DRAINAGE REPORT

FOR

SUNSET WEST UNIT 2
ALBUQUERQUE, NEW MEXICO

Prepared for

Tom Neilson
Albuquerque, New Mexico

April 1994

LH 94005.11

LEEDSHILL-HERKENHOFF, INC.
Copper Square, 500 Copper Avenue, NW
P.O. Box 1217 - Phone (505) 247-0294
Albuquerque, New Mexico 87103

ENGINEERS ARCHITECTS

SUSAN M. ALVAREZ
NEW MEXICO
11521
REGISTERED PROFESSIONAL ENGINEER

4-18-04

I, Susan M. Alvarez, Registered Professional Engineer No. 11511, hereby certify that these documents were prepared by me, or under my direct supervision, and are true and correct to the best of my knowledge and belief.

Registered Professional Engineer
No. 11521

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I. INTRODUCTION

A. GENERAL

The Sunset West Subdivision is located on Albuquerque's westside near the intersection of Sage Road and Unser Boulevard. This subdivision was originally designed by Gordon Herkenhoff and Associates in the early 1980's. Unit 1 was approved and constructed in or around 1980. Unit 2 was designed and the construction plans were approved by the City in 1981, however, this section of the subdivision was never constructed. Recently, Mr. Tom Neilson contracted Leedshill-Herkenhoff, Inc. (LH) to proceed with a redesign in order to update the project to current City of Albuquerque - Development Process Manual (DPM) standards.

An initial meeting was held with Mr. Fred Aguirre (City of Albuquerque - Hydrology) and Lee Lunsford (City of Albuquerque - Special Assessment Districts (SAD)) in order to assess the City's requirements for project drainage improvements. At that meeting, LH was directed to regrade the lots to remove proposed rear lot retention facilities, and to analyze the project drainage for existing and proposed site development conditions. A hydraulic analysis of Sage and 90th Streets to assess the need for underground storm drainage was also requested. Because of ongoing planning and design for storm improvements for the adjacent SAD #222, City decisions regarding requirements for storm sewerage and on-site detention were deferred until receipt and review of this report.

This report presents the results of the Drainage Analysis completed for the project using Section 22.2 of the DPM. This analysis basically includes development of peak runoff rates occurring from the 10-year and 100-year frequency rainfall events, and analysis of the resulting hydraulic characteristics under site conditions with and without the construction of the Sunset West Unit 2 project. We have included a description of the methodologies and assumptions used for this analysis, as well as the results and conclusions reached through this study.

B. PROJECT DESCRIPTION

As shown on Figure 1, Unit 2 of the Sunset West Subdivision is located between San Ygnacio Road to the north, Sage Road to the south, and 90th Street to the east; Unit 1 is located directly west of Unit 2. The project is located adjacent to the Special Assessment District #222 and is affected by construction of SAD storm and water utility construction. The project is included on City of Albuquerque Zone Atlas Maps L-9 and M-9. The original plat for this project was filed on October 31, 1980. This plat incorporates 76 single family residential lots on approximately 16.3 acres of land.

SUNSET WEST UNIT 2

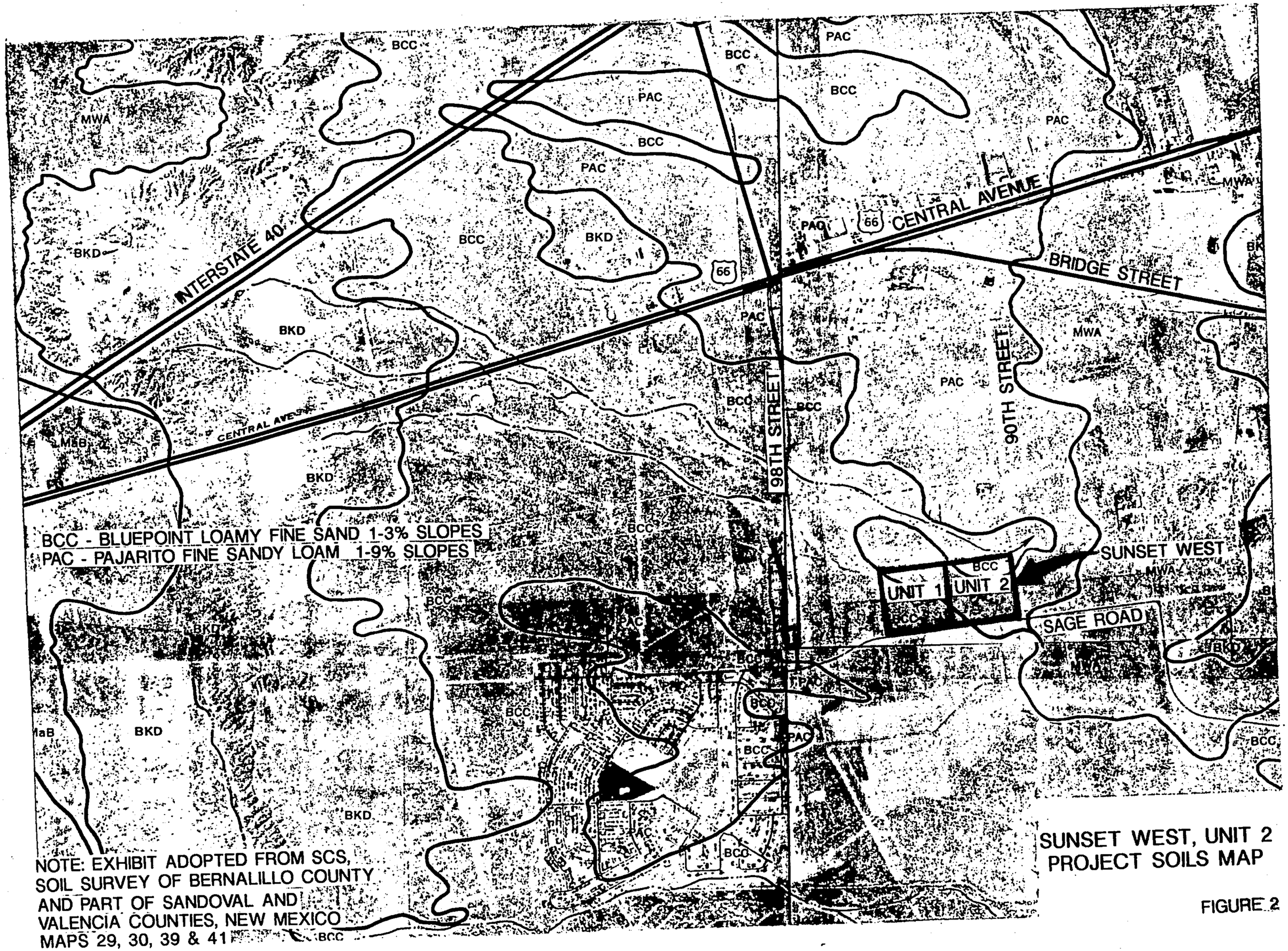
PROJECT LOCATION MAP

The entire area gently slopes from northwest to southeast at an approximate 1.5 percent slope. The soils are generally very permeable, fine loamy sands as indicated by the "Soil Conservation Service (SCS) - Soil Survey of Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico (1977)". Present surface cover consists of approximately 75 percent native grasses with bare earth. Figure 2 indicates an overlay of the site onto the SCS base mapping.

The entire drainage area currently drains toward Sage Road. The runoff is then conveyed eastward along Sage Road, partially by the roadway and partially by adjacent roadside ditches. There is one channel north of Sage from 90th Street to 86th Street. From 86th Street eastward to Unser Boulevard, there are currently roadside ditches on both sides of the road. The drainage currently crosses Unser Boulevard and discharges to a large playa located east of Unser Boulevard. The Sage Road Improvements, Drainage Report, prepared for the City of Albuquerque by Andrews, Asbury and Robert in 1990, and a DRC Review Comment Sheet by Carlos Montoya of the City of Albuquerque, Public Works Department, Hydrology Division, dated January 17, 1990, both cite the need for storm improvements in Sage Road. To date, these improvements have not been constructed. WHO IS RESPONSIBLE FOR THESE?

The project area is contained within Community Panel No. 350020033C, dated October 14, 1983 of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps. Sage Road and the existing playa lake are both indicated within the 100-year flood plain; however, the site itself is not within the 100-year flood plain as indicated on Figure 3, adopted from the FEMA mapping of the area.

CURRENTLY NO EASEMENT



NOTE: EXHIBIT ADOPTED FROM SCS, SOIL SURVEY OF BERNALILLO COUNTY AND PART OF SANDOVAL AND VALENCIA COUNTIES, NEW MEXICO MAPS 29, 30, 39 & 41

SUNSET WEST, UNIT 2
PROJECT SOILS MAP

FIGURE 2

NOTE: EXHIBIT ADOPTED FROM FEMA FIRM
COMMUNITY PANEL NO. 350002 0033 C
DATED OCTOBER 14, 1983

SUNSET WEST, UNIT 2
PROJECT FLOOD PLAIN MAP

FIGURE 3

II. HYDROLOGY

A. METHODOLOGY

The hydrologic analysis was performed using the Albuquerque Metropolitan Arroyo Flood Control Authority's (AMAFCA) version of the USDA Agricultural Research Service HYMO Computer Program known as AHYMO; version 9.93 was utilized for this analysis. Because the timing of the SAD construction is unknown at this time, the analysis was performed for four different development scenarios in order to provide quantification of localized impacts, and impacts to the receiving waters (the plaza east of Unser). The analyses incorporated the area generally bounded by Tower on the north, Unser on the east, Sage on the south and 98th Street on the west. The area west of 98th Street is assumed to be diverted southward to Snow Vista Channel by SAD construction in all four scenarios. These scenarios are indicated in Figures 4A - 4D and are generally described as follows:

- Existing Conditions (Figure 4A) - SAD #222 improvements have not been construction; the drainage areas north of San Ygnacio are undeveloped and follow the existing paths. Sunset West Unit 2 is undeveloped. All other areas are modelled to reflect current level of development. (The retention pond for Westview Town homes remains in place.)

- Interim Conditions (Figure 4B) - The SAD #222 improvements have not been constructed, the drainage areas north of San Ygnacio are undeveloped and follow the existing paths. Sunset West Unit 2 is developed. All other areas are modelled to reflect current level of development. This presents a "worse case" for drainage conditions for 90th Street and the Sage Road system.

- Interim II Conditions (Figure 4C) - The SAD #222 improvements have been constructed. These consist of a storm drain located in San Ygnacio and a proposed detention facility to be located near 86th and the San Ygnacio. While it is assumed that those areas are to be developed as part of the SAD #222 it is also assumed that the outflow from the detention facility should approximate existing conditions. Because the detailed information on these facilities necessary to properly route the flows through the system is not available at this time, it was modelled as existing conditions flow rates. Therefore, because the expected lag resulting from the detention facility will not occur, the peak flow values arriving at the Unser Plaza may not be totally correct, the volume of runoff at this location should be. Sunset West is undeveloped; the remaining areas are modelled to reflect current development. This presents an "existing condition" for Sunset West with the SAD in place. -?

- Developed Conditions (Figure 4D) - The SAD #222 improvements have been constructed. Sunset West is developed; the remaining areas are modelled to reflect current development. This presents a "developed conditions" for Sunset West with the SAD in place.

Table 1 provides a brief summary of these four analysis scenarios.

TABLE 1
Summary of Analysis Conditions

Scenario	Area West of 98th	Area North of San Ygnacio	SAD Improvements	Sunset West Unit 2	Remaining Areas
Existing Conditions	Diverted south	Undeveloped	Not in place	Undeveloped	As current
Interim I Conditions	Diverted south	Undeveloped	Not in place	Developed	As current
Interim II Conditions	Diverted south	Developed*	Constructed	Undeveloped	As current
Developed Conditions	Diverted south	Developed*	Constructed	Developed	As current
* Modelled as existing to account for detention facility.					

B. BASIN PARAMETERS

The AHYMO computer model requires the input of several variables, or basin parameters, which define the characteristics of each sub-basin in the analysis. Table 2 includes a summary of the basin parameters utilized for the existing basin conditions analysis; Table 3 shows the same parameters but for the developed condition. A brief description of these parameters, and the methods and assumptions used in their determination follows.

1. Drainage Areas

The drainage areas were determined from an orthophotographic map of the area developed for the City of Albuquerque in 1980, by Bohannan-Huston. The areas, so determined, were then field verified. Figures 4A - 4D indicate the basins used for these analyses. It should be noted that runoff from the area west of 98th Street was assumed to be diverted southward to the Snow Vista Channel. Coordination with on-going work for Special Assessment District #222 (SAD) indicates that runoff from the drainage areas north of San Ygnacio will be diverted eastward along San Ygnacio by a storm drain to a proposed detention facility to be located on the northeast corner of San

IS IT?

SUNSET WEST UNIT 2

AHYMO BASIN PARAMETER WORKSHEET

MARCH 21, 1994
LEEDSHILL–HERKENHOFF, INC.

TABLE 2

UNDEVELOPED BASIN CONDITIONS

BASIN	AREA (AC)	LENGTH (FT)	ELEV DIFF (FT)	SLOPE (FT/FT)	K	VELOCITY (FT/S)	T(C) (HRS)	T(P) (HRS)	SURFACE TREATMENT % A	B	C	D
A1–U	57.97	400	10	0.025	0.7	1.11	0.10	0.07	100	0	0	0
		550	12	0.022	1.0	1.48	0.10	0.07	100	0	0	0
		900	16	0.018	3.0	4.00	0.06	0.04	100	0	0	0
		1550	20	0.013	2.0	2.27	0.19	0.13	100	0	0	0
	TOTAL =	3400	58	0.017			0.46	0.30				
A2–U	25.3	400	9	0.023	0.7	1.05	0.11	0.07	100	0	0	0
		1050	13	0.012	1.0	1.11	0.26	0.17	100	0	0	0
	TOTAL =	1450	22	0.015			0.37	0.25				
A3–U	59.26	2600	56	0.022	3.0	4.40	0.16	0.11	100	0	0	0
		1100	28	0.025	1.0	1.60	0.19	0.13	100	0	0	0
	TOTAL =	3700	84	0.023			0.36	0.24				
A4–U	39.6	400	8	0.020	0.7	0.99	0.11	0.07	100	0	0	0
		1230	16	0.013	1.0	1.14	0.30	0.20	100	0	0	0
	TOTAL =	1630	24	0.015			0.41	0.27				
A5–U	57.77	400	6	0.015	0.7	0.86	0.13	0.09	100	0	0	0
		2230	24	0.011	1.0	1.04	0.60	0.40	100	0	0	0
	TOTAL =	2630	30	0.011			0.73	0.48				

TABLE 2 (Cont'd.)

UNDEVELOPED BASIN CONDITIONS

BASIN	AREA (AC)	LENGTH (FT)	ELEV DIFF (FT)	SLOPE (FT/FT)	K	VELOCITY (FT/S)	T(C) (HRS)	T(P) (HRS)	SURFACE TREATMENT %			
									A	B	C	D
B1-U	4.3	400	8	0.020	0.7	0.99	0.11	0.07	75	0	0	25
		150	2	0.013	0.7	0.81	0.05	0.03	75	0	0	25
	TOTAL =	550	10	0.018			0.16	0.11				
B2-U	10.3	150	1	0.007	0.7	0.57	0.07	0.05				
		100	3	0.030	3.0	5.20	0.01	0.00				
		800	9	0.011	3.0	3.18	0.07	0.05				
		450	8	0.018	3.0	4.00	0.03	0.02				
		125	1	0.008	3.0	2.68	0.01	0.01				
	TOTAL =	1625	22	0.014			0.19	0.13	20	50	0	30
B3-U	27.0	150	1	0.007	0.7	0.57	0.07	0.05				
		50	2	0.040	3.0	6.00	0.00	0.00				
		1550	24	0.015	3.0	3.73	0.12	0.08				
		700	12	0.017	1.0	1.31	0.15	0.10				
	TOTAL =	2450	39	0.016			0.34	0.23	50	25	0	25
B4-U	10.4	400	4	0.010	0.7	0.70	0.16	0.11	100	0	0	0
		800	12	0.015	1.0	1.22	0.18	0.12	100	0	0	0
	TOTAL =	1200	16	0.013			0.34	0.23				
C1-U	11.5	2200	14	0.006	3.0	2.39	0.26	0.17	50	0	0	50

SUNSET WEST UNIT 2

AHYMO BASIN PARAMETER WORKSHEET

TABLE 3

MARCH 21, 1994
LEEDSHILL-HERKENHOFF, INC.

DEVELOPED BASIN CONDITIONS

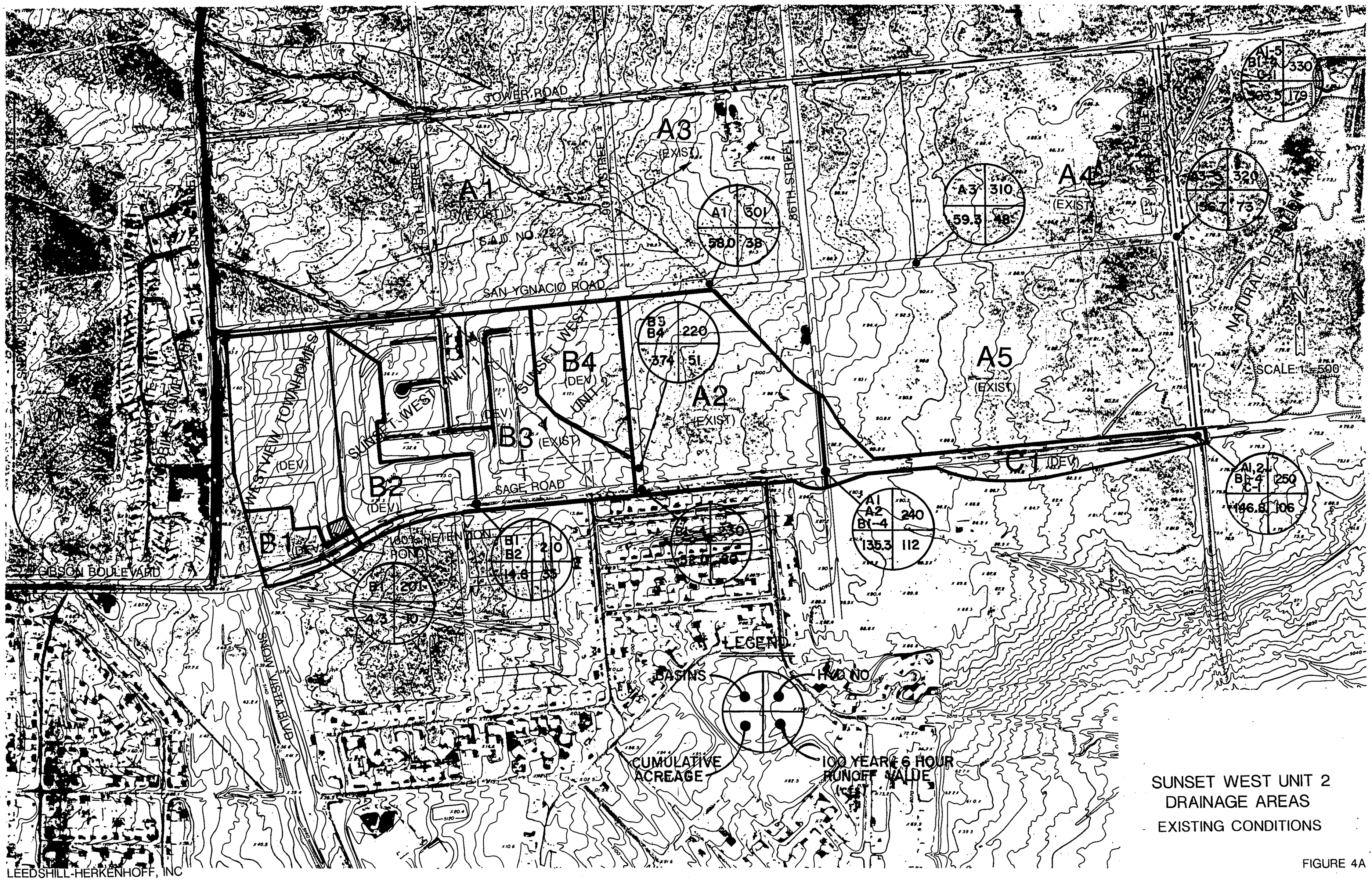
BASIN	AREA (AC)	LENGTH (FT)	ELEV DIFF (FT)	SLOPE (FT/FT)	K	VELOCITY (FT/S)	T(C) (HRS)	T(P) (HRS)	SURFACE TREATMENT % A	B	C	D
A1-D*	57.97	400	10	0.025	0.7	1.11	0.10	0.07	100	0	0	0
		550	12	0.022	1.0	1.48	0.10	0.07	100	0	0	0
		900	16	0.018	3.0	4.00	0.06	0.04	100	0	0	0
		1550	20	0.013	2.0	2.27	0.19	0.13	100	0	0	0
	TOTAL =	3400	58	0.017			0.46	0.30				
A2-D	25.3	400	9	0.023	0.7	1.05	0.11	0.07	100	0	0	0
		1050	13	0.012	1.0	1.11	0.26	0.17	100	0	0	0
	TOTAL =	1450	22	0.015			0.37	0.25				
A3-D*	59.26	2600	56	0.022	3.0	4.40	0.16	0.11	100	0	0	0
		1100	28	0.025	1.0	1.60	0.19	0.13	100	0	0	0
	TOTAL =	3700	84	0.023			0.36	0.24				
A4-D*	39.6	400	8	0.020	0.7	0.99	0.11	0.07	100	0	0	0
		1230	16	0.013	1.0	1.14	0.30	0.20	100	0	0	0
	TOTAL =	1630	24	0.015			0.41	0.27				
A5-D*	57.77	400	6	0.015	0.7	0.86	0.13	0.09	100	0	0	0
		2230	24	0.011	1.0	1.04	0.60	0.40	100	0	0	0
	TOTAL =	2630	30	0.011			0.73	0.48				

*BASIN ACTUALLY DEVELOPED; HOWEVER, MODELLED AS EXISTING TO REFLECT DETENTION FACILITY

TABLE 3 (Cont'd.)

DEVELOPED BASIN CONDITIONS

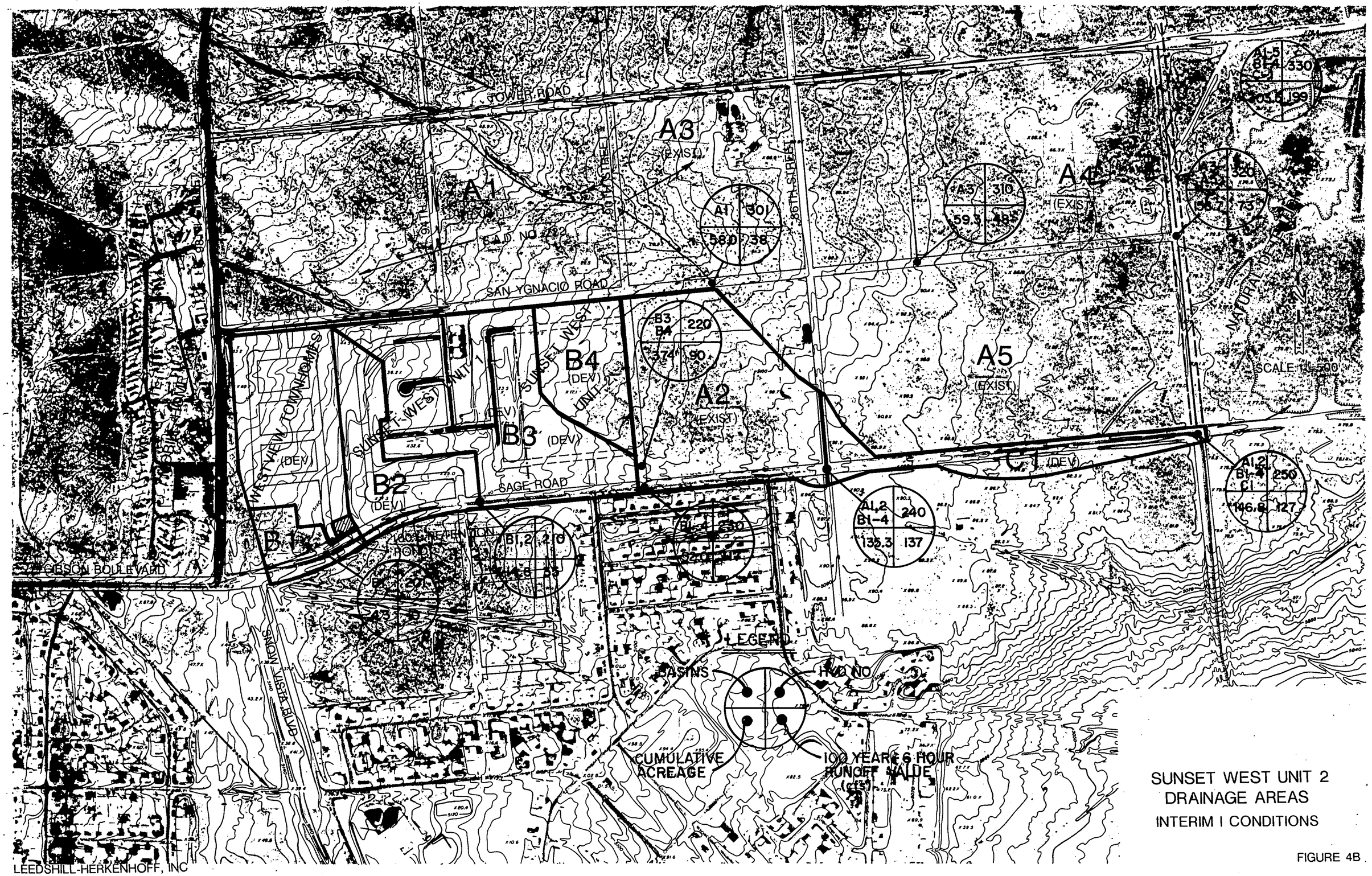
BASIN	AREA (AC)	LENGTH (FT)	ELEV DIFF (FT)	SLOPE (FT/FT)	K	VELOCITY (FT/S)	T(C) (HRS)	T(P) (HRS)	SURFACE TREATMENT % A	B	C	D
B1-D	4.3	400	8	0.020	0.7	0.99	0.11	0.07	75	0	0	25
		150	2	0.013	1.0	1.15	0.04	0.02	75	0	0	25
	TOTAL =	550	10	0.018			0.15	0.10				
B2-D	10.3	150	1	0.007	0.7	0.57	0.07	0.05				
		100	3	0.030	3.0	5.20	0.01	0.00				
		800	9	0.011	3.0	3.18	0.07	0.05				
		450	8	0.018	3.0	4.00	0.03	0.02				
		125	1	0.008	3.0	2.68	0.01	0.01				
	TOTAL =	1625	22	0.014			0.19	0.13	20	50	0	30
B3-D	27.0	150	1	0.007	0.7	0.57	0.07	0.05				
		50	2	0.040	3.0	6.00	0.00	0.00				
		1550	24	0.015	3.0	3.73	0.12	0.08				
		700	12	0.017	3.0	3.93	0.05	0.03				
	TOTAL =	2450	39	0.016			0.24	0.16	20	50	0	30
B4-D	10.4	150	2	0.013	0.7	0.81	0.05	0.03				
		1450	16	0.011	3.0	3.15	0.13	0.09				
	TOTAL =						0.18	0.12	20	50	0	30
C1-D	11.5	2200	14	0.006	3.0	2.39	0.26	0.17	50	0	0	50



SUNSET WEST UNIT 2
DRAINAGE AREAS
EXISTING CONDITIONS

LEEDSHILL-HERKENHOFF, INC

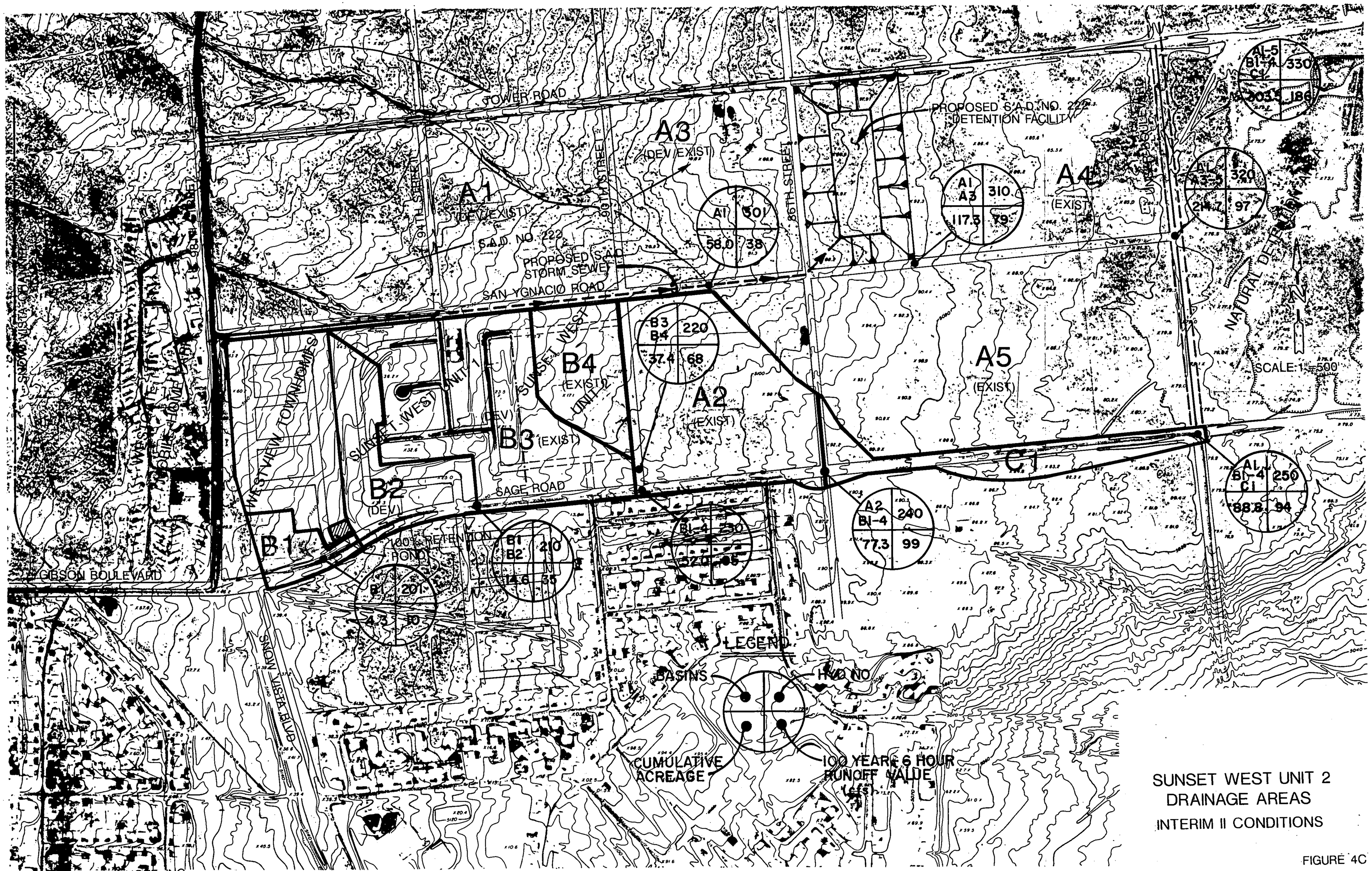
FIGURE 4A



SUNSET WEST UNIT 2
DRAINAGE AREAS
INTERIM I CONDITIONS

FIGURE 4B

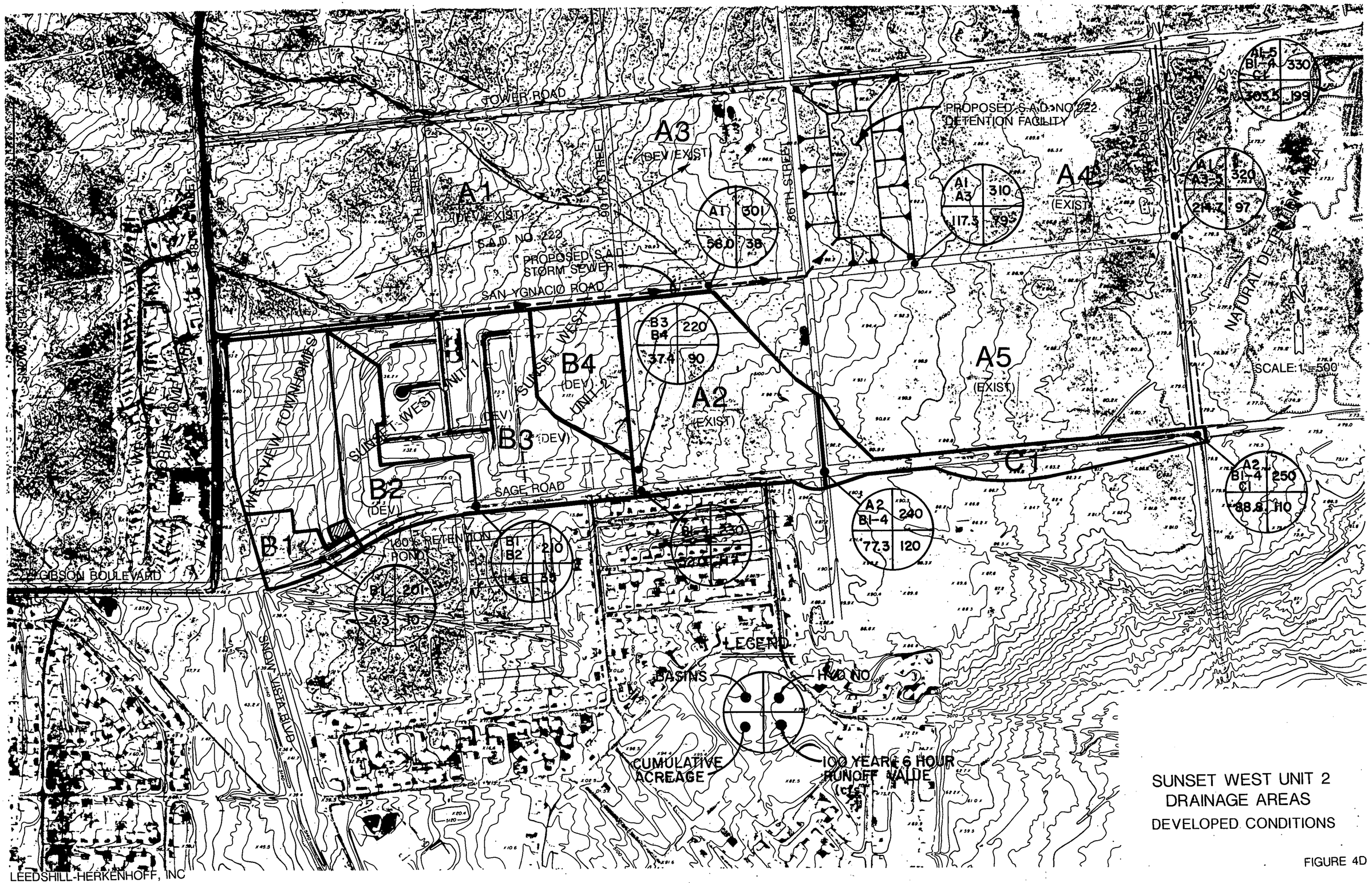
LEEDSHILL-HERKENHOFF, INC



SUNSET WEST UNIT 2
DRAINAGE AREAS
INTERIM II CONDITIONS

FIGURE 4C

LEEDSHILL-HERKENHOFF, INC



SUNSET WEST UNIT 2
DRAINAGE AREAS
DEVELOPED CONDITIONS

FIGURE 4D

LEEDSHILL-HERKENHOFF, INC

Ygnacio and 86th Street. In addition, it was assumed that the runoff from the Westview Townhomes Addition, located at West Sky Street between San Ygnacio Road and Sage Road, is directed to an existing retention pond located at the southeast corner of this subdivision. They may want to reclaim

2. Surface Treatment

The surface treatment consists of four groups as defined in the DPM. These groups are defined by surface cover, amount of impervious area, general soil type, and land uses. The surface treatments for this study were selected based upon field reconnaissance, the orthophotographic mapping, and engineering judgement based upon knowledge of the construction of the previous section of Sunset West. In general, a 30-percent impervious assumption was made for the existing Sunset West Unit 1 subdivision and for the proposed Sunset West Unit 2 subdivision. This assumption was made to maintain consistency with the assumptions utilized in the Sage Road Drainage Report.

