
*C ASSUME AS IF BOTH SIDES PAVED, EST n AS .017
COMPUTE RATING CURVE CID= -1   VS NO= 1    NO SEGS FOR MANNING n= 1
                     ELMIN= 0 ELMAX= 4  FT  CHSLP= .0235  FPSLP= .0235  FT/FT
                     n .017  DIST 40
                     DIST  ELEV     DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0      4        .01    0      20      .40    39.99    0
                     40     4
ROUTE MCUNGE         ID= 5   HYD= 209          INFLOW HYD ID= 4   DT= 0.0 HR
                     LENGTH= 1055      NSUBRCH= 0      SLOPE= .0235
                     MATCODE= 0        REGCODE= 0      CCODE= 0
       Inflow ID end= 63   Max Number=600

       dt = .0333 hr   q0 =    23.84 cfs   ck0 =  5.46 fps
       nlen =  4   dlen =  263.75
```

Depth ft	Area sf	Q cfs	Qbar cfs	ck fps	b ft	C	D	c1	c2	vel fps	fr	tt hr
.00	.0	.0	3.3	2.95	10.5	1.34	.02	.99	.15	2.95	1.60	.099
.21	2.2	6.5	24.6	5.46	30.5	2.48	.02	.99	.43	4.45	1.84	.066
.42	8.8	42.7	86.0	10.29	40.0	4.68	.03	.99	.65	6.59	2.03	.044
.63	17.3	129.3	189.2	14.23	40.0	6.47	.05	.99	.73	8.81	2.12	.033
.84	25.7	249.1	323.0	17.56	40.0	7.99	.07	.98	.78	10.81	2.20	.027
1.05	34.1	396.9	483.2	20.51	40.0	9.33	.10	.98	.81	12.62	2.27	.023
1.26	42.5	569.6	667.1	23.18	40.0	10.54	.12	.98	.83	14.28	2.33.	.021
1.47	50.9	764.7	872.5	25.62	40.0	11.66	.14	.98	.84	15.82	2.37	.019
1.68	59.3	980.4	1097.7	27.88	40.0	12.69	.16	.98	.86	17.27	2.41	.017
1.89	67.8	1215.1	1341.3	29.99	40.0	13.64	.18	.98	.87	18.64	2.45	.016
2.11	76.2	1467.6	1602.1	31.97	40.0	14.54	.20	.97	.87	19.93	2.48	.015
2.32	84.6	1736.7	1879.1	33.83	40.0	15.39	.22	.97	.88	21.16	2.50	.014
2.53	93.0	2021.5	2171.3	35.59	40.0	16.19	.25	.97	.89	22.33	2.52	.013
2.74	101.4	2321.1	2478.0	37.25	40.0	16.95	.27	.97	.89	23.45	2.54	.012
2.95	109.9	2634.8	2798.3	38.84	40.0	17.67	.29	.97	.89	24.53	2.56	.012
3.16	118.3	2961.8	3131.6	40.34	40.0	18.36	.31	.97	.90	25.57	2.57	.011
3.37	126.7	3301.5	3477.4	41.78	40.0	19.01	.34	.97	.90	26.56	2.59	.011
3.58	135.1	3653.3	3835.0	43.16	40.0	19.63	.36	.97	.90	27.52	2.60	.011
3.79	143.5	4016.7	4204.0	44.47	40.0	20.23	.38	.96	.91	28.45	2.61	.010
4.00	152.0	4391.2	.0	.00	.0	.00	.00	.00	.00	.00	.00	.000

```
       nlen= 4   Outflow ID end=600
    Route using Ponce procedure:  C1 > 0
PRINT HYD              ID= 5   CODE= 1

                                        PARTIAL HYDROGRAPH   209.00

    RUNOFF VOLUME =      1.47973 INCHES      =        1.1192 ACRE-FEET
    PEAK DISCHARGE RATE =       47.57 CFS  AT   1.567 HOURS   BASIN AREA =   .0142 SQ. MI.


*
*****************************************************************************
COMPUTE NM HYD         ID= 1    HYD= J                DA=0.00228 SQ MI
                       PER A= 0       B= 15       C= 0        D= 85
                       TP= -0.13333 HRS   RAIN= -1
```

```
K =    .072665HR    TP =    .133330HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
UNIT PEAK =    7.6496    CFS   UNIT VOLUME =    .9978       B =   526.28      P60 =
1.9000
AREA =       .001938 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

K =    .130790HR    TP =    .133330HR    K/TP RATIO =    .980950     SHAPE CONSTANT, N =
3.599935
UNIT PEAK =    .84019    CFS   UNIT VOLUME =    .9837       B =   327.55      P60 =
1.9000
AREA =       .000342 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

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

PRINT HYD              ID= 1   CODE= 1

                                        HYDROGRAPH FROM AREA J

RUNOFF VOLUME =      1.81798 INCHES      =          .2211 ACRE-FEET
PEAK DISCHARGE RATE =        6.09 CFS  AT   1.500 HOURS   BASIN AREA =    .0023 SQ. MI.


*
*****************************************************************************
ADD HYD                ID OUT= 3  HYD= 210              IDIN I= 1   IDIN II= 5
PRINT HYD              ID= 3   CODE= 1

                                   PARTIAL HYDROGRAPH   210.00


RUNOFF VOLUME =      1.52653 INCHES      =        1.3402 ACRE-FEET
PEAK DISCHARGE RATE =       53.08 CFS  AT   1.533 HOURS   BASIN AREA =    .0165 SQ. MI.


*
*****************************************************************************
* CALC CONTRIBUTING PART OF CANTO SITE; THEN ADD TO HYD 210
COMPUTE NM HYD         ID= 1   HYD=SITE.II      DA=0.00839 SQ MI
                       PER A= 0      B= 35      C= 0       D= 65
                       TP= -0.13333 HRS   RAIN= -1

K =    .072665HR    TP =    .133330HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
UNIT PEAK =    21.526    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 =
1.9000
AREA =       .005454 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

K =    .130790HR    TP =    .133330HR    K/TP RATIO =    .980950     SHAPE CONSTANT, N =
3.599935
UNIT PEAK =    7.2141    CFS   UNIT VOLUME =    .9985       B =   327.55      P60 =
1.9000
AREA =       .002937 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

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

PRINT HYD              ID= 1   CODE= 1

                                        HYDROGRAPH FROM AREA SITE.II
```

```
    RUNOFF VOLUME =      1.55434 INCHES      =          .6955 ACRE-FEET
    PEAK DISCHARGE RATE =       19.75 CFS  AT   1.500 HOURS   BASIN AREA =    .0084 SQ. MI.

*
*****************************************************************************
*S PARTIAL WATERBLOCK ==> FLOW > 11.6cfs TO 86TH
DIVIDE HYD            ID=1  Q=11.6  ID=2 HYD=S2.TO.S3   ID=7 HYD=S2.TO.86TH
PRINT HYD             ID= 2   CODE= 1

                                        HYDROGRAPH FROM AREA S2.TO.S3

    RUNOFF VOLUME =      1.55431 INCHES      =          .6070 ACRE-FEET
    PEAK DISCHARGE RATE =       11.60 CFS  AT   1.433 HOURS   BASIN AREA =    .0073 SQ. MI.

PRINT HYD             ID= 7   CODE= 1

                                        HYDROGRAPH FROM AREA S2.TO.86TH

    RUNOFF VOLUME =      1.55431 INCHES      =          .0885 ACRE-FEET
    PEAK DISCHARGE RATE =        8.15 CFS  AT   1.500 HOURS   BASIN AREA =    .0011 SQ. MI.

*
*****************************************************************************
COMPUTE NM HYD        ID= 1   HYD=SITE.III        DA=0.02360 SQ MI
                      PER A= 0      B= 35      C= 0       D= 65
                      TP= -0.13333 HRS   RAIN= -1

    K =    .072665HR    TP =    .133330HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
    UNIT PEAK =   60.549    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 =
1.9000
    AREA =       .015340 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

    K =    .130790HR    TP =    .133330HR    K/TP RATIO =    .980950     SHAPE CONSTANT, N =
3.599935
    UNIT PEAK =   20.292    CFS   UNIT VOLUME =    .9997       B =   327.55      P60 =
1.9000
    AREA =       .008260 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333
    BULKING FACTOR APPLIED TO HYDROGRAPH.  FACTOR =  1.02000 AT PEAK FLOW.

PRINT HYD             ID= 1   CODE= 1

                                        HYDROGRAPH FROM AREA SITE.III

    RUNOFF VOLUME =      1.55434 INCHES      =         1.9564 ACRE-FEET
    PEAK DISCHARGE RATE =       55.53 CFS  AT   1.500 HOURS   BASIN AREA =    .0236 SQ. MI.

*
*****************************************************************************
* TOTAL FLOW LEAVING CANTO NORTH OF SUNSET GARDENS
ADD HYD               ID OUT= 16  HYD=SITE.OUT      IDIN I= 1   IDIN II= 2
PRINT HYD             ID= 16   CODE= 1

                                        HYDROGRAPH FROM AREA SITE.OUT
```

```
RUNOFF VOLUME =      1.55433 INCHES      =        2.5634 ACRE-FEET
PEAK DISCHARGE RATE =      67.13 CFS  AT   1.500 HOURS   BASIN AREA =   .0309 SQ. MI.


*
*****************************************************************************
*S TOTAL FLOW SUNSET GARDENS WEST OF 86TH
ADD HYD              ID OUT= 5  HYD= SG.W.OF.86     IDIN I= 3   IDIN II= 16
PRINT HYD            ID= 5   CODE= 1

                                     HYDROGRAPH FROM AREA SG.W.OF.86


RUNOFF VOLUME =      1.54467 INCHES      =        3.9036 ACRE-FEET
PEAK DISCHARGE RATE =     118.05 CFS  AT   1.533 HOURS   BASIN AREA =   .0474 SQ. MI.


*
*****************************************************************************
COMPUTE NM HYD       ID= 1    HYD= C              DA=0.00127 SQ MI
                     PER A= 0      B= 10      C= 0       D= 90
                     TP= -0.13333 HRS   RAIN= -1

K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
UNIT PEAK =   4.5116    CFS   UNIT VOLUME =    .9969       B =   526.28      P60 =
1.9000
AREA =       .001143 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


K =   .130790HR    TP =   .133330HR    K/TP RATIO =   .980950     SHAPE CONSTANT, N =
3.599935
UNIT PEAK =   .31200    CFS   UNIT VOLUME =    .9579       B =   327.55      P60 =
1.9000
AREA =       .000127 SQ MI    IA =    .50000 INCHES    INF =  . 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

PRINT HYD            ID= 1   CODE= 1

                                     HYDROGRAPH FROM AREA C


RUNOFF VOLUME =      1.88389 INCHES      =         .1276 ACRE-FEET
PEAK DISCHARGE RATE =       3.50 CFS  AT   1.500 HOURS   BASIN AREA =   .0013 SQ. MI.


*
*****************************************************************************
* ADD SPILL FROM S2 TO ROAD FLOW IN 86TH N OF SUNSET GARDENS
ADD HYD              ID OUT= 3  HYD=   218          IDIN I= 1   IDIN II= 7
PRINT HYD            ID= 3   CODE= 1

                                  PARTIAL HYDROGRAPH   218.00


RUNOFF VOLUME =      1.73326 INCHES      =         .2161 ACRE-FEET
PEAK DISCHARGE RATE =      11.65 CFS  AT   1.500 HOURS   BASIN AREA =   .0023 SQ. MI.


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

```
* COMBINED FLOW TO 86TH & SUNSET GARDENS FROM NORTH & WEST; HOLD FOR LATER
ADD HYD              ID OUT= 7  HYD= 86&SG.N&W       IDIN I= 3   IDIN II= 5
PRINT HYD            ID= 7   CODE= 1

                                        HYDROGRAPH FROM AREA 86&SG.N&W


    RUNOFF VOLUME =      1.55353 INCHES      =       4.1196 ACRE-FEET
    PEAK DISCHARGE RATE =      128.76 CFS  AT   1.533 HOURS   BASIN AREA =   .0497 SQ. MI.


*
*****************************************************************************
*
*C BASIN NN (N North): CURRENTLY PARTLY DEVELOPED
COMPUTE NM HYD       ID= 1    HYD= NN              DA=0.01830  SQ MI
                     PER A= 28.0   B= 20.2    C= 15.4    D= 36.4
                     TP= -0.13333 HRS   RAIN= -1

        K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =   26.293    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 =
1.9000
        AREA =       .006661 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


        K =   .139008HR    TP =   .133330HR    K/TP RATIO =  1.042583     SHAPE CONSTANT, N =
3.386093
        UNIT PEAK =   27.229    CFS   UNIT VOLUME =    .9996       B =   311.92      P60 =
1.9000
        AREA =       .011639 SQ MI    IA =    .52972 INCHES    INF =   1.33321 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

    PRINT HYD            ID= 1   CODE= 1

                                        HYDROGRAPH FROM AREA NN


        RUNOFF VOLUME =      1.14350 INCHES      =       1.1161 ACRE-FEET
        PEAK DISCHARGE RATE =      33.56 CFS  AT   1.500 HOURS   BASIN AREA =   .0183 SQ. MI.


    *
    *****************************************************************************
    * ADD IN HYD 90.S.PAST.SG, ('HELD' SPILL SOUTH OF SUNSET GDNS INTERSECTION)
    ADD HYD              ID OUT= 3  HYD= INTO.JYDN   IDIN I= 1   IDIN II= 6
    PRINT HYD            ID= 3   CODE= 1

                                        HYDROGRAPH FROM AREA INTO.JYDN


        RUNOFF VOLUME =      1.26804 INCHES      =       1.9375 ACRE-FEET
        PEAK DISCHARGE RATE =      42.16 CFS  AT   1.500 HOURS   BASIN AREA =   .0286 SQ. MI.


    *
    *****************************************************************************
    * ROUTE NORTH PART OF OFFSITE THROUGH NORTH STREET IN JYD
    * APPROX AS 28' F-F STREET, ASSUME APX 1.8% SLOPE
    * ASSUME PAVED ROAD, EST n AS .017
    COMPUTE RATING CURVE CID= -1   VS NO= 1    NO SEGS FOR MANNING n= 1
                         ELMIN= 0 ELMAX= 4  FT   CHSLP= .018   FPSLP= .018  FT/FT
                         n .017  DIST 28
```

```
                        DIST  ELEV     DIST  ELEV    DIST  ELEV    DIST  ELEV
                        0      4       .01    0      14    .28    27.99    0
                        28     4
ROUTE MCUNGE            ID= 5   HYD= 300          INFLOW HYD ID= 3   DT= 0.0 HR
                        LENGTH= 1338     NSUBRCH= 0     SLOPE= .018
                        MATCODE= 0       REGCODE= 0     CCODE= 0
      Inflow ID end=211   Max Number=600

      dt = .0333 hr   q0 =    21.08 cfs   ck0 =  5.86 fps
      nlen =  4   dlen =  334.50

      Depth  Area      Q     Qbar   ck    b     C    D     c1    c2   vel   fr    tt
        ft    sf      cfs    cfs   fps   ft                          fps          hr
        .00     .0      .0     2.9  2.58  10.5  .93  .02   .98  -.03  2.58 1.40  .144
        .21    2.2     5.7    22.3  5.86  24.5 2.10  .03   .98   .36  4.42 1.72  .084
        .42    7.9    38.8    68.2  9.97  28.0 3.58  .04   .98   .57  6.31 1.79  .059
        .63   13.8    97.6   136.3 13.15  28.0 4.72  .06   .98   .65  8.16 1.86  .046
        .84   19.6   175.0   221.8 15.86  28.0 5.69  .08   .98   .70  9.82 1.93  .038
       1.05   25.5   268.5   322.2 18.24  28.0 6.54  .10   .97   .74 11.31 1.98  .033
       1.26   31.4   376.0   436.0 20.38  28.0 7.31  .13   .97   .76 12.68 2.02  .029
       1.47   37.3   496.1   561.9 22.33  28.0 8.01  .15   .97   .78 13.95 2.05  .027
       1.68   43.2   627.7   698.7 24.12  28.0 8.65  .17   .97   .80 15.14 2.08  .025
       1.89   49.1   769.8   845.8 25.78  28.0 9.25  .19   .96   .81 16.25 2.10  .023
       2.11   55.0   921.7  1002.2 27.32  28.0 9.80  .22   .96   .82 17.30 2.12  .021
       2.32   60.9  1082.7  1167.4 28.76  28.010.32  .24   .96   .83 18.29 2.13  .020
       2.53   66.8  1252.2  1340.9 30.10  28.010.80  .26   .96   .83 19.23 2.15  .019
       2.74   72.7  1429.6  1522.0 31.37  28.011.25  .29   .95   .84 20.13 2.16  .018
       2.95   78.6  1614.4  1710.4 32.56  28.011.68  .31   .95   .85 20.98 2.17  .018
       3.16   84.5  1806.3  1905.6 33.69  28.012.09  .34   .95   .85 21.80 2.17  .017
       3.37   90.4  2004.9  2107.3 34.75  28.012.47  .36   .95   .86 22.58 2.18  .016
       3.58   96.3  2209.7  2315.1 35.76  28.012.83  .38   .95   .86 23.34 2.18  .016
       3.79  102.1  2420.5  2528.8 36.73  28.013.17  .41   .94   .86 24.06 2.19  .015
       4.00  108.0  2637.0      .0   .00     .0  .00  .00   .00   .00   .00  .00  .000
        nlen= 4   Outflow ID end=213
      Route using Ponce procedure:  C1 > 0
        nlen= 4   Outflow ID end=215
      Route using Maidment procedure:  C0, C1 & C2 > 0
PRINT HYD               ID= 5 CODE= 1

                                        HYDROGRAPH FROM AREA   300.00

      RUNOFF VOLUME =      1.26109 INCHES      =        1.9268 ACRE-FEET
      PEAK DISCHARGE RATE =       40.55 CFS  AT   1.600 HOURS   BASIN AREA =   .0286 SQ. MI.


*
*****************************************************************************
* BASIN NS (N South): CURRENTLY PARTLY DEVELOPED
COMPUTE NM HYD          ID= 1    HYD= NS                DA=0.01719  SQ MI
                        PER A= 16.0    B= 28.6    C= 8.8    D= 46.6
                        TP= -0.13333 HRS   RAIN= -1

        K =    .072665HR    TP =    .133330HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =   31.619    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 =
1.9000
        AREA =       .008011 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


        K =    .136383HR    TP =    .133330HR    K/TP RATIO =  1.022896     SHAPE CONSTANT, N =
3.450895
        UNIT PEAK =   21.806    CFS   UNIT VOLUME =    .9996       B =   316.73      P60 =
1.9000
        AREA =       .009179 SQ MI    IA =    .52022 INCHES    INF =   1.30663 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333
```

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

PRINT HYD              ID= 1   CODE= 1

                                          HYDROGRAPH FROM AREA NS


    RUNOFF VOLUME =      1.29219 INCHES      =        1.1847 ACRE-FEET
    PEAK DISCHARGE RATE =       34.79 CFS  AT   1.500 HOURS   BASIN AREA =    .0172 SQ. MI.


*
*****************************************************************************
* ROUTE SOUTH PART OF OFFSITE THROUGH SOUTH STREET IN JYD
*C APPROX AS 28' F-F STREET, ASSUME APX 2.0% SLOPE (STEEPER THAN NORTH)
*C ASSUME PAVED ROAD, EST n AS .017
COMPUTE RATING CURVE CID= -1   VS NO= 1    NO SEGS FOR MANNING n= 1
                     ELMIN= 0 ELMAX= 4  FT   CHSLP= .020   FPSLP= .020  FT/FT
                     n .017  DIST 28
                     DIST  ELEV     DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0      4       .01    0      14    .28    27.99    0
                     28     4
ROUTE MCUNGE         ID= 2   HYD= 302          INFLOW HYD ID= 1   DT= 0.0 HR
                     LENGTH= 1221      NSUBRCH= 0      SLOPE= .020
                     MATCODE= 0        REGCODE= 0      CCODE= 0
      Inflow ID end=209   Max Number=600

      dt = .0333 hr   q0 =    17.39 cfs   ck0 =  6.17 fps
      nlen =  4   dlen =  305.25
```

Depth ft	Area sf	Q cfs	Qbar cfs	ck fps	b ft	C	D	c1	c2	vel fps	fr	tt hr
.00	.0	.0	3.0	2.72	10.5	1.07	.02	.98	.04	2.72	1.48	.125
.21	2.2	6.0	23.5	6.17	24.5	2.43	.03	.99	.42	4.65	1.81	.073
.42	7.9	40.9	71.9	10.51	28.0	4.13	.04	.98	.61	6.65	1.88	.051
.63	13.8	102.8	143.7	13.86	28.0	5.45	.06	.98	.69	8.60	1.96	.039
.84	19.6	184.5	233.8	16.72	28.0	6.57	.08	.98	.74	10.35	2.03	.033
1.05	25.5	283.0	339.6	19.23	28.0	7.56	..10	.98	.77	11.92	2.08	.028
1.26	31.4	396.3	459.6	21.49	28.0	8.45	.13	.97	.79	13.37	2.13	.025
1.47	37.3	522.9	592.2	23.54	28.0	9.25	.15	.97	.81	14.71	2.16	.023
1.68	43.2	661.6	736.5	25.43	28.0	10.00	.17	.97	.82	15.96	2.19	.021
1.89	49.1	811.4	891.5	27.17	28.0	10.68	.19	.97	.83	17.13	2.21	.020
2.11	55.0	971.6	1056.4	28.80	28.0	11.32	.21	.97	.84	18.23	2.23	.019
2.32	60.9	1141.3	1230.6	30.31	28.0	11.92	.24	.96	.85	19.28	2.25	.018
2.53	66.8	1319.9	1413.4	31.73	28.0	12.47	.26	.96	.85	20.27	2.26	.017
2.74	72.7	1506.9	1604.3	33.06	28.0	13.00	.28	.96	.86	21.21	2.27	.016
2.95	78.6	1701.8	1802.9	34.32	28.0	13.49	.31	.96	.86	22.12	2.28	.015
3.16	84.5	1904.0	2008.7	35.51	28.0	13.96	.33	.96	.87	22.98	2.29	.015
3.37	90.4	2113.3	2221.3	36.63	28.0	14.40	.35	.95	.87	23.81	2.30	.014
3.58	96.3	2329.3	2440.4	37.70	28.0	14.82	.38	.95	.88	24.60	2.30	.014
3.79	102.1	2551.5	2665.6	38.71	28.0	15.22	.40	.95	.88	25.36	2.31	.013
4.00	108.0	2779.7	.0	.00	.0	.00	.00	.00	.00	.00	.00	.000

```
      nlen= 4   Outflow ID end=206
    Route using Ponce procedure:  C1 > 0
PRINT HYD              ID= 2 CODE= 1

                                          HYDROGRAPH FROM AREA   302.00


    RUNOFF VOLUME =      1.29208 INCHES      =        1.1846 ACRE-FEET
    PEAK DISCHARGE RATE =       34.26 CFS  AT   1.567 HOURS   BASIN AREA =    .0172 SQ. MI.


*
*****************************************************************************
*C ADD NORTH & SOUTH ROUTED OFFSITE, THEN COMPUTE & ADD JYD
ADD HYD                ID OUT= 3  HYD= 304          IDIN I= 2   IDIN II= 5
```

```
PRINT HYD              ID= 3   CODE= 1

                                        HYDROGRAPH FROM AREA   304.00


    RUNOFF VOLUME =      1.27270 INCHES      =       3.1114 ACRE-FEET
    PEAK DISCHARGE RATE =       73.97 CFS  AT   1.600 HOURS   BASIN AREA =   .0458 SQ. MI.


*
*****************************************************************************
COMPUTE NM HYD         ID= 17    HYD= JYD            DA=0.02353 SQ MI
                       PER A= 0       B= 35       C= 0        D= 65
                       TP= -0.13333 HRS   RAIN= -1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
    UNIT PEAK =   60.370    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 =
1.9000
    AREA =       .015295 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .130790HR    TP =   .133330HR    K/TP RATIO =   .980950     SHAPE CONSTANT, N =
3.599935
    UNIT PEAK =   20.232    CFS   UNIT VOLUME =    .9997       B =   327.55      P60 =
1.9000
    AREA =       .008236 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

PRINT HYD              ID= 17   CODE= 1

                                        HYDROGRAPH FROM AREA JYD


    RUNOFF VOLUME =      1.55434 INCHES      =       1.9506 ACRE-FEET
    PEAK DISCHARGE RATE =       55.37 CFS  AT   1.500 HOURS   BASIN AREA =   .0235 SQ. MI.


*
*****************************************************************************
* TOTAL FLOW LEAVING JYD (CANTO III), INCLUDING 86TH ST ROW EAST OF JYD
ADD HYD                ID OUT= 4  HYD= JYD.E.AT.86   IDIN I= 3   IDIN II= 17
PRINT HYD              ID= 4   CODE= 1

                                        HYDROGRAPH FROM AREA JYD.E.AT.86

    RUNOFF VOLUME =      1.36823 INCHES      =       5.0620 ACRE-FEET
    PEAK DISCHARGE RATE =      118.68 CFS  AT   1.533 HOURS   BASIN AREA =   .0694 SQ. MI.


*
*****************************************************************************
* ROUTE TO 86TH & SG INTERSECTION, ASSUME 48" PIPE W/ 1% FRICTION SLOPE
COMPUTE RATING CURVE CID= -1 VSN= 1  CODE= -1  S= .010   D= 4 FT   n= 0.013
ROUTE MCUNGE           ID= 5   HYD= 86.S.OF.SG   INFLOW HYD ID= 4   DT= 0.0 HR
                       LENGTH= 300      NSUBRCH= 0     SLOPE= .010
                       MATCODE= 0       REGCODE= 0     CCODE= 0
      Inflow ID end=215   Max Number=600

      dt = .0333 hr   q0 =    59.34 cfs   ck0 = 14.67 fps
      nlen =  1   dlen =  300.00
```

Depth ft	Area sf	Q cfs	Qbar cfs	ck fps	b ft	C	D	c1	c2	vel fps	fr	tt hr
.00	.0	.0	.4	3.02	.9	1.21	.05	.96	.11	3.02	1.42	.028
.21	.2	.8	2.0	5.66	2.1	2.26	.06	.97	.40	4.26	1.59	.020
.42	.7	3.3	5.4	7.74	2.7	3.09	.09	.96	.52	5.58	1.63	.015
.63	1.3	7.6	10.6	9.44	3.1	3.78	.12	.95	.59	6.75	1.66	.012
.83	1.9	13.7	17.5	10.88	3.4	4.35	.16	.94	.64	7.78	1.68	.011
1.04	2.6	21.4	25.9	12.09	3.6	4.84	.20	.93	.67	8.69	1.69	.010
1.25	3.4	30.5	35.6	13.12	3.8	5.25	.24	.93	.69	9.50	1.68	.009
1.46	4.1	40.8	46.5	13.98	3.9	5.59	.28	.92	.71	10.21	1.67	.008
1.67	5.0	52.2	58.3	14.67	4.0	5.87	.33	.91	.72	10.84	1.64	.008
1.88	5.8	64.3	70.7	15.19	4.0	6.08	.39	.90	.73	11.39	1.61	.007
2.08	6.6	77.0	83.4	15.54	4.0	6.22	.45	.88	.74	11.86	1.58	.007
2.29	7.5	89.9	96.3	15.69	4.0	6.28	.51	.87	.74	12.25	1.54	.007
2.50	8.3	102.7	108.9	15.62	4.0	6.25	.58	.85	.74	12.57	1.51	.007
2.71	9.1	115.1	120.9	15.27	4.0	6.11	.66	.83	.74	12.81	1.47	.007
2.92	9.8	126.7	131.9	14.52	4.0	5.81	.76	.80	.74	12.96	1.43	.006
3.13	10.5	137.1	141.5	13.18	4.0	5.27	.89	.75	.72	13.02	1.39	.006
3.34	11.2	145.8	148.9	10.71	4.0	4.29	1.16	.64	.69	12.96	1.35	.006
3.54	11.8	152.0	153.2	5.41	4.0	2.16	2.36	.14	.64	12.76	1.30	.007
3.75	12.2	154.5	154.5	.00	4.0	.00*****	-1.00	1.00	12.46	1.25		.007
4.00	12.6	154.5	.0	.00	.0	.00	.00	.00	.00	.00	.00	.000

```
  nlen= 1   Outflow ID end=215
Route using Ponce procedure:  C1 > 0
  nlen= 1   Outflow ID end=216
Route using Maidment procedure:  C0, C1 & C2 > 0
PRINT HYD            ID= 5 CODE= 1

                                    HYDROGRAPH FROM AREA 86.S.OF.SG

RUNOFF VOLUME =      1.36766 INCHES      =        5.0599 ACRE-FEET
PEAK DISCHARGE RATE =      118.57 CFS  AT   1.567 HOURS   BASIN AREA =    .0694 SQ. MI.


*
*****************************************************************************
* COMBINED FLOWS AT 86TH & SUNSET GARDENS: RETRIEVE 'ON-HOLD' ID=7
ADD HYD              ID OUT= 6  HYD= TOT.SG&86     IDIN I= 5   IDIN II= 7
PRINT HYD            ID= 6   CODE= 1

                                    HYDROGRAPH FROM AREA TOT.SG&86

RUNOFF VOLUME =      1.44526 INCHES      =        9.1795 ACRE-FEET
PEAK DISCHARGE RATE =      240.79 CFS  AT   1.533 HOURS   BASIN AREA =    .1191 SQ. MI.


*
*****************************************************************************
* ROUTE 86TH TO 82ND IN SUNSET GARDENS: CONC PIPE; Sf=.01 APX
* IF EST DIAM SMALL => TRAVEL FASTER => DNSTR PEAK HIGHER => CONSERVATIVE
* VALLEY SEGMENT & REACH NUMBERS ARE USER ID'S NOT USED BY PROG; DUMMIES HERE
COMPUTE RATING CURVE CID= -1   VS NO= 11   NO SEGS FOR MANNING n= -1
                     SLOPE= .01   DIAM= 5.0 FT   n= .013
COMPUTE TRAVEL TIME  ID= 5   REACH= 11   NO VS= 1   L= 1100 FT   S= .01
```

TRAVEL TIME TABLE

REACH= 11.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.261	.390	1.37	.0873
.521	1.086	5.93	.0559
.782	1.961	13.79	.0435
1.042	2.966	24.80	.0365

```
                                  1.303       4.069       38.72       .0321
                                  1.563       5.246       55.24       .0290
                                  1.824       6.479       74.01       .0267
                                  2.084       7.749       94.62       .0250
                                  2.345       9.043      116.65       .0237
                                  2.606      10.345      139.60       .0226
                                  2.866      11.641      162.98       .0218
                                  3.127      12.918      186.22       .0212
                                  3.387      14.159      208.72       .0207
                                  3.648      15.348      229.78       .0204
                                  3.908      16.467      248.64       .0202
                                  4.169      17.492      264.32       .0202
                                  4.429      18.395      275.55       .0204
                                  4.690      19.130      280.16       .0209
                                  5.000      19.635      280.16       .0214
ROUTE                   ID= 5   HYD= 308    IN ID= 6   DT= 0.0
PRINT HYD               ID= 5  CODE= 1

                                          HYDROGRAPH FROM AREA   308.00

     RUNOFF VOLUME =      1.44527 INCHES      =       9.1795 ACRE-FEET
     PEAK DISCHARGE RATE =      238.77 CFS  AT   1.567 HOURS   BASIN AREA =   .1191 SQ. MI.


*****************************************************************************
* BASIN T
COMPUTE NM HYD          ID= 1    HYD= T                DA= .00467 SQ MI
                        PER A= 0       B= 15       C=  0       D= 85
                        TP= -0.13333 HRS   RAIN= -1

     K =    .072665HR    TP =   .133330HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
     UNIT PEAK =   15.668    CFS   UNIT VOLUME =    .9987       B =   526.28      P60 =
1.9000
     AREA =       .003970 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

     K =    .130790HR    TP =   .133330HR    K/TP RATIO =    .980950     SHAPE CONSTANT, N =
3.599935
     UNIT PEAK =   1.7209    CFS   UNIT VOLUME =    .9926       B =   327.55      P60 =
1.9000
     AREA =       .000701 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

PRINT HYD               ID= 1   CODE= 1

                                          HYDROGRAPH FROM AREA T

     RUNOFF VOLUME =      1.81798 INCHES      =        .4528 ACRE-FEET
     PEAK DISCHARGE RATE =       12.45 CFS  AT   1.500 HOURS   BASIN AREA =   .0047 SQ. MI.


*
*****************************************************************************
ADD HYD                 ID OUT= 3  HYD= 310     IDIN I= 1   IDIN II= 5
PRINT HYD               ID= 3   CODE= 1

                                          HYDROGRAPH FROM AREA   310.00

     RUNOFF VOLUME =      1.45932 INCHES      =       9.6323 ACRE-FEET
     PEAK DISCHARGE RATE =      249.07 CFS  AT   1.567 HOURS   BASIN AREA =   .1238 SQ. MI.
```

```
*
*****************************************************************************
* BASIN U
COMPUTE NM HYD          ID= 1    HYD= U                DA= .01032 SQ MI
                        PER A= 0       B= 30       C=  0       D= 70
                        TP= -0.13333 HRS   RAIN= -1

        K =    .072665HR    TP =    .133330HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =    28.514    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 =
1.9000
        AREA =       .007224 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

        K =    .130790HR    TP =    .133330HR    K/TP RATIO =    .980950     SHAPE CONSTANT, N =
3.599935
        UNIT PEAK =    7.6059    CFS   UNIT VOLUME =    .9985       B =   327.55      P60 =
1.9000
        AREA =       .003096 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

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

PRINT HYD               ID= 1   CODE= 1

                                          HYDROGRAPH FROM AREA U

        RUNOFF VOLUME =      1.62025 INCHES      =         .8918 ACRE-FEET
        PEAK DISCHARGE RATE =       25.09 CFS  AT   1.500 HOURS   BASIN AREA =    .0103 SQ. MI.

*
*****************************************************************************
*
ADD HYD                 ID OUT= 19   HYD= 312     IDIN I= 1   IDIN II= 3
PRINT HYD               ID= 19  CODE= 1

                                          HYDROGRAPH FROM AREA   312.00

        RUNOFF VOLUME =      1.47171 INCHES      =      10.5240 ACRE-FEET
        PEAK DISCHARGE RATE =      270.07 CFS  AT   1.567 HOURS   BASIN AREA =    .1341 SQ. MI.

*
*****************************************************************************
* BASIN V: % IMPERV A LA POINTE WEST DESIGN & DENSITY
COMPUTE NM HYD          ID= 11    HYD= V                DA= .03200 SQ MI
                        PER A= 0       B= 50       C=  0       D= 50
                        TP= -0.13333 HRS   RAIN= -1

        K =    .072665HR    TP =    .133330HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =    63.155    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 =
1.9000
        AREA =       .016000 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

        K =    .130790HR    TP =    .133330HR    K/TP RATIO =    .980950     SHAPE CONSTANT, N =
3.599935
        UNIT PEAK =    39.307    CFS   UNIT VOLUME =    1.000       B =   327.55      P60 =
1.9000
```

```
    AREA =       .016000 SQ MI    IA =     .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

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

PRINT HYD              ID= 11   CODE= 1

                                          HYDROGRAPH FROM AREA V


    RUNOFF VOLUME =      1.35662 INCHES      =       2.3153 ACRE-FEET
    PEAK DISCHARGE RATE =       67.84 CFS  AT   1.500 HOURS   BASIN AREA =    .0320 SQ. MI.


*
*****************************************************************************
ADD HYD                ID OUT= 3  HYD= SG.AT.82ND    IDIN I= 11   IDIN II= 19
PRINT HYD              ID= 3   CODE= 1

                                          HYDROGRAPH FROM AREA SG.AT.82ND


    RUNOFF VOLUME =      1.44953 INCHES      =      12.8393 ACRE-FEET
    PEAK DISCHARGE RATE =      330.10 CFS  AT   1.533 HOURS   BASIN AREA =    .1661 SQ. MI.


*
*****************************************************************************
*  ROUTE TO UNSER IN CONC PIPE; Sf=.01 APX AVG
*  IF EST DIAM SMALL => TRAVEL FASTER => DNSTR PEAK HIGHER => CONSERVATIVE
*  VALLEY SEGMENT & REACH NUMBERS ARE USER ID'S ONLY; DUMMIES HERE
*  AVAIL SLOPE BTW UNSER/AMOLE & SG/82 APX .01 AVG.
COMPUTE RATING CURVE CID= -1   VS NO= 11   NO SEGS FOR MANNING n= -1
                     SLOPE= .01   DIAM= 5.5 FT   n= .013
COMPUTE TRAVEL TIME  ID= 5   REACH= 11   NO VS= 1   L= 1100 FT   S= .01

                                TRAVEL TIME TABLE
                                          REACH= 11.0

                                WATER       AVERAGE     FLOW        TRAVEL
                                DEPTH       AREA        RATE        TIME
                                FEET        SQ.FT.      CFS         HRS
                                   .287        .472        1.76       .0819
                                   .573       1.314        7.65       .0525
                                   .860       2.373       17.78       .0408
                                  1.146       3.589       31.97       .0343
                                  1.433       4.923       49.92       .0301
                                  1.720       6.348       71.23       .0272
                                  2.006       7.839       95.43       .0251
                                  2.293       9.377      122.00       .0235
                                  2.579      10.942      150.40       .0222
                                  2.866      12.518      180.00       .0212
                                  3.153      14.086      210.14       .0205
                                  3.439      15.630      240.11       .0199
                                  3.726      17.132      269.11       .0195
                                  4.013      18.571      296.28       .0192
                                  4.299      19.925      320.59       .0190
                                  4.586      21.166      340.81       .0190
                                  4.872      22.258      355.29       .0191
                                  5.159      23.147      361.23       .0196
                                  5.500      23.758      361.23       .0201
ROUTE                  ID= 5   HYD= 314    IN ID= 3   DT= 0.0
PRINT HYD              ID= 5   CODE= 1

                                          HYDROGRAPH FROM AREA   314.00
```

```
RUNOFF VOLUME =      1.44953 INCHES      =       12.8393 ACRE-FEET
PEAK DISCHARGE RATE =      328.29 CFS  AT   1.567 HOURS   BASIN AREA =   .1661 SQ. MI.


*****************************************************************************
*C BASIN W: WHISPER POINTE SUBDIVISION UNDER DESIGN MARK GOODWIN & ASSOC
*C % IMPERV (PER D) REVISED 1-7-98 PER GOODWIN LETTER OF 11-29-97: Qp APX 77
*C BASIN W IS ONLY BASIN W Tp (&Tc) > REGULATORY MINIMUM
COMPUTE NM HYD        ID= 12    HYD= W                DA= .03422 SQ MI
                      PER A= 0      B= 40      C=  0      D= 60
                      TP= -0.13333 HRS   RAIN= -1

K =    .072665HR    TP =    .133330HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
UNIT PEAK =   81.043    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 =
1.9000
AREA =       .020532 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

K =    .130790HR    TP =    .133330HR    K/TP RATIO =    .980950     SHAPE CONSTANT, N =
3.599935
UNIT PEAK =   33.627    CFS   UNIT VOLUME =    .9999       B =   327.55      P60 =
1.9000
AREA =       .013688 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

*C                      TP= -0.16325 HRS   RAIN= -1
PRINT HYD             ID= 12   CODE= 1

                                        HYDROGRAPH FROM AREA W


RUNOFF VOLUME =      1.48844 INCHES      =        2.7165 ACRE-FEET
PEAK DISCHARGE RATE =       77.86 CFS  AT   1.500 HOURS   BASIN AREA =   .0342 SQ. MI.

*
*****************************************************************************
ADD HYD               ID OUT= 3  HYD= 316     IDIN I= 12   IDIN II= 5
PRINT HYD             ID= 3   CODE= 1

                                        HYDROGRAPH FROM AREA   316.00


RUNOFF VOLUME =      1.45618 INCHES      =       15.5558 ACRE-FEET
PEAK DISCHARGE RATE =      394.29 CFS  AT   1.533 HOURS   BASIN AREA =   .2003 SQ. MI.


*
*****************************************************************************
* BASIN X: R.O.W. FOR SUNSET GARDENS AND (LIMITED ACCESS) UNSER & EUCARIZ
*C BASIN BOUNDARY REVISED 1-7-98; OLD AREA WAS 0.00674 SQ MI
COMPUTE NM HYD        ID= 13    HYD= X                DA= .01058 SQ MI
                      PER A= 0      B= 20      C=  0      D= 80
                      TP= -0.13333 HRS   RAIN= -1

K =    .072665HR    TP =    .133330HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
UNIT PEAK =   33.409    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 =
1.9000
AREA =       .008464 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333
```

```
K =    .130790HR    TP =    .133330HR    K/TP RATIO =    .980950    SHAPE CONSTANT, N =
3.599935
UNIT PEAK =    5.1984    CFS    UNIT VOLUME =    .9978    B =    327.55    P60 =
1.9000
AREA =    .002116 SQ MI    IA =    .50000 INCHES    INF =    1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

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

PRINT HYD              ID= 13    CODE= 1

                                   HYDROGRAPH FROM AREA X

RUNOFF VOLUME =     1.75207 INCHES     =        .9886 ACRE-FEET
PEAK DISCHARGE RATE =      27.37 CFS  AT   1.500 HOURS   BASIN AREA =    .0106 SQ. MI.

*
*****************************************************************************
ADD HYD                ID OUT= 4  HYD= SG.AT.UNSER   IDIN I= 13   IDIN II= 3
PRINT HYD              ID= 4    CODE= 1

                                   HYDROGRAPH FROM AREA SG.AT.UNSER

RUNOFF VOLUME =     1.47102 INCHES     =      16.5444 ACRE-FEET
PEAK DISCHARGE RATE =     420.45 CFS  AT   1.533 HOURS   BASIN AREA =    .2109 SQ. MI.

*
*****************************************************************************
* ROUTE TO UNSER 340 FT N OF SG (APX HALF DIST TO AMOLE CHAN); Sf=.01 APX
* EST DIAM SMALL => TRAVEL FASTER => DNSTR PEAK HIGHER => CONSERVATIVE
* VALLEY SEGMENT & REACH NUMBERS ARE USER ID'S ONLY; DUMMIES HERE
COMPUTE RATING CURVE CID= -1    VS NO= 11    NO SEGS FOR MANNING n= -1
                       SLOPE= .01    DIAM= 6.0 FT    n= .013
COMPUTE TRAVEL TIME  ID= 5    REACH= 11    NO VS= 1    L= 340    FT    S= .01
```

TRAVEL TIME TABLE

REACH= 11.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.313	.562	2.22	.0239
.625	1.564	9.64	.0153
.938	2.824	22.42	.0119
1.251	4.271	40.32	.0100
1.563	5.859	62.96	.0088
1.876	7.554	89.83	.0079
2.189	9.329	120.35	.0073
2.501	11.159	153.87	.0068
2.814	13.022	189.68	.0065
3.127	14.897	227.01	.0062
3.439	16.764	265.02	.0060
3.752	18.601	302.81	.0058
4.065	20.388	339.39	.0057
4.377	22.101	373.65	.0056
4.690	23.712	404.31	.0055
5.003	25.189	429.82	.0055
5.315	26.489	448.07	.0056
5.628	27.547	455.57	.0057
6.000	28.274	455.57	.0059

```
ROUTE                  ID= 5    HYD= 318    IN ID= 4    DT= 0.0
PRINT HYD              ID= 5    CODE= 1
```

```
                                        HYDROGRAPH FROM AREA   318.00

     RUNOFF VOLUME =      1.47102 INCHES      =       16.5444 ACRE-FEET
     PEAK DISCHARGE RATE =      418.41 CFS  AT   1.567 HOURS   BASIN AREA =   .2109 SQ. MI.


   ***********************************************************************************
   * BASIN Y DEVELOPED: EST ENTIRE SITE; ZONING = O-1; USE % IMPERV AS FOR C-2
   * WHEN BUILT, N APX 200' POSS DRAIN TO BRIDGE PER GREINER FOR BRIDGE BLVD SD
   *  REV ORIGINAL AREA OF .02964 2/26/98 URS GREINER -  ASSUME 0.0101 SM
   * WILL DRAIN TO BRIDGE BLVD SD- BASIN 21D ALONG BRIDGE FRONTAGE
   COMPUTE NM HYD          ID= 14    HYD= Y                DA= .01954 SQ MI
                           PER A= 0       B= 10       C= 5       D= 85
                           TP= -0.13333 HRS   RAIN= -1

     K =    .072665HR    TP =    .133330HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
     UNIT PEAK =   65.558    CFS   UNIT VOLUME =     .9992       B =   526.28      P60 =
1.9000
     AREA =       .016609 SQ MI    IA =     .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


     K =    .122603HR    TP =    .133330HR    K/TP RATIO =    .919546     SHAPE CONSTANT, N =
3.849372
     UNIT PEAK =   7.5841    CFS   UNIT VOLUME =     .9986       B =   345.00      P60 =
1.9000
     AREA =       .002931 SQ MI    IA =     .45000 INCHES    INF =   1.11000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

   PRINT HYD               ID= 14   CODE= 1

                                        HYDROGRAPH FROM AREA Y


     RUNOFF VOLUME =      1.83290 INCHES      =        1.9101 ACRE-FEET
     PEAK DISCHARGE RATE =       52.58 CFS  AT   1.500 HOURS   BASIN AREA =   .0195 SQ. MI.


   *
   ***********************************************************************************
   *s TOTAL FLOW FROM UNSER APROX 300' S OF AMOLE CHANNEL
   *   ADD TO FLOW FROM BRIDGE & UNSER NORTH
   ADD HYD                 ID OUT= 7  HYD= FUT.TO.AMOLE   IDIN I= 14   IDIN II= 5
   PRINT HYD               ID= 7   CODE= 1

                                        HYDROGRAPH FROM AREA FUT.TO.AMOLE

     RUNOFF VOLUME =      1.50171 INCHES      =       18.4545 ACRE-FEET
     PEAK DISCHARGE RATE =      468.17 CFS  AT   1.533 HOURS   BASIN AREA =   .2304 SQ. MI.


   *
   ***********************************************************************************
   *S  TOTAL FLOW TO HEAD OF CONCRETE CHANNEL
   *ADD SUNSET GARDENS/UNSER BLVD FLOW TO CHANNEL
   ADD HYD                 ID=5  HYD=CHANNEL  ID=7  ID=9
   PRINT HYD               ID=5  CODE=1

                                        HYDROGRAPH FROM AREA CHANNEL
```

```
RUNOFF VOLUME =      1.70867 INCHES      =      252.7143 ACRE-FEET
PEAK DISCHARGE RATE =    2112.30 CFS  AT   1.600 HOURS   BASIN AREA =  2.7732 SQ. MI.


*_____________________________________________________________
* ROUTE FLOW DOWN CONCRETE TRAPAZOIDAL CHANNEL PARALLEL TO BRIDGE BLVD.
*   STA 41+06 TO STA 30+25
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=0
                    MAX ELEV=7.5  CH SLOPE=0.004  FP SLOPE=0.004
                    N=0.013   DIST=40
                    DIST  ELEV
                    0      7.5
                    15     0
                    25     0
                    40     7.5

                                  RATING CURVE VALLEY SECTION  1.0
                                      WATER        FLOW        FLOW        TOP
                                     SURFACE       AREA        RATE       WIDTH
                                      ELEV         SQ FT       CFS        FT
                                      .00          .00         .00        .00
                                      .39         4.26        15.64      11.58
                                      .79         9.14        50.88      13.16
                                     1.18        14.65       102.87      14.74
                                     1.58        20.78       171.27      16.32
                                     1.97        27.53       256.37      17.89
                                     2.37        34.90       358.71      19.47
                                     2.76        42.90       478.94      21.05
                                     3.16        51.52       617.78      22.63
                                     3.55        60.77       775.97      24.21
                                     3.95        70.64       954.26      25.79
                                     4.34        81.13      1153.41      27.37
                                     4.74        92.24      1374.20      28.95
                                     5.13       103.98      1617.37      30.53
                                     5.53       116.34      1883.67      32.11
                                     5.92       129.33      2173.84      33.68
                                     6.32       142.94      2488.63      35.26
                                     6.71       157.17      2828.77      36.84
                                     7.11       172.02      3194.96      38.42
                                     7.50       187.50      3587.93      40.00
COMPUTE TRAVEL TIME ID=6  REACH NO=1  NOVS=1 · L=1081  SLP=0.004

                         TRAVEL TIME TABLE
                                        REACH=  1.0

                         WATER       AVERAGE      FLOW        TRAVEL
                         DEPTH       AREA         RATE        TIME
                         FEET        SQ.FT.       CFS         HRS
                           .395        4.259       15.64        .0818
                           .789        9.141       50.88        .0539
                          1.184       14.647      102.87        .0428
                          1.579       20.776      171.27        .0364
                          1.974       27.528      256.37        .0322
                          2.368       34.903      358.71        .0292
                          2.763       42.902      478.94        .0269
                          3.158       51.524      617.78        .0250
                          3.553       60.769      775.97        .0235
                          3.947       70.637      954.26        .0222
                          4.342       81.129     1153.41        .0211
                          4.737       92.244     1374.20        .0202
                          5.132      103.982     1617.37        .0193
                          5.526      116.343     1883.67        .0185
                          5.921      129.328     2173.84        .0179
                          6.316      142.936     2488.63        .0172
                          6.711      157.168     2828.77        .0167
                          7.105      172.022     3194.96        .0162
                          7.500      187.500     3587.93        .0157
ROUTE                 ID=6  HYD=R5  INFLOW ID=5  DT=0.0
```

```
PRINT HYD              ID=6  CODE=1

                                        HYDROGRAPH FROM AREA R5

     RUNOFF VOLUME =      1.70752 INCHES      =      252.5442 ACRE-FEET
     PEAK DISCHARGE RATE =     2113.42 CFS  AT   1.600 HOURS   BASIN AREA =  2.7732 SQ. MI.


*
COMPUTE NM HYD         ID=18  HYD=18W  AREA=0.1122   PER A=0   PER B=27
                       PER C=5  PER D=68  TP=0.1817  MASS RAIN=-1

     K =    .100095HR    TP =    .181700HR    K/TP RATIO =    .550882     SHAPE CONSTANT, N =
7.009509
     UNIT PEAK =   219.06    CFS   UNIT VOLUME =    .9999       B =   521.70      P60 =
1.9000
     AREA =       .076296 SQ MI    IA =     .10000 INCHES    INF =     .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

     K =    .170075HR    TP =    .181700HR    K/TP RATIO =    .936020     SHAPE CONSTANT, N =
3.778402
     UNIT PEAK =   67.207    CFS   UNIT VOLUME =    .9998       B =   340.11      P60 =
1.9000
     AREA =       .035904 SQ MI    IA =     .47656 INCHES    INF =   1.18438 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

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

PRINT HYD              ID=18  CODE=1

                                        HYDROGRAPH FROM AREA 18W

     RUNOFF VOLUME =      1.60831 INCHES      =        9.6241 ACRE-FEET
     PEAK DISCHARGE RATE =      231.19 CFS  AT   1.567 HOURS   BASIN AREA =    .1122 SQ. MI.


*
*ADD BASIN 18W TO CHANNEL FLOW
ADD HYD                ID=7  HYD=18.1  ID=18   ID=6
PRINT HYD              ID=7  CODE=1

                                        OUTFLOW HYDROGRAPH REACH    18.10

     RUNOFF VOLUME =      1.70366 INCHES      =      262.1683 ACRE-FEET
     PEAK DISCHARGE RATE =     2330.57 CFS  AT   1.600 HOURS   BASIN AREA =  2.8854 SQ. MI.


*
*ROUTE FLOW DOWN CHANNEL STA 31+25 TO 23+50
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=0
                     MAX ELEV=6.5  CH SLOPE=0.0144  FP SLOPE=0.0144
                     N=0.013   DIST=36
                     DIST  ELEV
                     0      6.5
                     13     0
                     23     0
                     36     6.5

                                RATING CURVE VALLEY SECTION  1.0
                                  WATER        FLOW        FLOW        TOP
                                 SURFACE       AREA        RATE       WIDTH
                                  ELEV         SQ FT       CFS         FT
```

.00	.00	.00	.00
.34	3.66	23.31	11.37
.68	7.78	75.53	12.74
1.03	12.37	151.99	14.11
1.37	17.43	251.86	15.47
1.71	22.96	375.23	16.84
2.05	28.95	522.62	18.21
2.39	35.42	694.75	19.58
2.74	42.35	892.44	20.95
3.08	49.75	1116.58	22.32
3.42	57.62	1368.08	23.68
3.76	65.95	1647.87	25.05
4.11	74.76	1956.89	26.42
4.45	84.03	2296.09	27.79
4.79	93.77	2666.39	29.16
5.13	103.98	3068.74	30.53
5.47	114.66	3504.05	31.89
5.82	125.80	3973.25	33.26
6.16	137.42	4477.25	34.63
6.50	149.50	5016.95	36.00

COMPUTE TRAVEL TIME ID=8 REACH NO=1 NOVS=1 L=775 SLP=0.0144

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.342	3.655	23.31	.0338
.684	7.778	75.53	.0222
1.026	12.370	151.99	.0175
1.368	17.429	251.86	.0149
1.711	22.957	375.23	.0132
2.053	28.953	522.62	.0119
2.395	35.417	694.75	.0110
2.737	42.349	892.44	.0102
3.079	49.749	1116.58	.0096
3.421	57.618	1368.08	.0091
3.763	65.954	1647.87	.0086
4.105	74.759	1956.89	.0082
4.447	84.032	2296.09	.0079
4.789	93.773	2666.39	.0076
5.132	103.982	3068.74	.0073
5.474	114.659	3504.05	.0070
5.816	125.805	3973.25	.0068
6.158	137.418	4477.25	.0066
6.500	149.500	5016.95	.0064

ROUTE ID=8 HYD=R7 INFLOW ID=7 DT=0.0
PRINT HYD ID=8 CODE=1

HYDROGRAPH FROM AREA R7

RUNOFF VOLUME = 1.70316 INCHES = 262.0903 ACRE-FEET
PEAK DISCHARGE RATE = 2333.99 CFS AT 1.600 HOURS BASIN AREA = 2.8854 SQ. MI.

*
COMPUTE NM HYD ID=21 HYD=21E AREA=0.0656 PER A=0 PER B=0
PER C=30 PER D=70 TP=0.1333 MASS RAIN=-1

K = .072697HR TP = .133300HR K/TP RATIO = .545367 SHAPE CONSTANT, N = 7.100313
UNIT PEAK = 181.20 CFS UNIT VOLUME = .9993 B = 525.99 P60 = 1.9000
AREA = .045920 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

K = .106176HR TP = .133300HR K/TP RATIO = .796520 SHAPE CONSTANT, N = 4.500118

UNIT PEAK = 57.170 CFS UNIT VOLUME = 1.000 B = 387.23 P60 = 1.9000

AREA = .019680 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

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

PRINT HYD ID=21 CODE=1

HYDROGRAPH FROM AREA 21E

RUNOFF VOLUME = 1.72180 INCHES = 6.0240 ACRE-FEET
PEAK DISCHARGE RATE = 170.43 CFS AT 1.500 HOURS BASIN AREA = .0656 SQ. MI.

THIS IS GREATER THAN OUR 156.60 CFS

*

*ADD 21E FLOW TO CHANNEL AT THE 42" STORM DRAIN TIE AT STINSON ST
ADD HYD ID=9 HYD=21.1 ID=21 ID=8
PRINT HYD ID=9 CODE=1

OUTFLOW HYDROGRAPH REACH 21.10

RUNOFF VOLUME = 1.70357 INCHES = 268.1143 ACRE-FEET
PEAK DISCHARGE RATE = 2453.09 CFS AT 1.600 HOURS BASIN AREA = 2.9510 SQ. MI.

*

*ROUTE FLOW DOWN CHANNEL - STA 23+50 TO 17+30
COMPUTE RATING CURVE CID=1 VSNO=1 NO SEG=1 MIN ELEV=0
MAX ELEV=6.5 CH SLOPE=0.022 FP SLOPE=0.022
N=0.013 DIST=26.1

DIST	ELEV
0	6.5
0.1	4
8	0
18	0
26	4
26.1	6.5

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.34	3.65	28.81	11.36
.68	7.77	93.31	12.72
1.03	12.36	187.73	14.08
1.37	17.41	311.00	15.44
1.71	22.92	463.23	16.80
2.05	28.90	645.04	18.16
2.39	35.35	857.31	19.52
2.74	42.26	1101.04	20.88
3.08	49.63	1377.31	22.24
3.42	57.47	1687.24	23.60
3.76	65.78	2031.97	24.96
4.11	74.53	2426.24	25.91
4.45	83.39	2879.52	25.94
4.79	92.27	3355.15	25.96
5.13	101.16	3851.21	25.99
5.47	110.06	4366.03	26.02
5.82	118.96	4898.15	26.05
6.16	127.88	5446.27	26.07
6.50	136.80	6009.27	26.10

COMPUTE TRAVEL TIME ID=10 REACH NO=1 NOVS=1 L=620 SLP=0.022

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.342	3.654	28.81	.0218
.684	7.773	93.31	.0143
1.026	12.357	187.73	.0113
1.368	17.406	311.00	.0096
1.711	22.920	463.23	.0085
2.053	28.900	645.04	.0077
2.395	35.345	857.31	.0071
2.737	42.255	1101.04	.0066
3.079	49.631	1377.31	.0062
3.421	57.471	1687.24	.0059
3.763	65.777	2031.97	.0056
4.105	74.527	2426.24	.0053
4.447	83.395	2879.52	.0050
4.789	92.272	3355.15	.0047
5.132	101.159	3851.21	.0045
5.474	110.055	4366.03	.0043
5.816	118.961	4898.15	.0042
6.158	127.876	5446.27	.0040
6.500	136.800	6009.27	.0039

ROUTE ID=10 HYD=R9 INFLOW ID=9 DT=0.0
PRINT HYD ID=10 CODE=1

HYDROGRAPH FROM AREA R9

RUNOFF VOLUME = 1.70324 INCHES = 268.0617 ACRE-FEET
PEAK DISCHARGE RATE = 2457.37 CFS AT 1.600 HOURS BASIN AREA = 2.9510 SQ. MI.

*
COMPUTE NM HYD ID=18 HYD=18E AREA=0.0075 PER A=30 PER B=0
PER C=0 PER D=70 TP=0.1333 MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 20.727 CFS UNIT VOLUME = .9989 B = 526.28 P60 = 1.9000
AREA = .005250 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

K = .162928HR TP = .133300HR K/TP RATIO = 1.222262 SHAPE CONSTANT, N = 2.911962
UNIT PEAK = 4.6344 CFS UNIT VOLUME = .9966 B = 274.56 P60 = 1.9000
AREA = .002250 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

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

PRINT HYD ID=18 CODE=1

HYDROGRAPH FROM AREA 18E

RUNOFF VOLUME = 1.54928 INCHES = .6197 ACRE-FEET
PEAK DISCHARGE RATE = 17.13 CFS AT 1.500 HOURS BASIN AREA = .0075 SQ. MI.

```
*
*ADD 18E TO CHANNEL FLOW
ADD HYD              ID=11  HYD=18.1  ID=18  ID=10
PRINT HYD            ID=11  CODE=1

                                    OUTFLOW HYDROGRAPH REACH    18.10

    RUNOFF VOLUME =      1.70285 INCHES     =     268.6813 ACRE-FEET
    PEAK DISCHARGE RATE =    2469.38 CFS  AT   1.600 HOURS   BASIN AREA =  2.9585 SQ. MI.


*
*ROUTE FLOW TO END OF CHANNEL - STA 17+30 TO 9+55
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=0
                     MAX ELEV=6.5  CH SLOPE=0.022  FP SLOPE=0.022
                     N=0.013   DIST=36
                     DIST ELEV
                     0      6.5
                     13     0
                     23     0
                     36     6.5
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.34	3.66	28.81	11.37
.68	7.78	93.36	12.74
1.03	12.37	187.87	14.11
1.37	17.43	311.30	15.47
1.71	22.96	463.79	16.84
2.05	28.95	645.97	18.21
2.39	35.42	858.73	19.58
2.74	42.35	1103.09	20.95
3.08	49.75	1380.13	22.32
3.42	57.62	1690.99	23.68
3.76	65.95	2036.82	25.05
4.11	74.76	2418.78	26.42
4.45	84.03	2838.04	27.79
4.79	93.77	3295.75	29.16
5.13	103.98	3793.06	30.53
5.47	114.66	4331.12	31.89
5.82	125.80	4911.07	33.26
6.16	137.42	5534.03	34.63
6.50	149.50	6201.12	36.00

```
COMPUTE TRAVEL TIME ID=12  REACH NO=1  NOVS=1  L=775  SLP=0.022
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.342	3.655	28.81	.0273
.684	7.778	93.36	.0179
1.026	12.370	187.87	.0142
1.368	17.429	311.30	.0121
1.711	22.957	463.79	.0107
2.053	28.953	645.97	.0096
2.395	35.417	858.73	.0089
2.737	42.349	1103.09	.0083
3.079	49.749	1380.13	.0078
3.421	57.618	1690.99	.0073
3.763	65.954	2036.82	.0070
4.105	74.759	2418.78	.0067
4.447	84.032	2838.04	.0064

```
                                  4.789      93.773     3295.75        .0061
                                  5.132     103.982     3793.06        .0059
                                  5.474     114.659     4331.12        .0057
                                  5.816     125.805     4911.07        .0055
                                  6.158     137.418     5534.03        .0053
                                  6.500     149.500     6201.12        .0052
ROUTE                   ID=12  HYD=R11  INFLOW ID=11  DT=0.0
PRINT HYD               ID=12  CODE=1

                                          HYDROGRAPH FROM AREA R11


    RUNOFF VOLUME =      1.70243 INCHES      =     268.6151 ACRE-FEET
    PEAK DISCHARGE RATE =    2473.55 CFS  AT   1.600 HOURS   BASIN AREA =  2.9585 SQ. MI.


*
*FLOW EMPTIES INTO NORTH/SOUTH COORS CONNECTION POND
FINISH
NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 14:44:32
```

```
AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 03/02/1998
     START TIME (HR:MIN:SEC) = 14:28:49     USER NO.= GREINRNM.STE
     INPUT FILE = p:\ahymo\ab100.dat

START                 0.0 HRS
* AHYMO MODEL FOR AMOLE PHASE III C
* MODEL CREATED BY GREINER AUG 1993 - BASED ON FILE AB100MKR FROM
*     FROM FEMA RESTUDY (AREAS A (#2) AND B (#3)) BY RTI
*
* TIERRA BAYITA ARROYO
* ULTIMATE DEVELOPMENT CONDITIONS 100-YR. 24-HR. STORM
*
*
*   FILE NAME - AB100.DAT
*
* THIS FILE COMPUTES THE HYDROLOGY FOR
*
*      AREA A (#2) - TIERRA BAYITA ARROYO, MIREHAVEN ARROYO
*
*     ASSUMPTIONS -
*       1. USE THE AHYMO991 VERSION OF HYMO AS DEVELOPED BY AMAFCA
*       2. MODEL THE 24-HOUR RAINFALL PER FEMA CRITERIA
*       3. USE THE draft REVISION OF SECTION 22.2, DPM by the DEVELOPMENT
*          PROCESS MANUAL DRAINAGE DESIGN CRITERIA COMMITTEE, AUGUST 1991
*       4. USE THE NM HYDROGRAPH COMPUTATIONAL METHOD IN AHYMO391
*       5. COMPUTATIONAL INTERVAL = 3 MINUTES = .05 hrs
*       6. PERCENTAGE OF EXISTING LAND USE WITHIN TREATMENT TYPES A,B,C AND D
*          WAS ESTIMATED FOR ULTIMATE DEVELOPMENT BASED ON LAND PLANNING
*          DOCUMENTS
*
* % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % %
*
*
RAINFALL              TYPE=2  RAIN QUARTER=0.0   RAIN ONE=1.95
                      RAIN SIX=2.2     RAIN DAY=2.7     DT=0.05

                 COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40
HR.
                 DT =     .050000 HOURS        END TIME =    24.000000 HOURS
                    .0000    .0014    .0028    .0042    .0057    .0073    .0089
                    .0106    .0124    .0142    .0161    .0182    .0203    .0225
                    .0248    .0273    .0300    .0328    .0359    .0392    .0428
                    .0510    .0601    .0864    .1486    .2555    .4209    .6590
                    .9846   1.2415   1.3575   1.4544   1.5392   1.6151   1.6838
                   1.7465   1.8040   1.8570   1.9058   1.9510   1.9928   2.0008
                   2.0081   2.0148   2.0211   2.0270   2.0326   2.0378   2.0427
                   2.0474   2.0519   2.0562   2.0604   2.0643   2.0682   2.0718
                   2.0754   2.0788   2.0822   2.0854   2.0885   2.0916   2.0945
                   2.0974   2.1002   2.1030   2.1057   2.1083   2.1108   2.1133
                   2.1158   2.1182   2.1205   2.1228   2.1251   2.1273   2.1295
                   2.1316   2.1337   2.1358   2.1378   2.1398   2.1417   2.1437
                   2.1456   2.1474   2.1493   2.1511   2.1529   2.1547   2.1564
                   2.1581   2.1598   2.1615   2.1631   2.1648   2.1664   2.1680
                   2.1695   2.1711   2.1726   2.1741   2.1756   2.1771   2.1786
                   2.1800   2.1814   2.1828   2.1842   2.1856   2.1870   2.1884
                   2.1897   2.1910   2.1924   2.1937   2.1950   2.1962   2.1975
                   2.1988   2.2000   2.2021   2.2042   2.2063   2.2084   2.2105
                   2.2126   2.2147   2.2167   2.2188   2.2209   2.2229   2.2250
                   2.2270   2.2290   2.2310   2.2330   2.2351   2.2371   2.2390
                   2.2410   2.2430   2.2450   2.2470   2.2489   2.2509   2.2528
                   2.2548   2.2567   2.2586   2.2605   2.2625   2.2644   2.2663
                   2.2682   2.2701   2.2720   2.2738   2.2757   2.2776   2.2795
                   2.2813   2.2832   2.2850   2.2869   2.2887   2.2905   2.2923
                   2.2942   2.2960   2.2978   2.2996   2.3014   2.3032   2.3050
                   2.3068   2.3085   2.3103   2.3121   2.3138   2.3156   2.3174
                   2.3191   2.3208   2.3226   2.3243   2.3260   2.3278   2.3295
```

2.3312	2.3329	2.3346	2.3363	2.3380	2.3397	2.3414
2.3431	2.3448	2.3464	2.3481	2.3498	2.3514	2.3531
2.3547	2.3564	2.3580	2.3596	2.3613	2.3629	2.3645
2.3662	2.3678	2.3694	2.3710	2.3726	2.3742	2.3758
2.3774	2.3790	2.3806	2.3821	2.3837	2.3853	2.3869
2.3884	2.3900	2.3915	2.3931	2.3946	2.3962	2.3977
2.3993	2.4008	2.4023	2.4038	2.4054	2.4069	2.4084
2.4099	2.4114	2.4129	2.4144	2.4159	2.4174	2.4189
2.4204	2.4219	2.4234	2.4248	2.4263	2.4278	2.4293
2.4307	2.4322	2.4336	2.4351	2.4365	2.4380	2.4394
2.4409	2.4423	2.4437	2.4452	2.4466	2.4480	2.4494
2.4509	2.4523	2.4537	2.4551	2.4565	2.4579	2.4593
2.4607	2.4621	2.4635	2.4649	2.4662	2.4676	2.4690
2.4704	2.4718	2.4731	2.4745	2.4759	2.4772	2.4786
2.4799	2.4813	2.4826	2.4840	2.4853	2.4867	2.4880
2.4893	2.4907	2.4920	2.4933	2.4946	2.4960	2.4973
2.4986	2.4999	2.5012	2.5025	2.5038	2.5051	2.5064
2.5077	2.5090	2.5103	2.5116	2.5129	2.5142	2.5155
2.5168	2.5180	2.5193	2.5206	2.5219	2.5231	2.5244
2.5257	2.5269	2.5282	2.5294	2.5307	2.5319	2.5332
2.5344	2.5357	2.5369	2.5382	2.5394	2.5406	2.5419
2.5431	2.5443	2.5455	2.5468	2.5480	2.5492	2.5504
2.5516	2.5528	2.5541	2.5553	2.5565	2.5577	2.5589
2.5601	2.5613	2.5625	2.5636	2.5648	2.5660	2.5672
2.5684	2.5696	2.5708	2.5719	2.5731	2.5743	2.5754
2.5766	2.5778	2.5790	2.5801	2.5813	2.5824	2.5836
2.5847	2.5859	2.5870	2.5882	2.5893	2.5905	2.5916
2.5928	2.5939	2.5950	2.5962	2.5973	2.5984	2.5996
2.6007	2.6018	2.6029	2.6041	2.6052	2.6063	2.6074
2.6085	2.6097	2.6108	2.6119	2.6130	2.6141	2.6152
2.6163	2.6174	2.6185	2.6196	2.6207	2.6218	2.6229
2.6239	2.6250	2.6261	2.6272	2.6283	2.6294	2.6304
2.6315	2.6326	2.6337	2.6347	2.6358	2.6369	2.6379
2.6390	2.6401	2.6411	2.6422	2.6432	2.6443	2.6454
2.6464	2.6475	2.6485	2.6496	2.6506	2.6516	2.6527
2.6537	2.6548	2.6558	2.6569	2.6579	2.6589	2.6600
2.6610	2.6620	2.6630	2.6641	2.6651	2.6661	2.6671
2.6682	2.6692	2.6702	2.6712	2.6722	2.6732	2.6742
2.6752	2.6763	2.6773	2.6783	2.6793	2.6803	2.6813
2.6823	2.6833	2.6843	2.6853	2.6862	2.6872	2.6882
2.6892	2.6902	2.6912	2.6922	2.6932	2.6941	2.6951
2.6961	2.6971	2.6981	2.6990	2.7000		

```
*
*s  DIVIDE HYD IS USED TO SIMULATE A BULKING FACTOR
COMPUTE NM HYD        ID=5   HYD=108.4    DA= .1426  SQ MI
                      PER A=0  B=2  C=28  D=70
                      TP= .1333  HRS  RAIN=-1

        K =   .073763HR    TP =   .133300HR    K/TP RATIO =   .553360     SHAPE CONSTANT, N =
6.969466
        UNIT PEAK =   389.25    CFS   UNIT VOLUME =    .9990       B =   519.81      P60 =
1.9500
        AREA =       .099820 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

        K =   .106958HR    TP =   .133300HR    K/TP RATIO =   .802389     SHAPE CONSTANT, N =
4.463305
        UNIT PEAK =   123.54    CFS   UNIT VOLUME =    1.002       B =   384.95      P60 =
1.9500
        AREA =       .042780 SQ MI    IA =    .36000 INCHES    INF =    .85800 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

    PRINT HYD             ID=5  CODE=1

                                  PARTIAL HYDROGRAPH   108.40
```

```
RUNOFF VOLUME =      2.03361 INCHES      =      15.4662 ACRE-FEET
PEAK DISCHARGE RATE =     363.67 CFS  AT   1.500 HOURS   BASIN AREA =   .1426 SQ. MI.