3. Hydraulic Length

The hydraulic length is a parameter which defines the longest path for runoff to follow as it travels through the sub-basin. The hydraulic lengths were determined from the orthophotographic mapping of the area.

4. Basin Slopes

The orthophotographic mapping was also used to determine the overall elevation difference across a basin, and to calculate the slope of the basin. In addition, slopes were also calculated for each reach used to route the hydrographs through the Sage Road system.

5. Conveyance, k

The conveyance factor, k, is a measure of how well a basin conveys runoff along its hydraulic length. The values of k used for this analysis were based upon review of aerial photography, the orthophotographic mapping, and field reconnaissance. The conveyance factors used were obtained from Table B-1 of the DPM Section 22.2, and ranged from 0.7 for turf areas, to 3.0 for street sections.

6. Velocity, v

As the hydraulic lengths for the basins in this study were all under 400 feet in length, the velocities were calculated as a function of the conveyance times the square root of the slope as recommended in the DPM Section 22.2.

7. Time of Concentration, T_c

The time of concentration, T_c is the time for runoff to travel from the hydraulically most distant part of the sub-basin to the point of analysis. This parameter was calculated by the Soils Conservation Service Upland method, which is a function of the hydraulic length divided by the velocity. A minimum T_c of 0.2 was utilized.

8. Time to Peak, T_p

The time to peak, T_p is the time from the beginning of the unit rainfall excess to the time of the peak flow of the unit runoff hydrograph. From empirical studies and as defined in the DPM 22.2, it is generally accepted to be 2/3 of the time of concentration, T_c.

C. HYDROGRAPH ROUTING

The basin hydrographs were calculated and routed along Sage Road using AHYMO. The streets were treated as channels and three different roadway cross-sections were utilized to reflect actual conditions found for Sage Road. A full four-lane street section with curb and gutter on both sides and a median was used from 98th Street to 90th Street. From 90th Street eastward to 86th Street, a two lane roadway cross-section with curb and gutter on the south side and a small ditch on the north side was used. From 86th Street to Unser Boulevard, a two lane roadway with borrow ditches located on both sides of the roadway was utilized. Copies of the AHYMO models utilized for this analysis are contained in Appendix A. Sketches of the road sections utilized for the hydraulic calculations are contained in Appendix B.

D. RESULTS

Using the AHYMO model, the peak run-off rates were calculated for the 10-year, 6-hour and the 100-year, 6-hour frequency rainfall events under existing interim, and developed watershed conditions. A summary of the resulting peak runoff rates at various key locations within the watershed under the 10-year event is presented in Table 4. The 100-year event values are contained in Table 5.

TABLE 4
Comparison of Peak Runoff Values for 10-year 6-hour Storm

Location	Existing	Interim I	Interim II	Developed
West Sky at Sage	4	4	4	4
94th and Sage	16	16	16	16
90th, north of Sage	27	45	27	45
90th and Sage	34	56	39	50
86th and Sage	36	52	35	50
Unser and Sage	38	51	38	48
San Ygnacio and Unser	12	12	14	15
Unser playa lake	50	62	51	62
Volume to Unser playa (acre-feet)	4.0	4.6	4.0	4.6

TABLE 5
Comparison of Peak Runoff Values for 100-year 6-hour Storm

Location	Existing	Interim I	Interim II	Developed
West Sky at Sage	10	10	10	10
94th and Sage	35	35	35	35
90th, north of Sage	52	90	68	90
90th and Sage	81	117	95	117
86th and Sage	112	137	99	120
Unser and Sage	106	127	93	110
San Ygnacio and Unser	73	73	97	97
Unser playa lake	179	198	186	198
Volume to Unser playa (acre-feet)	13.8	14.6	13.8	1.6

As indicated in these tables, there is a localized increase in runoff resulting from the development of Sunset West Unit 2. However, there is also a slight reduction of the

peak runoff values which results from the implementation of the SAD #222 improvements north of the project. For the 10-year event the runoff from drainage areas B3 and B4 (Sunset West Units 1 and 2) increases from 27 to 45 cfs. The runoff from the 100-year event at this location increases from 52 to 90 cfs. However, because of hydrograph timing and attenuation of these peaks, the impacts on Sage Road are not as pronounced. At Sage and 90th there is an increase from 34 to 56 cfs; further east on Sage and 86th the increase from 36 to 52 cfs under the 10-year storm event. These increases would be 81 to 117 cfs and 112 to 137 cfs, respectively for the 100-year event. This attenuation is due in part to the roadside channels located along Sage which convey runoff more slowly than a street section would.

private land

An investigation into the overall effects on the existing receiving water course was also made. This water course is presently a large 12± acre natural playa located east of Unser Boulevard and north of Sage. The peak inflow from the entire area east of Unser, between Tower and Sage, for the 100-year event increases from 179 to 198 cfs without the SAD improvements in place (approximately 10 percent), and from 186 to 198 cfs with the SAD improvements. There is an overall 5.8 percent increase in the 100-year runoff volume to this playa, however, because of its size, this results in an approximate 0.06 foot increase in ponding in this playa.

III. HYDRAULICS

A. METHODOLOGY

In order to assess the adequacy of the roadways to convey the peak runoff resulting from the 10-year and the 100-year frequency storm events, hydraulic analyses were performed for the following existing street sections:

- 90th Street between San Ygnacio Road and Sage Road - a two lane (32 foot wide) roadway with curb and gutter;
- Sage Road between 86th and 90th Streets - a two-lane (30-foot wide) roadway cross-section with curb and gutter on the south side and a small ditch on the north side; and
- Sage Road between 86th and Unser Boulevard - a two-lane (30-foot wide) roadway with borrow ditches located on both sides of the roadway;

Sketches of these road sections are contained within Appendix B. Manning's formula for open channel flow was utilized to analyze the maximum allowable capacity of these streets under two scenarios:

- 10-year frequency storm with one 12-foot wide lane open to traffic (per DPM criteria);
- 100-year frequency storm with a maximum water level of 0.2 feet above the top of curb or 0.2 feet above the crown of the road where no curb and gutter is present (Sage Road between 86th Street and Unser Boulevard)(also per DPM criteria).

This allowable street capacity was then compared with the peak runoff rates calculated under existing interim and developed conditions in order to assess the adequacy of the streets to convey these flows. The hydraulic calculations for the maximum allowable street capacities are contained in Appendix B.

B. RESULTS

Table 6 provides a comparison of the calculated maximum allowable street capacity versus the peak runoff rates for the 10-year frequency rainfall event under existing, interim and developed watershed conditions. The flow rates for the 10-year storm show an increase on 90th Street between the existing and developed condition. The street

TABLE 6
Comparison of Street Capacity Versus Calculated Peak Runoff Values for 10-year Storm

Location	Street Capacity (cfs)	Peak Runoff (cfs)			
		Existing	Interim I	Interim II	Developed
90th Street between San Ygnacio and Sage	4	27	45	27	45
Sage Road between 86th and 90th	26	34	56	39	50
Sage Road between 86th and 90th	78	36	52	35	50

capacity is exceeded for all conditions. It may be possible to install an interim channel within the right-of-way of 90th Street to convey this runoff as contained in the original plans for this subdivision.

Sage Road between 90th Street and 86th Street does not have adequate capacity to convey the 10-year runoff event from existing, interim or developed conditions; however, it may be possible to increase the capacity of the adjacent roadside channel to mitigate this problem. → Ditch only on north side Q86 on south

These results are consistent with the previous analyses performed for the Sage Road Improvements, Drainage Report, performed for the City of Albuquerque in 1990, and with the previous Review Comments to DRC from Carlos Montoya of the City of Albuquerque, Public Works Department, Hydrology Division. Both of these previous sources advocate the need for storm improvements to be included with the construction of Sage Road. Due to funding constraints, these improvements were not provided at the time of the original Sage Road construction.

Sage Road between 86th Street and Unser Boulevard, with ditches along both the north and southbound lanes, is capable of handling both existing and future flows during a 10-year frequency.

Table 7 provides a comparison of the calculated maximum allowable street capacity versus the peak runoff rates and velocities for the 100-year frequency rainfall event under both existing and developed watershed conditions. This table indicates that all three roadway sections analyzed are capable of handling both existing and developed peak runoff.

TABLE 7
Comparison of Street Capacity Versus Calculated Peak Runoff Values for 100-year Storm

Location	Street Capacity (cfs)	Peak Runoff (cfs)			
		Existing	Interim I	Interim II	Developed
90th Street between San Ygnacio and Sage	122	52	90	58	90
Sage Road between 86th and 90th	233	81	117	95	117
Sage Road between 86th and 90th	207	112	137	99	120

IV. CONCLUSIONS AND RECOMMENDATIONS

Based upon the results of the hydrologic and hydraulic analysis performed for this study, it is possible to draw the following conclusions and recommendations.

1. As would be expected, there will be a slight increase in the 10 and 100-year peak runoff rates due to the development of the Sunset West Unit 2 subdivision.

2. The construction of the SAD improvements results in a slight reduction of peak runoff along Sage Road.

3. There are negligible impacts to the offsite playa resulting from the construction of Sunset West Unit 2.

4. The street capacities of 90th Street and Sage Road between 90th Street and 86th Street are inadequate to convey the runoff resulting from the 10-year 6-hour frequency storm event under existing watershed conditions.

5. Because of the increase in runoff between existing and developed conditions, the street capacities of 90th Street, and Sage Road between 90th Street and 86th Street are inadequate to convey the runoff resulting from the 10-year, 6-hour frequency storm event under developed watershed conditions for conditions with and without the SAD improvements in place.

6. The street capacity of all three roadway segments analyzed is adequate for conveyance of the 100-year frequency storm runoff.

7. Under DPM guidelines, street capacity less than the 10-year rainfall event would normally require installation of storm sewerage; however, lack of a downstream outfall renders storm sewer construction at this time impractical.

8. The lack of storm sewer infrastructure in Sage Road is an existing problem. Therefore, it may not be wholly equitable to require the private sector to remedy this situation.

9. Channel improvements along the east side of 90th Street and along the westbound lanes of Sage Road between 86th and 90th Streets, are recommended as an interim system to mitigate the nuisance flooding occurring under the 10-year frequency rainfall events.

10. If storm sewers are required to be constructed in 90th Street, it may be possible to install them at this time, and plug them until an outfall can be constructed in Sage Boulevard. This would alleviate the need to re-construct the paving in this area at a later date.

V. BIBLIOGRAPHY

1. Herkenhoff, Gordon, and Associates. Engineer's Report on Storm Drainage for Sunset West Unit 2. February 1980.

2. Andrews, Asbury, and Robert, Inc. Sage Road Improvements Drainage Report. December 1990.

3. Andrews, John. Telephone Conversations. February & March 1994.

4. Albuquerque Metropolitan Arroyo Flood Control Authority. AHYMO Computer Program and User's Manual. September 1993.

5. City of Albuquerque, et al. Development Process Manual. Volume 2, Design Criteria, Section 22.2 - Hydrology. January 1993.

6. Soil Conservation Service - Soil Survey of Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico (1977)", United State Department of Agriculture.

7. Montoya, Carlos. Memorandum to Development Review Committee (DRC) concerning Sage Road Drainage Improvements, dated January 17, 1990.

APPENDIX A

AHYMO COMPUTER RUNS

APPENDIX B

HYDRAULIC CALCULATIONS

APPENDIX A

AHYMO COMPUTER RUNS

4-14-93

AHYMO SUMMARY TABLE (AHYMO993) - AMAFCA VERSION OF HYMO - SEPTEMBER, 1993
INPUT FILE = c:\ahymo\sunset\sw2-e100.dat

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOF VOLUM (AC-F
START						
*S	INPUT FILE NAME: SW2-e100.DAT					
*S	OUTPUT FILE NAME: SW2-e100.OUT					
*S	PROJECT: SUNSET WEST UNIT 2					
*S	CONDITION: EXISTING; 100-YEAR STORM					
*S	(SAD 222 NOT IN PLACE)					
*S	LEEDSHILL-HERKENHOFF, INC.					
RAINFALL	TYPE= 1					
*S	COMPUTE BASIN B1 & PRINT VALUES					
COMPUTE	NM HYD	201.00	-	1	.00672	10.14 .30
*S	ROUTE BASIN B1 FLOWS TO BASIN B2					
*S	COMPUTE TRAVEL TIME					
*S	ROUTE THE FLOW & PRINT					
ROUTE		201.10	1	2	.00672	8.28 .30
*S	COMPUTE BASIN B2					
COMPUTE	NM HYD	202.00	-	1	.01609	27.42 .87
*S	ADD BASIN B1 & B2					
ADD HYD		210.00	1& 2	3	.02281	34.83 1.18
*S	ROUTE COMBINATION OF BASIN B1/B2 FLOWS TO BASIN B3/B4					
ROUTE		202.10	3	4	.02281	29.19 1.18
*S	COMPUTE BASIN B3					
COMPUTE	NM HYD	203.00	-	1	.04219	42.97 2.00
*S	COMPUTE BASIN B4					
COMPUTE	NM HYD	204.00	-	2	.01625	8.55 .39
*S	ADD BASIN B3 & B4					
ADD HYD		220.00	1& 2	5	.05844	51.49 2.39
*S	ADD BASIN B3/B4 & BASIN B1/B2					
ADD HYD		230.00	4& 5	6	.08125	80.52 3.57
*S	ROUTE BASIN B1,B2,B3 & B4 FLOWS TO BASIN A2					
ROUTE		230.10	6	3	.08125	73.61 3.57
*S	COMPUTE BASIN A1					
COMPUTE	NM HYD	301.00	-	2	.09058	37.64 2.19
*S	ROUTE A1 THROUGH A2					
ROUTE		301.10	2	4	.09058	28.46 2.19
*S	COMPUTE BASIN A2					
COMPUTE	NM HYD	102.00	-	1	.03953	19.27 .95
*S	ADD BASINS A1 & A2					
ADD HYD		301.20	4& 1	5	.13011	42.59 3.15
*S	ADD BASINS A1&A2 TO BASIN B1/B2/B3/B4					
ADD HYD		240.00	3& 5	2	.21136	112.19 6.73
*S	ROUTE BASIN A2/B1/B2/B3/B4 FLOWS TO BASIN C1					
ROUTE		240.10	2	3	.21136	94.62 6.73
*S	COMPUTE BASIN C1					
COMPUTE	NM HYD	301.00	-	1	.01797	29.04 1.17
*S	ADD BASIN C1 IN WITH OTHER BASINS					
ADD HYD		250.00	3& 1	2	.22933	106.86 7.90
*S	CALCULATE DRAINAGE FOR BASINS NORTH OF SAN YGNACIO					
*S	COMPUTE BASIN A3					
COMPUTE	NM HYD	310.00	-	3	.09259	47.73 2.24
*S ROUTE A3 THROUGH A4						

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOF VOLUM (AC-F
ROUTE	310.10	3	1	.09259	25.95	2.24
*S	COMPUTE BASIN A4					
COMPUTE NM HYD	310.20	-	4	.06187	28.01	1.50
*S	ADD A3 & A4					
ADD HYD	310.30	4& 1	6	.15446	50.12	3.74
*S	COMPUTE BASIN A5					
COMPUTE NM HYD	305.00	-	5	.09021	23.71	2.18
*S	ADD A5 TO BASINS A3 & A4					
ADD HYD	320.00	5& 6	3	.24467	72.54	5.93
*S	CALCULATE INFLOW INTO UNSER PLAYA					
ADD HYD	330.00	3& 2	4	.47400	179.00	13.83
*S	END CALCULATIONS					
FINISH						

```
    AHYMO PROGRAM (AHYMO993) - AMAFCA VERSION OF HYMO - SEPTEMBER, 1993
         RUN DATE (MON/DAY/YR) = 04/14/1994
         START TIME (HR:MIN:SEC) = 15:15:30     USER NO.= G_NEMETH.S93
         INPUT FILE = c:\ahymo\sunset\sw2-e100.dat

START                    0.0
*
*S       INPUT  FILE NAME:  SW2-e100.DAT
*S       OUTPUT FILE NAME:  SW2-e100.OUT
*S       PROJECT:           SUNSET WEST UNIT 2
*S       CONDITION:         EXISTING; 100-YEAR STORM
*S                                       (SAD  222 NOT IN PLACE)
*S       LEEDSHILL-HERKENHOFF, INC.
*
RAINFALL                 TYPE=1  RAIN QUARTER=0.0
                                    RAIN ONE=1.90 IN  RAIN SIX=2.22 IN
                                    RAIN DAY=0.00 IN  DT=0.033333 HRS

                 COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2
                 DT =     .033333 HOURS        END TIME =     5.999940 HOURS
                    .0000   .0015   .0030   .0046   .0062   .0079   .0096
                    .0113   .0130   .0149   .0167   .0186   .0206   .0226
                    .0246   .0268   .0290   .0312   .0336   .0360   .0385
                    .0411   .0438   .0466   .0496   .0526   .0558   .0592
                    .0627   .0665   .0704   .0757   .0813   .0873   .1002
                    .1291   .1735   .2373   .3244   .4388   .5847   .7664
                    .9881  1.1931  1.2789  1.3514  1.4159  1.4745  1.5285
                   1.5786  1.6255  1.6694  1.7107  1.7497  1.7865  1.8214
                   1.8544  1.8857  1.9154  1.9436  1.9704  1.9765  1.9822
                   1.9876  1.9928  1.9977  2.0025  2.0070  2.0114  2.0156
                   2.0196  2.0235  2.0273  2.0310  2.0346  2.0381  2.0415
                   2.0448  2.0480  2.0511  2.0542  2.0571  2.0601  2.0629
                   2.0657  2.0685  2.0712  2.0738  2.0764  2.0789  2.0814
                   2.0839  2.0863  2.0887  2.0910  2.0933  2.0955  2.0978
                   2.0999  2.1021  2.1042  2.1063  2.1084  2.1104  2.1124
                   2.1144  2.1164  2.1183  2.1202  2.1221  2.1240  2.1258
                   2.1277  2.1295  2.1312  2.1330  2.1347  2.1365  2.1382
                   2.1399  2.1415  2.1432  2.1448  2.1464  2.1480  2.1496
                   2.1512  2.1527  2.1543  2.1558  2.1573  2.1588  2.1603
                   2.1618  2.1633  2.1647  2.1661  2.1676  2.1690  2.1704
                   2.1718  2.1732  2.1745  2.1759  2.1772  2.1786  2.1799
                   2.1812  2.1825  2.1838  2.1851  2.1864  2.1876  2.1889
                   2.1902  2.1914  2.1926  2.1939  2.1951  2.1963  2.1975
                   2.1987  2.1999  2.2010  2.2022  2.2034  2.2045  2.2057
                   2.2068  2.2080  2.2091  2.2102  2.2113  2.2124  2.2135
                   2.2146  2.2157  2.2168  2.2179  2.2189  2.2200

*
*S       COMPUTE BASIN B1 & PRINT VALUES
*
COMPUTE NM HYD           ID=1  HYD=201.0  AREA=0.00672 SQ MI
                                    PER A=75  PER B=0  PER C=0  PER D=25
                                    TP=0.11 HRS  MASS RAIN=-1

    K =    .059950HR    TP =    .110000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =    8.0377    CFS   UNIT VOLUME =    .9982        B =   526.28
    AREA =       .001680 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
```

```
K =    .134449HR    TP =    .110000HR    K/TP RATIO =  1.222262     SHAPE
UNIT PEAK =   12.580    CFS   UNIT VOLUME =    .9981        B =   274.56
AREA =       .005040 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=1  CODE=1

                                        PARTIAL HYDROGRAPH   201.00


RUNOFF VOLUME =       .83763 INCHES      =         .3002 ACRE-FEET
PEAK DISCHARGE RATE =       10.14 CFS  AT   1.500 HOURS   BASIN AREA =


*
*S       ROUTE BASIN B1 FLOWS TO BASIN B2
*
COMPUTE RATING CURVE     CID=1  VS NO=1  NO SEGS=1
                                MIN ELEV=139.1 FT  MAX ELEV=140.7 FT
                                CH SLP=0.0166  FP SLP=0.0166  N=0.018
                                DIST=87 FT
                                DIST  ELEV      DIST  ELEV      DIST  EL
                                  0   140.2      9   139.8      10   13
                                 35   139.6     36   140.3      43   14
                                 50   140.3     51   139.6      76   13
                                 77   139.8     87   140.2

                                 RATING CURVE VALLEY SECTION  1.0
                                    WATER       FLOW       FLOW
                                   SURFACE      AREA       RATE
                                    ELEV        SQ FT      CFS
                                   139.10        .00        .00
                                   139.18        .36        .47
                                   139.27       1.46       2.97
                                   139.35       3.28       8.75
                                   139.44       5.84      18.85
                                   139.52       9.12      34.18
                                   139.61      13.13      55.93
                                   139.69      17.48      89.48
                                   139.77      21.88     129.06
                                   139.86      26.39     169.73
                                   139.94      31.24     214.08
                                   140.03      36.45     264.42
                                   140.11      42.01     321.02
                                   140.19      47.93     384.15
                                   140.28      54.07     467.20
                                   140.36      60.28     548.84
                                   140.45      66.74     634.00
                                   140.53      73.45     725.74
                                   140.62      80.40     824.19
                                   140.70      87.60     929.50
*
*S       COMPUTE TRAVEL TIME
*
COMPUTE TRAVEL TIME      ID=2  REACH NO=1  NO VS=1  L=772 FT
                                     SLP=0.0166
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.084	.365	.47	.1673
.168	1.459	2.97	.1054
.253	3.283	8.75	.0804
.337	5.836	18.85	.0664
.421	9.118	34.18	.0572
.505	13.129	55.93	.0503
.589	17.483	89.48	.0419
.674	21.877	129.06	.0364
.758	26.387	169.73	.0333
.842	31.238	214.08	.0313
.926	36.446	264.42	.0296
1.011	42.012	321.02	.0281
1.095	47.935	384.15	.0268
1.179	54.067	467.20	.0248
1.263	60.284	548.84	.0236
1.347	66.742	634.00	.0226
1.432	73.448	725.74	.0217
1.516	80.402	824.19	.0209
1.600	87.605	929.50	.0202

```
*
*S       ROUTE THE FLOW & PRINT
*
ROUTE                    ID=2  HYD NO=201.1  INFLOW ID=1  DT=0.0
*
PRINT HYD                ID=2  CODE=1

                                   PARTIAL HYDROGRAPH   201.10


    RUNOFF VOLUME =       .83766 INCHES      =        .3002 ACRE-FEET
    PEAK DISCHARGE RATE =        8.28 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B2
*
COMPUTE NM HYD           ID=1  HYD=202.0  AREA=0.01609 SQ MI
                                PER A=20  PER B=50  PER C=0  PER D=30
                                TP=0.13 HRS  MASS RAIN=-1

    K =    .070850HR    TP =    .130000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =    19.541    CFS   UNIT VOLUME =    .9994        B =   526.28
    AREA =       .004827 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =    .136487HR    TP =    .130000HR    K/TP RATIO =  1.049896     SHAPE
    UNIT PEAK =    26.873    CFS   UNIT VOLUME =    .9997        B =   310.18
    AREA =       .011263 SQ MI    IA =    .54286 INCHES    INF =   1.37000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                ID=1  CODE=1
```

PARTIAL HYDROGRAPH 202.00

RUNOFF VOLUME = 1.02481 INCHES = .8794 ACRE-FEET
PEAK DISCHARGE RATE = 27.42 CFS AT 1.500 HOURS BASIN AREA =

```
*
*S      ADD BASIN B1 & B2
*
ADD HYD                 ID=3  HYD=210.0 ID I=1  ID II=2
*
PRINT HYD               ID=3  CODE=1
```

PARTIAL HYDROGRAPH 210.00

RUNOFF VOLUME = .96965 INCHES = 1.1796 ACRE-FEET
PEAK DISCHARGE RATE = 34.83 CFS AT 1.533 HOURS BASIN AREA =

```
*
*S      ROUTE COMBINATION OF BASIN B1/B2 FLOWS TO BASIN B3/B4
*
COMPUTE RATING CURVE    CID=1  VS NO=1  NO SEGS=1
                                MIN ELEV=139.1 FT  MAX ELEV=140.7 FT
                                CH SLP=0.0152  FP SLP=0.0152  N=0.018
                                DIST=87 FT
                                DIST    ELEV    DIST    ELEV    DIST
                                  0     140.2     9     139.8    10
                                 35     139.6    36     140.3    43
                                 50     140.3    51     139.6    76
                                 77     139.8    87     140.2
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
139.10	.00	.00
139.18	.36	.45
139.27	1.46	2.84
139.35	3.28	8.38
139.44	5.84	18.04
139.52	9.12	32.71
139.61	13.13	53.52
139.69	17.48	85.62
139.77	21.88	123.49
139.86	26.39	162.42
139.94	31.24	204.85
140.03	36.45	253.02
140.11	42.01	307.19
140.19	47.93	367.60
140.28	54.07	447.07
140.36	60.28	525.19
140.45	66.74	606.68
140.53	73.45	694.46
140.62	80.40	788.67

```
                                        140.70        87.60        889.44
*
COMPUTE TRAVEL TIME      ID=4  REACH NO=2  NO VS=1  L=1079 FT
                                    SLP=0.0152
```

TRAVEL TIME TABLE

REACH= 2.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.084	.365	.45	.2443
.168	1.459	2.84	.1539
.253	3.283	8.38	.1175
.337	5.836	18.04	.0970
.421	9.118	32.71	.0836
.505	13.129	53.52	.0735
.589	17.483	85.62	.0612
.674	21.877	123.49	.0531
.758	26.387	162.42	.0487
.842	31.238	204.85	.0457
.926	36.446	253.02	.0432
1.011	42.012	307.19	.0410
1.095	47.935	367.60	.0391
1.179	54.067	447.07	.0362
1.263	60.284	525.19	.0344
1.347	66.742	606.68	.0330
1.432	73.448	694.46	.0317
1.516	80.402	788.67	.0306
1.600	87.605	889.44	.0295

```
*
ROUTE                    ID=4  HYD NO=202.1  INFLOW ID=3  DT=0.0
*
PRINT HYD                ID=4  CODE=1

                                   PARTIAL HYDROGRAPH   202.10


    RUNOFF VOLUME =       .96967 INCHES      =       1.1796 ACRE-FEET
    PEAK DISCHARGE RATE =      29.19 CFS  AT   1.567 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B3
*
COMPUTE NM HYD           ID=1  HYD=203.0  AREA=0.04219 SQ MI
                                   PER A=50  PER B=25  PER C=0  PER D=25
                                   TP=0.23 HRS  MASS RAIN=-1

    K =    .125350HR    TP =    .230000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =   24.134    CFS   UNIT VOLUME =    .9995        B =   526.28
    AREA =       .010548 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =    .262620HR    TP =    .230000HR    K/TP RATIO =  1.141825     SHAPE
    UNIT PEAK =   39.894    CFS   UNIT VOLUME =    .9996        B =   289.98
    AREA =       .031643 SQ MI    IA =    .60000 INCHES    INF =   1.53000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
```

```
*
PRINT HYD                    ID=1  CODE=1

                                          PARTIAL HYDROGRAPH   203.00


    RUNOFF VOLUME =       .89009 INCHES      =       2.0028 ACRE-FEET
    PEAK DISCHARGE RATE =       42.97 CFS  AT   1.600 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B4
*
COMPUTE NM HYD               ID=2  HYD=204.0  AREA=0.01625 SQ MI
                                        PER A=100  PER B=0  PER C=0  PER D=0
                                        TP=0.23 HRS  MASS RAIN=-1

    K =   .281120HR    TP =   .230000HR    K/TP RATIO =  1.222262     SHAPE
    UNIT PEAK =   19.399    CFS   UNIT VOLUME =    .9992        B =   274.56
    AREA =       .016250 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=2  CODE=1

                                          PARTIAL HYDROGRAPH   204.00


    RUNOFF VOLUME =       .45484 INCHES      =        .3942 ACRE-FEET
    PEAK DISCHARGE RATE =        8.55 CFS  AT   1.633 HOURS   BASIN AREA =


*
*S       ADD BASIN B3 & B4
*
ADD HYD                      ID=5  HYD=220.0  ID I=1  ID II=2
*
PRINT HYD                    ID=5  CODE=1

                                          PARTIAL HYDROGRAPH   220.00


    RUNOFF VOLUME =       .76906 INCHES      =       2.3970 ACRE-FEET
    PEAK DISCHARGE RATE =       51.49 CFS  AT   1.600 HOURS   BASIN AREA =


*
*S       ADD BASIN B3/B4 & BASIN B1/B2
*
ADD HYD                      ID=6  HYD=230.0  ID I=4  ID II=5
*
PRINT HYD                    ID=6  CODE=1

                                          PARTIAL HYDROGRAPH   230.00
```

RUNOFF VOLUME = .82537 INCHES = 3.5766 ACRE-FEET
PEAK DISCHARGE RATE = 80.52 CFS AT 1.600 HOURS BASIN AREA =

*
*S ROUTE BASIN B1,B2,B3 & B4 FLOWS TO BASIN A2
*
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=2
MIN ELEV=0.0 FT MAX ELEV=2.75 FT
CH SLP=0.0108 FP SLP=0.0108 N=0.022
DIST=20.0 FT N=0.018 DIST=59 FT

DIST	ELEV	DIST	ELEV	DIST
0	2.75	11	0.0	17
23	1.12	29	1.24	38
53	0.88	54	1.55	59

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.00	.00
.14	.10	.13
.29	.42	.80
.43	.94	2.36
.58	1.68	5.08
.72	2.62	9.21
.87	3.77	14.97
1.01	5.73	22.64
1.16	9.83	34.42
1.30	16.30	66.21
1.45	23.28	113.80
1.59	30.40	171.50
1.74	38.00	236.40
1.88	45.99	320.02
2.03	54.07	415.33
2.17	62.23	521.08
2.32	70.48	636.87
2.46	78.81	762.38
2.61	87.22	897.37
2.75	95.72	1041.60

*
COMPUTE TRAVEL TIME ID=3 REACH NO=3 VS NO=1 L=1069 FT
SLP=0.0108

TRAVEL TIME TABLE
REACH= 3.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.145	.105	.13	.2469
.289	.419	.80	.1556
.434	.943	2.36	.1187
.579	1.676	5.08	.0980
.724	2.619	9.21	.0844
.868	3.771	14.97	.0748
1.013	5.728	22.64	.0751
1.158	9.833	34.42	.0848
1.303	16.298	66.21	.0731

```
                                  1.447      23.279      113.80       .0607
                                  1.592      30.397      171.50       .0526
                                  1.737      37.999      236.40       .0477
                                  1.882      45.991      320.02       .0427
                                  2.026      54.070      415.33       .0387
                                  2.171      62.232      521.08       .0355
                                  2.316      70.479      636.87       .0329
                                  2.461      78.809      762.38       .0307
                                  2.605      87.222      897.37       .0289
                                  2.750      95.720     1041.60       .0273
*
ROUTE                     ID=3  HYD NO=230.1  INFLOW ID=6  DT=0.0
*
PRINT HYD                 ID=3  CODE=1

                                     PARTIAL HYDROGRAPH   230.10


    RUNOFF VOLUME =       .82538 INCHES      =       3.5766 ACRE-FEET
    PEAK DISCHARGE RATE =      73.61 CFS  AT   1.667 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN A1
*
COMPUTE NM HYD            ID=2  HYD=301.0  AREA=0.09058 SQ MI
                           PER A=100 PER B=0 PER C=0 PER D=0
                           TP=0.30 MASS RAIN=-1

    K =    .359078HR    TP =    .300000HR    K/TP RATIO =  1.196927     SHAPE
    UNIT PEAK =   84.305    CFS   UNIT VOLUME =    .9998        B =   279.22
    AREA =       .090580 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                      ID=2 CODE=1

                                        HYDROGRAPH FROM AREA   301.00


    RUNOFF VOLUME =       .45484 INCHES      =       2.1973 ACRE-FEET
    PEAK DISCHARGE RATE =      37.64 CFS  AT   1.700 HOURS   BASIN AREA =


*
*S                    ROUTE A1 THROUGH A2
*
COMPUTE RATING CURVE        CID=1   VS NO=1 NO SEGS=1
                                    MIN ELEV=109.0  MAX ELEV=110.0
                                    CH SLP=0.0152   FP SLP=0.0152 N=0.035
                                    DIST=100.0
                                    DIST    ELEV    DIST    ELEV
                                    0       110.0   10      109.0
                                    90      109.0   100     110.0

                                     RATING CURVE VALLEY SECTION  1.0
                                         WATER       FLOW        FLOW
                                        SURFACE      AREA        RATE
```

ELEV	SQ FT	CFS
109.00	.00	.00
109.05	4.24	3.10
109.11	8.53	9.87
109.16	12.88	19.45
109.21	17.29	31.48
109.26	21.75	45.77
109.32	26.26	62.17
109.37	30.83	80.58
109.42	35.46	100.91
109.47	40.14	123.10
109.53	44.88	147.09
109.58	49.67	172.85
109.63	54.52	200.33
109.68	59.42	229.51
109.74	64.38	260.36
109.79	69.40	292.85
109.84	74.47	326.96
109.89	79.59	362.69
109.95	84.77	400.01
110.00	90.01	438.91

```
*
COMPUTE TRAVEL TIME ID=4    REACH NO=4       NO VS=1 L=1450
                                  SLP=0.0152
```

TRAVEL TIME TABLE

REACH= 4.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	4.239	3.10	.5503
.105	8.532	9.87	.3481
.158	12.882	19.45	.2668
.211	17.287	31.48	.2212
.263	21.747	45.77	.1914
.316	26.262	62.17	.1701
.368	30.833	80.58	.1541
.421	35.460	100.91	.1415
.474	40.141	123.10	.1313
.526	44.879	147.09	.1229
.579	49.671	172.85	.1157
.632	54.519	200.33	.1096
.684	59.423	229.51	.1043
.737	64.382	260.36	.0996
.790	69.396	292.85	.0954
.842	74.465	326.96	.0917
.895	79.590	362.69	.0884
.947	84.771	400.01	.0854
1.000	90.007	438.91	.0826

```
*
ROUTE                                ID=4    HYD NO=301.1    INFLOW ID=2
*
PRINT HYD                      ID=4 CODE=1
```

HYDROGRAPH FROM AREA 301.10

```
RUNOFF VOLUME =       .45485 INCHES     =       2.1973 ACRE-FEET
PEAK DISCHARGE RATE =      28.46 CFS  AT   1.833 HOURS   BASIN AREA =
```

```
*
*S       COMPUTE BASIN A2
*
COMPUTE NM HYD            ID=1  HYD=102.0  AREA=0.03953 SQ MI
                                     PER A=100  PER B=0  PER C=0  PER D=0
                                     TP=0.25 HRS  MASS RAIN=-1

    K =    .305565HR    TP =    .250000HR    K/TP RATIO =  1.222262     SHAPE
    UNIT PEAK =   43.414    CFS   UNIT VOLUME =    .9996        B =   274.56
    AREA =       .039530 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                 ID=1  CODE=1

                                     PARTIAL HYDROGRAPH   102.00


    RUNOFF VOLUME =       .45484 INCHES     =        .9589 ACRE-FEET
    PEAK DISCHARGE RATE =      19.27 CFS  AT   1.633 HOURS   BASIN AREA =


*
*S                  ADD BASINS A1 & A2
*
ADD HYD                           ID=5 HYD=301.2  ID I=4 ID II=1
*
PRINT HYD                    ID=5  CODE=1

                                     HYDROGRAPH FROM AREA   301.20


    RUNOFF VOLUME =       .45484 INCHES     =       3.1562 ACRE-FEET
    PEAK DISCHARGE RATE =      42.59 CFS  AT   1.767 HOURS   BASIN AREA =


*
*S       ADD BASINS A1&A2 TO BASIN B1/B2/B3/B4
*
ADD HYD                   ID=2  HYD=240.0  ID I=3  ID II=5
*
PRINT HYD                 ID=2  CODE=1

                                     PARTIAL HYDROGRAPH   240.00


    RUNOFF VOLUME =       .59728 INCHES     =       6.7328 ACRE-FEET
    PEAK DISCHARGE RATE =     112.19 CFS  AT   1.700 HOURS   BASIN AREA =


*
*S       ROUTE BASIN A2/B1/B2/B3/B4 FLOWS TO BASIN C1
*
COMPUTE RATING CURVE      CID=1  VS NO=1  NO SEGS=2
```

MIN ELEV=1.58 FT MAX ELEV=5.58 FT
CH SLP=0.0108 FP SLP=0.0108 N=0.022
DIST=20.0 FT N=0.018 DIST=86 FT

DIST	ELEV	DIST	ELEV	DIST
0	5.58	16	1.58	22
43	3.0	64	2.58	70
86	5.58			

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
1.58	.00	.00
1.79	.44	.76
2.00	1.77	4.83
2.21	3.99	14.23
2.42	7.09	30.65
2.63	11.20	50.14
2.84	19.00	85.57
3.05	31.45	161.32
3.26	45.47	286.78
3.47	59.86	443.19
3.69	74.59	628.34
3.90	89.68	840.79
4.11	105.13	1079.52
4.32	120.93	1343.78
4.53	137.09	1633.04
4.74	153.60	1946.86
4.95	170.46	2284.94
5.16	187.68	2647.03
5.37	205.25	3032.97
5.58	223.18	3442.61

*
COMPUTE TRAVEL TIME ID=3 REACH NO=5 VS NO=1 L=2170 FT
SLP=0.0108

TRAVEL TIME TABLE
REACH= 5.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.211	.443	.76	.3514
.421	1.773	4.83	.2214
.632	3.989	14.23	.1689
.842	7.091	30.65	.1395
1.053	11.202	50.14	.1347
1.263	19.003	85.57	.1339
1.474	31.446	161.32	.1175
1.684	45.474	286.78	.0956
1.895	59.856	443.19	.0814
2.105	74.593	628.34	.0716
2.316	89.684	840.79	.0643
2.526	105.130	1079.52	.0587
2.737	120.931	1343.78	.0542
2.947	137.086	1633.04	.0506
3.158	153.595	1946.86	.0476
3.368	170.460	2284.94	.0450
3.579	187.679	2647.03	.0427
3.789	205.252	3032.97	.0408

```
                                    4.000      223.180      3442.61          .0391
*
ROUTE                      ID=3  HYD NO=240.1  INFLOW ID=2  DT=0.0
*
PRINT HYD                  ID=3  CODE=1

                                         PARTIAL HYDROGRAPH   240.10


    RUNOFF VOLUME =        .59728 INCHES      =        6.7328 ACRE-FEET
    PEAK DISCHARGE RATE =      94.62 CFS  AT   1.833 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN C1
*
COMPUTE NM HYD             ID=1  HYD=301.0  AREA=0.01797 SQ MI
                                 PER A=50  PER B=0  PER C=0  PER D=50
                                 TP=0.17 HRS  MASS RAIN=-1

    K =    .092650HR    TP =    .170000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =   27.815    CFS   UNIT VOLUME =    .9998        B =   526.28
    AREA =       .008985 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =    .207785HR    TP =    .170000HR    K/TP RATIO =  1.222262     SHAPE
    UNIT PEAK =   14.512    CFS   UNIT VOLUME =    .9988        B =   274.56
    AREA =       .008985 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                  ID=1  CODE=1

                                         HYDROGRAPH FROM AREA   301.00


    RUNOFF VOLUME =      1.22041 INCHES      =        1.1696 ACRE-FEET
    PEAK DISCHARGE RATE =      29.04 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S       ADD BASIN C1 IN WITH OTHER BASINS
*
ADD HYD                    ID=2  HYD=250.0  ID I=3  ID II=1
*
PRINT HYD                  ID=2  CODE=1

                                         PARTIAL HYDROGRAPH   250.00


    RUNOFF VOLUME =        .64610 INCHES      =        7.9024 ACRE-FEET
    PEAK DISCHARGE RATE =     106.86 CFS  AT   1.800 HOURS   BASIN AREA =


*
*S                 CALCULATE DRAINAGE FOR BASINS NORTH OF SAN YGNACIO
```

```
*
*S                    COMPUTE BASIN A3
*
COMPUTE NM HYD                ID=3 HYD NO=310.0  AREA=0.09259 SQ MI
                                     PER A=100 PER B=0 PER C=0 PER D=0
                                     TP=0.24 MASS RAIN=-1

    K =    .286827HR    TP =    .240000HR    K/TP RATIO =  1.195114     SHAPE
    UNIT PEAK =   107.85    CFS   UNIT VOLUME =    .9999        B =   279.56
    AREA =       .092590 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                     ID=3 CODE=1

                                          HYDROGRAPH FROM AREA   310.00


    RUNOFF VOLUME =       .45484 INCHES      =       2.2461 ACRE-FEET
    PEAK DISCHARGE RATE =      47.73 CFS  AT   1.633 HOURS   BASIN AREA =


*
*S ROUTE A3 THROUGH A4
*
COMPUTE RATING CURVE          CID=1 VS NO=1 NO SEGS=1
                                     MIN ELEV=85.6 MAX ELEV=86.0
                                     CH SLP=0.0147 FP SLP=0.0147 N=0.035
                                     DIST=250.0 FT
                                     DIST    ELEV    DIST    ELEV
                                     0       86.0    20      85.8
                                     125     85.6    230     85.8
                                     250     86.0

                                      RATING CURVE VALLEY SECTION  1.0
                                          WATER        FLOW        FLOW
                                         SURFACE       AREA        RATE
                                          ELEV         SQ FT       CFS
                                          85.60          .00         .00
                                          85.62          .23         .06
                                          85.64          .93         .37
                                          85.66         2.09        1.08
                                          85.68         3.72        2.32
                                          85.71         5.82        4.20
                                          85.73         8.37        6.84
                                          85.75        11.40       10.31
                                          85.77        14.89       14.72
                                          85.79        18.84       20.15
                                          85.81        23.21       27.34
                                          85.83        27.72       36.28
                                          85.85        32.32       46.25
                                          85.87        37.01       57.23
                                          85.89        41.78       69.20
                                          85.92        46.64       82.13
                                          85.94        51.60       96.02
                                          85.96        56.64      110.85
                                          85.98        61.77      126.62
                                          86.00        66.98      143.31
*
```

```
COMPUTE TRAVEL TIME ID=1 REACH NO=6          VS=1 L=1630
                                   SLP=0.0147

                          TRAVEL TIME TABLE
                                          REACH=  6.0

                          WATER      AVERAGE     FLOW        TRAVEL
                          DEPTH      AREA        RATE        TIME
                          FEET       SQ.FT.      CFS         HRS
                             .021        .233        .06      1.8315
                             .042        .930        .37      1.1538
                             .063       2.094       1.08       .8805
                             .084       3.722       2.32       .7268
                             .105       5.815       4.20       .6264
                             .126       8.374       6.84       .5547
                             .147      11.398      10.31       .5005
                             .168      14.887      14.72       .4579
                             .189      18.842      20.15       .4233
                             .210      23.214      27.34       .3844
                             .232      27.723      36.28       .3460
                             .253      32.321      46.25       .3164
                             .274      37.007      57.23       .2928
                             .295      41.782      69.20       .2734
                             .316      46.645      82.13       .2571
                             .337      51.597      96.02       .2433
                             .358      56.638     110.85       .2313
                             .379      61.767     126.62       .2209
                             .400      66.985     143.31       .2116
*
ROUTE                                  ID=1    HYD NO=310.1    INFLOW ID=3 DT=0
*
PRINT HYD                     ID=1 CODE=1

                                         HYDROGRAPH FROM AREA   310.10


    RUNOFF VOLUME =       .45485 INCHES      =       2.2461 ACRE-FEET
    PEAK DISCHARGE RATE =       25.95 CFS  AT   1.833 HOURS   BASIN AREA =

*
*S                   COMPUTE  BASIN A4
*
COMPUTE NM HYD                ID=4    HYD=310.2        AREA=0.06187 SQ MI
                                      PER A=100 PER B=0 PER C=0 PER D=0
                                      TP=0.27 MASS RAIN=-1

    K =    .330011HR    TP =    .270000HR    K/TP RATIO =  1.222262     SHAPE
    UNIT PEAK =   62.916    CFS   UNIT VOLUME =    .9997        B =   274.56
    AREA =       .061870 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
*S                   ADD A3 & A4
*
ADD HYD                               ID=6 HYD NO=310.3 ID I=4 ID II=1
*
PRINT HYD           ID=6 CODE=1
```

HYDROGRAPH FROM AREA 310.30

RUNOFF VOLUME = .45483 INCHES = 3.7468 ACRE-FEET
PEAK DISCHARGE RATE = 50.12 CFS AT 1.733 HOURS BASIN AREA =

```
*
*S                    COMPUTE BASIN A5
*
COMPUTE NM HYD                ID=5    HYD NO=305.0    AREA=0.09021 SQ MI
                                      PER A=100 PER B=0 PER C=0 PER D=0
                                      TP=0.48 MASS RAIN=-1
```

K = .574685HR TP = .480000HR K/TP RATIO = 1.197261 SHAPE
UNIT PEAK = 52.464 CFS UNIT VOLUME = .9997 B = 279.15
AREA = .090210 SQ MI IA = .65000 INCHES INF = 1.67000 I
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

```
*
PRINT HYD                     ID=5 CODE=1
```

HYDROGRAPH FROM AREA 305.00

RUNOFF VOLUME = .45484 INCHES = 2.1883 ACRE-FEET
PEAK DISCHARGE RATE = 23.71 CFS AT 1.867 HOURS BASIN AREA =

```
*
*S                    ADD A5 TO BASINS A3 & A4
*
ADD HYD                               ID=3    HYD NO=320.0 ID I = 5   ID II=6
*
PRINT HYD                     ID=3 CODE=1
```

HYDROGRAPH FROM AREA 320.00

RUNOFF VOLUME = .45483 INCHES = 5.9351 ACRE-FEET
PEAK DISCHARGE RATE = 72.54 CFS AT 1.767 HOURS BASIN AREA =

```
*
*S                    CALCULATE INFLOW INTO UNSER PLAYA
*
ADD HYD                               ID=4 HYD=330.0  ID I=3 ID II=2
*
PRINT HYD                     ID=4 CODE=-1
```

HYDROGRAPH FROM AREA 330.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	3.300	15.3	6.600	1.2
.033	.0	3.333	14.7	6.633	1.2
.067	.0	3.367	14.2	6.667	1.1

.100	.0	3.400	13.8	6.700	1.1
.133	.0	3.433	13.3	6.733	1.1
.167	.0	3.467	12.9	6.767	1.0
.200	.0	3.500	12.5	6.800	1.0
.233	.0	3.533	12.1	6.833	1.0
.267	.0	3.567	11.7	6.867	.9
.300	.0	3.600	11.3	6.900	.9
.333	.0	3.633	11.0	6.933	.9
.367	.0	3.667	10.6	6.967	.9
.400	.0	3.700	10.3	7.000	.8
.433	.0	3.733	10.0	7.033	.8

.1	13.633	.0			
.467	.0	3.767	9.6	7.067	.8
.500	.0	3.800	9.3	7.100	.8
.533	.0	3.833	9.0	7.133	.7
.567	.0	3.867	8.7	7.167	.7
.600	.0	3.900	8.5	7.200	.7
.633	.0	3.933	8.2	7.233	.7
.667	.0	3.967	8.0	7.267	.7
.700	.0	4.000	7.7	7.300	.6
.733	.0	4.033	7.5	7.333	.6
.767	.0	4.067	7.3	7.367	.6
.800	.0	4.100	7.1	7.400	.6
.833	.0	4.133	6.9	7.433	.6
.867	.0	4.167	6.7	7.467	.6
.900	.0	4.200	6.6	7.500	.5
.933	.0	4.233	6.4	7.533	.5
.967	.0	4.267	6.2	7.567	.5
1.000	.0	4.300	6.1	7.600	.5
1.033	.0	4.333	5.9	7.633	.5
1.067	.0	4.367	5.8	7.667	.5
1.100	.0	4.400	5.6	7.700	.5
1.133	.0	4.433	5.5	7.733	.4
1.167	.0	4.467	5.4	7.767	.4
1.200	.1	4.500	5.2	7.800	.4
1.233	.5	4.533	5.1	7.833	.4
1.267	1.5	4.567	5.0	7.867	.4
1.300	3.0	4.600	4.9	7.900	.4
1.333	5.1	4.633	4.7	7.933	.4
1.367	8.6	4.667	4.6	7.967	.4
1.400	15.8	4.700	4.5	8.000	.4
1.433	28.2	4.733	4.4	8.033	.4
1.467	45.6	4.767	4.3	8.067	.3
1.500	66.5	4.800	4.2	8.100	.3
1.533	87.9	4.833	4.0	8.133	.3
1.567	108.4	4.867	3.9	8.167	.3
1.600	127.3	4.900	3.9	8.200	.3
1.633	143.7	4.933	3.8	8.233	.3
1.667	157.4	4.967	3.7	8.267	.3
1.700	167.8	5.000	3.6	8.300	.3
1.733	174.8	5.033	3.5	8.333	.3
1.767	178.4	5.067	3.4	8.367	.3
1.800	179.0	5.100	3.3	8.400	.3
1.833	176.9	5.133	3.3	8.433	.3
1.867	172.7	5.167	3.2	8.467	.3
1.900	167.1	5.200	3.1	8.500	.3
1.933	160.8	5.233	3.1	8.533	.2
1.967	154.0	5.267	3.0	8.567	.2
2.000	146.9	5.300	2.9	8.600	.2
2.033	139.7	5.333	2.9	8.633	.2
2.067	132.4	5.367	2.8	8.667	.2
2.100	124.8	5.400	2.7	8.700	.2
2.133	117.1	5.433	2.7	8.733	.2
2.167	109.3	5.467	2.6	8.767	.2
2.200	101.7	5.500	2.6	8.800	.2
2.233	94.5	5.533	2.5	8.833	.2
2.267	87.7	5.567	2.5	8.867	.2
2.300	81.1	5.600	2.4	8.900	.2
2.333	74.6	5.633	2.4	8.933	.2
2.367	68.5	5.667	2.3	8.967	.2
2.400	63.3	5.700	2.3	9.000	.2

2.433	58.6	5.733	2.3	9.033	.2
2.467	54.4	5.767	2.2	9.067	.2
2.500	50.5	5.800	2.2	9.100	.2
2.533	47.1	5.833	2.1	9.133	.2
2.567	44.1	5.867	2.1	9.167	.2
2.600	41.4	5.900	2.1	9.200	.2
2.633	39.0	5.933	2.0	9.233	.2
2.667	36.8	5.967	2.0	9.267	.1
2.700	34.7	6.000	2.0	9.300	.1
2.733	32.9	6.033	1.9	9.333	.1
2.767	31.2	6.067	1.9	9.367	.1
2.800	29.6	6.100	1.8	9.400	.1
2.833	28.1	6.133	1.8	9.433	.1
2.867	26.7	6.167	1.7	9.467	.1
2.900	25.5	6.200	1.7	9.500	.1
2.933	24.3	6.233	1.6	9.533	.1
2.967	23.3	6.267	1.6	9.567	.1
3.000	22.3	6.300	1.5	9.600	.1
3.033	21.3	6.333	1.5	9.633	.1
3.067	20.4	6.367	1.4	9.667	.1
3.100	19.6	6.400	1.4	9.700	.1
3.133	18.8	6.433	1.4	9.733	.1
3.167	18.0	6.467	1.3	9.767	.1
3.200	17.3	6.500	1.3	9.800	.1
3.233	16.6	6.533	1.3	9.833	.1
3.267	15.9	6.567	1.2	9.867	.1

```
RUNOFF VOLUME =        .54737 INCHES      =       13.8375 ACRE-FEET
PEAK DISCHARGE RATE =      179.00 CFS  AT   1.800 HOURS   BASIN AREA =
```

```
*
*S       END CALCULATIONS
*
FINISH

    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 15:16:55
```

```
AHYMO SUMMARY TABLE (AHYMO993) - AMAFCA VERSION OF HYMO - SEPTEMBER, 1993
INPUT FILE = c:\ahymo\sunset\sw2-i100.dat

                                  FROM  TO                        PEAK          RUNOF
                     HYDROGRAPH    ID   ID          AREA      DISCHARGE        VOLUM
COMMAND        IDENTIFICATION     NO.  NO.       (SQ MI)        (CFS)         (AC-F

START
*S       INPUT  FILE NAME:  SW2-i100.DAT
*S       OUTPUT FILE NAME:  SW2-i100.OUT
*S       PROJECT:           SUNSET WEST UNIT 2
*S       CONDITION:         INTERIM 1; 100-YEAR STORM
*S                                    (SAD  222 NOT IN PLACE; SUNSET WEST U
*S       LEEDSHILL-HERKENHOFF, INC.
RAINFALL  TYPE= 1
*S       COMPUTE BASIN B1 & PRINT VALUES
COMPUTE NM HYD        201.00   -     1        .00672        10.14         .30
*S       ROUTE BASIN B1 FLOWS TO BASIN B2
*S       COMPUTE TRAVEL TIME
*S       ROUTE THE FLOW & PRINT
ROUTE                 201.10    1    2        .00672         8.28         .30
*S       COMPUTE BASIN B2
COMPUTE NM HYD        202.00   -     1        .01609        27.42         .87
*S       ADD BASIN B1 & B2
ADD HYD               210.00  1& 2   3        .02281        34.83        1.18
*S       ROUTE COMBINATION OF BASIN B1/B2 FLOWS TO BASIN B3/B4
ROUTE                 202.10    3    4        .02281        29.19        1.18
*S       COMPUTE BASIN B3
COMPUTE NM HYD        203.00   -     1        .04219        63.51        2.30
*S       COMPUTE BASIN B4
COMPUTE NM HYD        204.00   -     2        .01625        27.69         .88
*S       ADD BASIN B3 & B4
ADD HYD               220.00  1& 2   5        .05844        90.32        3.19
*S       ADD BASIN B3/B4 & BASIN B1/B2
ADD HYD               230.00  4& 5   6        .08125       117.08        4.37
*S       ROUTE BASIN B1,B2,B3 & B4 FLOWS TO BASIN A2
ROUTE                 230.10    6    3        .08125       107.28        4.37
*S       COMPUTE BASIN A1
COMPUTE NM HYD        301.00   -     2        .09058        37.64        2.19
*S                  ROUTE A1 THROUGH A2
ROUTE                 301.10    2    4        .09058        28.46        2.19
*S       COMPUTE BASIN A2
COMPUTE NM HYD        102.00   -     1        .03953        19.27         .95
*S                  ADD BASINS A1 & A2
ADD HYD               301.20  4& 1   5        .13011        42.59        3.15
*S       ADD BASINS A1&A2 TO BASIN B1/B2/B3/B4
ADD HYD               240.00  3& 5   2        .21136       136.57        7.53
*S       ROUTE BASIN A2/B1/B2/B3/B4 FLOWS TO BASIN C1
ROUTE                 240.10    2    3        .21136       111.67        7.53
*S       COMPUTE BASIN C1
COMPUTE NM HYD        301.00   -     1        .01797        29.04        1.17
*S       ADD BASIN C1 IN WITH OTHER BASINS
ADD HYD               250.00  3& 1   2        .22933       127.18        8.70
*S                  CALCULATE DRAINAGE FOR BASINS NORTH OF SAN YGNACIO
*S                  COMPUTE BASIN A3
COMPUTE NM HYD        310.00   -     3        .09259        47.73        2.24
*S ROUTE A3 THROUGH A4
```

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOF VOLUM (AC-F
ROUTE	310.10	3	1	.09259	25.95	2.24
*S	COMPUTE BASIN A4					
COMPUTE NM HYD	310.20	-	4	.06187	28.01	1.50
*S	ADD A3 & A4					
ADD HYD	310.30	4& 1	6	.15446	50.12	3.74
*S	COMPUTE BASIN A5					
COMPUTE NM HYD	305.00	-	5	.09021	23.71	2.18
*S	ADD A5 TO BASINS A3 & A4					
ADD HYD	320.00	5& 6	3	.24467	72.54	5.93
*S	CALCULATE INFLOW INTO UNSER PLAYA					
ADD HYD	330.00	3& 2	4	.47400	198.91	14.63
*S	END CALCULATIONS					
FINISH						

```
     AHYMO PROGRAM (AHYMO993) - AMAFCA VERSION OF HYMO - SEPTEMBER, 1993
          RUN DATE (MON/DAY/YR) = 04/14/1994
          START TIME (HR:MIN:SEC) = 15:22:47     USER NO.= G_NEMETH.S93
          INPUT FILE = c:\ahymo\sunset\sw2-i100.dat

START                    0.0
*
*S       INPUT  FILE NAME:  SW2-i100.DAT
*S       OUTPUT FILE NAME:  SW2-i100.OUT
*S       PROJECT:           SUNSET WEST UNIT 2
*S       CONDITION:         INTERIM 1; 100-YEAR STORM
*S                                     (SAD  222 NOT IN PLACE; SUNSET WEST U
*S       LEEDSHILL-HERKENHOFF, INC.
*
RAINFALL                 TYPE=1  RAIN QUARTER=0.0
                                    RAIN ONE=1.90 IN  RAIN SIX=2.22 IN
                                    RAIN DAY=0.00 IN  DT=0.033333 HRS

                    COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2
                    DT =     .033333 HOURS        END TIME =     5.999940 HOURS
                       .0000   .0015   .0030   .0046   .0062   .0079   .0096
                       .0113   .0130   .0149   .0167   .0186   .0206   .0226
                       .0246   .0268   .0290   .0312   .0336   .0360   .0385
                       .0411   .0438   .0466   .0496   .0526   .0558   .0592
                       .0627   .0665   .0704   .0757   .0813   .0873   .1002
                       .1291   .1735   .2373   .3244   .4388   .5847   .7664
                       .9881  1.1931  1.2789  1.3514  1.4159  1.4745  1.5285
                      1.5786  1.6255  1.6694  1.7107  1.7497  1.7865  1.8214
                      1.8544  1.8857  1.9154  1.9436  1.9704  1.9765  1.9822
                      1.9876  1.9928  1.9977  2.0025  2.0070  2.0114  2.0156
                      2.0196  2.0235  2.0273  2.0310  2.0346  2.0381  2.0415
                      2.0448  2.0480  2.0511  2.0542  2.0571  2.0601  2.0629
                      2.0657  2.0685  2.0712  2.0738  2.0764  2.0789  2.0814
                      2.0839  2.0863  2.0887  2.0910  2.0933  2.0955  2.0978
                      2.0999  2.1021  2.1042  2.1063  2.1084  2.1104  2.1124
                      2.1144  2.1164  2.1183  2.1202  2.1221  2.1240  2.1258
                      2.1277  2.1295  2.1312  2.1330  2.1347  2.1365  2.1382
                      2.1399  2.1415  2.1432  2.1448  2.1464  2.1480  2.1496
                      2.1512  2.1527  2.1543  2.1558  2.1573  2.1588  2.1603
                      2.1618  2.1633  2.1647  2.1661  2.1676  2.1690  2.1704
                      2.1718  2.1732  2.1745  2.1759  2.1772  2.1786  2.1799
                      2.1812  2.1825  2.1838  2.1851  2.1864  2.1876  2.1889
                      2.1902  2.1914  2.1926  2.1939  2.1951  2.1963  2.1975
                      2.1987  2.1999  2.2010  2.2022  2.2034  2.2045  2.2057
                      2.2068  2.2080  2.2091  2.2102  2.2113  2.2124  2.2135
                      2.2146  2.2157  2.2168  2.2179  2.2189  2.2200

*
*S       COMPUTE BASIN B1 & PRINT VALUES
*
COMPUTE NM HYD           ID=1  HYD=201.0  AREA=0.00672 SQ MI
                                    PER A=75  PER B=0  PER C=0  PER D=25
                                    TP=0.11 HRS  MASS RAIN=-1

     K =    .059950HR    TP =    .110000HR    K/TP RATIO =    .545000     SHAPE
     UNIT PEAK =    8.0377    CFS   UNIT VOLUME =    .9982        B =   526.28
     AREA =       .001680 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
```

```
K =    .134449HR     TP =    .110000HR     K/TP RATIO =  1.222262      SHAPE
UNIT PEAK =    12.580     CFS    UNIT VOLUME =     .9981        B =    274.56
AREA =       .005040 SQ MI     IA =     .65000 INCHES     INF =    1.67000 I
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=1  CODE=1

                                        PARTIAL HYDROGRAPH   201.00


RUNOFF VOLUME =       .83763 INCHES      =          .3002 ACRE-FEET
PEAK DISCHARGE RATE =      10.14 CFS  AT   1.500 HOURS   BASIN AREA =


*
*S       ROUTE BASIN B1 FLOWS TO BASIN B2
*
COMPUTE RATING CURVE     CID=1  VS NO=1  NO SEGS=1
                                  MIN ELEV=139.1 FT  MAX ELEV=140.7 FT
                                  CH SLP=0.0166  FP SLP=0.0166  N=0.018
                                  DIST=87 FT
                                  DIST  ELEV      DIST  ELEV      DIST  EL
                                    0   140.2       9   139.8      10   13
                                   35   139.6      36   140.3      43   14
                                   50   140.3      51   139.6      76   13
                                   77   139.8      87   140.2

                                   RATING CURVE VALLEY SECTION  1.0
                                       WATER        FLOW        FLOW
                                      SURFACE       AREA        RATE
                                       ELEV         SQ FT       CFS
                                      139.10         .00         .00
                                      139.18         .36         .47
                                      139.27        1.46        2.97
                                      139.35        3.28        8.75
                                      139.44        5.84       18.85
                                      139.52        9.12       34.18
                                      139.61       13.13       55.93
                                      139.69       17.48       89.48
                                      139.77       21.88      129.06
                                      139.86       26.39      169.73
                                      139.94       31.24      214.08
                                      140.03       36.45      264.42
                                      140.11       42.01      321.02
                                      140.19       47.93      384.15
                                      140.28       54.07      467.20
                                      140.36       60.28      548.84
                                      140.45       66.74      634.00
                                      140.53       73.45      725.74
                                      140.62       80.40      824.19
                                      140.70       87.60      929.50
*
*S       COMPUTE TRAVEL TIME
*
COMPUTE TRAVEL TIME      ID=2  REACH NO=1  NO VS=1  L=772 FT
                                     SLP=0.0166
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.084	.365	.47	.1673
.168	1.459	2.97	.1054
.253	3.283	8.75	.0804
.337	5.836	18.85	.0664
.421	9.118	34.18	.0572
.505	13.129	55.93	.0503
.589	17.483	89.48	.0419
.674	21.877	129.06	.0364
.758	26.387	169.73	.0333
.842	31.238	214.08	.0313
.926	36.446	264.42	.0296
1.011	42.012	321.02	.0281
1.095	47.935	384.15	.0268
1.179	54.067	467.20	.0248
1.263	60.284	548.84	.0236
1.347	66.742	634.00	.0226
1.432	73.448	725.74	.0217
1.516	80.402	824.19	.0209
1.600	87.605	929.50	.0202