*DIVIDE HYD NO  108.4
DIVIDE HYD            ID=5   PER=-105  ID I=5 HYD=108.4
                                       ID II=16  HYD II=000
*** WARNING *** - PERCENTAGE OF     -105.0 FOUND - A HYDROGRAPH BULKING FACTOR IS ASSUMED
PRINT HYD             ID=5  CODE=1

                                  PARTIAL HYDROGRAPH  108.40

RUNOFF VOLUME =      2.13528 INCHES      =      16.2394 ACRE-FEET
PEAK DISCHARGE RATE =     381.85 CFS  AT   1.500 HOURS   BASIN AREA =   .1426 SQ. MI.

*
*
COMPUTE NM HYD        ID=1    HYD= 101       DA=0.026    SQ MI
                      PER A=0    B=100  C=0     D=0
                      TP=.133    HRS        RAIN=-1

K =    .131068HR    TP =    .133000HR    K/TP RATIO =    .985475     SHAPE CONSTANT, N =
3.583086
UNIT PEAK =   63.796    CFS   UNIT VOLUME =    1.001       B =   326.34      P60 =
1.9500
AREA =       .026000 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

*
DIVIDE HYD            ID=1    PER=-110    ID=1  HYD=101
                                          ID=16  HYD=000
*** WARNING *** - PERCENTAGE OF     -110.0 FOUND - A HYDROGRAPH BULKING FACTOR IS ASSUMED
*
*ROUTE BULKED 101 THROUGH BASIN 108.3 - ASSUME A CONCRETE TRAPAZOIDAL
*            CHANNEL TO SIMULATE DEVELOPED CONDITIONS
*            USE:  10FT BOTTOM  W/2H:1V SIDE SLOPES AT EXISTING SLOPE
COMPUTE RATING CURVE CID=1   VS NO=1   NO SEG = 1
                      MIN ELEV=0  MAX ELEV= 6  CH SLP= 0.0375
                      FP SLP=0.375    N=.013  DIST=34
                      DIST  ELEV
                       0     6
                       12    0
                       22    0
                       34    6
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.32	3.36	103.95	11.26
.63	7.11	336.16	12.53
.95	11.27	674.95	13.79
1.26	15.82	1115.75	15.05
1.58	20.78	1658.34	16.32
1.89	26.13	2304.37	17.58
2.21	31.88	3056.45	18.84
2.53	38.03	3917.71	20.11
2.84	44.58	4891.57	21.37
3.16	51.52	5981.63	22.63
3.47	58.87	7191.59	23.89
3.79	66.61	8525.20	25.16
4.11	74.76	9986.22	26.42
4.42	83.30	11578.44	27.68
4.74	92.24	13305.61	28.95

5.05	101.58	15171.49	30.21
5.37	111.32	17179.79	31.47
5.68	121.46	19334.22	32.74
6.00	132.00	21638.44	34.00

COMPUTE TRAVEL TIME ID=2 REACH=1 NO VS=1 L=4000 SLOPE= 0.0375

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.357	103.95	.0359
.632	7.114	336.16	.0235
.947	11.269	674.95	.0186
1.263	15.823	1115.75	.0158
1.579	20.776	1658.34	.0139
1.895	26.127	2304.37	.0126
2.211	31.878	3056.45	.0116
2.526	38.028	3917.71	.0108
2.842	44.576	4891.57	.0101
3.158	51.524	5981.63	.0096
3.474	58.870	7191.59	.0091
3.789	66.615	8525.20	.0087
4.105	74.759	9986.22	.0083
4.421	83.302	11578.44	.0080
4.737	92.244	13305.61	.0077
5.053	101.584	15171.49	.0074
5.368	111.324	17179.79	.0072
5.684	121.463	19334.22	.0070
6.000	132.000	21638.44	.0068

ROUTE ID=2 HYD= 101.80 INFLOW HYD ID=1 DT=0.0
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 101.80

RUNOFF VOLUME = .77528 INCHES = 1.0750 ACRE-FEET
PEAK DISCHARGE RATE = 36.46 CFS AT 1.550 HOURS BASIN AREA = .0260 SQ. MI.

*

COMPUTE NM HYD ID=1 HYD= 108.3 DA= .1478 SQ MI
PER A=0 B=2 C=41 D=57
TP=.175 HRS RAIN=-1

K = .096933HR TP = .175000HR K/TP RATIO = .553902 SHAPE CONSTANT, N = 6.960743
UNIT PEAK = 250.04 CFS UNIT VOLUME = .9997 B = 519.39 P60 = 1.9500
AREA = .084246 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .139737HR TP = .175000HR K/TP RATIO = .798497 SHAPE CONSTANT, N = 4.487627
UNIT PEAK = 140.35 CFS UNIT VOLUME = 1.000 B = 386.46 P60 = 1.9500
AREA = .063554 SQ MI IA = .35698 INCHES INF = .84953 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

*

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 108.30

RUNOFF VOLUME = 1.84830 INCHES = 14.5694 ACRE-FEET

```
PEAK DISCHARGE RATE =     312.33 CFS  AT   1.550 HOURS   BASIN AREA =   .1478 SQ. MI.

*
*       DIVIDE HYD NO.        108.3
DIVIDE HYD            ID=1     PER=-105      ID  I=1   HYD  I=108.3
                                           ID II=16   HYD II=000
*** WARNING *** - PERCENTAGE OF     -105.0 FOUND - A HYDROGRAPH BULKING FACTOR IS ASSUMED
PRINT HYD             ID=1  CODE=1

                                    PARTIAL HYDROGRAPH   108.30

RUNOFF VOLUME =     1.94071 INCHES     =      15.2979 ACRE-FEET
PEAK DISCHARGE RATE =     327.95 CFS  AT   1.550 HOURS   BASIN AREA =   .1478 SQ. MI.

*
*ADD ROUTED 101 AND 108.3
ADD HYD               ID=3   HYD=108.39  ID=1  ID=2
PRINT HYD             ID=3  CODE=1

                                    PARTIAL HYDROGRAPH   108.39

RUNOFF VOLUME =     1.76636 INCHES     =      16.3729 ACRE-FEET
PEAK DISCHARGE RATE =     364.41 CFS  AT   1.550 HOURS   BASIN AREA =   .1738 SQ. MI.

*
*ROUTE COMBINED 101 AND 108.3 TO NORTH POND INFLOW
*            ASSUME A CONCRETE TRAPAZOIDAL
*            CHANNEL TO SIMULATE DEVELOPED CONDITIONS
*            USE:  10FT BOTTOM  W/2H:1V SIDE SLOPES AT EXISTING SLOPE
COMPUTE RATING CURVE CID=1   VS NO=1   NO SEG = 1
                     MIN ELEV=0  MAX ELEV= 6  CH SLP= 0.02
                     FP SLP=0.02    N=.013  DIST=34
                     DIST  ELEV
                      0     6
                      12    0
                      22    0
                      34    6
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.32	3.36	24.01	11.26
.63	7.11	77.63	12.53
.95	11.27	155.87	13.79
1.26	15.82	257.67	15.05
1.58	20.78	382.98	16.32
1.89	26.13	532.17	17.58
2.21	31.88	705.86	18.84
2.53	38.03	904.76	20.11
2.84	44.58	1129.66	21.37
3.16	51.52	1381.40	22.63
3.47	58.87	1660.83	23.89
3.79	66.61	1968.81	25.16
4.11	74.76	2306.22	26.42
4.42	83.30	2673.93	27.68
4.74	92.24	3072.80	28.95
5.05	101.58	3503.70	30.21
5.37	111.32	3967.50	31.47
5.68	121.46	4465.05	32.74

```
                                    6.00        132.00      4997.18        34.00
COMPUTE TRAVEL TIME  ID=2      REACH=1  NO VS=1
                     L=2150       SLP=.015

                          TRAVEL TIME TABLE
                                          REACH=  1.0

                          WATER       AVERAGE     FLOW        TRAVEL
                          DEPTH       AREA        RATE        TIME
                          FEET        SQ.FT.      CFS         HRS
                             .316       3.357       24.01       .0835
                             .632       7.114       77.63       .0547
                             .947      11.269      155.87       .0432
                            1.263      15.823      257.67       .0367
                            1.579      20.776      382.98       .0324
                            1.895      26.127      532.17       .0293
                            2.211      31.878      705.86       .0270
                            2.526      38.028      904.76       .0251
                            2.842      44.576     1129.66       .0236
                            3.158      51.524     1381.40       .0223
                            3.474      58.870     1660.83       .0212
                            3.789      66.615     1968.81       .0202
                            4.105      74.759     2306.22       .0194
                            4.421      83.302     2673.93       .0186
                            4.737      92.244     3072.80       .0179
                            5.053     101.584     3503.70       .0173
                            5.368     111.324     3967.50       .0168
                            5.684     121.463     4465.05       .0162
                            6.000     132.000     4997.18       .0158
ROUTE                ID=2      HYD= 108.38    INFLOW ID=3    DT=0.0
PRINT HYD            ID=2    CODE=1

                                   PARTIAL HYDROGRAPH   108.38

     RUNOFF VOLUME =      1.76637 INCHES      =      16.3729 ACRE-FEET
     PEAK DISCHARGE RATE =     357.91 CFS  AT   1.550 HOURS   BASIN AREA =    .1738 SQ. MI.


*
COMPUTE NM HYD       ID=7    HYD=108.2      DA= .1710   SQ MI
                     PER A=0    B=5    C=35    D=63
                     TP=.158    HRS        RAIN=-1
     *****WARNING*****  SUM OF TREATMENT TYPES DOES NOT EQUAL 100 PERCENT OR TOTAL AREA

     K =    .087899HR    TP =    .158000HR    K/TP RATIO =    .556324     SHAPE CONSTANT, N =
6.922152
     UNIT PEAK =   342.61    CFS   UNIT VOLUME =    .9992       B =   517.56      P60 =
1.9500
     AREA =       .104592 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000

     K =    .127558HR    TP =    .158000HR    K/TP RATIO =    .807329     SHAPE CONSTANT, N =
4.432534
     UNIT PEAK =   161.00    CFS   UNIT VOLUME =    1.000       B =   383.05      P60 =
1.9500
     AREA =       .066408 SQ MI    IA =    .36875 INCHES    INF =    .88250 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000

PRINT HYD            ID=7    CODE=1

                                   PARTIAL HYDROGRAPH   108.20

     RUNOFF VOLUME =      1.89651 INCHES      =      17.2960 ACRE-FEET
     PEAK DISCHARGE RATE =     376.60 CFS  AT   1.500 HOURS   BASIN AREA =    .1710 SQ. MI.
```

```
*
*       DIVIDE HYD NO.        108.2
DIVIDE HYD            ID=7     PER=-105      ID  I=7   HYD  I=108.2
                                           ID II=16   HYD II=000
*** WARNING *** - PERCENTAGE OF     -105.0 FOUND - A HYDROGRAPH BULKING FACTOR IS ASSUMED
PRINT HYD             ID=7  CODE=1

                                     PARTIAL HYDROGRAPH   108.20

    RUNOFF VOLUME =      1.99133 INCHES      =      18.1608 ACRE-FEET
    PEAK DISCHARGE RATE =     395.43 CFS  AT   1.500 HOURS   BASIN AREA =   .1710 SQ. MI.


*
*S COMBINE HYD'S 108.38 AND 108.2
ADD HYD               ID=7  HYD=108.29  ID=7  ID=2
PRINT HYD             ID=7  CODE=1

                                     PARTIAL HYDROGRAPH   108.29

    RUNOFF VOLUME =      1.87793 INCHES      =      34.5337 ACRE-FEET
    PEAK DISCHARGE RATE =     752.47 CFS  AT   1.550 HOURS   BASIN AREA =   .3448 SQ. MI.


*
*
COMPUTE NM HYD        ID=2    HYD= 102    DA=0.281    SQ MI
                      PER A=40   B=19   C=10     D=31
                      TP=.20   RAIN=-1

    K =    .113561HR    TP =    .200000HR    K/TP RATIO =    .567804     SHAPE CONSTANT, N =
6.744929
    UNIT PEAK =   221.71    CFS   UNIT VOLUME =    .9997       B =   509.04      P60 =
1.9500
    AREA =       .087110 SQ MI    IA =     .10000 INCHES    INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

    K =    .189271HR    TP =    .200000HR    K/TP RATIO =    .946357     SHAPE CONSTANT, N =
3.735450
    UNIT PEAK =   326.83    CFS   UNIT VOLUME =    1.000       B =   337.13      P60 =
1.9500
    AREA =       .193890 SQ MI    IA =     .56522 INCHES    INF =   1.43261 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000
PRINT HYD             ID=2    CODE=1

                                     PARTIAL HYDROGRAPH   102.00

    RUNOFF VOLUME =      1.17382 INCHES      =      17.5915 ACRE-FEET
    PEAK DISCHARGE RATE =     370.96 CFS  AT   1.550 HOURS   BASIN AREA =   .2810 SQ. MI.


*
DIVIDE HYD            ID=2     PER=-105  ID  I=2   HYD  I=102
                                           ID II=16   HYD II=000
*** WARNING *** - PERCENTAGE OF     -105.0 FOUND - A HYDROGRAPH BULKING FACTOR IS ASSUMED
PRINT HYD             ID=2  CODE=1

                                     PARTIAL HYDROGRAPH   102.00
```

RUNOFF VOLUME = 1.23250 INCHES = 18.4710 ACRE-FEET
PEAK DISCHARGE RATE = 389.50 CFS AT 1.550 HOURS BASIN AREA = .2810 SQ. MI.

```
*
*ROUTE BASIN 102 THROUGH BASIN 108.1
*            ASSUME A CONCRETE TRAPAZOIDAL
*            CHANNEL TO SIMULATE DEVELOPED CONDITIONS
*            USE:  10FT BOTTOM  W/2H:1V SIDE SLOPES AT EXISTING SLOPE
COMPUTE RATING CURVE CID=1   VS NO=1   NO SEG = 1
                     MIN ELEV=0  MAX ELEV= 6  CH SLP= 0.03
                     FP SLP=0.03    N=.013  DIST=34
                     DIST  ELEV
                      0     6
                      12    0
                      22    0
                      34    6
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.32	3.36	29.40	11.26
.63	7.11	95.08	12.53
.95	11.27	190.91	13.79
1.26	15.82	315.58	15.05
1.58	20.78	469.05	16.32
1.89	26.13	651.78	17.58
2.21	31.88	864.50	18.84
2.53	38.03	1108.10	20.11
2.84	44.58	1383.55	21.37
3.16	51.52	1691.86	22.63
3.47	58.87	2034.09	23.89
3.79	66.61	2411.29	25.16
4.11	74.76	2824.53	26.42
4.42	83.30	3274.88	27.68
4.74	92.24	3763.40	28.95
5.05	101.58	4291.14	30.21
5.37	111.32	4859.18	31.47
5.68	121.46	5468.54	32.74
6.00	132.00	6120.27	34.00

```
COMPUTE TRAVEL TIME  ID=3      REACH=1  NO VS=1
                     L=3100       SLP=.03
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.357	29.40	.0983
.632	7.114	95.08	.0644
.947	11.269	190.91	.0508
1.263	15.823	315.58	.0432
1.579	20.776	469.05	.0381
1.895	26.127	651.78	.0345
2.211	31.878	864.50	.0318
2.526	38.028	1108.10	.0296
2.842	44.576	1383.55	.0277
3.158	51.524	1691.86	.0262
3.474	58.870	2034.09	.0249
3.789	66.615	2411.29	.0238
4.105	74.759	2824.53	.0228
4.421	83.302	3274.88	.0219
4.737	92.244	3763.40	.0211
5.053	101.584	4291.14	.0204
5.368	111.324	4859.18	.0197

```
                                  5.684      121.463      5468.54        .0191
                                  6.000      132.000      6120.27        .0186
ROUTE                  ID=3      HYD= 102.80    INFLOW ID=2    DT=0.0
PRINT HYD              ID=3    CODE=1

                                     PARTIAL HYDROGRAPH   102.80


     RUNOFF VOLUME =      1.23251 INCHES      =      18.4710 ACRE-FEET
     PEAK DISCHARGE RATE =     391.90 CFS  AT   1.600 HOURS   BASIN AREA =   .2810 SQ. MI.


*
COMPUTE NM HYD         ID=4    HYD= 108.1     DA= .1713    SQ MI
                       PER A=0    B=3    C=30    D=67
                       TP=.133    HRS        RAIN=-1

     K =    .073995HR    TP =    .133000HR    K/TP RATIO =    .556355     SHAPE CONSTANT, N =
6.921654
     UNIT PEAK =    446.60    CFS   UNIT VOLUME =    .9991       B =   517.53      P60 =
1.9500
     AREA =       .114771 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


     K =    .106685HR    TP =    .133000HR    K/TP RATIO =    .802144     SHAPE CONSTANT, N =
4.464820
     UNIT PEAK =    163.66    CFS   UNIT VOLUME =    1.002       B =   385.05      P60 =
1.9500
     AREA =       .056529 SQ MI    IA =    .36364 INCHES    INF =    .86818 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD              ID=4    CODE=1

                                     PARTIAL HYDROGRAPH   108.10


     RUNOFF VOLUME =      1.98693 INCHES      =      18.1524 ACRE-FEET
     PEAK DISCHARGE RATE =     431.18 CFS  AT   1.500 HOURS   BASIN AREA =   .1713 SQ. MI.


*
DIVIDE HYD             ID=4     PER=-105      ID  I=4   HYD  I=108.1
                                            ID II=16   HYD II=000
*** WARNING *** - PERCENTAGE OF     -105.0 FOUND - A HYDROGRAPH BULKING FACTOR IS ASSUMED
PRINT HYD              ID=4  CODE=1

                                     PARTIAL HYDROGRAPH   108.10


     RUNOFF VOLUME =      2.08627 INCHES      =      19.0601 ACRE-FEET
     PEAK DISCHARGE RATE =     452.74 CFS  AT   1.500 HOURS   BASIN AREA =   .1713 SQ. MI.


*
*ADD ROUTED 102 TO 108.1 FLOW
ADD HYD                ID=2  HYD=108.17  ID=4  ID=3
PRINT HYD              ID=2  CODE=1

                                     PARTIAL HYDROGRAPH   108.17


     RUNOFF VOLUME =      1.55585 INCHES      =      37.5311 ACRE-FEET
     PEAK DISCHARGE RATE =     753.68 CFS  AT   1.550 HOURS   BASIN AREA =   .4523 SQ. MI.
```

```
*
*
*ROUTE FLOW SOUTH ON 102ND THRU 72" PIPE TO NORTH POND
COMPUTE RATING CURVE RC=1   VS NO=1   CODE=-1
                     SLP=0.013     DIA= 72 IN  N=.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.31	.56	2.53	2.67
.63	1.56	11.00	3.67
.94	2.82	25.56	4.36
1.25	4.27	45.97	4.87
1.56	5.86	71.78	5.27
1.88	7.55	102.42	5.56
2.19	9.33	137.22	5.78
2.50	11.16	175.44	5.92
2.81	13.02	216.27	5.99
3.13	14.90	258.83	6.00
3.44	16.76	302.17	6.00
3.75	18.60	345.26	6.00
4.06	20.39	386.97	6.00
4.38	22.10	426.03	6.00
4.69	23.71	460.99	6.00
5.00	25.19	490.07	6.00
5.32	26.49	510.88	6.00
5.63	27.55	519.43	6.00
6.00	28.27	519.43	6.00

```
COMPUTE TRAVEL TIME  ID=8 REACH=1  NO VS=1    L=1200     SLP=.013
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.313	.562	2.53	.0740
.625	1.564	11.00	.0474
.938	2.824	25.56	.0368
1.251	4.271	45.97	.0310
1.563	5.859	71.78	.0272
1.876	7.554	102.42	.0246
2.189	9.329	137.22	.0227
2.501	11.159	175.44	.0212
2.814	13.022	216.27	.0201
3.127	14.897	258.83	.0192
3.439	16.764	302.17	.0185
3.752	18.601	345.26	.0180
4.065	20.388	386.97	.0176
4.377	22.101	426.03	.0173
4.690	23.712	460.99	.0171
5.003	25.189	490.07	.0171
5.315	26.489	510.88	.0173
5.628	27.547	519.43	.0177
6.000	28.274	519.43	.0181

```
    ROUTE                  ID=8      HYD= 108.18    INFLOW HYD ID=2    DT=0.0
TRAVEL TIME TABLE EXCEEDED
    PRINT HYD              ID=8    CODE=1
```

PARTIAL HYDROGRAPH 108.18

```
RUNOFF VOLUME =     1.55585 INCHES     =      37.5311 ACRE-FEET
PEAK DISCHARGE RATE =     743.28 CFS  AT   1.550 HOURS   BASIN AREA =   .4523 SQ. MI.
```

```
*
* COMBINE FLOW FROM 108.18 & 108.29
ADD HYD                ID=9  HYD=108.9  ID=7  ID=8
PRINT HYD              ID=9  CODE=1

                                   PARTIAL HYDROGRAPH   108.90

    RUNOFF VOLUME =      1.69518 INCHES      =      72.0648 ACRE-FEET
    PEAK DISCHARGE RATE =    1495.75 CFS  AT   1.550 HOURS   BASIN AREA =   .7971 SQ. MI.


*
*
******THE FOLLOWING POND IS WHAT WAS APPROVED BY THE STATE ENGINEER &
*       COA - DURING CONSTRUCTION ACCESS RAMPS WERE ADDED REDUCING THE
*       VOLUME -- REVISED STORAGE VOLUMES
*ROUTE FLOW THROUGH NORTH POND
*ROUTE RESERVOIR       ID=10  HYD=502  INFLOW ID=9  CODE=5
*                      OUTFLOW  STORAGE  ELEV
*                        0        0      5204.21
*                        3      0.287    5205
*                       13      1.582    5206
*                       25      3.486    5207
*                       42      7.543    5209
*                       52     11.939    5211
*                       64     16.689    5213
*                       72     21.805    5215
*                       80     27.301    5217
*                       88     33.189    5219
*                       90     39.483    5221
*                       91     46.197    5223
*                      968     49.715    5224
*                     2615     53.343    5225
*                     4809     57.082    5226
*
*ROUTE FLOW THROUGH NORTH POND - REVISED FOR ACCESS RAMP
ROUTE RESERVOIR        ID=10  HYD=502  INFLOW ID=9  CODE=5
                       OUTFLOW  STORAGE  ELEV
                          0        0      5204.21
                          3      0.287    5205
                         13      1.565    5206
                         25      3.402    5207
                         42      7.394    5209
                         52     11.731    5211
                         64     16.428    5213
                         72     21.498    5215
                         80     26.955    5217
                         88     32.809    5219
                         90     39.075    5221
                         91     45.767    5223
                        968     49.276    5224
                       2615     52.896    5225
                       4809     56.628    5226

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	5204.21	.000	.00
.25	.00	5204.21	.000	.00
.50	.00	5204.21	.000	.00
.75	.00	5204.21	.000	.00
1.00	.00	5204.21	.000	.00
1.25	22.58	5204.36	.053	.56
1.50	1325.33	5210.27	10.143	48.34
1.75	870.74	5219.54	34.488	88.54

2.00	429.13	5222.82	45.180	90.91
2.25	164.76	5223.13	46.229	206.54
2.50	77.32	5223.00	45.755	91.00
2.75	42.43	5222.79	45.074	90.90
3.00	24.34	5222.43	43.866	90.72
3.25	14.48	5221.99	42.386	90.49
3.50	9.71	5221.50	40.764	90.25
3.75	7.05	5221.00	39.073	90.00
4.00	5.58	5220.45	37.348	89.45
4.25	4.80	5219.89	35.612	88.89
4.50	4.48	5219.34	33.876	88.34
4.75	4.41	5218.78	32.151	87.10
5.00	4.56	5218.20	30.468	84.80
5.25	4.85	5217.64	28.836	82.57
5.50	5.19	5217.10	27.256	80.41
5.75	5.69	5216.55	25.730	78.20
6.00	6.18	5216.01	24.259	76.05
6.25	8.89	5215.50	22.859	74.00
6.50	10.40	5215.02	21.553	72.08
6.75	10.65	5214.53	20.303	70.11
7.00	10.62	5214.05	19.094	68.21
7.25	10.51	5213.59	17.922	66.36
7.50	10.33	5213.14	16.785	64.56
7.75	10.21	5212.68	15.686	62.10
8.00	10.01	5212.24	14.640	59.43
8.25	9.89	5211.81	13.644	56.89
8.50	9.74	5211.41	12.696	54.47
8.75	9.60	5211.03	11.795	52.16
9.00	9.44	5210.63	10.935	50.16
9.25	9.30	5210.25	10.112	48.27
9.50	9.20	5209.89	9.325	46.45
9.75	9.06	5209.54	8.571	44.71
10.00	8.94	5209.21	7.851	43.05
10.25	8.82	5208.88	7.163	41.02
10.50	8.69	5208.56	6.525	38.30
10.75	8.59	5208.27	5.939	35.80
11.00	8.50	5208.00	5.399	33.51
11.25	8.38	5207.75	4.903	31.39
11.50	8.26	5207.52	4.447	29.45
11.75	8.14	5207.31	4.027	27.66
12.00	8.05	5207.12	3.640	26.01
12.25	7.97	5206.94	3.285	24.23
12.50	7.87	5206.76	2.970	22.18
12.75	7.78	5206.61	2.693	20.37
13.00	7.71	5206.48	2.449	18.77
13.25	7.61	5206.36	2.234	17.37
13.50	7.54	5206.26	2.045	16.13
13.75	7.45	5206.17	1.877	15.04

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
14.00	7.33	5206.09	1.730	14.08
14.25	7.30	5206.02	1.599	13.22
14.50	7.20	5205.94	1.485	12.37
14.75	7.13	5205.86	1.385	11.59
15.00	7.05	5205.79	1.299	10.92
15.25	6.96	5205.73	1.225	10.34
15.50	6.90	5205.68	1.160	9.83
15.75	6.89	5205.64	1.104	9.39
16.00	6.81	5205.60	1.055	9.01
16.25	6.72	5205.57	1.012	8.67
16.50	6.64	5205.54	.974	8.37
16.75	6.59	5205.51	.941	8.11
17.00	6.51	5205.49	.911	7.88
17.25	6.43	5205.47	.884	7.67
17.50	6.43	5205.45	.861	7.49
17.75	6.29	5205.43	.840	7.33
18.00	6.32	5205.42	.820	7.17

18.25	6.21	5205.40	.803	7.04
18.50	6.18	5205.39	.787	6.91
18.75	6.11	5205.38	.772	6.80
19.00	6.09	5205.37	.759	6.69
19.25	6.02	5205.36	.747	6.60
19.50	5.99	5205.35	.735	6.51
19.75	5.96	5205.34	.724	6.42
20.00	5.87	5205.33	.715	6.35
20.25	5.84	5205.33	.705	6.27
20.50	5.75	5205.32	.696	6.20
20.75	5.72	5205.31	.687	6.13
21.00	5.68	5205.31	.679	6.07
21.25	5.62	5205.30	.671	6.01
21.50	5.61	5205.29	.664	5.95
21.75	5.53	5205.29	.657	5.89
22.00	5.52	5205.28	.650	5.84
22.25	5.45	5205.28	.643	5.79
22.50	5.45	5205.27	.636	5.73
22.75	5.35	5205.27	.630	5.68
23.00	5.38	5205.26	.624	5.64
23.25	5.32	5205.26	.618	5.59
23.50	5.23	5205.25	.612	5.54
23.75	5.24	5205.25	.606	5.50
24.00	5.20	5205.25	.601	5.46
24.25	2.52	5205.23	.576	5.26
24.50	.75	5205.17	.503	4.69
24.75	.27	5205.11	.422	4.06
25.00	.11	5205.05	.348	3.48
25.25	.05	5204.99	.283	2.96
25.50	.02	5204.84	.229	2.39
25.75	.01	5204.72	.185	1.93
26.00	.00	5204.62	.149	1.56
26.25	.00	5204.54	.120	1.25
26.50	.00	5204.48	.097	1.01
26.75	.00	5204.42	.078	.81
27.00	.00	5204.38	.063	.66
27.25	.00	5204.35	.051	.53
27.50	.00	5204.32	.041	.43
27.75	.00	5204.30	.033	.34

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
28.00	.00	5204.28	.026	.28
28.25	.00	5204.27	.021	.22
28.50	.00	5204.26	.017	.18
28.75	.00	5204.25	.014	.14
29.00	.00	5204.24	.011	.12
29.25	.00	5204.23	.009	.09
29.50	.00	5204.23	.007	.08
29.75	.00	5204.23	.006	.06

```
PEAK DISCHARGE =        308.175 CFS - PEAK OCCURS AT HOUR    2.10
MAXIMUM WATER SURFACE ELEVATION =      5223.248
MAXIMUM STORAGE =         46.6359 AC-FT      INCREMENTAL TIME=      .050000HRS

*
*
COMPUTE NM HYD          ID=1    HYD=109      DA= .0720   SQ MI
                        PER A=0    B=2    C=16    D=82
                        TP=.140    HRS        RAIN=-1

K =    .076439HR    TP =    .140000HR    K/TP RATIO =    .545991    SHAPE CONSTANT, N =
7.089916
UNIT PEAK =   221.61    CFS   UNIT VOLUME =    .9983       B =   525.50      P60 =
1.9500
AREA =       .059040 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000
```

```
        K =    .114807HR    TP =    .140000HR    K/TP RATIO =    .820048     SHAPE CONSTANT, N =
4.356214
        UNIT PEAK =   35.016    CFS   UNIT VOLUME =    1.001       B =   378.26      P60 =
1.9500
        AREA =       .012960 SQ MI    IA =     .36667 INCHES    INF =     .87667 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000

    *
    PRINT HYD              ID=1    CODE=1

                                        PARTIAL HYDROGRAPH   109.00


        RUNOFF VOLUME =      2.20466 INCHES      =       8.4659 ACRE-FEET
        PEAK DISCHARGE RATE =      188.50 CFS  AT   1.500 HOURS   BASIN AREA =    .0720 SQ. MI.


    *
    DIVIDE HYD             ID=1     PER=-105       ID  I=1   HYD  I=109
                                                   ID II=16   HYD II=000
*** WARNING *** - PERCENTAGE OF     -105.0 FOUND - A HYDROGRAPH BULKING FACTOR IS ASSUMED
    PRINT HYD              ID=1  CODE=1

                                        PARTIAL HYDROGRAPH   109.00


        RUNOFF VOLUME =      2.31489 INCHES      =       8.8891 ACRE-FEET
        PEAK DISCHARGE RATE =      197.93 CFS  AT   1.500 HOURS   BASIN AREA =    .0720 SQ. MI.


    *
    *ROUTE SOUTH ALONG 98TH IN PIPE - FROM AVALON TO VOLCANO
    COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.02
                           DIA= 66  N=.013

                                        RATING CURVE PIPE SECTION  1.0
                                            WATER        FLOW        FLOW        MAX
                                           SURFACE       AREA        RATE       WIDTH
                                            ELEV         SQ FT       CFS        FT
                                              .00          .00         .00        .00
                                              .29          .47        2.49       2.44
                                              .57         1.31       10.81       3.36
                                              .86         2.37       25.14       3.99
                                             1.15         3.59       45.21       4.47
                                             1.43         4.92       70.60       4.83
                                             1.72         6.35      100.73       5.10
                                             2.01         7.84      134.95       5.30
                                             2.29         9.38      172.54       5.42
                                             2.58        10.94      212.70       5.49
                                             2.87        12.52      254.56       5.50
                                             3.15        14.09      297.19       5.50
                                             3.44        15.63      339.56       5.50
                                             3.73        17.13      380.58       5.50
                                             4.01        18.57      419.00       5.50
                                             4.30        19.92      453.38       5.50
                                             4.59        21.17      481.98       5.50
                                             4.87        22.26      502.45       5.50
                                             5.16        23.15      510.86       5.50
                                             5.50        23.76      510.86       5.50
    COMPUTE TRAVEL TIME  ID=6  REACH NO=1  NOVS=1  LEN=1150  SLP=0.02

                                   TRAVEL TIME TABLE
                                                   REACH=  1.0

                                   WATER       AVERAGE     FLOW        TRAVEL
                                   DEPTH       AREA        RATE        TIME
                                   FEET        SQ.FT.      CFS         HRS
```

```
                                .287        .472        2.49        .0606
                                .573       1.314       10.81        .0388
                                .860       2.373       25.14        .0301
                               1.146       3.589       45.21        .0254
                               1.433       4.923       70.60        .0223
                               1.720       6.348      100.73        .0201
                               2.006       7.839      134.95        .0186
                               2.293       9.377      172.54        .0174
                               2.579      10.942      212.70        .0164
                               2.866      12.518      254.56        .0157
                               3.153      14.086      297.19        .0151
                               3.439      15.630      339.56        .0147
                               3.726      17.132      380.58        .0144
                               4.013      18.571      419.00        .0142
                               4.299      19.925      453.38        .0140
                               4.586      21.166      481.98        .0140
                               4.872      22.258      502.45        .0142
                               5.159      23.147      510.86        .0145
                               5.500      23.758      510.86        .0149
ROUTE                  ID=6  HYD=109.19  INFLOW ID=1  DT=0.0
PRINT HYD              ID=6  CODE=1

                                PARTIAL HYDROGRAPH   109.19

     RUNOFF VOLUME =      2.31490 INCHES      =       8.8892 ACRE-FEET
     PEAK DISCHARGE RATE =     194.20 CFS  AT   1.500 HOURS   BASIN AREA =   .0720 SQ. MI.


*
COMPUTE NM HYD         ID=1  HYD=109.1  DA= 0.0495  SQ MI
                       PER A= 0  B=0  C=15  D=85
                       TP= 0.1333  RAIN=-1

     K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
     UNIT PEAK =   166.11    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 =
1.9500
     AREA =       .042075 SQ MI    IA =     .10000 INCHES    INF =     .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

     K =    .106769HR    TP =    .133300HR    K/TP RATIO =    .800969     SHAPE CONSTANT, N =
4.472154
     UNIT PEAK =   21.473    CFS   UNIT VOLUME =    1.001       B =   385.50      P60 =
1.9500
     AREA =       .007425 SQ MI    IA =     .35000 INCHES    INF =     .83000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD              ID=1  CODE=1

                                PARTIAL HYDROGRAPH   109.10

     RUNOFF VOLUME =      2.25532 INCHES      =       5.9540 ACRE-FEET
     PEAK DISCHARGE RATE =     134.34 CFS  AT   1.500 HOURS   BASIN AREA =   .0495 SQ. MI.


*
DIVIDE HYD             ID=1  PER=-105  IDI=1  HYD=109.1
                                       IDII=16  HYD=000
*** WARNING *** - PERCENTAGE OF     -105.0 FOUND - A HYDROGRAPH BULKING FACTOR IS ASSUMED
PRINT HYD              ID=1  CODE=1

                                PARTIAL HYDROGRAPH   109.10
```

```
    RUNOFF VOLUME =      2.36808 INCHES      =        6.2517 ACRE-FEET
    PEAK DISCHARGE RATE =      141.06 CFS  AT   1.500 HOURS   BASIN AREA =   .0495 SQ. MI.


*
*ADD TO FLOW FROM 109 (HYD109.19)
ADD HYD                ID=6  HYD=109.39  ID=6  ID=1
PRINT HYD              ID=6  CODE=1

                                   PARTIAL HYDROGRAPH   109.39

    RUNOFF VOLUME =      2.33656 INCHES      =       15.1408 ACRE-FEET
    PEAK DISCHARGE RATE =      335.26 CFS  AT   1.500 HOURS   BASIN AREA =   .1215 SQ. MI.


*
* ADD HYD 109.39 TO BASIN 108.4
ADD HYD                ID=6  HYD=109.49  ID=6  ID=5
PRINT HYD              ID=6  CODE=1

                                   PARTIAL HYDROGRAPH   109.49

    RUNOFF VOLUME =      2.22788 INCHES      =       31.3803 ACRE-FEET
    PEAK DISCHARGE RATE =      717.11 CFS  AT   1.500 HOURS   BASIN AREA =   .2641 SQ. MI.


*
*ADD ABOVE TO NORTH POND OUTFLOW
ADD HYD                ID=6  HYD=109.59  ID=6  ID=10
PRINT HYD              ID=6  CODE=1

                                   PARTIAL HYDROGRAPH   109.59

    RUNOFF VOLUME =      1.82766 INCHES      =      103.4401 ACRE-FEET
    PEAK DISCHARGE RATE =      765.45 CFS  AT   1.500 HOURS   BASIN AREA =  1.0612 SQ. MI.


*
*ROUTE THROUGH SOUTH POND
ROUTE RESERVOIR        ID=10 HYD=501  IN ID=6  CODE=5
                       OUTFLOW  STORAGE   ELEV
                          0        0      5201
                          5      0.934    5202
                          6      3.359    5203
                         27      6.080    5204
                         43     11.813    5206
                         55     17.946    5208
                         64     24.492    5210
                         72     31.465    5212
                       1137     35.115    5213
                       3122     38.877    5214
                       7217     44.733    5215.5

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

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

    .00        .00    5201.00       .000        .00
    .25        .00    5201.00       .000        .00
    .50        .00    5201.00       .000        .00
    .75        .00    5201.00       .000        .00
```

1.00	.00	5201.00	.000	.00
1.25	33.40	5201.09	.083	.44
1.50	765.45	5204.48	7.466	30.87
1.75	376.10	5208.00	17.961	55.02
2.00	260.12	5209.60	23.181	62.20
2.25	253.65	5211.30	29.018	69.19
2.50	111.23	5211.87	31.007	71.47
2.75	101.27	5212.03	31.560	99.77
3.00	96.55	5212.02	31.551	97.16
3.25	94.21	5212.02	31.542	94.50
3.50	92.98	5212.02	31.538	93.16
3.75	92.28	5212.02	31.535	92.37
4.00	91.53	5212.02	31.532	91.63
4.25	90.92	5212.02	31.530	91.00
4.50	90.41	5212.02	31.528	90.48
4.75	89.25	5212.02	31.525	89.60
5.00	87.11	5212.01	31.518	87.46
5.25	85.11	5212.01	31.511	85.42
5.50	83.14	5212.01	31.504	83.44
5.75	81.22	5212.01	31.498	81.53
6.00	79.33	5212.01	31.491	79.62
6.25	79.15	5212.01	31.490	79.22
6.50	77.58	5212.01	31.485	77.87
6.75	75.61	5212.00	31.479	75.96
7.00	73.65	5212.00	31.472	74.00
7.25	71.74	5212.00	31.465	72.07
7.50	69.83	5211.99	31.440	71.97
7.75	67.33	5211.97	31.373	71.89
8.00	64.56	5211.94	31.251	71.75
8.25	61.95	5211.89	31.077	71.56
8.50	59.47	5211.83	30.855	71.30
8.75	57.08	5211.75	30.589	70.99
9.00	54.98	5211.66	30.283	70.64
9.25	53.02	5211.56	29.943	70.25
9.50	51.16	5211.46	29.572	69.83
9.75	49.35	5211.34	29.172	69.37
10.00	47.61	5211.22	28.746	68.88
10.25	45.53	5211.09	28.293	68.36
10.50	42.74	5210.95	27.798	67.79
10.75	40.19	5210.79	27.260	67.18
11.00	37.86	5210.63	26.685	66.52
11.25	35.68	5210.45	26.077	65.82
11.50	33.68	5210.27	25.441	65.09
11.75	31.81	5210.08	24.780	64.33
12.00	30.13	5209.88	24.100	63.46
12.25	28.32	5209.67	23.404	62.50
12.50	26.19	5209.45	22.685	61.52
12.75	24.34	5209.22	21.947	60.50
13.00	22.73	5208.99	21.193	59.46
13.25	21.26	5208.76	20.430	58.41
13.50	19.99	5208.52	19.660	57.36
13.75	18.86	5208.29	18.887	56.29

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
14.00	17.84	5208.05	18.113	55.23
14.25	16.97	5207.80	17.346	53.83
14.50	16.05	5207.56	16.590	52.35
14.75	15.23	5207.32	15.847	50.89
15.00	14.54	5207.08	15.117	49.47
15.25	13.89	5206.84	14.404	48.07
15.50	13.37	5206.62	13.706	46.70
15.75	12.93	5206.40	13.027	45.37
16.00	12.51	5206.18	12.365	44.08
16.25	12.11	5205.97	11.721	42.74
16.50	11.78	5205.75	11.103	41.02
16.75	11.48	5205.55	10.513	39.37
17.00	11.23	5205.35	9.950	37.80

17.25	10.96	5205.16	9.414	36.31
17.50	10.78	5204.99	8.904	34.88
17.75	10.53	5204.82	8.418	33.52
18.00	10.42	5204.65	7.955	32.23
18.25	10.21	5204.50	7.515	31.00
18.50	10.06	5204.35	7.097	29.84
18.75	9.93	5204.22	6.698	28.73
19.00	9.81	5204.08	6.320	27.67
19.25	9.69	5203.96	5.962	26.09
19.50	9.59	5203.84	5.647	23.66
19.75	9.50	5203.74	5.377	21.58
20.00	9.35	5203.66	5.145	19.78
20.25	9.27	5203.58	4.945	18.24
20.50	9.16	5203.52	4.772	16.91
20.75	9.07	5203.46	4.623	15.76
21.00	8.97	5203.42	4.495	14.76
21.25	8.88	5203.38	4.383	13.91
21.50	8.82	5203.34	4.287	13.16
21.75	8.73	5203.31	4.203	12.51
22.00	8.65	5203.28	4.130	11.95
22.25	8.59	5203.26	4.067	11.46
22.50	8.54	5203.24	4.011	11.03
22.75	8.42	5203.22	3.962	10.66
23.00	8.39	5203.21	3.920	10.33
23.25	8.32	5203.19	3.882	10.04
23.50	8.23	5203.18	3.848	9.77
23.75	8.16	5203.17	3.818	9.54
24.00	8.11	5203.16	3.792	9.34
24.25	5.86	5203.14	3.748	9.00
24.50	4.85	5203.12	3.677	8.46
24.75	4.11	5203.09	3.601	7.87
25.00	3.50	5203.06	3.523	7.27
25.25	2.97	5203.03	3.446	6.67
25.50	2.39	5203.00	3.369	6.08
25.75	1.93	5202.97	3.290	5.97
26.00	1.56	5202.94	3.203	5.94
26.25	1.25	5202.90	3.109	5.90
26.50	1.01	5202.86	3.011	5.86
26.75	.81	5202.81	2.910	5.81
27.00	.66	5202.77	2.805	5.77
27.25	.53	5202.73	2.698	5.73
27.50	.43	5202.68	2.590	5.68
27.75	.34	5202.64	2.481	5.64

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
28.00	.28	5202.59	2.372	5.59
28.25	.22	5202.55	2.262	5.55
28.50	.18	5202.50	2.152	5.50
28.75	.14	5202.46	2.042	5.46
29.00	.12	5202.41	1.932	5.41
29.25	.09	5202.37	1.823	5.37
29.50	.08	5202.32	1.714	5.32
29.75	.06	5202.28	1.606	5.28

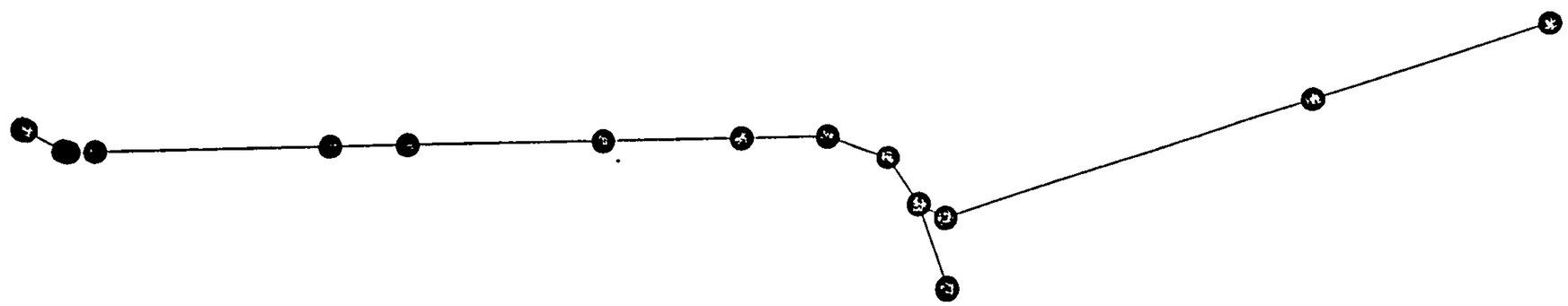
```
PEAK DISCHARGE =        100.431 CFS - PEAK OCCURS AT HOUR    2.80
MAXIMUM WATER SURFACE ELEVATION =      5212.027
MAXIMUM STORAGE =        31.5624 AC-FT      INCREMENTAL TIME=     .050000HRS

*
PUNCH HYD              ID=10
FINISH

    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 14:28:56
```

NOTE: THE HYDRAULIC GRADE LINE BASED ON THESE CALCULATIONS IS SHOWN IN CITY OF ALBUQUERQUE PROJECT NUMBER 4076.93 - AMOLE DEL NORTE STORM DIVERSION FACILITIES, TIERRA BAYITA DRAINAGE FACILITIES - PHASE IIID ON SHEETS 3, 4 AND 5.

Storm Sewer Design & Analysis



Proj. file: ABEND2.STM	IDF file: SAMPLE.IDF	No. Lines: 19	03-16-1998

Line 1 Q = 922.00 Size = 90 x 90 (Cir) Nv = 0.013 Len = 34.8 JLC = 0.01

Tie to Chan / Outfall

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	68.45	90	76.66	83.43	44.17	20.87	0.00	9.05
Upstrm	68.87	90	77.16	83.93	44.18	20.87	0.00	6.13

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.200
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.441
Time of conc. (min)	= 5.19	Critical depth (in)	= 87
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 82.50
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 0.80
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 841.36
Q Catchment (cfs)	= 0.00	Inlet Type	= MH
Q Carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.00
Q Captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.00
Q Bypassed to offsite	= 0.00	Width of Flow (ft)	= 0.00

Line 2 Q = 922.00 Size = 90 x 90 (Cir) Nv = 0.013 Len = 8.0 JLC = 0.01

Tie to 41+40.75 / Downstream line = 1

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	68.87	90	77.23	84.00	44.17	20.87	0.00	6.13
Upstrm	68.96	90	77.35	84.11	44.18	20.87	0.00	6.04

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.200
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.441
Time of conc. (min)	= 5.19	Critical depth (in)	= 87
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 82.50
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 0.89
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 841.36
Q Catchment (cfs)	= 0.00	Inlet Type	= MH

Line 3 **Q = 922.00** **Size = 90 x 90 (Cir)** **Nv = 0.013** **Len = 8.0** **JLC = 0.12**

41+48.75 / Downstream line = 2

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	68.96	90	77.42	84.18	44.17	20.87	0.00	6.04
Upstrm	69.06	90	77.53	84.30	44.18	20.87	0.00	5.94

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.200
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.441
Time of conc. (min)	= 5.18	Critical depth (in)	= 87
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 82.50
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 0.98
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 841.36
Q Catchment (cfs)	= 0.00	Inlet Type	= MH
Q Carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.00
Q Captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.00
Q Bypassed to 2 (cfs)	= 0.00	Width of Flow (ft)	= 0.00

Line 4 **Q = 922.00** **Size = 90 x 90 (Cir)** **Nv = 0.013** **Len = 165.7** **JLC = 0.01**

tie to 41+56.75 / Downstream line = 3

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	69.06	90	78.31	85.08	44.17	20.87	0.00	5.94
Upstrm	71.05	90	80.70	87.47	44.18	20.87	0.00	3.95

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.200
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.441
Time of conc. (min)	= 5.04	Critical depth (in)	= 87
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 82.50
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 2.16
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 841.35
Q Catchment (cfs)	= 0.00	Inlet Type	= MH

Line 5 **Q = 922.00** **Size = 90 x 90 (Cir)** **Nv = 0.013** **Len = 8.0** **JLC = 0.01**

Tie to 43+22.47 / Downstream line = 4

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	71.05	90	80.77	87.54	44.17	20.87	0.00	3.95
Upstrm	71.15	90	80.89	87.65	44.18	20.87	0.00	6.35

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.200
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.441
Time of conc. (min)	= 5.03	Critical depth (in)	= 87
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 85.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 2.24
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 841.36
Q Catchment (cfs)	= 0.00	Inlet Type	= MH
Q Carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.00
Q Captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.00
Q Bypassed to 4 (cfs)	= 0.00	Width of Flow (ft)	= 0.00

Line 6 **Q = 922.00** **Size = 90 x 90 (Cir)** **Nv = 0.013** **Len = 8.0** **JLC = 0.01**

43+30.47 / Downstream line = 5

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	71.15	90	80.96	87.72	44.17	20.87	0.00	6.35
Upstrm	71.24	90	81.07	87.84	44.18	20.87	0.00	6.26

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.199
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.441
Time of conc. (min)	= 5.03	Critical depth (in)	= 87
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 85.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 2.33
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 840.89
Q Catchment (cfs)	= 0.00	Inlet Type	= MH

Line 7 **Q = 922.00** **Size = 90 x 90 (Cir)** **Nv = 0.013** **Len = 8.0** **JLC = 0.12**

43+38.47 / Downstream line = 6

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	71.24	90	81.14	87.91	44.17	20.87	0.00	6.26
Upstrm	71.34	90	81.26	88.02	44.18	20.87	0.00	6.16

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.200
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.441
Time of conc. (min)	= 5.02	Critical depth (in)	= 87
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 85.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 2.42
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 841.36
Q Catchment (cfs)	= 0.00	Inlet Type	= MH
Q Carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.00
Q Captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.00
Q Bypassed to 6 (cfs)	= 0.00	Width of Flow (ft)	= 0.00

Line 8 **Q = 922.00** **Size = 90 x 90 (Cir)** **Nv = 0.013** **Len = 103.0** **JLC = 0.01**

Tie to 43+46.47 / Downstream line = 7

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	71.34	90	82.04	88.80	44.17	20.87	0.00	6.16
Upstrm	72.60	90	83.52	90.29	44.18	20.87	0.00	6.90

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.225
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.441
Time of conc. (min)	= 4.94	Critical depth (in)	= 87
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 87.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 3.42
Cumulative C x A	= 0.00	Additional Q (cfs)	= 50.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 850.16
Q Catchment (cfs)	= 0.00	Inlet Type	= MH

Line 9 Q = 872.00 Size = 90 x 90 (Cir) Nv = 0.013 Len = 925.0 JLC = 0.17

Tie to Sta. 44+50 / Downstream line = 8

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	72.60	90	83.59	89.64	44.17	19.74	0.00	6.90
Upstrm	83.77	90	95.52	101.57	44.18	19.74	0.00	6.23

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.208
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.289
Time of conc. (min)	= 4.16	Critical depth (in)	= 86
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 97.50
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 4.25
Cumulative C x A	= 0.00	Additional Q (cfs)	= 95.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 844.01
Q Catchment (cfs)	= 0.00	Inlet Type	= MH
Q Carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.00
Q Captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.00
Q Bypassed to 8 (cfs)	= 0.00	Width of Flow (ft)	= 0.00

Line 10 Q = 777.00 Size = 90 x 90 (Cir) Nv = 0.013 Len = 300.7 JLC = 0.38

Tie to Sta. 53+75 / Downstream line = 9

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	83.77	90	96.55	101.35	44.17	17.59	0.00	6.23
Upstrm	87.40	90	99.63	104.43	44.18	17.59	0.00	6.60

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.206
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.024
Time of conc. (min)	= 3.91	Critical depth (in)	= 84
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 101.50
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 4.73
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 843.46
Q Catchment (cfs)	= 0.00	Inlet Type	= MH

Line 11 **Q = 777.00** **Size = 84 x 84 (Cir)** **Nv = 0.013** **Len = 764.3** **JLC = 0.05**

Tie to Sta. 56+75.74 / Downstream line = 10

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	87.40	84	101.45	107.79	38.48	20.19	0.00	7.10
Upstrm	100.39	84	112.76	119.09	38.48	20.19	0.00	7.61

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.700
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.479
Time of conc. (min)	= 3.28	Critical depth (in)	= 81
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 115.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 5.37
Cumulative C x A	= 0.00	Additional Q (cfs)	= 47.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 833.00
Q Catchment (cfs)	= 0.00	Inlet Type	= MH
Q Carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.00
Q Captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.00
Q Bypassed to 10 (cfs)	= 0.00	Width of Flow (ft)	= 0.00

Line 12 **Q = 730.00** **Size = 84 x 84 (Cir)** **Nv = 0.013** **Len = 540.0** **JLC = 0.11**

Tie to Sta. 64+40 / Downstream line = 11

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	100.39	84	113.08	118.67	38.48	18.97	0.00	7.61
Upstrm	109.57	84	120.13	125.72	38.48	18.97	0.00	9.43

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.700
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.305
Time of conc. (min)	= 2.83	Critical depth (in)	= 80
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 126.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 3.56
Cumulative C x A	= 0.00	Additional Q (cfs)	= 99.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 833.11
Q Catchment (cfs)	= 0.00	Inlet Type	= MH

Line 13 **Q = 631.00** **Size = 84 x 84 (Cir)** **Nv = 0.013** **Len = 334.0** **JLC = 0.10**

Tie to Sta. 69+80 / Downstream line = 12

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	109.57	84	120.74	124.92	38.48	16.40	0.00	9.43
Upstrm	115.25	84	124.00	128.18	38.48	16.40	0.00	12.65

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.700
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 0.975
Time of conc. (min)	= 2.55	Critical depth (in)	= 78
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 134.90
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 1.76
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 833.11
Q Catchment (cfs)	= 0.00	Inlet Type	= MH
Q Carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.00
Q Captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.00
Q Bypassed to 12 (cfs)	= 0.00	Width of Flow (ft)	= 0.00

Line 14 **Q = 631.00** **Size = 84 x 84 (Cir)** **Nv = 0.013** **Len = 250.0** **JLC = 0.10**

Bridge&90th / Downstream line = 13

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	115.25	84	124.42	128.60	38.48	16.40	0.00	12.65
Upstrm	119.50	84	126.86	131.03	38.48	16.40	0.00	15.50

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.700
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 0.975
Time of conc. (min)	= 2.34	Critical depth (in)	= 78
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 142.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 0.36
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 833.11
Q Catchment (cfs)	= 0.00	Inlet Type	= MH

Line 15 **Q = 631.00** **Size = 84 x 84 (Cir)** **Nv = 0.013** **Len = 220.0** **JLC = 0.10**

Central&90th / Downstream line = 14

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	119.50	84	127.28	131.45	38.48	16.40	0.00	15.50
Upstrm	123.24	78	129.74	134.19	37.26	16.93	3.61	11.76

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.700
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.245
Time of conc. (min)	= 2.16	Critical depth (in)	= 78
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 142.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 0.00
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 833.11
Q Catchment (cfs)	= 0.00	Inlet Type	= MH
Q Carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.00
Q Captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.00
Q Bypassed to 14 (cfs)	= 0.00	Width of Flow (ft)	= 0.00

Line 16 **Q = 364.00** **Size = 66 x 66 (Cir)** **Nv = 0.013** **Len = 344.0** **JLC = 0.50**

SD in 90th, 77+84 / Downstream line = 15

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	125.26	49	129.34	135.10	18.89	19.27	4.82	11.24
Upstrm	130.42	49	134.50	140.26	18.89	19.27	4.82	6.08

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.500
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.500
Time of conc. (min)	= 0.00	Critical depth (in)	= 62
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 142.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 0.00
Cumulative C x A	= 0.00	Additional Q (cfs)	= 364.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 411.33
Q Catchment (cfs)	= 0.00	Inlet Type	= MH

Line 17 **Q = 267.00** **Size = 54 x 54 (Cir)** **Nv = 0.013** **Len = 117.0** **JLC = 0.50**

SD up Central, 10+00 / Downstream line = 15

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	125.26	54	130.18	134.56	15.90	16.79	0.00	12.24
Upstrm	128.07	52	132.44	136.89	15.77	16.93	1.51	12.43

Drainage area (ac)	= 0.00	Slope of invert (%)	= 2.400
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.987
Time of conc. (min)	= 2.06	Critical depth (in)	= 52
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 145.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 0.00
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 304.67
Q Catchment (cfs)	= 0.00	Inlet Type	= MH
Q Carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.00
Q Captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.00
Q Bypassed to 15 (cfs)	= 0.00	Width of Flow (ft)	= 0.00

Line 18 **Q = 267.00** **Size = 54 x 54 (Cir)** **Nv = 0.013** **Len = 1503.0** **JLC = 0.50**

Tie to 11+17 / Downstream line = 17

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	128.07	54	134.66	139.04	15.90	16.79	0.00	12.43
Upstrm	164.33	52	168.70	173.15	15.77	16.93	1.51	6.17

Drainage area (ac)	= 0.00	Slope of invert (%)	= 2.413
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 2.269
Time of conc. (min)	= 0.81	Critical depth (in)	= 52
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 175.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 0.00
Cumulative C x A	= 0.00	Additional Q (cfs)	= 170.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 305.47
Q Catchment (cfs)	= 0.00	Inlet Type	= MH

Line 19 **Q = 97.00** **Size = 36 x 36 (Cir)** **Nv = 0.013** **Len = 968.0** **JLC = 0.10**

Central&98th, 26+28 / Downstream line = 18

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	164.33	36	170.92	173.85	7.07	13.73	0.00	7.67
Upstrm	191.05	35	193.96	196.93	7.01	13.84	1.00	7.95

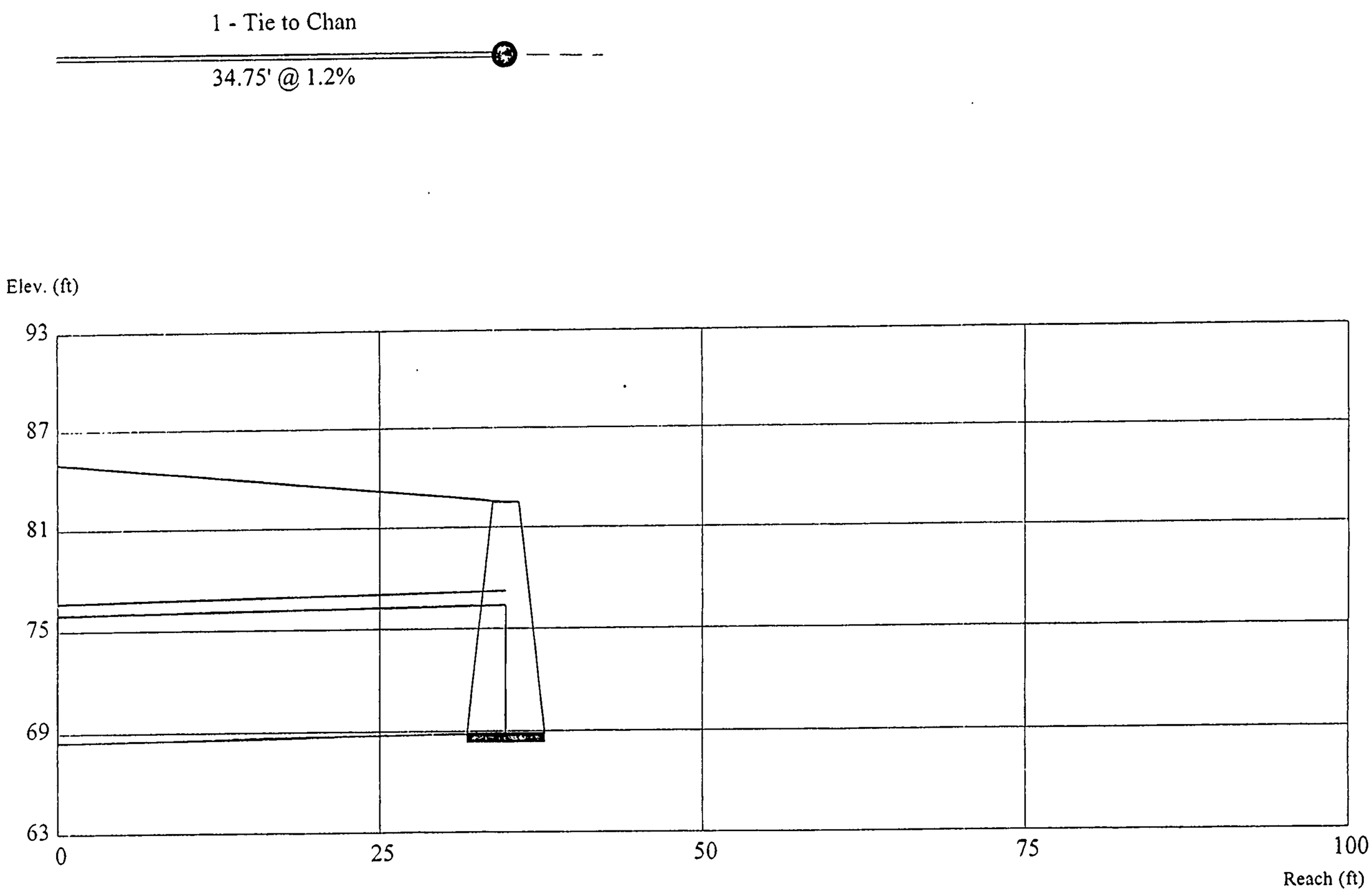
Drainage area (ac)	= 0.00	Slope of invert (%)	= 2.760
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 2.385
Time of conc. (min)	= 0.00	Critical depth (in)	= 35
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 202.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 0.00
Cumulative C x A	= 0.00	Additional Q (cfs)	= 97.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 110.80
Q Catchment (cfs)	= 0.00	Inlet Type	= MH
Q Carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.00
Q Captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.00
Q Bypassed to 18 (cfs)	= 0.00	Width of Flow (ft)	= 0.00