```
*
*S      ROUTE THE FLOW & PRINT
*
ROUTE                    ID=2  HYD NO=201.1  INFLOW ID=1  DT=0.0
*
PRINT HYD                ID=2  CODE=1

                                   PARTIAL HYDROGRAPH   201.10


    RUNOFF VOLUME =       .83766 INCHES      =        .3002 ACRE-FEET
    PEAK DISCHARGE RATE =       8.28 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S      COMPUTE BASIN B2
*
COMPUTE NM HYD           ID=1  HYD=202.0  AREA=0.01609 SQ MI
                                   PER A=20  PER B=50  PER C=0  PER D=30
                                   TP=0.13 HRS  MASS RAIN=-1

    K =    .070850HR    TP =    .130000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =    19.541    CFS   UNIT VOLUME =    .9994        B =   526.28
    AREA =       .004827 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =    .136487HR    TP =    .130000HR    K/TP RATIO =  1.049896     SHAPE
    UNIT PEAK =    26.873    CFS   UNIT VOLUME =    .9997        B =   310.18
    AREA =       .011263 SQ MI    IA =    .54286 INCHES    INF =   1.37000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                ID=1  CODE=1
```

PARTIAL HYDROGRAPH 202.00

RUNOFF VOLUME = 1.02481 INCHES = .8794 ACRE-FEET
PEAK DISCHARGE RATE = 27.42 CFS AT 1.500 HOURS BASIN AREA =

```
*
*S      ADD BASIN B1 & B2
*
ADD HYD                ID=3  HYD=210.0 ID I=1  ID II=2
*
PRINT HYD              ID=3  CODE=1
```

PARTIAL HYDROGRAPH 210.00

RUNOFF VOLUME = .96965 INCHES = 1.1796 ACRE-FEET
PEAK DISCHARGE RATE = 34.83 CFS AT 1.533 HOURS BASIN AREA =

```
*
*S      ROUTE COMBINATION OF BASIN B1/B2 FLOWS TO BASIN B3/B4
*
COMPUTE RATING CURVE    CID=1  VS NO=1  NO SEGS=1
                                MIN ELEV=139.1 FT  MAX ELEV=140.7 FT
                                CH SLP=0.0152  FP SLP=0.0152  N=0.018
                                DIST=87 FT
                                DIST    ELEV    DIST    ELEV    DIST
                                  0     140.2     9     139.8    10
                                 35     139.6    36     140.3    43
                                 50     140.3    51     139.6    76
                                 77     139.8    87     140.2
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
139.10	.00	.00
139.18	.36	.45
139.27	1.46	2.84
139.35	3.28	8.38
139.44	5.84	18.04
139.52	9.12	32.71
139.61	13.13	53.52
139.69	17.48	85.62
139.77	21.88	123.49
139.86	26.39	162.42
139.94	31.24	204.85
140.03	36.45	253.02
140.11	42.01	307.19
140.19	47.93	367.60
140.28	54.07	447.07
140.36	60.28	525.19
140.45	66.74	606.68
140.53	73.45	694.46
140.62	80.40	788.67

```
                                        140.70        87.60       889.44
*
COMPUTE TRAVEL TIME      ID=4  REACH NO=2  NO VS=1  L=1079 FT
                                    SLP=0.0152

                                TRAVEL TIME TABLE
                                                  REACH=  2.0

                                WATER        AVERAGE      FLOW         TRAVEL
                                DEPTH        AREA         RATE         TIME
                                FEET         SQ.FT.       CFS          HRS
                                   .084          .365          .45        .2443
                                   .168         1.459         2.84        .1539
                                   .253         3.283         8.38        .1175
                                   .337         5.836        18.04        .0970
                                   .421         9.118        32.71        .0836
                                   .505        13.129        53.52        .0735
                                   .589        17.483        85.62        .0612
                                   .674        21.877       123.49        .0531
                                   .758        26.387       162.42        .0487
                                   .842        31.238       204.85        .0457
                                   .926        36.446       253.02        .0432
                                  1.011        42.012       307.19        .0410
                                  1.095        47.935       367.60        .0391
                                  1.179        54.067       447.07        .0362
                                  1.263        60.284       525.19        .0344
                                  1.347        66.742       606.68        .0330
                                  1.432        73.448       694.46        .0317
                                  1.516        80.402       788.67        .0306
                                  1.600        87.605       889.44        .0295
*
ROUTE                    ID=4  HYD NO=202.1  INFLOW ID=3  DT=0.0
*
PRINT HYD                ID=4  CODE=1

                                     PARTIAL HYDROGRAPH   202.10


    RUNOFF VOLUME =       .96967 INCHES      =       1.1796 ACRE-FEET
    PEAK DISCHARGE RATE =      29.19 CFS  AT   1.567 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B3
*
COMPUTE NM HYD           ID=1  HYD=203.0  AREA=0.04219 SQ MI
                                     PER A=20  PER B=50  PER C=0  PER D=30
                                     TP=0.16 HRS  MASS RAIN=-1

    K =    .087200HR    TP =    .160000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =   41.632    CFS   UNIT VOLUME =    .9993        B =   526.28
    AREA =       .012657 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =    .167983HR    TP =    .160000HR    K/TP RATIO =  1.049896     SHAPE
    UNIT PEAK =   57.253    CFS   UNIT VOLUME =    .9998        B =   310.18
    AREA =       .029533 SQ MI    IA =    .54286 INCHES    INF =   1.37000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
```

```
*
PRINT HYD                    ID=1  CODE=1

                                        PARTIAL HYDROGRAPH   203.00


    RUNOFF VOLUME =      1.02481 INCHES      =        2.3060 ACRE-FEET
    PEAK DISCHARGE RATE =       63.51 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B4
*
COMPUTE NM HYD               ID=2  HYD=204.0  AREA=0.01625 SQ MI
                                        PER A=20  PER B=50  PER C=0  PER D=30
                                        TP=0.13 HRS  MASS RAIN=-1

    K =   .070850HR    TP =   .130000HR    K/TP RATIO =   .545000     SHAPE
    UNIT PEAK =   19.735    CFS   UNIT VOLUME =    .9994        B =   526.28
    AREA =       .004875 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =   .136487HR    TP =   .130000HR    K/TP RATIO =  1.049896     SHAPE
    UNIT PEAK =   27.140    CFS   UNIT VOLUME =    .9997        B =   310.18
    AREA =       .011375 SQ MI    IA =    .54286 INCHES    INF =   1.37000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=2  CODE=1

                                        PARTIAL HYDROGRAPH   204.00


    RUNOFF VOLUME =      1.02481 INCHES      =         .8882 ACRE-FEET
    PEAK DISCHARGE RATE =       27.69 CFS  AT   1.500 HOURS   BASIN AREA =


*
*S       ADD BASIN B3 & B4
*
ADD HYD                      ID=5  HYD=220.0  ID I=1  ID II=2
*
PRINT HYD                    ID=5  CODE=1

                                        PARTIAL HYDROGRAPH   220.00


    RUNOFF VOLUME =      1.02480 INCHES      =        3.1941 ACRE-FEET
    PEAK DISCHARGE RATE =       90.32 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S       ADD BASIN B3/B4 & BASIN B1/B2
*
ADD HYD                      ID=6  HYD=230.0  ID I=4  ID II=5
```

```
*
PRINT HYD                    ID=6   CODE=1

                                          PARTIAL HYDROGRAPH   230.00

    RUNOFF VOLUME =      1.00932 INCHES      =        4.3737 ACRE-FEET
    PEAK DISCHARGE RATE =      117.08 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S       ROUTE BASIN B1,B2,B3 & B4 FLOWS TO BASIN A2
*
COMPUTE RATING CURVE     CID=1  VS NO=1  NO SEGS=2
                                     MIN ELEV=0.0 FT  MAX ELEV=2.75 FT
                                     CH SLP=0.0108  FP SLP=0.0108  N=0.022
                                     DIST=20.0 FT  N=0.018  DIST=59 FT
                                     DIST    ELEV    DIST    ELEV    DIST
                                      0      2.75    11      0.0     17
                                     23      1.12    29      1.24    38
                                     53      0.88    54      1.55    59

                                     RATING CURVE VALLEY SECTION  1.0
                                         WATER        FLOW        FLOW
                                        SURFACE       AREA        RATE
                                         ELEV         SQ FT       CFS
                                          .00          .00         .00
                                          .14          .10         .13
                                          .29          .42         .80
                                          .43          .94        2.36
                                          .58         1.68        5.08
                                          .72         2.62        9.21
                                          .87         3.77       14.97
                                         1.01         5.73       22.64
                                         1.16         9.83       34.42
                                         1.30        16.30       66.21
                                         1.45        23.28      113.80
                                         1.59        30.40      171.50
                                         1.74        38.00      236.40
                                         1.88        45.99      320.02
                                         2.03        54.07      415.33
                                         2.17        62.23      521.08
                                         2.32        70.48      636.87
                                         2.46        78.81      762.38
                                         2.61        87.22      897.37
                                         2.75        95.72     1041.60
*
COMPUTE TRAVEL TIME      ID=3   REACH NO=3  VS NO=1  L=1069 FT
                                     SLP=0.0108

                                     TRAVEL TIME TABLE
                                                        REACH=  3.0

                                     WATER       AVERAGE     FLOW        TRAVEL
                                     DEPTH       AREA        RATE        TIME
                                     FEET        SQ.FT.      CFS         HRS
                                        .145        .105        .13        .2469
                                        .289        .419        .80        .1556
                                        .434        .943       2.36        .1187
```

```
                    .579        1.676        5.08        .0980
                    .724        2.619        9.21        .0844
                    .868        3.771       14.97        .0748
                   1.013        5.728       22.64        .0751
                   1.158        9.833       34.42        .0848
                   1.303       16.298       66.21        .0731
                   1.447       23.279      113.80        .0607
                   1.592       30.397      171.50        .0526
                   1.737       37.999      236.40        .0477
                   1.882       45.991      320.02        .0427
                   2.026       54.070      415.33        .0387
                   2.171       62.232      521.08        .0355
                   2.316       70.479      636.87        .0329
                   2.461       78.809      762.38        .0307
                   2.605       87.222      897.37        .0289
                   2.750       95.720     1041.60        .0273
*
ROUTE                    ID=3  HYD NO=230.1  INFLOW ID=6  DT=0.0
*
PRINT HYD                ID=3  CODE=1

                                   PARTIAL HYDROGRAPH   230.10


    RUNOFF VOLUME =      1.00933 INCHES      =       4.3737 ACRE-FEET
    PEAK DISCHARGE RATE =     107.28 CFS  AT   1.600 HOURS   BASIN AREA =



*
*S       COMPUTE BASIN A1
*
COMPUTE NM HYD           ID=2  HYD=301.0  AREA=0.09058 SQ MI
                          PER A=100 PER B=0 PER C=0 PER D=0
                          TP=0.30 MASS RAIN=-1

    K =    .359078HR    TP =    .300000HR    K/TP RATIO =  1.196927     SHAPE
    UNIT PEAK =   84.305    CFS   UNIT VOLUME =    .9998        B =   279.22
    AREA =       .090580 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                ID=2 CODE=1

                                   HYDROGRAPH FROM AREA   301.00


    RUNOFF VOLUME =       .45484 INCHES      =       2.1973 ACRE-FEET
    PEAK DISCHARGE RATE =      37.64 CFS  AT   1.700 HOURS   BASIN AREA =



*
*S                  ROUTE A1 THROUGH A2
*
COMPUTE RATING CURVE        CID=1   VS NO=1 NO SEGS=1
                                    MIN ELEV=109.0  MAX ELEV=110.0
                                    CH SLP=0.0152   FP SLP=0.0152 N=0.035
                                    DIST=100.0
                                    DIST    ELEV    DIST    ELEV
```

0	110.0	10	109.0
90	109.0	100	110.0

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
109.00	.00	.00
109.05	4.24	3.10
109.11	8.53	9.87
109.16	12.88	19.45
109.21	17.29	31.48
109.26	21.75	45.77
109.32	26.26	62.17
109.37	30.83	80.58
109.42	35.46	100.91
109.47	40.14	123.10
109.53	44.88	147.09
109.58	49.67	172.85
109.63	54.52	200.33
109.68	59.42	229.51
109.74	64.38	260.36
109.79	69.40	292.85
109.84	74.47	326.96
109.89	79.59	362.69
109.95	84.77	400.01
110.00	90.01	438.91

*
COMPUTE TRAVEL TIME ID=4 REACH NO=4 NO VS=1 L=1450
SLP=0.0152

TRAVEL TIME TABLE
REACH= 4.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	4.239	3.10	.5503
.105	8.532	9.87	.3481
.158	12.882	19.45	.2668
.211	17.287	31.48	.2212
.263	21.747	45.77	.1914
.316	26.262	62.17	.1701
.368	30.833	80.58	.1541
.421	35.460	100.91	.1415
.474	40.141	123.10	.1313
.526	44.879	147.09	.1229
.579	49.671	172.85	.1157
.632	54.519	200.33	.1096
.684	59.423	229.51	.1043
.737	64.382	260.36	.0996
.790	69.396	292.85	.0954
.842	74.465	326.96	.0917
.895	79.590	362.69	.0884
.947	84.771	400.01	.0854
1.000	90.007	438.91	.0826

*
ROUTE ID=4 HYD NO=301.1 INFLOW ID=2
*
PRINT HYD ID=4 CODE=1

```
                                        HYDROGRAPH FROM AREA   301.10

    RUNOFF VOLUME =       .45485 INCHES     =       2.1973 ACRE-FEET
    PEAK DISCHARGE RATE =      28.46 CFS  AT   1.833 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN A2
*
COMPUTE NM HYD            ID=1  HYD=102.0  AREA=0.03953 SQ MI
                                     PER A=100  PER B=0  PER C=0  PER D=0
                                     TP=0.25 HRS  MASS RAIN=-1

    K =    .305565HR    TP =    .250000HR    K/TP RATIO =  1.222262     SHAPE
    UNIT PEAK =    43.414    CFS   UNIT VOLUME =    .9996        B =   274.56
    AREA =       .039530 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                 ID=1  CODE=1

                                     PARTIAL HYDROGRAPH   102.00


    RUNOFF VOLUME =       .45484 INCHES     =        .9589 ACRE-FEET
    PEAK DISCHARGE RATE =      19.27 CFS  AT   1.633 HOURS   BASIN AREA =


*
*S                   ADD BASINS A1 & A2
*
ADD HYD                           ID=5 HYD=301.2  ID I=4 ID II=1
*
PRINT HYD                    ID=5  CODE=1

                                        HYDROGRAPH FROM AREA   301.20


    RUNOFF VOLUME =       .45484 INCHES     =       3.1562 ACRE-FEET
    PEAK DISCHARGE RATE =      42.59 CFS  AT   1.767 HOURS   BASIN AREA =


*
*S       ADD BASINS A1&A2 TO BASIN B1/B2/B3/B4
*
ADD HYD                   ID=2  HYD=240.0  ID I=3  ID II=5
*
PRINT HYD                 ID=2  CODE=1

                                     PARTIAL HYDROGRAPH   240.00


    RUNOFF VOLUME =       .66799 INCHES     =       7.5299 ACRE-FEET
    PEAK DISCHARGE RATE =     136.57 CFS  AT   1.600 HOURS   BASIN AREA =
```

```
*
*S       ROUTE BASIN A2/B1/B2/B3/B4 FLOWS TO BASIN C1
*
COMPUTE RATING CURVE     CID=1  VS NO=1  NO SEGS=2
                                MIN ELEV=1.58 FT  MAX ELEV=5.58 FT
                                CH SLP=0.0108  FP SLP=0.0108  N=0.022
                                DIST=20.0 FT  N=0.018  DIST=86 FT
                                DIST    ELEV    DIST    ELEV    DIST
                                  0     5.58     16     1.58     22
                                 43      3.0     64     2.58     70
                                 86     5.58
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
1.58	.00	.00
1.79	.44	.76
2.00	1.77	4.83
2.21	3.99	14.23
2.42	7.09	30.65
2.63	11.20	50.14
2.84	19.00	85.57
3.05	31.45	161.32
3.26	45.47	286.78
3.47	59.86	443.19
3.69	74.59	628.34
3.90	89.68	840.79
4.11	105.13	1079.52
4.32	120.93	1343.78
4.53	137.09	1633.04
4.74	153.60	1946.86
4.95	170.46	2284.94
5.16	187.68	2647.03
5.37	205.25	3032.97
5.58	223.18	3442.61

```
*
COMPUTE TRAVEL TIME      ID=3  REACH NO=5  VS NO=1  L=2170 FT
                                SLP=0.0108
```

TRAVEL TIME TABLE

REACH= 5.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.211	.443	.76	.3514
.421	1.773	4.83	.2214
.632	3.989	14.23	.1689
.842	7.091	30.65	.1395
1.053	11.202	50.14	.1347
1.263	19.003	85.57	.1339
1.474	31.446	161.32	.1175
1.684	45.474	286.78	.0956
1.895	59.856	443.19	.0814
2.105	74.593	628.34	.0716
2.316	89.684	840.79	.0643
2.526	105.130	1079.52	.0587

```
                                  2.737      120.931      1343.78        .0542
                                  2.947      137.086      1633.04        .0506
                                  3.158      153.595      1946.86        .0476
                                  3.368      170.460      2284.94        .0450
                                  3.579      187.679      2647.03        .0427
                                  3.789      205.252      3032.97        .0408
                                  4.000      223.180      3442.61        .0391
*
ROUTE                     ID=3  HYD NO=240.1  INFLOW ID=2  DT=0.0
*
PRINT HYD                 ID=3  CODE=1

                                     PARTIAL HYDROGRAPH   240.10


    RUNOFF VOLUME =       .66799 INCHES      =       7.5299 ACRE-FEET
    PEAK DISCHARGE RATE =     111.67 CFS  AT   1.733 HOURS   BASIN AREA =


*
*S      COMPUTE BASIN C1
*
COMPUTE NM HYD            ID=1  HYD=301.0  AREA=0.01797 SQ MI
                                     PER A=50  PER B=0  PER C=0  PER D=50
                                     TP=0.17 HRS  MASS RAIN=-1

    K =   .092650HR    TP =   .170000HR    K/TP RATIO =   .545000     SHAPE
    UNIT PEAK =   27.815    CFS   UNIT VOLUME =    .9998        B =   526.28
    AREA =       .008985 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =   .207785HR    TP =   .170000HR    K/TP RATIO =  1.222262     SHAPE
    UNIT PEAK =   14.512    CFS   UNIT VOLUME =    .9988        B =   274.56
    AREA =       .008985 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                 ID=1  CODE=1

                                     HYDROGRAPH FROM AREA   301.00


    RUNOFF VOLUME =      1.22041 INCHES      =       1.1696 ACRE-FEET
    PEAK DISCHARGE RATE =      29.04 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S      ADD BASIN C1 IN WITH OTHER BASINS
*
ADD HYD                   ID=2  HYD=250.0  ID I=3  ID II=1
*
PRINT HYD                 ID=2  CODE=1

                                     PARTIAL HYDROGRAPH   250.00


    RUNOFF VOLUME =       .71128 INCHES      =       8.6995 ACRE-FEET
```

```
PEAK DISCHARGE RATE =      127.18 CFS  AT   1.733 HOURS   BASIN AREA =


*
*S                    CALCULATE DRAINAGE FOR BASINS NORTH OF SAN YGNACIO
*
*S                    COMPUTE BASIN A3
*
COMPUTE NM HYD                ID=3 HYD NO=310.0  AREA=0.09259 SQ MI
                                     PER A=100 PER B=0 PER C=0 PER D=0
                                     TP=0.24 MASS RAIN=-1

K =    .286827HR    TP =    .240000HR    K/TP RATIO =  1.195114     SHAPE
UNIT PEAK =   107.85    CFS   UNIT VOLUME =    .9999        B =   279.56
AREA =       .092590 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                     ID=3 CODE=1

                                          HYDROGRAPH FROM AREA   310.00


RUNOFF VOLUME =       .45484 INCHES     =       2.2461 ACRE-FEET
PEAK DISCHARGE RATE =      47.73 CFS  AT   1.633 HOURS   BASIN AREA =


*
*S ROUTE A3 THROUGH A4
*
COMPUTE RATING CURVE          CID=1 VS NO=1 NO SEGS=1
                                     MIN ELEV=85.6 MAX ELEV=86.0
                                     CH SLP=0.0147 FP SLP=0.0147 N=0.035
                                     DIST=250.0 FT
                                     DIST    ELEV    DIST    ELEV
                                     0       86.0    20      85.8
                                     125     85.6    230     85.8
                                     250     86.0

                                      RATING CURVE VALLEY SECTION  1.0
                                      WATER     FLOW      FLOW
                                     SURFACE    AREA      RATE
                                      ELEV      SQ FT     CFS
                                      85.60       .00       .00
                                      85.62       .23       .06
                                      85.64       .93       .37
                                      85.66      2.09      1.08
                                      85.68      3.72      2.32
                                      85.71      5.82      4.20
                                      85.73      8.37      6.84
                                      85.75     11.40     10.31
                                      85.77     14.89     14.72
                                      85.79     18.84     20.15
                                      85.81     23.21     27.34
                                      85.83     27.72     36.28
                                      85.85     32.32     46.25
                                      85.87     37.01     57.23
                                      85.89     41.78     69.20
```

85.92	46.64	82.13
85.94	51.60	96.02
85.96	56.64	110.85
85.98	61.77	126.62
86.00	66.98	143.31

```
*
COMPUTE TRAVEL TIME ID=1 REACH NO=6          VS=1 L=1630
                                   SLP=0.0147
```

TRAVEL TIME TABLE

REACH= 6.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.021	.233	.06	1.8315
.042	.930	.37	1.1538
.063	2.094	1.08	.8805
.084	3.722	2.32	.7268
.105	5.815	4.20	.6264
.126	8.374	6.84	.5547
.147	11.398	10.31	.5005
.168	14.887	14.72	.4579
.189	18.842	20.15	.4233
.210	23.214	27.34	.3844
.232	27.723	36.28	.3460
.253	32.321	46.25	.3164
.274	37.007	57.23	.2928
.295	41.782	69.20	.2734
.316	46.645	82.13	.2571
.337	51.597	96.02	.2433
.358	56.638	110.85	.2313
.379	61.767	126.62	.2209
.400	66.985	143.31	.2116

```
*
ROUTE                          ID=1    HYD NO=310.1    INFLOW ID=3 DT=0
*
PRINT HYD                   ID=1 CODE=1
```

HYDROGRAPH FROM AREA 310.10

```
RUNOFF VOLUME =      .45485 INCHES      =       2.2461 ACRE-FEET
PEAK DISCHARGE RATE =      25.95 CFS  AT   1.833 HOURS   BASIN AREA =


*
*S                    COMPUTE  BASIN A4
*
COMPUTE NM HYD              ID=4    HYD=310.2        AREA=0.06187 SQ MI
                                    PER A=100 PER B=0 PER C=0 PER D=0
                                    TP=0.27 MASS RAIN=-1

K =   .330011HR    TP =   .270000HR    K/TP RATIO =  1.222262     SHAPE
UNIT PEAK =   62.916    CFS   UNIT VOLUME =    .9997        B =   274.56
AREA =      .061870 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
```

```
*S                    ADD A3 & A4
*
ADD HYD                                   ID=6 HYD NO=310.3 ID I=4 ID II=1
*
PRINT HYD             ID=6 CODE=1

                                          HYDROGRAPH FROM AREA   310.30


    RUNOFF VOLUME =       .45483 INCHES      =       3.7468 ACRE-FEET
    PEAK DISCHARGE RATE =       50.12 CFS  AT   1.733 HOURS   BASIN AREA =


*
*S                    COMPUTE BASIN A5
*
COMPUTE NM HYD                ID=5    HYD NO=305.0    AREA=0.09021 SQ MI
                                      PER A=100 PER B=0 PER C=0 PER D=0
                                      TP=0.48 MASS RAIN=-1

    K =    .574685HR    TP =    .480000HR    K/TP RATIO =  1.197261     SHAPE
    UNIT PEAK =   52.464    CFS   UNIT VOLUME =    .9997        B =   279.15
    AREA =       .090210 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                     ID=5 CODE=1

                                          HYDROGRAPH FROM AREA   305.00


    RUNOFF VOLUME =       .45484 INCHES      =       2.1883 ACRE-FEET
    PEAK DISCHARGE RATE =       23.71 CFS  AT   1.867 HOURS   BASIN AREA =


*
*S                    ADD A5 TO BASINS A3 & A4
*
ADD HYD                                   ID=3    HYD NO=320.0 ID I = 5   ID II=6
*
PRINT HYD                     ID=3 CODE=1

                                          HYDROGRAPH FROM AREA   320.00


    RUNOFF VOLUME =       .45483 INCHES      =       5.9351 ACRE-FEET
    PEAK DISCHARGE RATE =       72.54 CFS  AT   1.767 HOURS   BASIN AREA =


*
*S                    CALCULATE INFLOW INTO UNSER PLAYA
*
ADD HYD                                     ID=4 HYD=330.0  ID I=3 ID II=2
*
PRINT HYD                     ID=4 CODE=-1

                                          HYDROGRAPH FROM AREA   330.00
```

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	3.300	14.7	6.600	1.2
.033	.0	3.333	14.2	6.633	1.2
.067	.0	3.367	13.7	6.667	1.1
.100	.0	3.400	13.2	6.700	1.1
.133	.0	3.433	12.8	6.733	1.1
.167	.0	3.467	12.4	6.767	1.0
.200	.0	3.500	12.0	6.800	1.0
.233	.0	3.533	11.6	6.833	1.0
.267	.0	3.567	11.2	6.867	.9
.300	.0	3.600	10.8	6.900	.9
.333	.0	3.633	10.5	6.933	.9
.367	.0	3.667	10.1	6.967	.9
.400	.0	3.700	9.8	7.000	.8
.433	.0	3.733	9.5	7.033	.8
.467	.0	3.767	9.2	7.067	.8
.500	.0	3.800	8.9	7.100	.8
.533	.0	3.833	8.6	7.133	.7
.567	.0	3.867	8.4	7.167	.7
.600	.0	3.900	8.1	7.200	.7
.633	.0	3.933	7.9	7.233	.7
.667	.0	3.967	7.7	7.267	.7
.700	.0	4.000	7.5	7.300	.6
.733	.0	4.033	7.3	7.333	.6
.767	.0	4.067	7.1	7.367	.6
.800	.0	4.100	6.9	7.400	.6
.833	.0	4.133	6.7	7.433	.6
.867	.0	4.167	6.5	7.467	.6
.900	.0	4.200	6.4	7.500	.5
.933	.0	4.233	6.2	7.533	.5
.967	.0	4.267	6.1	7.567	.5
1.000	.0	4.300	5.9	7.600	.5
1.033	.0	4.333	5.8	7.633	.5
1.067	.0	4.367	5.6	7.667	.5
1.100	.0	4.400	5.5	7.700	.5
1.133	.0	4.433	5.4	7.733	.4
1.167	.0	4.467	5.2	7.767	.4
1.200	.1	4.500	5.1	7.800	.4
1.233	.6	4.533	5.0	7.833	.4
1.267	1.5	4.567	4.9	7.867	.4
1.300	3.2	4.600	4.8	7.900	.4
1.333	5.6	4.633	4.6	7.933	.4
1.367	10.0	4.667	4.5	7.967	.4
1.400	18.9	4.700	4.4	8.000	.4
1.433	34.6	4.733	4.3	8.033	.4
1.467	57.0	4.767	4.2	8.067	.3
1.500	84.2	4.800	4.1	8.100	.3
1.533	112.8	4.833	4.0	8.133	.3
1.567	139.3	4.867	3.9	8.167	.3
1.600	161.4	4.900	3.8	8.200	.3
1.633	178.2	4.933	3.7	8.233	.3
1.667	189.9	4.967	3.6	8.267	.3
1.700	196.5	5.000	3.5	8.300	.3
1.733	198.9	5.033	3.5	8.333	.3
1.767	197.8	5.067	3.4	8.367	.3
1.800	194.0	5.100	3.3	8.400	.3
1.833	188.2	5.133	3.3	8.433	.3
1.867	181.1	5.167	3.2	8.467	.3

1.900	173.4	5.200	3.1	8.500	.3
1.933	165.3	5.233	3.1	8.533	.2
1.967	157.2	5.267	3.0	8.567	.2
2.000	149.2	5.300	2.9	8.600	.2
2.033	141.3	5.333	2.9	8.633	.2
2.067	133.5	5.367	2.8	8.667	.2
2.100	125.6	5.400	2.8	8.700	.2
2.133	117.6	5.433	2.7	8.733	.2
2.167	109.6	5.467	2.7	8.767	.2
2.200	101.7	5.500	2.6	8.800	.2
2.233	94.2	5.533	2.6	8.833	.2
2.267	87.1	5.567	2.5	8.867	.2
2.300	80.2	5.600	2.5	8.900	.2
2.333	73.6	5.633	2.4	8.933	.2
2.367	67.6	5.667	2.4	8.967	.2
2.400	62.4	5.700	2.3	9.000	.2
2.433	57.8	5.733	2.3	9.033	.2
2.467	53.5	5.767	2.3	9.067	.2
2.500	49.7	5.800	2.2	9.100	.2
2.533	46.3	5.833	2.2	9.133	.2
2.567	43.4	5.867	2.2	9.167	.2
2.600	40.7	5.900	2.1	9.200	.2
2.633	38.2	5.933	2.1	9.233	.2
2.667	36.0	5.967	2.1	9.267	.1
2.700	33.9	6.000	2.0	9.300	.1
2.733	32.1	6.033	2.0	9.333	.1
2.767	30.4	6.067	2.0	9.367	.1
2.800	28.9	6.100	1.9	9.400	.1
2.833	27.4	6.133	1.9	9.433	.1
2.867	26.0	6.167	1.8	9.467	.1
2.900	24.8	6.200	1.7	9.500	.1
2.933	23.6	6.233	1.7	9.533	.1
2.967	22.6	6.267	1.6	9.567	.1
3.000	21.6	6.300	1.6	9.600	.1
3.033	20.6	6.333	1.5	9.633	.1
3.067	19.7	6.367	1.5	9.667	.1
3.100	18.9	6.400	1.4	9.700	.1
3.133	18.1	6.433	1.4	9.733	.1
3.167	17.4	6.467	1.4	9.767	.1
3.200	16.7	6.500	1.3	9.800	.1
3.233	16.0	6.533	1.3	9.833	.1
3.267	15.4	6.567	1.2	9.867	.1