Storm Sewer Tabulation

Line #	Line ID	Incr. Area (ac)	Rnoff coeff (C)	Incr. CA	Sum CA	Tc (min)	Rnfal Inten (in/hr)	Total runoff (cfs)	Add. flow (cfs)	Total flow (cfs)	Capac. @ full (cfs)	Line size (in x in)	Line length (ft)	Line slope (%)	Veloc. up (ft/s)	Veloc. down (ft/s)	NG up (ft)	NG down (ft)	Invert up (ft)	Invert down (ft)	Dns line #
1	Tie to Chan	0.00	0.00	0.00	0.00	5.2	0.00	0.0	0.0	922.0	841.4	90 c	35	1.20	20.9	20.9	82.50	85.00	68.87	68.45	0
2	Tie to 41+40	0.00	0.00	0.00	0.00	5.2	0.00	0.0	0.0	922.0	841.4	90 c	8	1.20	20.9	20.9	82.50	82.50	68.96	68.87	1
3	41+48.75	0.00	0.00	0.00	0.00	5.2	0.00	0.0	0.0	922.0	841.4	90 c	8	1.20	20.9	20.9	82.50	82.50	69.06	68.96	2
4	tie to 41+56	0.00	0.00	0.00	0 00	5 0	0.00	0.0	0.0	922.0	841.4	90 c	166	1.20	20.9	20.9	82.50	82.50	71.05	69.06	3
5	Tie to 43+22	0.00	0.00	0.00	0.00	5.0	0.00	0.0	0.0	922.0	841.4	90 c	8	1.20	20.9	20.9	85.00	82.50	71.15	71.05	4
6	43+30.47	0.00	0.00	0.00	0.00	5.0	0.00	0.0	0.0	922.0	840.9	90 c	8	1.20	20.9	20.9	85.00	85.00	71.24	71.15	5
7	43+38.47	0.00	0.00	0.00	0.00	5.0	0.00	0.0	0.0	922.0	841.4	90 c	8	1.20	20.9	20.9	85.00	85.00	71.34	71.24	6
8	Tie to 43+46	0.00	0.00	0.00	0.00	4.9	0.00	0.0	50.0	922.0	850.2	90 c	103	1.23	20.9	20.9	87.00	85.00	72.60	71.34	7
9	Tie to Sta.	0.00	0.00	0 00	0.00	4.2	0.00	0 0	95.0	872.0	844.0	90 c	925	1.21	19.7	19.7	97.50	87.00	83.77	72.60	8
10	Tie to Sta.	0.00	0.00	0.00	0.00	3.9	0.00	0.0	0.0	777.0	843.5	90 c	301	1.21	17.6	17.6	101.50	97.50	87.40	83.77	9
11	Tie to Sta.	0 00	0.00	0.00	0.00	3.3	0.00	0.0	47.0	777.0	833.0	84 c	764	1.70	20.2	20.2	115.00	101.50	100.39	87.40	10
12	Tie to Sta.	0 00	0.00	0.00	0.00	2.8	0 00	0.0	99.0	730.0	833.1	84 c	540	1.70	19.0	19.0	126.00	115.00	109.57	100.39	11
13	Tie to Sta	0.00	0.00	0.00	0.00	2.5	0.00	0.0	0.0	631.0	833.1	84 c	334	1.70	16.4	16.4	134.90	126.00	115.25	109.57	12
14	Bridge&90th	0.00	0.00	0.00	0.00	2.3	0.00	0.0	0.0	631.0	833.1	84 c	250	1.70	16.4	16.4	142.00	134.90	119.50	115.25	13
15	Central&90th	0.00	0.00	0.00	0.00	2.2	0.00	0.0	0.0	631.0	833.1	84 c	220	1.70	16.9	16.4	142.00	142.00	123.24	119.50	14
16	SD in 90th,	0.00	0.00	0.00	0.00	0.0	0.00	0.0	364.0	364.0	411.3	66 c	344	1.50	19.3	19.3	142.00	142.00	130.42	125.26	15
17	SD up Centra	0.00	0.00	0.00	0.00	2.1	0.00	0.0	0.0	267.0	304.7	54 c	117	2.40	16.9	16.8	145.00	142.00	128.07	125.26	15
18	Tie to 11+17	0.00	0.00	0.00	0.00	0.8	0.00	0.0	170.0	267.0	305.5	54 c	1503	2.41	16.9	16.8	175.00	145.00	164.33	128.07	17
19	Central&98th	0.00	0.00	0.00	0.00	0.0	0.00	0.0	97.0	97.0	110.8	36 c	968	2.76	13.8	13.7	202.00	175.00	191.05	164.33	18

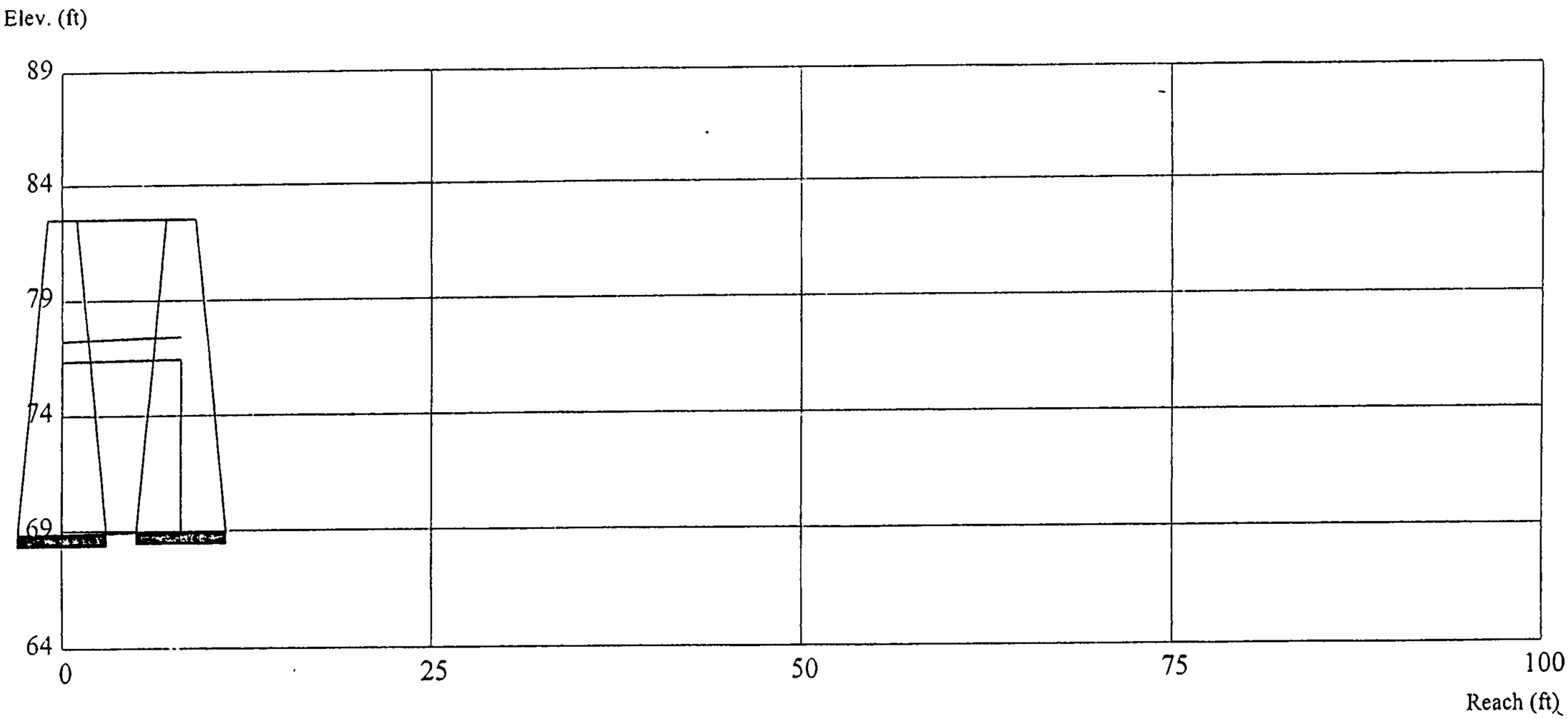
PROJECT FILE: ABEND2.STM | I-D-F FILE: SAMPLE.IDF | TOTAL NUMBER OF LINES: 19 | RUN DATE: 03-16-1998

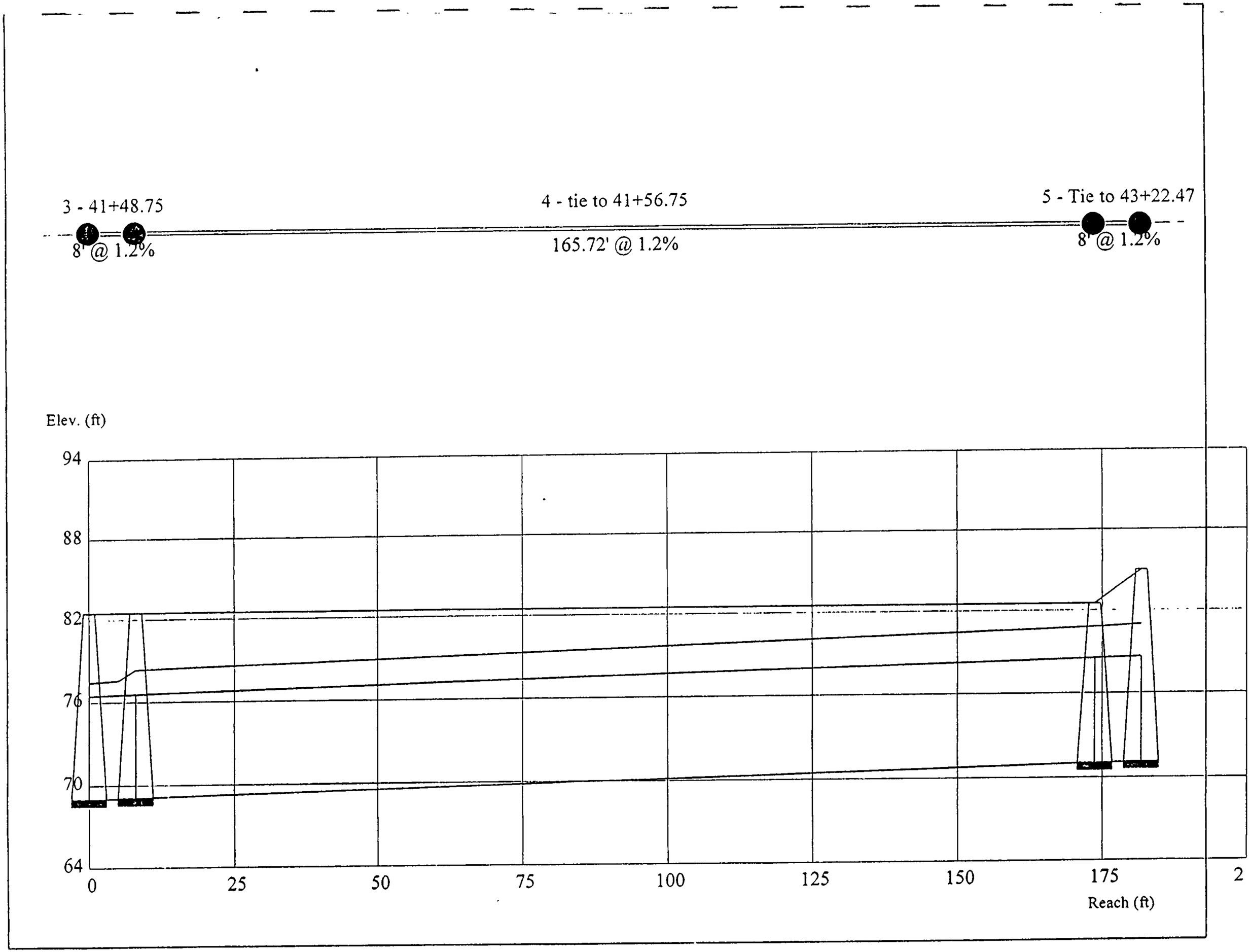
NOTES: c = circular; e = elliptical; b = box; Intensity = 0 / (Tc + 0) ^ 0; Return period = 100 Yrs.

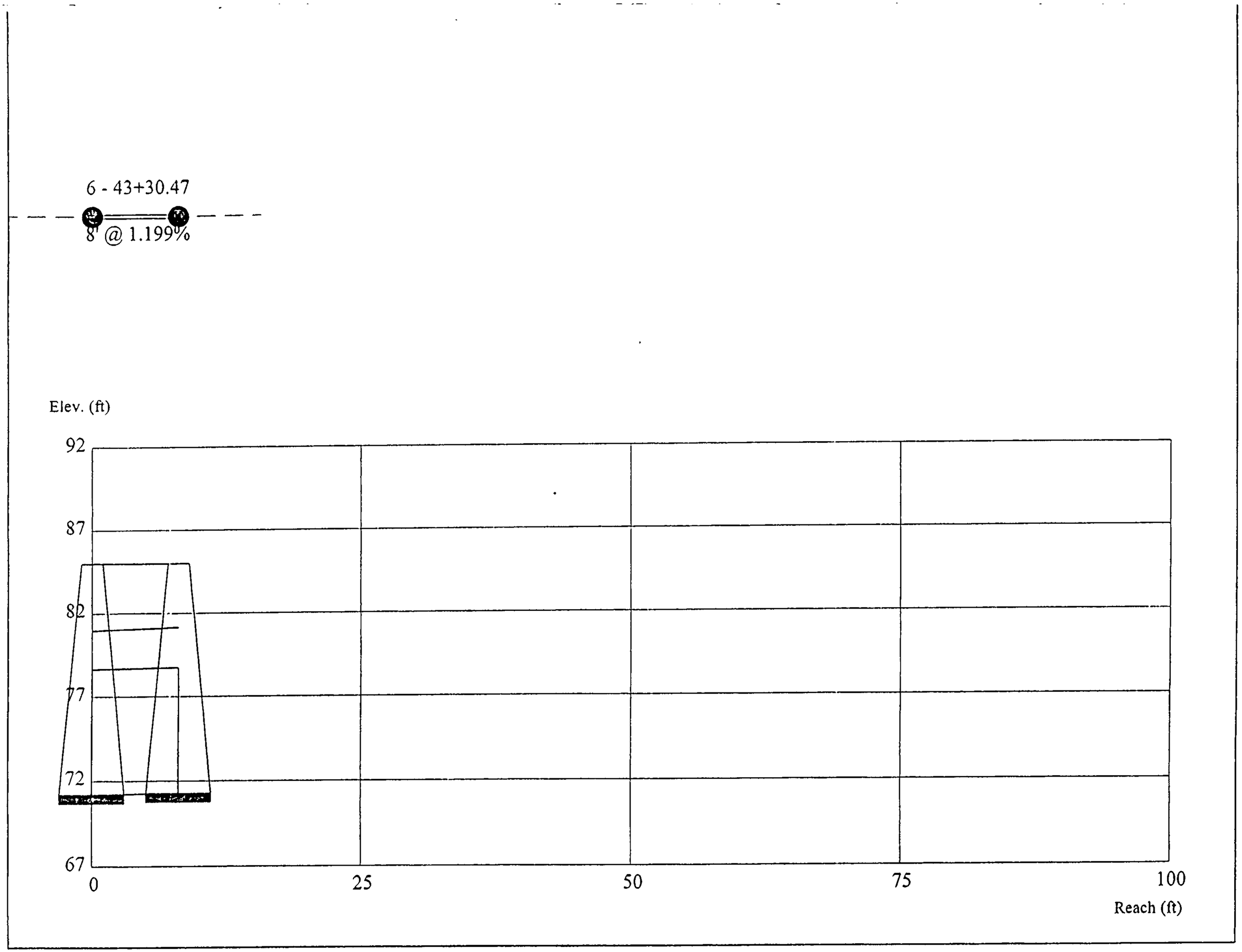

1 - Tie to Chan
34.75' @ 1.2%
Elev. (ft)
93
87
81
75
69
63
0
25
50
75
100
Reach (ft)

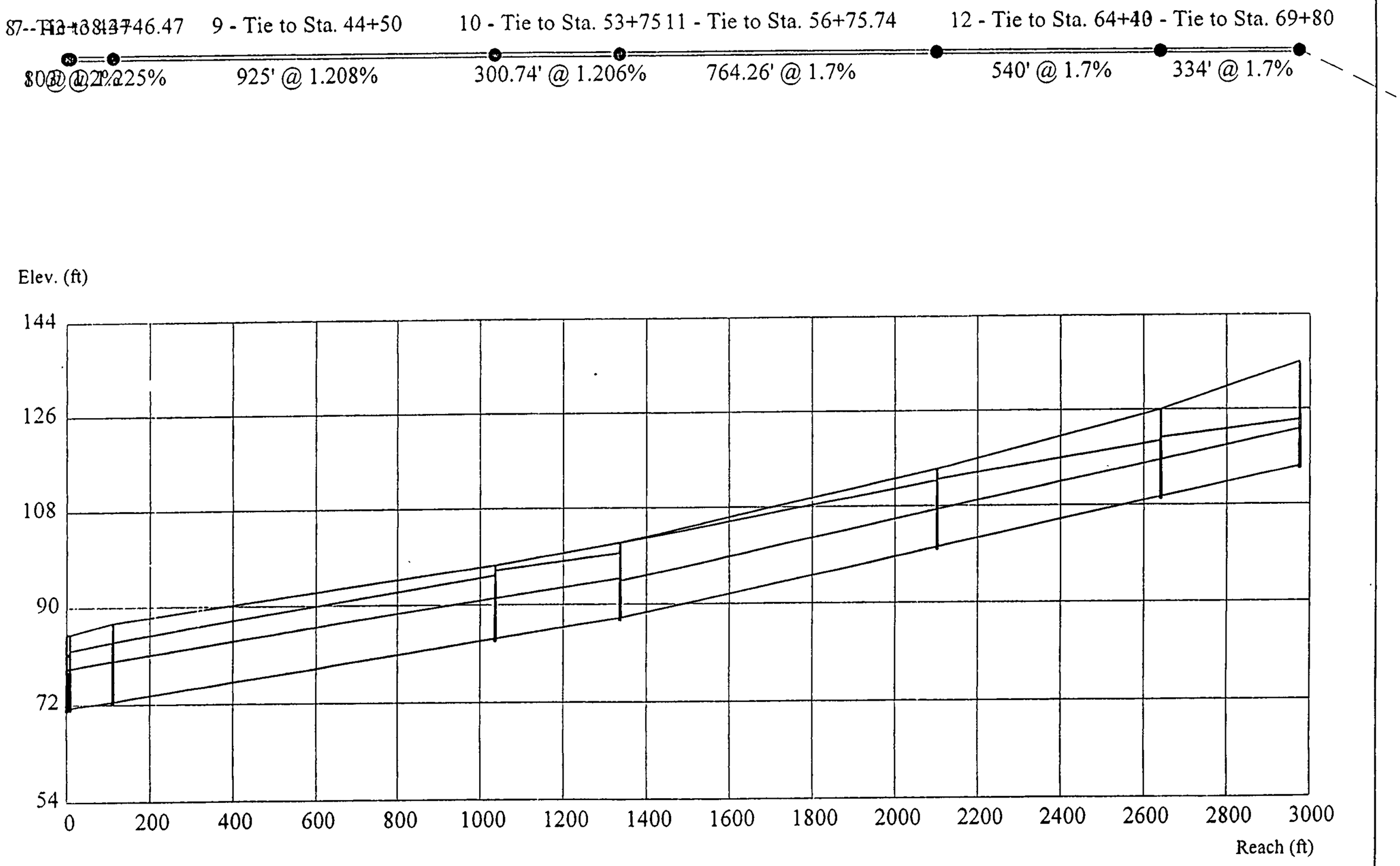
2 - Tie to 41+40.75

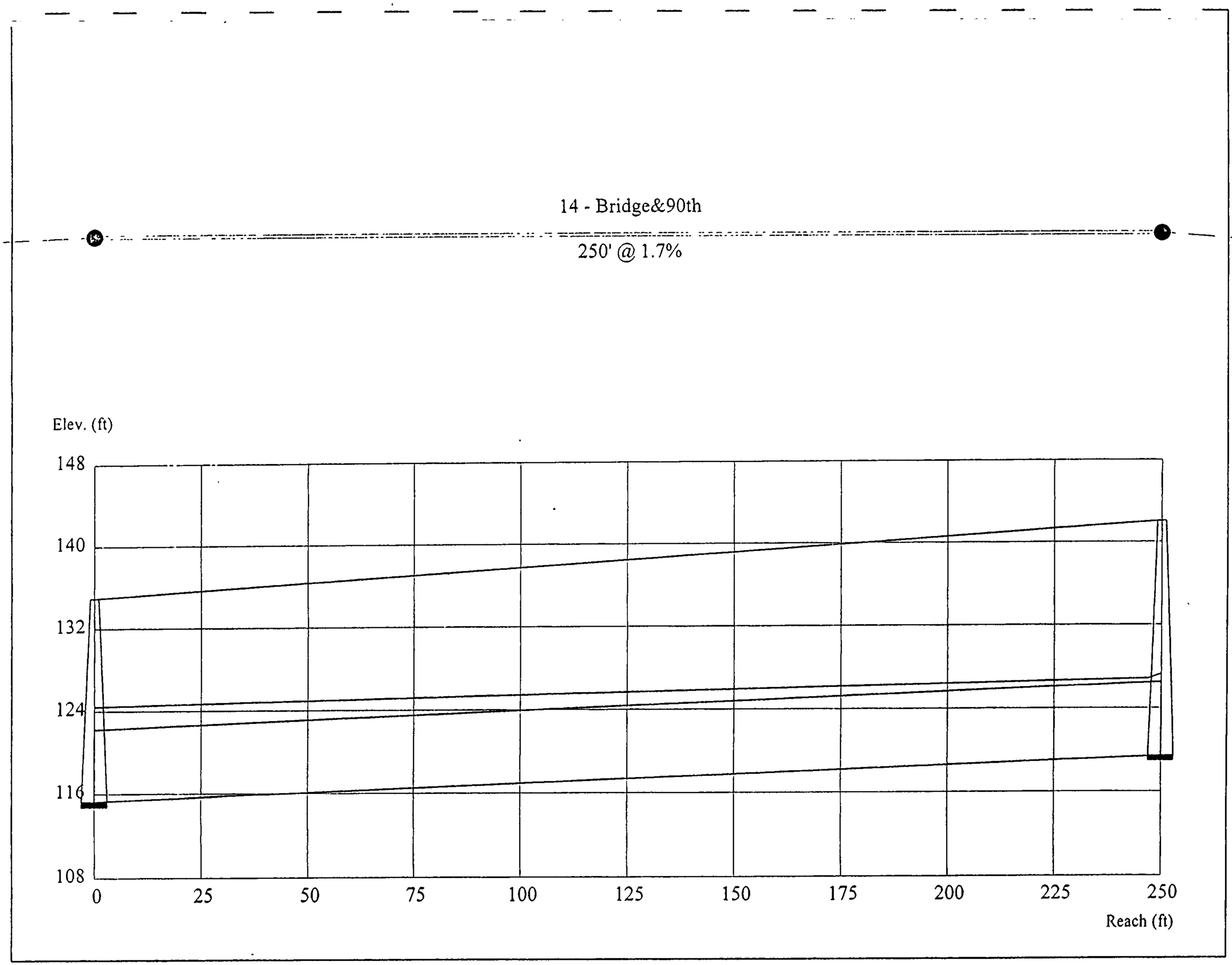
8' @ 1.2%

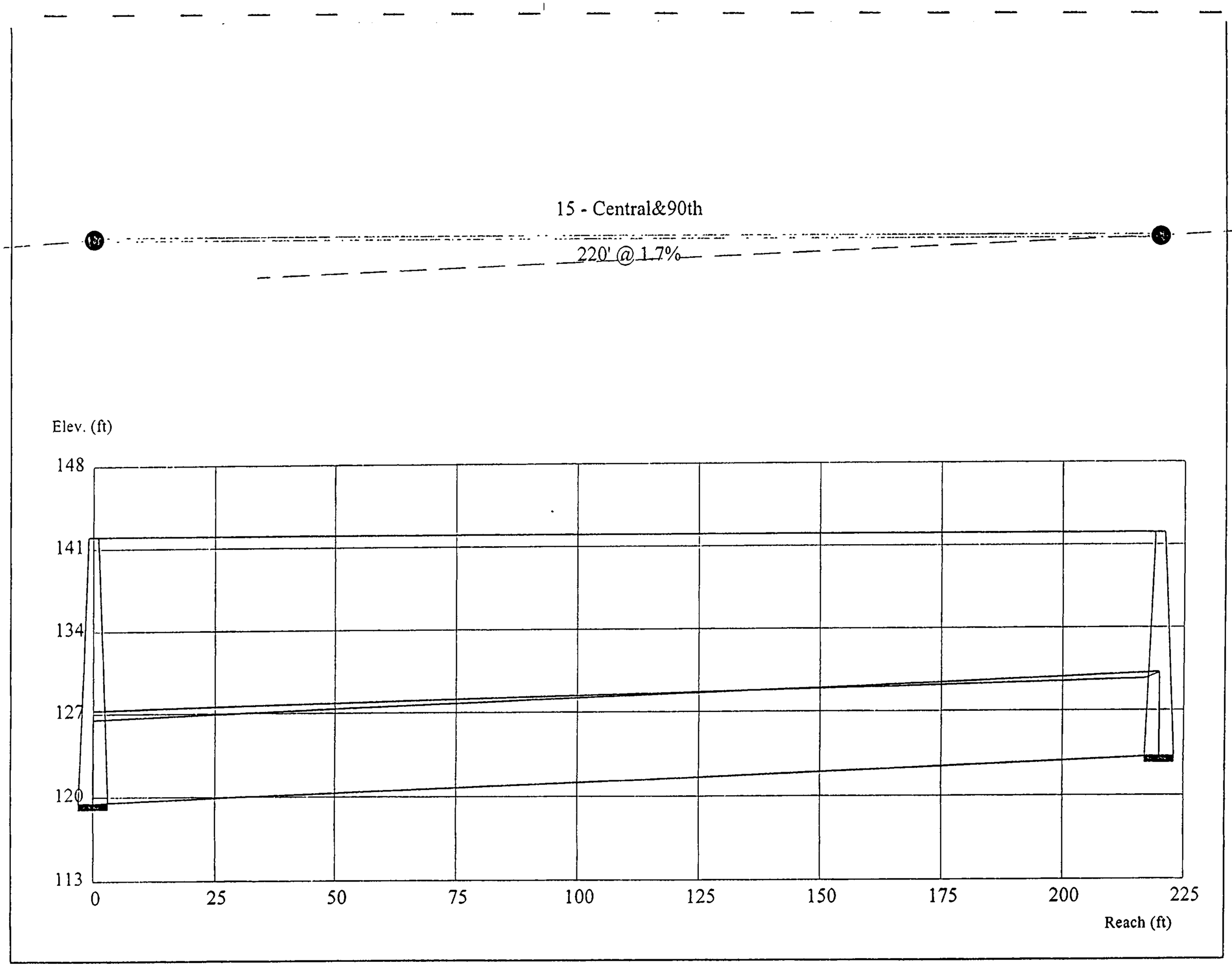


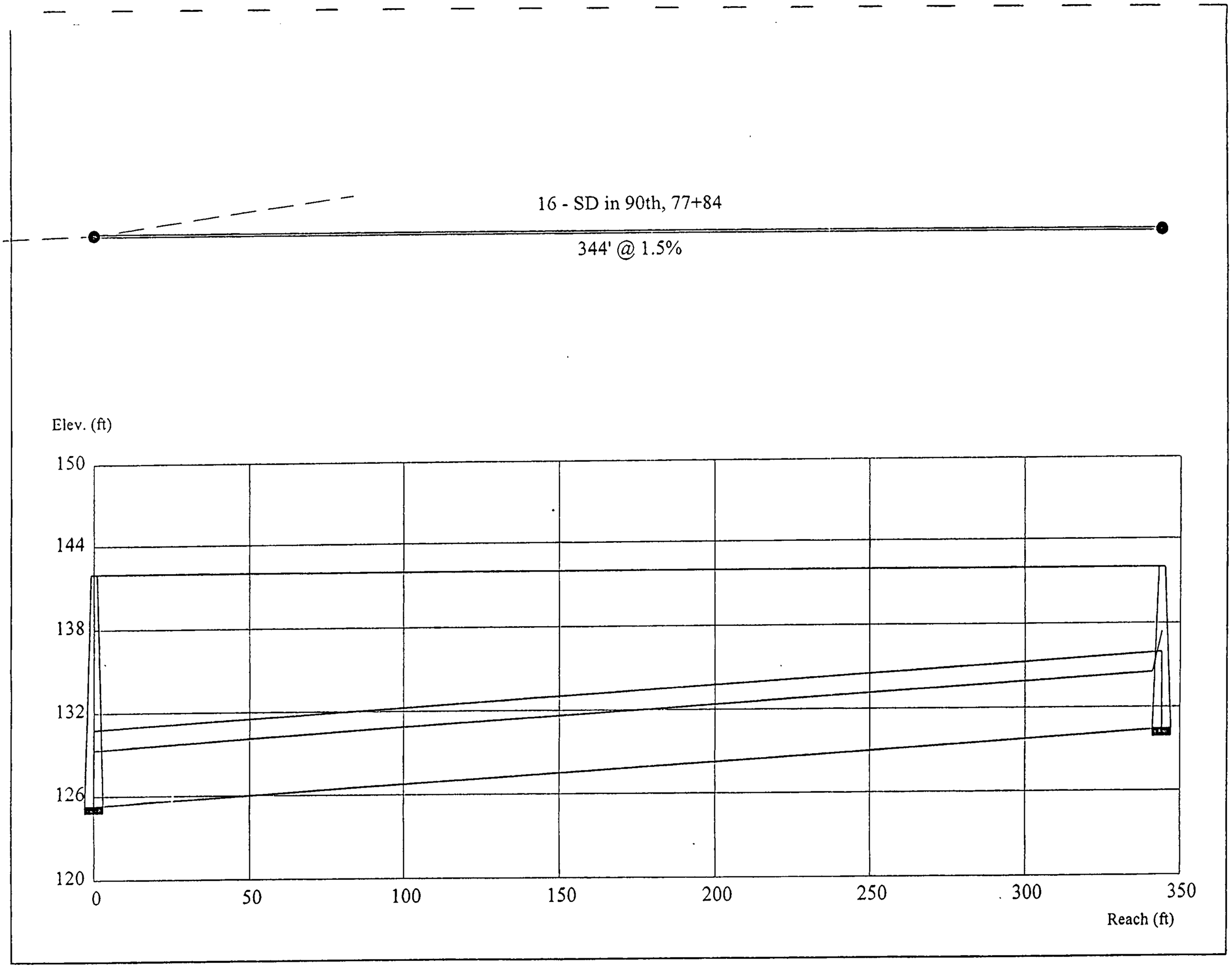

3 - 41+48.75
4 - tie to 41+56.75
5 - Tie to 43+22.47
8' @ 1.2%
165.72' @ 1.2%
8' @ 1.2%
Elev. (ft)
94
88
82
76
70
64
0
25
50
75
100
125
150
175
2
Reach (ft)

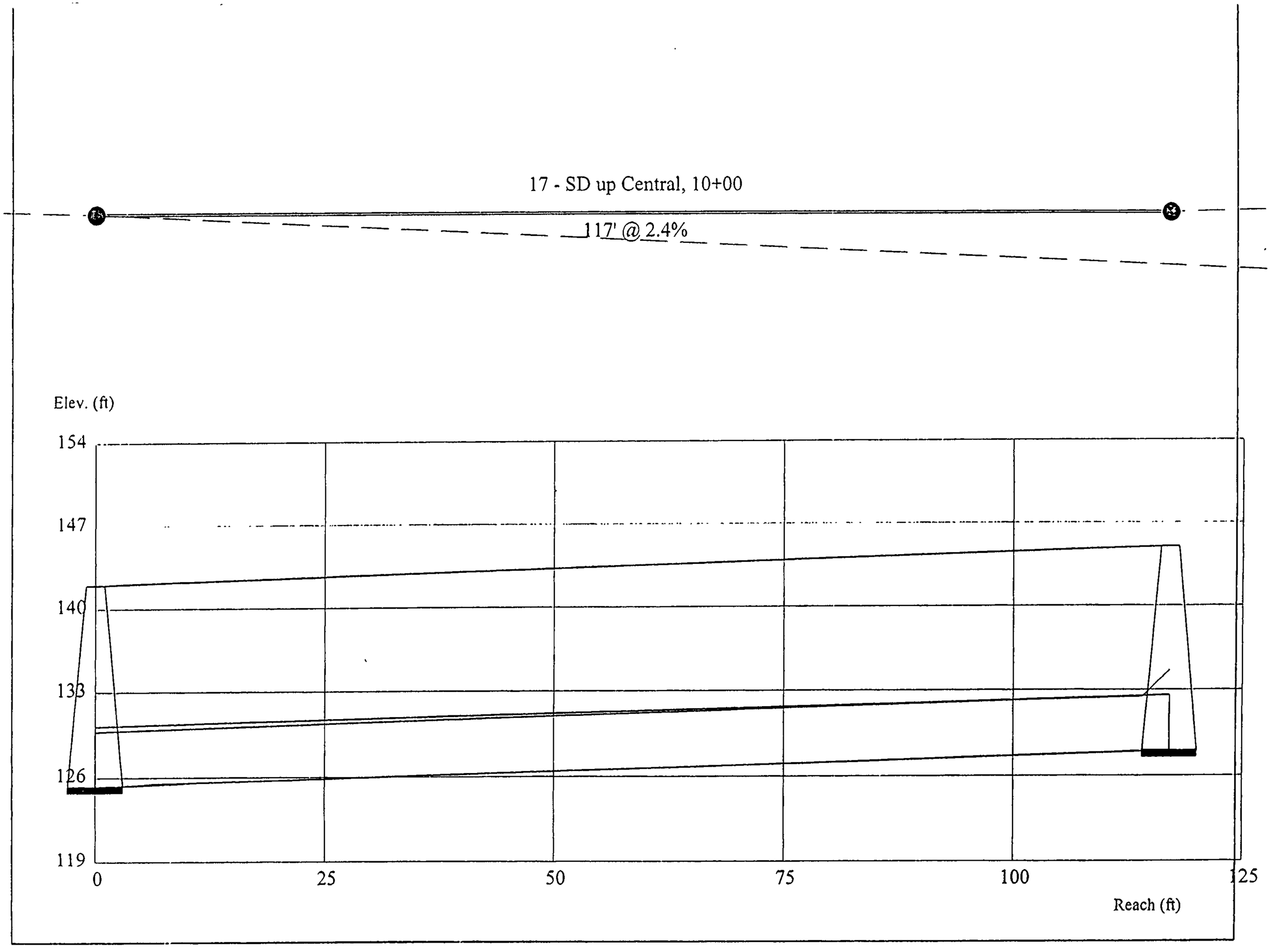

6 - 43+30.47
8" @ 1.199%
Elev. (ft)
92
87
82
77
72
67
0
25
50
75
100
Reach (ft)

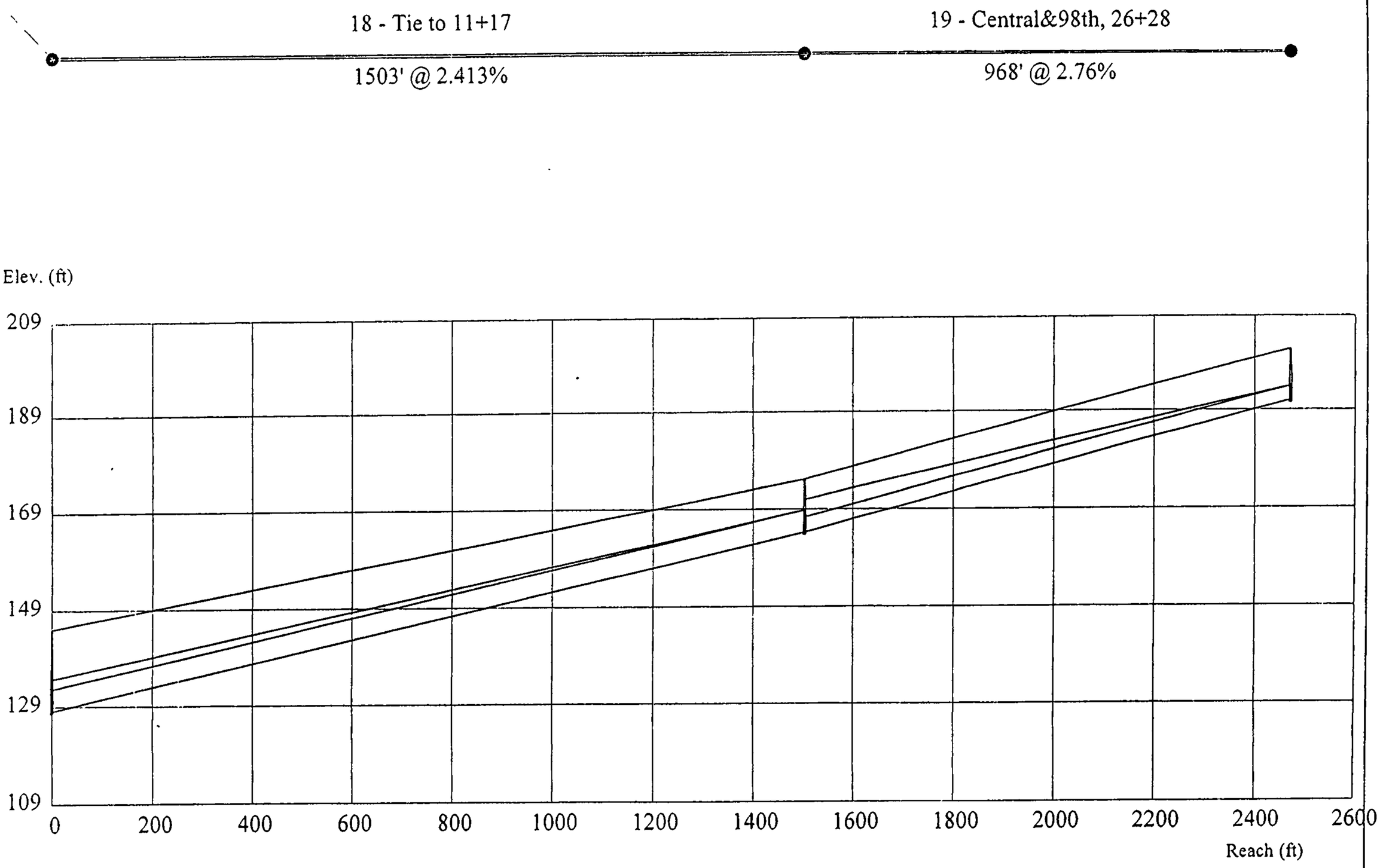

9 - Tie to Sta. 44+50
10 - Tie to Sta. 53+75
11 - Tie to Sta. 56+75.74
12 - Tie to Sta. 64+40
- Tie to Sta. 69+80
925' @ 1.208%
300.74' @ 1.206%
764.26' @ 1.7%
540' @ 1.7%
334' @ 1.7%
Elev. (ft)
144
126
108
90
72
54
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
Reach (ft)


14 - Bridge&90th
250' @ 1.7%
Elev. (ft)
148
140
132
124
116
108
0
25
50
75
100
125
150
175
200
225
250
Reach (ft)


15 - Central&90th
220' @ 1.7%
Elev. (ft)
148
141
134
127
120
113
0
25
50
75
100
125
150
175
200
225
Reach (ft)


16 - SD in 90th, 77+84
344' @ 1.5%
Elev. (ft)
150
144
138
132
126
120
0
50
100
150
200
250
300
350
Reach (ft)


17 - SD up Central, 10+00
117' @ 2.4%
Elev. (ft)
154
147
140
133
126
119
0
25
50
75
100
125
Reach (ft)


18 - Tie to 11+17
19 - Central&98th, 26+28
1503' @ 2.413%
968' @ 2.76%
Elev. (ft)
209
189
169
149
129
109
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
Reach (ft)

Greiner

Job ANNUS III Project No. E36[illegible].14 Sheet ____ of ____

Description CHECK TAILWATER FOR FLOW IN STREET Computed By [illegible] Date 13 FEB 98 (FRIDAY)

Checked By MRH Date 3/2/98

FIND TOTAL FLOW ALLOWABLE w/TAILWATER = 1' or less

$$\frac{D_2}{D_1} = \frac{1}{2}\left(\sqrt{1 + 8F^2} - 1\right)$$ ~ use formula to calc

~~TOTAL Q-EXCESS = 61 cfs — to 1/2 street = 30.5~~

~~@ S = .012 Fe = 1.36 $\frac{D_2}{D_1}$ = 1.49~~

~~Q = 30.5~~

~~d_1 = .62~~

~~D_2 = 0.92~~

IF	Froude		
d_1 = .73	Fe = 1.41	D_2 = 1.1	too high
d_1 = .70	1.40	D_2 = 1.08	too high
d_1 = .66	1.38	D_2 = 1.01	Q = 37.0 ½ of street

Q total in street = 74 cfs

BRIDGE BOULEVARD - ONE HALF STREET FLOW

Worksheet for Irregular Channel

Project Description	
Project File	p:\e000115\docs\amole.fm2
Worksheet	BRIDGE BLVD - HALF
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data				
Channel Slope	0.012000 ft/ft			
Elevation range: 0.00 ft to 0.87 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	28.63	0.017
4.46	0.67			
4.63	0.00			
6.63	0.13			
28.63	0.57			
Discharge	37.00 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.66	ft
Flow Area	8.13	ft^2
Wetted Perimeter	24.78	ft
Top Width	24.17	ft
Height	0.66	ft
Critical Depth	0.75	ft
Critical Slope	0.005932	ft/ft
Velocity	4.55	ft/s
Velocity Head	0.32	ft
Specific Energy	0.98	ft
Froude Number	1.38	

Flow is supercritical.

Water elevation exceeds lowest end station by 0.09 ft.

[redacted]

N-09/D006

Greiner

FINAL DESIGN REPORT
AMOLE DEL NORTE
STORM DIVERSION FACILITIES
TIERRA BAYITA DRAINAGE FACILITIES
PHASE III

CITY PROJECT NO. 4076.93
March, 1998

Greiner Job No. E30000114 & E30000115

Prepared for:

City of Albuquerque
Public Works Department
P.O. Box 1293
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Figure 2 - Sunset Gardens/Unser Boulevard Storm Drain Drainage Basins

Appendix

AHYMO Summaries
AHYMO Input
AHYMO Output
Hydraulic Grade Line Analysis
Bridge Boulevard street capacity

Map Pocket - Drainage Basin Map

Disk

FINAL DRAINAGE REPORT
AMOLE DEL NORTE PHASE III
TIERRA BAYITA DRAINAGE FACILITIES

March 1998

GENERAL INFORMATION

The Tierra Bayita Drainage Facilities is the third phase of the Amole Del Norte Storm Diversion Facilities. The Phase III project was begun in 1990, for the City of Albuquerque (City), with a corridor study and has progressed to the design of a large comprehensive system with several pieces of the full system being constructed and operating. This final report documents the design decisions, calculations and reports that went into bringing the project to this stage and presenting the information that is necessary to complete it. A Location Map is shown Figure 1. A Drainage Basin Map is shown in the Map Pocket.

The initial corridor study is shown in the following report which also contains a listing of the previous reports contributing information pertinent to this project.

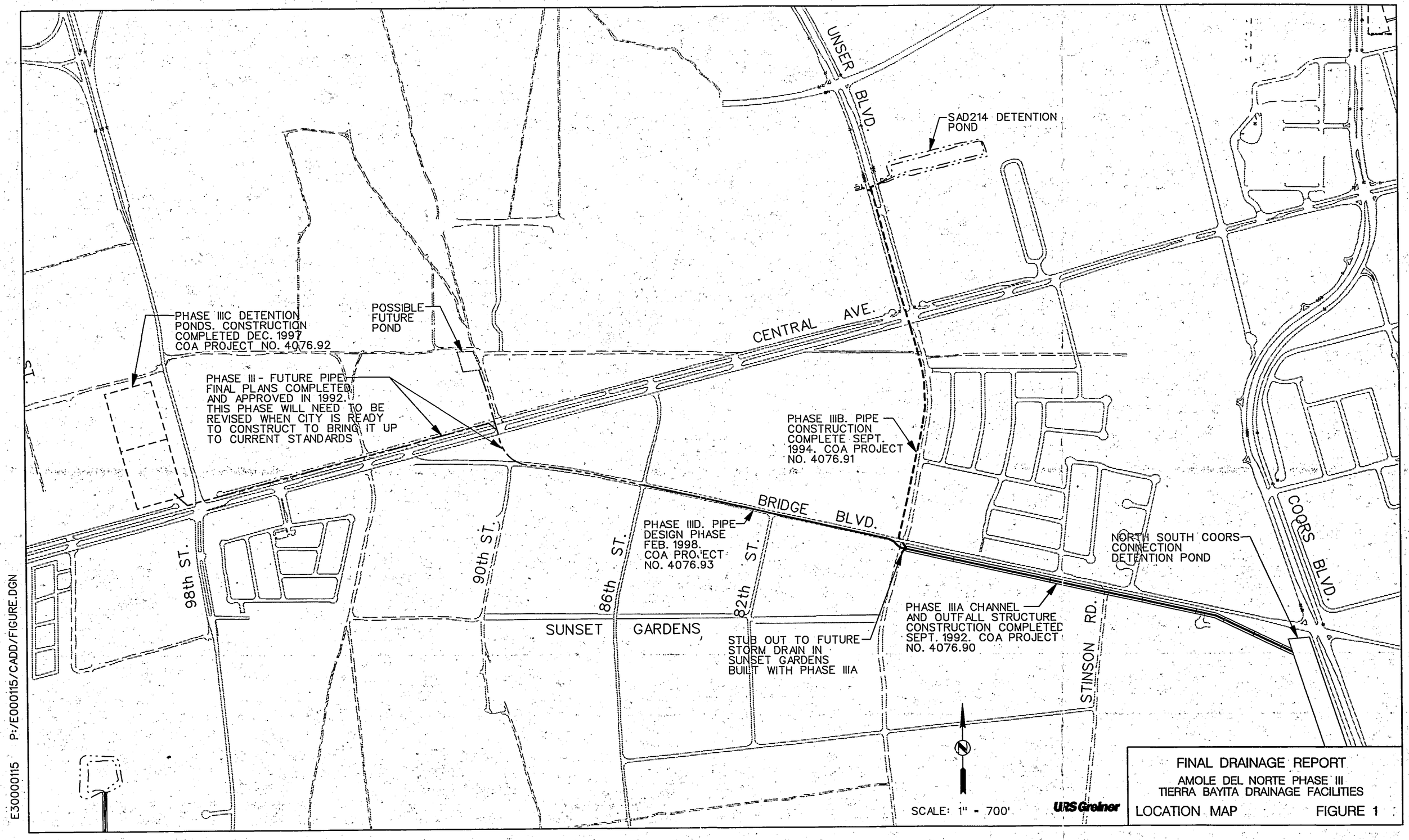
> "Preliminary Analysis Report for Amole Del Norte Storm Diversion Facilities Tierra Bayita Drainage Facilities," August 7, 1990 COA Project No. 4076-01 by Greiner, Inc.

Because the project is quite large, it was necessary to build it in phases. Phase IIIA, IIIB and IIIC have been constructed and the design information is presented in the following reports:

> "Preliminary Design Report for Amole Del Norte Storm Diversion Facilities Tierra Bayita Drainage Facilities," COA Project No. 4076-01, October 31, 1990 by Greiner, Inc.
>
> "Calculations for Amole Del Norte Storm Diversion Facilities Phase IIIA & B," COA Project No. 4076-01, January 15, 1993 by Greiner, Inc.
>
> "Design Report for Amole Del Norte Storm Diversion Facilities Tierra Bayita Drainage Facilities Phase IIIC," COA Project No. 4076-92, June 7, 1994 by Greiner, Inc.

PROGRESSION OF HYDROLOGY AND DESIGN

The initial hydrology covering the area was presented in the "Investigation Phase Report for the Re-Evaluation Study of the Amole Del Norte Storm Diversion Facility" by Boyle Engineering Corporation in July 1984. This report addresses the entire Amole Del Norte system of which the Tierra Bayita is a part. The method used in the Boyle report to determine hydrology was the computer model HYMO. Based on



E30000115 P:/E000115/CADD/FIGURE.DGN

direction from the City, URS Greiner continued using the HYMO model for Phases IIIA & B. A ten percent bulking factor was added to all flows.

When the time came to design and construct Phase IIIC, AHYMO had become the accepted hydrology model for use in Albuquerque, and it was necessary to revise the hydrology model. The bulking factor was dropped to 2 percent for the final design. Final AHYMO printouts and summaries are included in the appendix for the system as currently designed and/or constructed.

Phase IIIA

This, the first phase to be constructed with the Tierra Bayita project, consists of a concrete channel and an outfall structure as shown in the Location Map. HYMO was used to determine flows and the design calculations are presented in the previously mentioned "Calculations" report dated January 15, 1993. Record drawings are available under City Project No. 4076.90.

Even though HYMO was used initially, the channel is capable of carrying the increased flows generated by AHYMO due to the freeboard requirements dictated by the DPM.

Phase IIIB

In late 1992 Phase IIIB plans were submitted to the City and approved. This plan set consisted of the entire Tierra Bayita project except for the Phase IIIA channel which had been constructed. Phase IIIB was subsequently broken into individual projects to match available construction funding.

The portion actually constructed under the Phase IIIB title consists of a storm drain line, varying in size from 96-inch to 42-inch, extending north up Unser Boulevard from the Phase IIIA channel to the SAD 214 pond which is north of Sarricino Place. Design calculations are shown in the "Calculations" report dated January 15, 1993. HYMO was used to determine the runoff and to do pond routing. Ultimate inflow to the system was taken from the "Master Drainage Plan for the Atrisco Business Park" dated October 1993. Record drawings are available under City Project No. 4076.91.

Part of the storm drain runs through an undeveloped section of Unser Right of Way between Bridge Boulevard and Central Avenue. Rundown inlets were placed along this stretch of storm drain to collect flow and sediment now. In the future, when Unser Boulevard is extended south of Central, the rundown portion of these inlets can be removed and the structures can be converted to standard manholes and inlets.

The SAD 214 pond connection is made with a 42-inch pipe. Currently flow upstream of the pond from Atrisco Business Park is directed to the SAD 214 pond where it is released into the storm drain system. A 48-inch stub out is constructed from the most upstream point in the Unser storm drain to the west for a future connection. The "Master Drainage Plan for the Atrisco Business Park," mentioned above describes the future runoff intended for the line.

Phase IIIC

Two interconnected ponds were built in Phase IIIC at the northwest corner of 98th Street and Central Avenue. Record drawings are available under City Project No. 4076.92. A detailed analysis is presented in the Phase IIIC Design Report mentioned above, dated June 7, 1994.

This phase required the conversion to AHYMO and it actually was a very good point in the project for the change over. Although the runoff generated from the basins upstream of the ponds increased with the use of AHYMO, the pond system could be (and was) designed to handle the flow and release it at a smaller rate than planned in the original report. Pond outflow went from a planned 342 cfs to 97 cfs(ultimate) or 13 cfs (current) in the 100-year event. An orifice plate was installed on the outlet pipe to keep the current outflow at 13 cfs. The orifice plate should be removed when the ultimate storm drain is constructed providing a piped outlet to the Phase IIIA channel.

The two ponds were large enough to require State Engineer involvement. Design and construction were monitored and approved by the State.

Phase IIID and III-Future

Phase IIID plans are currently being revised for bidding and construction under City Project No. 4076.93. Originally IIID was part of the initial Phase IIIB. The rest of the project is to be done in the future, as construction funding permits.

Phase III D consists of the portion of 90-inch/84-inch pipe extending from the Phase IIIA channel west along Bridge Boulevard to just west of 82nd Street, or possibly if the Additive Alternate is chosen, to just west of 86th Street.

AHYMO modeling is of course required and even with the flow reductions mentioned in the previous section, addition of the basins downstream of the 98th/Central ponds causes a significant increase in flow to Bridge Boulevard. The resulting modifications to the system and the model have been made.

The sediment bulking factor has been dropped from 10 percent to 2 percent since all basins are considered fully developed. The Land Treatments were also reduced to more correctly reflect how development is actually occurring. The current Land Treatment values are identified on the input and output printouts included in the Appendix.

The Mountain View Mobile Home Park at the southwest corner of Central and 98th has been modeled to load on the Amole IIID system. This Park was built in 1986 and currently uses a retention pond. The approved drainage report shows a future connection to a future (Tierra Bayita) storm drain on the south side of Central Avenue. Based on the August 7, 1990 study, the Tierra Bayita system will cross Central at 90th Street and run along the north side of Central.

The ultimate routing of flow from the Park is beyond the scope of this study, however, two alternatives exist, both of which work with the design of the Phase IIID improvements.

The current AHYMO model assumes the Park runoff drains, along with the runoff from the property fronting onto Central between 98th and 94th, into the system at 90th Street and Bridge. The other possibility is to extend a pipe north across Central at 94th Street to the future extension of the Tierra Bayita system. This issue should be revisited during design of future (Phase IIIE, etc.) extensions of the Tierra Bayita system.

A pond is assumed at 90th Street and Volcano Road. This detention facility is at a very conceptual stage and no design data are available at this time. It has been modeled in AHYMO by splitting the hydrograph and with flow entering the system limited to a peak flow of 315 cfs.

The final AHYMO analysis has been modified to mesh with analysis for various developments in the south portion of the Tierra Bayita basin. Specifically the "Design Analysis Report for Sunset Gardens/Unser Boulevard Storm Drain," dated December 5, 1997, by Ryals Engineering and Construction Services has compiled all the data for the individual developments into one AHYMO model. This study has been approved by the City and it has been incorporated into our model. Based on this report, the area west of 94th Street and south of Sunset Gardens was eliminated from the project watershed. Basin 16 was also modified to allow more flow to drain to the Bridge Boulevard storm drain rather than the Sunset Gardens storm drain as was originally planned.

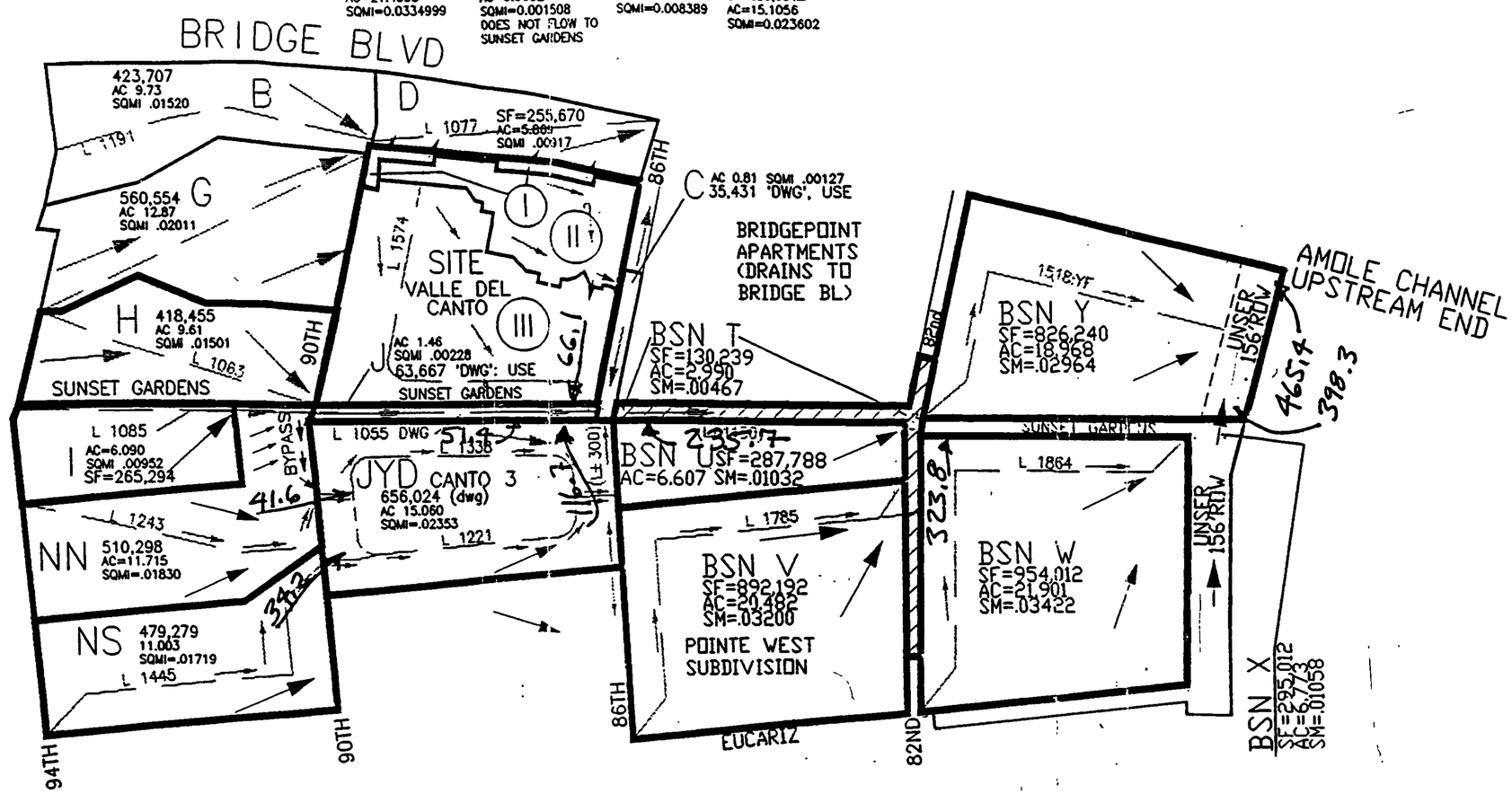
Figure 2 shows the internal drainage basins from the Sunset Gardens/Unser Boulevard report which are now incorporated in the attached AHYMO analysis.

PHASE IIID HYDRAULICS

The City performed a new Hydraulic Grade Line analysis on the Tierra Bayita system using the AHYMO flow rates, and the results are shown in the Appendix and the HGL is shown on the plans. The Phase IIID system is designed for pressure conditions with some flow draining in Bridge Boulevard. The flow beyond the capacity of the storm drain will flow overland in Bridge to the rundowns provided in the Phase IIIA channel. Calculations attached in the Appendix identify a street capacity of 74 cfs with the flow at the top of curb and the tailwater at 1 foot.

VALLE DEL CANTO SITE (PH'S I & II)

ENTIRE (ALL) SITE	BASIN SITE-1	BASIN SITE-2	BASIN SITE-3
SF=933,903	SF=42,044	SF=233,858	(ALL SITE - (1&2))
AC=21.4395	AC=0.9652	AC=5.3686	SF=658,001±
SQMI=0.0334999	SQMI=0.001508	SQMI=0.008389	AC=15.1056
	DOES NOT FLOW TO SUNSET GARDENS		SQMI=0.023602



DWG: VCOFF7 DATE: 11/20/97 TIME: 22:36 T. GREEN

0 500 1000 1500

"FUTURE" BASINS FOR SUNSET/UNSER STORM SEWER

ALL BASINS IN FUTURE DEVELOPMENT CONDITION, INCLUDING Y. SG (SUNSET GARDENS) SD (STORM DRAIN) COMPLETE TO UNSER THEN NORTH TO AMOLE. NO FLOW FROM WEST OF 94th ST; SOUTH OF SG, 94th DRAINS SOUTH PER DESIGN BY ANDREWS, ASBURY, AND ROBERT. NORTH OF SG, 94TH DRAINS TO CENTRAL/BRIDGE (TIERRA BAYITA) SD PER GRADES APPROVED WITH MOBILE HOME PARK. SG SD COMPLETE TO UNSER THEN TO AMOLE. HIGH POINT IN 90th 1 LOT N OF EUCARIZ ASSUMED PER SAD 222 & TOWER/UNSER DMP. FLOW INTO WEST END OF ALLEY AT 90th TO BE HELD TO EXISTING CONDITIONS OR LESS. PROBABLY BY STORM DRAIN TO BRIDGE BLVD. FLOW FROM BASINS B, G, & D SHOWN FOR INFO ONLY: NO FLOW TO SG SD.

MAP TAKEN FROM: SUNSET GARDENS/UNSER BOULEVARD STORM DRAIN

BY: RYALS ENGINEERING & CONSTRUCTION SERVICES

DATED 12/5/97

FINAL DRAINAGE REPORT

AMOLE DEL NORTE PHASE III
TIERRA BAYITA DRAINAGE FACILITIES

SUNSET GARDENS/UNSER BOULEVARD STORM DRAIN

UMS Greiner

DRAINAGE BASINS FIGURE 2

APPENDIX

AHYMO SUMMARIES
AHYMO INPUT
AHYMO OUTPUT

FILENAMES:

AMOLE.DAT - Drainage basins downstream of 98th/Central ponds
AB100.DAT - Drainage basins to 98th/Central ponds

HYDRAULIC GRADE LINE ANALYSIS

BRIDGE BOULEVARD STREET CAPACITY

The following AHYMO summaries and output files assume:

Ultimate Developed conditions

100 year flow

2% bulking factor

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =02/26/1998
INPUT FILE = AMOLE.DAT USER NO.= GREINRNM.STE

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
*S 100 YEAR, 6 HOUR STORM										
RAINFALL TYPE= 1										
*S ALL FLOWS INCLUDE A 2% BULKING FACTOR										RAIN6= 2.210
SEDIMENT BULK										
COMPUTE NM HYD	11D	-	11	.02500	21.77	.615	.46095	1.533	1.361	PK BF = 1.02 PER IMP= .00
COMPUTE NM HYD	10D	-	10	.03360	36.63	1.108	.61847	1.533	1.703	PER IMP= 8.00
ADD HYD	10.10	10&11	1	.05860	58.40	1.723	.55127	1.533	1.557	
ROUTE	R1	1	2	.05860	42.04	1.723	.55127	1.600	1.121	
COMPUTE NM HYD	12D	-	12	.24070	462.31	20.498	1.59678	1.567	3.001	PER IMP= 65.00
ADD HYD	R12	12& 2	4	.29930	501.92	22.221	1.39208	1.567	2.620	
DIVIDE HYD	PIPE	4	3	.26269	315.00	19.503	1.39208	1.500	1.874	
	POND	AND	5	.03661	186.92	2.718	1.39207	1.567	7.978	
ROUTE	RR12	3	4	.26269	315.00	19.503	1.39208	1.667	1.874	
*s RECALL FLOW FROM AMOLE DEL NORTE PHASE IIIC - DETENTION BASINS										
RECALL HYD	501.00	-	10	1.06120	97.00	101.925	1.80088	2.950	.143	
COMPUTE NM HYD	19D	-	19	.08970	202.80	8.212	1.71647	1.533	3.533	PER IMP= 75.00
ADD HYD	19.10	19&10	5	1.15090	239.79	102.748	1.67393	1.567	.326	
ROUTE	R19.1	5	6	1.15090	236.32	102.630	1.67200	1.567	.321	
ADD HYD	19.20	6& 4	7	1.41359	551.30	122.133	1.61998	1.567	.609	
ROUTE	19.30	7	8	1.41359	551.28	122.090	1.61941	1.600	.609	
COMPUTE NM HYD	16A	-	1	.01282	34.51	1.253	1.83290	1.500	4.206	PER IMP= 85.00
COMPUTE NM HYD	16F	-	2	.03493	80.83	2.847	1.52798	1.500	3.616	PER IMP= 63.00
ADD HYD	16F.1	1& 2	3	.04775	115.33	4.100	1.60983	1.500	3.774	
ROUTE	16F.2	3	4	.04775	112.16	4.100	1.60984	1.533	3.670	
COMPUTE NM HYD	16B	-	1	.01520	40.91	1.486	1.83290	1.500	4.205	PER IMP= 85.00
ADD HYD	16B.1	1& 4	3	.06295	151.18	5.586	1.66369	1.533	3.753	
COMPUTE NM HYD	16G	-	2	.02011	49.99	1.770	1.65010	1.500	3.884	PER IMP= 70.00
ADD HYD	16G.1	2& 3	16	.08306	199.09	7.355	1.66040	1.533	3.745	
ADD HYD	16.10	16& 8	9	1.49665	730.13	129.445	1.62169	1.533	.762	
ROUTE	16.20	9	1	1.49665	730.06	129.412	1.62127	1.567	.762	
COMPUTE NM HYD	16D	-	10	.01119	30.12	1.094	1.83290	1.500	4.206	PER IMP= 85.00
ADD HYD	16D.1	1&10	1	1.50784	754.97	130.506	1.62285	1.567	.782	
COMPUTE NM HYD	17W	-	17	.08020	173.01	7.342	1.71647	1.567	3.371	PER IMP= 75.00
DIVIDE HYD	86TH	17	17	.06327	82.00	5.792	1.71646	1.433	2.025	
	82TH	AND	18	.01693	91.01	1.550	1.71646	1.567	8.398	
ADD HYD	17.10	17& 1	2	1.57111	836.97	136.298	1.62662	1.567	.832	
ROUTE	17.20	2	3	1.57111	835.00	136.233	1.62584	1.567	.830	
ROUTE	17.30	3	4	1.57111	834.48	136.215	1.62562	1.567	.830	
ADD HYD	17.40	4&18	5	1.58804	925.49	137.765	1.62659	1.567	.911	
COMPUTE NM HYD	BPD	-	6	.03420	77.22	2.615	1.43350	1.500	3.528	PER IMP= 50.00
ADD HYD	6.10	6& 5	7	1.62224	991.01	140.380	1.62252	1.567	.955	
ROUTE	6.20	7	8	1.62224	978.45	140.302	1.62162	1.600	.942	
COMPUTE NM HYD	21D	-	21	.01010	24.83	.881	1.63469	1.500	3.841	PER IMP= 70.00
ADD HYD	21.10	21& 8	6	1.63234	995.91	141.182	1.62170	1.600	.953	
*s UNSER BOULEVARD FLOWS TO CHANNEL - FLOW FROM NORTH OF BRIDGE BLVD										
*s THE FOLLOWING HYDROGRAPH IS TAKEN FROM THE MASTER DRAINAGE PLAN FOR THE										
*s ATRISCO BUSINESS PARK - SEPTEMBER 1992 & REVISED MARCH 1993 & SEPT 1993										
*s by Easterling and Associates & REPRESENTS THE ENTIRE UNSER DIVERSION										
RECALL HYD	180.16	-	2	.67890	248.30	73.770	2.03740	1.550	.571	

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ROUTE	R2	2	3	.67890	247.01	73.770	2.03740	1.600	.568	
ROUTE	R3	3	4	.67890	247.54	73.770	2.03740	1.600	.570	
COMPUTE NM HYD	13D	-	13	.16640	342.65	15.680	1.76677	1.567	3.217	PER IMP= 80.00
ROUTE	R13	13	5	.16640	336.38	15.680	1.76678	1.600	3.159	
ADD HYD	13.10	5& 4	5	.84530	583.91	86.967	1.92905	1.600	1.079	
COMPUTE NM HYD	17E	-	17	.06510	171.89	6.190	1.78282	1.500	4.126	PER IMP= 80.00
ADD HYD	17.10	17& 5	7	.91040	703.48	93.157	1.91859	1.567	1.207	
ROUTE	R6	7	8	.91040	688.34	93.079	1.91700	1.633	1.181	
*S FLOW FROM NORTH ON UNSER TO CHANNEL - ADD TO FLOW FROM BRIDGE										
ADD HYD	CHANNEL	8& 6	9	2.54274	1682.47	234.261	1.72743	1.600	1.034	
*s UNSER BLVD - FLOW FROM SOUTH OF BRIDGE EMPTYING TO THE CHANNEL										
*s THE FOLLOWING IS TAKEN FROM SUNSET GARDENS/UNSER BLVD STORM DRAIN										
*s DESIGN ANALYSIS REPORT, DATED 12/5/97 BY RYALS ENGINEERING AND										
*s CONSTRUCTION SERVICES AS REVISED BY TUCKER GREEN, PER SE ENGENEERING										
COMPUTE NM HYD	I	-	1	.00952	18.97	.626	1.23320	1.500	3.113	PER IMP= 38.00
COMPUTE NM HYD	H	-	2	.01501	37.31	1.321	1.65010	1.500	3.884	PER IMP= 70.00
ADD HYD	208.00	1& 2	3	.02453	56.28	1.947	1.48828	1.500	3.585	
*s DIVIDE SO 1ST 8.6 CFS (ID=6) S ON 90TH (ON HOLD): ID=4 E ON SUNSET GARDENS										
DIVIDE HYD	90.S.PAST.SG	3	6	.01035	8.60	.821	1.48828	1.333	1.298	
	SG.E.OF.90	AND	4	.01418	47.68	1.126	1.48828	1.500	5.253	
ROUTE MCUNGE	209.00	4	5	.01418	47.57	1.119	1.47973	1.567	5.241	CCODE = .2
COMPUTE NM HYD	J	-	1	.00228	6.09	.221	1.81798	1.500	4.172	PER IMP= 85.00
ADD HYD	210.00	1& 5	3	.01646	53.08	1.340	1.52653	1.533	5.038	
COMPUTE NM HYD	SITE.II	-	1	.00839	19.75	.696	1.55434	1.500	3.679	PER IMP= 65.00
*S PARTIAL WATERBLOCK ==> FLOW > 11.6cfs TO 86TH										
DIVIDE HYD	S2.TO.S3	1	2	.00732	11.60	.607	1.55431	1.433	2.475	
	S2.TO.86TH	AND	7	.00107	8.15	.088	1.55431	1.500	11.934	
COMPUTE NM HYD	SITE.III	-	1	.02360	55.53	1.956	1.55434	1.500	3.677	PER IMP= 65.00
ADD HYD	SITE.OUT	1& 2	16	.03092	67.13	2.563	1.55433	1.500	3.392	
*S TOTAL FLOW SUNSET GARDENS WEST OF 86TH										
ADD HYD	SG.W.OF.86	3&16	5	.04738	118.05	3.904	1.54467	1.533	3.893	
COMPUTE NM HYD	C	-	1	.00127	3.50	.128	1.88389	1.500	4.301	PER IMP= 90.00
ADD HYD	218.00	1& 7	3	.00234	11.65	.216	1.73326	1.500	7.787	
ADD HYD	86&SG.N&W	3& 5	7	.04972	128.76	4.120	1.55353	1.533	4.046	
COMPUTE NM HYD	NN	-	1	.01830	33.56	1.116	1.14350	1.500	2.865	PER IMP= 36.40
ADD HYD	INTO.JYDN	1& 6	3	.02865	42.16	1.937	1.26804	1.500	2.299	
ROUTE MCUNGE	300.00	3	5	.02865	40.55	1.927	1.26109	1.600	2.211	CCODE = .1
COMPUTE NM HYD	NS	-	1	.01719	34.79	1.185	1.29219	1.500	3.162	PER IMP= 46.60
ROUTE MCUNGE	302.00	1	2	.01719	34.26	1.185	1.29208	1.567	3.114	CCODE = .2
ADD HYD	304.00	2& 5	3	.04584	73.97	3.111	1.27270	1.600	2.521	
COMPUTE NM HYD	JYD	-	17	.02353	55.37	1.951	1.55434	1.500	3.677	PER IMP= 65.00
ADD HYD	JYD.E.AT.86	3&17	4	.06937	118.68	5.062	1.36823	1.533	2.673	
ROUTE MCUNGE	86.S.OF.SG	4	5	.06937	118.57	5.060	1.36766	1.567	2.671	CCODE = .1
ADD HYD	TOT.SG&86	5& 7	6	.11909	240.79	9.180	1.44526	1.533	3.159	
ROUTE	308.00	6	5	.11909	238.77	9.180	1.44527	1.567	3.133	
COMPUTE NM HYD	T	-	1	.00467	12.45	.453	1.81798	1.500	4.166	PER IMP= 85.00
ADD HYD	310.00	1& 5	3	.12376	249.07	9.632	1.45932	1.567	3.145	
COMPUTE NM HYD	U	-	1	.01032	25.09	.892	1.62025	1.500	3.799	PER IMP= 70.00
ADD HYD	312.00	1& 3	19	.13408	270.07	10.524	1.47171	1.567	3.147	
COMPUTE NM HYD	V	-	11	.03200	67.84	2.315	1.35662	1.500	3.313	PER IMP= 50.00
ADD HYD	SG.AT.82ND	11&19	3	.16608	330.10	12.839	1.44953	1.533	3.106	
ROUTE	314.00	3	5	.16608	328.29	12.839	1.44953	1.567	3.089	

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
COMPUTE NM HYD	W	-	12	.03422	77.86	2.716	1.48844	1.500	3.555	PER IMP= 60.00
ADD HYD	316.00	12& 5	3	.20030	394.29	15.556	1.45618	1.533	3.076	
COMPUTE NM HYD	X	-	13	.01058	27.37	.989	1.75207	1.500	4.042	PER IMP= 80.00
ADD HYD	SG.AT.UNSER	13& 3	4	.21088	420.45	16.544	1.47102	1.533	3.115	
ROUTE	318.00	4	5	.21088	418.41	16.544	1.47102	1.567	3.100	
COMPUTE NM HYD	Y	-	14	.01954	52.58	1.910	1.83290	1.500	4.205	PER IMP= 85.00
*s TOTAL FLOW FROM UNSER APROX 300' S OF AMOLE CHANNEL										
ADD HYD	FUT.TO.AMOLE	14& 5	7	.23042	468.17	18.455	1.50171	1.533	3.175	
*S TOTAL FLOW TO HEAD OF CONCRETE CHANNEL										
ADD HYD	CHANNEL	7& 9	5	2.77316	2112.30	252.716	1.70867	1.600	1.190	
ROUTE	R5	5	6	2.77316	2113.42	252.546	1.70752	1.600	1.191	
COMPUTE NM HYD	18W	-	18	.11220	231.19	9.624	1.60831	1.567	3.220	PER IMP= 68.00
ADD HYD	18.10	18& 6	7	2.88536	2330.57	262.170	1.70366	1.600	1.262	
ROUTE	R7	7	8	2.88536	2333.99	262.092	1.70316	1.600	1.264	
COMPUTE NM HYD	21E	-	21	.06560	170.43	6.024	1.72180	1.500	4.059	PER IMP= 70.00
ADD HYD	21.10	21& 8	9	2.95096	2453.09	268.116	1.70357	1.600	1.299	
ROUTE	R9	9	10	2.95096	2457.37	268.063	1.70324	1.600	1.301	
COMPUTE NM HYD	18E	-	18	.00750	17.13	.620	1.54928	1.500	3.569	PER IMP= 70.00
ADD HYD	18.10	18&10	11	2.95846	2469.38	268.683	1.70285	1.600	1.304	
ROUTE	R11	11	12	2.95846	2473.55	268.617	1.70243	1.600	1.306	
FINISH										

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =02/23/1998
INPUT FILE = P:\AHYMO\AB100.DAT USER NO.= GREINRNM.STE

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
START										TIME= .00
RAINFALL TYPE= 2										RAIN24= 2.700
*s DIVIDE HYD IS USED TO SIMULATE A BULKING FACTOR										
COMPUTE NM HYD	108.40	-	5	.14260	363.67	15.466	2.03361	1.500	3.985	PER IMP= 70.00
DIVIDE HYD	108.40	5	5	.14260	381.85	16.240	2.13528	1.500	4.184	
	.00	AND	16	.14260	18.18	.773	.10168	1.500	.199	
COMPUTE NM HYD	101.00	-	1	.02600	34.91	.977	.70476	1.500	2.098	PER IMP= .00
DIVIDE HYD	101.00	1	1	.02600	38.40	1.075	.77523	1.500	2.308	
	.00	AND	16	.02600	3.49	.098	.07048	1.500	.210	
ROUTE	101.80	1	2	.02600	36.46	1.075	.77528	1.550	2.191	
COMPUTE NM HYD	108.30	-	1	.14780	312.33	14.570	1.84830	1.550	3.302	PER IMP= 57.00
DIVIDE HYD	108.30	1	1	.14780	327.95	15.298	1.94071	1.550	3.467	
	.00	AND	16	.14780	15.62	.728	.09241	1.550	.165	
ADD HYD	108.39	1& 2	3	.17380	364.41	16.373	1.76636	1.550	3.276	
ROUTE	108.38	3	2	.17380	357.91	16.373	1.76637	1.550	3.218	
COMPUTE NM HYD	108.20	-	7	.17100	376.60	17.296	1.89651	1.500	3.441	PER IMP= 61.17
DIVIDE HYD	108.20	7	7	.17100	395.43	18.161	1.99133	1.500	3.613	
	.00	AND	16	.17100	18.83	.865	.09483	1.500	.172	
*S COMBINE HYD'S 108.38 AND 108.2										
ADD HYD	108.29	7& 2	7	.34480	752.47	34.534	1.87793	1.550	3.410	
COMPUTE NM HYD	102.00	-	2	.28100	370.96	17.592	1.17382	1.550	2.063	PER IMP= 31.00
DIVIDE HYD	102.00	2	2	.28100	389.50	18.471	1.23250	1.550	2.166	
	.00	AND	16	.28100	18.55	.880	.05869	1.550	.103	
ROUTE	102.80	2	3	.28100	391.90	18.471	1.23251	1.600	2.179	
COMPUTE NM HYD	108.10	-	4	.17130	431.18	18.153	1.98693	1.500	3.933	PER IMP= 67.00
DIVIDE HYD	108.10	4	4	.17130	452.74	19.060	2.08627	1.500	4.130	
	.00	AND	16	.17130	21.56	.908	.09935	1.500	.197	
ADD HYD	108.17	4& 3	2	.45230	753.68	37.531	1.55585	1.550	2.604	
ROUTE	108.18	2	8	.45230	743.28	37.531	1.55585	1.550	2.568	
ADD HYD	108.90	7& 8	9	.79710	1495.75	72.065	1.69518	1.550	2.932	
ROUTE RESERVOIR	502.00	9	10	.79710	308.18	72.060	1.69506	2.100	.604	AC-FT= 46.636
COMPUTE NM HYD	109.00	-	1	.07200	188.50	8.466	2.20466	1.500	4.091	PER IMP= 82.00
DIVIDE HYD	109.00	1	1	.07200	197.93	8.889	2.31489	1.500	4.295	
	.00	AND	16	.07200	9.43	.423	.11023	1.500	.205	
ROUTE	109.19	1	6	.07200	194.20	8.889	2.31490	1.500	4.214	
COMPUTE NM HYD	109.10	-	1	.04950	134.34	5.954	2.25532	1.500	4.241	PER IMP= 85.00
DIVIDE HYD	109.10	1	1	.04950	141.06	6.252	2.36808	1.500	4.453	
	.00	AND	16	.04950	6.72	.298	.11277	1.500	.212	
ADD HYD	109.39	6& 1	6	.12150	335.26	15.141	2.33656	1.500	4.311	
ADD HYD	109.49	6& 5	6	.26410	717.11	31.380	2.22788	1.500	4.243	
ADD HYD	109.59	6&10	6	1.06120	765.45	103.441	1.82766	1.500	1.127	
ROUTE RESERVOIR	501.00	6	10	1.06120	100.43	101.931	1.80099	2.800	.148	AC-FT= 31.562
FINISH										

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*  AMOLE DEL NORTE STORM DRAIN FACILITIES PHASE III D MODEL - DECEMBER 1995
*    FULLY DEVELOPED CONDITIONS  100 YEAR, 6 HOUR STORM
*  GREINER JN E30000114
* COA PROJECT 4076.92
*  This model is an update of the previous HYMO model for the Amole Del
*    Norte drainage system.  The HYMO was done in 1990.  Basin
*    areas have been revised somewhat due to the current condition changing
*    from 1990 and incorporation of newer Master Drainage Reports for
*    the area
*  ------------------------------------------------------------------
*  Developed conditions are to be modeled.  This was done by assuming
*    concrete trapazoidal channels for routing purposes using the
*    existing slopes and lengths.  channels - 10'bottom w/ 2:1 ss
*  ------------------------------------------------------------------
*  Station references are from Amole Del Norte Storm Diversion Facilities
*  Tierra Bayita Drainage Facilities Phases IIIB or IIIA
*******************************************************************
*S  100 YEAR, 6 HOUR STORM
RAINFALL              TYPE=1   QUARTER HR = 0  ONE HR RAIN=1.90
                      SIX HR RAIN=2.21   TWENTYFOUR HR RAIN=2.70
*
*S ALL FLOWS INCLUDE A 2% BULKING FACTOR
SEDIMENT BULK         CODE=1  BULKING FACTOR = 1.02
*
COMPUTE NM HYD        ID=11  HYD=11D  AREA=0.0250   PER A=100  PER B=0
                      PER C=0   PER D=0   TP=0.1333  MASS RAIN=-1
PRINT HYD             ID=11  CODE=1
*
COMPUTE NM HYD        ID=10  HYD=10D  AREA=0.0336   PER A=84  PER B=0
                      PER C=8   PER D=8  TP=0.1333  MASS RAIN=-1
PRINT HYD             ID=10  CODE=1
*
*ADD FLOW FROM 10D AND 11D
*    EXISTING CONDITION - THESE FLOWS ENTER 12D NEAR EACH OTHER AND CROSS
*     12D TO A POINT WHERE THEY COMBINE. - FOR DEVELOPED MODEL ADD
*     HYDROGRAPHS THEN ROUTE THROUGH 12D IN AN ASSUMED CONCRETE CHANNEL
*     TO SIMULATE DEVELOPED CONDITIONS ·
ADD HYD               ID=1   HYD=10.1  ID=10  ID=11
PRINT HYD             ID=1  CODE=1
*
*ROUTE COMBINED 11/10 FLOW THROUGH 12D - USE 10 FT BOTTOM/ 2:1 SIDE SLOPE
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=0
                      MAX ELEV=6  CH SLOPE=0.0255  FP SLOPE=0.0255
                      N=0.013   DIST=34
                      DIST ELEV
                       0    6
                       12   0
                       22   0
                       34   6
COMPUTE TRAVEL TIME ID=2  REACH NO=1  NOVS=1  L=4000  SLP=0.0255
ROUTE                 ID=2  HYD=R1  INFLOW ID=1  DT=0.0
PRINT HYD             ID=2  CODE=1
*
COMPUTE NM HYD        ID=12  HYD=12D  AREA=0.2407   PER A=1  PER B=19
                      PER C=15   PER D=65  TP=0.2051  MASS RAIN=-1
PRINT HYD             ID=12  CODE=1
*
*ADD 12D AND ROUTED 11&10
ADD HYD               ID=4  HYD=R12  ID=12  ID=2
PRINT HYD             ID=4  CODE=1
*
*ADD A DIVIDE HYD HERE TO SIMULATE LIMITING THE FLOW TO THE DOWNSTREAM
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*  SYSTEM TO 331 CFS - WHICH WAS THE ORIGINAL DESIGN FLOW
*  IN THE FUTURE COA IS PLANNING ON PROBABLY BUILDING A POND TO LIMIT FLOW
DIVIDE HYD          ID=4  Q=315   ID=3  HYD=PIPE
                                  ID=5  HYD=POND
PRINT HYD           ID=3  CODE=1
PRINT HYD           ID=5  CODE=1
*
*ROUTE THROUGH 66INCH STORM DRAIN - USE FRICTION SLOPE INSTEAD OF PIPE SLOPE
COMPUTE RATING CURVE CID=1  VSNO=1  CODE= -1  SLP=0.0038
                     DIA=66    N=0.013
COMPUTE TRAVEL TIME ID=4  REACH NO=1  NOVS=1  L=630  SLP=0.0038
ROUTE               ID=4  HYD=RR12  INFLOW ID=3  DT=0.0
PRINT HYD           ID=4  CODE=1
*
*s RECALL FLOW FROM AMOLE DEL NORTE PHASE IIIC - DETENTION BASINS
RECALL HYD          ID=10 HYD=      501.00 DT=  .050000 HRS DA=   1.0612 SM
                    PEAK=     97.003CFS  RO= 1.8009 INCHES  NO PTS=600
                    FLOW RATES
                      .000       .000       .000       .000       .000
                      .000       .000       .000       .000       .000
                      .000       .000       .000       .000       .000
                      .000       .000       .000       .000       .000
                      .000       .000       .000       .000       .039
                      .443      2.000      5.064      5.630     15.910
                    30.855     38.966     45.067     48.996     52.226
                    55.002     56.732     58.292     59.709     61.000
                    62.177     63.386     64.835     66.377     67.693
                    68.710     69.473     70.043     70.466     70.776
                    71.001     71.185     71.357     71.517     71.669
                    71.812     71.948     84.498     95.031     97.003
                    96.932     96.408     95.844     95.338     94.890
                    94.505     94.183     93.910     93.656     93.401
                    93.163     92.971     92.815     92.661     92.507
                    92.378     92.252     92.103     91.946     91.786
                    91.644     91.513     91.377     91.236     91.110
                    91.008     90.895     90.778     90.678     90.584
                    90.495     90.402     90.295     90.194     90.007
                    89.662     89.252     88.838     88.416     87.976
                    87.540     87.121     86.705     86.294     85.898
                    85.515     85.125     84.716     84.307     83.916
                    83.546     83.190     82.834     82.451     82.042
                    81.649     81.281     80.908     80.512     80.117
                    79.752     79.413     79.223     79.268     79.370
                    79.363     79.227     78.998     78.712     78.380
                    78.026     77.678     77.316     76.932     76.541
                    76.135     75.722     75.319     74.945     74.584
                    74.190     73.772     73.377     73.009     72.646
                    72.268     71.999     71.996     71.992     71.985
                    71.977     71.967     71.955     71.942     71.925
                    71.907     71.885     71.861     71.835     71.806
                    71.775     71.741     71.705     71.667     71.626
                    71.583     71.538     71.491     71.442     71.390
                    71.336     71.281     71.223     71.164     71.102
                    71.039     70.973     70.906     70.837     70.767
                    70.695     70.621     70.547     70.470     70.392
                    70.312     70.232     70.149     70.065     69.980
                    69.894     69.806     69.717     69.627     69.535
                    69.442     69.348     69.253     69.157     69.059
                    68.960     68.860     68.759     68.657     68.554
                    68.450     68.343     68.234     68.124     68.011
                    67.896     67.779     67.660     67.539     67.417
                    67.292     67.166     67.038     66.909     66.778
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66.645	66.511	66.375	66.238	66.099
65.959	65.818	65.676	65.532	65.387
65.241	65.093	64.945	64.795	64.645
64.493	64.341	64.187	64.033	63.853
63.666	63.479	63.290	63.101	62.911
62.720	62.529	62.336	62.142	61.946
61.749	61.551	61.352	61.152	60.951
60.749	60.546	60.342	60.137	59.932
59.726	59.520	59.313	59.105	58.897
58.688	58.479	58.270	58.060	57.850
57.640	57.430	57.219	57.008	56.797
56.586	56.375	56.164	55.953	55.742
55.531	55.320	55.109	54.856	54.557
54.259	53.962	53.666	53.371	53.077
52.784	52.492	52.201	51.911	51.621
51.333	51.046	50.759	50.474	50.190
49.906	49.625	49.344	49.064	48.785
48.508	48.232	47.957	47.683	47.410
47.139	46.870	46.601	46.334	46.068
45.804	45.541	45.280	45.019	44.760
44.502	44.246	43.991	43.738	43.486
43.235	42.980	42.627	42.278	41.931
41.588	41.248	40.911	40.577	40.247
39.919	39.595	39.273	38.955	38.639
38.327	38.017	37.711	37.407	37.106
36.808	36.513	36.221	35.933	35.646
35.363	35.082	34.803	34.528	34.255
33.984	33.716	33.451	33.189	32.929
32.672	32.417	32.165	31.915	31.668
31.423	31.180	30.941	30.703	30.468
30.235	30.004	29.776	29.550	29.326
29.104	28.885	28.668	28.453	28.240
28.030	27.821	27.614	27.410	27.207
27.007	26.477	25.950	25.438	24.942
24.461	23.995	23.542	23.102	22.676
22.263	21.863	21.474	21.096	20.729
20.373	20.028	19.693	19.368	19.052
18.746	18.449	18.160	17.878	17.605
17.341	17.085	16.837	16.595	16.360
16.131	15.910	15.696	15.486	15.284
15.086	14.895	14.709	14.529	14.353
14.182	14.016	13.855	13.700	13.548
13.400	13.257	13.117	12.981	12.848
12.719	12.594	12.473	12.356	12.241
12.130	12.021	11.916	11.813	11.712
11.614	11.519	11.427	11.337	11.249
11.164	11.082	11.001	10.922	10.844
10.768	10.695	10.624	10.556	10.489
10.424	10.360	10.298	10.237	10.177
10.120	10.063	10.007	9.952	9.897
9.845	9.795	9.746	9.699	9.653
9.607	9.562	9.517	9.475	9.434
9.393	9.351	9.301	9.234	9.149
9.052	8.948	8.839	8.728	8.615
8.499	8.383	8.265	8.146	8.026
7.906	7.786	7.665	7.544	7.423
7.302	7.182	7.061	6.942	6.823
6.704	6.586	6.468	6.349	6.231
6.113	6.000	5.993	5.987	5.980
5.973	5.967	5.960	5.952	5.945
5.938	5.930	5.923	5.915	5.907
5.899	5.891	5.883	5.875	5.867

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                    5.859     5.851     5.842     5.834     5.826
                    5.817     5.809     5.800     5.791     5.783
                    5.774     5.765     5.757     5.748     5.739
                    5.730     5.721     5.712     5.703     5.695
                    5.686     5.677     5.668     5.659     5.650
                    5.641     5.632     5.623     5.614     5.604
                    5.595     5.586     5.577     5.568     5.559
                    5.550     5.541     5.532     5.523     5.514
                    5.505     5.496     5.487     5.478     5.468
                    5.459     5.450     5.441     5.432     5.423
                    5.414     5.405     5.396     5.387     5.378
                    5.369     5.360     5.351     5.342     5.333
                    5.324     5.315     5.306     5.298     5.289
                    5.280     5.271     5.262     5.253     5.244

COMPUTE NM HYD      ID=19  HYD=19D  AREA=0.0897   PER A=0 PER B=15
                    PER C=10   PER D=75  TP=0.1714  MASS RAIN=-1
PRINT HYD           ID=19  CODE=1
*
*ADD 19D AND OUTFLOW FROM DETENTION BASINS
ADD HYD             ID=5  HYD=19.1  ID=19  ID=10
PRINT HYD           ID=5  CODE=1
*
*ROUTE FLOW ALONG CENTRAL FROM 98TH ST TO 90TH ST IN 66INCH STORM DRAIN
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.024
                    DIA=66    N=0.013
COMPUTE TRAVEL TIME ID=6  REACH NO=1  NOVS=1  L=2550  SLP=.024
ROUTE               ID=6  HYD=R19.1  INFLOW ID=5  DT=0.0
PRINT HYD           ID=6  CODE=1
*
*ADD ROUTED FLOW FROM 12D, 10D and 11D
ADD HYD             ID=7  HYD=19.2   ID=6  ID=4
PRINT HYD           ID=7  CODE=1
*
*ROUTE FLOW TO STA 69+71 IN 84INCH STORM DRAIN
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.017
                     DIA=84    N=0.013
COMPUTE TRAVEL TIME ID=8  REACH NO=1  NOVS=1  L=813  SLP=0.017
ROUTE               ID=8  HYD=19.3  INFLOW ID=7  DT=0.0
PRINT HYD           ID=8  CODE=1
*
*REVISE BASIN 16 NORTH TO BRING FLOW FROM MOBILE HOMES BTWN 98TH AND 94TH
*   TO THE BRIDGE STORM DRAIN & REVISE AREA BTWN 94TH AND 90TH
*   PER SUNSET GARDENS/UNSER BLVD SD REPORT (AREA PREVIOUSLY IN 16SOUTH)
*AREA NORTH OF MOBILE HOMES FRONTING ON CENTRAL AVENUE
COMPUTE NM HYD      ID=1  HYD=16A  AREA=0.01282  PER A=0  PER B=10
                    PER C=5  PER D=85  TP=0.1333  MASS RAIN=-1
PRINT HYD           ID=1  CODE=1
*
*  MOUNTAIN VIEW MOBILE HOME PARK
COMPUTE NM HYD      ID=2  HYD=16F  AREA=0.03493  PER A=2  PER B=33
                    PER C=2  PER D=63  TP=0.134  MASS RAIN=-1
PRINT HYD           ID=2  CODE=1
*
*ADD BASINS 16A AND 16F
ADD HYD             ID=3  HYD=16F.1  ID=1  ID=2
PRINT HYD           ID=3  CODE=1
*
*ROUTE THIS FLOW DOWN BRIDGE TO BRING IT TO THE PROJECT THROUGH 16B
*    ASSUME IN A PIPE
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLOPE=0.01
                    DIA= 48  N=0.013
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COMPUTE TRAVEL TIME ID=4  REACH NO=1  NOVS=1  L=1300  SLP=0.01
ROUTE               ID=4  HYD=16F.2  INFLOW ID=3  DT=0.0
PRINT HYD           ID=4  CODE=1
*
COMPUTE NM HYD      ID=1  HYD=16B  AREA=0.01520   PER A=0  PER B=10
                    PER C=5  PER D=85   TP=0.1333  MASS RAIN=-1
PRINT HYD           ID=1  CODE=1
*
*ADD ROUTED 16A/16F FLOW TO 16B
ADD HYD             ID=3  HYD=16B.1  ID=1  ID=4
PRINT HYD           ID=3  CODE=1
*
COMPUTE NM HYD      ID=2  HYD=16G  AREA=0.02011   PER A=0  PER B=20
                    PER C=10  PER D=70  TP=0.1333  MASS RAIN=-1
PRINT HYD           ID=2  CODE=1
*
*ADD 16G FLOW
ADD HYD             ID=16  HYD=16G.1  ID=2  ID=3
PRINT HYD           ID=16  CODE=1
*
*ADD 16 FLOW TO STORM DRAIN
ADD HYD             ID=9  HYD=16.1  ID=16  ID=8
PRINT HYD           ID=9  CODE=1
*
*ROUTE STORM DRAIN FLOW TO 86TH STREET (STA 64+34)
*  USE FRICTION SLOPE IN THE PIPE
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.012
                     DIA=84    N=0.013
COMPUTE TRAVEL TIME ID=1  REACH NO=1  NOVS=1  L=537  SLP=0.012
ROUTE               ID=1  HYD=16.2  INFLOW ID=9  DT=0.0
PRINT HYD           ID=1  CODE=1
*
*BASIN ADJACENT TO BRIDGE BLVD INCLUDING HALF OF BRIDGE ROW
COMPUTE NM HYD      ID=10  HYD=16D  AREA=0.01119   PER A=0  PER B=10
                    PER C=5  PER D=85   TP=0.1333  MASS RAIN=-1
PRINT HYD           ID=10  CODE=1
*
*ADD THIS FLOW TO THE STORM DRAIN - SOUTH SIDE
ADD HYD             ID=1  HYD=16D.1  ID=1  ID=10
PRINT HYD           ID=1  CODE=1
*
COMPUTE NM HYD      ID=17  HYD=17W  AREA=0.0802   PER A=0  PER B=15
                    PER C=10  PER D=75  TP=0.1881  MASS RAIN=-1
PRINT HYD           ID=17  CODE=1
*
*DIVIDE FLOW FOR PORTION ENTERING SD AT 86TH AND PART ENTERING NEAR 82ND
DIVIDE HYD          ID=17  Q=82  ID=17  HYD=86TH
                                 ID=18 HYD=82TH
*ADD 17W TO STORM DRAIN FLOW - NORTH SIDE
ADD HYD             ID=2  HYD=17.1  ID=17  ID=1
PRINT HYD           ID=2  CODE=1
*
*ROUTE 84INCH STORM DRAIN FLOW STA 56+75 WHERE LINE IS UPSIZED TO 90INCH
*  USE FRICTION SLOPE
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.0045
                     DIA=84    N=0.013
COMPUTE TRAVEL TIME ID=3  REACH NO=1  NOVS=1  L=759  SLP=0.0045
ROUTE               ID=3  HYD=17.2  INFLOW ID=2  DT=0.0
PRINT HYD           ID=3  CODE=1
*
*ROUTE STORM DRAIN FLOW TO 82ND STREET (STA 53+70) IN 90INCH
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.012
```

```
                        DIA=90    N=0.013
COMPUTE TRAVEL TIME ID=4  REACH NO=1  NOVS=1  L=305  SLP=0.012
ROUTE               ID=4  HYD=17.3  INFLOW ID=3  DT=0.0
PRINT HYD           ID=4  CODE=1
*
*ADD FLOW FROM 17W AT 82ND STEET LOCATION (STA 53+70)
ADD HYD             ID=5  HYD=17.4  ID=4  ID=18
PRINT HYD           ID=5  CODE=1
*
*ADD FLOW FROM BRIDGEPOINT APARTMENTS (AREA BOUNDED BY 86TH, BRIDGE, 82ND
*   & SUNSET GARDENS - BASIN INFORMATION FROM CONCEPTUAL GRADING & DRAINAGE
*   PLAN FOR BRIDGEPOINT APARTMENTS MARCH 1995 BY COMMUNITY SCIENCES
COMPUTE NM HYD      ID=6  HYD=BPD  AREA=0.0342   PER A=0 PER B=25
                    PER C=25  PER D=50  TP=0.1333  MASS RAIN=-1
PRINT HYD           ID=6  CODE=1
*
*ADD TO FLOW IN STORM DRAIN
ADD HYD             ID=7  HYD=6.1  ID=6  ID=5
PRINT HYD           ID=7  CODE=1
*
*ROUTE STORM DRAIN FLOW TO UNSER BLVD. (STA 41+06)
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.012
                        DIA=90    N=0.013
COMPUTE TRAVEL TIME ID=8  REACH NO=1  NOVS=1  L=1264  SLP=0.012
ROUTE               ID=8  HYD=6.2  INFLOW ID=7  DT=0.0
PRINT HYD           ID=8  CODE=1
*
COMPUTE NM HYD      ID=21  HYD=21D  AREA=0.0101   PER A=0 PER B=25
                    PER C=5  PER D=70  TP=0.1333  MASS RAIN=-1
PRINT HYD           ID=21  CODE=1
*ADD 21D NORTH FLOW TO STORM DRAIN
ADD HYD             ID=6  HYD=21.1  ID=21  ID=8
PRINT HYD           ID=6  CODE=1
*   ------------------------------------------------------------
*s UNSER BOULEVARD FLOWS TO CHANNEL - FLOW FROM NORTH OF BRIDGE BLVD
*
*s THE FOLLOWING HYDROGRAPH IS TAKEN FROM THE MASTER DRAINAGE PLAN FOR THE
*s  ATRISCO BUSINESS PARK - SEPTEMBER 1992 & REVISED MARCH 1993 & SEPT 1993
*s  by Easterling and Associates  & REPRESENTS THE ENTIRE UNSER DIVERSION
*
RECALL HYD          ID= 2 HYD= 180.16 DT=  .050000 HRS DA=    .6789 SQ MI
                    PEAK=    248.301CFS  RO= 2.0374 INCHES  NO PTS=561
                    FLOW RATES
```

.000	.000	.000	.000	.000
.000	.000	.000	.000	.000
.000	.000	.000	.000	.000
.000	.000	.000	.000	.000
.000	.000	.000	.000	.000
.000	.000	.000	.190	2.607
15.681	52.706	94.629	130.751	179.000
222.374	248.301	242.350	233.146	229.654
226.551	222.642	219.306	216.954	214.894
213.362	212.455	209.391	203.507	198.669
199.114	200.160	201.946	205.697	211.556
217.013	220.800	223.673	225.619	226.601
226.804	226.312	225.212	223.520	221.330
218.733	215.818	212.634	209.194	205.557
201.783	197.931	194.053	190.261	186.446
182.991	180.488	178.390	176.122	173.838
171.586	169.319	166.424	163.146	160.027
156.929	153.920	150.945	148.040	145.123
134.843	92.294	88.602	91.040	87.107
88.199	85.848	85.857	84.316	83.861

82.657	81.833	80.707	79.841	78.850
77.971	77.036	76.136	75.215	74.326
73.422	72.442	71.302	70.095	68.924
67.761	66.560	65.360	64.175	62.986
61.779	60.276	58.142	55.697	53.376
51.113	48.896	46.831	44.865	42.875
40.778	38.632	36.589	34.670	32.782
30.939	29.100	27.213	25.383	23.739
22.102	19.794	16.958	14.696	13.463
12.935	12.693	12.561	12.490	12.435
12.393	12.364	12.340	12.313	12.284
12.253	12.210	12.163	12.136	12.110
12.070	12.032	11.999	11.969	11.941
11.913	11.874	11.828	11.789	11.753
11.717	11.682	11.645	11.610	11.579
11.552	11.515	11.476	11.455	11.434
11.397	11.360	11.315	11.276	11.250
11.212	11.176	11.153	11.120	11.077
11.044	11.016	10.990	10.963	10.935
10.906	10.866	10.824	10.799	10.774
10.736	10.700	10.666	10.635	10.606
10.579	10.555	10.531	10.499	10.461
10.443	10.435	10.410	10.372	10.340
10.313	10.289	10.264	10.225	10.180
10.153	10.137	10.105	10.063	10.038
10.018	9.987	9.961	9.938	9.916
9.896	9.874	9.843	9.816	9.802
9.776	9.741	9.723	9.715	9.694
9.661	9.634	9.612	9.593	9.574
9.553	9.531	9.497	9.458	9.438
9.428	9.402	9.366	9.346	9.328
9.301	9.276	9.255	9.236	9.217
9.196	9.165	9.139	9.126	9.102
9.080	9.070	9.047	9.016	8.990
8.967	8.947	8.939	8.937	8.918
8.876	8.837	8.820	8.817	8.808
8.791	8.769	8.740	8.707	8.694
8.684	8.660	8.646	8.632	8.604
8.580	8.560	8.543	8.527	8.510
8.494	8.478	8.453	8.433	8.425
8.406	8.388	8.381	8.361	8.331
8.308	8.289	8.282	8.282	8.266
8.237	8.217	8.204	8.194	8.184
8.170	8.141	8.107	8.088	8.081
8.068	8.041	8.007	7.992	7.992
7.979	7.955	7.946	7.938	7.918
7.901	7.885	7.869	7.854	7.837
7.822	7.807	7.793	7.780	7.760
7.742	7.736	7.720	7.691	7.677
7.674	7.657	7.629	7.617	7.618
7.609	7.586	7.566	7.553	7.540
7.527	7.512	7.495	7.479	7.465
7.452	7.440	7.431	7.423	7.403
7.375	7.364	7.368	7.364	7.340
7.310	7.298	7.287	7.268	7.260
7.252	7.232	7.224	7.218	7.201
7.185	7.173	7.161	7.151	7.141
7.128	7.116	7.107	7.096	7.075
7.058	7.055	7.041	7.025	7.021
7.004	6.977	6.967	6.971	6.957
6.931	6.912	6.909	6.916	6.909
6.886	6.867	6.856	6.847	6.836

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                    6.824     6.810     6.796     6.782     6.771
                    6.763     6.754     6.746     6.742     6.737
                    6.719     6.694     6.686     6.689     6.684
                    6.664     6.635     6.623     6.627     6.616
                    6.595     6.587     6.581     6.565     6.560
                    6.555     6.539     6.532     6.530     6.515
                    6.499     6.489     6.482     6.473     6.460
                    6.448     6.437     6.428     6.419     6.397
                    6.381     6.382     6.382     6.372     6.353
                    6.338     6.337     6.329     6.320     6.321
                    6.306     6.282     6.276     6.282     6.273
                    6.248     6.227     6.214     6.215     6.224
                    6.214     6.189     6.171     6.164     6.158
                    6.150     6.140     6.129     6.114     6.102
                    6.092     6.083     6.078     6.070     6.065
                    6.063     6.044     5.886     5.529     5.147
                    4.835     4.520     4.142     3.718     3.300
                    2.917     2.568     2.250     1.966     1.715
                    1.500     1.316     1.156     1.014      .890
                     .782      .689      .609      .539      .479
                     .426      .380      .339      .304      .272
                     .244      .220      .198      .178      .161
                     .145      .130      .117      .106      .095
                     .086      .077      .070      .063      .057
                     .051      .046      .042      .038      .034
                     .031      .027      .025      .022      .019
                     .017      .015      .014      .012      .011
                     .010      .009      .007      .007      .006
                     .006      .005      .005      .004      .004
                     .003      .003      .003      .002      .002
                     .002      .002      .002      .001      .001
                     .001
*
*ROUTE FLOW SOUTH IN UNSER BLVD - 72INCH STORM DRAIN
*
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.0100
                     DIA=72    N=0.013
COMPUTE TRAVEL TIME ID=3  REACH NO=1  NOVS=1  L=1225  SLP=0.01
ROUTE               ID=3  HYD=R2  INFLOW ID=2  DT=0.0
PRINT HYD           ID=3  CODE=1
*
*ROUTE FLOW TO LOCATION WHERE BASIN 13 TIES IN - PIPE IS UPSIZED TO 78INCH
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.004
                     DIA=78    N=0.013
COMPUTE TRAVEL TIME ID=4  REACH NO=1  NOVS=1  L=209  SLP=0.004
ROUTE               ID=4  HYD=R3  INFLOW ID=3  DT=0.0
PRINT HYD           ID=4  CODE=1
*
COMPUTE NM HYD      ID=13  HYD=13D  AREA=0.1664   PER A=0  PER B=15
                    PER C=5  PER D=80  TP=0.2098  MASS RAIN=-1
PRINT HYD           ID=13  CODE=1
*
*ROUTE BASIN 13 FLOWS THROUGH EARTHEN CHANNEL TO UNSER STORM DRAIN
*
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=5089
                    MAX ELEV=5090  CH SLOPE=0.007  FP SLOPE=0.007
                    N=0.03   DIST=15
                    DIST ELEV
                     0   5090
                     3   5089
                     12  5089
                     15  5090
```

```
COMPUTE TRAVEL TIME ID=5  REACH NO=1  NOVS=1  L=230  SLP=0.007
ROUTE               ID=5  HYD=R13  INFLOW ID=13  DT=0.0
PRINT HYD           ID=5  CODE=1
*
*ADD BASIN 13 TO FLOWS IN UNSER STORM DRAIN
ADD HYD             ID=5  HYD=13.1  ID=5  ID=4
PRINT HYD           ID=5  CODE=1
*
COMPUTE NM HYD      ID=17  HYD=17E  AREA=0.0651   PER A=0  PER B=10
                    PER C=10  PER D=80  TP=0.1333  MASS RAIN=-1
PRINT HYD           ID=17  CODE=1
*
*ADD 17E FLOW TO STORM DRAIN FLOW
ADD HYD             ID=7  HYD=17.1  ID=17  ID=5
PRINT HYD           ID=7  CODE=1
*
*ROUTE FLOWS IN 96INCH UNSER STORM DRAIN
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.004
                     DIA=96    N=0.013
COMPUTE TRAVEL TIME ID=8  REACH NO=1  NOVS=1  L=1711  SLP=0.004
ROUTE               ID=8  HYD=R6  INFLOW ID=7  DT=0.0
PRINT HYD           ID=8  CODE=1
*
*S FLOW FROM NORTH ON UNSER TO CHANNEL - ADD TO FLOW FROM BRIDGE
ADD HYD             ID=9  HYD=CHANNEL  ID=8  ID=6
PRINT HYD           ID=9  CODE=1
*
*    ____________________________________________________
*
*s UNSER BLVD - FLOW FROM SOUTH OF BRIDGE EMPTYING TO THE CHANNEL
*
*s THE FOLLOWING IS TAKEN FROM SUNSET GARDENS/UNSER BLVD STORM DRAIN
*s   DESIGN ANALYSIS REPORT, DATED 12/5/97  BY RYALS ENGINEERING AND
*s   CONSTRUCTION SERVICES AS REVISED BY TUCKER GREEN, PER SE ENGENEERING
*****************************************************************************
*
* URS GREINER RECEIVED file (tg386) csgif00d.dat    1-7-98   T. Green
       ON 20 FEBRUARY, 1998 TO INCORPORATE IN THIS MODEL - ONLY THE FUTURE
       FULLY-DEVELOPED CONDITION WAS USED
* THE SUNSET GARDENS STORM DRAIN RUNS ALONG SUNSET GARDENS, THEN TO UNSER
*  THEN NORTH TO THE HEAD OF THE AMOLE CHANNEL. A FULLY DEVELOPED BASIN Y
*  CONTRIBUTES TO THIS FLOW, AS DO BASINS V (POINTE WEST), W, & X.
*
* CONDITONS BASED ON CURRENT ZONING & DEVELOPMENT, CURRENT DEVELOPMENT PLANS,
* AND ON ENGINEERING JUDGMENT.
*C REVISION NOTES: BASED ON FILES VCF4100 & SGU100.DAT BY TUCKER GREEN P.E.
*C                 REVISED 10-15-97 TO REFLECT NEW BASIN BOUNDARIES BASED ON
*C                 DISCUSSION WITH THE CITY, THE ENGINEERS FOR SAD 222, AND
*C                 DEVELOPERS OF NEARBY PROPERTIES, ESPECIALLY BASINS V & W.
*C                 IN PARTICULAR: (1) BASIN M (S OF SUNSET GARDENS, BETWEEN
*C                 94TH & 98TH) IS REMOVED FROM INTERIM & FUTURE CONDTION
CASES
*C                 BY PROPOSED CONSTRUCTION OF 94TH ST; AND (2) THE HIGH
POINT
*C                 IN 86 ST IS MOVED NORTH TO THE SOUTH PROPERTY LINE OF THE
*C                 CANTO III SITE (BASIN JYD).
*C               :
*C               : REVISED 1-7-98 FOR MORE IMPERVIOUS BASIN W (WHISPER
POINTE)
*C                 & LARGER BASIN X (ADD ECUARIZ & MORE UNSER R.O.W.)
*C               : REVISED 1-22-98 TO ADD 'INFO ONLY' HYD U+V, AND TO
*C                 PROVIDE DETAILED OUTPUT FOR BASINS T-Y, U.PLUS.V,
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*C                    SG.AT.82ND, AND 314 (SG.AT.82ND ROUTED TO UNSER)
*C
*****************************************************************************
*
COMPUTE NM HYD        ID= 1    HYD= I                DA=0.00952  SQ MI
                      PER A= 12      B= 26       C= 24       D= 38
                      TP= -0.13333 HRS   RAIN= -1
PRINT HYD             ID= 1   CODE= 1
*
*****************************************************************************
*
COMPUTE NM HYD        ID= 2    HYD= H                DA=0.01501  SQ MI
                      PER A= 0       B= 20       C= 10       D= 70
                      TP= -0.13333 HRS   RAIN= -1
PRINT HYD             ID= 2   CODE= 1
*
*****************************************************************************
*
* E PLUS H PLUS I AT SUNSET GARDENS & 90TH FOLLOWS
ADD HYD               ID OUT= 3   HYD= 208            IDIN I= 1   IDIN II= 2
PRINT HYD             ID= 3   CODE= 1
*
*****************************************************************************
*
*s DIVIDE SO 1ST 8.6 CFS (ID=6) S ON 90TH (ON HOLD): ID=4 E ON SUNSET GARDENS
DIVIDE HYD            ID=3  Q=8.6 ID=6 HYD= 90.S.PAST.SG  ID=4 HYD= SG.E.OF.90
PRINT HYD             ID= 4   CODE= 1
PRINT HYD             ID= 6   CODE= 1
*
*****************************************************************************
*
* ROUTE MAIN FLOW EAST DOWN SG FROM 90TH, FOLLOW IT TO 86TH ST
*C APPROX AS 40' F-F STREET, ASSUME APX 2.35% SLOPE
*C ASSUME AS IF BOTH SIDES PAVED, EST n AS .017
COMPUTE RATING CURVE CID= -1   VS NO= 1    NO SEGS FOR MANNING n= 1
                      ELMIN= 0 ELMAX= 4  FT  CHSLP= .0235  FPSLP= .0235  FT/FT
                      n .017  DIST 40
                      DIST  ELEV     DIST  ELEV    DIST  ELEV    DIST  ELEV
                      0      4       .01    0      20     .40    39.99    0
                      40     4
ROUTE MCUNGE          ID= 5   HYD= 209          INFLOW HYD ID= 4   DT= 0.0 HR
                      LENGTH= 1055     NSUBRCH= 0     SLOPE= .0235
                      MATCODE= 0       REGCODE= 0     CCODE= 0
PRINT HYD             ID= 5   CODE= 1
*
*****************************************************************************
*
COMPUTE NM HYD        ID= 1    HYD= J                DA=0.00228 SQ MI
                      PER A= 0       B= 15       C= 0        D= 85
                      TP= -0.13333 HRS   RAIN= -1
PRINT HYD             ID= 1   CODE= 1
*
*****************************************************************************
*
ADD HYD               ID OUT= 3  HYD= 210             IDIN I= 1   IDIN II= 5
PRINT HYD             ID= 3   CODE= 1
*
*****************************************************************************
*
* CALC CONTRIBUTING PART OF CANTO SITE; THEN ADD TO HYD 210
COMPUTE NM HYD        ID= 1   HYD=SITE.II        DA=0.00839 SQ MI
                      PER A= 0       B= 35       C= 0        D= 65
```

```
                        TP= -0.13333 HRS   RAIN= -1
PRINT HYD               ID= 1   CODE= 1
*
*****************************************************************************
*
*S PARTIAL WATERBLOCK ==> FLOW > 11.6cfs TO 86TH
DIVIDE HYD              ID=1  Q=11.6  ID=2 HYD=S2.TO.S3   ID=7 HYD=S2.TO.86TH
PRINT HYD               ID= 2   CODE= 1
PRINT HYD               ID= 7   CODE= 1
*
*****************************************************************************
*
COMPUTE NM HYD          ID= 1   HYD=SITE.III        DA=0.02360 SQ MI
                        PER A= 0      B= 35      C= 0       D= 65
                        TP= -0.13333 HRS   RAIN= -1
PRINT HYD               ID= 1   CODE= 1
*
*****************************************************************************
*
* TOTAL FLOW LEAVING CANTO NORTH OF SUNSET GARDENS
ADD HYD                 ID OUT= 16  HYD=SITE.OUT      IDIN I= 1   IDIN II= 2
PRINT HYD               ID= 16   CODE= 1
*
*****************************************************************************
*
*S TOTAL FLOW SUNSET GARDENS WEST OF 86TH
ADD HYD                 ID OUT= 5  HYD= SG.W.OF.86     IDIN I= 3   IDIN II= 16
PRINT HYD               ID= 5   CODE= 1
*
*****************************************************************************
*
COMPUTE NM HYD          ID= 1    HYD= C               DA=0.00127 SQ MI
                        PER A= 0      B= 10      C= 0       D= 90
                        TP= -0.13333 HRS   RAIN= -1
PRINT HYD               ID= 1   CODE= 1
*
*****************************************************************************
*
* ADD SPILL FROM S2 TO ROAD FLOW IN 86TH N OF SUNSET GARDENS
ADD HYD                 ID OUT= 3  HYD=   218          IDIN I= 1   IDIN II= 7
PRINT HYD               ID= 3   CODE= 1
*
*****************************************************************************
*
* COMBINED FLOW TO 86TH & SUNSET GARDENS FROM NORTH & WEST; HOLD FOR LATER
ADD HYD                 ID OUT= 7  HYD= 86&SG.N&W       IDIN I= 3   IDIN II= 5
PRINT HYD               ID= 7   CODE= 1
*
*****************************************************************************
*
*
*C BASIN NN (N North): CURRENTLY PARTLY DEVELOPED
COMPUTE NM HYD          ID= 1    HYD= NN              DA=0.01830  SQ MI
                        PER A= 28.0   B= 20.2    C= 15.4    D= 36.4
                        TP= -0.13333 HRS   RAIN= -1
PRINT HYD               ID= 1   CODE= 1
*
*****************************************************************************
*
* ADD IN HYD 90.S.PAST.SG, ('HELD' SPILL SOUTH OF SUNSET GDNS INTERSECTION)
ADD HYD                 ID OUT= 3  HYD= INTO.JYDN   IDIN I= 1   IDIN II= 6
PRINT HYD               ID= 3   CODE= 1
```

```
*
*****************************************************************************
*
* ROUTE NORTH PART OF OFFSITE THROUGH NORTH STREET IN JYD
* APPROX AS 28' F-F STREET, ASSUME APX 1.8% SLOPE
* ASSUME PAVED ROAD, EST n AS .017
COMPUTE RATING CURVE CID= -1   VS NO= 1    NO SEGS FOR MANNING n= 1
                     ELMIN= 0 ELMAX= 4  FT   CHSLP= .018   FPSLP= .018  FT/FT
                     n .017  DIST 28
                     DIST  ELEV     DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0      4       .01    0      14    .28    27.99    0
                     28     4
ROUTE MCUNGE         ID= 5   HYD= 300          INFLOW HYD ID= 3   DT= 0.0 HR
                     LENGTH= 1338     NSUBRCH= 0     SLOPE= .018
                     MATCODE= 0       REGCODE= 0     CCODE= 0
PRINT HYD            ID= 5 CODE= 1
*
*****************************************************************************
*
* BASIN NS (N South): CURRENTLY PARTLY DEVELOPED
COMPUTE NM HYD       ID= 1    HYD= NS                DA=0.01719  SQ MI
                     PER A= 16.0    B= 28.6    C= 8.8    D= 46.6
                     TP= -0.13333 HRS   RAIN= -1
PRINT HYD            ID= 1   CODE= 1
*
*****************************************************************************
*
* ROUTE SOUTH PART OF OFFSITE THROUGH SOUTH STREET IN JYD
*C APPROX AS 28' F-F STREET, ASSUME APX 2.0% SLOPE (STEEPER THAN NORTH)
*C ASSUME PAVED ROAD, EST n AS .017
COMPUTE RATING CURVE CID= -1   VS NO= 1    NO SEGS FOR MANNING n= 1
                     ELMIN= 0 ELMAX= 4  FT   CHSLP= .020   FPSLP= .020  FT/FT
                     n .017  DIST 28
                     DIST  ELEV     DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0      4       .01    0      14    .28    27.99    0
                     28     4
ROUTE MCUNGE         ID= 2   HYD= 302          INFLOW HYD ID= 1   DT= 0.0 HR
                     LENGTH= 1221     NSUBRCH= 0     SLOPE= .020
                     MATCODE= 0       REGCODE= 0     CCODE= 0
PRINT HYD            ID= 2 CODE= 1
*
*****************************************************************************
*
*C ADD NORTH & SOUTH ROUTED OFFSITE, THEN COMPUTE & ADD JYD
ADD HYD              ID OUT= 3  HYD= 304          IDIN I= 2   IDIN II= 5
PRINT HYD            ID= 3   CODE= 1
*
*****************************************************************************
*
COMPUTE NM HYD       ID= 17    HYD= JYD             DA=0.02353 SQ MI
                     PER A= 0      B= 35      C= 0       D= 65
                     TP= -0.13333 HRS   RAIN= -1
PRINT HYD            ID= 17   CODE= 1
*
*****************************************************************************
*
* TOTAL FLOW LEAVING JYD (CANTO III), INCLUDING 86TH ST ROW EAST OF JYD
ADD HYD              ID OUT= 4  HYD= JYD.E.AT.86   IDIN I= 3   IDIN II= 17
PRINT HYD            ID= 4   CODE= 1
*
*****************************************************************************
*
```

```
* ROUTE TO 86TH & SG INTERSECTION, ASSUME 48" PIPE W/ 1% FRICTION SLOPE
COMPUTE RATING CURVE CID= -1 VSN= 1  CODE= -1  S= .010   D= 4 FT   n= 0.013
ROUTE MCUNGE         ID= 5   HYD= 86.S.OF.SG   INFLOW HYD ID= 4   DT= 0.0 HR
                     LENGTH= 300      NSUBRCH= 0     SLOPE= .010
                     MATCODE= 0       REGCODE= 0     CCODE= 0
PRINT HYD            ID= 5 CODE= 1
*
*****************************************************************************
*
* COMBINED FLOWS AT 86TH & SUNSET GARDENS: RETRIEVE 'ON-HOLD' ID=7
ADD HYD              ID OUT= 6  HYD= TOT.SG&86     IDIN I= 5   IDIN II= 7
PRINT HYD            ID= 6   CODE= 1
*
*****************************************************************************
*
* ROUTE 86TH TO 82ND IN SUNSET GARDENS: CONC PIPE; Sf=.01 APX
* IF EST DIAM SMALL => TRAVEL FASTER => DNSTR PEAK HIGHER => CONSERVATIVE
* VALLEY SEGMENT & REACH NUMBERS ARE USER ID'S NOT USED BY PROG; DUMMIES HERE
COMPUTE RATING CURVE CID= -1   VS NO= 11   NO SEGS FOR MANNING n= -1
                     SLOPE= .01   DIAM= 5.0 FT   n= .013
COMPUTE TRAVEL TIME  ID= 5   REACH= 11   NO VS= 1   L= 1100 FT   S= .01
ROUTE                ID= 5   HYD= 308    IN ID= 6   DT= 0.0
PRINT HYD            ID= 5  CODE= 1
*****************************************************************************
*
* BASIN T
COMPUTE NM HYD       ID= 1    HYD= T              DA= .00467 SQ MI
                     PER A= 0      B= 15      C=  0      D= 85
                     TP= -0.13333 HRS   RAIN= -1
PRINT HYD            ID= 1   CODE= 1
*
*****************************************************************************
*
ADD HYD              ID OUT= 3  HYD= 310     IDIN I= 1   IDIN II= 5
PRINT HYD            ID= 3   CODE= 1
*
*****************************************************************************
*
* BASIN U
COMPUTE NM HYD       ID= 1    HYD= U              DA= .01032 SQ MI
                     PER A= 0      B= 30      C=  0      D= 70
                     TP= -0.13333 HRS   RAIN= -1
PRINT HYD            ID= 1   CODE= 1
*
*****************************************************************************
*
*
ADD HYD              ID OUT= 19   HYD= 312     IDIN I= 1   IDIN II= 3
PRINT HYD            ID= 19  CODE= 1
*
*****************************************************************************
*
* BASIN V: % IMPERV A LA POINTE WEST DESIGN & DENSITY
COMPUTE NM HYD       ID= 11    HYD= V              DA= .03200 SQ MI
                     PER A= 0      B= 50      C=  0      D= 50
                     TP= -0.13333 HRS   RAIN= -1
PRINT HYD            ID= 11   CODE= 1
*
*****************************************************************************
*
ADD HYD              ID OUT= 3  HYD= SG.AT.82ND    IDIN I= 11   IDIN II= 19
PRINT HYD            ID= 3   CODE= 1
```

```
*
*****************************************************************************
*
*  ROUTE TO UNSER IN CONC PIPE; Sf=.01 APX AVG
*  IF EST DIAM SMALL => TRAVEL FASTER => DNSTR PEAK HIGHER => CONSERVATIVE
*  VALLEY SEGMENT & REACH NUMBERS ARE USER ID'S ONLY; DUMMIES HERE
*  AVAIL SLOPE BTW UNSER/AMOLE & SG/82 APX .01 AVG.
COMPUTE RATING CURVE CID= -1   VS NO= 11   NO SEGS FOR MANNING n= -1
                     SLOPE= .01   DIAM= 5.5 FT   n= .013
COMPUTE TRAVEL TIME  ID= 5   REACH= 11   NO VS= 1   L= 1100 FT   S= .01
ROUTE                ID= 5   HYD= 314    IN ID= 3   DT= 0.0
PRINT HYD            ID= 5  CODE= 1
*****************************************************************************
*
*C BASIN W: WHISPER POINTE SUBDIVISION UNDER DESIGN MARK GOODWIN & ASSOC
*C % IMPERV (PER D) REVISED 1-7-98 PER GOODWIN LETTER OF 11-29-97: Qp APX 77
*C BASIN W IS ONLY BASIN W Tp (&Tc) > REGULATORY MINIMUM
COMPUTE NM HYD       ID= 12    HYD= W              DA= .03422 SQ MI
                     PER A= 0      B= 40      C=  0      D= 60
                     TP= -0.13333 HRS   RAIN= -1
*C                     TP= -0.16325 HRS   RAIN= -1
PRINT HYD            ID= 12   CODE= 1
*
*****************************************************************************
*
ADD HYD              ID OUT= 3  HYD= 316     IDIN I= 12   IDIN II= 5
PRINT HYD            ID= 3   CODE= 1
*
*****************************************************************************
*
* BASIN X: R.O.W. FOR SUNSET GARDENS AND (LIMITED ACCESS) UNSER & EUCARIZ
*C BASIN BOUNDARY REVISED 1-7-98; OLD AREA WAS 0.00674 SQ MI
COMPUTE NM HYD       ID= 13    HYD= X              DA= .01058 SQ MI
                     PER A= 0      B= 20      C=  0      D= 80
                     TP= -0.13333 HRS   RAIN= -1
PRINT HYD            ID= 13   CODE= 1
*
*****************************************************************************
*
ADD HYD              ID OUT= 4  HYD= SG.AT.UNSER   IDIN I= 13   IDIN II= 3
PRINT HYD            ID= 4   CODE= 1
*
*****************************************************************************
*
* ROUTE TO UNSER 340 FT N OF SG (APX HALF DIST TO AMOLE CHAN); Sf=.01 APX
* EST DIAM SMALL => TRAVEL FASTER => DNSTR PEAK HIGHER => CONSERVATIVE
* VALLEY SEGMENT & REACH NUMBERS ARE USER ID'S ONLY; DUMMIES HERE
COMPUTE RATING CURVE CID= -1   VS NO= 11   NO SEGS FOR MANNING n= -1
                     SLOPE= .01   DIAM= 6.0 FT   n= .013
COMPUTE TRAVEL TIME  ID= 5   REACH= 11   NO VS= 1   L= 340  FT   S= .01
ROUTE                ID= 5   HYD= 318    IN ID= 4   DT= 0.0
PRINT HYD            ID= 5  CODE= 1
*****************************************************************************
*
* BASIN Y DEVELOPED: EST ENTIRE SITE; ZONING = O-1; USE % IMPERV AS FOR C-2
* WHEN BUILT, N APX 200' POSS DRAIN TO BRIDGE PER GREINER FOR BRIDGE BLVD SD
*  REV ORIGINAL AREA OF .02964 2/26/98 URS GREINER -  ASSUME 0.0101 SM
* WILL DRAIN TO BRIDGE BLVD SD- BASIN 21D ALONG BRIDGE FRONTAGE
COMPUTE NM HYD       ID= 14    HYD= Y              DA= .01954 SQ MI
                     PER A= 0      B= 10      C= 5      D= 85
                     TP= -0.13333 HRS   RAIN= -1
PRINT HYD            ID= 14   CODE= 1
```

```
*
*****************************************************************************
*
*s TOTAL FLOW FROM UNSER APROX 300' S OF AMOLE CHANNEL
*   ADD TO FLOW FROM BRIDGE & UNSER NORTH
ADD HYD              ID OUT= 7  HYD= FUT.TO.AMOLE   IDIN I= 14   IDIN II= 5
PRINT HYD            ID= 7   CODE= 1
*
*****************************************************************************
*
*S  TOTAL FLOW TO HEAD OF CONCRETE CHANNEL
*ADD SUNSET GARDENS/UNSER BLVD FLOW TO CHANNEL
ADD HYD              ID=5  HYD=CHANNEL  ID=7  ID=9
PRINT HYD            ID=5  CODE=1
*_____________________________________________________________
* ROUTE FLOW DOWN CONCRETE TRAPAZOIDAL CHANNEL PARALLEL TO BRIDGE BLVD.
*   STA 41+06 TO STA 30+25
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=0
                     MAX ELEV=7.5  CH SLOPE=0.004  FP SLOPE=0.004
                     N=0.013   DIST=40
                     DIST  ELEV
                     0      7.5
                     15     0
                     25     0
                     40     7.5
COMPUTE TRAVEL TIME ID=6  REACH NO=1  NOVS=1  L=1081  SLP=0.004
ROUTE                ID=6  HYD=R5  INFLOW ID=5  DT=0.0
PRINT HYD            ID=6  CODE=1
*
COMPUTE NM HYD       ID=18  HYD=18W  AREA=0.1122   PER A=0   PER B=27
                     PER C=5  PER D=68  TP=0.1817  MASS RAIN=-1
PRINT HYD            ID=18  CODE=1
*
*ADD BASIN 18W TO CHANNEL FLOW
ADD HYD              ID=7  HYD=18.1  ID=18   ID=6
PRINT HYD            ID=7  CODE=1
*
*ROUTE FLOW DOWN CHANNEL STA 31+25 TO 23+50
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=0
                     MAX ELEV=6.5  CH SLOPE=0.0144  FP SLOPE=0.0144
                     N=0.013   DIST=36
                     DIST  ELEV
                     0      6.5
                     13     0
                     23     0
                     36     6.5
COMPUTE TRAVEL TIME ID=8  REACH NO=1  NOVS=1  L=775   SLP=0.0144
ROUTE                ID=8  HYD=R7  INFLOW ID=7  DT=0.0
PRINT HYD            ID=8  CODE=1
*
COMPUTE NM HYD       ID=21  HYD=21E  AREA=0.0656   PER A=0   PER B=0
                     PER C=30  PER D=70   TP=0.1333  MASS RAIN=-1
PRINT HYD            ID=21  CODE=1
*
*ADD 21E FLOW TO CHANNEL AT THE 42" STORM DRAIN TIE AT STINSON ST
ADD HYD              ID=9  HYD=21.1   ID=21  ID=8
PRINT HYD            ID=9  CODE=1
*
*ROUTE FLOW DOWN CHANNEL - STA 23+50 TO 17+30
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=0
                     MAX ELEV=6.5  CH SLOPE=0.022   FP SLOPE=0.022
                     N=0.013   DIST=26.1
```

```
                        DIST  ELEV
                        0      6.5
                        0.1    4
                        8      0
                        18     0
                        26     4
                        26.1   6.5
COMPUTE TRAVEL TIME ID=10 REACH NO=1  NOVS=1  L=620   SLP=0.022
ROUTE               ID=10 HYD=R9  INFLOW ID=9  DT=0.0
PRINT HYD           ID=10 CODE=1
*
COMPUTE NM HYD      ID=18  HYD=18E  AREA=0.0075  PER A=30 PER B=0
                    PER C=0  PER D=70   TP=0.1333  MASS RAIN=-1
PRINT HYD           ID=18  CODE=1
*
*ADD 18E TO CHANNEL FLOW
ADD HYD             ID=11  HYD=18.1  ID=18  ID=10
PRINT HYD           ID=11  CODE=1
*
*ROUTE FLOW TO END OF CHANNEL - STA 17+30 TO 9+55
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=0
                    MAX ELEV=6.5  CH SLOPE=0.022  FP SLOPE=0.022
                    N=0.013   DIST=36
                    DIST ELEV
                    0      6.5
                    13     0
                    23     0
                    36     6.5
COMPUTE TRAVEL TIME ID=12  REACH NO=1  NOVS=1  L=775  SLP=0.022
ROUTE               ID=12  HYD=R11  INFLOW ID=11  DT=0.0
PRINT HYD           ID=12  CODE=1
*
*FLOW EMPTIES INTO NORTH/SOUTH COORS CONNECTION POND
FINISH
```

```
START                    0.0 HRS
* AHYMO MODEL FOR AMOLE PHASE III C
* MODEL CREATED BY GREINER AUG 1993 - BASED ON FILE AB100MKR FROM
*     FROM FEMA RESTUDY (AREAS A (#2) AND B (#3)) BY RTI
*
* TIERRA BAYITA ARROYO
* ULTIMATE DEVELOPMENT CONDITIONS 100-YR. 24-HR. STORM
*
*
*   FILE NAME - AB100.DAT
*
* THIS FILE COMPUTES THE HYDROLOGY FOR
*
*      AREA A (#2) - TIERRA BAYITA ARROYO, MIREHAVEN ARROYO
*
*     ASSUMPTIONS -
*       1. USE THE AHYMO991 VERSION OF HYMO AS DEVELOPED BY AMAFCA
*       2. MODEL THE 24-HOUR RAINFALL PER FEMA CRITERIA
*       3. USE THE draft REVISION OF SECTION 22.2, DPM by the DEVELOPMENT
*          PROCESS MANUAL DRAINAGE DESIGN CRITERIA COMMITTEE, AUGUST 1991
*       4. USE THE NM HYDROGRAPH COMPUTATIONAL METHOD IN AHYMO391
*       5. COMPUTATIONAL INTERVAL = 3 MINUTES = .05 hrs
*       6. PERCENTAGE OF EXISTING LAND USE WITHIN TREATMENT TYPES A,B,C AND D
*          WAS ESTIMATED FOR ULTIMATE DEVELOPMENT BASED ON LAND PLANNING
*          DOCUMENTS
*
* % % % % % % % % % % % % % % % % % % % % % % % % % % % % % %
*
*
RAINFALL                 TYPE=2  RAIN QUARTER=0.0   RAIN ONE=1.95
                         RAIN SIX=2.2     RAIN DAY=2.7     DT=0.05
*
*s  DIVIDE HYD IS USED TO SIMULATE A BULKING FACTOR
COMPUTE NM HYD           ID=5   HYD=108.4    DA= .1426  SQ MI
                         PER A=0  B=2  C=28  D=70
                         TP= .1333  HRS  RAIN=-1
PRINT HYD                ID=5  CODE=1
*DIVIDE HYD NO  108.4
DIVIDE HYD               ID=5   PER=-105  ID I=5 HYD=108.4
                                          ID II=16  HYD II=000
PRINT HYD                ID=5  CODE=1
*
*
COMPUTE NM HYD           ID=1    HYD= 101       DA=0.026    SQ MI
                         PER A=0    B=100  C=0      D=0
                         TP=.133    HRS        RAIN=-1
*
DIVIDE HYD               ID=1    PER=-110    ID=1  HYD=101
                                             ID=16  HYD=000
*
*ROUTE BULKED 101 THROUGH BASIN 108.3 - ASSUME A CONCRETE TRAPAZOIDAL
*            CHANNEL TO SIMULATE DEVELOPED CONDITIONS
*            USE:  10FT BOTTOM  W/2H:1V SIDE SLOPES AT EXISTING SLOPE
COMPUTE RATING CURVE CID=1   VS NO=1   NO SEG = 1
                         MIN ELEV=0  MAX ELEV= 6  CH SLP= 0.0375
                         FP SLP=0.375    N=.013  DIST=34
                         DIST  ELEV
                          0     6
                          12    0
                          22    0
                          34    6
COMPUTE TRAVEL TIME      ID=2   REACH=1  NO VS=1  L=4000   SLOPE= 0.0375
```

```
ROUTE                   ID=2      HYD= 101.80    INFLOW HYD ID=1    DT=0.0
PRINT HYD               ID=2    CODE=1
*
COMPUTE NM HYD          ID=1    HYD= 108.3     DA= .1478   SQ MI
                        PER A=0    B=2    C=41    D=57
                        TP=.175    HRS        RAIN=-1
*
PRINT HYD               ID=1    CODE=1
*
*       DIVIDE HYD NO.        108.3
DIVIDE HYD              ID=1     PER=-105      ID  I=1   HYD  I=108.3
                                            ID II=16   HYD II=000
PRINT HYD               ID=1  CODE=1
*
*ADD ROUTED 101 AND 108.3
ADD HYD                 ID=3   HYD=108.39  ID=1  ID=2
PRINT HYD               ID=3  CODE=1
*
*ROUTE COMBINED 101 AND 108.3 TO NORTH POND INFLOW
*            ASSUME A CONCRETE TRAPAZOIDAL
*            CHANNEL TO SIMULATE DEVELOPED CONDITIONS
*            USE:  10FT BOTTOM  W/2H:1V SIDE SLOPES AT EXISTING SLOPE
COMPUTE RATING CURVE CID=1   VS NO=1   NO SEG = 1
                        MIN ELEV=0  MAX ELEV= 6  CH SLP= 0.02
                        FP SLP=0.02    N=.013  DIST=34
                        DIST  ELEV
                         0     6
                         12    0
                         22    0
                         34    6
COMPUTE TRAVEL TIME     ID=2      REACH=1  NO VS=1
                        L=2150       SLP=.015
ROUTE                   ID=2      HYD= 108.38    INFLOW ID=3    DT=0.0
PRINT HYD               ID=2    CODE=1
*
COMPUTE NM HYD          ID=7    HYD=108.2      DA= .1710   SQ MI
                        PER A=0    B=5    C=35    D=63
                        TP=.158    HRS        RAIN=-1
PRINT HYD               ID=7    CODE=1
*
*       DIVIDE HYD NO.        108.2
DIVIDE HYD              ID=7     PER=-105      ID  I=7   HYD  I=108.2
                                            ID II=16   HYD II=000
PRINT HYD               ID=7  CODE=1
*
*S COMBINE HYD'S 108.38 AND 108.2
ADD HYD                 ID=7  HYD=108.29  ID=7  ID=2
PRINT HYD               ID=7  CODE=1
*
*
COMPUTE NM HYD          ID=2    HYD= 102    DA=0.281    SQ MI
                        PER A=40   B=19   C=10     D=31
                        TP=.20   RAIN=-1
PRINT HYD               ID=2    CODE=1
*
DIVIDE HYD              ID=2     PER=-105  ID  I=2   HYD  I=102
                                            ID II=16   HYD II=000
PRINT HYD               ID=2  CODE=1
*
*ROUTE BASIN 102 THROUGH BASIN 108.1
*            ASSUME A CONCRETE TRAPAZOIDAL
*            CHANNEL TO SIMULATE DEVELOPED CONDITIONS
```

```
*            USE:  10FT BOTTOM  W/2H:1V SIDE SLOPES AT EXISTING SLOPE
COMPUTE RATING CURVE CID=1   VS NO=1   NO SEG = 1
                     MIN ELEV=0  MAX ELEV= 6  CH SLP= 0.03
                     FP SLP=0.03    N=.013  DIST=34
                     DIST  ELEV
                      0     6
                      12    0
                      22    0
                      34    6
COMPUTE TRAVEL TIME  ID=3      REACH=1  NO VS=1
                     L=3100       SLP=.03
ROUTE                ID=3      HYD= 102.80    INFLOW ID=2    DT=0.0
PRINT HYD            ID=3    CODE=1
*
COMPUTE NM HYD       ID=4    HYD= 108.1     DA= .1713   SQ MI
                     PER A=0    B=3    C=30    D=67
                     TP=.133    HRS        RAIN=-1
PRINT HYD            ID=4    CODE=1
*
DIVIDE HYD           ID=4     PER=-105      ID  I=4   HYD  I=108.1
                                          ID II=16   HYD II=000
PRINT HYD            ID=4  CODE=1
*
*ADD ROUTED 102 TO 108.1 FLOW
ADD HYD              ID=2  HYD=108.17  ID=4  ID=3
PRINT HYD            ID=2  CODE=1
*
*
*ROUTE FLOW SOUTH ON 102ND THRU 72" PIPE TO NORTH POND
COMPUTE RATING CURVE RC=1   VS NO=1   CODE=-1
                     SLP=0.013     DIA= 72 IN  N=.013
COMPUTE TRAVEL TIME  ID=8 REACH=1  NO VS=1    L=1200     SLP=.013
ROUTE                ID=8      HYD= 108.18    INFLOW HYD ID=2    DT=0.0
PRINT HYD            ID=8    CODE=1
*
* COMBINE FLOW FROM 108.18 & 108.29
ADD HYD              ID=9  HYD=108.9  ID=7  ID=8
PRINT HYD            ID=9  CODE=1
*
*
******THE FOLLOWING POND IS WHAT WAS APPROVED BY THE STATE ENGINEER &
*       COA - DURING CONSTRUCTION ACCESS RAMPS WERE ADDED REDUCING THE
*       VOLUME -- REVISED STORAGE VOLUMES
*ROUTE FLOW THROUGH NORTH POND
*ROUTE RESERVOIR      ID=10  HYD=502  INFLOW ID=9  CODE=5
*                   OUTFLOW  STORAGE  ELEV
*                      0       0      5204.21
*                      3     0.287    5205
*                      13    1.582    5206
*                      25    3.486    5207
*                      42    7.543    5209
*                      52   11.939    5211
*                      64   16.689    5213
*                      72   21.805    5215
*                      80   27.301    5217
*                      88   33.189    5219
*                      90   39.483    5221
*                      91   46.197    5223
*                      968  49.715    5224
*                      2615 53.343    5225
*                      4809 57.082    5226
*
```

```
*ROUTE FLOW THROUGH NORTH POND - REVISED FOR ACCESS RAMP
ROUTE RESERVOIR        ID=10  HYD=502  INFLOW ID=9  CODE=5
                       OUTFLOW  STORAGE  ELEV
                          0        0     5204.21
                          3      0.287   5205
                         13      1.565   5206
                         25      3.402   5207
                         42      7.394   5209
                         52     11.731   5211
                         64     16.428   5213
                         72     21.498   5215
                         80     26.955   5217
                         88     32.809   5219
                         90     39.075   5221
                         91     45.767   5223
                        968     49.276   5224
                       2615     52.896   5225
                       4809     56.628   5226
*
*
COMPUTE NM HYD         ID=1    HYD=109      DA= .0720   SQ MI
                       PER A=0    B=2    C=16    D=82
                       TP=.140    HRS        RAIN=-1
*
PRINT HYD              ID=1    CODE=1
*
DIVIDE HYD             ID=1     PER=-105      ID  I=1   HYD  I=109
                                          ID II=16   HYD II=000
PRINT HYD              ID=1  CODE=1
*
*ROUTE SOUTH ALONG 98TH IN PIPE - FROM AVALON TO VOLCANO
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.02
                       DIA= 66  N=.013
COMPUTE TRAVEL TIME    ID=6  REACH NO=1  NOVS=1  LEN=1150  SLP=0.02
ROUTE                  ID=6  HYD=109.19  INFLOW ID=1  DT=0.0
PRINT HYD              ID=6  CODE=1
*
COMPUTE NM HYD         ID=1  HYD=109.1  DA= 0.0495  SQ MI
                       PER A= 0  B=0  C=15  D=85
                       TP= 0.1333  RAIN=-1
PRINT HYD              ID=1  CODE=1
*
DIVIDE HYD             ID=1  PER=-105  IDI=1  HYD=109.1
                                       IDII=16  HYD=000
PRINT HYD              ID=1  CODE=1
*
*ADD TO FLOW FROM 109 (HYD109.19)
ADD HYD                ID=6  HYD=109.39  ID=6  ID=1
PRINT HYD              ID=6  CODE=1
*
* ADD HYD 109.39 TO BASIN 108.4
ADD HYD                ID=6  HYD=109.49  ID=6  ID=5
PRINT HYD              ID=6  CODE=1
*
*ADD ABOVE TO NORTH POND OUTFLOW
ADD HYD                ID=6  HYD=109.59  ID=6  ID=10
PRINT HYD              ID=6  CODE=1
*
*ROUTE THROUGH SOUTH POND
ROUTE RESERVOIR        ID=10 HYD=501  IN ID=6  CODE=5
                       OUTFLOW  STORAGE   ELEV
                          0        0      5201
```

```
                    5       0.934     5202
                    6       3.359     5203
                    27      6.080     5204
                    43     11.813     5206
                    55     17.946     5208
                    64     24.492     5210
                    72     31.465     5212
                    1137   35.115     5213
                    3122   38.877     5214
                    7217   44.733     5215.5
*
PUNCH HYD           ID=10
FINISH
```

```
AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 03/02/1998
     START TIME (HR:MIN:SEC) = 14:44:24     USER NO.= GREINRNM.STE
     INPUT FILE = AMOLE.DAT

*  AMOLE DEL NORTE STORM DRAIN FACILITIES PHASE III D MODEL - DECEMBER 1995
*    FULLY DEVELOPED CONDITIONS  100 YEAR, 6 HOUR STORM
*  GREINER JN E30000114
* COA PROJECT 4076.92
*  This model is an update of the previous HYMO model for the Amole Del
*    Norte drainage system.  The HYMO was done in 1990.  Basin
*    areas have been revised somewhat due to the current condition changing
*    from 1990 and incorporation of newer Master Drainage Reports for
*    the area
*  ------------------------------------------------------------------
*  Developed conditions are to be modeled.  This was done by assuming
*    concrete trapazoidal channels for routing purposes using the
*    existing slopes and lengths.  channels - 10'bottom w/ 2:1 ss
*  ------------------------------------------------------------------
*  Station references are from Amole Del Norte Storm Diversion Facilities
*  Tierra Bayita Drainage Facilities Phases IIIB or IIIA
*******************************************************************
*S  100 YEAR, 6 HOUR STORM
RAINFALL            TYPE=1   QUARTER HR = 0  ONE HR RAIN=1.90
                    SIX HR RAIN=2.21   TWENTYFOUR HR RAIN=2.70

                  COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40
HR.
                  DT =     .033333 HOURS       END TIME =     5.999940 HOURS
                     .0000   .0014   .0029   .0043   .0059   .0074   .0090
                     .0106   .0123   .0140   .0157   .0175   .0193   .0212
                     .0232   .0252   .0272   .0294   .0316   .0339   .0362
                     .0387   .0412   .0439   .0466   .0495   .0525   .0557
                     .0590   .0625   .0663   .0715   .0771   .0831   .0961
                     .1249   .1694   .2331   .3202   .4347   .5806   .7622
                     .9839  1.1890  1.2748  1.3472  1.4117  1.4703  1.5243
                    1.5745  1.6213  1.6652  1.7065  1.7455. 1.7824  1.8172
                    1.8502  1.8816  1.9113  1.9395  1.9662  1.9722  1.9779
                    1.9832  1.9883  1.9932  1.9978  2.0023  2.0066  2.0107
                    2.0147  2.0185  2.0223  2.0259  2.0294  2.0328  2.0361
                    2.0393  2.0425  2.0455  2.0485  2.0515  2.0543  2.0571
                    2.0599  2.0625  2.0652  2.0678  2.0703  2.0728  2.0752
                    2.0776  2.0800  2.0823  2.0845  2.0868  2.0890  2.0912
                    2.0933  2.0954  2.0975  2.0995  2.1015  2.1035  2.1055
                    2.1074  2.1093  2.1112  2.1131  2.1149  2.1167  2.1185
                    2.1203  2.1221  2.1238  2.1255  2.1272  2.1289  2.1305
                    2.1322  2.1338  2.1354  2.1370  2.1386  2.1401  2.1417
                    2.1432  2.1447  2.1462  2.1477  2.1492  2.1506  2.1521
                    2.1535  2.1549  2.1564  2.1577  2.1591  2.1605  2.1619
                    2.1632  2.1646  2.1659  2.1672  2.1685  2.1698  2.1711
                    2.1724  2.1736  2.1749  2.1762  2.1774  2.1786  2.1799
                    2.1811  2.1823  2.1835  2.1847  2.1858  2.1870  2.1882
                    2.1893  2.1905  2.1916  2.1928  2.1939  2.1950  2.1961
                    2.1972  2.1983  2.1994  2.2005  2.2016  2.2027  2.2037
                    2.2048  2.2058  2.2069  2.2079  2.2090  2.2100

*
*S ALL FLOWS INCLUDE A 2% BULKING FACTOR
SEDIMENT BULK       CODE=1  BULKING FACTOR = 1.02
*
COMPUTE NM HYD      ID=11  HYD=11D  AREA=0.0250   PER A=100  PER B=0
                    PER C=0   PER D=0   TP=0.1333  MASS RAIN=-1

        K =   .162928HR    TP =   .133300HR    K/TP RATIO =  1.222262     SHAPE CONSTANT, N =
2.911962
        UNIT PEAK =   51.494    CFS   UNIT VOLUME =    .9994       B =   274.56      P60 =
1.9000
```

```
    AREA =       .025000 SQ MI    IA =     .65000 INCHES    INF =   1.67000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

PRINT HYD            ID=11  CODE=1

                                        HYDROGRAPH FROM AREA 11D


    RUNOFF VOLUME =      .46095 INCHES     =        .6146 ACRE-FEET
    PEAK DISCHARGE RATE =      21.77 CFS  AT   1.533 HOURS   BASIN AREA =   .0250 SQ. MI.


*
COMPUTE NM HYD       ID=10  HYD=10D  AREA=0.0336   PER A=84  PER B=0
                     PER C=8   PER D=8  TP=0.1333  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
    UNIT PEAK =   10.612    CFS   UNIT VOLUME =    .9982       B =   526.28      P60 =
1.9000
    AREA =       .002688 SQ MI    IA =     .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .157995HR    TP =   .133300HR    K/TP RATIO =  1.185260     SHAPE CONSTANT, N =
2.995080
    UNIT PEAK =   65.261    CFS   UNIT VOLUME =    .9996       B =   281.42      P60 =
1.9000
    AREA =       .030912 SQ MI    IA =     .62391 INCHES    INF =   1.59696 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

PRINT HYD            ID=10  CODE=1

                                        HYDROGRAPH FROM AREA 10D


    RUNOFF VOLUME =      .61847 INCHES     =       1.1083 ACRE-FEET
    PEAK DISCHARGE RATE =      36.63 CFS  AT   1.533 HOURS   BASIN AREA =   .0336 SQ. MI.


*
*ADD FLOW FROM 10D AND 11D
*    EXISTING CONDITION - THESE FLOWS ENTER 12D NEAR EACH OTHER AND CROSS
*     12D TO A POINT WHERE THEY COMBINE. - FOR DEVELOPED MODEL ADD
*     HYDROGRAPHS THEN ROUTE THROUGH 12D IN AN ASSUMED CONCRETE CHANNEL
*     TO SIMULATE DEVELOPED CONDITIONS
ADD HYD              ID=1   HYD=10.1  ID=10  ID=11
PRINT HYD            ID=1  CODE=1

                                        OUTFLOW HYDROGRAPH REACH    10.10


    RUNOFF VOLUME =      .55127 INCHES     =       1.7229 ACRE-FEET
    PEAK DISCHARGE RATE =      58.40 CFS  AT   1.533 HOURS   BASIN AREA =   .0586 SQ. MI.


*
*ROUTE COMBINED 11/10 FLOW THROUGH 12D - USE 10 FT BOTTOM/ 2:1 SIDE SLOPE
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=0
                     MAX ELEV=6  CH SLOPE=0.0255  FP SLOPE=0.0255
                     N=0.013   DIST=34
                     DIST ELEV
```

```
0    6
12   0
22   0
34   6
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.32	3.36	27.11	11.26
.63	7.11	87.66	12.53
.95	11.27	176.01	13.79
1.26	15.82	290.95	15.05
1.58	20.78	432.44	16.32
1.89	26.13	600.91	17.58
2.21	31.88	797.03	18.84
2.53	38.03	1021.61	20.11
2.84	44.58	1275.57	21.37
3.16	51.52	1559.82	22.63
3.47	58.87	1875.34	23.89
3.79	66.61	2223.10	25.16
4.11	74.76	2604.09	26.42
4.42	83.30	3019.29	27.68
4.74	92.24	3469.68	28.95
5.05	101.58	3956.24	30.21
5.37	111.32	4479.94	31.47
5.68	121.46	5041.75	32.74
6.00	132.00	5642.61	34.00