```
    RUNOFF VOLUME =        .57891 INCHES      =       14.6346 ACRE-FEET
    PEAK DISCHARGE RATE =      198.91 CFS  AT   1.733 HOURS   BASIN AREA =


*
*S       END CALCULATIONS
*
FINISH

    NORMAL PROGRAM FINISH                END TIME (HR:MIN:SEC) = 15:24:16
```

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AHYMO SUMMARY TABLE (AHYMO993) - AMAFCA VERSION OF HYMO - SEPTEMBER, 1993
INPUT FILE = c:\ahymo\sunset\sw2ii100.dat

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOF VOLUM (AC-F
START						
*S	INPUT FILE NAME: SW2ii100.DAT					
*S	OUTPUT FILE NAME: SW2ii100.OUT					
*S	PROJECT: SUNSET WEST UNIT 2					
*S	CONDITION: INTERIM II; 100-YEAR STORM					
*S	SAD 222 IN PLACE; SUNSET WEST UNIT 2					
*S	LEEDSHILL-HERKENHOFF, INC.					
RAINFALL	TYPE= 1					
*S	COMPUTE BASIN B1 & PRINT VALUES					
COMPUTE	NM HYD 201.00	-	1	.00672	10.14	.30
*S	ROUTE BASIN B1 FLOWS TO BASIN B2					
*S	COMPUTE TRAVEL TIME					
*S	ROUTE THE FLOW & PRINT					
ROUTE	201.10	1	2	.00672	8.28	.30
*S	COMPUTE BASIN B2					
COMPUTE	NM HYD 202.00	-	1	.01609	27.42	.87
*S	ADD BASIN B1 & B2					
ADD HYD	210.00	1& 2	3	.02281	34.83	1.18
*S	ROUTE COMBINATION OF BASIN B1/B2 FLOWS TO BASIN B3/B4					
ROUTE	202.10	3	4	.02281	29.19	1.18
*S	COMPUTE BASIN B3					
COMPUTE	NM HYD 203.00	-	1	.04219	52.41	2.00
*S	COMPUTE BASIN B4					
COMPUTE	NM HYD 204.00	-	2	.01625	17.65	.39
*S	ADD BASIN B3 & B4					
ADD HYD	220.00	1& 2	5	.05844	68.25	2.39
*S	ADD BASIN B3/B4 & BASIN B1/B2					
ADD HYD	230.00	4& 5	6	.08125	95.01	3.57
*S	ROUTE BASIN B1,B2,B3 & B4 FLOWS TO BASIN A2					
ROUTE	230.10	6	3	.08125	86.03	3.57
*S	COMPUTE BASIN A2					
COMPUTE	NM HYD 102.00	-	1	.03953	15.20	.95
*S	ADD BASIN A2 TO BASIN B1/B2/B3/B4					
ADD HYD	240.00	3& 1	2	.12078	99.28	4.53
*S	ROUTE BASIN A2/B1/B2/B3/B4 FLOWS TO BASIN C1					
ROUTE	240.10	2	3	.12078	77.53	4.53
*S	COMPUTE BASIN C1					
COMPUTE	NM HYD 301.00	-	1	.01797	29.04	1.17
*S	ADD BASIN C1 IN WITH OTHER BASINS					
ADD HYD	250.00	3& 1	2	.13875	93.97	5.70
*S	CALCULATE DRAINAGE FOR BASINS NORTH OF SAN YGNACIO					
*S	ASSUME SAD 222 IMPROVEMENTS ARE IN PLACE					
*S	COMPUTE BASIN A1					
COMPUTE	NM HYD 301.00	-	1	.09058	37.64	2.19
*S	ROUTE A1 ALONG SAN YGNACIO TO A3					
ROUTE	301.10	1	4	.09058	35.96	2.19
*S	COMPUTE BASIN A3					
COMPUTE	NM HYD 310.00	-	3	.09259	47.73	2.24
*S	ADD BASINS A1& A3					

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOF VOLUM (AC-F
ADD HYD	315.00	4& 3	6	.18317	79.48	4.44
*S	ROUTE BASINS A1 &A3 THRU A4					
ROUTE	320.00	6	1	.18317	52.58	4.44
*S	COMPUTE BASIN A4					
COMPUTE NM HYD	320.10	-	4	.06187	28.01	1.50
*S	ADD BASINS A1&3 TO BASIN A4					
ADD HYD	310.30	4& 1	6	.24504	73.42	5.94
*S	COMPUTE BASIN A5					
COMPUTE NM HYD	305.00	-	5	.09021	23.71	2.18
*S	ADD BASINS A1,A3,A4 & A5					
ADD HYD	320.00	5& 6	1	.33525	96.78	8.13
*S	CALCULATE TOTAL INFLOW INTO UNSER PLAYA					
ADD HYD	330.00	1& 2	3	.47400	185.61	13.83
*S	END CALCULATIONS					
FINISH						

```
     AHYMO PROGRAM (AHYMO993) - AMAFCA VERSION OF HYMO - SEPTEMBER, 1993
          RUN DATE (MON/DAY/YR) = 04/15/1994
          START TIME (HR:MIN:SEC) = 10:42:25     USER NO.= G_NEMETH.S93
          INPUT FILE = c:\ahymo\sunset\sw2ii100.dat

START                    0.0
*
*S       INPUT  FILE NAME:  SW2ii100.DAT
*S       OUTPUT FILE NAME:  SW2ii100.OUT
*S       PROJECT:           SUNSET WEST UNIT 2
*S       CONDITION:         INTERIM II; 100-YEAR STORM
*S                                  SAD 222 IN PLACE; SUNSET WEST UNIT 2
*S       LEEDSHILL-HERKENHOFF, INC.
*
RAINFALL                 TYPE=1  RAIN QUARTER=0.0
                                    RAIN ONE=1.90 IN  RAIN SIX=2.22 IN
                                    RAIN DAY=0.00 IN  DT=0.033333 HRS

                 COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2
                 DT =     .033333 HOURS        END TIME =     5.999940 HOURS
                    .0000   .0015   .0030   .0046   .0062   .0079   .0096
                    .0113   .0130   .0149   .0167   .0186   .0206   .0226
                    .0246   .0268   .0290   .0312   .0336   .0360   .0385
                    .0411   .0438   .0466   .0496   .0526   .0558   .0592
                    .0627   .0665   .0704   .0757   .0813   .0873   .1002
                    .1291   .1735   .2373   .3244   .4388   .5847   .7664
                    .9881  1.1931  1.2789  1.3514  1.4159  1.4745  1.5285
                   1.5786  1.6255  1.6694  1.7107  1.7497  1.7865  1.8214
                   1.8544  1.8857  1.9154  1.9436  1.9704  1.9765  1.9822
                   1.9876  1.9928  1.9977  2.0025  2.0070  2.0114  2.0156
                   2.0196  2.0235  2.0273  2.0310  2.0346  2.0381  2.0415
                   2.0448  2.0480  2.0511  2.0542  2.0571  2.0601  2.0629
                   2.0657  2.0685  2.0712  2.0738  2.0764  2.0789  2.0814
                   2.0839  2.0863  2.0887  2.0910  2.0933  2.0955  2.0978
                   2.0999  2.1021  2.1042  2.1063  2.1084  2.1104  2.1124
                   2.1144  2.1164  2.1183  2.1202  2.1221  2.1240  2.1258
                   2.1277  2.1295  2.1312  2.1330  2.1347  2.1365  2.1382
                   2.1399  2.1415  2.1432  2.1448  2.1464  2.1480  2.1496
                   2.1512  2.1527  2.1543  2.1558  2.1573  2.1588  2.1603
                   2.1618  2.1633  2.1647  2.1661  2.1676  2.1690  2.1704
                   2.1718  2.1732  2.1745  2.1759  2.1772  2.1786  2.1799
                   2.1812  2.1825  2.1838  2.1851  2.1864  2.1876  2.1889
                   2.1902  2.1914  2.1926  2.1939  2.1951  2.1963  2.1975
                   2.1987  2.1999  2.2010  2.2022  2.2034  2.2045  2.2057
                   2.2068  2.2080  2.2091  2.2102  2.2113  2.2124  2.2135
                   2.2146  2.2157  2.2168  2.2179  2.2189  2.2200
*
*S       COMPUTE BASIN B1 & PRINT VALUES
*
COMPUTE NM HYD           ID=1  HYD=201.0  AREA=0.00672 SQ MI
                                    PER A=75  PER B=0  PER C=0  PER D=25
                                    TP=0.11 HRS  MASS RAIN=-1

     K =    .059950HR    TP =    .110000HR    K/TP RATIO =    .545000     SHAPE
     UNIT PEAK =    8.0377    CFS   UNIT VOLUME =    .9982        B =   526.28
     AREA =       .001680 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
```

```
K =    .134449HR    TP =    .110000HR    K/TP RATIO =  1.222262     SHAPE
UNIT PEAK =   12.580    CFS   UNIT VOLUME =    .9981        B =   274.56
AREA =       .005040 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=1  CODE=1

                                        PARTIAL HYDROGRAPH   201.00


RUNOFF VOLUME =       .83763 INCHES      =         .3002 ACRE-FEET
PEAK DISCHARGE RATE =       10.14 CFS  AT   1.500 HOURS   BASIN AREA =



*
*S       ROUTE BASIN B1 FLOWS TO BASIN B2
*
COMPUTE RATING CURVE     CID=1  VS NO=1  NO SEGS=1
                                        MIN ELEV=139.1 FT  MAX ELEV=140.7 FT
                                        CH SLP=0.0166  FP SLP=0.0166  N=0.018
                                        DIST=87 FT
                                        DIST  ELEV       DIST  ELEV       DIST  EL
                                          0   140.2        9   139.8       10   13
                                         35   139.6       36   140.3       43   14
                                         50   140.3       51   139.6       76   13
                                         77   139.8       87   140.2

                                         RATING CURVE VALLEY SECTION  1.0
                                             WATER        FLOW        FLOW
                                            SURFACE       AREA        RATE
                                             ELEV         SQ FT       CFS
                                            139.10         .00         .00
                                            139.18         .36         .47
                                            139.27        1.46        2.97
                                            139.35        3.28        8.75
                                            139.44        5.84       18.85
                                            139.52        9.12       34.18
                                            139.61       13.13       55.93
                                            139.69       17.48       89.48
                                            139.77       21.88      129.06
                                            139.86       26.39      169.73
                                            139.94       31.24      214.08
                                            140.03       36.45      264.42
                                            140.11       42.01      321.02
                                            140.19       47.93      384.15
                                            140.28       54.07      467.20
                                            140.36       60.28      548.84
                                            140.45       66.74      634.00
                                            140.53       73.45      725.74
                                            140.62       80.40      824.19
                                            140.70       87.60      929.50
*
*S       COMPUTE TRAVEL TIME
*
COMPUTE TRAVEL TIME      ID=2  REACH NO=1  NO VS=1  L=772 FT
                                        SLP=0.0166
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.084	.365	.47	.1673
.168	1.459	2.97	.1054
.253	3.283	8.75	.0804
.337	5.836	18.85	.0664
.421	9.118	34.18	.0572
.505	13.129	55.93	.0503
.589	17.483	89.48	.0419
.674	21.877	129.06	.0364
.758	26.387	169.73	.0333
.842	31.238	214.08	.0313
.926	36.446	264.42	.0296
1.011	42.012	321.02	.0281
1.095	47.935	384.15	.0268
1.179	54.067	467.20	.0248
1.263	60.284	548.84	.0236
1.347	66.742	634.00	.0226
1.432	73.448	725.74	.0217
1.516	80.402	824.19	.0209
1.600	87.605	929.50	.0202

```
*
*S       ROUTE THE FLOW & PRINT
*
ROUTE                    ID=2  HYD NO=201.1  INFLOW ID=1  DT=0.0
*
PRINT HYD                ID=2  CODE=1

                                   PARTIAL HYDROGRAPH   201.10


    RUNOFF VOLUME =       .83766 INCHES      =        .3002 ACRE-FEET
    PEAK DISCHARGE RATE =        8.28 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B2
*
COMPUTE NM HYD           ID=1  HYD=202.0  AREA=0.01609 SQ MI
                                   PER A=20  PER B=50  PER C=0  PER D=30
                                   TP=0.13 HRS  MASS RAIN=-1

    K =    .070850HR    TP =    .130000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =    19.541    CFS   UNIT VOLUME =     .9994        B =   526.28
    AREA =       .004827 SQ MI    IA =     .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =    .136487HR    TP =    .130000HR    K/TP RATIO =  1.049896     SHAPE
    UNIT PEAK =    26.873    CFS   UNIT VOLUME =     .9997        B =   310.18
    AREA =       .011263 SQ MI    IA =     .54286 INCHES    INF =   1.37000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                ID=1  CODE=1
```

PARTIAL HYDROGRAPH 202.00

RUNOFF VOLUME = 1.02481 INCHES = .8794 ACRE-FEET
PEAK DISCHARGE RATE = 27.42 CFS AT 1.500 HOURS BASIN AREA =

```
*
*S      ADD BASIN B1 & B2
*
ADD HYD                 ID=3  HYD=210.0 ID I=1  ID II=2
*
PRINT HYD               ID=3  CODE=1
```

PARTIAL HYDROGRAPH 210.00

RUNOFF VOLUME = .96965 INCHES = 1.1796 ACRE-FEET
PEAK DISCHARGE RATE = 34.83 CFS AT 1.533 HOURS BASIN AREA =

```
*
*S      ROUTE COMBINATION OF BASIN B1/B2 FLOWS TO BASIN B3/B4
*
COMPUTE RATING CURVE    CID=1  VS NO=1  NO SEGS=1
                                MIN ELEV=139.1 FT  MAX ELEV=140.7 FT
                                CH SLP=0.0152  FP SLP=0.0152  N=0.018
                                DIST=87 FT
                                DIST    ELEV    DIST    ELEV    DIST
                                  0     140.2     9     139.8    10
                                 35     139.6    36     140.3    43
                                 50     140.3    51     139.6    76
                                 77     139.8    87     140.2
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
139.10	.00	.00
139.18	.36	.45
139.27	1.46	2.84
139.35	3.28	8.38
139.44	5.84	18.04
139.52	9.12	32.71
139.61	13.13	53.52
139.69	17.48	85.62
139.77	21.88	123.49
139.86	26.39	162.42
139.94	31.24	204.85
140.03	36.45	253.02
140.11	42.01	307.19
140.19	47.93	367.60
140.28	54.07	447.07
140.36	60.28	525.19
140.45	66.74	606.68
140.53	73.45	694.46
140.62	80.40	788.67

```
                                        140.70        87.60        889.44
*
COMPUTE TRAVEL TIME      ID=4  REACH NO=2  NO VS=1  L=1079 FT
                                   SLP=0.0152

                                TRAVEL TIME TABLE
                                                  REACH=  2.0

                                WATER        AVERAGE      FLOW         TRAVEL
                                DEPTH        AREA         RATE         TIME
                                FEET         SQ.FT.       CFS          HRS
                                   .084          .365          .45        .2443
                                   .168         1.459         2.84        .1539
                                   .253         3.283         8.38        .1175
                                   .337         5.836        18.04        .0970
                                   .421         9.118        32.71        .0836
                                   .505        13.129        53.52        .0735
                                   .589        17.483        85.62        .0612
                                   .674        21.877       123.49        .0531
                                   .758        26.387       162.42        .0487
                                   .842        31.238       204.85        .0457
                                   .926        36.446       253.02        .0432
                                  1.011        42.012       307.19        .0410
                                  1.095        47.935       367.60        .0391
                                  1.179        54.067       447.07        .0362
                                  1.263        60.284       525.19        .0344
                                  1.347        66.742       606.68        .0330
                                  1.432        73.448       694.46        .0317
                                  1.516        80.402       788.67        .0306
                                  1.600        87.605       889.44        .0295
*
ROUTE                    ID=4  HYD NO=202.1  INFLOW ID=3  DT=0.0
*
PRINT HYD                ID=4  CODE=1

                                     PARTIAL HYDROGRAPH   202.10


    RUNOFF VOLUME =       .96967 INCHES      =       1.1796 ACRE-FEET
    PEAK DISCHARGE RATE =      29.19 CFS  AT   1.567 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B3
*
COMPUTE NM HYD           ID=1  HYD=203.0  AREA=0.04219 SQ MI
                                     PER A=50  PER B=25  PER C=0  PER D=25
                                     TP=0.17 HRS  MASS RAIN=-1

    K =    .092650HR    TP =    .170000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =   32.652    CFS   UNIT VOLUME =    .9998        B =   526.28
    AREA =       .010548 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =    .194110HR    TP =    .170000HR    K/TP RATIO =  1.141825     SHAPE
    UNIT PEAK =   53.974    CFS   UNIT VOLUME =    .9997        B =   289.98
    AREA =       .031643 SQ MI    IA =    .60000 INCHES    INF =   1.53000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
```

```
*
PRINT HYD                    ID=1  CODE=1

                                        PARTIAL HYDROGRAPH   203.00


    RUNOFF VOLUME =       .89009 INCHES      =        2.0028 ACRE-FEET
    PEAK DISCHARGE RATE =       52.41 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B4
*
COMPUTE NM HYD               ID=2  HYD=204.0  AREA=0.01625 SQ MI
                                        PER A=100  PER B=0  PER C=0  PER D=0
                                        TP=0.10 HRS  MASS RAIN=-1

    K =   .122226HR    TP =   .100000HR    K/TP RATIO =  1.222262     SHAPE
    UNIT PEAK =   44.617    CFS   UNIT VOLUME =    .9989        B =   274.56
    AREA =       .016250 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=2  CODE=1

                                        PARTIAL HYDROGRAPH   204.00


    RUNOFF VOLUME =       .45484 INCHES      =         .3942 ACRE-FEET
    PEAK DISCHARGE RATE =       17.65 CFS  AT   1.500 HOURS   BASIN AREA =


*
*S       ADD BASIN B3 & B4
*
ADD HYD                      ID=5  HYD=220.0  ID I=1  ID II=2
*
PRINT HYD                    ID=5  CODE=1

                                        PARTIAL HYDROGRAPH   220.00


    RUNOFF VOLUME =       .76906 INCHES      =        2.3970 ACRE-FEET
    PEAK DISCHARGE RATE =       68.25 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S       ADD BASIN B3/B4 & BASIN B1/B2
*
ADD HYD                      ID=6  HYD=230.0  ID I=4  ID II=5
*
PRINT HYD                    ID=6  CODE=1

                                        PARTIAL HYDROGRAPH   230.00
```

RUNOFF VOLUME = .82537 INCHES = 3.5766 ACRE-FEET
PEAK DISCHARGE RATE = 95.01 CFS AT 1.533 HOURS BASIN AREA =

*
*S ROUTE BASIN B1,B2,B3 & B4 FLOWS TO BASIN A2
*
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=2
MIN ELEV=0.0 FT MAX ELEV=2.75 FT
CH SLP=0.0108 FP SLP=0.0108 N=0.022
DIST=20.0 FT N=0.018 DIST=59 FT

DIST	ELEV	DIST	ELEV	DIST
0	2.75	11	0.0	17
23	1.12	29	1.24	38
53	0.88	54	1.55	59

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.00	.00
.14	.10	.13
.29	.42	.80
.43	.94	2.36
.58	1.68	5.08
.72	2.62	9.21
.87	3.77	14.97
1.01	5.73	22.64
1.16	9.83	34.42
1.30	16.30	66.21
1.45	23.28	113.80
1.59	30.40	171.50
1.74	38.00	236.40
1.88	45.99	320.02
2.03	54.07	415.33
2.17	62.23	521.08
2.32	70.48	636.87
2.46	78.81	762.38
2.61	87.22	897.37
2.75	95.72	1041.60

*
COMPUTE TRAVEL TIME ID=3 REACH NO=3 VS NO=1 L=1069 FT
SLP=0.0108

TRAVEL TIME TABLE
REACH= 3.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.145	.105	.13	.2469
.289	.419	.80	.1556
.434	.943	2.36	.1187
.579	1.676	5.08	.0980
.724	2.619	9.21	.0844
.868	3.771	14.97	.0748
1.013	5.728	22.64	.0751
1.158	9.833	34.42	.0848
1.303	16.298	66.21	.0731

```
                                    1.447      23.279      113.80       .0607
                                    1.592      30.397      171.50       .0526
                                    1.737      37.999      236.40       .0477
                                    1.882      45.991      320.02       .0427
                                    2.026      54.070      415.33       .0387
                                    2.171      62.232      521.08       .0355
                                    2.316      70.479      636.87       .0329
                                    2.461      78.809      762.38       .0307
                                    2.605      87.222      897.37       .0289
                                    2.750      95.720     1041.60       .0273
*
ROUTE                       ID=3  HYD NO=230.1  INFLOW ID=6  DT=0.0
*
PRINT HYD                   ID=3  CODE=1

                                        PARTIAL HYDROGRAPH   230.10


    RUNOFF VOLUME =        .82538 INCHES      =        3.5766 ACRE-FEET
    PEAK DISCHARGE RATE =      86.03 CFS  AT   1.600 HOURS   BASIN AREA =


*
*S      COMPUTE BASIN A2
*
COMPUTE NM HYD              ID=1  HYD=102.0  AREA=0.03953 SQ MI
                                       PER A=100  PER B=0  PER C=0  PER D=0
                                       TP=0.32 HRS  MASS RAIN=-1

    K =    .391124HR    TP =    .320000HR    K/TP RATIO =  1.222262     SHAPE
    UNIT PEAK =   33.917    CFS   UNIT VOLUME =    .9995        B =   274.56
    AREA =       .039530 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                   ID=1  CODE=1

                                        PARTIAL HYDROGRAPH   102.00


    RUNOFF VOLUME =        .45484 INCHES      =         .9589 ACRE-FEET
    PEAK DISCHARGE RATE =      15.20 CFS  AT   1.700 HOURS   BASIN AREA =


*
*S      ADD BASIN A2 TO BASIN B1/B2/B3/B4
*
ADD HYD                     ID=2  HYD=240.0  ID I=3  ID II=1
*
PRINT HYD                   ID=2  CODE=1

                                        PARTIAL HYDROGRAPH   240.00


    RUNOFF VOLUME =        .70410 INCHES      =        4.5355 ACRE-FEET
    PEAK DISCHARGE RATE =      99.28 CFS  AT   1.600 HOURS   BASIN AREA =
```

```
*
*S       ROUTE BASIN A2/B1/B2/B3/B4 FLOWS TO BASIN C1
*
COMPUTE RATING CURVE    CID=1  VS NO=1  NO SEGS=2
                                MIN ELEV=1.58 FT  MAX ELEV=5.58 FT
                                CH SLP=0.0108  FP SLP=0.0108  N=0.022
                                DIST=20.0 FT  N=0.018  DIST=86 FT
                                DIST    ELEV    DIST    ELEV    DIST
                                  0     5.58     16     1.58     22
                                 43      3.0     64     2.58     70
                                 86     5.58
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
1.58	.00	.00
1.79	.44	.76
2.00	1.77	4.83
2.21	3.99	14.23
2.42	7.09	30.65
2.63	11.20	50.14
2.84	19.00	85.57
3.05	31.45	161.32
3.26	45.47	286.78
3.47	59.86	443.19
3.69	74.59	628.34
3.90	89.68	840.79
4.11	105.13	1079.52
4.32	120.93	1343.78
4.53	137.09	1633.04
4.74	153.60	1946.86
4.95	170.46	2284.94
5.16	187.68	2647.03
5.37	205.25	3032.97
5.58	223.18	3442.61

```
*
COMPUTE TRAVEL TIME     ID=3  REACH NO=4  VS NO=1  L=2170 FT
                              SLP=0.0108
```

TRAVEL TIME TABLE

REACH= 4.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.211	.443	.76	.3514
.421	1.773	4.83	.2214
.632	3.989	14.23	.1689
.842	7.091	30.65	.1395
1.053	11.202	50.14	.1347
1.263	19.003	85.57	.1339
1.474	31.446	161.32	.1175
1.684	45.474	286.78	.0956
1.895	59.856	443.19	.0814
2.105	74.593	628.34	.0716
2.316	89.684	840.79	.0643
2.526	105.130	1079.52	.0587
2.737	120.931	1343.78	.0542

```
                                    2.947     137.086     1633.04        .0506
                                    3.158     153.595     1946.86        .0476
                                    3.368     170.460     2284.94        .0450
                                    3.579     187.679     2647.03        .0427
                                    3.789     205.252     3032.97        .0408
                                    4.000     223.180     3442.61        .0391
*
ROUTE                     ID=3  HYD NO=240.1  INFLOW ID=2  DT=0.0
*
PRINT HYD                 ID=3  CODE=1

                                     PARTIAL HYDROGRAPH   240.10


    RUNOFF VOLUME =       .70411 INCHES     =       4.5356 ACRE-FEET
    PEAK DISCHARGE RATE =      77.53 CFS  AT   1.733 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN C1
*
COMPUTE NM HYD            ID=1  HYD=301.0  AREA=0.01797 SQ MI
                                     PER A=50  PER B=0  PER C=0  PER D=50
                                     TP=0.17 HRS  MASS RAIN=-1

    K =    .092650HR    TP =    .170000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =    27.815    CFS   UNIT VOLUME =    .9998        B =   526.28
    AREA =       .008985 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =    .207785HR    TP =    .170000HR    K/TP RATIO =  1.222262     SHAPE
    UNIT PEAK =    14.512    CFS   UNIT VOLUME =    .9988        B =   274.56
    AREA =       .008985 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                 ID=1  CODE=1

                                     HYDROGRAPH FROM AREA   301.00


    RUNOFF VOLUME =      1.22041 INCHES     =       1.1696 ACRE-FEET
    PEAK DISCHARGE RATE =      29.04 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S       ADD BASIN C1 IN WITH OTHER BASINS
*
ADD HYD                   ID=2  HYD=250.0  ID I=3  ID II=1
*
PRINT HYD                 ID=2  CODE=1

                                     PARTIAL HYDROGRAPH   250.00


    RUNOFF VOLUME =       .77097 INCHES     =       5.7052 ACRE-FEET
    PEAK DISCHARGE RATE =      93.97 CFS  AT   1.700 HOURS   BASIN AREA =
```

```
*
*S                    CALCULATE DRAINAGE FOR BASINS NORTH OF SAN YGNACIO
*S                    ASSUME SAD 222 IMPROVEMENTS ARE IN PLACE
*
*S                    COMPUTE BASIN A1
*
COMPUTE NM HYD                ID=1 HYD NO=301.0  AREA=0.09058 SQ MI
                                       PER A=100 PER B=0 PER C=0 PER D=0
                                       TP=0.30 MASS RAIN=-1

    K =    .359078HR    TP =    .300000HR    K/TP RATIO =  1.196927     SHAPE
    UNIT PEAK =   84.305    CFS   UNIT VOLUME =    .9998        B =   279.22
    AREA =       .090580 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                     ID=1 CODE=1

                                          HYDROGRAPH FROM AREA   301.00


    RUNOFF VOLUME =       .45484 INCHES     =       2.1973 ACRE-FEET
    PEAK DISCHARGE RATE =       37.64 CFS  AT   1.700 HOURS   BASIN AREA =


*
*S                    ROUTE A1  ALONG SAN YGNACIO TO A3
*
COMPUTE RATING CURVE          CID=1   NO VS=1  NO SEGS=1
                                      MIN ELEV=110.1 MAX ELEV=111.7
                                      CH SLP=0.0120   FP SLP=0.0120 N=0.017
                                      DIST=87 FT
                                      DIST    ELEV    DIST    ELEV    DIST
                                      0       111.2   9       110.8   10
                                      35      110.1   36      111.3   43
                                      50      111.3   51      110.6   76
                                      77      110.8   87      111.2

                                RATING CURVE VALLEY SECTION  1.0
                                   WATER        FLOW        FLOW
                                  SURFACE       AREA        RATE
                                   ELEV         SQ FT       CFS
                                  110.10         .00         .00
                                  110.18        2.30        4.00
                                  110.27        4.97       13.16
                                  110.35        8.03       26.88
                                  110.44       11.47       45.17
                                  110.52       15.29       68.19
                                  110.61       19.49       96.44
                                  110.69       23.87      134.34
                                  110.77       28.29      177.11
                                  110.86       32.83      218.53
                                  110.94       37.70      262.22
                                  111.03       42.92      311.19
                                  111.11       48.50      365.68
                                  111.19       54.43      425.95
```

111.28	60.57	506.62
111.36	66.78	584.31
111.45	73.24	664.49
111.53	79.95	750.48
111.62	86.90	842.39
111.70	94.10	940.39

```
*
COMPUTE TRAVEL TIME ID=4    REACH NO=5  VS NO=1 L=1000 FT
                                SLP=0.0120
```

TRAVEL TIME TABLE

REACH= 5.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.084	2.296	4.00	.1596
.168	4.972	13.16	.1050
.253	8.029	26.88	.0830
.337	11.467	45.17	.0705
.421	15.286	68.19	.0623
.505	19.485	96.44	.0561
.589	23.872	134.34	.0494
.674	28.294	177.11	.0444
.758	32.828	218.53	.0417
.842	37.700	262.22	.0399
.926	42.924	311.19	.0383
1.011	48.501	365.68	.0368
1.095	54.432	425.95	.0355
1.179	60.566	506.62	.0332
1.263	66.783	584.31	.0317
1.347	73.241	664.49	.0306
1.432	79.947	750.48	.0296
1.516	86.902	842.39	.0287
1.600	94.104	940.39	.0278

```
*
ROUTE                          ID=4 HYD NO=301.1 INFLOW ID=1   DT=0
*
PRINT HYD                   ID=4 CODE=1

                                   HYDROGRAPH FROM AREA   301.10

    RUNOFF VOLUME =       .45485 INCHES     =       2.1973 ACRE-FEET
    PEAK DISCHARGE RATE =      35.96 CFS  AT   1.767 HOURS   BASIN AREA =


*
*S                    COMPUTE BASIN A3
*
COMPUTE NM HYD              ID=3  HYD NO=310.0  AREA=0.09259 SQ MI
                                    PER A=100 PER B=0 PER C=0 PER D=0
                                    TP=0.24 MASS RAIN=-1

    K =   .286827HR    TP =   .240000HR    K/TP RATIO =  1.195114     SHAPE
    UNIT PEAK =   107.85    CFS   UNIT VOLUME =    .9999        B =   279.56
    AREA =      .092590 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
```

```
*
PRINT HYD                    ID=3 CODE=1

                                          HYDROGRAPH FROM AREA   310.00

    RUNOFF VOLUME =       .45484 INCHES     =       2.2461 ACRE-FEET
    PEAK DISCHARGE RATE =      47.73 CFS  AT   1.633 HOURS   BASIN AREA =


*
*S                  ADD BASINS A1& A3
*
ADD HYD                              ID=6 HYD NO=315.0 ID I=4 ID II=3
*
PRINT HYD                    ID=6    CODE=1

                                          HYDROGRAPH FROM AREA   315.00

    RUNOFF VOLUME =       .45484 INCHES     =       4.4434 ACRE-FEET
    PEAK DISCHARGE RATE =      79.48 CFS  AT   1.667 HOURS   BASIN AREA =


*
*S                  ROUTE BASINS A1 &A3 THRU A4
*
COMPUTE RATING CURVE         CID=1   NO VS=1  NO SEGS=1
                                     MIN ELEV=85.6   MAX ELEV=86.0
                                     CH SLP=0.0147   FP SLP=0.0147   N=0.035
                                     DIST=250.0 FT
                                     DIST    ELEV    DIST    ELEV
                                     0       86.0    20      85.8
                                     125     85.6    230     85.8
                                     250     86.0
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
85.60	.00	.00
85.62	.23	.06
85.64	.93	.37
85.66	2.09	1.08
85.68	3.72	2.32
85.71	5.82	4.20
85.73	8.37	6.84
85.75	11.40	10.31
85.77	14.89	14.72
85.79	18.84	20.15
85.81	23.21	27.34
85.83	27.72	36.28
85.85	32.32	46.25
85.87	37.01	57.23
85.89	41.78	69.20
85.92	46.64	82.13
85.94	51.60	96.02
85.96	56.64	110.85