```
COMPUTE TRAVEL TIME ID=2  REACH NO=1  NOVS=1  L=4000  SLP=0.0255
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.357	27.11	.1376
.632	7.114	87.66	.0902
.947	11.269	176.01	.0711
1.263	15.823	290.95	.0604
1.579	20.776	432.44	.0534
1.895	26.127	600.91	.0483
2.211	31.878	797.03	.0444
2.526	38.028	1021.61	.0414
2.842	44.576	1275.57	.0388
3.158	51.524	1559.82	.0367
3.474	58.870	1875.34	.0349
3.789	66.615	2223.10	.0333
4.105	74.759	2604.09	.0319
4.421	83.302	3019.29	.0307
4.737	92.244	3469.68	.0295
5.053	101.584	3956.24	.0285
5.368	111.324	4479.94	.0276
5.684	121.463	5041.75	.0268
6.000	132.000	5642.61	.0260

```
ROUTE              ID=2  HYD=R1  INFLOW ID=1  DT=0.0
PRINT HYD          ID=2  CODE=1
```

HYDROGRAPH FROM AREA R1

```
RUNOFF VOLUME =       .55127 INCHES     =       1.7229 ACRE-FEET
PEAK DISCHARGE RATE =      42.04 CFS  AT   1.600 HOURS   BASIN AREA =   .0586 SQ. MI.


*
COMPUTE NM HYD      ID=12  HYD=12D  AREA=0.2407   PER A=1  PER B=19
```

```
                    PER C=15   PER D=65  TP=0.2051  MASS RAIN=-1

        K =   .116105HR    TP =   .205100HR    K/TP RATIO =   .566089     SHAPE CONSTANT, N =
6.770819
        UNIT PEAK =   389.26    CFS   UNIT VOLUME =    1.000       B =   510.29      P60 =
1.9000
        AREA =      .156455 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


        K =   .176990HR    TP =   .205100HR    K/TP RATIO =   .862946     SHAPE CONSTANT, N =
4.119566
        UNIT PEAK =   149.13    CFS   UNIT VOLUME =    1.000       B =   363.06      P60 =
1.9000
        AREA =      .084245 SQ MI    IA =    .44000 INCHES    INF =   1.08200 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

    PRINT HYD           ID=12  CODE=1

                                        HYDROGRAPH FROM AREA 12D

    RUNOFF VOLUME =     1.59678 INCHES     =      20.4982 ACRE-FEET
    PEAK DISCHARGE RATE =     462.31 CFS  AT   1.567 HOURS   BASIN AREA =   .2407 SQ. MI.


    *
    *ADD 12D AND ROUTED 11&10
    ADD HYD             ID=4  HYD=R12  ID=12  ID=2
    PRINT HYD           ID=4  CODE=1

                                        HYDROGRAPH FROM AREA R12

    RUNOFF VOLUME =     1.39208 INCHES     =      22.2211 ACRE-FEET
    PEAK DISCHARGE RATE =     501.92 CFS  AT   1.567 HOURS   BASIN AREA =   .2993 SQ. MI.

    *
    *ADD A DIVIDE HYD HERE TO SIMULATE LIMITING THE FLOW TO THE DOWNSTREAM
    *  SYSTEM TO 331 CFS - WHICH WAS THE ORIGINAL DESIGN FLOW
    *  IN THE FUTURE COA IS PLANNING ON PROBABLY BUILDING A POND TO LIMIT FLOW
    DIVIDE HYD          ID=4  Q=315   ID=3  HYD=PIPE
                                      ID=5  HYD=POND
    PRINT HYD           ID=3  CODE=1

                                        HYDROGRAPH FROM AREA PIPE

    RUNOFF VOLUME =     1.39208 INCHES     =      19.5031 ACRE-FEET
    PEAK DISCHARGE RATE =     315.00 CFS  AT   1.500 HOURS   BASIN AREA =   .2627 SQ. MI.


    PRINT HYD           ID=5  CODE=1

                                        HYDROGRAPH FROM AREA POND

    RUNOFF VOLUME =     1.39207 INCHES     =       2.7180 ACRE-FEET
    PEAK DISCHARGE RATE =     186.92 CFS  AT   1.567 HOURS   BASIN AREA =   .0366 SQ. MI.


    *
```

```
*ROUTE THROUGH 66INCH STORM DRAIN - USE FRICTION SLOPE INSTEAD OF PIPE SLOPE
COMPUTE RATING CURVE CID=1  VSNO=1  CODE= -1  SLP=0.0038
                     DIA=66    N=0.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.29	.47	1.09	2.44
.57	1.31	4.71	3.36
.86	2.37	10.96	3.99
1.15	3.59	19.71	4.47
1.43	4.92	30.77	4.83
1.72	6.35	43.91	5.10
2.01	7.84	58.82	5.30
2.29	9.38	75.21	5.42
2.58	10.94	92.71	5.49
2.87	12.52	110.96	5.50
3.15	14.09	129.54	5.50
3.44	15.63	148.01	5.50
3.73	17.13	165.89	5.50
4.01	18.57	182.64	5.50
4.30	19.92	197.62	5.50
4.59	21.17	210.09	5.50
4.87	22.26	219.01	5.50
5.16	23.15	222.68	5.50
5.50	23.76	222.68	5.50

```
COMPUTE TRAVEL TIME ID=4  REACH NO=1  NOVS=1  L=630  SLP=0.0038
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.287	.472	1.09	.0761
.573	1.314	4.71	.0488
.860	2.373	10.96	.0379
1.146	3.589	19.71	.0319
1.433	4.923	30.77	.0280
1.720	6.348	43.91	.0253
2.006	7.839	58.82	.0233
2.293	9.377	75.21	.0218
2.579	10.942	92.71	.0207
2.866	12.518	110.96	.0197
3.153	14.086	129.54	.0190
3.439	15.630	148.01	.0185
3.726	17.132	165.89	.0181
4.013	18.571	182.64	.0178
4.299	19.925	197.62	.0176
4.586	21.166	210.09	.0176
4.872	22.258	219.01	.0178
5.159	23.147	222.68	.0182
5.500	23.758	222.68	.0187

```
    ROUTE                ID=4  HYD=RR12  INFLOW ID=3  DT=0.0
 TRAVEL TIME TABLE EXCEEDED
    PROBLEM FAILED TO CONVERGE AFTER 50 ITERATIONS. CONVERGENCE WAS FORCED.  OUTFLOW NUMBER =
58  RATE =    219.23
    PRINT HYD            ID=4  CODE=1
```

HYDROGRAPH FROM AREA RR12

```
RUNOFF VOLUME =     1.39208 INCHES     =      19.5031 ACRE-FEET
PEAK DISCHARGE RATE =     315.00 CFS  AT   1.667 HOURS   BASIN AREA =   .2627 SQ. MI.
```

```
*
*s RECALL FLOW FROM AMOLE DEL NORTE PHASE IIIC - DETENTION BASINS
RECALL HYD          ID=10 HYD=      501.00 DT=  .050000 HRS DA=   1.0612 SM
                    PEAK=     97.003CFS  RO= 1.8009 INCHES  NO PTS=600
                    FLOW RATES
                          .000       .000       .000       .000       .000
                          .000       .000       .000       .000       .000
                          .000       .000       .000       .000       .000
                          .000       .000       .000       .000       .000
                          .000       .000       .000       .000       .039
                          .443      2.000      5.064      5.630     15.910
                        30.855     38.966     45.067     48.996     52.226
                        55.002     56.732     58.292     59.709     61.000
                        62.177     63.386     64.835     66.377     67.693
                        68.710     69.473     70.043     70.466     70.776
                        71.001     71.185     71.357     71.517     71.669
                        71.812     71.948     84.498     95.031     97.003
                        96.932     96.408     95.844     95.338     94.890
                        94.505     94.183     93.910     93.656     93.401
                        93.163     92.971     92.815     92.661     92.507
                        92.378     92.252     92.103     91.946     91.786
                        91.644     91.513     91.377     91.236     91.110
                        91.008     90.895     90.778     90.678     90.584
                        90.495     90.402     90.295     90.194     90.007
                        89.662     89.252     88.838     88.416     87.976
                        87.540     87.121     86.705     86.294     85.898
                        85.515     85.125     84.716     84.307     83.916
                        83.546     83.190     82.834     82.451     82.042
                        81.649     81.281     80.908     80.512     80.117
                        79.752     79.413     79.223     79.268     79.370
                        79.363     79.227     78.998     78.712     78.380
                        78.026     77.678     77.316     76.932     76.541
                        76.135     75.722     75.319     74.945     74.584
                        74.190     73.772     73.377     73.009     72.646
                        72.268     71.999     71.996     71.992     71.985
                        71.977     71.967     71.955     71.942     71.925
                        71.907     71.885     71.861     71.835     71.806
                        71.775     71.741     71.705     71.667     71.626
                        71.583     71.538     71.491     71.442     71.390
                        71.336     71.281     71.223     71.164     71.102
                        71.039     70.973     70.906     70.837     70.767
                        70.695     70.621     70.547     70.470     70.392
                        70.312     70.232     70.149     70.065     69.980
                        69.894     69.806     69.717     69.627     69.535
                        69.442     69.348     69.253     69.157     69.059
                        68.960     68.860     68.759     68.657     68.554
                        68.450     68.343     68.234     68.124     68.011
                        67.896     67.779     67.660     67.539     67.417
                        67.292     67.166     67.038     66.909     66.778
                        66.645     66.511     66.375     66.238     66.099
                        65.959     65.818     65.676     65.532     65.387
                        65.241     65.093     64.945     64.795     64.645
                        64.493     64.341     64.187     64.033     63.853
                        63.666     63.479     63.290     63.101     62.911
                        62.720     62.529     62.336     62.142     61.946
                        61.749     61.551     61.352     61.152     60.951
                        60.749     60.546     60.342     60.137     59.932
                        59.726     59.520     59.313     59.105     58.897
                        58.688     58.479     58.270     58.060     57.850
                        57.640     57.430     57.219     57.008     56.797
                        56.586     56.375     56.164     55.953     55.742
                        55.531     55.320     55.109     54.856     54.557
                        54.259     53.962     53.666     53.371     53.077
                        52.784     52.492     52.201     51.911     51.621
                        51.333     51.046     50.759     50.474     50.190
                        49.906     49.625     49.344     49.064     48.785
                        48.508     48.232     47.957     47.683     47.410
                        47.139     46.870     46.601     46.334     46.068
                        45.804     45.541     45.280     45.019     44.760
```

44.502	44.246	43.991	43.738	43.486
43.235	42.980	42.627	42.278	41.931
41.588	41.248	40.911	40.577	40.247
39.919	39.595	39.273	38.955	38.639
38.327	38.017	37.711	37.407	37.106
36.808	36.513	36.221	35.933	35.646
35.363	35.082	34.803	34.528	34.255
33.984	33.716	33.451	33.189	32.929
32.672	32.417	32.165	31.915	31.668
31.423	31.180	30.941	30.703	30.468
30.235	30.004	29.776	29.550	29.326
29.104	28.885	28.668	28.453	28.240
28.030	27.821	27.614	27.410	27.207
27.007	26.477	25.950	25.438	24.942
24.461	23.995	23.542	23.102	22.676
22.263	21.863	21.474	21.096	20.729
20.373	20.028	19.693	19.368	19.052
18.746	18.449	18.160	17.878	17.605
17.341	17.085	16.837	16.595	16.360
16.131	15.910	15.696	15.486	15.284
15.086	14.895	14.709	14.529	14.353
14.182	14.016	13.855	13.700	13.548
13.400	13.257	13.117	12.981	12.848
12.719	12.594	12.473	12.356	12.241
12.130	12.021	11.916	11.813	11.712
11.614	11.519	11.427	11.337	11.249
11.164	11.082	11.001	10.922	10.844
10.768	10.695	10.624	10.556	10.489
10.424	10.360	10.298	10.237	10.177
10.120	10.063	10.007	9.952	9.897
9.845	9.795	9.746	9.699	9.653
9.607	9.562	9.517	9.475	9.434
9.393	9.351	9.301	9.234	9.149
9.052	8.948	8.839	8.728	8.615
8.499	8.383	8.265	8.146	8.026
7.906	7.786	7.665	7.544	7.423
7.302	7.182	7.061	6.942	6.823
6.704	6.586	6.468	6.349	6.231
6.113	6.000	5.993	5.987	5.980
5.973	5.967	5.960	5.952	5.945
5.938	5.930	5.923	5.915	5.907
5.899	5.891	5.883	5.875	5.867
5.859	5.851	5.842	5.834	5.826
5.817	5.809	5.800	5.791	5.783
5.774	5.765	5.757	5.748	5.739
5.730	5.721	5.712	5.703	5.695
5.686	5.677	5.668	5.659	5.650
5.641	5.632	5.623	5.614	5.604
5.595	5.586	5.577	5.568	5.559
5.550	5.541	5.532	5.523	5.514
5.505	5.496	5.487	5.478	5.468
5.459	5.450	5.441	5.432	5.423
5.414	5.405	5.396	5.387	5.378
5.369	5.360	5.351	5.342	5.333
5.324	5.315	5.306	5.298	5.289
5.280	5.271	5.262	5.253	5.244

```
COMPUTE NM HYD       ID=19  HYD=19D  AREA=0.0897   PER A=0 PER B=15
                     PER C=10   PER D=75  TP=0.1714  MASS RAIN=-1

        K =   .093965HR    TP =   .171400HR    K/TP RATIO =   .548219     SHAPE CONSTANT, N =
7.053046
        UNIT PEAK =   205.58    CFS   UNIT VOLUME =    1.000       B =   523.76      P60 =
1.9000
        AREA =       .067275 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


        K =   .154334HR    TP =   .171400HR    K/TP RATIO =   .900429     SHAPE CONSTANT, N =
```

```
3.935850
        UNIT PEAK =   45.906    CFS   UNIT VOLUME =    .9999       B =   350.87      P60 =
1.9000
        AREA =       .022425 SQ MI    IA =    .44000 INCHES    INF =   1.08200 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

    PRINT HYD            ID=19  CODE=1

                                          HYDROGRAPH FROM AREA 19D


        RUNOFF VOLUME =     1.71647 INCHES     =       8.2115 ACRE-FEET
        PEAK DISCHARGE RATE =     202.80 CFS  AT   1.533 HOURS   BASIN AREA =   .0897 SQ. MI.


    *
    *ADD 19D AND OUTFLOW FROM DETENTION BASINS
    ADD HYD              ID=5  HYD=19.1  ID=19  ID=10
    PRINT HYD            ID=5  CODE=1

                                             OUTFLOW HYDROGRAPH REACH    19.10


        RUNOFF VOLUME =     1.67393 INCHES     =     102.7471 ACRE-FEET
        PEAK DISCHARGE RATE =     239.79 CFS  AT   1.567 HOURS   BASIN AREA =  1.1509 SQ. MI.


    *
    *ROUTE FLOW ALONG CENTRAL FROM 98TH ST TO 90TH ST IN 66INCH STORM DRAIN
    COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.024
                         DIA=66    N=0.013

                                        RATING CURVE PIPE SECTION  1.0
                                            WATER       FLOW        FLOW        MAX
                                           SURFACE      AREA        RATE       WIDTH
                                            ELEV        SQ FT       CFS        FT
                                              .00         .00         .00        .00
                                              .29         .47        2.73       2.44
                                              .57        1.31       11.85       3.36
                                              .86        2.37       27.54       3.99
                                             1.15        3.59       49.53       4.47
                                             1.43        4.92       77.34       4.83
                                             1.72        6.35      110.34       5.10
                                             2.01        7.84      147.83       5.30
                                             2.29        9.38      189.01       5.42
                                             2.58       10.94      233.00       5.49
                                             2.87       12.52      278.85       5.50
                                             3.15       14.09      325.55       5.50
                                             3.44       15.63      371.97       5.50
                                             3.73       17.13      416.91       5.50
                                             4.01       18.57      458.99       5.50
                                             4.30       19.92      496.65       5.50
                                             4.59       21.17      527.98       5.50
                                             4.87       22.26      550.41       5.50
                                             5.16       23.15      559.62       5.50
                                             5.50       23.76      559.62       5.50
    COMPUTE TRAVEL TIME ID=6  REACH NO=1  NOVS=1  L=2550  SLP=.024

                                 TRAVEL TIME TABLE
                                                   REACH=  1.0

                                 WATER       AVERAGE     FLOW        TRAVEL
                                 DEPTH       AREA        RATE        TIME
                                 FEET        SQ.FT.      CFS         HRS
                                    .287        .472        2.73       .1226
```

.573	1.314	11.85	.0786
.860	2.373	27.54	.0610
1.146	3.589	49.53	.0513
1.433	4.923	77.34	.0451
1.720	6.348	110.34	.0407
2.006	7.839	147.83	.0376
2.293	9.377	189.01	.0351
2.579	10.942	233.00	.0333
2.866	12.518	278.85	.0318
3.153	14.086	325.55	.0306
3.439	15.630	371.97	.0298
3.726	17.132	416.91	.0291
4.013	18.571	458.99	.0287
4.299	19.925	496.65	.0284
4.586	21.166	527.98	.0284
4.872	22.258	550.41	.0286
5.159	23.147	559.62	.0293
5.500	23.758	559.62	.0301

```
ROUTE                ID=6  HYD=R19.1  INFLOW ID=5  DT=0.0
PRINT HYD            ID=6  CODE=1
```

HYDROGRAPH FROM AREA R19.1

```
    RUNOFF VOLUME =     1.67200 INCHES     =     102.6290 ACRE-FEET
    PEAK DISCHARGE RATE =     236.32 CFS  AT   1.567 HOURS   BASIN AREA =  1.1509 SQ. MI.


*
*ADD ROUTED FLOW FROM 12D, 10D and 11D
ADD HYD              ID=7  HYD=19.2   ID=6  ID=4
PRINT HYD            ID=7  CODE=1
```

OUTFLOW HYDROGRAPH REACH 19.20

```
    RUNOFF VOLUME =     1.61998 INCHES     =     122.1321 ACRE-FEET
    PEAK DISCHARGE RATE =     551.30 CFS  AT   1.567 HOURS   BASIN AREA =  1.4136 SQ. MI.


*
*ROUTE FLOW TO STA 69+71 IN 84INCH STORM DRAIN
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.017
                     DIA=84    N=0.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.36	.76	4.37	3.11
.73	2.13	18.97	4.28
1.09	3.84	44.09	5.08
1.46	5.81	79.30	5.69
1.82	7.97	123.82	6.15
2.19	10.28	176.67	6.49
2.55	12.70	236.69	6.74
2.92	15.19	302.62	6.90
3.28	17.72	373.05	6.99
3.65	20.28	446.47	7.00
4.01	22.82	521.23	7.00
4.38	25.32	595.56	7.00
4.74	27.75	667.50	7.00
5.11	30.08	734.88	7.00
5.47	32.27	795.18	7.00
5.84	34.28	845.35	7.00
6.20	36.05	881.24	7.00

```
                                        6.57        37.49       895.99        7.00
                                        7.00        38.48       895.99        7.00
COMPUTE TRAVEL TIME ID=8  REACH NO=1  NOVS=1  L=813  SLP=0.017

                          TRAVEL TIME TABLE
                                          REACH=  1.0

                          WATER       AVERAGE     FLOW        TRAVEL
                          DEPTH       AREA        RATE        TIME
                          FEET        SQ.FT.      CFS         HRS
                             .365        .765        4.37       .0395
                             .730       2.128       18.97       .0253
                            1.094       3.843       44.09       .0197
                            1.459       5.813       79.30       .0166
                            1.824       7.975      123.82       .0145
                            2.189      10.282      176.67       .0131
                            2.553      12.698      236.69       .0121
                            2.918      15.189      302.62       .0113
                            3.283      17.724      373.05       .0107
                            3.648      20.276      446.47       .0103
                            4.013      22.817      521.23       .0099
                            4.377      25.319      595.56       .0096
                            4.742      27.751      667.50       .0094
                            5.107      30.082      734.88       .0092
                            5.472      32.275      795.18       .0092
                            5.836      34.285      845.35       .0092
                            6.201      36.054      881.24       .0092
                            6.566      37.495      895.99       .0095
                            7.000      38.485      895.99       .0097
ROUTE                ID=8  HYD=19.3  INFLOW ID=7  DT=0.0
PRINT HYD            ID=8  CODE=1

                                     OUTFLOW HYDROGRAPH REACH    19.30


    RUNOFF VOLUME =     1.61941 INCHES     =     122.0891 ACRE-FEET
    PEAK DISCHARGE RATE =     551.28 CFS  AT   1.600 HOURS   BASIN AREA =  1.4136 SQ. MI.


*
*REVISE BASIN 16 NORTH TO BRING FLOW FROM MOBILE HOMES BTWN 98TH AND 94TH
*   TO THE BRIDGE STORM DRAIN & REVISE AREA BTWN 94TH AND 90TH
*   PER SUNSET GARDENS/UNSER BLVD SD REPORT (AREA PREVIOUSLY IN 16SOUTH)
*AREA NORTH OF MOBILE HOMES FRONTING ON CENTRAL AVENUE
COMPUTE NM HYD       ID=1  HYD=16A  AREA=0.01282  PER A=0  PER B=10
                     PER C=5  PER D=85  TP=0.1333  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =   43.022    CFS   UNIT VOLUME =    .9991       B =   526.28      P60 =
1.9000
        AREA =       .010897 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


        K =   .122575HR    TP =   .133300HR    K/TP RATIO =   .919546     SHAPE CONSTANT, N =
3.849372
        UNIT PEAK =   4.9770    CFS   UNIT VOLUME =    .9978       B =   345.00      P60 =
1.9000
        AREA =       .001923 SQ MI    IA =    .45000 INCHES    INF =   1.11000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

    PRINT HYD            ID=1  CODE=1

                                     HYDROGRAPH FROM AREA 16A
```

```
        RUNOFF VOLUME =      1.83290 INCHES      =        1.2532 ACRE-FEET
        PEAK DISCHARGE RATE =       34.51 CFS  AT   1.500 HOURS   BASIN AREA =   .0128 SQ. MI.


    *
    *  MOUNTAIN VIEW MOBILE HOME PARK
    COMPUTE NM HYD       ID=2  HYD=16F  AREA=0.03493  PER A=2  PER B=33
                         PER C=2  PER D=63  TP=0.134  MASS RAIN=-1

        K =    .073030HR    TP =    .134000HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =   86.427    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 =
1.9000
        AREA =       .022006 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


        K =    .131861HR    TP =    .134000HR    K/TP RATIO =    .984037     SHAPE CONSTANT, N =
3.588426
        UNIT PEAK =   31.512    CFS   UNIT VOLUME =    .9999       B =   326.73      P60 =
1.9000
        AREA =       .012924 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

    PRINT HYD            ID=2  CODE=1

                                          HYDROGRAPH FROM AREA 16F


        RUNOFF VOLUME =      1.52798 INCHES      =        2.8465 ACRE-FEET
        PEAK DISCHARGE RATE =       80.83 CFS  AT   1.500 HOURS   BASIN AREA =   .0349 SQ. MI.


    *
    *ADD BASINS 16A AND 16F
    ADD HYD              ID=3  HYD=16F.1  ID=1  ID=2
    PRINT HYD            ID=3  CODE=1

                                          HYDROGRAPH FROM AREA 16F.1


        RUNOFF VOLUME =      1.60983 INCHES      =        4.0997 ACRE-FEET
        PEAK DISCHARGE RATE =      115.33 CFS  AT   1.500 HOURS   BASIN AREA =   .0478 SQ. MI.


    *
    *ROUTE THIS FLOW DOWN BRIDGE TO BRING IT TO THE PROJECT THROUGH 16B
    *    ASSUME IN A PIPE
    COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLOPE=0.01
                         DIA= 48  N=0.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.21	.25	.75	1.78
.42	.69	3.27	2.44
.63	1.25	7.60	2.91
.83	1.90	13.68	3.25
1.04	2.60	21.35	3.51
1.25	3.36	30.47	3.71
1.46	4.15	40.82	3.85
1.67	4.96	52.19	3.94

1.88	5.79	64.33	3.99
2.08	6.62	77.00	4.00
2.29	7.45	89.89	4.00
2.50	8.27	102.71	4.00
2.71	9.06	115.11	4.00
2.92	9.82	126.73	4.00
3.13	10.54	137.13	4.00
3.34	11.20	145.78	4.00
3.54	11.77	151.97	4.00
3.75	12.24	154.52	4.00
4.00	12.57	154.52	4.00

COMPUTE TRAVEL TIME ID=4 REACH NO=1 NOVS=1 L=1300 SLP=0.01

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	.75	.1197
.417	.695	3.27	.0767
.625	1.255	7.60	.0596
.834	1.898	13.68	.0501
1.042	2.604	21.35	.0440
1.251	3.358	30.47	.0398
1.459	4.146	40.82	.0367
1.668	4.960	52.19	.0343
1.876	5.788	64.33	.0325
2.084	6.621	77.00	.0311
2.293	7.451	89.89	.0299
2.501	8.267	102.71	.0291
2.710	9.062	115.11	.0284
2.918	9.823	126.73	.0280
3.127	10.539	137.13	.0278
3.335	11.195	145.78	.0277
3.544	11.773	151.97	.0280
3.752	12.243	154.52	.0286
4.000	12.566	154.52	.0294

ROUTE ID=4 HYD=16F.2 INFLOW ID=3 DT=0.0
PRINT HYD ID=4 CODE=1

HYDROGRAPH FROM AREA 16F.2

RUNOFF VOLUME = 1.60984 INCHES = 4.0997 ACRE-FEET
PEAK DISCHARGE RATE = 112.16 CFS AT 1.533 HOURS BASIN AREA = .0478 SQ. MI.

*
COMPUTE NM HYD ID=1 HYD=16B AREA=0.01520 PER A=0 PER B=10
PER C=5 PER D=85 TP=0.1333 MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 51.009 CFS UNIT VOLUME = .9992 B = 526.28 P60 = 1.9000
AREA = .012920 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

K = .122575HR TP = .133300HR K/TP RATIO = .919546 SHAPE CONSTANT, N = 3.849372
UNIT PEAK = 5.9010 CFS UNIT VOLUME = .9982 B = 345.00 P60 = 1.9000
AREA = .002280 SQ MI IA = .45000 INCHES INF = 1.11000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

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

```
PRINT HYD            ID=1  CODE=1

                                        HYDROGRAPH FROM AREA 16B

    RUNOFF VOLUME =      1.83290 INCHES      =        1.4859 ACRE-FEET
    PEAK DISCHARGE RATE =       40.91 CFS  AT   1.500 HOURS   BASIN AREA =   .0152 SQ. MI.


*
*ADD ROUTED 16A/16F FLOW TO 16B
ADD HYD              ID=3  HYD=16B.1  ID=1  ID=4
PRINT HYD            ID=3  CODE=1

                                        HYDROGRAPH FROM AREA 16B.1

    RUNOFF VOLUME =      1.66369 INCHES      =        5.5855 ACRE-FEET
    PEAK DISCHARGE RATE =      151.18 CFS  AT   1.533 HOURS   BASIN AREA =   .0630 SQ. MI.


*
COMPUTE NM HYD       ID=2  HYD=16G  AREA=0.02011   PER A=0  PER B=20
                     PER C=10  PER D=70  TP=0.1333  MASS RAIN=-1

        K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =   55.577    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 =
1.9000
        AREA =       .014077 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


        K =   .122575HR    TP =   .133300HR    K/TP RATIO =   .919546     SHAPE CONSTANT, N =
3.849372
        UNIT PEAK =   15.614    CFS   UNIT VOLUME =    .9995       B =   345.00      P60 =
1.9000
        AREA =       .006033 SQ MI    IA =    .45000 INCHES    INF =   1.11000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

PRINT HYD            ID=2  CODE=1

                                        HYDROGRAPH FROM AREA 16G

    RUNOFF VOLUME =      1.65010 INCHES      =        1.7698 ACRE-FEET
    PEAK DISCHARGE RATE =       49.99 CFS  AT   1.500 HOURS   BASIN AREA =   .0201 SQ. MI.


*
*ADD 16G FLOW
ADD HYD              ID=16  HYD=16G.1  ID=2  ID=3
PRINT HYD            ID=16  CODE=1

                                        HYDROGRAPH FROM AREA 16G.1

    RUNOFF VOLUME =      1.66040 INCHES      =        7.3553 ACRE-FEET
    PEAK DISCHARGE RATE =      199.09 CFS  AT   1.533 HOURS   BASIN AREA =   .0831 SQ. MI.


*
*ADD 16 FLOW TO STORM DRAIN
```

```
ADD HYD              ID=9  HYD=16.1  ID=16  ID=8
PRINT HYD            ID=9  CODE=1

                                   OUTFLOW HYDROGRAPH REACH    16.10

    RUNOFF VOLUME =     1.62169 INCHES     =     129.4443 ACRE-FEET
    PEAK DISCHARGE RATE =     730.13 CFS  AT   1.533 HOURS   BASIN AREA =  1.4967 SQ. MI.


*
*ROUTE STORM DRAIN FLOW TO 86TH STREET (STA 64+34)
*  USE FRICTION SLOPE IN THE PIPE
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.012
                     DIA=84    N=0.013

                                  RATING CURVE PIPE SECTION  1.0
                                      WATER        FLOW        FLOW        MAX
                                     SURFACE       AREA        RATE       WIDTH
                                     ELEV          SQ FT       CFS        FT
                                       .00          .00         .00        .00
                                       .36          .76        3.67       3.11
                                       .73         2.13       15.94       4.28
                                      1.09         3.84       37.05       5.08
                                      1.46         5.81       66.63       5.69
                                      1.82         7.97      104.03       6.15
                                      2.19        10.28      148.43       6.49
                                      2.55        12.70      198.86       6.74
                                      2.92        15.19      254.25       6.90
                                      3.28        17.72      313.42       6.99
                                      3.65        20.28      375.11       7.00
                                      4.01        22.82      437.92       7.00
                                      4.38        25.32      500.37       7.00
                                      4.74        27.75      560.81       7.00
                                      5.11        30.08      617.42       7.00
                                      5.47        32.27      668.09       7.00
                                      5.84        34.28      710.23       7.00
                                      6.20        36.05      740.39       7.00
                                      6.57        37.49      752.78       7.00
                                      7.00        38.48      752.78       7.00
COMPUTE TRAVEL TIME ID=1  REACH NO=1  NOVS=1  L=537  SLP=0.012

                              TRAVEL TIME TABLE
                                                REACH=  1.0

                              WATER       AVERAGE     FLOW        TRAVEL
                              DEPTH       AREA        RATE        TIME
                              FEET        SQ.FT.      CFS         HRS
                                 .365        .765        3.67       .0311
                                 .730       2.128       15.94       .0199
                                1.094       3.843       37.05       .0155
                                1.459       5.813       66.63       .0130
                                1.824       7.975      104.03       .0114
                                2.189      10.282      148.43       .0103
                                2.553      12.698      198.86       .0095
                                2.918      15.189      254.25       .0089
                                3.283      17.724      313.42       .0084
                                3.648      20.276      375.11       .0081
                                4.013      22.817      437.92       .0078
                                4.377      25.319      500.37       .0075
                                4.742      27.751      560.81       .0074
                                5.107      30.082      617.42       .0073
                                5.472      32.275      668.09       .0072
                                5.836      34.285      710.23       .0072
                                6.201      36.054      740.39       .0073
                                6.566      37.495      752.78       .0074
                                7.000      38.485      752.78       .0076
ROUTE                ID=1  HYD=16.2  INFLOW ID=9  DT=0.0
```

```
PRINT HYD            ID=1  CODE=1

                                        OUTFLOW HYDROGRAPH REACH    16.20

    RUNOFF VOLUME =     1.62127 INCHES     =     129.4115 ACRE-FEET
    PEAK DISCHARGE RATE =     730.06 CFS  AT   1.567 HOURS   BASIN AREA =  1.4967 SQ. MI.


*
*BASIN ADJACENT TO BRIDGE BLVD INCLUDING HALF OF BRIDGE ROW
COMPUTE NM HYD       ID=10  HYD=16D  AREA=0.01119   PER A=0  PER B=10
                     PER C=5  PER D=85   TP=0.1333  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
    UNIT PEAK =   37.552    CFS   UNIT VOLUME =    .9991       B =   526.28      P60 =
1.9000
    AREA =      .009512 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

    K =   .122575HR    TP =   .133300HR    K/TP RATIO =   .919546     SHAPE CONSTANT, N =
3.849372
    UNIT PEAK =   4.3442    CFS   UNIT VOLUME =    .9972       B =   345.00      P60 =
1.9000
    AREA =      .001679 SQ MI    IA =    .45000 INCHES    INF =   1.11000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

PRINT HYD            ID=10  CODE=1

                                        HYDROGRAPH FROM AREA 16D


    RUNOFF VOLUME =     1.83290 INCHES     =       1.0939 ACRE-FEET
    PEAK DISCHARGE RATE =      30.12 CFS  AT   1.500 HOURS   BASIN AREA =   .0112 SQ. MI.


*
*ADD THIS FLOW TO THE STORM DRAIN - SOUTH SIDE
ADD HYD              ID=1  HYD=16D.1  ID=1  ID=10
PRINT HYD            ID=1  CODE=1

                                        HYDROGRAPH FROM AREA 16D.1


    RUNOFF VOLUME =     1.62285 INCHES     =     130.5054 ACRE-FEET
    PEAK DISCHARGE RATE =     754.97 CFS  AT   1.567 HOURS   BASIN AREA =  1.5078 SQ. MI.


*
COMPUTE NM HYD       ID=17  HYD=17W  AREA=0.0802   PER A=0  PER B=15
                     PER C=10  PER D=75  TP=0.1881  MASS RAIN=-1

    K =   .102909HR    TP =   .188100HR    K/TP RATIO =   .547095     SHAPE CONSTANT, N =
7.071606
    UNIT PEAK =   167.77    CFS   UNIT VOLUME =    .9998       B =   524.64      P60 =
1.9000
    AREA =      .060150 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

    K =   .169820HR    TP =   .188100HR    K/TP RATIO =   .902817     SHAPE CONSTANT, N =
3.924796
```

```
        UNIT PEAK =   37.320    CFS   UNIT VOLUME =    .9997       B =   350.12      P60 =
1.9000
        AREA =       .020050 SQ MI    IA =    .44000 INCHES    INF =   1.08200 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

    PRINT HYD            ID=17  CODE=1

                                          HYDROGRAPH FROM AREA 17W


        RUNOFF VOLUME =     1.71647 INCHES     =       7.3419 ACRE-FEET
        PEAK DISCHARGE RATE =     173.01 CFS  AT   1.567 HOURS   BASIN AREA =   .0802 SQ. MI.


    *
    *DIVIDE FLOW FOR PORTION ENTERING SD AT 86TH AND PART ENTERING NEAR 82ND
    DIVIDE HYD           ID=17  Q=82  ID=17  HYD=86TH
                                      ID=18 HYD=82TH
    *ADD 17W TO STORM DRAIN FLOW - NORTH SIDE
    ADD HYD              ID=2  HYD=17.1  ID=17  ID=1
    PRINT HYD            ID=2  CODE=1

                                         OUTFLOW HYDROGRAPH REACH    17.10


        RUNOFF VOLUME =     1.62662 INCHES     =     136.2971 ACRE-FEET
        PEAK DISCHARGE RATE =     836.97 CFS  AT   1.567 HOURS   BASIN AREA =  1.5711 SQ. MI.


    *
    *ROUTE 84INCH STORM DRAIN FLOW STA 56+75 WHERE LINE IS UPSIZED TO 90INCH
    *  USE FRICTION SLOPE
    COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.0045
                         DIA=84    N=0.013

                                        RATING CURVE PIPE SECTION  1.0
                                            WATER        FLOW        FLOW        MAX
                                           SURFACE       AREA        RATE       WIDTH
                                            ELEV        SQ FT       CFS         FT
                                              .00          .00         .00        .00
                                              .36          .76        2.25       3.11
                                              .73         2.13        9.76       4.28
                                             1.09         3.84       22.69       5.08
                                             1.46         5.81       40.80       5.69
                                             1.82         7.97       63.71       6.15
                                             2.19        10.28       90.89       6.49
                                             2.55        12.70      121.78       6.74
                                             2.92        15.19      155.70       6.90
                                             3.28        17.72      191.93       6.99
                                             3.65        20.28      229.71       7.00
                                             4.01        22.82      268.17       7.00
                                             4.38        25.32      306.41       7.00
                                             4.74        27.75      343.43       7.00
                                             5.11        30.08      378.09       7.00
                                             5.47        32.27      409.12       7.00
                                             5.84        34.28      434.93       7.00
                                             6.20        36.05      453.40       7.00
                                             6.57        37.49      460.98       7.00
                                             7.00        38.48      460.98       7.00
    COMPUTE TRAVEL TIME ID=3  REACH NO=1  NOVS=1  L=759  SLP=0.0045

                                   TRAVEL TIME TABLE
                                                   REACH=  1.0

                                   WATER       AVERAGE     FLOW        TRAVEL
```

DEPTH FEET	AREA SQ.FT.	RATE CFS	TIME HRS
.365	.765	2.25	.0717
.730	2.128	9.76	.0460
1.094	3.843	22.69	.0357
1.459	5.813	40.80	.0300
1.824	7.975	63.71	.0264
2.189	10.282	90.89	.0239
2.553	12.698	121.78	.0220
2.918	15.189	155.70	.0206
3.283	17.724	191.93	.0195
3.648	20.276	229.71	.0186
4.013	22.817	268.17	.0179
4.377	25.319	306.41	.0174
4.742	27.751	343.43	.0170
5.107	30.082	378.09	.0168
5.472	32.275	409.12	.0166
5.836	34.285	434.93	.0166
6.201	36.054	453.40	.0168
6.566	37.495	460.98	.0171
7.000	38.485	460.98	.0176

```
    ROUTE                ID=3  HYD=17.2  INFLOW ID=2  DT=0.0
TRAVEL TIME TABLE EXCEEDED
    PRINT HYD            ID=3  CODE=1

                                        OUTFLOW HYDROGRAPH REACH    17.20


        RUNOFF VOLUME =      1.62584 INCHES     =     136.2325 ACRE-FEET
        PEAK DISCHARGE RATE =     835.00 CFS  AT   1.567 HOURS   BASIN AREA =  1.5711 SQ. MI.


    *
    *ROUTE STORM DRAIN FLOW TO 82ND STREET (STA 53+70) IN 90INCH
    COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.012
                         DIA=90    N=0.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.39	.88	4.41	3.33
.78	2.44	19.15	4.58
1.17	4.41	44.53	5.45
1.56	6.67	80.09	6.09
1.95	9.15	125.04	6.58
2.35	11.80	178.41	6.95
2.74	14.58	239.03	7.22
3.13	17.44	305.61	7.40
3.52	20.35	376.73	7.49
3.91	23.28	450.88	7.50
4.30	26.19	526.38	7.50
4.69	29.06	601.44	7.50
5.08	31.86	674.10	7.50
5.47	34.53	742.14	7.50
5.86	37.05	803.03	7.50
6.25	39.36	853.69	7.50
6.64	41.39	889.95	7.50
7.04	43.04	904.84	7.50
7.50	44.18	904.84	7.50

```
COMPUTE TRAVEL TIME ID=4  REACH NO=1  NOVS=1  L=305  SLP=0.012
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH	AVERAGE AREA	FLOW RATE	TRAVEL TIME

```
                                  FEET        SQ.FT.      CFS         HRS
                                   .391         .878       4.41       .0169
                                   .782        2.443      19.15       .0108
                                  1.173        4.412      44.53       .0084
                                  1.563        6.673      80.09       .0071
                                  1.954        9.155     125.04       .0062
                                  2.345       11.804     178.41       .0056
                                  2.736       14.577     239.03       .0052
                                  3.127       17.436     305.61       .0048
                                  3.518       20.347     376.73       .0046
                                  3.908       23.276     450.88       .0044
                                  4.299       26.193     526.38       .0042
                                  4.690       29.065     601.44       .0041
                                  5.081       31.857     674.10       .0040
                                  5.472       34.533     742.14       .0039
                                  5.863       37.050     803.03       .0039
                                  6.253       39.357     853.69       .0039
                                  6.644       41.389     889.95       .0039
                                  7.035       43.043     904.84       .0040
                                  7.500       44.179     904.84       .0041
ROUTE                   ID=4  HYD=17.3  INFLOW ID=3  DT=0.0
PRINT HYD               ID=4  CODE=1

                                        OUTFLOW HYDROGRAPH REACH    17.30

    RUNOFF VOLUME =      1.62562 INCHES      =     136.2138 ACRE-FEET
    PEAK DISCHARGE RATE =     834.48 CFS  AT   1.567 HOURS   BASIN AREA =  1.5711 SQ. MI.


*
*ADD FLOW FROM 17W AT 82ND STEET LOCATION (STA 53+70)
ADD HYD                 ID=5  HYD=17.4  ID=4  ID=18
PRINT HYD               ID=5  CODE=1

                                        OUTFLOW HYDROGRAPH REACH    17.40

    RUNOFF VOLUME =      1.62659 INCHES      =     137.7640 ACRE-FEET
    PEAK DISCHARGE RATE =     925.49 CFS  AT   1.567 HOURS   BASIN AREA =  1.5880 SQ. MI.


*
*ADD FLOW FROM BRIDGEPOINT APARTMENTS (AREA BOUNDED BY 86TH, BRIDGE, 82ND
*   & SUNSET GARDENS - BASIN INFORMATION FROM CONCEPTUAL GRADING & DRAINAGE
*   PLAN FOR BRIDGEPOINT APARTMENTS MARCH 1995 BY COMMUNITY SCIENCES
COMPUTE NM HYD          ID=6  HYD=BPD  AREA=0.0342   PER A=0 PER B=25
                        PER C=25  PER D=50  TP=0.1333  MASS RAIN=-1

        K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =   67.512    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 =
1.9000
        AREA =       .017100 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


        K =   .118483HR    TP =   .133300HR    K/TP RATIO =   .888844     SHAPE CONSTANT, N =
3.990548
        UNIT PEAK =   45.481    CFS   UNIT VOLUME =    1.000       B =   354.54      P60 =
1.9000
        AREA =       .017100 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

    PRINT HYD           ID=6  CODE=1
```

HYDROGRAPH FROM AREA BPD

RUNOFF VOLUME = 1.43350 INCHES = 2.6147 ACRE-FEET
PEAK DISCHARGE RATE = 77.22 CFS AT 1.500 HOURS BASIN AREA = .0342 SQ. MI.

```
*
*ADD TO FLOW IN STORM DRAIN
ADD HYD          ID=7  HYD=6.1  ID=6  ID=5
PRINT HYD        ID=7  CODE=1
```

OUTFLOW HYDROGRAPH REACH 6.10

RUNOFF VOLUME = 1.62252 INCHES = 140.3787 ACRE-FEET
PEAK DISCHARGE RATE = 991.01 CFS AT 1.567 HOURS BASIN AREA = 1.6222 SQ. MI.

```
*
*ROUTE STORM DRAIN FLOW TO UNSER BLVD. (STA 41+06)
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.012
                     DIA=90    N=0.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.39	.88	4.41	3.33
.78	2.44	19.15	4.58
1.17	4.41	44.53	5.45
1.56	6.67	80.09	6.09
1.95	9.15	125.04	6.58
2.35	11.80	178.41	6.95
2.74	14.58	239.03	7.22
3.13	17.44	305.61	7.40
3.52	20.35	376.73	7.49
3.91	23.28	450.88	7.50
4.30	26.19	526.38	7.50
4.69	29.06	601.44	7.50
5.08	31.86	674.10	7.50
5.47	34.53	742.14	7.50
5.86	37.05	803.03	7.50
6.25	39.36	853.69	7.50
6.64	41.39	889.95	7.50
7.04	43.04	904.84	7.50
7.50	44.18	904.84	7.50

```
COMPUTE TRAVEL TIME ID=8  REACH NO=1  NOVS=1  L=1264  SLP=0.012
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.391	.878	4.41	.0699
.782	2.443	19.15	.0448
1.173	4.412	44.53	.0348
1.563	6.673	80.09	.0293
1.954	9.155	125.04	.0257
2.345	11.804	178.41	.0232
2.736	14.577	239.03	.0214
3.127	17.436	305.61	.0200
3.518	20.347	376.73	.0190
3.908	23.276	450.88	.0181
4.299	26.193	526.38	.0175

```
                                        4.690      29.065      601.44       .0170
                                        5.081      31.857      674.10       .0166
                                        5.472      34.533      742.14       .0163
                                        5.863      37.050      803.03       .0162
                                        6.253      39.357      853.69       .0162
                                        6.644      41.389      889.95       .0163
                                        7.035      43.043      904.84       .0167
                                        7.500      44.179      904.84       .0171
    ROUTE                   ID=8  HYD=6.2  INFLOW ID=7  DT=0.0
TRAVEL TIME TABLE EXCEEDED
    PRINT HYD               ID=8  CODE=1

                                          OUTFLOW HYDROGRAPH REACH     6.20

        RUNOFF VOLUME =      1.62162 INCHES      =     140.3007 ACRE-FEET
        PEAK DISCHARGE RATE =     978.45 CFS  AT   1.600 HOURS   BASIN AREA =  1.6222 SQ. MI.


    *
    COMPUTE NM HYD          ID=21  HYD=21D  AREA=0.0101   PER A=0 PER B=25
                            PER C=5  PER D=70  TP=0.1333  MASS RAIN=-1

        K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =   27.913    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 =
1.9000
        AREA =       .007070 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


        K =    .126668HR    TP =    .133300HR    K/TP RATIO =    .950248     SHAPE CONSTANT, N =
3.719588
        UNIT PEAK =   7.6380    CFS   UNIT VOLUME =    .9983       B =   336.02      P60 =
1.9000
        AREA =       .003030 SQ MI    IA =    .47500 INCHES    INF =   1.18000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

    PRINT HYD               ID=21  CODE=1

                                          HYDROGRAPH FROM AREA 21D


        RUNOFF VOLUME =      1.63469 INCHES      =        .8805 ACRE-FEET
        PEAK DISCHARGE RATE =      24.83 CFS  AT   1.500 HOURS   BASIN AREA =   .0101 SQ. MI.


    *ADD 21D NORTH FLOW TO STORM DRAIN
    ADD HYD                 ID=6  HYD=21.1  ID=21  ID=8
    PRINT HYD               ID=6  CODE=1

                                          OUTFLOW HYDROGRAPH REACH    21.10

        RUNOFF VOLUME =      1.62170 INCHES      =     141.1812 ACRE-FEET
        PEAK DISCHARGE RATE =     995.91 CFS  AT   1.600 HOURS   BASIN AREA =  1.6323 SQ. MI.


    *   ------------------------------------------------------------
    *s UNSER BOULEVARD FLOWS TO CHANNEL - FLOW FROM NORTH OF BRIDGE BLVD
    *
    *s THE FOLLOWING HYDROGRAPH IS TAKEN FROM THE MASTER DRAINAGE PLAN FOR THE
    *s  ATRISCO BUSINESS PARK - SEPTEMBER 1992 & REVISED MARCH 1993 & SEPT 1993
    *s  by Easterling and Associates  & REPRESENTS THE ENTIRE UNSER DIVERSION
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*

RECALL HYD ID= 2 HYD= 180.16 DT= .050000 HRS DA= .6789 SQ MI

PEAK= 248.301CFS RO= 2.0374 INCHES NO PTS=561

FLOW RATES

.000	.000	.000	.000	.000
.000	.000	.000	.000	.000
.000	.000	.000	.000	.000
.000	.000	.000	.000	.000
.000	.000	.000	.190	2.607
15.681	52.706	94.629	130.751	179.000
222.374	248.301	242.350	233.146	229.654
226.551	222.642	219.306	216.954	214.894
213.362	212.455	209.391	203.507	198.669
199.114	200.160	201.946	205.697	211.556
217.013	220.800	223.673	225.619	226.601
226.804	226.312	225.212	223.520	221.330
218.733	215.818	212.634	209.194	205.557
201.783	197.931	194.053	190.261	186.446
182.991	180.488	178.390	176.122	173.838
171.586	169.319	166.424	163.146	160.027
156.929	153.920	150.945	148.040	145.123
134.843	92.294	88.602	91.040	87.107
88.199	85.848	85.857	84.316	83.861
82.657	81.833	80.707	79.841	78.850
77.971	77.036	76.136	75.215	74.326
73.422	72.442	71.302	70.095	68.924
67.761	66.560	65.360	64.175	62.986
61.779	60.276	58.142	55.697	53.376
51.113	48.896	46.831	44.865	42.875
40.778	38.632	36.589	34.670	32.782
30.939	29.100	27.213	25.383	23.739
22.102	19.794	16.958	14.696	13.463
12.935	12.693	12.561	12.490	12.435
12.393	12.364	12.340	12.313	12.284
12.253	12.210	12.163	12.136	12.110
12.070	12.032	11.999	11.969	11.941
11.913	11.874	11.828	11.789	11.753
11.717	11.682	11.645	11.610	11.579
11.552	11.515	11.476	11.455	11.434
11.397	11.360	11.315	11.276	11.250
11.212	11.176	11.153	11.120	11.077
11.044	11.016	10.990	10.963	10.935
10.906	10.866	10.824	10.799	10.774
10.736	10.700	10.666	10.635	10.606
10.579	10.555	10.531	10.499	10.461
10.443	10.435	10.410	10.372	10.340
10.313	10.289	10.264	10.225	10.180
10.153	10.137	10.105	10.063	10.038
10.018	9.987	9.961	9.938	9.916
9.896	9.874	9.843	9.816	9.802
9.776	9.741	9.723	9.715	9.694
9.661	9.634	9.612	9.593	9.574
9.553	9.531	9.497	9.458	9.438
9.428	9.402	9.366	9.346	9.328
9.301	9.276	9.255	9.236	9.217
9.196	9.165	9.139	9.126	9.102
9.080	9.070	9.047	9.016	8.990
8.967	8.947	8.939	8.937	8.918
8.876	8.837	8.820	8.817	8.808
8.791	8.769	8.740	8.707	8.694
8.684	8.660	8.646	8.632	8.604
8.580	8.560	8.543	8.527	8.510
8.494	8.478	8.453	8.433	8.425
8.406	8.388	8.381	8.361	8.331
8.308	8.289	8.282	8.282	8.266
8.237	8.217	8.204	8.194	8.184
8.170	8.141	8.107	8.088	8.081
8.068	8.041	8.007	7.992	7.992
7.979	7.955	7.946	7.938	7.918

7.901	7.885	7.869	7.854	7.837
7.822	7.807	7.793	7.780	7.760
7.742	7.736	7.720	7.691	7.677
7.674	7.657	7.629	7.617	7.618
7.609	7.586	7.566	7.553	7.540
7.527	7.512	7.495	7.479	7.465
7.452	7.440	7.431	7.423	7.403
7.375	7.364	7.368	7.364	7.340
7.310	7.298	7.287	7.268	7.260
7.252	7.232	7.224	7.218	7.201
7.185	7.173	7.161	7.151	7.141
7.128	7.116	7.107	7.096	7.075
7.058	7.055	7.041	7.025	7.021
7.004	6.977	6.967	6.971	6.957
6.931	6.912	6.909	6.916	6.909
6.886	6.867	6.856	6.847	6.836
6.824	6.810	6.796	6.782	6.771
6.763	6.754	6.746	6.742	6.737
6.719	6.694	6.686	6.689	6.684
6.664	6.635	6.623	6.627	6.616
6.595	6.587	6.581	6.565	6.560
6.555	6.539	6.532	6.530	6.515
6.499	6.489	6.482	6.473	6.460
6.448	6.437	6.428	6.419	6.397
6.381	6.382	6.382	6.372	6.353
6.338	6.337	6.329	6.320	6.321
6.306	6.282	6.276	6.282	6.273
6.248	6.227	6.214	6.215	6.224
6.214	6.189	6.171	6.164	6.158
6.150	6.140	6.129	6.114	6.102
6.092	6.083	6.078	6.070	6.065
6.063	6.044	5.886	5.529	5.147
4.835	4.520	4.142	3.718	3.300
2.917	2.568	2.250	1.966	1.715
1.500	1.316	1.156	1.014	.890
.782	.689	.609	.539	.479
.426	.380	.339	.304	.272
.244	.220	.198	.178	.161
.145	.130	.117	.106	.095
.086	.077	.070	.063	.057
.051	.046	.042	.038	.034
.031	.027	.025	.022	.019
.017	.015	.014	.012	.011
.010	.009	.007	.007	.006
.006	.005	.005	.004	.004
.003	.003	.003	.002	.002
.002	.002	.002	.001	.001
.001				

```
*
*ROUTE FLOW SOUTH IN UNSER BLVD - 72INCH STORM DRAIN
*
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.0100
                     DIA=72    N=0.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.31	.56	2.22	2.67
.63	1.56	9.64	3.67
.94	2.82	22.42	4.36
1.25	4.27	40.32	4.87
1.56	5.86	62.96	5.27
1.88	7.55	89.83	5.56
2.19	9.33	120.35	5.78
2.50	11.16	153.87	5.92
2.81	13.02	189.68	5.99
3.13	14.90	227.01	6.00

3.44	16.76	265.02	6.00
3.75	18.60	302.81	6.00
4.06	20.39	339.39	6.00
4.38	22.10	373.65	6.00
4.69	23.71	404.31	6.00
5.00	25.19	429.82	6.00
5.32	26.49	448.07	6.00
5.63	27.55	455.57	6.00
6.00	28.27	455.57	6.00

COMPUTE TRAVEL TIME ID=3 REACH NO=1 NOVS=1 L=1225 SLP=0.01

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.313	.562	2.22	.0861
.625	1.564	9.64	.0552
.938	2.824	22.42	.0429
1.251	4.271	40.32	.0360
1.563	5.859	62.96	.0317
1.876	7.554	89.83	.0286
2.189	9.329	120.35	.0264
2.501	11.159	153.87	.0247
2.814	13.022	189.68	.0234
3.127	14.897	227.01	.0223
3.439	16.764	265.02	.0215
3.752	18.601	302.81	.0209
4.065	20.388	339.39	.0204
4.377	22.101	373.65	.0201
4.690	23.712	404.31	.0200
5.003	25.189	429.82	.0199
5.315	26.489	448.07	.0201
5.628	27.547	455.57	.0206
6.000	28.274	455.57	.0211

ROUTE ID=3 HYD=R2 INFLOW ID=2 DT=0.0
PRINT HYD ID=3 CODE=1

HYDROGRAPH FROM AREA R2

RUNOFF VOLUME = 2.03740 INCHES = 73.7698 ACRE-FEET
PEAK DISCHARGE RATE = 247.01 CFS AT 1.600 HOURS BASIN AREA = .6789 SQ. MI.

*
*ROUTE FLOW TO LOCATION WHERE BASIN 13 TIES IN - PIPE IS UPSIZED TO 78INCH
COMPUTE RATING CURVE CID=1 VSNO=1 CODE=-1 SLP=0.004
DIA=78 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.34	.66	1.74	2.89
.68	1.84	7.55	3.97
1.02	3.31	17.55	4.72
1.35	5.01	31.57	5.28
1.69	6.88	49.29	5.71
2.03	8.87	70.33	6.03
2.37	10.95	94.22	6.26
2.71	13.10	120.47	6.41
3.05	15.28	148.51	6.49
3.39	17.48	177.73	6.50
3.73	19.67	207.50	6.50
4.06	21.83	237.09	6.50

4.40	23.93	265.73	6.50
4.74	25.94	292.55	6.50
5.08	27.83	316.55	6.50
5.42	29.56	336.52	6.50
5.76	31.09	350.81	6.50
6.10	32.33	356.68	6.50
6.50	33.18	356.68	6.50

COMPUTE TRAVEL TIME ID=4 REACH NO=1 NOVS=1 L=209 SLP=0.004

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.339	.660	1.74	.0220
.677	1.835	7.55	.0141
1.016	3.314	17.55	.0110
1.355	5.012	31.57	.0092
1.694	6.876	49.29	.0081
2.032	8.866	70.33	.0073
2.371	10.949	94.22	.0067
2.710	13.096	120.47	.0063
3.049	15.283	148.51	.0060
3.387	17.483	177.73	.0057
3.726	19.674	207.50	.0055
4.065	21.831	237.09	.0053
4.403	23.928	265.73	.0052
4.742	25.938	292.55	.0051
5.081	27.829	316.55	.0051
5.420	29.562	336.52	.0051
5.758	31.088	350.81	.0051
6.097	32.330	356.68	.0053
6.500	33.183	356.68	.0054

ROUTE ID=4 HYD=R3 INFLOW ID=3 DT=0.0
PRINT HYD ID=4 CODE=1

HYDROGRAPH FROM AREA R3

RUNOFF VOLUME = 2.03740 INCHES = . 73.7698 ACRE-FEET
PEAK DISCHARGE RATE = 247.54 CFS AT 1.600 HOURS BASIN AREA = .6789 SQ. MI.

*
COMPUTE NM HYD ID=13 HYD=13D AREA=0.1664 PER A=0 PER B=15
PER C=5 PER D=80 TP=0.2098 MASS RAIN=-1

K = .116921HR TP = .209800HR K/TP RATIO = .557296 SHAPE CONSTANT, N = 6.906776
UNIT PEAK = 327.93 CFS UNIT VOLUME = .9999 B = 516.82 P60 = 1.9000
AREA = .133120 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

K = .189676HR TP = .209800HR K/TP RATIO = .904080 SHAPE CONSTANT, N = 3.918978
UNIT PEAK = 55.477 CFS UNIT VOLUME = .9999 B = 349.73 P60 = 1.9000
AREA = .033280 SQ MI IA = .46250 INCHES INF = 1.14500 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

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

PRINT HYD ID=13 CODE=1

HYDROGRAPH FROM AREA 13D

```
RUNOFF VOLUME =      1.76677 INCHES      =       15.6794 ACRE-FEET
PEAK DISCHARGE RATE =     342.65 CFS  AT   1.567 HOURS   BASIN AREA =   .1664 SQ. MI.


*
*ROUTE BASIN 13 FLOWS THROUGH EARTHEN CHANNEL TO UNSER STORM DRAIN
*
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=5089
                     MAX ELEV=5090  CH SLOPE=0.007  FP SLOPE=0.007
                     N=0.03   DIST=15
                     DIST ELEV
                      0   5090
                      3   5089
                      12  5089
                      15  5090
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
5089.00	.00	.00	.00
5089.05	.48	.28	9.32
5089.11	.98	.89	9.63
5089.16	1.50	1.75	9.95
5089.21	2.03	2.85	10.27
5089.26	2.58	4.15	10.58
5089.32	3.15	5.67	10.90
5089.37	3.73	7.37	11.21
5089.42	4.33	9.27	11.53
5089.47	4.95	11.36	11.85
5089.53	5.58	13.63	12.16
5089.58	6.23	16.09	12.48
5089.63	6.90	18.73	12.80
5089.69	7.58	21.55	13.11
5089.74	8.28	24.56	13.43
5089.79	9.00	27.76	13.75
5089.84	9.73	31.14	14.06
5089.90	10.48	34.70	14.38
5089.95	11.25	38.46	14.70
5090.00	12.03	42.42	15.00

```
COMPUTE TRAVEL TIME ID=5  REACH NO=1  NOVS=1  L=230  SLP=0.007
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.483	.28	.1110
.105	.983	.89	.0708
.158	1.499	1.75	.0546
.211	2.032	2.85	.0456
.264	2.582	4.15	.0397
.316	3.148	5.67	.0355
.369	3.731	7.37	.0323
.422	4.331	9.27	.0298
.475	4.947	11.36	.0278
.527	5.580	13.63	.0262
.580	6.230	16.09	.0247
.633	6.897	18.73	.0235
.686	7.580	21.55	.0225
.738	8.280	24.56	.0215
.791	8.996	27.76	.0207
.844	9.729	31.14	.0200
.896	10.479	34.70	.0193
.949	11.246	38.46	.0187
1.002	12.029	42.42	.0181

```
    ROUTE                ID=5  HYD=R13  INFLOW ID=13  DT=0.0
TRAVEL TIME TABLE EXCEEDED
    PRINT HYD            ID=5  CODE=1

                                        HYDROGRAPH FROM AREA R13

        RUNOFF VOLUME =     1.76678 INCHES     =      15.6795 ACRE-FEET
        PEAK DISCHARGE RATE =     336.38 CFS  AT   1.600 HOURS   BASIN AREA =   .1664 SQ. MI.


    *
    *ADD BASIN 13 TO FLOWS IN UNSER STORM DRAIN
    ADD HYD              ID=5  HYD=13.1  ID=5  ID=4
    PRINT HYD            ID=5  CODE=1

                                        OUTFLOW HYDROGRAPH REACH    13.10

        RUNOFF VOLUME =     1.92905 INCHES     =      86.9662 ACRE-FEET
        PEAK DISCHARGE RATE =     583.91 CFS  AT   1.600 HOURS   BASIN AREA =   .8453 SQ. MI.


    *
    COMPUTE NM HYD       ID=17  HYD=17E  AREA=0.0651   PER A=0  PER B=10
                         PER C=10  PER D=80  TP=0.1333  MASS RAIN=-1

        K =   .072690HR    TP =   .133300HR    K/TP RATIO =   .545308     SHAPE CONSTANT, N =
7.101310
        UNIT PEAK =   205.52    CFS   UNIT VOLUME =    .9993       B =   526.03      P60 =
1.9000
        AREA =      .052080 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


        K =   .118406HR    TP =   .133300HR    K/TP RATIO =   .888269     SHAPE CONSTANT, N =
3.993314
        UNIT PEAK =   34.647    CFS   UNIT VOLUME =    1.000       B =   354.72      P60 =
1.9000
        AREA =      .013020 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

    PRINT HYD            ID=17  CODE=1

                                        HYDROGRAPH FROM AREA 17E

        RUNOFF VOLUME =     1.78282 INCHES     =       6.1899 ACRE-FEET
        PEAK DISCHARGE RATE =     171.89 CFS  AT   1.500 HOURS   BASIN AREA =   .0651 SQ. MI.


    *
    *ADD 17E FLOW TO STORM DRAIN FLOW
    ADD HYD              ID=7  HYD=17.1  ID=17  ID=5
    PRINT HYD            ID=7  CODE=1

                                        OUTFLOW HYDROGRAPH REACH    17.10

        RUNOFF VOLUME =     1.91859 INCHES     =      93.1561 ACRE-FEET
        PEAK DISCHARGE RATE =     703.48 CFS  AT   1.567 HOURS   BASIN AREA =   .9104 SQ. MI.
```

```
*
*ROUTE FLOWS IN 96INCH UNSER STORM DRAIN
COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.004
                     DIA=96    N=0.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.42	1.00	3.03	3.56
.83	2.78	13.14	4.89
1.25	5.02	30.54	5.81
1.67	7.59	54.92	6.50
2.08	10.42	85.75	7.02
2.50	13.43	122.35	7.42
2.92	16.59	163.92	7.70
3.34	19.84	209.58	7.89
3.75	23.15	258.36	7.98
4.17	26.48	309.20	8.00
4.59	29.80	360.98	8.00
5.00	33.07	412.46	8.00
5.42	36.25	462.28	8.00
5.84	39.29	508.94	8.00
6.25	42.15	550.70	8.00
6.67	44.78	585.44	8.00
7.09	47.09	610.30	8.00
7.50	48.97	620.52	8.00
8.00	50.27	620.52	8.00

```
COMPUTE TRAVEL TIME ID=8  REACH NO=1  NOVS=1  L=1711  SLP=0.004
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.417	.999	3.03	.1569
.834	2.780	13.14	.1006
1.251	5.020	30.54	.0781
1.668	7.592	54.92	.0657
2.084	10.416	85.75	.0577
2.501	13.430	122.35	.0522
2.918	16.585	163.92	.0481
3.335	19.838	209.58	.0450
3.752	23.150	258.36	.0426
4.169	26.483	309.20	.0407
4.586	29.802	360.98	.0392
5.003	33.069	412.46	.0381
5.420	36.246	462.28	.0373
5.836	39.290	508.94	.0367
6.253	42.154	550.70	.0364
6.670	44.780	585.44	.0364
7.087	47.091	610.30	.0367
7.504	48.973	620.52	.0375
8.000	50.265	620.52	.0385

```
    ROUTE                ID=8  HYD=R6  INFLOW ID=7  DT=0.0
TRAVEL TIME TABLE EXCEEDED
    PRINT HYD            ID=8  CODE=1
```

HYDROGRAPH FROM AREA R6

```
RUNOFF VOLUME =      1.91700 INCHES      =      93.0787 ACRE-FEET
PEAK DISCHARGE RATE =     688.34 CFS  AT   1.633 HOURS   BASIN AREA =   .9104 SQ. MI.

*
```

```
*S FLOW FROM NORTH ON UNSER TO CHANNEL - ADD TO FLOW FROM BRIDGE
ADD HYD              ID=9  HYD=CHANNEL  ID=8  ID=6
PRINT HYD            ID=9  CODE=1

                                        HYDROGRAPH FROM AREA CHANNEL


    RUNOFF VOLUME =     1.72743 INCHES     =     234.2600 ACRE-FEET
    PEAK DISCHARGE RATE =    1682.47 CFS  AT   1.600 HOURS   BASIN AREA =  2.5427 SQ. MI.


*
*   ____________________________________________________
*
*s UNSER BLVD - FLOW FROM SOUTH OF BRIDGE EMPTYING TO THE CHANNEL
*
*s THE FOLLOWING IS TAKEN FROM SUNSET GARDENS/UNSER BLVD STORM DRAIN
*s   DESIGN ANALYSIS REPORT, DATED 12/5/97  BY RYALS ENGINEERING AND
*s   CONSTRUCTION SERVICES AS REVISED BY TUCKER GREEN, PER SE ENGENEERING
*****************************************************************************
*
* URS GREINER RECEIVED file (tg386) csgif00d.dat    1-7-98   T. Green
       ON 20 FEBRUARY, 1998 TO INCORPORATE IN THIS MODEL - ONLY THE FUTURE
       FULLY-DEVELOPED CONDITION WAS USED
* THE SUNSET GARDENS STORM DRAIN RUNS ALONG SUNSET GARDENS, THEN TO UNSER
*  THEN NORTH TO THE HEAD OF THE AMOLE CHANNEL. A FULLY DEVELOPED BASIN Y
*  CONTRIBUTES TO THIS FLOW, AS DO BASINS V (POINTE WEST), W, & X.
*
* CONDITONS BASED ON CURRENT ZONING & DEVELOPMENT, CURRENT DEVELOPMENT PLANS,
* AND ON ENGINEERING JUDGMENT.
*C REVISION NOTES: BASED ON FILES VCF4100 & SGU100.DAT BY TUCKER GREEN P.E.
*C                 REVISED 10-15-97 TO REFLECT NEW BASIN BOUNDARIES BASED ON
*C                 DISCUSSION WITH THE CITY, THE ENGINEERS FOR SAD 222, AND
*C                 DEVELOPERS OF NEARBY PROPERTIES, ESPECIALLY BASINS V & W.
*C                 IN PARTICULAR: (1) BASIN M (S OF SUNSET GARDENS, BETWEEN
*C                 94TH & 98TH) IS REMOVED FROM INTERIM & FUTURE CONDTION CASES
*C                 BY PROPOSED CONSTRUCTION OF 94TH ST; AND (2) THE HIGH POINT
*C                 IN 86 ST IS MOVED NORTH TO THE SOUTH PROPERTY LINE OF THE
*C                 CANTO III SITE (BASIN JYD).
*C               :
*C               : REVISED 1-7-98 FOR MORE IMPERVIOUS BASIN W (WHISPER POINTE)
*C                 & LARGER BASIN X (ADD ECUARIZ & MORE UNSER R.O.W.)
*C               : REVISED 1-22-98 TO ADD 'INFO ONLY' HYD U+V, AND TO
*C                 PROVIDE DETAILED OUTPUT FOR BASINS T-Y, U.PLUS.V,
*C                 SG.AT.82ND, AND 314 (SG.AT.82ND ROUTED TO UNSER)
*C
*****************************************************************************
COMPUTE NM HYD       ID= 1    HYD= I              DA=0.00952  SQ MI
                     PER A= 12     B= 26      C= 24      D= 38
                     TP= -0.13333 HRS   RAIN= -1

         K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
         UNIT PEAK =   14.279    CFS   UNIT VOLUME =    .9985       B =   526.28      P60 =
1.9000
         AREA =       .003618 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


         K =   .127510HR    TP =   .133330HR    K/TP RATIO =   .956348     SHAPE CONSTANT, N =
3.695043
         UNIT PEAK =   14.799    CFS   UNIT VOLUME =    .9993       B =   334.30      P60 =
1.9000
         AREA =       .005902 SQ MI    IA =    .47097 INCHES    INF =   1.16871 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

```
PRINT HYD              ID= 1   CODE= 1

                                          HYDROGRAPH FROM AREA I

    RUNOFF VOLUME =     1.23320 INCHES     =        .6261 ACRE-FEET
    PEAK DISCHARGE RATE =      18.97 CFS  AT   1.500 HOURS   BASIN AREA =   .0095 SQ. MI.


*
*****************************************************************************
COMPUTE NM HYD         ID= 2    HYD= H                DA=0.01501  SQ MI
                       PER A= 0      B= 20      C= 10      D= 70
                       TP= -0.13333 HRS   RAIN= -1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
    UNIT PEAK =   41.473    CFS   UNIT VOLUME =    .9991       B =   526.28      P60 =
1.9000
    AREA =       .010507 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .122603HR    TP =   .133330HR    K/TP RATIO =   .919546     SHAPE CONSTANT, N =
3.849372
    UNIT PEAK =   11.652    CFS   UNIT VOLUME =    .9992       B =   345.00      P60 =
1.9000
    AREA =       .004503 SQ MI    IA =    .45000 INCHES    INF =   1.11000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

PRINT HYD              ID= 2   CODE= 1

                                          HYDROGRAPH FROM AREA H

    RUNOFF VOLUME =     1.65010 INCHES     =       1.3209 ACRE-FEET
    PEAK DISCHARGE RATE =      37.31 CFS  AT   1.500 HOURS   BASIN AREA =   .0150 SQ. MI.


*
*****************************************************************************
* E PLUS H PLUS I AT SUNSET GARDENS & 90TH FOLLOWS
ADD HYD                ID OUT= 3   HYD= 208          IDIN I= 1   IDIN II= 2
PRINT HYD              ID= 3   CODE= 1

                                       PARTIAL HYDROGRAPH   208.00

    RUNOFF VOLUME =     1.48828 INCHES     =       1.9471 ACRE-FEET
    PEAK DISCHARGE RATE =      56.28 CFS  AT   1.500 HOURS   BASIN AREA =   .0245 SQ. MI.


*
*****************************************************************************
*s DIVIDE SO 1ST 8.6 CFS (ID=6) S ON 90TH (ON HOLD): ID=4 E ON SUNSET GARDENS
DIVIDE HYD             ID=3  Q=8.6 ID=6 HYD= 90.S.PAST.SG  ID=4 HYD= SG.E.OF.90
PRINT HYD              ID= 4   CODE= 1

                                          HYDROGRAPH FROM AREA SG.E.OF.90

    RUNOFF VOLUME =     1.48828 INCHES     =       1.1256 ACRE-FEET
    PEAK DISCHARGE RATE =      47.68 CFS  AT   1.500 HOURS   BASIN AREA =   .0142 SQ. MI.
```

```
PRINT HYD              ID= 6   CODE= 1

                                        HYDROGRAPH FROM AREA 90.S.PAST.SG

    RUNOFF VOLUME =      1.48828 INCHES     =         .8214 ACRE-FEET
    PEAK DISCHARGE RATE =        8.60 CFS  AT   1.333 HOURS   BASIN AREA =   .0103 SQ. MI.


*
*****************************************************************************
* ROUTE MAIN FLOW EAST DOWN SG FROM 90TH, FOLLOW IT TO 86TH ST
*C APPROX AS 40' F-F STREET, ASSUME APX 2.35% SLOPE
*C ASSUME AS IF BOTH SIDES PAVED, EST n AS .017
COMPUTE RATING CURVE CID= -1   VS NO= 1    NO SEGS FOR MANNING n= 1
                     ELMIN= 0 ELMAX= 4  FT  CHSLP= .0235  FPSLP= .0235  FT/FT
                     n .017  DIST 40
                     DIST  ELEV     DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0      4       .01    0      20      .40    39.99    0
                     40     4
ROUTE MCUNGE         ID= 5   HYD= 209          INFLOW HYD ID= 4   DT= 0.0 HR
                     LENGTH= 1055     NSUBRCH= 0     SLOPE= .0235
                     MATCODE= 0       REGCODE= 0     CCODE= 0
      Inflow ID end= 63   Max Number=600

      dt = .0333 hr   q0 =    23.84 cfs   ck0 =  5.46 fps
      nlen =  4   dlen =  263.75
```

Depth ft	Area sf	Q cfs	Qbar cfs	ck fps	b ft	C	D	c1	c2	vel fps	fr	tt hr
.00	.0	.0	3.3	2.95	10.5	1.34	.02	.99	.15	2.95	1.60	.099
.21	2.2	6.5	24.6	5.46	30.5	2.48	.02	.99	.43	4.45	1.84	.066
.42	8.8	42.7	86.0	10.29	40.0	4.68	.03	.99	.65	6.59	2.03	.044
.63	17.3	129.3	189.2	14.23	40.0	6.47	.05	.99	.73	8.81	2.12	.033
.84	25.7	249.1	323.0	17.56	40.0	7.99	.07	.98	.78	10.81	2.20	.027
1.05	34.1	396.9	483.2	20.51	40.0	9.33	.10	.98	.81	12.62	2.27	.023
1.26	42.5	569.6	667.1	23.18	40.0	10.54	.12	.98	.83	14.28	2.33.	.021
1.47	50.9	764.7	872.5	25.62	40.0	11.66	.14	.98	.84	15.82	2.37	.019
1.68	59.3	980.4	1097.7	27.88	40.0	12.69	.16	.98	.86	17.27	2.41	.017
1.89	67.8	1215.1	1341.3	29.99	40.0	13.64	.18	.98	.87	18.64	2.45	.016
2.11	76.2	1467.6	1602.1	31.97	40.0	14.54	.20	.97	.87	19.93	2.48	.015
2.32	84.6	1736.7	1879.1	33.83	40.0	15.39	.22	.97	.88	21.16	2.50	.014
2.53	93.0	2021.5	2171.3	35.59	40.0	16.19	.25	.97	.89	22.33	2.52	.013
2.74	101.4	2321.1	2478.0	37.25	40.0	16.95	.27	.97	.89	23.45	2.54	.012
2.95	109.9	2634.8	2798.3	38.84	40.0	17.67	.29	.97	.89	24.53	2.56	.012
3.16	118.3	2961.8	3131.6	40.34	40.0	18.36	.31	.97	.90	25.57	2.57	.011
3.37	126.7	3301.5	3477.4	41.78	40.0	19.01	.34	.97	.90	26.56	2.59	.011
3.58	135.1	3653.3	3835.0	43.16	40.0	19.63	.36	.97	.90	27.52	2.60	.011
3.79	143.5	4016.7	4204.0	44.47	40.0	20.23	.38	.96	.91	28.45	2.61	.010
4.00	152.0	4391.2	.0	.00	.0	.00	.00	.00	.00	.00	.00	.000

```
      nlen= 4   Outflow ID end=600
    Route using Ponce procedure:  C1 > 0
PRINT HYD              ID= 5   CODE= 1

                                        PARTIAL HYDROGRAPH   209.00

    RUNOFF VOLUME =      1.47973 INCHES     =        1.1192 ACRE-FEET
    PEAK DISCHARGE RATE =       47.57 CFS  AT   1.567 HOURS   BASIN AREA =   .0142 SQ. MI.


*
*****************************************************************************
COMPUTE NM HYD         ID= 1    HYD= J                DA=0.00228 SQ MI
                       PER A= 0       B= 15       C= 0        D= 85
                       TP= -0.13333 HRS   RAIN= -1
```

```
        K =    .072665HR    TP =    .133330HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =    7.6496    CFS   UNIT VOLUME =    .9978       B =   526.28      P60 =
1.9000
        AREA =       .001938 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

        K =    .130790HR    TP =    .133330HR    K/TP RATIO =    .980950     SHAPE CONSTANT, N =
3.599935
        UNIT PEAK =    .84019    CFS   UNIT VOLUME =    .9837       B =   327.55      P60 =
1.9000
        AREA =       .000342 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

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

    PRINT HYD              ID= 1   CODE= 1

                                                HYDROGRAPH FROM AREA J

        RUNOFF VOLUME =      1.81798 INCHES      =          .2211 ACRE-FEET
        PEAK DISCHARGE RATE =        6.09 CFS  AT   1.500 HOURS   BASIN AREA =    .0023 SQ. MI.


    *
    ************************************************************************************
    ADD HYD                ID OUT= 3  HYD= 210              IDIN I= 1   IDIN II= 5
    PRINT HYD              ID= 3   CODE= 1

                                        PARTIAL HYDROGRAPH   210.00


        RUNOFF VOLUME =      1.52653 INCHES      =        1.3402 ACRE-FEET
        PEAK DISCHARGE RATE =       53.08 CFS  AT   1.533 HOURS   BASIN AREA =    .0165 SQ. MI.


    *
    ************************************************************************************
    * CALC CONTRIBUTING PART OF CANTO SITE; THEN ADD TO HYD 210
    COMPUTE NM HYD         ID= 1   HYD=SITE.II        DA=0.00839 SQ MI
                           PER A= 0      B= 35      C= 0       D= 65
                           TP= -0.13333 HRS   RAIN= -1

        K =    .072665HR    TP =    .133330HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =    21.526    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 =
1.9000
        AREA =       .005454 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

        K =    .130790HR    TP =    .133330HR    K/TP RATIO =    .980950     SHAPE CONSTANT, N =
3.599935
        UNIT PEAK =    7.2141    CFS   UNIT VOLUME =    .9985       B =   327.55      P60 =
1.9000
        AREA =       .002937 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

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

    PRINT HYD              ID= 1   CODE= 1

                                                HYDROGRAPH FROM AREA SITE.II
```

```
    RUNOFF VOLUME =      1.55434 INCHES      =          .6955 ACRE-FEET
    PEAK DISCHARGE RATE =       19.75 CFS  AT   1.500 HOURS   BASIN AREA =   .0084 SQ. MI.


*
*****************************************************************************
*S PARTIAL WATERBLOCK ==> FLOW > 11.6cfs TO 86TH
DIVIDE HYD            ID=1  Q=11.6  ID=2 HYD=S2.TO.S3   ID=7 HYD=S2.TO.86TH
PRINT HYD             ID= 2   CODE= 1

                                        HYDROGRAPH FROM AREA S2.TO.S3


    RUNOFF VOLUME =      1.55431 INCHES      =          .6070 ACRE-FEET
    PEAK DISCHARGE RATE =       11.60 CFS  AT   1.433 HOURS   BASIN AREA =   .0073 SQ. MI.


PRINT HYD             ID= 7   CODE= 1

                                        HYDROGRAPH FROM AREA S2.TO.86TH

    RUNOFF VOLUME =      1.55431 INCHES      =          .0885 ACRE-FEET
    PEAK DISCHARGE RATE =        8.15 CFS  AT   1.500 HOURS   BASIN AREA =   .0011 SQ. MI.


*
*****************************************************************************
COMPUTE NM HYD        ID= 1   HYD=SITE.III        DA=0.02360 SQ MI
                      PER A= 0      B= 35      C= 0       D= 65
                      TP= -0.13333 HRS   RAIN= -1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
    UNIT PEAK =   60.549    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 =
1.9000
    AREA =       .015340 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .130790HR    TP =   .133330HR    K/TP RATIO =   .980950     SHAPE CONSTANT, N =
3.599935
    UNIT PEAK =   20.292    CFS   UNIT VOLUME =    .9997       B =   327.55      P60 =
1.9000
    AREA =       .008260 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333
    BULKING FACTOR APPLIED TO HYDROGRAPH.  FACTOR =  1.02000 AT PEAK FLOW.

PRINT HYD             ID= 1   CODE= 1

                                        HYDROGRAPH FROM AREA SITE.III


    RUNOFF VOLUME =      1.55434 INCHES      =        1.9564 ACRE-FEET
    PEAK DISCHARGE RATE =       55.53 CFS  AT   1.500 HOURS   BASIN AREA =   .0236 SQ. MI.


*
*****************************************************************************
* TOTAL FLOW LEAVING CANTO NORTH OF SUNSET GARDENS
ADD HYD               ID OUT= 16  HYD=SITE.OUT      IDIN I= 1   IDIN II= 2
PRINT HYD             ID= 16   CODE= 1

                                        HYDROGRAPH FROM AREA SITE.OUT
```

```
    RUNOFF VOLUME =      1.55433 INCHES      =        2.5634 ACRE-FEET
    PEAK DISCHARGE RATE =       67.13 CFS  AT   1.500 HOURS   BASIN AREA =   .0309 SQ. MI.


*
*****************************************************************************
*S TOTAL FLOW SUNSET GARDENS WEST OF 86TH
ADD HYD                ID OUT= 5  HYD= SG.W.OF.86     IDIN I= 3   IDIN II= 16
PRINT HYD              ID= 5   CODE= 1

                                        HYDROGRAPH FROM AREA SG.W.OF.86


    RUNOFF VOLUME =      1.54467 INCHES      =        3.9036 ACRE-FEET
    PEAK DISCHARGE RATE =      118.05 CFS  AT   1.533 HOURS   BASIN AREA =   .0474 SQ. MI.


*
*****************************************************************************
COMPUTE NM HYD         ID= 1    HYD= C                DA=0.00127 SQ MI
                       PER A= 0       B= 10       C= 0        D= 90
                       TP= -0.13333 HRS   RAIN= -1

        K =    .072665HR    TP =    .133330HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =   4.5116    CFS   UNIT VOLUME =    .9969       B =   526.28      P60 =
1.9000
        AREA =       .001143 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


        K =    .130790HR    TP =    .133330HR    K/TP RATIO =    .980950     SHAPE CONSTANT, N =
3.599935
        UNIT PEAK =   .31200    CFS   UNIT VOLUME =    .9579       B =   327.55      P60 =
1.9000
        AREA =       .000127 SQ MI    IA =    .50000 INCHES    INF =  1.25000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

    PRINT HYD              ID= 1   CODE= 1

                                        HYDROGRAPH FROM AREA C


        RUNOFF VOLUME =      1.88389 INCHES      =         .1276 ACRE-FEET
        PEAK DISCHARGE RATE =        3.50 CFS  AT   1.500 HOURS   BASIN AREA =   .0013 SQ. MI.


*
*****************************************************************************
* ADD SPILL FROM S2 TO ROAD FLOW IN 86TH N OF SUNSET GARDENS
ADD HYD                ID OUT= 3  HYD=   218          IDIN I= 1   IDIN II= 7
PRINT HYD              ID= 3   CODE= 1

                                      PARTIAL HYDROGRAPH   218.00


    RUNOFF VOLUME =      1.73326 INCHES      =         .2161 ACRE-FEET
    PEAK DISCHARGE RATE =       11.65 CFS  AT   1.500 HOURS   BASIN AREA =   .0023 SQ. MI.


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

```
* COMBINED FLOW TO 86TH & SUNSET GARDENS FROM NORTH & WEST; HOLD FOR LATER
ADD HYD              ID OUT= 7  HYD= 86&SG.N&W       IDIN I= 3   IDIN II= 5
PRINT HYD            ID= 7   CODE= 1

                                        HYDROGRAPH FROM AREA 86&SG.N&W


    RUNOFF VOLUME =     1.55353 INCHES     =       4.1196 ACRE-FEET
    PEAK DISCHARGE RATE =     128.76 CFS  AT   1.533 HOURS   BASIN AREA =   .0497 SQ. MI.


*
*****************************************************************************
*
*C BASIN NN (N North): CURRENTLY PARTLY DEVELOPED
COMPUTE NM HYD       ID= 1    HYD= NN              DA=0.01830  SQ MI
                     PER A= 28.0   B= 20.2    C= 15.4    D= 36.4
                     TP= -0.13333 HRS   RAIN= -1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =   26.293    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 =
1.9000
        AREA =       .006661 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


        K =   .139008HR    TP =   .133330HR    K/TP RATIO =  1.042583     SHAPE CONSTANT, N =
3.386093
        UNIT PEAK =   27.229    CFS   UNIT VOLUME =    .9996       B =   311.92      P60 =
1.9000
        AREA =       .011639 SQ MI    IA =    .52972 INCHES    INF =   1.33321 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

    PRINT HYD            ID= 1   CODE= 1

                                        HYDROGRAPH FROM AREA NN


        RUNOFF VOLUME =     1.14350 INCHES     =       1.1161 ACRE-FEET
        PEAK DISCHARGE RATE =      33.56 CFS  AT   1.500 HOURS   BASIN AREA =   .0183 SQ. MI.


    *
    *****************************************************************************
    * ADD IN HYD 90.S.PAST.SG, ('HELD' SPILL SOUTH OF SUNSET GDNS INTERSECTION)
    ADD HYD              ID OUT= 3  HYD= INTO.JYDN   IDIN I= 1   IDIN II= 6
    PRINT HYD            ID= 3   CODE= 1

                                        HYDROGRAPH FROM AREA INTO.JYDN


        RUNOFF VOLUME =     1.26804 INCHES     =       1.9375 ACRE-FEET
        PEAK DISCHARGE RATE =      42.16 CFS  AT   1.500 HOURS   BASIN AREA =   .0286 SQ. MI.


    *
    *****************************************************************************
    * ROUTE NORTH PART OF OFFSITE THROUGH NORTH STREET IN JYD
    * APPROX AS 28' F-F STREET, ASSUME APX 1.8% SLOPE
    * ASSUME PAVED ROAD, EST n AS .017
    COMPUTE RATING CURVE CID= -1   VS NO= 1    NO SEGS FOR MANNING n= 1
                         ELMIN= 0 ELMAX= 4  FT   CHSLP= .018   FPSLP= .018  FT/FT
                         n .017  DIST 28
```

```
                    DIST  ELEV     DIST  ELEV    DIST  ELEV    DIST  ELEV
                    0      4       .01    0      14    .28    27.99    0
                    28     4
ROUTE MCUNGE        ID= 5   HYD= 300          INFLOW HYD ID= 3   DT= 0.0 HR
                    LENGTH= 1338     NSUBRCH= 0     SLOPE= .018
                    MATCODE= 0       REGCODE= 0     CCODE= 0
     Inflow ID end=211   Max Number=600

     dt = .0333 hr   q0 =    21.08 cfs   ck0 =  5.86 fps
     nlen =  4   dlen =  334.50

     Depth  Area      Q     Qbar   ck    b     C    D     c1    c2   vel   fr    tt
       ft    sf      cfs    cfs   fps   ft                          fps          hr
       .00     .0      .0     2.9  2.58  10.5  .93  .02   .98  -.03  2.58 1.40  .144
       .21    2.2     5.7    22.3  5.86  24.5 2.10  .03   .98   .36  4.42 1.72  .084
       .42    7.9    38.8    68.2  9.97  28.0 3.58  .04   .98   .57  6.31 1.79  .059
       .63   13.8    97.6   136.3 13.15  28.0 4.72  .06   .98   .65  8.16 1.86  .046
       .84   19.6   175.0   221.8 15.86  28.0 5.69  .08   .98   .70  9.82 1.93  .038
      1.05   25.5   268.5   322.2 18.24  28.0 6.54  .10   .97   .74 11.31 1.98  .033
      1.26   31.4   376.0   436.0 20.38  28.0 7.31  .13   .97   .76 12.68 2.02  .029
      1.47   37.3   496.1   561.9 22.33  28.0 8.01  .15   .97   .78 13.95 2.05  .027
      1.68   43.2   627.7   698.7 24.12  28.0 8.65  .17   .97   .80 15.14 2.08  .025
      1.89   49.1   769.8   845.8 25.78  28.0 9.25  .19   .96   .81 16.25 2.10  .023
      2.11   55.0   921.7  1002.2 27.32  28.0 9.80  .22   .96   .82 17.30 2.12  .021
      2.32   60.9  1082.7  1167.4 28.76  28.010.32  .24   .96   .83 18.29 2.13  .020
      2.53   66.8  1252.2  1340.9 30.10  28.010.80  .26   .96   .83 19.23 2.15  .019
      2.74   72.7  1429.6  1522.0 31.37  28.011.25  .29   .95   .84 20.13 2.16  .018
      2.95   78.6  1614.4  1710.4 32.56  28.011.68  .31   .95   .85 20.98 2.17  .018
      3.16   84.5  1806.3  1905.6 33.69  28.012.09  .34   .95   .85 21.80 2.17  .017
      3.37   90.4  2004.9  2107.3 34.75  28.012.47  .36   .95   .86 22.58 2.18  .016
      3.58   96.3  2209.7  2315.1 35.76  28.012.83  .38   .95   .86 23.34 2.18  .016
      3.79  102.1  2420.5  2528.8 36.73  28.013.17  .41   .94   .86 24.06 2.19  .015
      4.00  108.0  2637.0      .0   .00     .0  .00  .00   .00   .00   .00  .00  .000
       nlen= 4   Outflow ID end=213
    Route using Ponce procedure:  C1 > 0
       nlen= 4   Outflow ID end=215
    Route using Maidment procedure:  C0, C1 & C2 > 0
PRINT HYD           ID= 5 CODE= 1

                                        HYDROGRAPH FROM AREA   300.00

    RUNOFF VOLUME =     1.26109 INCHES     =       1.9268 ACRE-FEET
    PEAK DISCHARGE RATE =      40.55 CFS  AT   1.600 HOURS   BASIN AREA =   .0286 SQ. MI.


*
*****************************************************************************
* BASIN NS (N South): CURRENTLY PARTLY DEVELOPED
COMPUTE NM HYD      ID= 1    HYD= NS              DA=0.01719  SQ MI
                    PER A= 16.0    B= 28.6    C= 8.8    D= 46.6
                    TP= -0.13333 HRS   RAIN= -1

        K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =   31.619    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 =
1.9000
        AREA =       .008011 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


        K =   .136383HR    TP =   .133330HR    K/TP RATIO =  1.022896     SHAPE CONSTANT, N =
3.450895
        UNIT PEAK =   21.806    CFS   UNIT VOLUME =    .9996       B =   316.73      P60 =
1.9000
        AREA =       .009179 SQ MI    IA =    .52022 INCHES    INF =   1.30663 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333
```

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

PRINT HYD              ID= 1   CODE= 1

                                          HYDROGRAPH FROM AREA NS


    RUNOFF VOLUME =     1.29219 INCHES     =       1.1847 ACRE-FEET
    PEAK DISCHARGE RATE =      34.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0172 SQ. MI.


*
*****************************************************************************
* ROUTE SOUTH PART OF OFFSITE THROUGH SOUTH STREET IN JYD
*C APPROX AS 28' F-F STREET, ASSUME APX 2.0% SLOPE (STEEPER THAN NORTH)
*C ASSUME PAVED ROAD, EST n AS .017
COMPUTE RATING CURVE CID= -1   VS NO= 1    NO SEGS FOR MANNING n= 1
                     ELMIN= 0 ELMAX= 4  FT   CHSLP= .020   FPSLP= .020  FT/FT
                     n .017  DIST 28
                     DIST  ELEV     DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0      4       .01    0      14    .28    27.99    0
                     28     4
ROUTE MCUNGE         ID= 2   HYD= 302          INFLOW HYD ID= 1   DT= 0.0 HR
                     LENGTH= 1221     NSUBRCH= 0     SLOPE= .020
                     MATCODE= 0       REGCODE= 0     CCODE= 0
      Inflow ID end=209   Max Number=600

      dt = .0333 hr   q0 =    17.39 cfs   ck0 =  6.17 fps
      nlen =  4   dlen =  305.25

      Depth  Area      Q     Qbar   ck    b     C    D     c1    c2   vel   fr    tt
        ft    sf      cfs    cfs   fps   ft                          fps          hr
        .00     .0      .0     3.0  2.72  10.5 1.07  .02   .98   .04  2.72 1.48  .125
        .21    2.2     6.0    23.5  6.17  24.5 2.43  .03   .99   .42  4.65 1.81  .073
        .42    7.9    40.9    71.9 10.51  28.0 4.13  .04   .98   .61  6.65 1.88  .051
        .63   13.8   102.8   143.7 13.86  28.0 5.45  .06   .98   .69  8.60 1.96  .039
        .84   19.6   184.5   233.8 16.72  28.0 6.57  .08   .98   .74 10.35 2.03  .033
       1.05   25.5   283.0   339.6 19.23  28.0 7.56 ..10   .98   .77 11.92 2.08  .028
       1.26   31.4   396.3   459.6 21.49  28.0 8.45  .13   .97   .79 13.37 2.13  .025
       1.47   37.3   522.9   592.2 23.54  28.0 9.25  .15   .97   .81 14.71 2.16  .023
       1.68   43.2   661.6   736.5 25.43  28.010.00  .17   .97   .82 15.96 2.19  .021
       1.89   49.1   811.4   891.5 27.17  28.010.68  .19   .97   .83 17.13 2.21  .020
       2.11   55.0   971.6  1056.4 28.80  28.011.32  .21   .97   .84 18.23 2.23  .019
       2.32   60.9  1141.3  1230.6 30.31  28.011.92  .24   .96   .85 19.28 2.25  .018
       2.53   66.8  1319.9  1413.4 31.73  28.012.47  .26   .96   .85 20.27 2.26  .017
       2.74   72.7  1506.9  1604.3 33.06  28.013.00  .28   .96   .86 21.21 2.27  .016
       2.95   78.6  1701.8  1802.9 34.32  28.013.49  .31   .96   .86 22.12 2.28  .015
       3.16   84.5  1904.0  2008.7 35.51  28.013.96  .33   .96   .87 22.98 2.29  .015
       3.37   90.4  2113.3  2221.3 36.63  28.014.40  .35   .95   .87 23.81 2.30  .014
       3.58   96.3  2329.3  2440.4 37.70  28.014.82  .38   .95   .88 24.60 2.30  .014
       3.79  102.1  2551.5  2665.6 38.71  28.015.22  .40   .95   .88 25.36 2.31  .013
       4.00  108.0  2779.7      .0   .00    .0  .00  .00   .00   .00   .00  .00  .000
      nlen= 4   Outflow ID end=206
    Route using Ponce procedure:  C1 > 0
PRINT HYD              ID= 2 CODE= 1

                                          HYDROGRAPH FROM AREA   302.00


    RUNOFF VOLUME =     1.29208 INCHES     =       1.1846 ACRE-FEET
    PEAK DISCHARGE RATE =      34.26 CFS  AT   1.567 HOURS   BASIN AREA =   .0172 SQ. MI.


*
*****************************************************************************
*C ADD NORTH & SOUTH ROUTED OFFSITE, THEN COMPUTE & ADD JYD
ADD HYD                ID OUT= 3  HYD= 304          IDIN I= 2   IDIN II= 5
```

```
PRINT HYD              ID= 3   CODE= 1

                                          HYDROGRAPH FROM AREA   304.00


    RUNOFF VOLUME =     1.27270 INCHES     =       3.1114 ACRE-FEET
    PEAK DISCHARGE RATE =      73.97 CFS  AT   1.600 HOURS   BASIN AREA =   .0458 SQ. MI.


*
*****************************************************************************
COMPUTE NM HYD         ID= 17    HYD= JYD            DA=0.02353 SQ MI
                       PER A= 0      B= 35      C= 0       D= 65
                       TP= -0.13333 HRS   RAIN= -1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
    UNIT PEAK =   60.370    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 =
1.9000
    AREA =      .015295 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .130790HR    TP =   .133330HR    K/TP RATIO =   .980950     SHAPE CONSTANT, N =
3.599935
    UNIT PEAK =   20.232    CFS   UNIT VOLUME =    .9997       B =   327.55      P60 =
1.9000
    AREA =      .008236 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

PRINT HYD              ID= 17   CODE= 1

                                          HYDROGRAPH FROM AREA JYD


    RUNOFF VOLUME =     1.55434 INCHES     =       1.9506 ACRE-FEET
    PEAK DISCHARGE RATE =      55.37 CFS  AT   1.500 HOURS   BASIN AREA =   .0235 SQ. MI.


*
*****************************************************************************
* TOTAL FLOW LEAVING JYD (CANTO III), INCLUDING 86TH ST ROW EAST OF JYD
ADD HYD                ID OUT= 4  HYD= JYD.E.AT.86   IDIN I= 3   IDIN II= 17
PRINT HYD              ID= 4   CODE= 1

                                          HYDROGRAPH FROM AREA JYD.E.AT.86


    RUNOFF VOLUME =     1.36823 INCHES     =       5.0620 ACRE-FEET
    PEAK DISCHARGE RATE =     118.68 CFS  AT   1.533 HOURS   BASIN AREA =   .0694 SQ. MI.


*
*****************************************************************************
* ROUTE TO 86TH & SG INTERSECTION, ASSUME 48" PIPE W/ 1% FRICTION SLOPE
COMPUTE RATING CURVE CID= -1 VSN= 1  CODE= -1  S= .010   D= 4 FT   n= 0.013
ROUTE MCUNGE           ID= 5   HYD= 86.S.OF.SG   INFLOW HYD ID= 4   DT= 0.0 HR
                       LENGTH= 300      NSUBRCH= 0     SLOPE= .010
                       MATCODE= 0       REGCODE= 0     CCODE= 0
      Inflow ID end=215   Max Number=600

      dt = .0333 hr   q0 =    59.34 cfs   ck0 = 14.67 fps
      nlen =  1   dlen =  300.00
```

Depth ft	Area sf	Q cfs	Qbar cfs	ck fps	b ft	C	D	c1	c2	vel fps	fr	tt hr
.00	.0	.0	.4	3.02	.9	1.21	.05	.96	.11	3.02	1.42	.028
.21	.2	.8	2.0	5.66	2.1	2.26	.06	.97	.40	4.26	1.59	.020
.42	.7	3.3	5.4	7.74	2.7	3.09	.09	.96	.52	5.58	1.63	.015
.63	1.3	7.6	10.6	9.44	3.1	3.78	.12	.95	.59	6.75	1.66	.012
.83	1.9	13.7	17.5	10.88	3.4	4.35	.16	.94	.64	7.78	1.68	.011
1.04	2.6	21.4	25.9	12.09	3.6	4.84	.20	.93	.67	8.69	1.69	.010
1.25	3.4	30.5	35.6	13.12	3.8	5.25	.24	.93	.69	9.50	1.68	.009
1.46	4.1	40.8	46.5	13.98	3.9	5.59	.28	.92	.71	10.21	1.67	.008
1.67	5.0	52.2	58.3	14.67	4.0	5.87	.33	.91	.72	10.84	1.64	.008
1.88	5.8	64.3	70.7	15.19	4.0	6.08	.39	.90	.73	11.39	1.61	.007
2.08	6.6	77.0	83.4	15.54	4.0	6.22	.45	.88	.74	11.86	1.58	.007
2.29	7.5	89.9	96.3	15.69	4.0	6.28	.51	.87	.74	12.25	1.54	.007
2.50	8.3	102.7	108.9	15.62	4.0	6.25	.58	.85	.74	12.57	1.51	.007
2.71	9.1	115.1	120.9	15.27	4.0	6.11	.66	.83	.74	12.81	1.47	.007
2.92	9.8	126.7	131.9	14.52	4.0	5.81	.76	.80	.74	12.96	1.43	.006
3.13	10.5	137.1	141.5	13.18	4.0	5.27	.89	.75	.72	13.02	1.39	.006
3.34	11.2	145.8	148.9	10.71	4.0	4.29	1.16	.64	.69	12.96	1.35	.006
3.54	11.8	152.0	153.2	5.41	4.0	2.16	2.36	.14	.64	12.76	1.30	.007
3.75	12.2	154.5	154.5	.00	4.0	.00*****	-1.00	1.00		12.46	1.25	.007
4.00	12.6	154.5	.0	.00	.0	.00	.00	.00	.00	.00	.00	.000

```
      nlen= 1   Outflow ID end=215
    Route using Ponce procedure:  C1 > 0
      nlen= 1   Outflow ID end=216
    Route using Maidment procedure:  C0, C1 & C2 > 0
PRINT HYD            ID= 5 CODE= 1

                                        HYDROGRAPH FROM AREA 86.S.OF.SG


    RUNOFF VOLUME =     1.36766 INCHES     =       5.0599 ACRE-FEET
    PEAK DISCHARGE RATE =     118.57 CFS  AT   1.567 HOURS   BASIN AREA =   .0694 SQ. MI.


*
*****************************************************************************
* COMBINED FLOWS AT 86TH & SUNSET GARDENS: RETRIEVE 'ON-HOLD' ID=7
ADD HYD              ID OUT= 6  HYD= TOT.SG&86     IDIN I= 5   IDIN II= 7
PRINT HYD            ID= 6   CODE= 1

                                        HYDROGRAPH FROM AREA TOT.SG&86


    RUNOFF VOLUME =     1.44526 INCHES     =       9.1795 ACRE-FEET
    PEAK DISCHARGE RATE =     240.79 CFS  AT   1.533 HOURS   BASIN AREA =   .1191 SQ. MI.


*
*****************************************************************************
* ROUTE 86TH TO 82ND IN SUNSET GARDENS: CONC PIPE; Sf=.01 APX
* IF EST DIAM SMALL => TRAVEL FASTER => DNSTR PEAK HIGHER => CONSERVATIVE
* VALLEY SEGMENT & REACH NUMBERS ARE USER ID'S NOT USED BY PROG; DUMMIES HERE
COMPUTE RATING CURVE CID= -1   VS NO= 11   NO SEGS FOR MANNING n= -1
                     SLOPE= .01   DIAM= 5.0 FT   n= .013
COMPUTE TRAVEL TIME  ID= 5   REACH= 11   NO VS= 1   L= 1100 FT   S= .01
```

TRAVEL TIME TABLE

REACH= 11.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.261	.390	1.37	.0873
.521	1.086	5.93	.0559
.782	1.961	13.79	.0435
1.042	2.966	24.80	.0365

```
                                  1.303       4.069       38.72       .0321
                                  1.563       5.246       55.24       .0290
                                  1.824       6.479       74.01       .0267
                                  2.084       7.749       94.62       .0250
                                  2.345       9.043      116.65       .0237
                                  2.606      10.345      139.60       .0226
                                  2.866      11.641      162.98       .0218
                                  3.127      12.918      186.22       .0212
                                  3.387      14.159      208.72       .0207
                                  3.648      15.348      229.78       .0204
                                  3.908      16.467      248.64       .0202
                                  4.169      17.492      264.32       .0202
                                  4.429      18.395      275.55       .0204
                                  4.690      19.130      280.16       .0209
                                  5.000      19.635      280.16       .0214
ROUTE                   ID= 5   HYD= 308    IN ID= 6   DT= 0.0
PRINT HYD               ID= 5  CODE= 1

                                          HYDROGRAPH FROM AREA   308.00

     RUNOFF VOLUME =     1.44527 INCHES     =       9.1795 ACRE-FEET
     PEAK DISCHARGE RATE =     238.77 CFS  AT   1.567 HOURS   BASIN AREA =   .1191 SQ. MI.


 ***********************************************************************
 * BASIN T
 COMPUTE NM HYD          ID= 1    HYD= T              DA= .00467 SQ MI
                         PER A= 0      B= 15      C=  0      D= 85
                         TP= -0.13333 HRS   RAIN= -1

     K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
     UNIT PEAK =   15.668    CFS   UNIT VOLUME =    .9987       B =   526.28      P60 =
1.9000
     AREA =       .003970 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333
                                        .

     K =   .130790HR    TP =   .133330HR    K/TP RATIO =   .980950     SHAPE CONSTANT, N =
3.599935
     UNIT PEAK =   1.7209    CFS   UNIT VOLUME =    .9926       B =   327.55      P60 =
1.9000
     AREA =       .000701 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

 PRINT HYD               ID= 1   CODE= 1

                                          HYDROGRAPH FROM AREA T

     RUNOFF VOLUME =     1.81798 INCHES     =         .4528 ACRE-FEET
     PEAK DISCHARGE RATE =      12.45 CFS  AT   1.500 HOURS   BASIN AREA =   .0047 SQ. MI.


 *
 ***********************************************************************
 ADD HYD                 ID OUT= 3  HYD= 310     IDIN I= 1   IDIN II= 5
 PRINT HYD               ID= 3   CODE= 1

                                          HYDROGRAPH FROM AREA   310.00

     RUNOFF VOLUME =     1.45932 INCHES     =       9.6323 ACRE-FEET
     PEAK DISCHARGE RATE =     249.07 CFS  AT   1.567 HOURS   BASIN AREA =   .1238 SQ. MI.
```

```
*
*****************************************************************************
* BASIN U
COMPUTE NM HYD        ID= 1    HYD= U                DA= .01032 SQ MI
                      PER A= 0       B= 30       C=  0       D= 70
                      TP= -0.13333 HRS   RAIN= -1

        K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =   28.514    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 =
1.9000
        AREA =       .007224 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


        K =   .130790HR    TP =   .133330HR    K/TP RATIO =   .980950     SHAPE CONSTANT, N =
3.599935
        UNIT PEAK =   7.6059    CFS   UNIT VOLUME =    .9985       B =   327.55      P60 =
1.9000
        AREA =       .003096 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

PRINT HYD             ID= 1   CODE= 1

                                          HYDROGRAPH FROM AREA U


        RUNOFF VOLUME =     1.62025 INCHES      =         .8918 ACRE-FEET
        PEAK DISCHARGE RATE =      25.09 CFS  AT   1.500 HOURS   BASIN AREA =   .0103 SQ. MI.


*
*****************************************************************************
*
ADD HYD               ID OUT= 19   HYD= 312     IDIN I= 1   IDIN II= 3
PRINT HYD             ID= 19  CODE= 1

                                          HYDROGRAPH FROM AREA   312.00


        RUNOFF VOLUME =     1.47171 INCHES      =      10.5240 ACRE-FEET
        PEAK DISCHARGE RATE =     270.07 CFS  AT   1.567 HOURS   BASIN AREA =   .1341 SQ. MI.


*
*****************************************************************************
* BASIN V: % IMPERV A LA POINTE WEST DESIGN & DENSITY
COMPUTE NM HYD        ID= 11    HYD= V                DA= .03200 SQ MI
                      PER A= 0       B= 50       C=  0       D= 50
                      TP= -0.13333 HRS   RAIN= -1

        K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =   63.155    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 =
1.9000
        AREA =       .016000 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


        K =   .130790HR    TP =   .133330HR    K/TP RATIO =   .980950     SHAPE CONSTANT, N =
3.599935
        UNIT PEAK =   39.307    CFS   UNIT VOLUME =    1.000       B =   327.55      P60 =
1.9000
```

```
    AREA =       .016000 SQ MI    IA =     .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

PRINT HYD              ID= 11   CODE= 1

                                          HYDROGRAPH FROM AREA V


    RUNOFF VOLUME =     1.35662 INCHES      =       2.3153 ACRE-FEET
    PEAK DISCHARGE RATE =      67.84 CFS  AT   1.500 HOURS   BASIN AREA =   .0320 SQ. MI.


*
*****************************************************************************
ADD HYD                ID OUT= 3  HYD= SG.AT.82ND    IDIN I= 11   IDIN II= 19
PRINT HYD              ID= 3   CODE= 1

                                          HYDROGRAPH FROM AREA SG.AT.82ND


    RUNOFF VOLUME =     1.44953 INCHES      =      12.8393 ACRE-FEET
    PEAK DISCHARGE RATE =     330.10 CFS  AT   1.533 HOURS   BASIN AREA =   .1661 SQ. MI.


*
*****************************************************************************
*  ROUTE TO UNSER IN CONC PIPE; Sf=.01 APX AVG
*  IF EST DIAM SMALL => TRAVEL FASTER => DNSTR PEAK HIGHER => CONSERVATIVE
*  VALLEY SEGMENT & REACH NUMBERS ARE USER ID'S ONLY; DUMMIES HERE
*  AVAIL SLOPE BTW UNSER/AMOLE & SG/82 APX .01 AVG.
COMPUTE RATING CURVE CID= -1   VS NO= 11   NO SEGS FOR MANNING n= -1
                     SLOPE= .01   DIAM= 5.5 FT   n= .013
COMPUTE TRAVEL TIME  ID= 5   REACH= 11   NO VS= 1   L= 1100 FT   S= .01

.                              TRAVEL TIME TABLE                    .
                                                REACH= 11.0
                                                .
                               WATER       AVERAGE     FLOW        TRAVEL
                               DEPTH       AREA        RATE        TIME
                               FEET        SQ.FT.      CFS         HRS
                                  .287        .472        1.76       .0819
                                  .573       1.314        7.65       .0525
                                  .860       2.373       17.78       .0408
                                 1.146       3.589       31.97       .0343
                                 1.433       4.923       49.92       .0301
                                 1.720       6.348       71.23       .0272
                                 2.006       7.839       95.43       .0251
                                 2.293       9.377      122.00       .0235
                                 2.579      10.942      150.40       .0222
                                 2.866      12.518      180.00       .0212
                                 3.153      14.086      210.14       .0205
                                 3.439      15.630      240.11       .0199
                                 3.726      17.132      269.11       .0195
                                 4.013      18.571      296.28       .0192
                                 4.299      19.925      320.59       .0190
                                 4.586      21.166      340.81       .0190
                                 4.872      22.258      355.29       .0191
                                 5.159      23.147      361.23       .0196
                                 5.500      23.758      361.23       .0201
ROUTE                  ID= 5   HYD= 314    IN ID= 3   DT= 0.0
PRINT HYD              ID= 5  CODE= 1

                                          HYDROGRAPH FROM AREA   314.00
```

```
RUNOFF VOLUME =      1.44953 INCHES      =       12.8393 ACRE-FEET
PEAK DISCHARGE RATE =      328.29 CFS  AT   1.567 HOURS   BASIN AREA =   .1661 SQ. MI.


*****************************************************************************
*C BASIN W: WHISPER POINTE SUBDIVISION UNDER DESIGN MARK GOODWIN & ASSOC
*C % IMPERV (PER D) REVISED 1-7-98 PER GOODWIN LETTER OF 11-29-97: Qp APX 77
*C BASIN W IS ONLY BASIN W Tp (&Tc) > REGULATORY MINIMUM
COMPUTE NM HYD        ID= 12    HYD= W                DA= .03422 SQ MI
                      PER A= 0      B= 40      C=  0      D= 60
                      TP= -0.13333 HRS   RAIN= -1

K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
UNIT PEAK =   81.043    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 =
1.9000
AREA =       .020532 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

K =   .130790HR    TP =   .133330HR    K/TP RATIO =   .980950     SHAPE CONSTANT, N =
3.599935
UNIT PEAK =   33.627    CFS   UNIT VOLUME =    .9999       B =   327.55      P60 =
1.9000
AREA =       .013688 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

*C                      TP= -0.16325 HRS   RAIN= -1
PRINT HYD             ID= 12   CODE= 1

                                        HYDROGRAPH FROM AREA W


RUNOFF VOLUME =      1.48844 INCHES      =        2.7165 ACRE-FEET
PEAK DISCHARGE RATE =       77.86 CFS  AT   1.500 HOURS   BASIN AREA =   .0342 SQ. MI.


*
*****************************************************************************
ADD HYD               ID OUT= 3  HYD= 316     IDIN I= 12   IDIN II= 5
PRINT HYD             ID= 3   CODE= 1

                                        HYDROGRAPH FROM AREA   316.00


RUNOFF VOLUME =      1.45618 INCHES      =       15.5558 ACRE-FEET
PEAK DISCHARGE RATE =      394.29 CFS  AT   1.533 HOURS   BASIN AREA =   .2003 SQ. MI.


*
*****************************************************************************
* BASIN X: R.O.W. FOR SUNSET GARDENS AND (LIMITED ACCESS) UNSER & EUCARIZ
*C BASIN BOUNDARY REVISED 1-7-98; OLD AREA WAS 0.00674 SQ MI
COMPUTE NM HYD        ID= 13    HYD= X                DA= .01058 SQ MI
                      PER A= 0      B= 20      C=  0      D= 80
                      TP= -0.13333 HRS   RAIN= -1

K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
UNIT PEAK =   33.409    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 =
1.9000
AREA =       .008464 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333
```

```
K =    .130790HR    TP =    .133330HR    K/TP RATIO =    .980950     SHAPE CONSTANT, N =
3.599935
UNIT PEAK =    5.1984    CFS   UNIT VOLUME =    .9978       B =   327.55      P60 =
1.9000
AREA =       .002116 SQ MI    IA =     .50000 INCHES    INF =   1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

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

PRINT HYD            ID= 13   CODE= 1

                                        HYDROGRAPH FROM AREA X


RUNOFF VOLUME =      1.75207 INCHES      =         .9886 ACRE-FEET
PEAK DISCHARGE RATE =       27.37 CFS  AT   1.500 HOURS   BASIN AREA =    .0106 SQ. MI.


*
*****************************************************************************
ADD HYD              ID OUT= 4  HYD= SG.AT.UNSER   IDIN I= 13   IDIN II= 3
PRINT HYD            ID= 4   CODE= 1

                                        HYDROGRAPH FROM AREA SG.AT.UNSER


RUNOFF VOLUME =      1.47102 INCHES      =       16.5444 ACRE-FEET
PEAK DISCHARGE RATE =      420.45 CFS  AT   1.533 HOURS   BASIN AREA =    .2109 SQ. MI.


*
*****************************************************************************
* ROUTE TO UNSER 340 FT N OF SG (APX HALF DIST TO AMOLE CHAN); Sf=.01 APX
* EST DIAM SMALL => TRAVEL FASTER => DNSTR PEAK HIGHER => CONSERVATIVE
* VALLEY SEGMENT & REACH NUMBERS ARE USER ID'S ONLY; DUMMIES HERE
COMPUTE RATING CURVE CID= -1   VS NO= 11   NO SEGS FOR MANNING n= -1
                     SLOPE= .01   DIAM= 6.0 FT   n= .013
COMPUTE TRAVEL TIME  ID= 5   REACH= 11   NO VS= 1   L= 340   FT   S= .01

                                TRAVEL TIME TABLE
                                          REACH= 11.0

                                WATER       AVERAGE     FLOW        TRAVEL
                                DEPTH       AREA        RATE        TIME
                                FEET        SQ.FT.      CFS         HRS
                                   .313        .562        2.22       .0239
                                   .625       1.564        9.64       .0153
                                   .938       2.824       22.42       .0119
                                  1.251       4.271       40.32       .0100
                                  1.563       5.859       62.96       .0088
                                  1.876       7.554       89.83       .0079
                                  2.189       9.329      120.35       .0073
                                  2.501      11.159      153.87       .0068
                                  2.814      13.022      189.68       .0065
                                  3.127      14.897      227.01       .0062
                                  3.439      16.764      265.02       .0060
                                  3.752      18.601      302.81       .0058
                                  4.065      20.388      339.39       .0057
                                  4.377      22.101      373.65       .0056
                                  4.690      23.712      404.31       .0055
                                  5.003      25.189      429.82       .0055
                                  5.315      26.489      448.07       .0056
                                  5.628      27.547      455.57       .0057
                                  6.000      28.274      455.57       .0059
ROUTE                ID= 5   HYD= 318    IN ID= 4   DT= 0.0
PRINT HYD            ID= 5  CODE= 1
```

```
                                        HYDROGRAPH FROM AREA   318.00

        RUNOFF VOLUME =      1.47102 INCHES      =       16.5444 ACRE-FEET
        PEAK DISCHARGE RATE =      418.41 CFS  AT   1.567 HOURS   BASIN AREA =   .2109 SQ. MI.