```
                                        85.98        61.77        126.62
                                        86.00        66.98        143.31
*
COMPUTE TRAVEL TIME ID=1 REACH NO=6 VS NO=1 L=1630 FT
                                   SLP=0.0147

                          TRAVEL TIME TABLE
                                          REACH=  6.0

                          WATER       AVERAGE      FLOW         TRAVEL
                          DEPTH       AREA         RATE         TIME
                          FEET        SQ.FT.       CFS          HRS
                             .021         .233          .06       1.8315
                             .042         .930          .37       1.1538
                             .063        2.094         1.08        .8805
                             .084        3.722         2.32        .7268
                             .105        5.815         4.20        .6264
                             .126        8.374         6.84        .5547
                             .147       11.398        10.31        .5005
                             .168       14.887        14.72        .4579
                             .189       18.842        20.15        .4233
                             .210       23.214        27.34        .3844
                             .232       27.723        36.28        .3460
                             .253       32.321        46.25        .3164
                             .274       37.007        57.23        .2928
                             .295       41.782        69.20        .2734
                             .316       46.645        82.13        .2571
                             .337       51.597        96.02        .2433
                             .358       56.638       110.85        .2313
                             .379       61.767       126.62        .2209
                             .400       66.985       143.31        .2116
*
ROUTE                                ID=1 HYD NO=320.0  INFLOW ID=6  DT=0.0
*
PRINT HYD                      ID=1 CODE=1

                                        HYDROGRAPH FROM AREA   320.00


    RUNOFF VOLUME =       .45484 INCHES     =       4.4434 ACRE-FEET
    PEAK DISCHARGE RATE =       52.58 CFS  AT   1.867 HOURS   BASIN AREA =


*
*S                    COMPUTE BASIN A4
*
COMPUTE NM HYD                 ID=4 HYD NO=320.1 AREA=0.06187 SQ MI
                                      PER A=100 PER B=0 PER C=0 PER D=0
                                      TP=0.27 MASS RAIN=-1

    K =    .330011HR    TP =    .270000HR    K/TP RATIO =  1.222262     SHAPE
    UNIT PEAK =    62.916    CFS   UNIT VOLUME =    .9997        B =   274.56
    AREA =       .061870 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                      ID=4 CODE=1

                                        HYDROGRAPH FROM AREA   320.10
```

```
    RUNOFF VOLUME =        .45484 INCHES      =        1.5009 ACRE-FEET
    PEAK DISCHARGE RATE =       28.01 CFS  AT   1.667 HOURS   BASIN AREA =


*
*S                    ADD BASINS A1&3 TO BASIN A4
*
ADD HYD                                ID=6 HYD NO=310.3        ID I=4 ID II=1
*
PRINT HYD                     ID=6 CODE=1

                                          HYDROGRAPH FROM AREA   310.30


    RUNOFF VOLUME =        .45483 INCHES      =        5.9441 ACRE-FEET
    PEAK DISCHARGE RATE =       73.42 CFS  AT   1.800 HOURS   BASIN AREA =


*
*S                    COMPUTE BASIN A5
*
COMPUTE NM HYD                ID=5 HYD NO=305.0 AREA=0.09021 SQ MI
                                       PER A=100 PER B=0 PER C=0 PER D=0
                                       TP=0.48 MASS RAIN=-1

    K =    .574685HR     TP =    .480000HR     K/TP RATIO =  1.197261     SHAPE
    UNIT PEAK =    52.464     CFS   UNIT VOLUME =     .9997        B =   279.15
    AREA =       .090210 SQ MI     IA =     .65000 INCHES     INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                     ID=5 CODE=1

                                          HYDROGRAPH FROM AREA   305.00


    RUNOFF VOLUME =        .45484 INCHES      =        2.1883 ACRE-FEET
    PEAK DISCHARGE RATE =       23.71 CFS  AT   1.867 HOURS   BASIN AREA =


*
*S                    ADD BASINS  A1,A3,A4 & A5
*
ADD HYD                                ID=1    HYD NO=320.0 ID I=5 ID II=6
*
PRINT HYD                     ID=1 CODE=1

                                          HYDROGRAPH FROM AREA   320.00


    RUNOFF VOLUME =        .45484 INCHES      =        8.1324 ACRE-FEET
    PEAK DISCHARGE RATE =       96.78 CFS  AT   1.833 HOURS   BASIN AREA =
```

```
*
*S                    CALCULATE TOTAL INFLOW INTO UNSER PLAYA
*
ADD HYD                                  ID=3 HYD NO=330.0 ID I=1 ID II=2
*
PRINT HYD             ID=3   CODE=1

                                         HYDROGRAPH FROM AREA   330.00


    RUNOFF VOLUME =        .54738 INCHES      =      13.8376 ACRE-FEET
    PEAK DISCHARGE RATE =      185.61 CFS  AT   1.767 HOURS   BASIN AREA =


*
*S       END CALCULATIONS
*
FINISH

    NORMAL PROGRAM FINISH            END TIME (HR:MIN:SEC) = 10:43:48
```

4-15-94

AHYMO SUMMARY TABLE (AHYMO993) - AMAFCA VERSION OF HYMO - SEPTEMBER, 1993
INPUT FILE = C:\AHYMO\SUNSET\SW2-D100.DAT

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOF VOLUM (AC-F
START						
*S	INPUT FILE NAME: SW2-D100.DAT					
*S	OUTPUT FILE NAME: SW2-D100.OUT					
*S	PROJECT: SUNSET WEST UNIT 2					
*S	CONDITION: DEVELOPED CONDITIONS; 100-YEAR STORM					
*S	SAD 222 IN PLACE; SUNSET WEST UNIT 2					
*S	LEEDSHILL-HERKENHOFF, INC.					
RAINFALL	TYPE= 1					
*S	COMPUTE BASIN B1 & PRINT VALUES					
COMPUTE	NM HYD 201.00	-	1	.00672	10.14	.30
*S	ROUTE BASIN B1 FLOWS TO BASIN B2					
*S	COMPUTE TRAVEL TIME					
*S	ROUTE THE FLOW & PRINT					
ROUTE	201.10	1	2	.00672	8.28	.30
*S	COMPUTE BASIN B2					
COMPUTE	NM HYD 202.00	-	1	.01609	27.42	.87
*S	ADD BASIN B1 & B2					
ADD HYD	210.00	1& 2	3	.02281	34.83	1.18
*S	ROUTE COMBINATION OF BASIN B1/B2 FLOWS TO BASIN B3/B4					
ROUTE	202.10	3	4	.02281	29.19	1.18
*S	COMPUTE BASIN B3					
COMPUTE	NM HYD 203.00	-	1	.04219	63.51	2.30
*S	COMPUTE BASIN B4					
COMPUTE	NM HYD 204.00	-	2	.01625	29.11	.88
*S	ADD BASIN B3 & B4					
ADD HYD	220.00	1& 2	5	.05844	90.58	3.19
*S	ADD BASIN B3/B4 & BASIN B1/B2					
ADD HYD	230.00	4& 5	6	.08125	117.34	4.37
*S	ROUTE BASIN B1,B2,B3 & B4 FLOWS TO BASIN A2					
ROUTE	230.10	6	3	.08125	107.20	4.37
*S	COMPUTE BASIN A2					
COMPUTE	NM HYD 102.00	-	1	.03953	15.20	.95
*S	ADD BASIN A2 TO BASIN B1/B2/B3/B4					
ADD HYD	240.00	3& 1	2	.12078	120.45	5.33
*S	ROUTE BASIN A2/B1/B2/B3/B4 FLOWS TO BASIN C1					
ROUTE	240.10	2	3	.12078	92.51	5.33
*S	COMPUTE BASIN C1					
COMPUTE	NM HYD 301.00	-	1	.01797	29.04	1.17
*S	ADD BASIN C1 IN WITH OTHER BASINS					
ADD HYD	250.00	3& 1	2	.13875	110.10	6.50
*S	CALCULATE DRAINAGE FOR BASINS NORTH OF SAN YGNACIO					
*S	ASSUME SAD 222 IMPROVEMENTS ARE IN PLACE					
*S	COMPUTE BASIN A1					
COMPUTE	NM HYD 301.00	-	1	.09058	37.64	2.19
*S	ROUTE A1 ALONG SAN YGNACIO TO A3					
ROUTE	301.10	1	4	.09058	35.68	2.19
*S	COMPUTE BASIN A3					
COMPUTE	NM HYD 310.00	-	3	.09259	47.73	2.24
*S	ADD BASINS A1& A3					

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOF VOLUM (AC-F
ADD HYD	315.00	3& 4	6	.18317	78.74	4.44
*S	ROUTE BASINS A1 &A3 THRU A4					
ROUTE	320.00	6	1	.18317	52.44	4.44
*S	COMPUTE BASIN A4					
COMPUTE NM HYD	320.10	-	4	.06187	28.01	1.50
*S	ADD BASINS A1&3 TO BASIN A4					
ADD HYD	310.30	4& 1	6	.24504	73.16	5.94
*S	COMPUTE BASIN A5					
COMPUTE NM HYD	305.00	-	5	.09021	23.71	2.18
*S	ADD BASINS A1,A3,A4 & A5					
ADD HYD	320.00	5& 6	1	.33525	96.57	8.13
*S	CALCULATE TOTAL INFLOW INTO UNSER PLAYA					
ADD HYD	330.00	1& 2	3	.47400	198.61	14.63
*S	END CALCULATIONS					
FINISH						

```
    AHYMO PROGRAM (AHYMO993) - AMAFCA VERSION OF HYMO - SEPTEMBER, 1993
         RUN DATE (MON/DAY/YR) = 04/15/1994
         START TIME (HR:MIN:SEC) = 10:29:10     USER NO.= G_NEMETH.S93
         INPUT FILE = C:\AHYMO\SUNSET\SW2-D100.DAT

START                    0.0
*
*S       INPUT  FILE NAME:  SW2-D100.DAT
*S       OUTPUT FILE NAME:  SW2-D100.OUT
*S       PROJECT:           SUNSET WEST UNIT 2
*S       CONDITION:         DEVELOPED CONDITIONS; 100-YEAR STORM
*S                                  SAD 222 IN PLACE; SUNSET WEST UNIT 2
*S       LEEDSHILL-HERKENHOFF, INC.
*
RAINFALL                 TYPE=1  RAIN QUARTER=0.0
                                    RAIN ONE=1.90 IN  RAIN SIX=2.22 IN
                                    RAIN DAY=0.00 IN  DT=0.033333 HRS

                 COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2
                 DT =     .033333 HOURS        END TIME =     5.999940 HOURS
                    .0000   .0015   .0030   .0046   .0062   .0079   .0096
                    .0113   .0130   .0149   .0167   .0186   .0206   .0226
                    .0246   .0268   .0290   .0312   .0336   .0360   .0385
                    .0411   .0438   .0466   .0496   .0526   .0558   .0592
                    .0627   .0665   .0704   .0757   .0813   .0873   .1002
                    .1291   .1735   .2373   .3244   .4388   .5847   .7664
                    .9881  1.1931  1.2789  1.3514  1.4159  1.4745  1.5285
                   1.5786  1.6255  1.6694  1.7107  1.7497  1.7865  1.8214
                   1.8544  1.8857  1.9154  1.9436  1.9704  1.9765  1.9822
                   1.9876  1.9928  1.9977  2.0025  2.0070  2.0114  2.0156
                   2.0196  2.0235  2.0273  2.0310  2.0346  2.0381  2.0415
                   2.0448  2.0480  2.0511  2.0542  2.0571  2.0601  2.0629
                   2.0657  2.0685  2.0712  2.0738  2.0764  2.0789  2.0814
                   2.0839  2.0863  2.0887  2.0910  2.0933  2.0955  2.0978
                   2.0999  2.1021  2.1042  2.1063  2.1084  2.1104  2.1124
                   2.1144  2.1164  2.1183  2.1202  2.1221  2.1240  2.1258
                   2.1277  2.1295  2.1312  2.1330  2.1347  2.1365  2.1382
                   2.1399  2.1415  2.1432  2.1448  2.1464  2.1480  2.1496
                   2.1512  2.1527  2.1543  2.1558  2.1573  2.1588  2.1603
                   2.1618  2.1633  2.1647  2.1661  2.1676  2.1690  2.1704
                   2.1718  2.1732  2.1745  2.1759  2.1772  2.1786  2.1799
                   2.1812  2.1825  2.1838  2.1851  2.1864  2.1876  2.1889
                   2.1902  2.1914  2.1926  2.1939  2.1951  2.1963  2.1975
                   2.1987  2.1999  2.2010  2.2022  2.2034  2.2045  2.2057
                   2.2068  2.2080  2.2091  2.2102  2.2113  2.2124  2.2135
                   2.2146  2.2157  2.2168  2.2179  2.2189  2.2200

*
*S       COMPUTE BASIN B1 & PRINT VALUES
*
COMPUTE NM HYD           ID=1  HYD=201.0  AREA=0.00672 SQ MI
                                    PER A=75  PER B=0  PER C=0  PER D=25
                                    TP=0.11 HRS  MASS RAIN=-1

    K =    .059950HR    TP =    .110000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =    8.0377    CFS   UNIT VOLUME =    .9982        B =   526.28
    AREA =       .001680 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
```

```
K =    .134449HR    TP =    .110000HR    K/TP RATIO =  1.222262     SHAPE
UNIT PEAK =    12.580    CFS   UNIT VOLUME =    .9981        B =   274.56
AREA =       .005040 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=1  CODE=1

                                        PARTIAL HYDROGRAPH   201.00

RUNOFF VOLUME =       .83763 INCHES      =         .3002 ACRE-FEET
PEAK DISCHARGE RATE =       10.14 CFS  AT   1.500 HOURS   BASIN AREA =


*
*S       ROUTE BASIN B1 FLOWS TO BASIN B2
*
COMPUTE RATING CURVE    CID=1  VS NO=1  NO SEGS=1
                                MIN ELEV=139.1 FT  MAX ELEV=140.7 FT
                                CH SLP=0.0166  FP SLP=0.0166  N=0.018
                                DIST=87 FT
                                DIST  ELEV      DIST  ELEV      DIST  EL
                                  0   140.2       9   139.8      10   13
                                 35   139.6      36   140.3      43   14
                                 50   140.3      51   139.6      76   13
                                 77   139.8      87   140.2

                                 RATING CURVE VALLEY SECTION  1.0
                                     WATER        FLOW        FLOW
                                    SURFACE       AREA        RATE
                                     ELEV         SQ FT       CFS
                                    139.10         .00         .00
                                    139.18         .36         .47
                                    139.27        1.46        2.97
                                    139.35        3.28        8.75
                                    139.44        5.84       18.85
                                    139.52        9.12       34.18
                                    139.61       13.13       55.93
                                    139.69       17.48       89.48
                                    139.77       21.88      129.06
                                    139.86       26.39      169.73
                                    139.94       31.24      214.08
                                    140.03       36.45      264.42
                                    140.11       42.01      321.02
                                    140.19       47.93      384.15
                                    140.28       54.07      467.20
                                    140.36       60.28      548.84
                                    140.45       66.74      634.00
                                    140.53       73.45      725.74
                                    140.62       80.40      824.19
                                    140.70       87.60      929.50
*
*S       COMPUTE TRAVEL TIME
*
COMPUTE TRAVEL TIME      ID=2  REACH NO=1  NO VS=1  L=772 FT
                                     SLP=0.0166
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.084	.365	.47	.1673
.168	1.459	2.97	.1054
.253	3.283	8.75	.0804
.337	5.836	18.85	.0664
.421	9.118	34.18	.0572
.505	13.129	55.93	.0503
.589	17.483	89.48	.0419
.674	21.877	129.06	.0364
.758	26.387	169.73	.0333
.842	31.238	214.08	.0313
.926	36.446	264.42	.0296
1.011	42.012	321.02	.0281
1.095	47.935	384.15	.0268
1.179	54.067	467.20	.0248
1.263	60.284	548.84	.0236
1.347	66.742	634.00	.0226
1.432	73.448	725.74	.0217
1.516	80.402	824.19	.0209
1.600	87.605	929.50	.0202

```
*
*S       ROUTE THE FLOW & PRINT
*
ROUTE                    ID=2  HYD NO=201.1  INFLOW ID=1  DT=0.0
*
PRINT HYD                ID=2  CODE=1

                                   PARTIAL HYDROGRAPH   201.10


    RUNOFF VOLUME =       .83766 INCHES      =        .3002 ACRE-FEET
    PEAK DISCHARGE RATE =        8.28 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B2
*
COMPUTE NM HYD           ID=1  HYD=202.0  AREA=0.01609 SQ MI
                                   PER A=20  PER B=50  PER C=0  PER D=30
                                   TP=0.13 HRS  MASS RAIN=-1

    K =    .070850HR    TP =    .130000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =    19.541    CFS   UNIT VOLUME =    .9994        B =   526.28
    AREA =       .004827 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

    K =    .136487HR    TP =    .130000HR    K/TP RATIO =  1.049896     SHAPE
    UNIT PEAK =    26.873    CFS   UNIT VOLUME =    .9997        B =   310.18
    AREA =       .011263 SQ MI    IA =    .54286 INCHES    INF =   1.37000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                ID=1  CODE=1
```

PARTIAL HYDROGRAPH 202.00

RUNOFF VOLUME = 1.02481 INCHES = .8794 ACRE-FEET
PEAK DISCHARGE RATE = 27.42 CFS AT 1.500 HOURS BASIN AREA =

```
*
*S      ADD BASIN B1 & B2
*
ADD HYD                 ID=3  HYD=210.0 ID I=1  ID II=2
*
PRINT HYD               ID=3  CODE=1
```

PARTIAL HYDROGRAPH 210.00

RUNOFF VOLUME = .96965 INCHES = 1.1796 ACRE-FEET
PEAK DISCHARGE RATE = 34.83 CFS AT 1.533 HOURS BASIN AREA =

```
*
*S      ROUTE COMBINATION OF BASIN B1/B2 FLOWS TO BASIN B3/B4
*
COMPUTE RATING CURVE    CID=1  VS NO=1  NO SEGS=1
                                MIN ELEV=139.1 FT  MAX ELEV=140.7 FT
                                CH SLP=0.0152  FP SLP=0.0152  N=0.018
                                DIST=87 FT
                                DIST    ELEV    DIST    ELEV    DIST
                                  0     140.2     9     139.8    10
                                 35     139.6    36     140.3    43
                                 50     140.3    51     139.6    76
                                 77     139.8    87     140.2
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
139.10	.00	.00
139.18	.36	.45
139.27	1.46	2.84
139.35	3.28	8.38
139.44	5.84	18.04
139.52	9.12	32.71
139.61	13.13	53.52
139.69	17.48	85.62
139.77	21.88	123.49
139.86	26.39	162.42
139.94	31.24	204.85
140.03	36.45	253.02
140.11	42.01	307.19
140.19	47.93	367.60
140.28	54.07	447.07
140.36	60.28	525.19
140.45	66.74	606.68
140.53	73.45	694.46
140.62	80.40	788.67

```
                                        140.70        87.60        889.44
*
COMPUTE TRAVEL TIME      ID=4  REACH NO=2  NO VS=1  L=1079 FT
                                   SLP=0.0152

                              TRAVEL TIME TABLE
                                                REACH=  2.0

                              WATER        AVERAGE      FLOW         TRAVEL
                              DEPTH        AREA         RATE         TIME
                              FEET         SQ.FT.       CFS          HRS
                                .084          .365          .45        .2443
                                .168         1.459         2.84        .1539
                                .253         3.283         8.38        .1175
                                .337         5.836        18.04        .0970
                                .421         9.118        32.71        .0836
                                .505        13.129        53.52        .0735
                                .589        17.483        85.62        .0612
                                .674        21.877       123.49        .0531
                                .758        26.387       162.42        .0487
                                .842        31.238       204.85        .0457
                                .926        36.446       253.02        .0432
                               1.011        42.012       307.19        .0410
                               1.095        47.935       367.60        .0391
                               1.179        54.067       447.07        .0362
                               1.263        60.284       525.19        .0344
                               1.347        66.742       606.68        .0330
                               1.432        73.448       694.46        .0317
                               1.516        80.402       788.67        .0306
                               1.600        87.605       889.44        .0295
*
ROUTE                    ID=4  HYD NO=202.1  INFLOW ID=3  DT=0.0
*
PRINT HYD                ID=4  CODE=1

                                   PARTIAL HYDROGRAPH   202.10


    RUNOFF VOLUME =        .96967 INCHES      =       1.1796 ACRE-FEET
    PEAK DISCHARGE RATE =      29.19 CFS  AT   1.567 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B3
*
COMPUTE NM HYD           ID=1  HYD=203.0  AREA=0.04219 SQ MI
                                   PER A=20  PER B=50  PER C=0  PER D=30
                                   TP=0.16 HRS  MASS RAIN=-1

    K =    .087200HR    TP =    .160000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =   41.632    CFS   UNIT VOLUME =    .9993        B =   526.28
    AREA =       .012657 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =    .167983HR    TP =    .160000HR    K/TP RATIO =  1.049896     SHAPE
    UNIT PEAK =   57.253    CFS   UNIT VOLUME =    .9998        B =   310.18
    AREA =       .029533 SQ MI    IA =    .54286 INCHES    INF =   1.37000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
```

```
*
PRINT HYD                    ID=1  CODE=1

                                        PARTIAL HYDROGRAPH   203.00


    RUNOFF VOLUME =      1.02481 INCHES      =        2.3060 ACRE-FEET
    PEAK DISCHARGE RATE =       63.51 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B4
*
COMPUTE NM HYD               ID=2  HYD=204.0  AREA=0.01625 SQ MI
                                        PER A=20  PER B=50 PER C=0  PER D=30
                                        TP=0.12 HRS  MASS RAIN=-1

    K =   .065400HR    TP =   .120000HR    K/TP RATIO =   .545000     SHAPE
    UNIT PEAK =   21.380    CFS   UNIT VOLUME =    .9992        B =   526.28
    AREA =       .004875 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =   .125988HR    TP =   .120000HR    K/TP RATIO =  1.049896     SHAPE
    UNIT PEAK =   29.402    CFS   UNIT VOLUME =    .9999        B =   310.18
    AREA =       .011375 SQ MI    IA =    .54286 INCHES    INF =   1.37000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=2  CODE=1

                                        PARTIAL HYDROGRAPH   204.00


    RUNOFF VOLUME =      1.02481 INCHES      =         .8882 ACRE-FEET
    PEAK DISCHARGE RATE =       29.11 CFS  AT   1.500 HOURS   BASIN AREA =


*
*S       ADD BASIN B3 & B4
*
ADD HYD                      ID=5  HYD=220.0  ID I=1  ID II=2
*
PRINT HYD                    ID=5  CODE=1

                                        PARTIAL HYDROGRAPH   220.00


    RUNOFF VOLUME =      1.02480 INCHES      =        3.1941 ACRE-FEET
    PEAK DISCHARGE RATE =       90.58 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S       ADD BASIN B3/B4 & BASIN B1/B2
*
ADD HYD                      ID=6  HYD=230.0  ID I=4  ID II=5
```

```
*
PRINT HYD                    ID=6   CODE=1

                                          PARTIAL HYDROGRAPH   230.00


    RUNOFF VOLUME =      1.00932 INCHES      =        4.3737 ACRE-FEET
    PEAK DISCHARGE RATE =      117.34 CFS  AT   1.533 HOURS   BASIN AREA =



*
*S       ROUTE BASIN B1,B2,B3 & B4 FLOWS TO BASIN A2
*
COMPUTE RATING CURVE     CID=1  VS NO=1  NO SEGS=2
                                     MIN ELEV=0.0 FT  MAX ELEV=2.75 FT
                                     CH SLP=0.0108  FP SLP=0.0108  N=0.022
                                     DIST=20.0 FT  N=0.018  DIST=59 FT
                                     DIST    ELEV    DIST    ELEV    DIST
                                      0      2.75     11      0.0     17
                                     23      1.12     29     1.24     38
                                     53      0.88     54     1.55     59

                                     RATING CURVE VALLEY SECTION  1.0
                                         WATER        FLOW        FLOW
                                        SURFACE       AREA        RATE
                                         ELEV         SQ FT       CFS
                                          .00          .00         .00
                                          .14          .10         .13
                                          .29          .42         .80
                                          .43          .94        2.36
                                          .58         1.68        5.08
                                          .72         2.62        9.21
                                          .87         3.77       14.97
                                         1.01         5.73       22.64
                                         1.16         9.83       34.42
                                         1.30        16.30       66.21
                                         1.45        23.28      113.80
                                         1.59        30.40      171.50
                                         1.74        38.00      236.40
                                         1.88        45.99      320.02
                                         2.03        54.07      415.33
                                         2.17        62.23      521.08
                                         2.32        70.48      636.87
                                         2.46        78.81      762.38
                                         2.61        87.22      897.37
                                         2.75        95.72     1041.60
*
COMPUTE TRAVEL TIME      ID=3  REACH NO=3  VS NO=1  L=1069 FT
                                     SLP=0.0108

                                     TRAVEL TIME TABLE
                                                        REACH=  3.0

                                     WATER       AVERAGE     FLOW        TRAVEL
                                     DEPTH       AREA        RATE        TIME
                                     FEET        SQ.FT.      CFS         HRS
                                        .145        .105        .13        .2469
                                        .289        .419        .80        .1556
                                        .434        .943       2.36        .1187
```

.579	1.676	5.08	.0980
.724	2.619	9.21	.0844
.868	3.771	14.97	.0748
1.013	5.728	22.64	.0751
1.158	9.833	34.42	.0848
1.303	16.298	66.21	.0731
1.447	23.279	113.80	.0607
1.592	30.397	171.50	.0526
1.737	37.999	236.40	.0477
1.882	45.991	320.02	.0427
2.026	54.070	415.33	.0387
2.171	62.232	521.08	.0355
2.316	70.479	636.87	.0329
2.461	78.809	762.38	.0307
2.605	87.222	897.37	.0289
2.750	95.720	1041.60	.0273

```
*
ROUTE                    ID=3  HYD NO=230.1  INFLOW ID=6  DT=0.0
*
PRINT HYD                ID=3  CODE=1

                                 PARTIAL HYDROGRAPH   230.10


    RUNOFF VOLUME =      1.00932 INCHES      =        4.3737 ACRE-FEET
    PEAK DISCHARGE RATE =     107.20 CFS  AT   1.600 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN A2
*
COMPUTE NM HYD           ID=1  HYD=102.0  AREA=0.03953 SQ MI
                                PER A=100  PER B=0  PER C=0  PER D=0
                                TP=0.32 HRS  MASS RAIN=-1

    K =    .391124HR    TP =    .320000HR    K/TP RATIO =  1.222262     SHAPE
    UNIT PEAK =   33.917    CFS   UNIT VOLUME =    .9995        B =   274.56
    AREA =       .039530 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                ID=1  CODE=1

                                 PARTIAL HYDROGRAPH   102.00


    RUNOFF VOLUME =       .45484 INCHES      =         .9589 ACRE-FEET
    PEAK DISCHARGE RATE =      15.20 CFS  AT   1.700 HOURS   BASIN AREA =


*
*S       ADD BASIN A2 TO BASIN B1/B2/B3/B4
*
ADD HYD                  ID=2  HYD=240.0  ID I=3  ID II=1
*
PRINT HYD                ID=2  CODE=1

                                 PARTIAL HYDROGRAPH   240.00
```

RUNOFF VOLUME = .82784 INCHES = 5.3326 ACRE-FEET
PEAK DISCHARGE RATE = 120.45 CFS AT 1.600 HOURS BASIN AREA =

*
*S ROUTE BASIN A2/B1/B2/B3/B4 FLOWS TO BASIN C1
*
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=2
MIN ELEV=1.58 FT MAX ELEV=5.58 FT
CH SLP=0.0108 FP SLP=0.0108 N=0.022
DIST=20.0 FT N=0.018 DIST=86 FT

DIST	ELEV	DIST	ELEV	DIST
0	5.58	16	1.58	22
43	3.0	64	2.58	70
86	5.58			

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
1.58	.00	.00
1.79	.44	.76
2.00	1.77	4.83
2.21	3.99	14.23
2.42	7.09	30.65
2.63	11.20	50.14
2.84	19.00	85.57
3.05	31.45	161.32
3.26	45.47	286.78
3.47	59.86	443.19
3.69	74.59	628.34
3.90	89.68	840.79
4.11	105.13	1079.52
4.32	120.93	1343.78
4.53	137.09	1633.04
4.74	153.60	1946.86
4.95	170.46	2284.94
5.16	187.68	2647.03
5.37	205.25	3032.97
5.58	223.18	3442.61

*
COMPUTE TRAVEL TIME ID=3 REACH NO=4 VS NO=1 L=2170 FT
SLP=0.0108

TRAVEL TIME TABLE
REACH= 4.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.211	.443	.76	.3514
.421	1.773	4.83	.2214
.632	3.989	14.23	.1689
.842	7.091	30.65	.1395
1.053	11.202	50.14	.1347
1.263	19.003	85.57	.1339
1.474	31.446	161.32	.1175

```
                                  1.684      45.474      286.78        .0956
                                  1.895      59.856      443.19        .0814
                                  2.105      74.593      628.34        .0716
                                  2.316      89.684      840.79        .0643
                                  2.526     105.130     1079.52        .0587
                                  2.737     120.931     1343.78        .0542
                                  2.947     137.086     1633.04        .0506
                                  3.158     153.595     1946.86        .0476
                                  3.368     170.460     2284.94        .0450
                                  3.579     187.679     2647.03        .0427
                                  3.789     205.252     3032.97        .0408
                                  4.000     223.180     3442.61        .0391
*
ROUTE                     ID=3  HYD NO=240.1  INFLOW ID=2  DT=0.0
*
PRINT HYD                 ID=3  CODE=1

                                     PARTIAL HYDROGRAPH   240.10


    RUNOFF VOLUME =       .82785 INCHES      =       5.3327 ACRE-FEET
    PEAK DISCHARGE RATE =      92.51 CFS  AT   1.700 HOURS   BASIN AREA =


*
*S      COMPUTE BASIN C1
*
COMPUTE NM HYD            ID=1  HYD=301.0  AREA=0.01797 SQ MI
                                     PER A=50  PER B=0  PER C=0  PER D=50
                                     TP=0.17 HRS  MASS RAIN=-1

    K =   .092650HR    TP =   .170000HR    K/TP RATIO =   .545000     SHAPE
    UNIT PEAK =   27.815    CFS   UNIT VOLUME =    .9998        B =   526.28
    AREA =       .008985 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =   .207785HR    TP =   .170000HR    K/TP RATIO =  1.222262     SHAPE
    UNIT PEAK =   14.512    CFS   UNIT VOLUME =    .9988        B =   274.56
    AREA =       .008985 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                 ID=1  CODE=1

                                     HYDROGRAPH FROM AREA   301.00


    RUNOFF VOLUME =       1.22041 INCHES      =       1.1696 ACRE-FEET
    PEAK DISCHARGE RATE =      29.04 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S      ADD BASIN C1 IN WITH OTHER BASINS
*
ADD HYD                   ID=2  HYD=250.0  ID I=3  ID II=1
*
PRINT HYD                 ID=2  CODE=1
```

PARTIAL HYDROGRAPH 250.00

RUNOFF VOLUME = .87869 INCHES = 6.5022 ACRE-FEET
PEAK DISCHARGE RATE = 110.10 CFS AT 1.667 HOURS BASIN AREA =

```
*
*S                    CALCULATE DRAINAGE FOR BASINS NORTH OF SAN YGNACIO
*S                    ASSUME SAD 222 IMPROVEMENTS ARE IN PLACE
*
*S                    COMPUTE BASIN A1
*
COMPUTE NM HYD                ID=1 HYD NO=301.0  AREA=0.09058 SQ MI
                                     PER A=100 PER B=0 PER C=0 PER D=0
                                     TP=0.30 MASS RAIN=-1
```

K = .359078HR TP = .300000HR K/TP RATIO = 1.196927 SHAPE
UNIT PEAK = 84.305 CFS UNIT VOLUME = .9998 B = 279.22
AREA = .090580 SQ MI IA = .65000 INCHES INF = 1.67000 I
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