     ***********************************************************************************
     * BASIN Y DEVELOPED: EST ENTIRE SITE; ZONING = O-1; USE % IMPERV AS FOR C-2
     * WHEN BUILT, N APX 200' POSS DRAIN TO BRIDGE PER GREINER FOR BRIDGE BLVD SD
     *  REV ORIGINAL AREA OF .02964 2/26/98 URS GREINER -  ASSUME 0.0101 SM
     * WILL DRAIN TO BRIDGE BLVD SD- BASIN 21D ALONG BRIDGE FRONTAGE
     COMPUTE NM HYD          ID= 14    HYD= Y                DA= .01954 SQ MI
                             PER A= 0       B= 10       C= 5       D= 85
                             TP= -0.13333 HRS   RAIN= -1

        K =    .072665HR    TP =    .133330HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =   65.558    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 =
1.9000
        AREA =       .016609 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

        K =    .122603HR    TP =    .133330HR    K/TP RATIO =    .919546     SHAPE CONSTANT, N =
3.849372
        UNIT PEAK =   7.5841    CFS   UNIT VOLUME =    .9986       B =   345.00      P60 =
1.9000
        AREA =       .002931 SQ MI    IA =    .45000 INCHES    INF =   1.11000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

     PRINT HYD               ID= 14   CODE= 1

                                        HYDROGRAPH FROM AREA Y

        RUNOFF VOLUME =      1.83290 INCHES      =        1.9101 ACRE-FEET
        PEAK DISCHARGE RATE =       52.58 CFS  AT   1.500 HOURS   BASIN AREA =   .0195 SQ. MI.


     *
     ***********************************************************************************
     *s TOTAL FLOW FROM UNSER APROX 300' S OF AMOLE CHANNEL
     *   ADD TO FLOW FROM BRIDGE & UNSER NORTH
     ADD HYD                 ID OUT= 7  HYD= FUT.TO.AMOLE   IDIN I= 14   IDIN II= 5
     PRINT HYD               ID= 7   CODE= 1

                                        HYDROGRAPH FROM AREA FUT.TO.AMOLE

        RUNOFF VOLUME =      1.50171 INCHES      =       18.4545 ACRE-FEET
        PEAK DISCHARGE RATE =      468.17 CFS  AT   1.533 HOURS   BASIN AREA =   .2304 SQ. MI.


     *
     ***********************************************************************************
     *S  TOTAL FLOW TO HEAD OF CONCRETE CHANNEL
     *ADD SUNSET GARDENS/UNSER BLVD FLOW TO CHANNEL
     ADD HYD                 ID=5  HYD=CHANNEL  ID=7  ID=9
     PRINT HYD               ID=5  CODE=1

                                        HYDROGRAPH FROM AREA CHANNEL
```

```
RUNOFF VOLUME =      1.70867 INCHES      =      252.7143 ACRE-FEET
PEAK DISCHARGE RATE =    2112.30 CFS  AT   1.600 HOURS   BASIN AREA =  2.7732 SQ. MI.


*
* ROUTE FLOW DOWN CONCRETE TRAPAZOIDAL CHANNEL PARALLEL TO BRIDGE BLVD.
*   STA 41+06 TO STA 30+25
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=0
                    MAX ELEV=7.5  CH SLOPE=0.004  FP SLOPE=0.004
                    N=0.013   DIST=40
                    DIST  ELEV
                    0      7.5
                    15     0
                    25     0
                    40     7.5

                                    RATING CURVE VALLEY SECTION  1.0
                                        WATER        FLOW        FLOW        TOP
                                       SURFACE       AREA        RATE       WIDTH
                                        ELEV         SQ FT       CFS        FT
                                         .00          .00         .00        .00
                                         .39         4.26       15.64      11.58
                                         .79         9.14       50.88      13.16
                                        1.18        14.65      102.87      14.74
                                        1.58        20.78      171.27      16.32
                                        1.97        27.53      256.37      17.89
                                        2.37        34.90      358.71      19.47
                                        2.76        42.90      478.94      21.05
                                        3.16        51.52      617.78      22.63
                                        3.55        60.77      775.97      24.21
                                        3.95        70.64      954.26      25.79
                                        4.34        81.13     1153.41      27.37
                                        4.74        92.24     1374.20      28.95
                                        5.13       103.98     1617.37      30.53
                                        5.53       116.34     1883.67      32.11
                                        5.92       129.33     2173.84      33.68
                                        6.32       142.94     2488.63      35.26
                                        6.71       157.17     2828.77      36.84
                                        7.11       172.02     3194.96      38.42
                                        7.50       187.50     3587.93      40.00
COMPUTE TRAVEL TIME ID=6  REACH NO=1  NOVS=1 · L=1081  SLP=0.004

                         TRAVEL TIME TABLE
                                          REACH=  1.0

                         WATER        AVERAGE      FLOW        TRAVEL
                         DEPTH        AREA         RATE        TIME
                         FEET         SQ.FT.       CFS         HRS
                            .395        4.259       15.64        .0818
                            .789        9.141       50.88        .0539
                           1.184       14.647      102.87        .0428
                           1.579       20.776      171.27        .0364
                           1.974       27.528      256.37        .0322
                           2.368       34.903      358.71        .0292
                           2.763       42.902      478.94        .0269
                           3.158       51.524      617.78        .0250
                           3.553       60.769      775.97        .0235
                           3.947       70.637      954.26        .0222
                           4.342       81.129     1153.41        .0211
                           4.737       92.244     1374.20        .0202
                           5.132      103.982     1617.37        .0193
                           5.526      116.343     1883.67        .0185
                           5.921      129.328     2173.84        .0179
                           6.316      142.936     2488.63        .0172
                           6.711      157.168     2828.77        .0167
                           7.105      172.022     3194.96        .0162
                           7.500      187.500     3587.93        .0157
ROUTE                 ID=6  HYD=R5  INFLOW ID=5  DT=0.0
```

```
PRINT HYD            ID=6  CODE=1

                                        HYDROGRAPH FROM AREA R5

    RUNOFF VOLUME =     1.70752 INCHES     =     252.5442 ACRE-FEET
    PEAK DISCHARGE RATE =    2113.42 CFS  AT   1.600 HOURS   BASIN AREA =  2.7732 SQ. MI.


*
COMPUTE NM HYD       ID=18  HYD=18W  AREA=0.1122   PER A=0   PER B=27
                     PER C=5  PER D=68  TP=0.1817  MASS RAIN=-1

    K =   .100095HR    TP =   .181700HR    K/TP RATIO =   .550882     SHAPE CONSTANT, N =
7.009509
    UNIT PEAK =   219.06    CFS   UNIT VOLUME =    .9999       B =   521.70      P60 =
1.9000
    AREA =      .076296 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

    K =   .170075HR    TP =   .181700HR    K/TP RATIO =   .936020     SHAPE CONSTANT, N =
3.778402
    UNIT PEAK =   67.207    CFS   UNIT VOLUME =    .9998       B =   340.11      P60 =
1.9000
    AREA =      .035904 SQ MI    IA =    .47656 INCHES    INF =   1.18438 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

PRINT HYD            ID=18  CODE=1

                                        HYDROGRAPH FROM AREA 18W

    RUNOFF VOLUME =     1.60831 INCHES     =       9.6241 ACRE-FEET
    PEAK DISCHARGE RATE =     231.19 CFS  AT   1.567 HOURS   BASIN AREA =   .1122 SQ. MI.


*
*ADD BASIN 18W TO CHANNEL FLOW
ADD HYD              ID=7  HYD=18.1  ID=18   ID=6
PRINT HYD            ID=7  CODE=1

                                     OUTFLOW HYDROGRAPH REACH    18.10

    RUNOFF VOLUME =     1.70366 INCHES     =     262.1683 ACRE-FEET
    PEAK DISCHARGE RATE =    2330.57 CFS  AT   1.600 HOURS   BASIN AREA =  2.8854 SQ. MI.


*
*ROUTE FLOW DOWN CHANNEL STA 31+25 TO 23+50
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=0
                     MAX ELEV=6.5  CH SLOPE=0.0144  FP SLOPE=0.0144
                     N=0.013   DIST=36
                     DIST  ELEV
                     0      6.5
                     13     0
                     23     0
                     36     6.5

                                RATING CURVE VALLEY SECTION  1.0
                                   WATER        FLOW        FLOW        TOP
                                  SURFACE       AREA        RATE       WIDTH
                                   ELEV         SQ FT       CFS         FT
```

.00	.00	.00	.00
.34	3.66	23.31	11.37
.68	7.78	75.53	12.74
1.03	12.37	151.99	14.11
1.37	17.43	251.86	15.47
1.71	22.96	375.23	16.84
2.05	28.95	522.62	18.21
2.39	35.42	694.75	19.58
2.74	42.35	892.44	20.95
3.08	49.75	1116.58	22.32
3.42	57.62	1368.08	23.68
3.76	65.95	1647.87	25.05
4.11	74.76	1956.89	26.42
4.45	84.03	2296.09	27.79
4.79	93.77	2666.39	29.16
5.13	103.98	3068.74	30.53
5.47	114.66	3504.05	31.89
5.82	125.80	3973.25	33.26
6.16	137.42	4477.25	34.63
6.50	149.50	5016.95	36.00

COMPUTE TRAVEL TIME ID=8 REACH NO=1 NOVS=1 L=775 SLP=0.0144

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.342	3.655	23.31	.0338
.684	7.778	75.53	.0222
1.026	12.370	151.99	.0175
1.368	17.429	251.86	.0149
1.711	22.957	375.23	.0132
2.053	28.953	522.62	.0119
2.395	35.417	694.75	.0110
2.737	42.349	892.44	.0102
3.079	49.749	1116.58	.0096
3.421	57.618	1368.08	.0091
3.763	65.954	1647.87	.0086
4.105	74.759	1956.89	.0082
4.447	84.032	2296.09	.0079
4.789	93.773	2666.39	.0076
5.132	103.982	3068.74	.0073
5.474	114.659	3504.05	.0070
5.816	125.805	3973.25	.0068
6.158	137.418	4477.25	.0066
6.500	149.500	5016.95	.0064

ROUTE ID=8 HYD=R7 INFLOW ID=7 DT=0.0
PRINT HYD ID=8 CODE=1

HYDROGRAPH FROM AREA R7

RUNOFF VOLUME = 1.70316 INCHES = 262.0903 ACRE-FEET
PEAK DISCHARGE RATE = 2333.99 CFS AT 1.600 HOURS BASIN AREA = 2.8854 SQ. MI.

*
COMPUTE NM HYD ID=21 HYD=21E AREA=0.0656 PER A=0 PER B=0
PER C=30 PER D=70 TP=0.1333 MASS RAIN=-1

K = .072697HR TP = .133300HR K/TP RATIO = .545367 SHAPE CONSTANT, N = 7.100313
UNIT PEAK = 181.20 CFS UNIT VOLUME = .9993 B = 525.99 P60 = 1.9000
AREA = .045920 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

```
        K =    .106176HR    TP =    .133300HR    K/TP RATIO =    .796520     SHAPE CONSTANT, N =
4.500118
        UNIT PEAK =    57.170    CFS   UNIT VOLUME =    1.000       B =   387.23       P60 =
1.9000
        AREA =       .019680 SQ MI    IA =     .35000 INCHES    INF =     .83000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

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

    PRINT HYD            ID=21  CODE=1

                                          HYDROGRAPH FROM AREA 21E


        RUNOFF VOLUME =      1.72180 INCHES      =       6.0240 ACRE-FEET
        PEAK DISCHARGE RATE =     170.43 CFS  AT   1.500 HOURS   BASIN AREA =    .0656 SQ. MI.


    *
    *ADD 21E FLOW TO CHANNEL AT THE 42" STORM DRAIN TIE AT STINSON ST
    ADD HYD              ID=9  HYD=21.1   ID=21  ID=8
    PRINT HYD            ID=9  CODE=1

                                       OUTFLOW HYDROGRAPH REACH    21.10


        RUNOFF VOLUME =      1.70357 INCHES      =     268.1143 ACRE-FEET
        PEAK DISCHARGE RATE =    2453.09 CFS  AT   1.600 HOURS   BASIN AREA =  2.9510 SQ. MI.


    *
    *ROUTE FLOW DOWN CHANNEL - STA 23+50 TO 17+30
    COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=0
                         MAX ELEV=6.5  CH SLOPE=0.022   FP SLOPE=0.022
                         N=0.013   DIST=26.1
                         DIST  ELEV
                         0      6.5
                         0.1    4
                         8      0
                         18     0
                         26     4
                         26.1   6.5
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.34	3.65	28.81	11.36
.68	7.77	93.31	12.72
1.03	12.36	187.73	14.08
1.37	17.41	311.00	15.44
1.71	22.92	463.23	16.80
2.05	28.90	645.04	18.16
2.39	35.35	857.31	19.52
2.74	42.26	1101.04	20.88
3.08	49.63	1377.31	22.24
3.42	57.47	1687.24	23.60
3.76	65.78	2031.97	24.96
4.11	74.53	2426.24	25.91
4.45	83.39	2879.52	25.94
4.79	92.27	3355.15	25.96
5.13	101.16	3851.21	25.99
5.47	110.06	4366.03	26.02
5.82	118.96	4898.15	26.05
6.16	127.88	5446.27	26.07
6.50	136.80	6009.27	26.10

```
COMPUTE TRAVEL TIME ID=10 REACH NO=1  NOVS=1  L=620   SLP=0.022

                                TRAVEL TIME TABLE
                                                REACH=  1.0

                                WATER       AVERAGE     FLOW        TRAVEL
                                DEPTH       AREA        RATE        TIME
                                FEET        SQ.FT.      CFS         HRS
                                   .342       3.654       28.81       .0218
                                   .684       7.773       93.31       .0143
                                 1.026      12.357      187.73       .0113
                                 1.368      17.406      311.00       .0096
                                 1.711      22.920      463.23       .0085
                                 2.053      28.900      645.04       .0077
                                 2.395      35.345      857.31       .0071
                                 2.737      42.255     1101.04       .0066
                                 3.079      49.631     1377.31       .0062
                                 3.421      57.471     1687.24       .0059
                                 3.763      65.777     2031.97       .0056
                                 4.105      74.527     2426.24       .0053
                                 4.447      83.395     2879.52       .0050
                                 4.789      92.272     3355.15       .0047
                                 5.132     101.159     3851.21       .0045
                                 5.474     110.055     4366.03       .0043
                                 5.816     118.961     4898.15       .0042
                                 6.158     127.876     5446.27       .0040
                                 6.500     136.800     6009.27       .0039
     ROUTE                ID=10 HYD=R9  INFLOW ID=9  DT=0.0
     PRINT HYD            ID=10 CODE=1

                                        HYDROGRAPH FROM AREA R9


         RUNOFF VOLUME =      1.70324 INCHES      =      268.0617 ACRE-FEET
         PEAK DISCHARGE RATE =    2457.37 CFS  AT   1.600 HOURS   BASIN AREA =  2.9510 SQ. MI.


     *
     COMPUTE NM HYD       ID=18  HYD=18E  AREA=0.0075  PER A=30 PER B=0
                          PER C=0  PER D=70   TP=0.1333  MASS RAIN=-1

         K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =
7.106420
         UNIT PEAK =   20.727    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 =
1.9000
         AREA =       .005250 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

         K =    .162928HR    TP =    .133300HR    K/TP RATIO =  1.222262     SHAPE CONSTANT, N =
2.911962
         UNIT PEAK =   4.6344    CFS   UNIT VOLUME =    .9966       B =   274.56      P60 =
1.9000
         AREA =       .002250 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

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

     PRINT HYD            ID=18  CODE=1

                                        HYDROGRAPH FROM AREA 18E


         RUNOFF VOLUME =      1.54928 INCHES      =        .6197 ACRE-FEET
         PEAK DISCHARGE RATE =      17.13 CFS  AT   1.500 HOURS   BASIN AREA =   .0075 SQ. MI.
```

```
*
*ADD 18E TO CHANNEL FLOW
ADD HYD              ID=11  HYD=18.1  ID=18  ID=10
PRINT HYD            ID=11  CODE=1

                                        OUTFLOW HYDROGRAPH REACH    18.10


    RUNOFF VOLUME =      1.70285 INCHES      =     268.6813 ACRE-FEET
    PEAK DISCHARGE RATE =    2469.38 CFS  AT   1.600 HOURS   BASIN AREA =  2.9585 SQ. MI.


*
*ROUTE FLOW TO END OF CHANNEL - STA 17+30 TO 9+55
COMPUTE RATING CURVE CID=1  VSNO=1  NO SEG=1  MIN ELEV=0
                     MAX ELEV=6.5  CH SLOPE=0.022  FP SLOPE=0.022
                     N=0.013   DIST=36
                     DIST ELEV
                     0      6.5
                     13     0
                     23     0
                     36     6.5

                                RATING CURVE VALLEY SECTION  1.0
                                   WATER        FLOW        FLOW        TOP
                                  SURFACE       AREA        RATE       WIDTH
                                   ELEV         SQ FT       CFS        FT
                                     .00          .00         .00        .00
                                     .34         3.66       28.81      11.37
                                     .68         7.78       93.36      12.74
                                    1.03        12.37      187.87      14.11
                                    1.37        17.43      311.30      15.47
                                    1.71        22.96      463.79      16.84
                                    2.05        28.95      645.97      18.21
                                    2.39        35.42      858.73      19.58
                                    2.74        42.35     1103.09      20.95
                                    3.08        49.75     1380.13      22.32
                                    3.42        57.62     1690.99      23.68
                                    3.76        65.95     2036.82      25.05
                                    4.11        74.76     2418.78      26.42
                                    4.45        84.03     2838.04      27.79
                                    4.79        93.77     3295.75      29.16
                                    5.13       103.98     3793.06      30.53
                                    5.47       114.66     4331.12      31.89
                                    5.82       125.80     4911.07      33.26
                                    6.16       137.42     5534.03      34.63
                                    6.50       149.50     6201.12      36.00
COMPUTE TRAVEL TIME ID=12  REACH NO=1  NOVS=1  L=775  SLP=0.022

TRAVEL TIME TABLE
                    REACH=  1.0

WATER        AVERAGE      FLOW        TRAVEL
DEPTH        AREA         RATE        TIME
FEET         SQ.FT.       CFS         HRS
   .342        3.655       28.81       .0273
   .684        7.778       93.36       .0179
  1.026       12.370      187.87       .0142
  1.368       17.429      311.30       .0121
  1.711       22.957      463.79       .0107
  2.053       28.953      645.97       .0096
  2.395       35.417      858.73       .0089
  2.737       42.349     1103.09       .0083
  3.079       49.749     1380.13       .0078
  3.421       57.618     1690.99       .0073
  3.763       65.954     2036.82       .0070
  4.105       74.759     2418.78       .0067
  4.447       84.032     2838.04       .0064
```

```
                                  4.789      93.773     3295.75       .0061
                                  5.132     103.982     3793.06       .0059
                                  5.474     114.659     4331.12       .0057
                                  5.816     125.805     4911.07       .0055
                                  6.158     137.418     5534.03       .0053
                                  6.500     149.500     6201.12       .0052
ROUTE                  ID=12  HYD=R11  INFLOW ID=11  DT=0.0
PRINT HYD              ID=12  CODE=1

                                          HYDROGRAPH FROM AREA R11


    RUNOFF VOLUME =      1.70243 INCHES      =     268.6151 ACRE-FEET
    PEAK DISCHARGE RATE =    2473.55 CFS  AT   1.600 HOURS   BASIN AREA =  2.9585 SQ. MI.


*
*FLOW EMPTIES INTO NORTH/SOUTH COORS CONNECTION POND
FINISH
    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 14:44:32
```

```
AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 03/02/1998
     START TIME (HR:MIN:SEC) = 14:28:49     USER NO.= GREINRNM.STE
     INPUT FILE = p:\ahymo\ab100.dat

START                 0.0 HRS
* AHYMO MODEL FOR AMOLE PHASE III C
* MODEL CREATED BY GREINER AUG 1993 - BASED ON FILE AB100MKR FROM
*     FROM FEMA RESTUDY (AREAS A (#2) AND B (#3)) BY RTI
*
* TIERRA BAYITA ARROYO
* ULTIMATE DEVELOPMENT CONDITIONS 100-YR. 24-HR. STORM
*
*
*   FILE NAME - AB100.DAT
*
* THIS FILE COMPUTES THE HYDROLOGY FOR
*
*      AREA A (#2) - TIERRA BAYITA ARROYO, MIREHAVEN ARROYO
*
*     ASSUMPTIONS -
*       1. USE THE AHYMO991 VERSION OF HYMO AS DEVELOPED BY AMAFCA
*       2. MODEL THE 24-HOUR RAINFALL PER FEMA CRITERIA
*       3. USE THE draft REVISION OF SECTION 22.2, DPM by the DEVELOPMENT
*          PROCESS MANUAL DRAINAGE DESIGN CRITERIA COMMITTEE, AUGUST 1991
*       4. USE THE NM HYDROGRAPH COMPUTATIONAL METHOD IN AHYMO391
*       5. COMPUTATIONAL INTERVAL = 3 MINUTES = .05 hrs
*       6. PERCENTAGE OF EXISTING LAND USE WITHIN TREATMENT TYPES A,B,C AND D
*          WAS ESTIMATED FOR ULTIMATE DEVELOPMENT BASED ON LAND PLANNING
*          DOCUMENTS
*
* % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % %
*
*
RAINFALL              TYPE=2  RAIN QUARTER=0.0   RAIN ONE=1.95
                      RAIN SIX=2.2     RAIN DAY=2.7     DT=0.05

                 COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40
HR.
                 DT =     .050000 HOURS        END TIME =    24.000000 HOURS
                    .0000   .0014   .0028   .0042   .0057   .0073   .0089
                    .0106   .0124   .0142   .0161   .0182   .0203   .0225
                    .0248   .0273   .0300   .0328   .0359   .0392   .0428
                    .0510   .0601   .0864   .1486   .2555   .4209   .6590
                    .9846  1.2415  1.3575  1.4544  1.5392  1.6151  1.6838
                   1.7465  1.8040  1.8570  1.9058  1.9510  1.9928  2.0008
                   2.0081  2.0148  2.0211  2.0270  2.0326  2.0378  2.0427
                   2.0474  2.0519  2.0562  2.0604  2.0643  2.0682  2.0718
                   2.0754  2.0788  2.0822  2.0854  2.0885  2.0916  2.0945
                   2.0974  2.1002  2.1030  2.1057  2.1083  2.1108  2.1133
                   2.1158  2.1182  2.1205  2.1228  2.1251  2.1273  2.1295
                   2.1316  2.1337  2.1358  2.1378  2.1398  2.1417  2.1437
                   2.1456  2.1474  2.1493  2.1511  2.1529  2.1547  2.1564
                   2.1581  2.1598  2.1615  2.1631  2.1648  2.1664  2.1680
                   2.1695  2.1711  2.1726  2.1741  2.1756  2.1771  2.1786
                   2.1800  2.1814  2.1828  2.1842  2.1856  2.1870  2.1884
                   2.1897  2.1910  2.1924  2.1937  2.1950  2.1962  2.1975
                   2.1988  2.2000  2.2021  2.2042  2.2063  2.2084  2.2105
                   2.2126  2.2147  2.2167  2.2188  2.2209  2.2229  2.2250
                   2.2270  2.2290  2.2310  2.2330  2.2351  2.2371  2.2390
                   2.2410  2.2430  2.2450  2.2470  2.2489  2.2509  2.2528
                   2.2548  2.2567  2.2586  2.2605  2.2625  2.2644  2.2663
                   2.2682  2.2701  2.2720  2.2738  2.2757  2.2776  2.2795
                   2.2813  2.2832  2.2850  2.2869  2.2887  2.2905  2.2923
                   2.2942  2.2960  2.2978  2.2996  2.3014  2.3032  2.3050
                   2.3068  2.3085  2.3103  2.3121  2.3138  2.3156  2.3174
                   2.3191  2.3208  2.3226  2.3243  2.3260  2.3278  2.3295
```

2.3312	2.3329	2.3346	2.3363	2.3380	2.3397	2.3414
2.3431	2.3448	2.3464	2.3481	2.3498	2.3514	2.3531
2.3547	2.3564	2.3580	2.3596	2.3613	2.3629	2.3645
2.3662	2.3678	2.3694	2.3710	2.3726	2.3742	2.3758
2.3774	2.3790	2.3806	2.3821	2.3837	2.3853	2.3869
2.3884	2.3900	2.3915	2.3931	2.3946	2.3962	2.3977
2.3993	2.4008	2.4023	2.4038	2.4054	2.4069	2.4084
2.4099	2.4114	2.4129	2.4144	2.4159	2.4174	2.4189
2.4204	2.4219	2.4234	2.4248	2.4263	2.4278	2.4293
2.4307	2.4322	2.4336	2.4351	2.4365	2.4380	2.4394
2.4409	2.4423	2.4437	2.4452	2.4466	2.4480	2.4494
2.4509	2.4523	2.4537	2.4551	2.4565	2.4579	2.4593
2.4607	2.4621	2.4635	2.4649	2.4662	2.4676	2.4690
2.4704	2.4718	2.4731	2.4745	2.4759	2.4772	2.4786
2.4799	2.4813	2.4826	2.4840	2.4853	2.4867	2.4880
2.4893	2.4907	2.4920	2.4933	2.4946	2.4960	2.4973
2.4986	2.4999	2.5012	2.5025	2.5038	2.5051	2.5064
2.5077	2.5090	2.5103	2.5116	2.5129	2.5142	2.5155
2.5168	2.5180	2.5193	2.5206	2.5219	2.5231	2.5244
2.5257	2.5269	2.5282	2.5294	2.5307	2.5319	2.5332
2.5344	2.5357	2.5369	2.5382	2.5394	2.5406	2.5419
2.5431	2.5443	2.5455	2.5468	2.5480	2.5492	2.5504
2.5516	2.5528	2.5541	2.5553	2.5565	2.5577	2.5589
2.5601	2.5613	2.5625	2.5636	2.5648	2.5660	2.5672
2.5684	2.5696	2.5708	2.5719	2.5731	2.5743	2.5754
2.5766	2.5778	2.5790	2.5801	2.5813	2.5824	2.5836
2.5847	2.5859	2.5870	2.5882	2.5893	2.5905	2.5916
2.5928	2.5939	2.5950	2.5962	2.5973	2.5984	2.5996
2.6007	2.6018	2.6029	2.6041	2.6052	2.6063	2.6074
2.6085	2.6097	2.6108	2.6119	2.6130	2.6141	2.6152
2.6163	2.6174	2.6185	2.6196	2.6207	2.6218	2.6229
2.6239	2.6250	2.6261	2.6272	2.6283	2.6294	2.6304
2.6315	2.6326	2.6337	2.6347	2.6358	2.6369	2.6379
2.6390	2.6401	2.6411	2.6422	2.6432	2.6443	2.6454
2.6464	2.6475	2.6485	2.6496	2.6506	2.6516	2.6527
2.6537	2.6548	2.6558	2.6569	2.6579	2.6589	2.6600
2.6610	2.6620	2.6630	2.6641	2.6651	2.6661	2.6671
2.6682	2.6692	2.6702	2.6712	2.6722	2.6732	2.6742
2.6752	2.6763	2.6773	2.6783	2.6793	2.6803	2.6813
2.6823	2.6833	2.6843	2.6853	2.6862	2.6872	2.6882
2.6892	2.6902	2.6912	2.6922	2.6932	2.6941	2.6951
2.6961	2.6971	2.6981	2.6990	2.7000		

```
*
*s  DIVIDE HYD IS USED TO SIMULATE A BULKING FACTOR
COMPUTE NM HYD        ID=5   HYD=108.4    DA= .1426  SQ MI
                      PER A=0  B=2  C=28  D=70
                      TP= .1333  HRS  RAIN=-1

         K =   .073763HR    TP =   .133300HR    K/TP RATIO =   .553360     SHAPE CONSTANT, N =
6.969466
         UNIT PEAK =   389.25    CFS   UNIT VOLUME =    .9990       B =   519.81      P60 =
1.9500
         AREA =       .099820 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


         K =   .106958HR    TP =   .133300HR    K/TP RATIO =   .802389     SHAPE CONSTANT, N =
4.463305
         UNIT PEAK =   123.54    CFS   UNIT VOLUME =    1.002       B =   384.95      P60 =
1.9500
         AREA =       .042780 SQ MI    IA =    .36000 INCHES    INF =    .85800 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

     PRINT HYD            ID=5  CODE=1

                                   PARTIAL HYDROGRAPH   108.40
```

```
        RUNOFF VOLUME =      2.03361 INCHES      =       15.4662 ACRE-FEET
        PEAK DISCHARGE RATE =      363.67 CFS  AT   1.500 HOURS   BASIN AREA =   .1426 SQ. MI.


    *DIVIDE HYD NO  108.4
    DIVIDE HYD            ID=5   PER=-105  ID I=5 HYD=108.4
                                           ID II=16  HYD II=000
 *** WARNING *** - PERCENTAGE OF     -105.0 FOUND - A HYDROGRAPH BULKING FACTOR IS ASSUMED
    PRINT HYD             ID=5  CODE=1

                                      PARTIAL HYDROGRAPH   108.40


        RUNOFF VOLUME =      2.13528 INCHES      =       16.2394 ACRE-FEET
        PEAK DISCHARGE RATE =      381.85 CFS  AT   1.500 HOURS   BASIN AREA =   .1426 SQ. MI.


    *
    *
    COMPUTE NM HYD        ID=1    HYD= 101       DA=0.026    SQ MI
                          PER A=0    B=100  C=0     D=0
                          TP=.133    HRS        RAIN=-1

        K =   .131068HR    TP =   .133000HR    K/TP RATIO =   .985475     SHAPE CONSTANT, N =
3.583086
        UNIT PEAK =   63.796    CFS   UNIT VOLUME =    1.001       B =   326.34      P60 =
1.9500
        AREA =       .026000 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

    *
    DIVIDE HYD            ID=1    PER=-110    ID=1  HYD=101
                                              ID=16  HYD=000
 *** WARNING *** - PERCENTAGE OF     -110.0 FOUND - A HYDROGRAPH BULKING FACTOR IS ASSUMED
    *
    *ROUTE BULKED 101 THROUGH BASIN 108.3 - ASSUME A CONCRETE TRAPAZOIDAL
    *            CHANNEL TO SIMULATE DEVELOPED CONDITIONS
    *            USE:  10FT BOTTOM  W/2H:1V SIDE SLOPES AT EXISTING SLOPE
    COMPUTE RATING CURVE CID=1   VS NO=1   NO SEG = 1
                          MIN ELEV=0  MAX ELEV= 6  CH SLP= 0.0375
                          FP SLP=0.375    N=.013  DIST=34
                          DIST  ELEV
                           0     6
                           12    0
                           22    0
                           34    6


                                      RATING CURVE VALLEY SECTION  1.0
                                WATER        FLOW        FLOW        TOP
                              SURFACE       AREA        RATE       WIDTH
                               ELEV         SQ FT       CFS        FT
                                .00          .00         .00        .00
                                .32         3.36      103.95      11.26
                                .63         7.11      336.16      12.53
                                .95        11.27      674.95      13.79
                               1.26        15.82     1115.75      15.05
                               1.58        20.78     1658.34      16.32
                               1.89        26.13     2304.37      17.58
                               2.21        31.88     3056.45      18.84
                               2.53        38.03     3917.71      20.11
                               2.84        44.58     4891.57      21.37
                               3.16        51.52     5981.63      22.63
                               3.47        58.87     7191.59      23.89
                               3.79        66.61     8525.20      25.16
                               4.11        74.76     9986.22      26.42
                               4.42        83.30    11578.44      27.68
                               4.74        92.24    13305.61      28.95
```

```
                                        5.05      101.58    15171.49       30.21
                                        5.37      111.32    17179.79       31.47
                                        5.68      121.46    19334.22       32.74
                                        6.00      132.00    21638.44       34.00
COMPUTE TRAVEL TIME  ID=2   REACH=1  NO VS=1  L=4000   SLOPE= 0.0375

                          TRAVEL TIME TABLE
                                          REACH=  1.0

                          WATER       AVERAGE     FLOW        TRAVEL
                          DEPTH       AREA        RATE        TIME
                          FEET        SQ.FT.      CFS         HRS
                             .316       3.357      103.95       .0359
                             .632       7.114      336.16       .0235
                             .947      11.269      674.95       .0186
                            1.263      15.823     1115.75       .0158
                            1.579      20.776     1658.34       .0139
                            1.895      26.127     2304.37       .0126
                            2.211      31.878     3056.45       .0116
                            2.526      38.028     3917.71       .0108
                            2.842      44.576     4891.57       .0101
                            3.158      51.524     5981.63       .0096
                            3.474      58.870     7191.59       .0091
                            3.789      66.615     8525.20       .0087
                            4.105      74.759     9986.22       .0083
                            4.421      83.302    11578.44       .0080
                            4.737      92.244    13305.61       .0077
                            5.053     101.584    15171.49       .0074
                            5.368     111.324    17179.79       .0072
                            5.684     121.463    19334.22       .0070
                            6.000     132.000    21638.44       .0068
ROUTE                 ID=2      HYD= 101.80    INFLOW HYD ID=1    DT=0.0
PRINT HYD             ID=2    CODE=1

                                  PARTIAL HYDROGRAPH   101.80


    RUNOFF VOLUME =       .77528 INCHES     =       1.0750 ACRE-FEET
    PEAK DISCHARGE RATE =      36.46 CFS  AT   1.550 HOURS   BASIN AREA =   .0260 SQ. MI.

                                                  .

*
COMPUTE NM HYD        ID=1    HYD= 108.3     DA= .1478   SQ MI
                      PER A=0    B=2    C=41    D=57
                      TP=.175    HRS        RAIN=-1

    K =   .096933HR    TP =   .175000HR    K/TP RATIO =   .553902     SHAPE CONSTANT, N =
6.960743
    UNIT PEAK =   250.04    CFS   UNIT VOLUME =    .9997       B =   519.39      P60 =
1.9500
    AREA =       .084246 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .139737HR    TP =   .175000HR    K/TP RATIO =   .798497     SHAPE CONSTANT, N =
4.487627
    UNIT PEAK =   140.35    CFS   UNIT VOLUME =    1.000       B =   386.46      P60 =
1.9500
    AREA =       .063554 SQ MI    IA =    .35698 INCHES    INF =    .84953 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

*
PRINT HYD             ID=1    CODE=1

                                  PARTIAL HYDROGRAPH   108.30


    RUNOFF VOLUME =     1.84830 INCHES     =      14.5694 ACRE-FEET
```

```
    PEAK DISCHARGE RATE =     312.33 CFS  AT   1.550 HOURS   BASIN AREA =   .1478 SQ. MI.


*
*      DIVIDE HYD NO.       108.3
DIVIDE HYD           ID=1     PER=-105      ID  I=1   HYD  I=108.3
                                          ID II=16   HYD II=000
*** WARNING *** - PERCENTAGE OF     -105.0 FOUND - A HYDROGRAPH BULKING FACTOR IS ASSUMED
PRINT HYD            ID=1  CODE=1

                                     PARTIAL HYDROGRAPH   108.30


    RUNOFF VOLUME =     1.94071 INCHES     =      15.2979 ACRE-FEET
    PEAK DISCHARGE RATE =     327.95 CFS  AT   1.550 HOURS   BASIN AREA =   .1478 SQ. MI.


*
*ADD ROUTED 101 AND 108.3
ADD HYD              ID=3   HYD=108.39  ID=1  ID=2
PRINT HYD            ID=3  CODE=1

                                     PARTIAL HYDROGRAPH   108.39


    RUNOFF VOLUME =     1.76636 INCHES     =      16.3729 ACRE-FEET
    PEAK DISCHARGE RATE =     364.41 CFS  AT   1.550 HOURS   BASIN AREA =   .1738 SQ. MI.


*
*ROUTE COMBINED 101 AND 108.3 TO NORTH POND INFLOW
*           ASSUME A CONCRETE TRAPAZOIDAL
*           CHANNEL TO SIMULATE DEVELOPED CONDITIONS
*           USE:  10FT BOTTOM  W/2H:1V SIDE SLOPES AT EXISTING SLOPE
COMPUTE RATING CURVE CID=1   VS NO=1   NO SEG = 1
                     MIN ELEV=0  MAX ELEV= 6  CH SLP= 0.02
                     FP SLP=0.02    N=.013  DIST=34
                     DIST  ELEV
                      0     6
                      12    0
                      22    0
                      34    6
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.32	3.36	24.01	11.26
.63	7.11	77.63	12.53
.95	11.27	155.87	13.79
1.26	15.82	257.67	15.05
1.58	20.78	382.98	16.32
1.89	26.13	532.17	17.58
2.21	31.88	705.86	18.84
2.53	38.03	904.76	20.11
2.84	44.58	1129.66	21.37
3.16	51.52	1381.40	22.63
3.47	58.87	1660.83	23.89
3.79	66.61	1968.81	25.16
4.11	74.76	2306.22	26.42
4.42	83.30	2673.93	27.68
4.74	92.24	3072.80	28.95
5.05	101.58	3503.70	30.21
5.37	111.32	3967.50	31.47
5.68	121.46	4465.05	32.74

```
                                        6.00       132.00      4997.18        34.00
COMPUTE TRAVEL TIME  ID=2      REACH=1  NO VS=1
                     L=2150       SLP=.015

                          TRAVEL TIME TABLE
                                          REACH=  1.0

                          WATER        AVERAGE      FLOW         TRAVEL
                          DEPTH        AREA         RATE         TIME
                          FEET         SQ.FT.       CFS          HRS
                             .316        3.357        24.01        .0835
                             .632        7.114        77.63        .0547
                             .947       11.269       155.87        .0432
                            1.263       15.823       257.67        .0367
                            1.579       20.776       382.98        .0324
                            1.895       26.127       532.17        .0293
                            2.211       31.878       705.86        .0270
                            2.526       38.028       904.76        .0251
                            2.842       44.576      1129.66        .0236
                            3.158       51.524      1381.40        .0223
                            3.474       58.870      1660.83        .0212
                            3.789       66.615      1968.81        .0202
                            4.105       74.759      2306.22        .0194
                            4.421       83.302      2673.93        .0186
                            4.737       92.244      3072.80        .0179
                            5.053      101.584      3503.70        .0173
                            5.368      111.324      3967.50        .0168
                            5.684      121.463      4465.05        .0162
                            6.000      132.000      4997.18        .0158
ROUTE                ID=2      HYD= 108.38    INFLOW ID=3    DT=0.0
PRINT HYD            ID=2    CODE=1

                                   PARTIAL HYDROGRAPH   108.38


    RUNOFF VOLUME =     1.76637 INCHES     =      16.3729 ACRE-FEET
    PEAK DISCHARGE RATE =     357.91 CFS  AT   1.550 HOURS   BASIN AREA =   .1738 SQ. MI.


*
COMPUTE NM HYD       ID=7    HYD=108.2      DA= .1710   SQ MI
                     PER A=0    B=5    C=35    D=63
                     TP=.158    HRS        RAIN=-1
    *****WARNING*****  SUM OF TREATMENT TYPES DOES NOT EQUAL 100 PERCENT OR TOTAL AREA


    K =   .087899HR    TP =   .158000HR    K/TP RATIO =   .556324     SHAPE CONSTANT, N =
6.922152
    UNIT PEAK =   342.61    CFS   UNIT VOLUME =    .9992       B =   517.56      P60 =
1.9500
    AREA =      .104592 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .127558HR    TP =   .158000HR    K/TP RATIO =   .807329     SHAPE CONSTANT, N =
4.432534
    UNIT PEAK =   161.00    CFS   UNIT VOLUME =    1.000       B =   383.05      P60 =
1.9500
    AREA =      .066408 SQ MI    IA =    .36875 INCHES    INF =    .88250 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD            ID=7    CODE=1

                                   PARTIAL HYDROGRAPH   108.20


    RUNOFF VOLUME =     1.89651 INCHES     =      17.2960 ACRE-FEET
    PEAK DISCHARGE RATE =     376.60 CFS  AT   1.500 HOURS   BASIN AREA =   .1710 SQ. MI.
```

```
*
*       DIVIDE HYD NO.        108.2
DIVIDE HYD            ID=7     PER=-105      ID  I=7   HYD  I=108.2
                                           ID II=16   HYD II=000
*** WARNING *** - PERCENTAGE OF     -105.0 FOUND - A HYDROGRAPH BULKING FACTOR IS ASSUMED
PRINT HYD             ID=7  CODE=1

                                      PARTIAL HYDROGRAPH   108.20


    RUNOFF VOLUME =     1.99133 INCHES     =      18.1608 ACRE-FEET
    PEAK DISCHARGE RATE =     395.43 CFS  AT   1.500 HOURS   BASIN AREA =   .1710 SQ. MI.


*
*S COMBINE HYD'S 108.38 AND 108.2
ADD HYD               ID=7  HYD=108.29  ID=7  ID=2
PRINT HYD             ID=7  CODE=1

                                      PARTIAL HYDROGRAPH   108.29


    RUNOFF VOLUME =     1.87793 INCHES     =      34.5337 ACRE-FEET
    PEAK DISCHARGE RATE =     752.47 CFS  AT   1.550 HOURS   BASIN AREA =   .3448 SQ. MI.


*
*
COMPUTE NM HYD        ID=2    HYD= 102    DA=0.281    SQ MI
                      PER A=40   B=19   C=10     D=31
                      TP=.20   RAIN=-1

    K =   .113561HR    TP =   .200000HR    K/TP RATIO =   .567804     SHAPE CONSTANT, N =
6.744929
    UNIT PEAK =   221.71    CFS   UNIT VOLUME =    .9997       B =   509.04      P60 =
1.9500
    AREA =      .087110 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .189271HR    TP =   .200000HR    K/TP RATIO =   .946357     SHAPE CONSTANT, N =
3.735450
    UNIT PEAK =   326.83    CFS   UNIT VOLUME =    1.000       B =   337.13      P60 =
1.9500
    AREA =      .193890 SQ MI    IA =    .56522 INCHES    INF =   1.43261 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD             ID=2    CODE=1

                                      PARTIAL HYDROGRAPH   102.00


    RUNOFF VOLUME =     1.17382 INCHES     =      17.5915 ACRE-FEET
    PEAK DISCHARGE RATE =     370.96 CFS  AT   1.550 HOURS   BASIN AREA =   .2810 SQ. MI.


*
DIVIDE HYD            ID=2     PER=-105  ID  I=2   HYD  I=102
                                           ID II=16   HYD II=000
*** WARNING *** - PERCENTAGE OF     -105.0 FOUND - A HYDROGRAPH BULKING FACTOR IS ASSUMED
PRINT HYD             ID=2  CODE=1

                                      PARTIAL HYDROGRAPH   102.00
```

```
RUNOFF VOLUME =      1.23250 INCHES      =       18.4710 ACRE-FEET
PEAK DISCHARGE RATE =     389.50 CFS  AT   1.550 HOURS   BASIN AREA =   .2810 SQ. MI.


*
*ROUTE BASIN 102 THROUGH BASIN 108.1
*            ASSUME A CONCRETE TRAPAZOIDAL
*            CHANNEL TO SIMULATE DEVELOPED CONDITIONS
*            USE:  10FT BOTTOM  W/2H:1V SIDE SLOPES AT EXISTING SLOPE
COMPUTE RATING CURVE CID=1   VS NO=1   NO SEG = 1
                     MIN ELEV=0  MAX ELEV= 6  CH SLP= 0.03
                     FP SLP=0.03    N=.013  DIST=34
                     DIST  ELEV
                      0     6
                      12    0
                      22    0
                      34    6
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.32	3.36	29.40	11.26
.63	7.11	95.08	12.53
.95	11.27	190.91	13.79
1.26	15.82	315.58	15.05
1.58	20.78	469.05	16.32
1.89	26.13	651.78	17.58
2.21	31.88	864.50	18.84
2.53	38.03	1108.10	20.11
2.84	44.58	1383.55	21.37
3.16	51.52	1691.86	22.63
3.47	58.87	2034.09	23.89
3.79	66.61	2411.29	25.16
4.11	74.76	2824.53	26.42
4.42	83.30	3274.88	27.68
4.74	92.24	3763.40	28.95
5.05	101.58	4291.14	30.21
5.37	111.32	4859.18	31.47
5.68	121.46	5468.54	32.74
6.00	132.00	6120.27	34.00

```
COMPUTE TRAVEL TIME  ID=3      REACH=1  NO VS=1
                     L=3100       SLP=.03
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.357	29.40	.0983
.632	7.114	95.08	.0644
.947	11.269	190.91	.0508
1.263	15.823	315.58	.0432
1.579	20.776	469.05	.0381
1.895	26.127	651.78	.0345
2.211	31.878	864.50	.0318
2.526	38.028	1108.10	.0296
2.842	44.576	1383.55	.0277
3.158	51.524	1691.86	.0262
3.474	58.870	2034.09	.0249
3.789	66.615	2411.29	.0238
4.105	74.759	2824.53	.0228
4.421	83.302	3274.88	.0219
4.737	92.244	3763.40	.0211
5.053	101.584	4291.14	.0204
5.368	111.324	4859.18	.0197

```
                                  5.684      121.463      5468.54        .0191
                                  6.000      132.000      6120.27        .0186
ROUTE                  ID=3      HYD= 102.80    INFLOW ID=2    DT=0.0
PRINT HYD              ID=3    CODE=1

                                     PARTIAL HYDROGRAPH   102.80


    RUNOFF VOLUME =      1.23251 INCHES      =      18.4710 ACRE-FEET
    PEAK DISCHARGE RATE =     391.90 CFS  AT   1.600 HOURS   BASIN AREA =   .2810 SQ. MI.


*
COMPUTE NM HYD         ID=4    HYD= 108.1     DA= .1713   SQ MI
                       PER A=0    B=3    C=30    D=67
                       TP=.133    HRS        RAIN=-1

    K =   .073995HR    TP =   .133000HR    K/TP RATIO =   .556355     SHAPE CONSTANT, N =
6.921654
    UNIT PEAK =   446.60    CFS   UNIT VOLUME =    .9991       B =   517.53      P60 =
1.9500
    AREA =       .114771 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .106685HR    TP =   .133000HR    K/TP RATIO =   .802144     SHAPE CONSTANT, N =
4.464820
    UNIT PEAK =   163.66    CFS   UNIT VOLUME =    1.002       B =   385.05      P60 =
1.9500
    AREA =       .056529 SQ MI    IA =    .36364 INCHES    INF =    .86818 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD              ID=4    CODE=1

                                     PARTIAL HYDROGRAPH   108.10


    RUNOFF VOLUME =      1.98693 INCHES      =      18.1524 ACRE-FEET
    PEAK DISCHARGE RATE =     431.18 CFS  AT   1.500 HOURS   BASIN AREA =   .1713 SQ. MI.


*
DIVIDE HYD             ID=4     PER=-105      ID  I=4   HYD  I=108.1
                                            ID II=16   HYD II=000
*** WARNING *** - PERCENTAGE OF     -105.0 FOUND - A HYDROGRAPH BULKING FACTOR IS ASSUMED
PRINT HYD              ID=4  CODE=1

                                     PARTIAL HYDROGRAPH   108.10


    RUNOFF VOLUME =      2.08627 INCHES      =      19.0601 ACRE-FEET
    PEAK DISCHARGE RATE =     452.74 CFS  AT   1.500 HOURS   BASIN AREA =   .1713 SQ. MI.


*
*ADD ROUTED 102 TO 108.1 FLOW
ADD HYD                ID=2  HYD=108.17  ID=4  ID=3
PRINT HYD              ID=2  CODE=1

                                     PARTIAL HYDROGRAPH   108.17


    RUNOFF VOLUME =      1.55585 INCHES      =      37.5311 ACRE-FEET
    PEAK DISCHARGE RATE =     753.68 CFS  AT   1.550 HOURS   BASIN AREA =   .4523 SQ. MI.
```

```
*
*
*ROUTE FLOW SOUTH ON 102ND THRU 72" PIPE TO NORTH POND
COMPUTE RATING CURVE RC=1   VS NO=1   CODE=-1
                     SLP=0.013     DIA= 72 IN  N=.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.31	.56	2.53	2.67
.63	1.56	11.00	3.67
.94	2.82	25.56	4.36
1.25	4.27	45.97	4.87
1.56	5.86	71.78	5.27
1.88	7.55	102.42	5.56
2.19	9.33	137.22	5.78
2.50	11.16	175.44	5.92
2.81	13.02	216.27	5.99
3.13	14.90	258.83	6.00
3.44	16.76	302.17	6.00
3.75	18.60	345.26	6.00
4.06	20.39	386.97	6.00
4.38	22.10	426.03	6.00
4.69	23.71	460.99	6.00
5.00	25.19	490.07	6.00
5.32	26.49	510.88	6.00
5.63	27.55	519.43	6.00
6.00	28.27	519.43	6.00

```
COMPUTE TRAVEL TIME  ID=8 REACH=1  NO VS=1    L=1200     SLP=.013
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.313	.562	2.53	.0740
.625	1.564	11.00	.0474
.938	2.824	25.56	.0368
1.251	4.271	45.97	.0310
1.563	5.859	71.78	.0272
1.876	7.554	102.42	.0246
2.189	9.329	137.22	.0227
2.501	11.159	175.44	.0212
2.814	13.022	216.27	.0201
3.127	14.897	258.83	.0192
3.439	16.764	302.17	.0185
3.752	18.601	345.26	.0180
4.065	20.388	386.97	.0176
4.377	22.101	426.03	.0173
4.690	23.712	460.99	.0171
5.003	25.189	490.07	.0171
5.315	26.489	510.88	.0173
5.628	27.547	519.43	.0177
6.000	28.274	519.43	.0181

```
    ROUTE                  ID=8      HYD= 108.18    INFLOW HYD ID=2    DT=0.0
TRAVEL TIME TABLE EXCEEDED
    PRINT HYD              ID=8    CODE=1
```

PARTIAL HYDROGRAPH 108.18

```
RUNOFF VOLUME =     1.55585 INCHES     =      37.5311 ACRE-FEET
PEAK DISCHARGE RATE =     743.28 CFS  AT   1.550 HOURS   BASIN AREA =   .4523 SQ. MI.
```

```
*
* COMBINE FLOW FROM 108.18 & 108.29
ADD HYD                ID=9  HYD=108.9  ID=7  ID=8
PRINT HYD              ID=9  CODE=1

                                   PARTIAL HYDROGRAPH   108.90


    RUNOFF VOLUME =     1.69518 INCHES     =      72.0648 ACRE-FEET
    PEAK DISCHARGE RATE =    1495.75 CFS  AT   1.550 HOURS   BASIN AREA =   .7971 SQ. MI.


*
*
******THE FOLLOWING POND IS WHAT WAS APPROVED BY THE STATE ENGINEER &
*       COA - DURING CONSTRUCTION ACCESS RAMPS WERE ADDED REDUCING THE
*       VOLUME -- REVISED STORAGE VOLUMES
*ROUTE FLOW THROUGH NORTH POND
*ROUTE RESERVOIR       ID=10  HYD=502  INFLOW ID=9  CODE=5
*                      OUTFLOW  STORAGE  ELEV
*                        0        0      5204.21
*                        3      0.287    5205
*                       13      1.582    5206
*                       25      3.486    5207
*                       42      7.543    5209
*                       52     11.939    5211
*                       64     16.689    5213
*                       72     21.805    5215
*                       80     27.301    5217
*                       88     33.189    5219
*                       90     39.483    5221
*                       91     46.197    5223
*                      968     49.715    5224
*                     2615     53.343    5225
*                     4809     57.082    5226
*
*ROUTE FLOW THROUGH NORTH POND - REVISED FOR ACCESS RAMP
ROUTE RESERVOIR       ID=10  HYD=502  INFLOW ID=9  CODE=5
                      OUTFLOW  STORAGE  ELEV
                        0        0      5204.21
                        3      0.287    5205
                       13      1.565    5206
                       25      3.402    5207
                       42      7.394    5209
                       52     11.731    5211
                       64     16.428    5213
                       72     21.498    5215
                       80     26.955    5217
                       88     32.809    5219
                       90     39.075    5221
                       91     45.767    5223
                      968     49.276    5224
                     2615     52.896    5225
                     4809     56.628    5226

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

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

    .00         .00    5204.21       .000        .00
    .25         .00    5204.21       .000        .00
    .50         .00    5204.21       .000        .00
    .75         .00    5204.21       .000        .00
   1.00         .00    5204.21       .000        .00
   1.25       22.58    5204.36       .053        .56
   1.50     1325.33    5210.27     10.143      48.34
   1.75      870.74    5219.54     34.488      88.54
```

2.00	429.13	5222.82	45.180	90.91
2.25	164.76	5223.13	46.229	206.54
2.50	77.32	5223.00	45.755	91.00
2.75	42.43	5222.79	45.074	90.90
3.00	24.34	5222.43	43.866	90.72
3.25	14.48	5221.99	42.386	90.49
3.50	9.71	5221.50	40.764	90.25
3.75	7.05	5221.00	39.073	90.00
4.00	5.58	5220.45	37.348	89.45
4.25	4.80	5219.89	35.612	88.89
4.50	4.48	5219.34	33.876	88.34
4.75	4.41	5218.78	32.151	87.10
5.00	4.56	5218.20	30.468	84.80
5.25	4.85	5217.64	28.836	82.57
5.50	5.19	5217.10	27.256	80.41
5.75	5.69	5216.55	25.730	78.20
6.00	6.18	5216.01	24.259	76.05
6.25	8.89	5215.50	22.859	74.00
6.50	10.40	5215.02	21.553	72.08
6.75	10.65	5214.53	20.303	70.11
7.00	10.62	5214.05	19.094	68.21
7.25	10.51	5213.59	17.922	66.36
7.50	10.33	5213.14	16.785	64.56
7.75	10.21	5212.68	15.686	62.10
8.00	10.01	5212.24	14.640	59.43
8.25	9.89	5211.81	13.644	56.89
8.50	9.74	5211.41	12.696	54.47
8.75	9.60	5211.03	11.795	52.16
9.00	9.44	5210.63	10.935	50.16
9.25	9.30	5210.25	10.112	48.27
9.50	9.20	5209.89	9.325	46.45
9.75	9.06	5209.54	8.571	44.71
10.00	8.94	5209.21	7.851	43.05
10.25	8.82	5208.88	7.163	41.02
10.50	8.69	5208.56	6.525	38.30
10.75	8.59	5208.27	5.939	35.80
11.00	8.50	5208.00	5.399	33.51
11.25	8.38	5207.75	4.903	31.39
11.50	8.26	5207.52	4.447	29.45
11.75	8.14	5207.31	4.027	27.66
12.00	8.05	5207.12	3.640	26.01
12.25	7.97	5206.94	3.285	24.23
12.50	7.87	5206.76	2.970	22.18
12.75	7.78	5206.61	2.693	20.37
13.00	7.71	5206.48	2.449	18.77
13.25	7.61	5206.36	2.234	17.37
13.50	7.54	5206.26	2.045	16.13
13.75	7.45	5206.17	1.877	15.04

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
14.00	7.33	5206.09	1.730	14.08
14.25	7.30	5206.02	1.599	13.22
14.50	7.20	5205.94	1.485	12.37
14.75	7.13	5205.86	1.385	11.59
15.00	7.05	5205.79	1.299	10.92
15.25	6.96	5205.73	1.225	10.34
15.50	6.90	5205.68	1.160	9.83
15.75	6.89	5205.64	1.104	9.39
16.00	6.81	5205.60	1.055	9.01
16.25	6.72	5205.57	1.012	8.67
16.50	6.64	5205.54	.974	8.37
16.75	6.59	5205.51	.941	8.11
17.00	6.51	5205.49	.911	7.88
17.25	6.43	5205.47	.884	7.67
17.50	6.43	5205.45	.861	7.49
17.75	6.29	5205.43	.840	7.33
18.00	6.32	5205.42	.820	7.17

18.25	6.21	5205.40	.803	7.04
18.50	6.18	5205.39	.787	6.91
18.75	6.11	5205.38	.772	6.80
19.00	6.09	5205.37	.759	6.69
19.25	6.02	5205.36	.747	6.60
19.50	5.99	5205.35	.735	6.51
19.75	5.96	5205.34	.724	6.42
20.00	5.87	5205.33	.715	6.35
20.25	5.84	5205.33	.705	6.27
20.50	5.75	5205.32	.696	6.20
20.75	5.72	5205.31	.687	6.13
21.00	5.68	5205.31	.679	6.07
21.25	5.62	5205.30	.671	6.01
21.50	5.61	5205.29	.664	5.95
21.75	5.53	5205.29	.657	5.89
22.00	5.52	5205.28	.650	5.84
22.25	5.45	5205.28	.643	5.79
22.50	5.45	5205.27	.636	5.73
22.75	5.35	5205.27	.630	5.68
23.00	5.38	5205.26	.624	5.64
23.25	5.32	5205.26	.618	5.59
23.50	5.23	5205.25	.612	5.54
23.75	5.24	5205.25	.606	5.50
24.00	5.20	5205.25	.601	5.46
24.25	2.52	5205.23	.576	5.26
24.50	.75	5205.17	.503	4.69
24.75	.27	5205.11	.422	4.06
25.00	.11	5205.05	.348	3.48
25.25	.05	5204.99	.283	2.96
25.50	.02	5204.84	.229	2.39
25.75	.01	5204.72	.185	1.93
26.00	.00	5204.62	.149	1.56
26.25	.00	5204.54	.120	1.25
26.50	.00	5204.48	.097	1.01
26.75	.00	5204.42	.078	.81
27.00	.00	5204.38	.063	.66
27.25	.00	5204.35	.051	.53
27.50	.00	5204.32	.041	.43
27.75	.00	5204.30	.033	.34

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
28.00	.00	5204.28	.026	.28
28.25	.00	5204.27	.021	.22
28.50	.00	5204.26	.017	.18
28.75	.00	5204.25	.014	.14
29.00	.00	5204.24	.011	.12
29.25	.00	5204.23	.009	.09
29.50	.00	5204.23	.007	.08
29.75	.00	5204.23	.006	.06

```
PEAK DISCHARGE =      308.175 CFS - PEAK OCCURS AT HOUR    2.10
MAXIMUM WATER SURFACE ELEVATION =     5223.248
MAXIMUM STORAGE =       46.6359 AC-FT      INCREMENTAL TIME=     .050000HRS

*
*
COMPUTE NM HYD        ID=1    HYD=109      DA= .0720   SQ MI
                      PER A=0    B=2    C=16    D=82
                      TP=.140    HRS        RAIN=-1

K =    .076439HR    TP =    .140000HR    K/TP RATIO =    .545991     SHAPE CONSTANT, N =
7.089916
UNIT PEAK =   221.61    CFS   UNIT VOLUME =    .9983       B =   525.50      P60 =
1.9500
AREA =       .059040 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000
```

```
        K =    .114807HR    TP =    .140000HR    K/TP RATIO =    .820048     SHAPE CONSTANT, N =
4.356214
        UNIT PEAK =   35.016    CFS   UNIT VOLUME =    1.001       B =   378.26      P60 =
1.9500
        AREA =       .012960 SQ MI    IA =    .36667 INCHES    INF =    .87667 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

    *
    PRINT HYD            ID=1    CODE=1

                                        PARTIAL HYDROGRAPH   109.00


        RUNOFF VOLUME =     2.20466 INCHES     =       8.4659 ACRE-FEET
        PEAK DISCHARGE RATE =     188.50 CFS  AT   1.500 HOURS   BASIN AREA =   .0720 SQ. MI.


    *
    DIVIDE HYD           ID=1     PER=-105      ID  I=1   HYD  I=109
                                             ID II=16   HYD II=000
*** WARNING *** - PERCENTAGE OF     -105.0 FOUND - A HYDROGRAPH BULKING FACTOR IS ASSUMED
    PRINT HYD            ID=1  CODE=1

                                        PARTIAL HYDROGRAPH   109.00


        RUNOFF VOLUME =     2.31489 INCHES     =       8.8891 ACRE-FEET
        PEAK DISCHARGE RATE =     197.93 CFS  AT   1.500 HOURS   BASIN AREA =   .0720 SQ. MI.


    *
    *ROUTE SOUTH ALONG 98TH IN PIPE - FROM AVALON TO VOLCANO
    COMPUTE RATING CURVE CID=1  VSNO=1  CODE=-1  SLP=0.02
                         DIA= 66  N=.013

                                        RATING CURVE PIPE SECTION  1.0
                                            WATER       FLOW        FLOW        MAX
                                           SURFACE      AREA        RATE        WIDTH
                                            ELEV        SQ FT       CFS         FT
                                              .00         .00         .00         .00
                                              .29         .47        2.49        2.44
                                              .57        1.31       10.81        3.36
                                              .86        2.37       25.14        3.99
                                             1.15        3.59       45.21        4.47
                                             1.43        4.92       70.60        4.83
                                             1.72        6.35      100.73        5.10
                                             2.01        7.84      134.95        5.30
                                             2.29        9.38      172.54        5.42
                                             2.58       10.94      212.70        5.49
                                             2.87       12.52      254.56        5.50
                                             3.15       14.09      297.19        5.50
                                             3.44       15.63      339.56        5.50
                                             3.73       17.13      380.58        5.50
                                             4.01       18.57      419.00        5.50
                                             4.30       19.92      453.38        5.50
                                             4.59       21.17      481.98        5.50
                                             4.87       22.26      502.45        5.50
                                             5.16       23.15      510.86        5.50
                                             5.50       23.76      510.86        5.50
    COMPUTE TRAVEL TIME  ID=6  REACH NO=1  NOVS=1  LEN=1150  SLP=0.02

                                 TRAVEL TIME TABLE
                                                REACH=  1.0

                                 WATER       AVERAGE     FLOW        TRAVEL
                                 DEPTH       AREA        RATE        TIME
                                 FEET        SQ.FT.      CFS         HRS
```

```
                                  .287        .472        2.49        .0606
                                  .573       1.314       10.81        .0388
                                  .860       2.373       25.14        .0301
                                 1.146       3.589       45.21        .0254
                                 1.433       4.923       70.60        .0223
                                 1.720       6.348      100.73        .0201
                                 2.006       7.839      134.95        .0186
                                 2.293       9.377      172.54        .0174
                                 2.579      10.942      212.70        .0164
                                 2.866      12.518      254.56        .0157
                                 3.153      14.086      297.19        .0151
                                 3.439      15.630      339.56        .0147
                                 3.726      17.132      380.58        .0144
                                 4.013      18.571      419.00        .0142
                                 4.299      19.925      453.38        .0140
                                 4.586      21.166      481.98        .0140
                                 4.872      22.258      502.45        .0142
                                 5.159      23.147      510.86        .0145
                                 5.500      23.758      510.86        .0149
    ROUTE                ID=6  HYD=109.19  INFLOW ID=1  DT=0.0
    PRINT HYD            ID=6  CODE=1

                                PARTIAL HYDROGRAPH   109.19

        RUNOFF VOLUME =     2.31490 INCHES     =       8.8892 ACRE-FEET
        PEAK DISCHARGE RATE =     194.20 CFS  AT   1.500 HOURS   BASIN AREA =   .0720 SQ. MI.


    *
    COMPUTE NM HYD       ID=1  HYD=109.1  DA= 0.0495  SQ MI
                         PER A= 0  B=0  C=15  D=85
                         TP= 0.1333  RAIN=-1

        K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =
7.106420
        UNIT PEAK =   166.11    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 =
1.9500
        AREA =      .042075 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

        K =   .106769HR    TP =   .133300HR    K/TP RATIO =   .800969     SHAPE CONSTANT, N =
4.472154
        UNIT PEAK =   21.473    CFS   UNIT VOLUME =    1.001       B =   385.50      P60 =
1.9500
        AREA =      .007425 SQ MI    IA =    .35000 INCHES    INF =    .83000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

    PRINT HYD            ID=1  CODE=1

                                PARTIAL HYDROGRAPH   109.10

        RUNOFF VOLUME =     2.25532 INCHES     =       5.9540 ACRE-FEET
        PEAK DISCHARGE RATE =     134.34 CFS  AT   1.500 HOURS   BASIN AREA =   .0495 SQ. MI.


    *
    DIVIDE HYD           ID=1  PER=-105  IDI=1  HYD=109.1
                                         IDII=16  HYD=000
*** WARNING *** - PERCENTAGE OF     -105.0 FOUND - A HYDROGRAPH BULKING FACTOR IS ASSUMED
    PRINT HYD            ID=1  CODE=1

                                PARTIAL HYDROGRAPH   109.10
```

```
    RUNOFF VOLUME =      2.36808 INCHES      =        6.2517 ACRE-FEET
    PEAK DISCHARGE RATE =      141.06 CFS  AT   1.500 HOURS   BASIN AREA =   .0495 SQ. MI.


*
*ADD TO FLOW FROM 109 (HYD109.19)
ADD HYD                ID=6  HYD=109.39  ID=6  ID=1
PRINT HYD              ID=6  CODE=1

                                   PARTIAL HYDROGRAPH   109.39


    RUNOFF VOLUME =      2.33656 INCHES      =       15.1408 ACRE-FEET
    PEAK DISCHARGE RATE =      335.26 CFS  AT   1.500 HOURS   BASIN AREA =   .1215 SQ. MI.


*
* ADD HYD 109.39 TO BASIN 108.4
ADD HYD                ID=6  HYD=109.49  ID=6  ID=5
PRINT HYD              ID=6  CODE=1

                                   PARTIAL HYDROGRAPH   109.49


    RUNOFF VOLUME =      2.22788 INCHES      =       31.3803 ACRE-FEET
    PEAK DISCHARGE RATE =      717.11 CFS  AT   1.500 HOURS   BASIN AREA =   .2641 SQ. MI.


*
*ADD ABOVE TO NORTH POND OUTFLOW
ADD HYD                ID=6  HYD=109.59  ID=6  ID=10
PRINT HYD              ID=6  CODE=1

                                   PARTIAL HYDROGRAPH   109.59


    RUNOFF VOLUME =      1.82766 INCHES      =      103.4401 ACRE-FEET
    PEAK DISCHARGE RATE =      765.45 CFS  AT   1.500 HOURS   BASIN AREA =  1.0612 SQ. MI.


*
*ROUTE THROUGH SOUTH POND
ROUTE RESERVOIR        ID=10 HYD=501  IN ID=6  CODE=5
                       OUTFLOW  STORAGE   ELEV
                          0        0      5201
                          5      0.934    5202
                          6      3.359    5203
                         27      6.080    5204
                         43     11.813    5206
                         55     17.946    5208
                         64     24.492    5210
                         72     31.465    5212
                       1137     35.115    5213
                       3122     38.877    5214
                       7217     44.733    5215.5

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

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

    .00        .00    5201.00       .000        .00
    .25        .00    5201.00       .000        .00
    .50        .00    5201.00       .000        .00
    .75        .00    5201.00       .000        .00
```

1.00	.00	5201.00	.000	.00
1.25	33.40	5201.09	.083	.44
1.50	765.45	5204.48	7.466	30.87
1.75	376.10	5208.00	17.961	55.02
2.00	260.12	5209.60	23.181	62.20
2.25	253.65	5211.30	29.018	69.19
2.50	111.23	5211.87	31.007	71.47
2.75	101.27	5212.03	31.560	99.77
3.00	96.55	5212.02	31.551	97.16
3.25	94.21	5212.02	31.542	94.50
3.50	92.98	5212.02	31.538	93.16
3.75	92.28	5212.02	31.535	92.37
4.00	91.53	5212.02	31.532	91.63
4.25	90.92	5212.02	31.530	91.00
4.50	90.41	5212.02	31.528	90.48
4.75	89.25	5212.02	31.525	89.60
5.00	87.11	5212.01	31.518	87.46
5.25	85.11	5212.01	31.511	85.42
5.50	83.14	5212.01	31.504	83.44
5.75	81.22	5212.01	31.498	81.53
6.00	79.33	5212.01	31.491	79.62
6.25	79.15	5212.01	31.490	79.22
6.50	77.58	5212.01	31.485	77.87
6.75	75.61	5212.00	31.479	75.96
7.00	73.65	5212.00	31.472	74.00
7.25	71.74	5212.00	31.465	72.07
7.50	69.83	5211.99	31.440	71.97
7.75	67.33	5211.97	31.373	71.89
8.00	64.56	5211.94	31.251	71.75
8.25	61.95	5211.89	31.077	71.56
8.50	59.47	5211.83	30.855	71.30
8.75	57.08	5211.75	30.589	70.99
9.00	54.98	5211.66	30.283	70.64
9.25	53.02	5211.56	29.943	70.25
9.50	51.16	5211.46	29.572	69.83
9.75	49.35	5211.34	29.172	69.37
10.00	47.61	5211.22	28.746	68.88
10.25	45.53	5211.09	28.293	68.36
10.50	42.74	5210.95	27.798	67.79
10.75	40.19	5210.79	27.260	67.18
11.00	37.86	5210.63	26.685	66.52
11.25	35.68	5210.45	26.077	65.82
11.50	33.68	5210.27	25.441	65.09
11.75	31.81	5210.08	24.780	64.33
12.00	30.13	5209.88	24.100	63.46
12.25	28.32	5209.67	23.404	62.50
12.50	26.19	5209.45	22.685	61.52
12.75	24.34	5209.22	21.947	60.50
13.00	22.73	5208.99	21.193	59.46
13.25	21.26	5208.76	20.430	58.41
13.50	19.99	5208.52	19.660	57.36
13.75	18.86	5208.29	18.887	56.29

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
14.00	17.84	5208.05	18.113	55.23
14.25	16.97	5207.80	17.346	53.83
14.50	16.05	5207.56	16.590	52.35
14.75	15.23	5207.32	15.847	50.89
15.00	14.54	5207.08	15.117	49.47
15.25	13.89	5206.84	14.404	48.07
15.50	13.37	5206.62	13.706	46.70
15.75	12.93	5206.40	13.027	45.37
16.00	12.51	5206.18	12.365	44.08
16.25	12.11	5205.97	11.721	42.74
16.50	11.78	5205.75	11.103	41.02
16.75	11.48	5205.55	10.513	39.37
17.00	11.23	5205.35	9.950	37.80

17.25	10.96	5205.16	9.414	36.31
17.50	10.78	5204.99	8.904	34.88
17.75	10.53	5204.82	8.418	33.52
18.00	10.42	5204.65	7.955	32.23
18.25	10.21	5204.50	7.515	31.00
18.50	10.06	5204.35	7.097	29.84
18.75	9.93	5204.22	6.698	28.73
19.00	9.81	5204.08	6.320	27.67
19.25	9.69	5203.96	5.962	26.09
19.50	9.59	5203.84	5.647	23.66
19.75	9.50	5203.74	5.377	21.58
20.00	9.35	5203.66	5.145	19.78
20.25	9.27	5203.58	4.945	18.24
20.50	9.16	5203.52	4.772	16.91
20.75	9.07	5203.46	4.623	15.76
21.00	8.97	5203.42	4.495	14.76
21.25	8.88	5203.38	4.383	13.91
21.50	8.82	5203.34	4.287	13.16
21.75	8.73	5203.31	4.203	12.51
22.00	8.65	5203.28	4.130	11.95
22.25	8.59	5203.26	4.067	11.46
22.50	8.54	5203.24	4.011	11.03
22.75	8.42	5203.22	3.962	10.66
23.00	8.39	5203.21	3.920	10.33
23.25	8.32	5203.19	3.882	10.04
23.50	8.23	5203.18	3.848	9.77
23.75	8.16	5203.17	3.818	9.54
24.00	8.11	5203.16	3.792	9.34
24.25	5.86	5203.14	3.748	9.00
24.50	4.85	5203.12	3.677	8.46
24.75	4.11	5203.09	3.601	7.87
25.00	3.50	5203.06	3.523	7.27
25.25	2.97	5203.03	3.446	6.67
25.50	2.39	5203.00	3.369	6.08
25.75	1.93	5202.97	3.290	5.97
26.00	1.56	5202.94	3.203	5.94
26.25	1.25	5202.90	3.109	5.90
26.50	1.01	5202.86	3.011	5.86
26.75	.81	5202.81	2.910	5.81
27.00	.66	5202.77	2.805	5.77
27.25	.53	5202.73	2.698	5.73
27.50	.43	5202.68	2.590	5.68
27.75	.34	5202.64	2.481	5.64

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
28.00	.28	5202.59	2.372	5.59
28.25	.22	5202.55	2.262	5.55
28.50	.18	5202.50	2.152	5.50
28.75	.14	5202.46	2.042	5.46
29.00	.12	5202.41	1.932	5.41
29.25	.09	5202.37	1.823	5.37
29.50	.08	5202.32	1.714	5.32
29.75	.06	5202.28	1.606	5.28

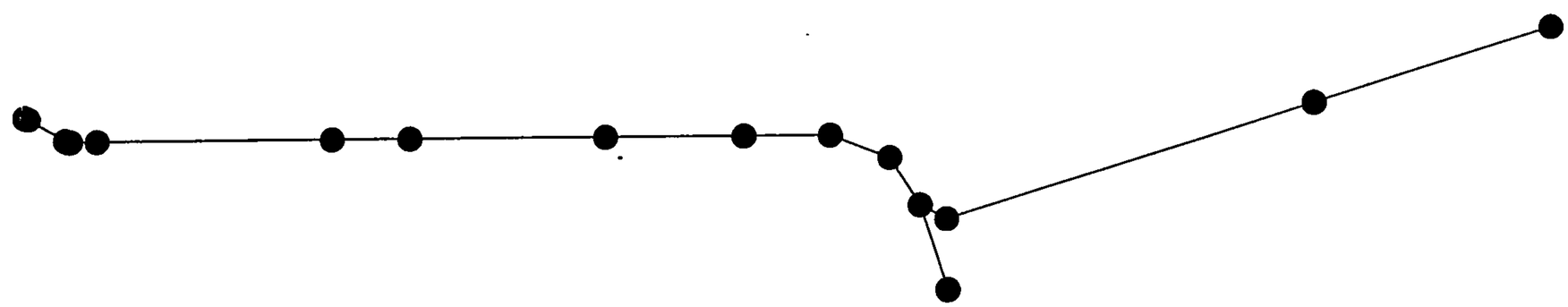
```
PEAK DISCHARGE =        100.431 CFS - PEAK OCCURS AT HOUR    2.80
MAXIMUM WATER SURFACE ELEVATION =      5212.027
MAXIMUM STORAGE =         31.5624 AC-FT      INCREMENTAL TIME=     .050000HRS

*
PUNCH HYD              ID=10
FINISH

    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 14:28:56
```

NOTE: THE HYDRAULIC GRADE LINE BASED ON THESE CALCULATIONS IS SHOWN IN CITY OF ALBUQUERQUE PROJECT NUMBER 4076.93 - AMOLE DEL NORTE STORM DIVERSION FACILITIES, TIERRA BAYITA DRAINAGE FACILITIES - PHASE IIID ON SHEETS 3, 4 AND 5.

Storm Sewer Design & Analysis



Proj. file: ABEND2.STM	IDF file: SAMPLE.IDF	No. Lines: 19	03-16-1998

Line 1 **Q = 922.00** **Size = 90 x 90 (Cir)** **Nv = 0.013** **Len = 34.8** **JLC = 0.01**

Tie to Chan / Outfall

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	68.45	90	76.66	83.43	44.17	20.87	0.00	9.05
Upstrm	68.87	90	77.16	83.93	44.18	20.87	0.00	6.13

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.200
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.441
Time of conc. (min)	= 5.19	Critical depth (in)	= 87
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 82.50
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 0.80
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 841.36
Q Catchment (cfs)	= 0.00	Inlet Type	= MH
Q Carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.00
Q Captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.00
Q Bypassed to offsite	= 0.00	Width of Flow (ft)	= 0.00

Line 2 **Q = 922.00** **Size = 90 x 90 (Cir)** **Nv = 0.013** **Len = 8.0** **JLC = 0.01**

Tie to 41+40.75 / Downstream line = 1

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	68.87	90	77.23	84.00	44.17	20.87	0.00	6.13
Upstrm	68.96	90	77.35	84.11	44.18	20.87	0.00	6.04

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.200
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.441
Time of conc. (min)	= 5.19	Critical depth (in)	= 87
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 82.50
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 0.89
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 841.36
Q Catchment (cfs)	= 0.00	Inlet Type	= MH

Line 3 **Q = 922.00** **Size = 90 x 90 (Cir)** **Nv = 0.013** **Len = 8.0** **JLC = 0.12**

41+48.75 / Downstream line = 2

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	68.96	90	77.42	84.18	44.17	20.87	0.00	6.04
Upstrm	69.06	90	77.53	84.30	44.18	20.87	0.00	5.94

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.200
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.441
Time of conc. (min)	= 5.18	Critical depth (in)	= 87
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 82.50
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 0.98
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 841.36
Q Catchment (cfs)	= 0.00	Inlet Type	= MH
Q Carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.00
Q Captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.00
Q Bypassed to 2 (cfs)	= 0.00	Width of Flow (ft)	= 0.00

Line 4 **Q = 922.00** **Size = 90 x 90 (Cir)** **Nv = 0.013** **Len = 165.7** **JLC = 0.01**

tie to 41+56.75 / Downstream line = 3

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	69.06	90	78.31	85.08	44.17	20.87	0.00	5.94
Upstrm	71.05	90	80.70	87.47	44.18	20.87	0.00	3.95

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.200
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.441
Time of conc. (min)	= 5.04	Critical depth (in)	= 87
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 82.50
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 2.16
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 841.35
Q Catchment (cfs)	= 0.00	Inlet Type	= MH

Line 5 **Q = 922.00** **Size = 90 x 90 (Cir)** **Nv = 0.013** **Len = 8.0** **JLC = 0.01**

Tie to 43+22.47 / Downstream line = 4

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	71.05	90	80.77	87.54	44.17	20.87	0.00	3.95
Upstrm	71.15	90	80.89	87.65	44.18	20.87	0.00	6.35

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.200
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.441
Time of conc. (min)	= 5.03	Critical depth (in)	= 87
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 85.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 2.24
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 841.36
Q Catchment (cfs)	= 0.00	Inlet Type	= MH
Q Carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.00
Q Captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.00
Q Bypassed to 4 (cfs)	= 0.00	Width of Flow (ft)	= 0.00

Line 6 **Q = 922.00** **Size = 90 x 90 (Cir)** **Nv = 0.013** **Len = 8.0** **JLC = 0.01**

43+30.47 / Downstream line = 5

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	71.15	90	80.96	87.72	44.17	20.87	0.00	6.35
Upstrm	71.24	90	81.07	87.84	44.18	20.87	0.00	6.26

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.199
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.441
Time of conc. (min)	= 5.03	Critical depth (in)	= 87
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 85.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 2.33
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 840.89
Q Catchment (cfs)	= 0.00	Inlet Type	= MH

Line 7 **Q = 922.00** **Size = 90 x 90 (Cir)** **Nv = 0.013** **Len = 8.0** **JLC = 0.12**

43+38.47 / Downstream line = 6

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	71.24	90	81.14	87.91	44.17	20.87	0.00	6.26
Upstrm	71.34	90	81.26	88.02	44.18	20.87	0.00	6.16

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.200
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.441
Time of conc. (min)	= 5.02	Critical depth (in)	= 87
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 85.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 2.42
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 841.36
Q Catchment (cfs)	= 0.00	Inlet Type	= MH
Q Carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.00
Q Captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.00
Q Bypassed to 6 (cfs)	= 0.00	Width of Flow (ft)	= 0.00

Line 8 **Q = 922.00** **Size = 90 x 90 (Cir)** **Nv = 0.013** **Len = 103.0** **JLC = 0.01**

Tie to 43+46.47 / Downstream line = 7

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	71.34	90	82.04	88.80	44.17	20.87	0.00	6.16
Upstrm	72.60	90	83.52	90.29	44.18	20.87	0.00	6.90

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.225
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.441
Time of conc. (min)	= 4.94	Critical depth (in)	= 87
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 87.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 3.42
Cumulative C x A	= 0.00	Additional Q (cfs)	= 50.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 850.16
Q Catchment (cfs)	= 0.00	Inlet Type	= MH

Line 9 **Q = 872.00** **Size = 90 x 90 (Cir)** **Nv = 0.013** **Len = 925.0** **JLC = 0.17**

Tie to Sta. 44+50 / Downstream line = 8

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	72.60	90	83.59	89.64	44.17	19.74	0.00	6.90
Upstrm	83.77	90	95.52	101.57	44.18	19.74	0.00	6.23

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.208
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.289
Time of conc. (min)	= 4.16	Critical depth (in)	= 86
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 97.50
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 4.25
Cumulative C x A	= 0.00	Additional Q (cfs)	= 95.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 844.01
Q Catchment (cfs)	= 0.00	Inlet Type	= MH
Q Carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.00
Q Captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.00
Q Bypassed to 8 (cfs)	= 0.00	Width of Flow (ft)	= 0.00

Line 10 **Q = 777.00** **Size = 90 x 90 (Cir)** **Nv = 0.013** **Len = 300.7** **JLC = 0.38**

Tie to Sta. 53+75 / Downstream line = 9

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	83.77	90	96.55	101.35	44.17	17.59	0.00	6.23
Upstrm	87.40	90	99.63	104.43	44.18	17.59	0.00	6.60

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.206
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.024
Time of conc. (min)	= 3.91	Critical depth (in)	= 84
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 101.50
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 4.73
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 843.46
Q Catchment (cfs)	= 0.00	Inlet Type	= MH

Line 11 **Q = 777.00** **Size = 84 x 84 (Cir)** **Nv = 0.013** **Len = 764.3** **JLC = 0.05**

Tie to Sta. 56+75.74 / Downstream line = 10

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	87.40	84	101.45	107.79	38.48	20.19	0.00	7.10
Upstrm	100.39	84	112.76	119.09	38.48	20.19	0.00	7.61

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.700
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.479
Time of conc. (min)	= 3.28	Critical depth (in)	= 81
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 115.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 5.37
Cumulative C x A	= 0.00	Additional Q (cfs)	= 47.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 833.00
Q Catchment (cfs)	= 0.00	Inlet Type	= MH
Q Carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.00
Q Captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.00
Q Bypassed to 10 (cfs)	= 0.00	Width of Flow (ft)	= 0.00

Line 12 **Q = 730.00** **Size = 84 x 84 (Cir)** **Nv = 0.013** **Len = 540.0** **JLC = 0.11**

Tie to Sta. 64+40 / Downstream line = 11

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	100.39	84	113.08	118.67	38.48	18.97	0.00	7.61
Upstrm	109.57	84	120.13	125.72	38.48	18.97	0.00	9.43

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.700
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.305
Time of conc. (min)	= 2.83	Critical depth (in)	= 80
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 126.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 3.56
Cumulative C x A	= 0.00	Additional Q (cfs)	= 99.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 833.11
Q Catchment (cfs)	= 0.00	Inlet Type	= MH

Line 13 **Q = 631.00** **Size = 84 x 84 (Cir)** **Nv = 0.013** **Len = 334.0** **JLC = 0.10**

Tie to Sta. 69+80 / Downstream line = 12

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	109.57	84	120.74	124.92	38.48	16.40	0.00	9.43
Upstrm	115.25	84	124.00	128.18	38.48	16.40	0.00	12.65

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.700
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 0.975
Time of conc. (min)	= 2.55	Critical depth (in)	= 78
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 134.90
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 1.76
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 833.11
Q Catchment (cfs)	= 0.00	Inlet Type	= MH
Q Carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.00
Q Captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.00
Q Bypassed to 12 (cfs)	= 0.00	Width of Flow (ft)	= 0.00

Line 14 **Q = 631.00** **Size = 84 x 84 (Cir)** **Nv = 0.013** **Len = 250.0** **JLC = 0.10**

Bridge&90th / Downstream line = 13

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	115.25	84	124.42	128.60	38.48	16.40	0.00	12.65
Upstrm	119.50	84	126.86	131.03	38.48	16.40	0.00	15.50

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.700
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 0.975
Time of conc. (min)	= 2.34	Critical depth (in)	= 78
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 142.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 0.36
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 833.11
Q Catchment (cfs)	= 0.00	Inlet Type	= MH

Line 15 **Q = 631.00** **Size = 84 x 84 (Cir)** **Nv = 0.013** **Len = 220.0** **JLC = 0.10**

Central&90th / Downstream line = 14

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	119.50	84	127.28	131.45	38.48	16.40	0.00	15.50
Upstrm	123.24	78	129.74	134.19	37.26	16.93	3.61	11.76

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.700
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.245
Time of conc. (min)	= 2.16	Critical depth (in)	= 78
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 142.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 0.00
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 833.11
Q Catchment (cfs)	= 0.00	Inlet Type	= MH
Q Carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.00
Q Captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.00
Q Bypassed to 14 (cfs)	= 0.00	Width of Flow (ft)	= 0.00

Line 16 **Q = 364.00** **Size = 66 x 66 (Cir)** **Nv = 0.013** **Len = 344.0** **JLC = 0.50**

SD in 90th, 77+84 / Downstream line = 15

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	125.26	49	129.34	135.10	18.89	19.27	4.82	11.24
Upstrm	130.42	49	134.50	140.26	18.89	19.27	4.82	6.08

Drainage area (ac)	= 0.00	Slope of invert (%)	= 1.500
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.500
Time of conc. (min)	= 0.00	Critical depth (in)	= 62
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 142.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 0.00
Cumulative C x A	= 0.00	Additional Q (cfs)	= 364.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 411.33
Q Catchment (cfs)	= 0.00	Inlet Type	= MH

Line 17 **Q = 267.00** **Size = 54 x 54 (Cir)** **Nv = 0.013** **Len = 117.0** **JLC = 0.50**

SD up Central, 10+00 / Downstream line = 15

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	125.26	54	130.18	134.56	15.90	16.79	0.00	12.24
Upstrm	128.07	52	132.44	136.89	15.77	16.93	1.51	12.43

Drainage area (ac)	= 0.00	Slope of invert (%)	= 2.400
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 1.987
Time of conc. (min)	= 2.06	Critical depth (in)	= 52
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 145.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 0.00
Cumulative C x A	= 0.00	Additional Q (cfs)	= 0.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 304.67
Q Catchment (cfs)	= 0.00	Inlet Type	= MH
Q Carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.00
Q Captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.00
Q Bypassed to 15 (cfs)	= 0.00	Width of Flow (ft)	= 0.00

Line 18 **Q = 267.00** **Size = 54 x 54 (Cir)** **Nv = 0.013** **Len = 1503.0** **JLC = 0.50**

Tie to 11+17 / Downstream line = 17

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	128.07	54	134.66	139.04	15.90	16.79	0.00	12.43
Upstrm	164.33	52	168.70	173.15	15.77	16.93	1.51	6.17

Drainage area (ac)	= 0.00	Slope of invert (%)	= 2.413
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 2.269
Time of conc. (min)	= 0.81	Critical depth (in)	= 52
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 175.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 0.00
Cumulative C x A	= 0.00	Additional Q (cfs)	= 170.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 305.47
Q Catchment (cfs)	= 0.00	Inlet Type	= MH

Line 19 **Q = 97.00** **Size = 36 x 36 (Cir)** **Nv = 0.013** **Len = 968.0** **JLC = 0.10**

Central&98th, 26+28 / Downstream line = 18

	Invert	Depth	HGL	EGL	Area	Vel	T-Wid	Cover
Dnstrm	164.33	36	170.92	173.85	7.07	13.73	0.00	7.67
Upstrm	191.05	35	193.96	196.93	7.01	13.84	1.00	7.95

Drainage area (ac)	= 0.00	Slope of invert (%)	= 2.760
Runoff coefficient (C)	= 0.00	Slope energy grade line (%)	= 2.385
Time of conc. (min)	= 0.00	Critical depth (in)	= 35
Inlet Time (min)	= 0.00	Natural ground elev. (ft)	= 202.00
Intensity @ 100 yr (in/hr)	= 0.00	Upstream surcharge (ft)	= 0.00
Cumulative C x A	= 0.00	Additional Q (cfs)	= 97.00
Q = CA x I (cfs)	= 0.00	Full-flow capacity (cfs)	= 110.80
Q Catchment (cfs)	= 0.00	Inlet Type	= MH
Q Carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.00
Q Captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.00
Q Bypassed to 18 (cfs)	= 0.00	Width of Flow (ft)	= 0.00

Storm Sewer Tabulation

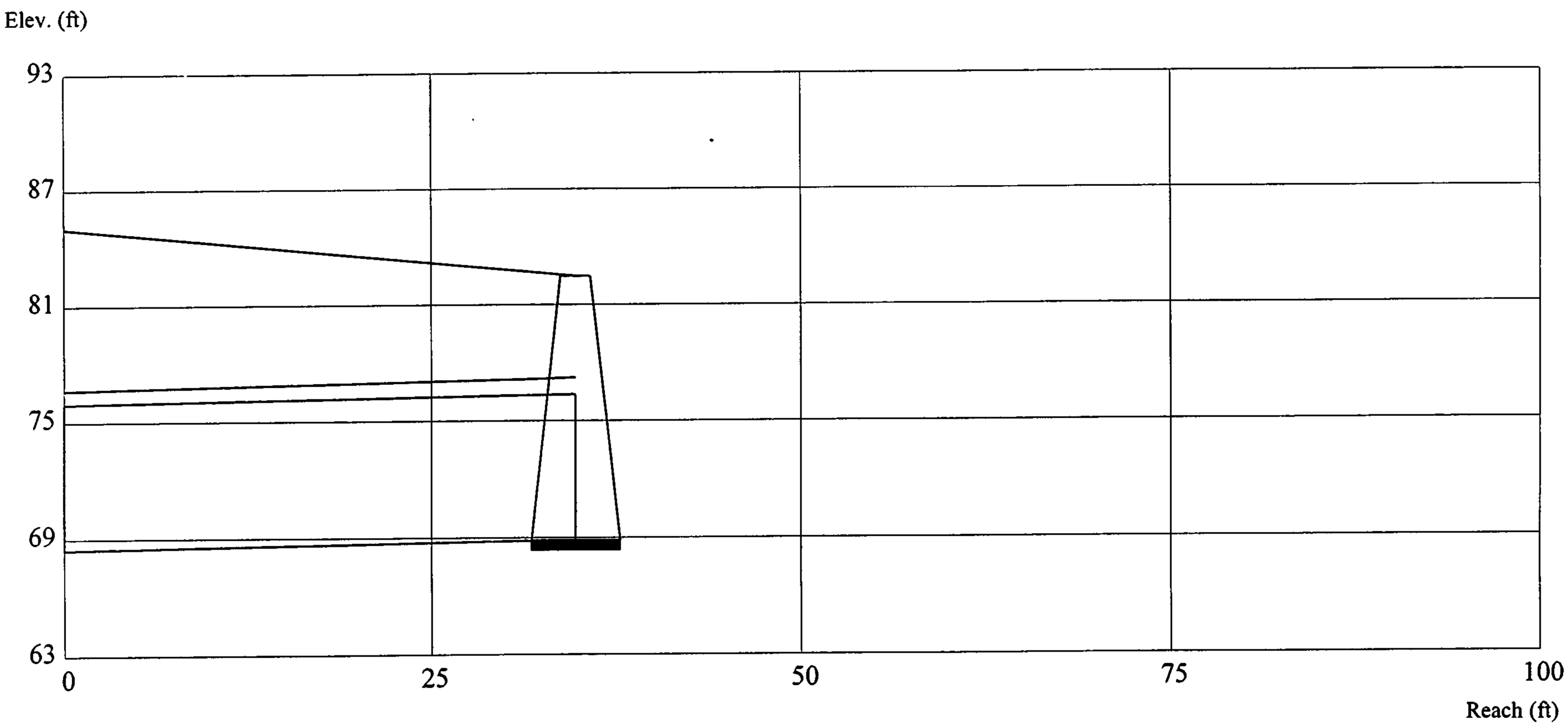
Line #	Line ID	Incr. Area (ac)	Rnoff coeff (C)	Incr. CA	Sum CA	Tc (min)	Rnfal Inten (in/hr)	Total runoff (cfs)	Add. flow (cfs)	Total flow (cfs)	Capac. @ full (cfs)	Line size (in x in)	Line length (ft)	Line slope (%)	Veloc. up (ft/s)	Veloc. down (ft/s)	NG up (ft)	NG down (ft)	Invert up (ft)	Invert down (ft)	Dns line #
1	Tie to Chan	0.00	0.00	0.00	0.00	5.2	0.00	0.0	0.0	922.0	841.4	90 c	35	1.20	20.9	20.9	82.50	85.00	68.87	68.45	0
2	Tie to 41+40	0.00	0.00	0.00	0.00	5.2	0.00	0.0	0.0	922.0	841.4	90 c	8	1.20	20.9	20.9	82.50	82.50	68.96	68.87	1
3	41+48.75	0.00	0.00	0.00	0.00	5.2	0.00	0.0	0.0	922.0	841.4	90 c	8	1.20	20.9	20.9	82.50	82.50	69.06	68.96	2
4	tie to 41+56	0.00	0.00	0.00	0.00	5.0	0.00	0.0	0.0	922.0	841.4	90 c	166	1.20	20.9	20.9	82.50	82.50	71.05	69.06	3
5	Tie to 43+22	0.00	0.00	0.00	0.00	5.0	0.00	0.0	0.0	922.0	841.4	90 c	8	1.20	20.9	20.9	85.00	82.50	71.15	71.05	4
6	43+30.47	0.00	0.00	0.00	0.00	5.0	0.00	0.0	0.0	922.0	840.9	90 c	8	1.20	20.9	20.9	85.00	85.00	71.24	71.15	5
7	43+38.47	0.00	0.00	0.00	0.00	5.0	0.00	0.0	0.0	922.0	841.4	90 c	8	1.20	20.9	20.9	85.00	85.00	71.34	71.24	6
8	Tie to 43+46	0.00	0.00	0.00	0.00	4.9	0.00	0.0	50.0	922.0	850.2	90 c	103	1.23	20.9	20.9	87.00	85.00	72.60	71.34	7
9	Tie to Sta.	0.00	0.00	0.00	0.00	4.2	0.00	0.0	95.0	872.0	844.0	90 c	925	1.21	19.7	19.7	97.50	87.00	83.77	72.60	8
10	Tie to Sta.	0.00	0.00	0.00	0.00	3.9	0.00	0.0	0.0	777.0	843.5	90 c	301	1.21	17.6	17.6	101.50	97.50	87.40	83.77	9
11	Tie to Sta.	0.00	0.00	0.00	0.00	3.3	0.00	0.0	47.0	777.0	833.0	84 c	764	1.70	20.2	20.2	115.00	101.50	100.39	87.40	10
12	Tie to Sta.	0.00	0.00	0.00	0.00	2.8	0.00	0.0	99.0	730.0	833.1	84 c	540	1.70	19.0	19.0	126.00	115.00	109.57	100.39	11
13	Tie to Sta.	0.00	0.00	0.00	0.00	2.5	0.00	0.0	0.0	631.0	833.1	84 c	334	1.70	16.4	16.4	134.90	126.00	115.25	109.57	12
14	Bridge&90th	0.00	0.00	0.00	0.00	2.3	0.00	0.0	0.0	631.0	833.1	84 c	250	1.70	16.4	16.4	142.00	134.90	119.50	115.25	13
15	Central&90th	0.00	0.00	0.00	0.00	2.2	0.00	0.0	0.0	631.0	833.1	84 c	220	1.70	16.9	16.4	142.00	142.00	123.24	119.50	14
16	SD in 90th,	0.00	0.00	0.00	0.00	0.0	0.00	0.0	364.0	364.0	411.3	66 c	344	1.50	19.3	19.3	142.00	142.00	130.42	125.26	15
17	SD up Centra	0.00	0.00	0.00	0.00	2.1	0.00	0.0	0.0	267.0	304.7	54 c	117	2.40	16.9	16.8	145.00	142.00	128.07	125.26	15
18	Tie to 11+17	0.00	0.00	0.00	0.00	0.8	0.00	0.0	170.0	267.0	305.5	54 c	1503	2.41	16.9	16.8	175.00	145.00	164.33	128.07	17
19	Central&98th	0.00	0.00	0.00	0.00	0.0	0.00	0.0	97.0	97.0	110.8	36 c	968	2.76	13.8	13.7	202.00	175.00	191.05	164.33	18

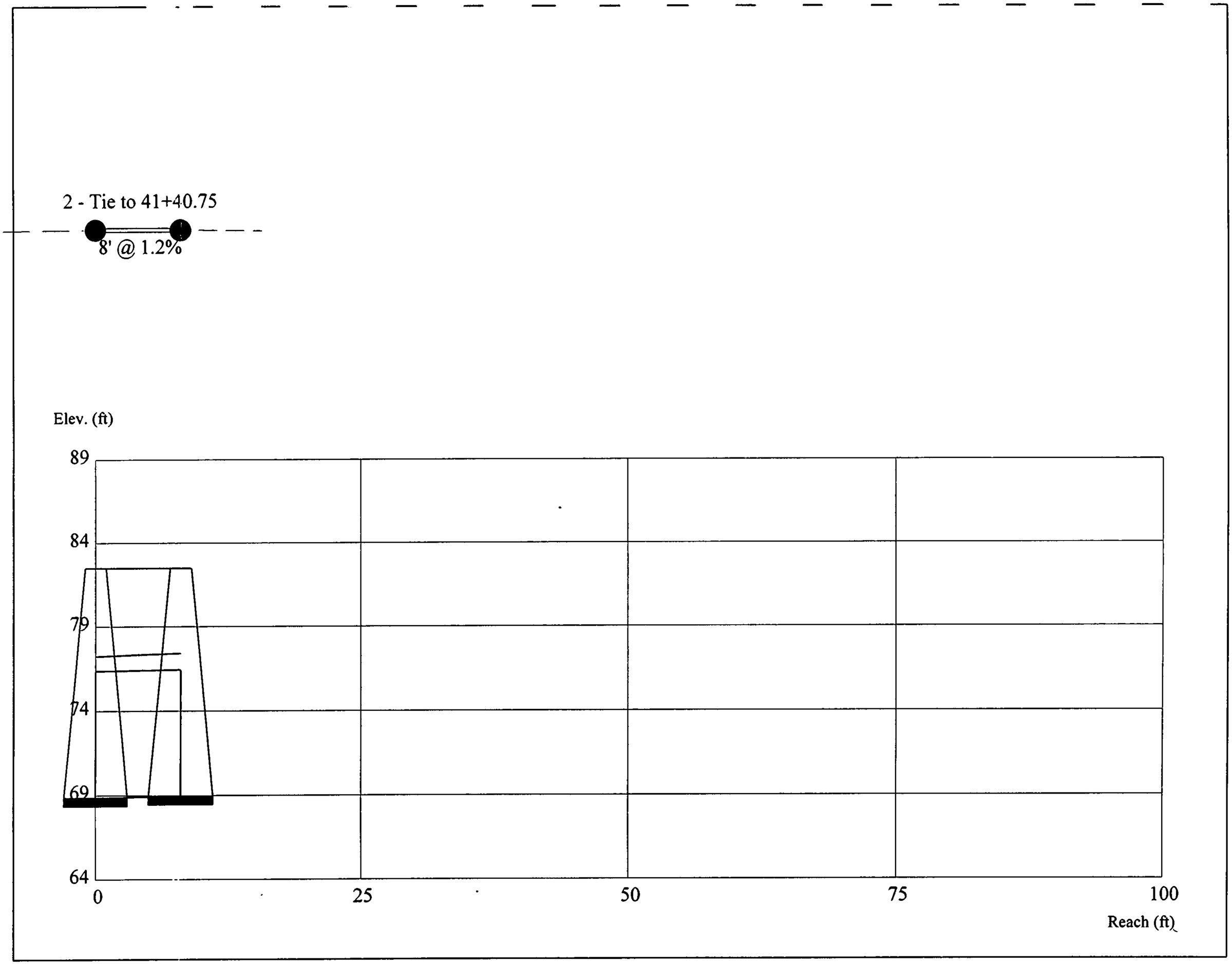
PROJECT FILE: ABEND2.STM | I-D-F FILE: SAMPLE.IDF | TOTAL NUMBER OF LINES: 19 | RUN DATE: 03-16-1998

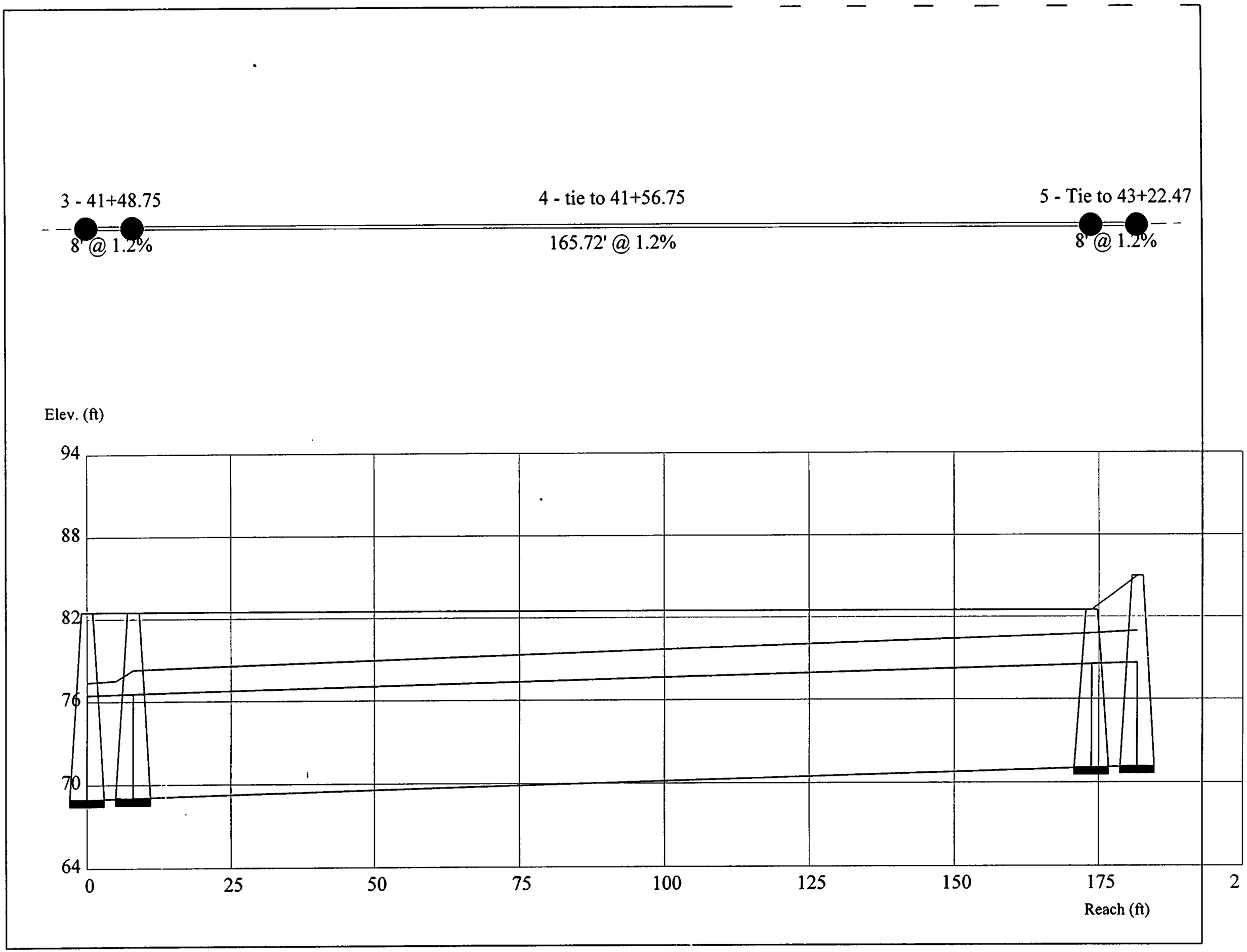
NOTES. c = circular; e = elliptical; b = box; Intensity = 0 / (Tc + 0) ^ 0; Return period = 100 Yrs.

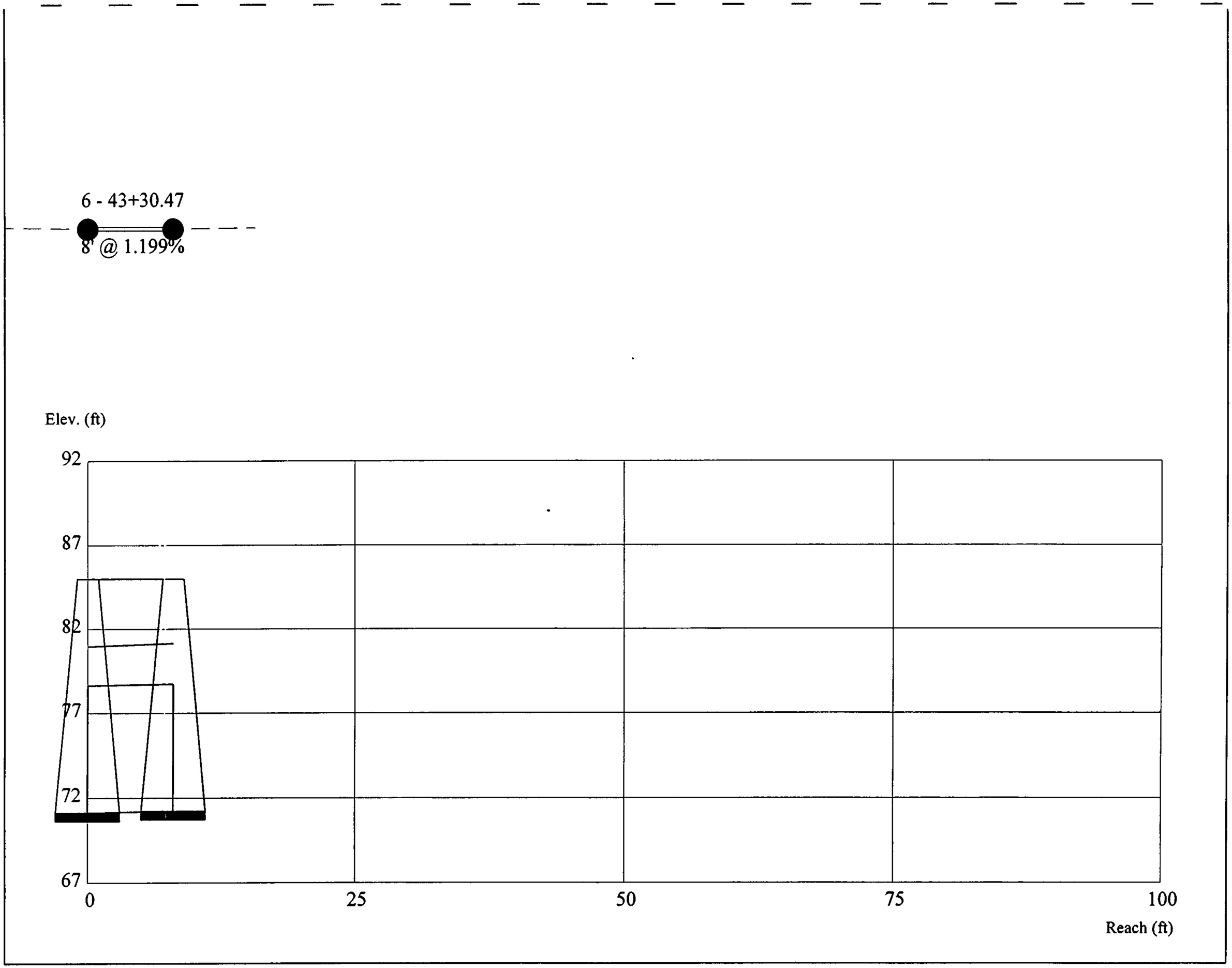
1 - Tie to Chan

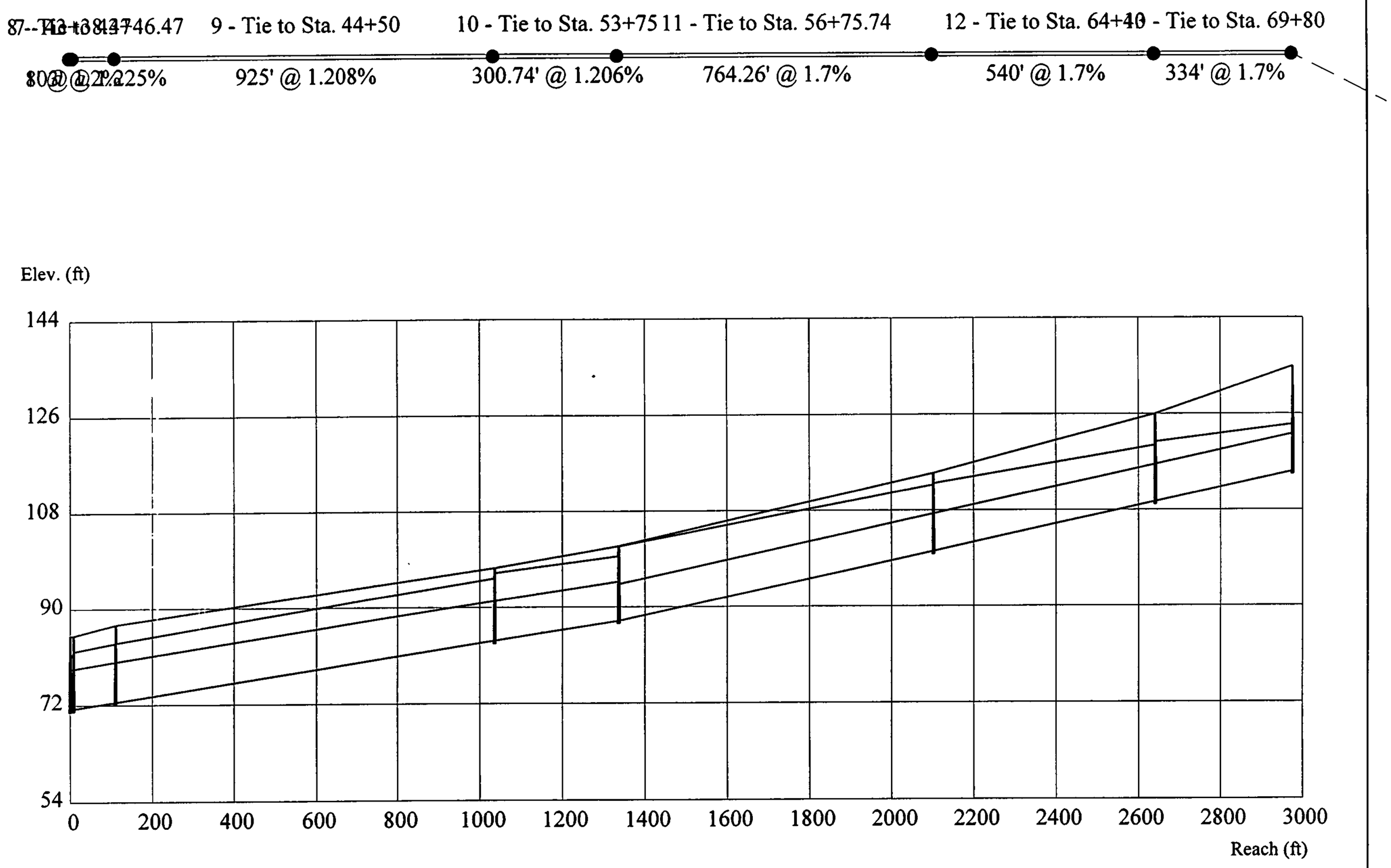
34.75' @ 1.2%

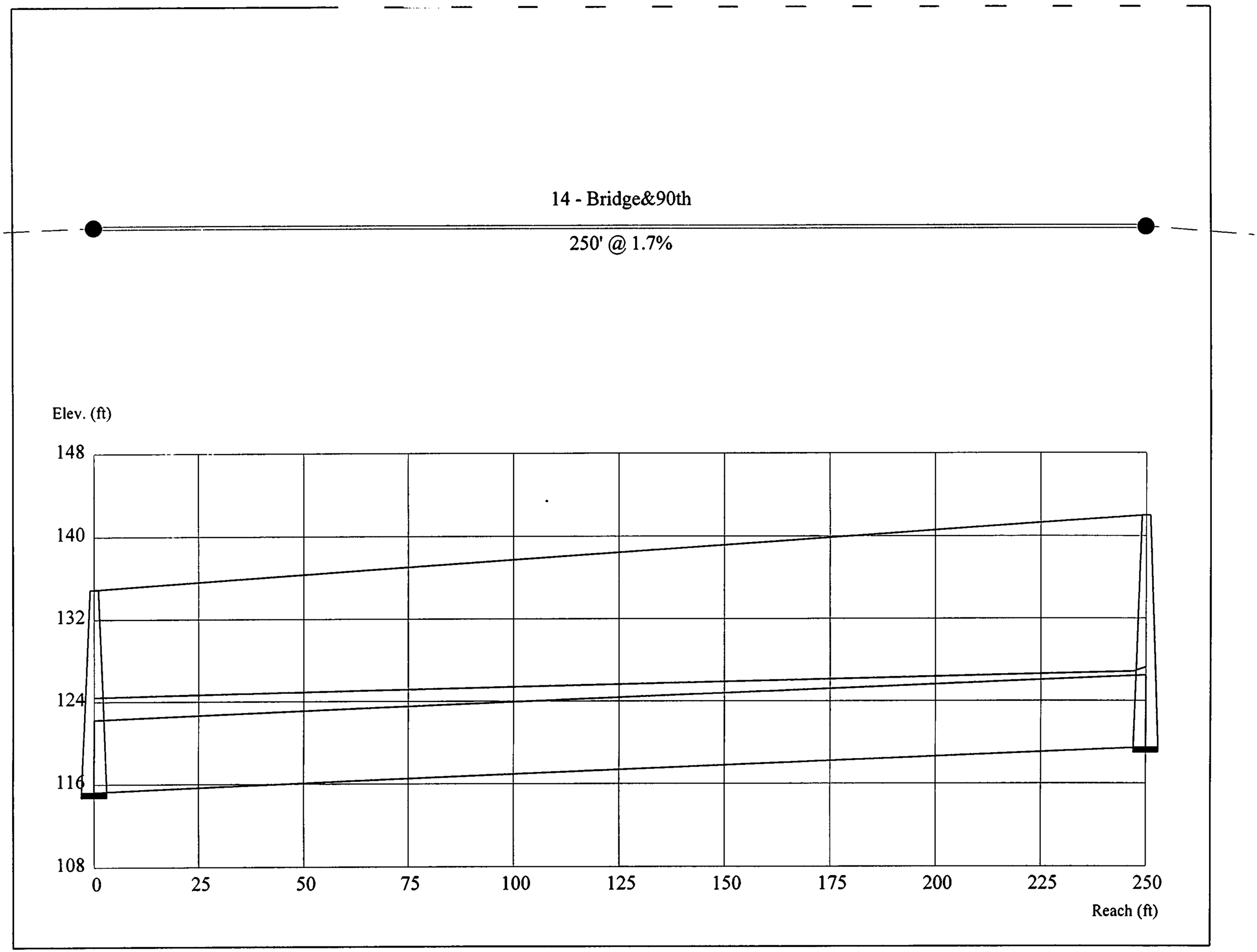


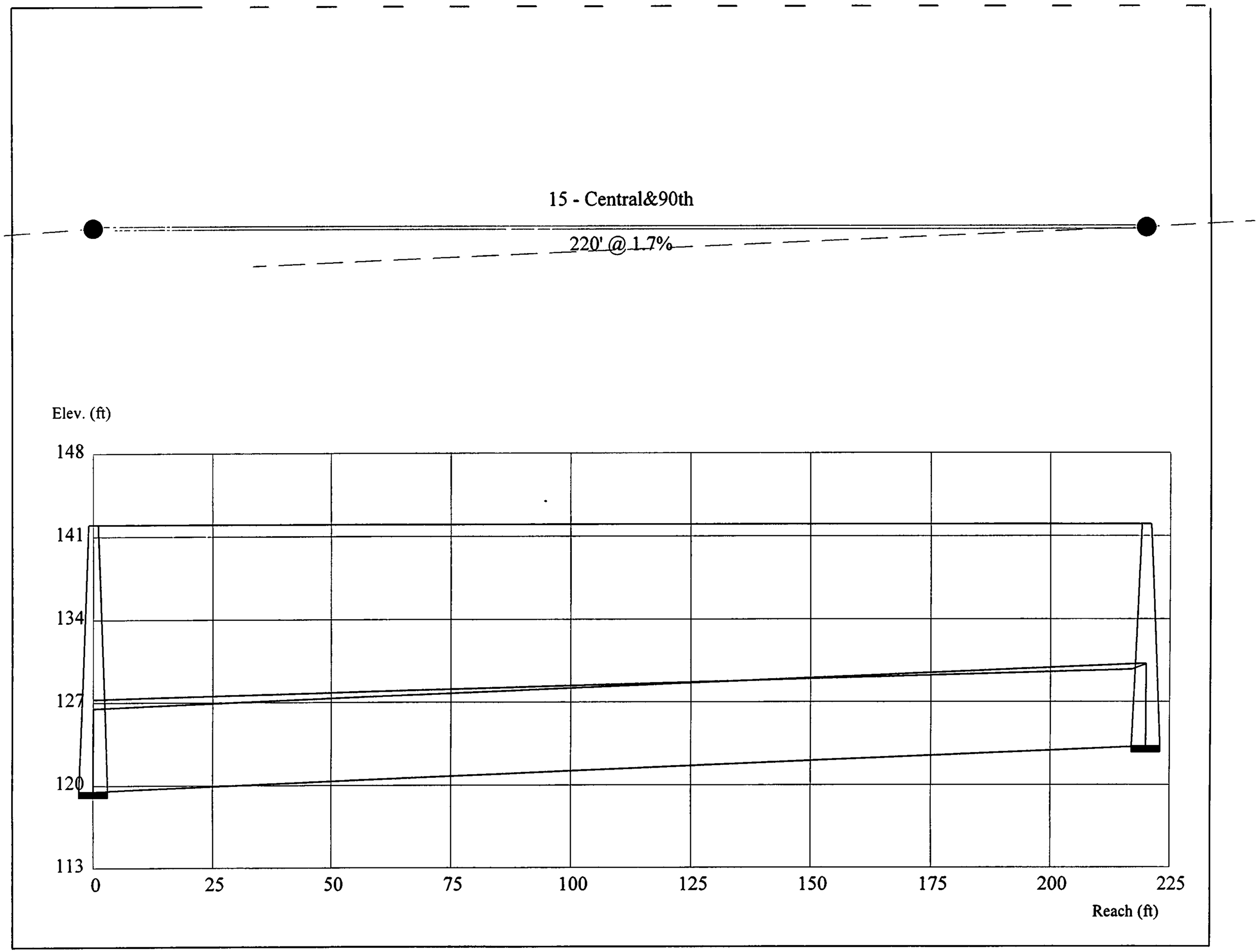

2 - Tie to 41+40.75
8' @ 1.2%
Elev. (ft)
89
84
79
74
69
64
0
25
50
75
100
Reach (ft)

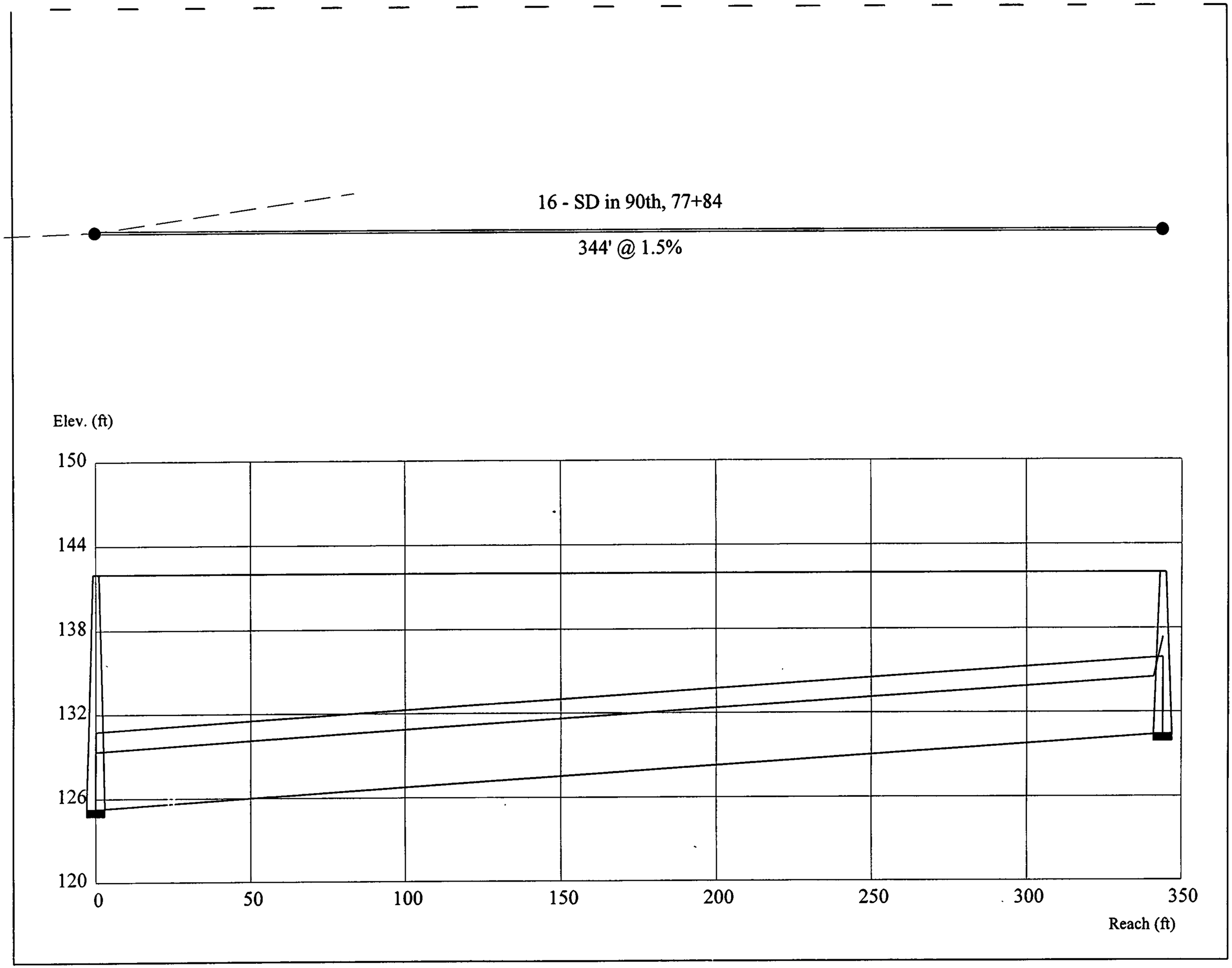

3 - 41+48.75
4 - tie to 41+56.75
5 - Tie to 43+22.47
8' @ 1.2%
165.72' @ 1.2%
8' @ 1.2%
Elev. (ft)
94
88
82
76
70
64
0
25
50
75
100
125
150
175
2
Reach (ft)

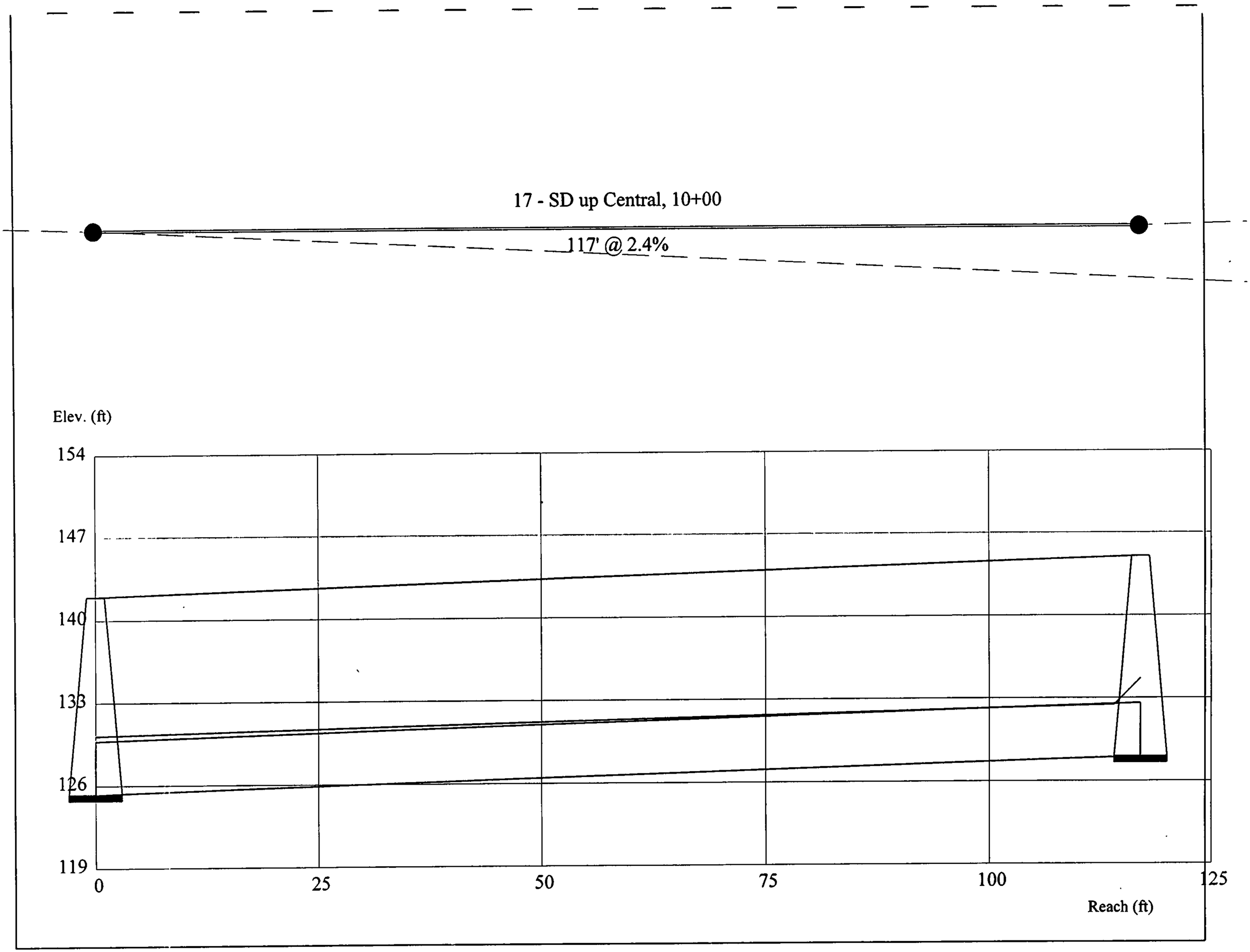

6 - 43+30.47
8' @ 1.199%
Elev. (ft)
92
87
82
77
72
67
0
25
50
75
100
Reach (ft)

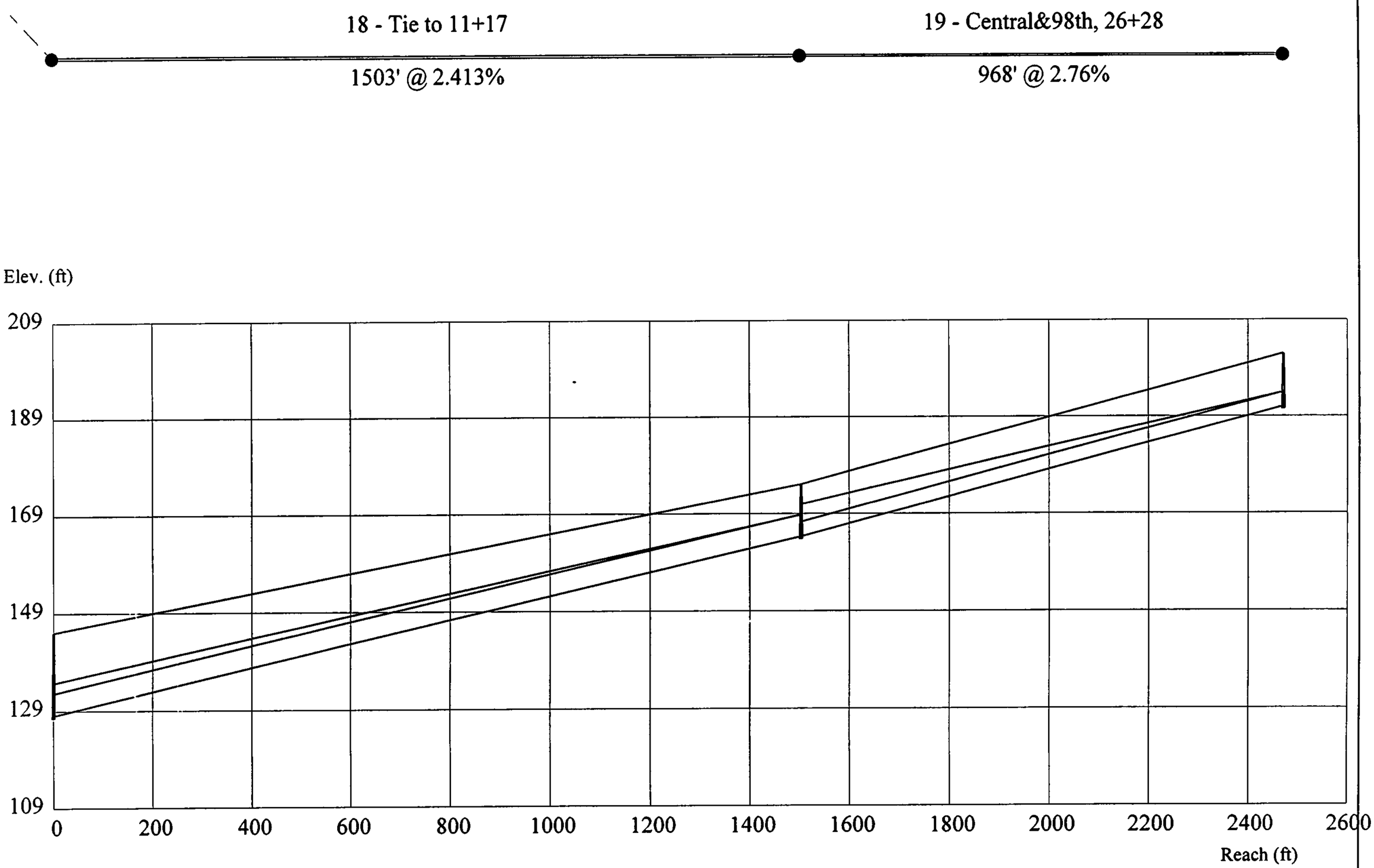

9 - Tie to Sta. 44+50
10 - Tie to Sta. 53+75
11 - Tie to Sta. 56+75.74
12 - Tie to Sta. 64+40
- Tie to Sta. 69+80
925' @ 1.208%
300.74' @ 1.206%
764.26' @ 1.7%
540' @ 1.7%
334' @ 1.7%
Elev. (ft)
144
126
108
90
72
54
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
Reach (ft)


14 - Bridge&90th
250' @ 1.7%
Elev. (ft)
148
140
132
124
116
108
0
25
50
75
100
125
150
175
200
225
250
Reach (ft)


15 - Central&90th
220' @ 1.7%
Elev. (ft)
148
141
134
127
120
113
0
25
50
75
100
125
150
175
200
225
Reach (ft)


16 - SD in 90th, 77+84
344' @ 1.5%
Elev. (ft)
150
144
138
132
126
120
0
50
100
150
200
250
300
350
Reach (ft)


17 - SD up Central, 10+00
117' @ 2.4%
Elev. (ft)
154
147
140
133
126
119
0
25
50
75
100
125
Reach (ft)


18 - Tie to 11+17
19 - Central&98th, 26+28
1503' @ 2.413%
968' @ 2.76%
Elev. (ft)
209
189
169
149
129
109
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
Reach (ft)

Greiner

Job ANNOLS III O | Project No. E3622214 | Sheet ____ of ____

Description CHECK TAILWATER FOR FLOW IN STREET | Computed By [signature] | Date 13 FEB 98 (FRIDAY)

Checked By MRH | Date 3/2/98

FIND TOTAL FLOW ALLOWABLE w/TAILWATER = 1' or less

$$\frac{D_2}{D_1} = \frac{1}{2}\left(\sqrt{1 + 8F^2} - 1\right)$$ ~ use formula to calc.

~~TOTAL Q-EXCESS = 61 cfs — to 1/2 street = 30.5~~

~~@ S = .012 Fe = 1.36 $\frac{D_2}{D_1}$ = 1.49~~

~~Q = 30.5~~

~~d_1 = .62~~

~~D_2 = 0.92~~

IF	Froude		
d_1 = .73	Fe = 1.41	D_2 = 1.1	too high
d_1 = .70	1.40	D_2 = 1.08	too high
d_1 = .66	1.38	D_2 = 1.01	Q = 32.0 ½ of street

Q total in street = 74 cfs

BRIDGE BOULEVARD - ONE HALF STREET FLOW
Worksheet for Irregular Channel

Project Description	
Project File	p:\e000115\docs\amole.fm2
Worksheet	BRIDGE BLVD - HALF
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data

Channel Slope 0.012000 ft/ft

Elevation range: 0.00 ft to 0.87 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	28.63	0.017
4.46	0.67			
4.63	0.00			
6.63	0.13			
28.63	0.57			

Discharge 37.00 cfs

Results

Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.66	ft
Flow Area	8.13	ft^2
Wetted Perimeter	24.78	ft
Top Width	24.17	ft
Height	0.66	ft
Critical Depth	0.75	ft
Critical Slope	0.005932	ft/ft
Velocity	4.55	ft/s
Velocity Head	0.32	ft
Specific Energy	0.98	ft
Froude Number	1.38	

Flow is supercritical.

Water elevation exceeds lowest end station by 0.09 ft.