```
*
PRINT HYD                     ID=1 CODE=1
```

HYDROGRAPH FROM AREA 301.00

RUNOFF VOLUME = .45484 INCHES = 2.1973 ACRE-FEET
PEAK DISCHARGE RATE = 37.64 CFS AT 1.700 HOURS BASIN AREA =

```
*
*S                    ROUTE A1  ALONG SAN YGNACIO TO A3
*
COMPUTE RATING CURVE          CID=1 NO VS=1 NO SEGS=1
                                     MIN ELEV=110.1 MAX ELEV=111.7
                                     CH SLP=0.0120   FP SLP=0.0120 N=0.017
                                     DIST=87 FT
```

DIST	ELEV	DIST	ELEV	DIST
0	111.2	9	110.8	10
35	110.6	36	111.3	43
50	111.3	51	110.6	76
77	110.8	87	111.2	

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
110.10	.00	.00
110.18	.36	.42
110.27	1.46	2.67
110.35	3.28	7.88
110.44	5.84	16.97
110.52	9.12	30.77
110.61	13.13	50.35
110.69	17.48	80.55

110.77	21.88	116.18
110.86	26.39	152.80
110.94	31.24	192.72
111.03	36.45	238.04
111.11	42.01	289.00
111.19	47.93	345.83
111.28	54.07	420.59
111.36	60.28	494.09
111.45	66.74	570.76
111.53	73.45	653.34
111.62	80.40	741.97
111.70	87.60	836.77

```
*
COMPUTE TRAVEL TIME ID=4    REACH NO=5  VS NO=1 L=1000 FT
                                  SLP=0.0120
```

TRAVEL TIME TABLE

REACH= 5.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.084	.365	.42	.2407
.168	1.459	2.67	.1516
.253	3.283	7.88	.1157
.337	5.836	16.97	.0955
.421	9.118	30.77	.0823
.505	13.129	50.35	.0724
.589	17.483	80.55	.0603
.674	21.877	116.18	.0523
.758	26.386	152.80	.0480
.842	31.238	192.72	.0450
.926	36.446	238.04	.0425
1.011	42.012	289.00	.0404
1.095	47.935	345.83	.0385
1.179	54.067	420.59	.0357
1.263	60.283	494.09	.0339
1.347	66.741	570.76	.0325
1.432	73.447	653.34	.0312
1.516	80.402	741.97	.0301
1.600	87.604	836.77	.0291

```
*
ROUTE                                ID=4 HYD NO=301.1 INFLOW ID=1   DT=0
*
PRINT HYD                     ID=4 CODE=1
```

HYDROGRAPH FROM AREA 301.10

```
    RUNOFF VOLUME =       .45485 INCHES      =       2.1973 ACRE-FEET
    PEAK DISCHARGE RATE =       35.68 CFS  AT   1.767 HOURS   BASIN AREA =


*
*S                    COMPUTE BASIN A3
*
COMPUTE NM HYD                ID=3  HYD NO=310.0  AREA=0.09259 SQ MI
                                  PER A=100 PER B=0 PER C=0 PER D=0
                                  TP=0.24 MASS RAIN=-1
```

```
K =    .286827HR    TP =    .240000HR    K/TP RATIO =  1.195114     SHAPE
UNIT PEAK =   107.85    CFS   UNIT VOLUME =    .9999        B =   279.56
AREA =       .092590 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=3 CODE=1

                                        HYDROGRAPH FROM AREA   310.00


RUNOFF VOLUME =       .45484 INCHES     =       2.2461 ACRE-FEET
PEAK DISCHARGE RATE =       47.73 CFS  AT   1.633 HOURS   BASIN AREA =


*
*S                    ADD BASINS A1& A3
*
ADD HYD                              ID=6  HYD NO=315.0  ID I=3  ID II=4
*
PRINT HYD                    ID=6    CODE=1

                                        HYDROGRAPH FROM AREA   315.00


RUNOFF VOLUME =       .45484 INCHES     =       4.4434 ACRE-FEET
PEAK DISCHARGE RATE =       78.74 CFS  AT   1.700 HOURS   BASIN AREA =


*
*S                    ROUTE BASINS A1 &A3 THRU A4
*
COMPUTE RATING CURVE         CID=1 VS NO=1 NO SEGS=1
                                     MIN ELEV=85.6 MAX ELEV=86.0
                                     CH SLP=0.0147 FP SLP=0.0147 N=0.035
                                     DIST=250.0 FT
                                     DIST    ELEV    DIST    ELEV
                                     0       86.0    20      85.8
                                     125     85.6    230     85.8
                                     250     86.0

                                RATING CURVE VALLEY SECTION  1.0
                                    WATER       FLOW       FLOW
                                   SURFACE      AREA       RATE
                                    ELEV        SQ FT      CFS
                                    85.60        .00        .00
                                    85.62        .23        .06
                                    85.64        .93        .37
                                    85.66       2.09       1.08
                                    85.68       3.72       2.32
                                    85.71       5.82       4.20
                                    85.73       8.37       6.84
                                    85.75      11.40      10.31
                                    85.77      14.89      14.72
                                    85.79      18.84      20.15
                                    85.81      23.21      27.34
                                    85.83      27.72      36.28
```

85.85	32.32	46.25
85.87	37.01	57.23
85.89	41.78	69.20
85.92	46.64	82.13
85.94	51.60	96.02
85.96	56.64	110.85
85.98	61.77	126.62
86.00	66.98	143.31

```
*
COMPUTE TRAVEL TIME ID=1 REACH NO=6 VS NO=1 L=1630 FT
                                    SLP=0.0147
```

TRAVEL TIME TABLE

REACH= 6.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.021	.233	.06	1.8315
.042	.930	.37	1.1538
.063	2.094	1.08	.8805
.084	3.722	2.32	.7268
.105	5.815	4.20	.6264
.126	8.374	6.84	.5547
.147	11.398	10.31	.5005
.168	14.887	14.72	.4579
.189	18.842	20.15	.4233
.210	23.214	27.34	.3844
.232	27.723	36.28	.3460
.253	32.321	46.25	.3164
.274	37.007	57.23	.2928
.295	41.782	69.20	.2734
.316	46.645	82.13	.2571
.337	51.597	96.02	.2433
.358	56.638	110.85	.2313
.379	61.767	126.62	.2209
.400	66.985	143.31	.2116

```
*
ROUTE                                ID=1 HYD NO=320.0  INFLOW ID=6  DT=0.0
*
PRINT HYD                      ID=1 CODE=1

                                   HYDROGRAPH FROM AREA   320.00


    RUNOFF VOLUME =       .45484 INCHES      =       4.4434 ACRE-FEET
    PEAK DISCHARGE RATE =       52.44 CFS  AT   1.867 HOURS   BASIN AREA =


*
*S                    COMPUTE BASIN A4
*
COMPUTE NM HYD                 ID=4 HYD NO=320.1 AREA=0.06187 SQ MI
                                     PER A=100 PER B=0 PER C=0 PER D=0
                                     TP=0.27 MASS RAIN=-1

    K =    .330011HR    TP =    .270000HR    K/TP RATIO =  1.222262     SHAPE
    UNIT PEAK =    62.916    CFS   UNIT VOLUME =    .9997        B =   274.56
    AREA =       .061870 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
```

```
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                        ID=4 CODE=1

                                                HYDROGRAPH FROM AREA   320.10


    RUNOFF VOLUME =       .45484 INCHES      =       1.5009 ACRE-FEET
    PEAK DISCHARGE RATE =       28.01 CFS  AT   1.667 HOURS   BASIN AREA =


*
*S                    ADD BASINS A1&3 TO BASIN A4
*
ADD HYD                                  ID=6 HYD NO=310.3 ID I=4 ID II=1
*
PRINT HYD                        ID=6 CODE=1

                                                HYDROGRAPH FROM AREA   310.30


    RUNOFF VOLUME =       .45483 INCHES      =       5.9441 ACRE-FEET
    PEAK DISCHARGE RATE =       73.16 CFS  AT   1.800 HOURS   BASIN AREA =


*
*S                    COMPUTE BASIN A5
*
COMPUTE NM HYD                   ID=5 HYD NO=305.0 AREA=0.09021 SQ MI
                                         PER A=100 PER B=0 PER C=0 PER D=0
                                         TP=0.48 MASS RAIN=-1

    K =    .574685HR    TP =    .480000HR    K/TP RATIO =  1.197261     SHAPE
    UNIT PEAK =    52.464    CFS   UNIT VOLUME =    .9997        B =   279.15
    AREA =       .090210 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                        ID=5 CODE=1

                                                HYDROGRAPH FROM AREA   305.00


    RUNOFF VOLUME =       .45484 INCHES      =       2.1883 ACRE-FEET
    PEAK DISCHARGE RATE =       23.71 CFS  AT   1.867 HOURS   BASIN AREA =


*
*S                    ADD BASINS  A1,A3,A4 & A5
*
ADD HYD                                  ID=1    HYD NO=320.0 ID I=5 ID II=6
*
PRINT HYD                        ID=1 CODE=1

                                                HYDROGRAPH FROM AREA   320.00
```

```
    RUNOFF VOLUME =        .45484 INCHES      =        8.1324 ACRE-FEET
    PEAK DISCHARGE RATE =       96.57 CFS  AT   1.833 HOURS   BASIN AREA =


*
*S                    CALCULATE TOTAL INFLOW INTO UNSER PLAYA
*
ADD HYD                                ID=3 HYD NO=330.0 ID I=1 ID II=2
*
PRINT HYD                     ID=3  CODE=1

                                          HYDROGRAPH FROM AREA   330.00


    RUNOFF VOLUME =        .57891 INCHES      =       14.6347 ACRE-FEET
    PEAK DISCHARGE RATE =      198.61 CFS  AT   1.733 HOURS   BASIN AREA =


*
*S       END CALCULATIONS
*
FINISH

    NORMAL PROGRAM FINISH            END TIME (HR:MIN:SEC) = 10:30:29
```

2-14-94

AHYMO SUMMARY TABLE (AHYMO993) - AMAFCA VERSION OF HYMO - SEPTEMBER, 1993
INPUT FILE = c:\ahymo\sunset\sw2-e10.dat

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOF VOLUM (AC-F
START						
*S	INPUT FILE NAME: SW2-e10.DAT					
*S	OUTPUT FILE NAME: SW2-e10.OUT					
*S	PROJECT: SUNSET WEST UNIT 2					
*S	CONDITION: EXISTING; 10-YEAR STORM					
*S	(SAD 222 NOT IN PLACE)					
*S	LEEDSHILL-HERKENHOFF, INC.					
RAINFALL	TYPE= 1					
*S	COMPUTE BASIN B1 & PRINT VALUES					
COMPUTE	NM HYD 201.00	-	1	.00672	4.36	.13
*S	ROUTE BASIN B1 FLOWS TO BASIN B2					
*S	COMPUTE TRAVEL TIME					
*S	ROUTE THE FLOW & PRINT					
ROUTE	201.10	1	2	.00672	3.36	.13
*S	COMPUTE BASIN B2					
COMPUTE	NM HYD 202.00	-	1	.01609	13.57	.43
*S	ADD BASIN B1 & B2					
ADD HYD	210.00	1& 2	3	.02281	16.41	.56
*S	ROUTE COMBINATION OF BASIN B1/B2 FLOWS TO BASIN B3/B4					
ROUTE	202.10	3	4	.02281	12.84	.56
*S	COMPUTE BASIN B3					
COMPUTE	NM HYD 203.00	-	1	.04219	19.98	.92
*S	COMPUTE BASIN B4					
COMPUTE	NM HYD 204.00	-	2	.01625	1.59	.07
*S	ADD BASIN B3 & B4					
ADD HYD	220.00	1& 2	5	.05844	21.56	1.00
*S	ADD BASIN B3/B4 & BASIN B1/B2					
ADD HYD	230.00	4& 5	6	.08125	34.40	1.56
*S	ROUTE BASIN B1,B2,B3 & B4 FLOWS TO BASIN A2					
ROUTE	230.10	6	3	.08125	30.07	1.56
*S	COMPUTE BASIN A1					
COMPUTE	NM HYD 301.00	-	2	.09058	6.86	.42
*S	ROUTE A1 THROUGH A2					
ROUTE	301.10	2	4	.09058	3.52	.42
*S	COMPUTE BASIN A2					
COMPUTE	NM HYD 102.00	-	1	.03953	3.55	.18
*S	ADD BASINS A1 & A2					
ADD HYD	301.20	4& 1	5	.13011	5.81	.61
*S	ADD BASINS A1&A2 TO BASIN B1/B2/B3/B4					
ADD HYD	240.00	3& 5	2	.21136	35.68	2.18
*S	ROUTE BASIN A2/B1/B2/B3/B4 FLOWS TO BASIN C1					
ROUTE	240.10	2	3	.21136	30.81	2.18
*S	COMPUTE BASIN C1					
COMPUTE	NM HYD 301.00	-	1	.01797	16.26	.64
*S	ADD BASIN C1 IN WITH OTHER BASINS					
ADD HYD	250.00	3& 1	2	.22933	37.62	2.82
*S	CALCULATE DRAINAGE FOR BASINS NORTH OF SAN YGNACIO					
*S	COMPUTE BASIN A3					
COMPUTE	NM HYD 310.00	-	3	.09259	8.76	.43
*S ROUTE A3 THROUGH A4						

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOF VOLUM (AC-F
ROUTE	310.10	3	1	.09259	3.63	.43
*S	COMPUTE BASIN A4					
COMPUTE NM HYD	310.20	-	4	.06187	5.17	.29
*S	ADD A3 & A4					
ADD HYD	310.30	4& 1	6	.15446	7.84	.72
*S	COMPUTE BASIN A5					
COMPUTE NM HYD	305.00	-	5	.09021	4.27	.42
*S	ADD A5 TO BASINS A3 & A4					
ADD HYD	320.00	5& 6	3	.24467	11.93	1.15
*S	CALCULATE INFLOW INTO UNSER PLAYA					
ADD HYD	330.00	3& 2	4	.47400	49.55	3.97
*S	END CALCULATIONS					
FINISH						

```
    AHYMO PROGRAM (AHYMO993) - AMAFCA VERSION OF HYMO - SEPTEMBER, 1993
         RUN DATE (MON/DAY/YR) = 04/15/1994
         START TIME (HR:MIN:SEC) = 11:07:47     USER NO.= G_NEMETH.S93
         INPUT FILE = c:\ahymo\sunset\sw2-e10.dat

START                    0.0
*
*S       INPUT  FILE NAME:  SW2-e10.DAT
*S       OUTPUT FILE NAME:  SW2-e10.OUT
*S       PROJECT:           SUNSET WEST UNIT 2
*S       CONDITION:         EXISTING; 10-YEAR STORM
*S                                       (SAD  222 NOT IN PLACE)
*S       LEEDSHILL-HERKENHOFF, INC.
*
RAINFALL                 TYPE=1  RAIN QUARTER=0.0
                                    RAIN ONE=1.27 IN  RAIN SIX=1.48 IN
                                    RAIN DAY=0.00 IN  DT=0.033333 HRS

COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2
DT =     .033333 HOURS        END TIME =     5.999940 HOURS
   .0000   .0010   .0020   .0030   .0040   .0051   .0062
   .0073   .0084   .0096   .0108   .0120   .0133   .0146
   .0159   .0173   .0187   .0201   .0217   .0232   .0248
   .0265   .0283   .0301   .0320   .0340   .0360   .0382
   .0405   .0429   .0454   .0490   .0527   .0567   .0654
   .0847   .1144   .1570   .2152   .2917   .3892   .5106
   .6588   .7959   .8532   .9017   .9448   .9840  1.0200
  1.0536  1.0849  1.1142  1.1418  1.1679  1.1925  1.2158
  1.2379  1.2588  1.2787  1.2975  1.3154  1.3195  1.3233
  1.3269  1.3303  1.3335  1.3367  1.3397  1.3426  1.3453
  1.3480  1.3506  1.3531  1.3556  1.3579  1.3602  1.3625
  1.3646  1.3668  1.3688  1.3708  1.3728  1.3748  1.3766
  1.3785  1.3803  1.3821  1.3838  1.3855  1.3872  1.3888
  1.3905  1.3920  1.3936  1.3951  1.3967  1.3981  1.3996
  1.4011  1.4025  1.4039  1.4053  1.4066  1.4080  1.4093
  1.4106  1.4119  1.4132  1.4144  1.4157  1.4169  1.4181
  1.4193  1.4205  1.4217  1.4228  1.4240  1.4251  1.4262
  1.4273  1.4284  1.4295  1.4306  1.4317  1.4327  1.4338
  1.4348  1.4358  1.4368  1.4378  1.4388  1.4398  1.4408
  1.4418  1.4427  1.4437  1.4446  1.4456  1.4465  1.4474
  1.4483  1.4492  1.4501  1.4510  1.4519  1.4528  1.4537
  1.4545  1.4554  1.4562  1.4571  1.4579  1.4588  1.4596
  1.4604  1.4612  1.4620  1.4628  1.4636  1.4644  1.4652
  1.4660  1.4668  1.4676  1.4683  1.4691  1.4698  1.4706
  1.4714  1.4721  1.4728  1.4736  1.4743  1.4750  1.4758
  1.4765  1.4772  1.4779  1.4786  1.4793  1.4800

*
*S       COMPUTE BASIN B1 & PRINT VALUES
*
COMPUTE NM HYD           ID=1  HYD=201.0  AREA=0.00672 SQ MI
                                    PER A=75  PER B=0  PER C=0  PER D=25
                                    TP=0.11 HRS  MASS RAIN=-1

    K =    .059950HR    TP =    .110000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =    8.0377    CFS    UNIT VOLUME =    .9982        B =   526.28
    AREA =       .001680 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
```

```
K =    .147555HR    TP =    .110000HR    K/TP RATIO =  1.341408     SHAPE
UNIT PEAK =   11.675    CFS   UNIT VOLUME =    .9972        B =   254.81
AREA =       .005040 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=1  CODE=1

                                        PARTIAL HYDROGRAPH   201.00


RUNOFF VOLUME =       .37843 INCHES      =         .1356 ACRE-FEET
PEAK DISCHARGE RATE =        4.36 CFS  AT   1.500 HOURS   BASIN AREA =


*
*S       ROUTE BASIN B1 FLOWS TO BASIN B2
*
COMPUTE RATING CURVE     CID=1  VS NO=1  NO SEGS=1
                                        MIN ELEV=139.1 FT  MAX ELEV=140.7 FT
                                        CH SLP=0.0166  FP SLP=0.0166  N=0.018
                                        DIST=87 FT
                                        DIST  ELEV      DIST  ELEV      DIST  EL
                                          0   140.2       9   139.8      10   13
                                         35   139.6      36   140.3      43   14
                                         50   140.3      51   139.6      76   13
                                         77   139.8      87   140.2

                                         RATING CURVE VALLEY SECTION  1.0
                                             WATER        FLOW        FLOW
                                            SURFACE       AREA        RATE
                                             ELEV         SQ FT       CFS
                                            139.10          .00         .00
                                            139.18          .36         .47
                                            139.27         1.46        2.97
                                            139.35         3.28        8.75
                                            139.44         5.84       18.85
                                            139.52         9.12       34.18
                                            139.61        13.13       55.93
                                            139.69        17.48       89.48
                                            139.77        21.88      129.06
                                            139.86        26.39      169.73
                                            139.94        31.24      214.08
                                            140.03        36.45      264.42
                                            140.11        42.01      321.02
                                            140.19        47.93      384.15
                                            140.28        54.07      467.20
                                            140.36        60.28      548.84
                                            140.45        66.74      634.00
                                            140.53        73.45      725.74
                                            140.62        80.40      824.19
                                            140.70        87.60      929.50
*
*S       COMPUTE TRAVEL TIME
*
COMPUTE TRAVEL TIME      ID=2  REACH NO=1  NO VS=1  L=772 FT
                                        SLP=0.0166
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.084	.365	.47	.1673
.168	1.459	2.97	.1054
.253	3.283	8.75	.0804
.337	5.836	18.85	.0664
.421	9.118	34.18	.0572
.505	13.129	55.93	.0503
.589	17.483	89.48	.0419
.674	21.877	129.06	.0364
.758	26.387	169.73	.0333
.842	31.238	214.08	.0313
.926	36.446	264.42	.0296
1.011	42.012	321.02	.0281
1.095	47.935	384.15	.0268
1.179	54.067	467.20	.0248
1.263	60.284	548.84	.0236
1.347	66.742	634.00	.0226
1.432	73.448	725.74	.0217
1.516	80.402	824.19	.0209
1.600	87.605	929.50	.0202

```
*
*S       ROUTE THE FLOW & PRINT
*
ROUTE                    ID=2  HYD NO=201.1  INFLOW ID=1  DT=0.0
*
PRINT HYD                ID=2  CODE=1

                                     PARTIAL HYDROGRAPH   201.10


    RUNOFF VOLUME =       .37847 INCHES      =        .1356 ACRE-FEET
    PEAK DISCHARGE RATE =        3.36 CFS  AT   1.567 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B2
*
COMPUTE NM HYD           ID=1  HYD=202.0  AREA=0.01609 SQ MI
                                   PER A=20  PER B=50  PER C=0  PER D=30
                                   TP=0.13 HRS  MASS RAIN=-1

    K =    .070850HR    TP =    .130000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =    19.541    CFS   UNIT VOLUME =    .9994        B =   526.28
    AREA =       .004827 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =    .148427HR    TP =    .130000HR    K/TP RATIO =  1.141749     SHAPE
    UNIT PEAK =    25.125    CFS   UNIT VOLUME =    .9994        B =   289.99
    AREA =       .011263 SQ MI    IA =    .54286 INCHES    INF =   1.37000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                ID=1  CODE=1
```

PARTIAL HYDROGRAPH 202.00

RUNOFF VOLUME = .50469 INCHES = .4331 ACRE-FEET
PEAK DISCHARGE RATE = 13.57 CFS AT 1.500 HOURS BASIN AREA =

```
*
*S      ADD BASIN B1 & B2
*
ADD HYD                ID=3  HYD=210.0 ID I=1  ID II=2
*
PRINT HYD              ID=3  CODE=1
```

PARTIAL HYDROGRAPH 210.00

RUNOFF VOLUME = .46747 INCHES = .5687 ACRE-FEET
PEAK DISCHARGE RATE = 16.41 CFS AT 1.533 HOURS BASIN AREA =

```
*
*S      ROUTE COMBINATION OF BASIN B1/B2 FLOWS TO BASIN B3/B4
*
COMPUTE RATING CURVE    CID=1  VS NO=1  NO SEGS=1
                                MIN ELEV=139.1 FT  MAX ELEV=140.7 FT
                                CH SLP=0.0152  FP SLP=0.0152  N=0.018
                                DIST=87 FT
                                DIST    ELEV    DIST    ELEV    DIST
                                  0     140.2     9     139.8    10
                                 35     139.6    36     140.3    43
                                 50     140.3    51     139.6    76
                                 77     139.8    87     140.2
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
139.10	.00	.00
139.18	.36	.45
139.27	1.46	2.84
139.35	3.28	8.38
139.44	5.84	18.04
139.52	9.12	32.71
139.61	13.13	53.52
139.69	17.48	85.62
139.77	21.88	123.49
139.86	26.39	162.42
139.94	31.24	204.85
140.03	36.45	253.02
140.11	42.01	307.19
140.19	47.93	367.60
140.28	54.07	447.07
140.36	60.28	525.19
140.45	66.74	606.68
140.53	73.45	694.46
140.62	80.40	788.67

```
                                        140.70        87.60       889.44
*
COMPUTE TRAVEL TIME      ID=4  REACH NO=2  NO VS=1  L=1079 FT
                                    SLP=0.0152

                               TRAVEL TIME TABLE
                                                REACH=  2.0

                               WATER       AVERAGE     FLOW        TRAVEL
                               DEPTH       AREA        RATE        TIME
                               FEET        SQ.FT.      CFS         HRS
                                  .084        .365        .45        .2443
                                  .168       1.459       2.84        .1539
                                  .253       3.283       8.38        .1175
                                  .337       5.836      18.04        .0970
                                  .421       9.118      32.71        .0836
                                  .505      13.129      53.52        .0735
                                  .589      17.483      85.62        .0612
                                  .674      21.877     123.49        .0531
                                  .758      26.387     162.42        .0487
                                  .842      31.238     204.85        .0457
                                  .926      36.446     253.02        .0432
                                 1.011      42.012     307.19        .0410
                                 1.095      47.935     367.60        .0391
                                 1.179      54.067     447.07        .0362
                                 1.263      60.284     525.19        .0344
                                 1.347      66.742     606.68        .0330
                                 1.432      73.448     694.46        .0317
                                 1.516      80.402     788.67        .0306
                                 1.600      87.605     889.44        .0295
*
ROUTE                    ID=4  HYD NO=202.1  INFLOW ID=3  DT=0.0
*
PRINT HYD                ID=4  CODE=1

                                     PARTIAL HYDROGRAPH   202.10


    RUNOFF VOLUME =       .46749 INCHES      =        .5687 ACRE-FEET
    PEAK DISCHARGE RATE =      12.84 CFS  AT   1.600 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B3
*
COMPUTE NM HYD           ID=1  HYD=203.0  AREA=0.04219 SQ MI
                                     PER A=50  PER B=25  PER C=0  PER D=25
                                     TP=0.23 HRS  MASS RAIN=-1

    K =    .125350HR    TP =    .230000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =    24.134    CFS   UNIT VOLUME =    .9995        B =   526.28
    AREA =       .010548 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =    .287094HR    TP =    .230000HR    K/TP RATIO =  1.248233     SHAPE
    UNIT PEAK =    37.141    CFS   UNIT VOLUME =    .9995        B =   269.97
    AREA =       .031643 SQ MI    IA =    .60000 INCHES    INF =   1.53000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
```

```
*
PRINT HYD                    ID=1  CODE=1

                                        PARTIAL HYDROGRAPH   203.00


    RUNOFF VOLUME =       .41023 INCHES      =         .9231 ACRE-FEET
    PEAK DISCHARGE RATE =       19.98 CFS  AT   1.600 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B4
*
COMPUTE NM HYD               ID=2  HYD=204.0  AREA=0.01625 SQ MI
                                        PER A=100  PER B=0  PER C=0  PER D=0
                                        TP=0.23 HRS  MASS RAIN=-1

    K =   .308524HR    TP =   .230000HR    K/TP RATIO =  1.341408     SHAPE
    UNIT PEAK =   18.003    CFS   UNIT VOLUME =    .9990        B =   254.81
    AREA =       .016250 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=2  CODE=1

                                        PARTIAL HYDROGRAPH   204.00


    RUNOFF VOLUME =       .08856 INCHES      =         .0768 ACRE-FEET
    PEAK DISCHARGE RATE =        1.59 CFS  AT   1.633 HOURS   BASIN AREA =


*
*S       ADD BASIN B3 & B4
*
ADD HYD                      ID=5  HYD=220.0  ID I=1  ID II=2
*
PRINT HYD                    ID=5  CODE=1

                                        PARTIAL HYDROGRAPH   220.00


    RUNOFF VOLUME =       .32077 INCHES      =         .9998 ACRE-FEET
    PEAK DISCHARGE RATE =       21.56 CFS  AT   1.600 HOURS   BASIN AREA =


*
*S       ADD BASIN B3/B4 & BASIN B1/B2
*
ADD HYD                      ID=6  HYD=230.0  ID I=4  ID II=5
*
PRINT HYD                    ID=6  CODE=1

                                        PARTIAL HYDROGRAPH   230.00
```

RUNOFF VOLUME = .36196 INCHES = 1.5685 ACRE-FEET
PEAK DISCHARGE RATE = 34.40 CFS AT 1.600 HOURS BASIN AREA =

```
*
*S      ROUTE BASIN B1,B2,B3 & B4 FLOWS TO BASIN A2
*
COMPUTE RATING CURVE    CID=1  VS NO=1  NO SEGS=2
                                MIN ELEV=0.0 FT  MAX ELEV=2.75 FT
                                CH SLP=0.0108  FP SLP=0.0108  N=0.022
                                DIST=20.0 FT  N=0.018  DIST=59 FT
                                DIST    ELEV    DIST    ELEV    DIST
                                  0     2.75     11      0.0     17
                                 23     1.12     29     1.24     38
                                 53     0.88     54     1.55     59
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.00	.00
.14	.10	.13
.29	.42	.80
.43	.94	2.36
.58	1.68	5.08
.72	2.62	9.21
.87	3.77	14.97
1.01	5.73	22.64
1.16	9.83	34.42
1.30	16.30	66.21
1.45	23.28	113.80
1.59	30.40	171.50
1.74	38.00	236.40
1.88	45.99	320.02
2.03	54.07	415.33
2.17	62.23	521.08
2.32	70.48	636.87
2.46	78.81	762.38
2.61	87.22	897.37
2.75	95.72	1041.60

```
*
COMPUTE TRAVEL TIME     ID=3  REACH NO=3  VS NO=1  L=1069 FT
                                SLP=0.0108
```

TRAVEL TIME TABLE

REACH= 3.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.145	.105	.13	.2469
.289	.419	.80	.1556
.434	.943	2.36	.1187
.579	1.676	5.08	.0980
.724	2.619	9.21	.0844
.868	3.771	14.97	.0748
1.013	5.728	22.64	.0751
1.158	9.833	34.42	.0848
1.303	16.298	66.21	.0731

```
                                  1.447      23.279      113.80       .0607
                                  1.592      30.397      171.50       .0526
                                  1.737      37.999      236.40       .0477
                                  1.882      45.991      320.02       .0427
                                  2.026      54.070      415.33       .0387
                                  2.171      62.232      521.08       .0355
                                  2.316      70.479      636.87       .0329
                                  2.461      78.809      762.38       .0307
                                  2.605      87.222      897.37       .0289
                                  2.750      95.720     1041.60       .0273
*
ROUTE                     ID=3  HYD NO=230.1  INFLOW ID=6  DT=0.0
*
PRINT HYD                 ID=3  CODE=1

                                     PARTIAL HYDROGRAPH   230.10


    RUNOFF VOLUME =       .36196 INCHES     =       1.5685 ACRE-FEET
    PEAK DISCHARGE RATE =      30.07 CFS  AT   1.700 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN A1
*
COMPUTE NM HYD            ID=2  HYD=301.0  AREA=0.09058 SQ MI
                           PER A=100 PER B=0 PER C=0 PER D=0
                           TP=0.30 MASS RAIN=-1

    K =    .398843HR    TP =    .300000HR    K/TP RATIO =  1.329478     SHAPE
    UNIT PEAK =   77.489    CFS   UNIT VOLUME =    .9997        B =   256.64
    AREA =       .090580 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                     ID=2 CODE=1

                                        HYDROGRAPH FROM AREA   301.00


    RUNOFF VOLUME =       .08856 INCHES     =        .4278 ACRE-FEET
    PEAK DISCHARGE RATE =       6.86 CFS  AT   1.700 HOURS   BASIN AREA =


*
*S                    ROUTE A1 THROUGH A2
*
COMPUTE RATING CURVE          CID=1   VS NO=1 NO SEGS=1
                                      MIN ELEV=109.0  MAX ELEV=110.0
                                      CH SLP=0.0152   FP SLP=0.0152 N=0.035
                                      DIST=100.0
                                      DIST     ELEV     DIST     ELEV
                                      0        110.0    10       109.0
                                      90       109.0    100      110.0

                                       RATING CURVE VALLEY SECTION  1.0
                                           WATER        FLOW        FLOW
                                          SURFACE       AREA        RATE
```

ELEV	SQ FT	CFS
109.00	.00	.00
109.05	4.24	3.10
109.11	8.53	9.87
109.16	12.88	19.45
109.21	17.29	31.48
109.26	21.75	45.77
109.32	26.26	62.17
109.37	30.83	80.58
109.42	35.46	100.91
109.47	40.14	123.10
109.53	44.88	147.09
109.58	49.67	172.85
109.63	54.52	200.33
109.68	59.42	229.51
109.74	64.38	260.36
109.79	69.40	292.85
109.84	74.47	326.96
109.89	79.59	362.69
109.95	84.77	400.01
110.00	90.01	438.91

```
*
COMPUTE TRAVEL TIME ID=4    REACH NO=4       NO VS=1 L=1450
                                SLP=0.0152
```

TRAVEL TIME TABLE

REACH= 4.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	4.239	3.10	.5503
.105	8.532	9.87	.3481
.158	12.882	19.45	.2668
.211	17.287	31.48	.2212
.263	21.747	45.77	.1914
.316	26.262	62.17	.1701
.368	30.833	80.58	.1541
.421	35.460	100.91	.1415
.474	40.141	123.10	.1313
.526	44.879	147.09	.1229
.579	49.671	172.85	.1157
.632	54.519	200.33	.1096
.684	59.423	229.51	.1043
.737	64.382	260.36	.0996
.790	69.396	292.85	.0954
.842	74.465	326.96	.0917
.895	79.590	362.69	.0884
.947	84.771	400.01	.0854
1.000	90.007	438.91	.0826

```
*
ROUTE                                ID=4    HYD NO=301.1    INFLOW ID=2
*
PRINT HYD                     ID=4 CODE=1
```

HYDROGRAPH FROM AREA 301.10

```
RUNOFF VOLUME =       .08856 INCHES     =        .4278 ACRE-FEET
PEAK DISCHARGE RATE =       3.52 CFS  AT   2.000 HOURS   BASIN AREA =
```

```
*
*S       COMPUTE BASIN A2
*
COMPUTE NM HYD            ID=1  HYD=102.0  AREA=0.03953 SQ MI
                                     PER A=100  PER B=0  PER C=0  PER D=0
                                     TP=0.25 HRS  MASS RAIN=-1

    K =    .335352HR    TP =    .250000HR    K/TP RATIO =  1.341408     SHAPE
    UNIT PEAK =   40.290    CFS   UNIT VOLUME =    .9995        B =   254.81
    AREA =       .039530 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                 ID=1  CODE=1

                                     PARTIAL HYDROGRAPH   102.00


    RUNOFF VOLUME =       .08856 INCHES     =        .1867 ACRE-FEET
    PEAK DISCHARGE RATE =       3.55 CFS  AT   1.633 HOURS   BASIN AREA =


*
*S                   ADD BASINS A1 & A2
*
ADD HYD                           ID=5 HYD=301.2  ID I=4 ID II=1
*
PRINT HYD                    ID=5  CODE=1

                                     HYDROGRAPH FROM AREA   301.20


    RUNOFF VOLUME =       .08856 INCHES     =        .6145 ACRE-FEET
    PEAK DISCHARGE RATE =       5.81 CFS  AT   1.767 HOURS   BASIN AREA =


*
*S       ADD BASINS A1&A2 TO BASIN B1/B2/B3/B4
*
ADD HYD                   ID=2  HYD=240.0  ID I=3  ID II=5
*
PRINT HYD                 ID=2  CODE=1

                                     PARTIAL HYDROGRAPH   240.00


    RUNOFF VOLUME =      .19366 INCHES     =       2.1830 ACRE-FEET
    PEAK DISCHARGE RATE =      35.68 CFS  AT   1.700 HOURS   BASIN AREA =


*
*S       ROUTE BASIN A2/B1/B2/B3/B4 FLOWS TO BASIN C1
*
COMPUTE RATING CURVE      CID=1  VS NO=1  NO SEGS=2
```

MIN ELEV=1.58 FT MAX ELEV=5.58 FT
CH SLP=0.0108 FP SLP=0.0108 N=0.022
DIST=20.0 FT N=0.018 DIST=86 FT

DIST	ELEV	DIST	ELEV	DIST
0	5.58	16	1.58	22
43	3.0	64	2.58	70
86	5.58			

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
1.58	.00	.00
1.79	.44	.76
2.00	1.77	4.83
2.21	3.99	14.23
2.42	7.09	30.65
2.63	11.20	50.14
2.84	19.00	85.57
3.05	31.45	161.32
3.26	45.47	286.78
3.47	59.86	443.19
3.69	74.59	628.34
3.90	89.68	840.79
4.11	105.13	1079.52
4.32	120.93	1343.78
4.53	137.09	1633.04
4.74	153.60	1946.86
4.95	170.46	2284.94
5.16	187.68	2647.03
5.37	205.25	3032.97
5.58	223.18	3442.61

*
COMPUTE TRAVEL TIME ID=3 REACH NO=5 VS NO=1 L=2170 FT
SLP=0.0108

TRAVEL TIME TABLE
REACH= 5.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.211	.443	.76	.3514
.421	1.773	4.83	.2214
.632	3.989	14.23	.1689
.842	7.091	30.65	.1395
1.053	11.202	50.14	.1347
1.263	19.003	85.57	.1339
1.474	31.446	161.32	.1175
1.684	45.474	286.78	.0956
1.895	59.856	443.19	.0814
2.105	74.593	628.34	.0716
2.316	89.684	840.79	.0643
2.526	105.130	1079.52	.0587
2.737	120.931	1343.78	.0542
2.947	137.086	1633.04	.0506
3.158	153.595	1946.86	.0476
3.368	170.460	2284.94	.0450
3.579	187.679	2647.03	.0427
3.789	205.252	3032.97	.0408

```
                                        4.000      223.180      3442.61          .0391
*
ROUTE                        ID=3  HYD NO=240.1  INFLOW ID=2  DT=0.0
*
PRINT HYD                    ID=3  CODE=1

                                          PARTIAL HYDROGRAPH   240.10


    RUNOFF VOLUME =       .19366 INCHES      =       2.1830 ACRE-FEET
    PEAK DISCHARGE RATE =      30.81 CFS  AT   1.833 HOURS   BASIN AREA =



*
*S       COMPUTE BASIN C1
*
COMPUTE NM HYD               ID=1  HYD=301.0  AREA=0.01797 SQ MI
                                   PER A=50  PER B=0  PER C=0  PER D=50
                                   TP=0.17 HRS  MASS RAIN=-1

    K =    .092650HR    TP =    .170000HR    K/TP RATIO =    .545000      SHAPE
    UNIT PEAK =    27.815    CFS   UNIT VOLUME =    .9998        B =    526.28
    AREA =       .008985 SQ MI    IA =     .10000 INCHES    INF =     .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =    .228039HR    TP =    .170000HR    K/TP RATIO =  1.341408      SHAPE
    UNIT PEAK =    13.467    CFS   UNIT VOLUME =     .9985        B =    254.81
    AREA =       .008985 SQ MI    IA =     .65000 INCHES    INF =    1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=1  CODE=1

                                       HYDROGRAPH FROM AREA   301.00


    RUNOFF VOLUME =       .66829 INCHES      =        .6405 ACRE-FEET
    PEAK DISCHARGE RATE =      16.26 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S       ADD BASIN C1 IN WITH OTHER BASINS
*
ADD HYD                      ID=2  HYD=250.0  ID I=3  ID II=1
*
PRINT HYD                    ID=2  CODE=1

                                          PARTIAL HYDROGRAPH   250.00


    RUNOFF VOLUME =       .23084 INCHES      =       2.8234 ACRE-FEET
    PEAK DISCHARGE RATE =      37.62 CFS  AT   1.800 HOURS   BASIN AREA =



*
*S                    CALCULATE DRAINAGE FOR BASINS NORTH OF SAN YGNACIO
```

```
*
*S                    COMPUTE BASIN A3
*
COMPUTE NM HYD                ID=3 HYD NO=310.0  AREA=0.09259 SQ MI
                                       PER A=100 PER B=0 PER C=0 PER D=0
                                       TP=0.24 MASS RAIN=-1

    K =    .318870HR    TP =    .240000HR    K/TP RATIO =  1.328624     SHAPE
    UNIT PEAK =    99.061    CFS   UNIT VOLUME =    .9997        B =   256.77
    AREA =       .092590 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                     ID=3 CODE=1

                                          HYDROGRAPH FROM AREA   310.00


    RUNOFF VOLUME =       .08856 INCHES      =          .4373 ACRE-FEET
    PEAK DISCHARGE RATE =        8.76 CFS  AT   1.633 HOURS   BASIN AREA =


*
*S ROUTE A3 THROUGH A4
*
COMPUTE RATING CURVE          CID=1 VS NO=1 NO SEGS=1
                                       MIN ELEV=85.6 MAX ELEV=86.0
                                       CH SLP=0.0147 FP SLP=0.0147 N=0.035
                                       DIST=250.0 FT
                                       DIST     ELEV     DIST     ELEV
                                       0        86.0     20       85.8
                                       125      85.6     230      85.8
                                       250      86.0

                                        RATING CURVE VALLEY SECTION  1.0
                                            WATER        FLOW        FLOW
                                           SURFACE       AREA        RATE
                                            ELEV         SQ FT       CFS
                                            85.60          .00         .00
                                            85.62          .23         .06
                                            85.64          .93         .37
                                            85.66         2.09        1.08
                                            85.68         3.72        2.32
                                            85.71         5.82        4.20
                                            85.73         8.37        6.84
                                            85.75        11.40       10.31
                                            85.77        14.89       14.72
                                            85.79        18.84       20.15
                                            85.81        23.21       27.34
                                            85.83        27.72       36.28
                                            85.85        32.32       46.25
                                            85.87        37.01       57.23
                                            85.89        41.78       69.20
                                            85.92        46.64       82.13
                                            85.94        51.60       96.02
                                            85.96        56.64      110.85
                                            85.98        61.77      126.62
                                            86.00        66.98      143.31
*
```

```
COMPUTE TRAVEL TIME ID=1 REACH NO=6          VS=1 L=1630
                                   SLP=0.0147

                                TRAVEL TIME TABLE
                                                REACH=  6.0

                                WATER      AVERAGE     FLOW        TRAVEL
                                DEPTH      AREA        RATE        TIME
                                FEET       SQ.FT.      CFS         HRS
                                   .021        .233        .06      1.8315
                                   .042        .930        .37      1.1538
                                   .063       2.094       1.08       .8805
                                   .084       3.722       2.32       .7268
                                   .105       5.815       4.20       .6264
                                   .126       8.374       6.84       .5547
                                   .147      11.398      10.31       .5005
                                   .168      14.887      14.72       .4579
                                   .189      18.842      20.15       .4233
                                   .210      23.214      27.34       .3844
                                   .232      27.723      36.28       .3460
                                   .253      32.321      46.25       .3164
                                   .274      37.007      57.23       .2928
                                   .295      41.782      69.20       .2734
                                   .316      46.645      82.13       .2571
                                   .337      51.597      96.02       .2433
                                   .358      56.638     110.85       .2313
                                   .379      61.767     126.62       .2209
                                   .400      66.985     143.31       .2116
*
ROUTE                                ID=1    HYD NO=310.1    INFLOW ID=3 DT=0
*
PRINT HYD                      ID=1 CODE=1

                                          HYDROGRAPH FROM AREA   310.10


    RUNOFF VOLUME =       .08856 INCHES     =        .4373 ACRE-FEET
    PEAK DISCHARGE RATE =       3.63 CFS  AT   1.933 HOURS   BASIN AREA =



*
*S                   COMPUTE  BASIN A4
*
COMPUTE NM HYD                 ID=4    HYD=310.2        AREA=0.06187 SQ MI
                                       PER A=100 PER B=0 PER C=0 PER D=0
                                       TP=0.27 MASS RAIN=-1

    K =    .362180HR    TP =    .270000HR    K/TP RATIO =  1.341408     SHAPE
    UNIT PEAK =   58.388    CFS   UNIT VOLUME =    .9996        B =   254.81
    AREA =       .061870 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
*S                   ADD A3 & A4
*
ADD HYD                                ID=6 HYD NO=310.3 ID I=4 ID II=1
*
PRINT HYD            ID=6 CODE=1
```

```
                                        HYDROGRAPH FROM AREA   310.30

    RUNOFF VOLUME =       .08854 INCHES     =        .7294 ACRE-FEET
    PEAK DISCHARGE RATE =       7.84 CFS  AT   1.767 HOURS   BASIN AREA =


*
*S                    COMPUTE BASIN A5
*
COMPUTE NM HYD                ID=5    HYD NO=305.0    AREA=0.09021 SQ MI
                                      PER A=100 PER B=0 PER C=0 PER D=0
                                      TP=0.48 MASS RAIN=-1

    K =    .638225HR    TP =    .480000HR    K/TP RATIO =  1.329635     SHAPE
    UNIT PEAK =   48.228    CFS   UNIT VOLUME =    .9997        B =   256.62
    AREA =       .090210 SQ MI    IA =     .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                     ID=5 CODE=1

                                        HYDROGRAPH FROM AREA   305.00

    RUNOFF VOLUME =       .08856 INCHES     =        .4261 ACRE-FEET
    PEAK DISCHARGE RATE =       4.27 CFS  AT   1.867 HOURS   BASIN AREA =


*
*S                    ADD A5 TO BASINS A3 & A4
*
ADD HYD                                ID=3    HYD NO=320.0 ID I = 5   ID II=6
*
PRINT HYD                     ID=3 CODE=1

                                        HYDROGRAPH FROM AREA   320.00

    RUNOFF VOLUME =       .08855 INCHES     =       1.1555 ACRE-FEET
    PEAK DISCHARGE RATE =      11.93 CFS  AT   1.800 HOURS   BASIN AREA =


*
*S                    CALCULATE INFLOW INTO UNSER PLAYA
*
ADD HYD                                ID=4 HYD=330.0  ID I=3 ID II=2
*
PRINT HYD                     ID=4 CODE=-1

                                        HYDROGRAPH FROM AREA   330.00
```

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	3.067	6.1	6.133	.6
.033	.0	3.100	5.8	6.167	.6
.067	.0	3.133	5.6	6.200	.6

.100	.0	3.167	5.4	6.233	.6
.133	.0	3.200	5.2	6.267	.6
.167	.0	3.233	5.0	6.300	.5
.200	.0	3.267	4.8	6.333	.5
.233	.0	3.300	4.6	6.367	.5
.267	.0	3.333	4.4	6.400	.5
.300	.0	3.367	4.2	6.433	.5
.333	.0	3.400	4.0	6.467	.5
.367	.0	3.433	3.9	6.500	.5
.400	.0	3.467	3.7	6.533	.5
.433	.0	3.500	3.6	6.567	.4
.467	.0	3.533	3.5	6.600	.4
.500	.0	3.567	3.4	6.633	.4
.533	.0	3.600	3.2	6.667	.4
.567	.0	3.633	3.1	6.700	.4
.600	.0	3.667	3.0	6.733	.4
.633	.0	3.700	3.0	6.767	.4
.667	.0	3.733	2.9	6.800	.4
.700	.0	3.767	2.8	6.833	.4
.733	.0	3.800	2.7	6.867	.3
.767	.0	3.833	2.6	6.900	.3
.800	.0	3.867	2.5	6.933	.3
.833	.0	3.900	2.5	6.967	.3
.867	.0	3.933	2.4	7.000	.3
.900	.0	3.967	2.3	7.033	.3
.933	.0	4.000	2.3	7.067	.3
.967	.0	4.033	2.2	7.100	.3
1.000	.0	4.067	2.1	7.133	.3
1.033	.0	4.100	2.1	7.167	.3
1.067	.0	4.133	2.0	7.200	.3
1.100	.0	4.167	2.0	7.233	.2
1.133	.0	4.200	1.9	7.267	.2
1.167	.0	4.233	1.9	7.300	.2
1.200	.0	4.267	1.8	7.333	.2
1.233	.1	4.300	1.8	7.367	.2
1.267	.4	4.333	1.7	7.400	.2
1.300	1.1	4.367	1.7	7.433	.2
1.333	2.4	4.400	1.6	7.467	.2
1.367	4.3	4.433	1.6	7.500	.2
1.400	6.7	4.467	1.6	7.533	.2
1.433	10.8	4.500	1.5	7.567	.2
1.467	16.2	4.533	1.5	7.600	.2
1.500	22.1	4.567	1.5	7.633	.2
1.533	27.7	4.600	1.4	7.667	.2
1.567	32.8	4.633	1.4	7.700	.2
1.600	37.1	4.667	1.4	7.733	.2
1.633	40.8	4.700	1.3	7.767	.2
1.667	43.7	4.733	1.3	7.800	.2
1.700	46.1	4.767	1.3	7.833	.1
1.733	48.0	4.800	1.2	7.867	.1
1.767	49.2	4.833	1.2	7.900	.1
1.800	49.5	4.867	1.2	7.933	.1
1.833	49.2	4.900	1.2	7.967	.1
1.867	48.0	4.933	1.1	8.000	.1
1.900	46.3	4.967	1.1	8.033	.1
1.933	44.3	5.000	1.1	8.067	.1
1.967	42.2	5.033	1.1	8.100	.1
2.000	40.1	5.067	1.0	8.133	.1
2.033	38.1	5.100	1.0	8.167	.1
2.067	36.1	5.133	1.0	8.200	.1

2.100	34.0	5.167	1.0	8.233	.1
2.133	31.9	5.200	1.0	8.267	.1
2.167	29.8	5.233	.9	8.300	.1
2.200	27.8	5.267	.9	8.333	.1
2.233	25.8	5.300	.9	8.367	.1
2.267	23.9	5.333	.9	8.400	.1
2.300	22.3	5.367	.9	8.433	.1
2.333	20.7	5.400	.9	8.467	.1
2.367	19.3	5.433	.9	8.500	.1
2.400	18.0	5.467	.8	8.533	.1
2.433	16.8	5.500	.8	8.567	.1
2.467	15.8	5.533	.8	8.600	.1
2.500	14.8	5.567	.8	8.633	.1
2.533	13.9	5.600	.8	8.667	.1
2.567	13.2	5.633	.8	8.700	.1
2.600	12.5	5.667	.8	8.733	.1
2.633	11.8	5.700	.8	8.767	.1
2.667	11.2	5.733	.8	8.800	.1
2.700	10.6	5.767	.7	8.833	.1
2.733	10.0	5.800	.7	8.867	.1
2.767	9.5	5.833	.7	8.900	.1
2.800	9.0	5.867	.7	8.933	.1
2.833	8.6	5.900	.7	8.967	.1
2.867	8.2	5.933	.7	9.000	.1
2.900	7.8	5.967	.7	9.033	.1
2.933	7.4	6.000	.7	9.067	.1
2.967	7.0	6.033	.7	9.100	.1
3.000	6.7	6.067	.7	9.133	.1
3.033	6.4	6.100	.7	9.167	.1

```
RUNOFF VOLUME =        .15739 INCHES      =        3.9789 ACRE-FEET
PEAK DISCHARGE RATE =       49.55 CFS  AT   1.800 HOURS   BASIN AREA =


*
*S       END CALCULATIONS
*
FINISH

    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 11:09:16
```

4-14-94

AHYMO SUMMARY TABLE (AHYMO993) - AMAFCA VERSION OF HYMO - SEPTEMBER, 1993
INPUT FILE = c:\ahymo\sunset\sw2-i10.dat

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOF VOLUM (AC-F
START						
*S	INPUT FILE NAME: SW2-i10.DAT					
*S	OUTPUT FILE NAME: SW2-i10.OUT					
*S	PROJECT: SUNSET WEST UNIT 2					
*S	CONDITION: INTERIM 1; 10-YEAR STORM					
*S	(SAD 222 NOT IN PLACE; SUNSET WEST U					
*S	LEEDSHILL-HERKENHOFF, INC.					
RAINFALL	TYPE= 1					
*S	COMPUTE BASIN B1 & PRINT VALUES					
COMPUTE	NM HYD 201.00	-	1	.00672	4.36	.13
*S	ROUTE BASIN B1 FLOWS TO BASIN B2					
*S	COMPUTE TRAVEL TIME					
*S	ROUTE THE FLOW & PRINT					
ROUTE	201.10	1	2	.00672	3.36	.13
*S	COMPUTE BASIN B2					
COMPUTE	NM HYD 202.00	-	1	.01609	13.57	.43
*S	ADD BASIN B1 & B2					
ADD HYD	210.00	1& 2	3	.02281	16.41	.56
*S	ROUTE COMBINATION OF BASIN B1/B2 FLOWS TO BASIN B3/B4					
ROUTE	202.10	3	4	.02281	12.84	.56
*S	COMPUTE BASIN B3					
COMPUTE	NM HYD 203.00	-	1	.04219	31.57	1.13
*S	COMPUTE BASIN B4					
COMPUTE	NM HYD 204.00	-	2	.01625	13.70	.43
*S	ADD BASIN B3 & B4					
ADD HYD	220.00	1& 2	5	.05844	44.80	1.57
*S	ADD BASIN B3/B4 & BASIN B1/B2					
ADD HYD	230.00	4& 5	6	.08125	56.27	2.14
*S	ROUTE BASIN B1,B2,B3 & B4 FLOWS TO BASIN A2					
ROUTE	230.10	6	3	.08125	47.27	2.14
*S	COMPUTE BASIN A1					
COMPUTE	NM HYD 301.00	-	2	.09058	6.86	.42
*S	ROUTE A1 THROUGH A2					
ROUTE	301.10	2	4	.09058	3.52	.42
*S	COMPUTE BASIN A2					
COMPUTE	NM HYD 102.00	-	1	.03953	3.55	.18
*S	ADD BASINS A1 & A2					
ADD HYD	301.20	4& 1	5	.13011	5.81	.61
*S	ADD BASINS A1&A2 TO BASIN B1/B2/B3/B4					
ADD HYD	240.00	3& 5	2	.21136	51.81	2.75
*S	ROUTE BASIN A2/B1/B2/B3/B4 FLOWS TO BASIN C1					
ROUTE	240.10	2	3	.21136	41.81	2.75
*S	COMPUTE BASIN C1					
COMPUTE	NM HYD 301.00	-	1	.01797	16.26	.64
*S	ADD BASIN C1 IN WITH OTHER BASINS					
ADD HYD	250.00	3& 1	2	.22933	50.66	3.39
*S	CALCULATE DRAINAGE FOR BASINS NORTH OF SAN YGNACIO					
*S	COMPUTE BASIN A3					
COMPUTE	NM HYD 310.00	-	3	.09259	8.76	.43
*S ROUTE A3 THROUGH A4						

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOF VOLUM (AC-F
ROUTE	310.10	3	1	.09259	3.63	.43
*S	COMPUTE BASIN A4					
COMPUTE NM HYD	310.20	-	4	.06187	5.17	.29
*S	ADD A3 & A4					
ADD HYD	310.30	4& 1	6	.15446	7.84	.72
*S	COMPUTE BASIN A5					
COMPUTE NM HYD	305.00	-	5	.09021	4.27	.42
*S	ADD A5 TO BASINS A3 & A4					
ADD HYD	320.00	5& 6	3	.24467	11.93	1.15
*S	CALCULATE INFLOW INTO UNSER PLAYA					
ADD HYD	330.00	3& 2	4	.47400	62.05	4.55
*S	END CALCULATIONS					
FINISH						

```
    AHYMO PROGRAM (AHYMO993) - AMAFCA VERSION OF HYMO - SEPTEMBER, 1993
         RUN DATE (MON/DAY/YR) = 04/15/1994
         START TIME (HR:MIN:SEC) = 11:11:42     USER NO.= G_NEMETH.S93
         INPUT FILE = c:\ahymo\sunset\sw2-i10.dat

START                    0.0
*
*S       INPUT  FILE NAME:  SW2-i10.DAT
*S       OUTPUT FILE NAME:  SW2-i10.OUT
*S       PROJECT:           SUNSET WEST UNIT 2
*S       CONDITION:         INTERIM 1; 10-YEAR STORM
*S                                     (SAD  222 NOT IN PLACE; SUNSET WEST U
*S       LEEDSHILL-HERKENHOFF, INC.
*
RAINFALL                 TYPE=1  RAIN QUARTER=0.0
                                    RAIN ONE=1.27 IN  RAIN SIX=1.48 IN
                                    RAIN DAY=0.00 IN  DT=0.033333 HRS

COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2
DT =     .033333 HOURS        END TIME =     5.999940 HOURS
   .0000   .0010   .0020   .0030   .0040   .0051   .0062
   .0073   .0084   .0096   .0108   .0120   .0133   .0146
   .0159   .0173   .0187   .0201   .0217   .0232   .0248
   .0265   .0283   .0301   .0320   .0340   .0360   .0382
   .0405   .0429   .0454   .0490   .0527   .0567   .0654
   .0847   .1144   .1570   .2152   .2917   .3892   .5106
   .6588   .7959   .8532   .9017   .9448   .9840  1.0200
  1.0536  1.0849  1.1142  1.1418  1.1679  1.1925  1.2158
  1.2379  1.2588  1.2787  1.2975  1.3154  1.3195  1.3233
  1.3269  1.3303  1.3335  1.3367  1.3397  1.3426  1.3453
  1.3480  1.3506  1.3531  1.3556  1.3579  1.3602  1.3625
  1.3646  1.3668  1.3688  1.3708  1.3728  1.3748  1.3766
  1.3785  1.3803  1.3821  1.3838  1.3855  1.3872  1.3888
  1.3905  1.3920  1.3936  1.3951  1.3967  1.3981  1.3996
  1.4011  1.4025  1.4039  1.4053  1.4066  1.4080  1.4093
  1.4106  1.4119  1.4132  1.4144  1.4157  1.4169  1.4181
  1.4193  1.4205  1.4217  1.4228  1.4240  1.4251  1.4262
  1.4273  1.4284  1.4295  1.4306  1.4317  1.4327  1.4338
  1.4348  1.4358  1.4368  1.4378  1.4388  1.4398  1.4408
  1.4418  1.4427  1.4437  1.4446  1.4456  1.4465  1.4474
  1.4483  1.4492  1.4501  1.4510  1.4519  1.4528  1.4537
  1.4545  1.4554  1.4562  1.4571  1.4579  1.4588  1.4596
  1.4604  1.4612  1.4620  1.4628  1.4636  1.4644  1.4652
  1.4660  1.4668  1.4676  1.4683  1.4691  1.4698  1.4706
  1.4714  1.4721  1.4728  1.4736  1.4743  1.4750  1.4758
  1.4765  1.4772  1.4779  1.4786  1.4793  1.4800

*
*S       COMPUTE BASIN B1 & PRINT VALUES
*
COMPUTE NM HYD           ID=1  HYD=201.0  AREA=0.00672 SQ MI
                                    PER A=75  PER B=0  PER C=0  PER D=25
                                    TP=0.11 HRS  MASS RAIN=-1

    K =    .059950HR    TP =    .110000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =    8.0377    CFS   UNIT VOLUME =    .9982        B =   526.28
    AREA =       .001680 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
```

```
K =   .147555HR     TP =    .110000HR     K/TP RATIO =  1.341408      SHAPE
UNIT PEAK =    11.675     CFS    UNIT VOLUME =     .9972          B =    254.81
AREA =        .005040 SQ MI     IA =     .65000 INCHES     INF =    1.67000 I
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=1  CODE=1

                                        PARTIAL HYDROGRAPH   201.00

RUNOFF VOLUME =        .37843 INCHES      =          .1356 ACRE-FEET
PEAK DISCHARGE RATE =        4.36 CFS  AT   1.500 HOURS   BASIN AREA =


*
*S       ROUTE BASIN B1 FLOWS TO BASIN B2
*
COMPUTE RATING CURVE     CID=1  VS NO=1  NO SEGS=1
                                  MIN ELEV=139.1 FT  MAX ELEV=140.7 FT
                                  CH SLP=0.0166  FP SLP=0.0166  N=0.018
                                  DIST=87 FT
                                  DIST  ELEV       DIST  ELEV       DIST  EL
                                    0   140.2        9   139.8       10   13
                                   35   139.6       36   140.3       43   14
                                   50   140.3       51   139.6       76   13
                                   77   139.8       87   140.2

                                   RATING CURVE VALLEY SECTION  1.0
                                       WATER        FLOW        FLOW
                                      SURFACE       AREA        RATE
                                       ELEV         SQ FT       CFS
                                      139.10         .00         .00
                                      139.18         .36         .47
                                      139.27        1.46        2.97
                                      139.35        3.28        8.75
                                      139.44        5.84       18.85
                                      139.52        9.12       34.18
                                      139.61       13.13       55.93
                                      139.69       17.48       89.48
                                      139.77       21.88      129.06
                                      139.86       26.39      169.73
                                      139.94       31.24      214.08
                                      140.03       36.45      264.42
                                      140.11       42.01      321.02
                                      140.19       47.93      384.15
                                      140.28       54.07      467.20
                                      140.36       60.28      548.84
                                      140.45       66.74      634.00
                                      140.53       73.45      725.74
                                      140.62       80.40      824.19
                                      140.70       87.60      929.50
*
*S       COMPUTE TRAVEL TIME
*
COMPUTE TRAVEL TIME      ID=2  REACH NO=1  NO VS=1  L=772 FT
                                     SLP=0.0166
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.084	.365	.47	.1673
.168	1.459	2.97	.1054
.253	3.283	8.75	.0804
.337	5.836	18.85	.0664
.421	9.118	34.18	.0572
.505	13.129	55.93	.0503
.589	17.483	89.48	.0419
.674	21.877	129.06	.0364
.758	26.387	169.73	.0333
.842	31.238	214.08	.0313
.926	36.446	264.42	.0296
1.011	42.012	321.02	.0281
1.095	47.935	384.15	.0268
1.179	54.067	467.20	.0248
1.263	60.284	548.84	.0236
1.347	66.742	634.00	.0226
1.432	73.448	725.74	.0217
1.516	80.402	824.19	.0209
1.600	87.605	929.50	.0202

```
*
*S       ROUTE THE FLOW & PRINT
*
ROUTE                    ID=2  HYD NO=201.1  INFLOW ID=1  DT=0.0
*
PRINT HYD                ID=2  CODE=1

                                   PARTIAL HYDROGRAPH   201.10


    RUNOFF VOLUME =       .37847 INCHES      =        .1356 ACRE-FEET
    PEAK DISCHARGE RATE =        3.36 CFS  AT   1.567 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B2
*
COMPUTE NM HYD           ID=1  HYD=202.0  AREA=0.01609 SQ MI
                                   PER A=20  PER B=50  PER C=0  PER D=30
                                   TP=0.13 HRS  MASS RAIN=-1

    K =    .070850HR    TP =    .130000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =    19.541    CFS   UNIT VOLUME =     .9994        B =   526.28
    AREA =       .004827 SQ MI    IA =     .10000 INCHES    INF =     .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =    .148427HR    TP =    .130000HR    K/TP RATIO =  1.141749     SHAPE
    UNIT PEAK =    25.125    CFS   UNIT VOLUME =     .9994        B =   289.99
    AREA =       .011263 SQ MI    IA =     .54286 INCHES    INF =   1.37000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                ID=1  CODE=1
```

PARTIAL HYDROGRAPH 202.00

RUNOFF VOLUME = .50469 INCHES = .4331 ACRE-FEET
PEAK DISCHARGE RATE = 13.57 CFS AT 1.500 HOURS BASIN AREA =

```
*
*S      ADD BASIN B1 & B2
*
ADD HYD                 ID=3  HYD=210.0 ID I=1  ID II=2
*
PRINT HYD               ID=3  CODE=1
```

PARTIAL HYDROGRAPH 210.00

RUNOFF VOLUME = .46747 INCHES = .5687 ACRE-FEET
PEAK DISCHARGE RATE = 16.41 CFS AT 1.533 HOURS BASIN AREA =

```
*
*S      ROUTE COMBINATION OF BASIN B1/B2 FLOWS TO BASIN B3/B4
*
COMPUTE RATING CURVE    CID=1  VS NO=1  NO SEGS=1
                                MIN ELEV=139.1 FT  MAX ELEV=140.7 FT
                                CH SLP=0.0152  FP SLP=0.0152  N=0.018
                                DIST=87 FT
                                DIST    ELEV    DIST    ELEV    DIST
                                  0     140.2     9     139.8    10
                                 35     139.6    36     140.3    43
                                 50     140.3    51     139.6    76
                                 77     139.8    87     140.2
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
139.10	.00	.00
139.18	.36	.45
139.27	1.46	2.84
139.35	3.28	8.38
139.44	5.84	18.04
139.52	9.12	32.71
139.61	13.13	53.52
139.69	17.48	85.62
139.77	21.88	123.49
139.86	26.39	162.42
139.94	31.24	204.85
140.03	36.45	253.02
140.11	42.01	307.19
140.19	47.93	367.60
140.28	54.07	447.07
140.36	60.28	525.19
140.45	66.74	606.68
140.53	73.45	694.46
140.62	80.40	788.67

```
                                        140.70        87.60       889.44
*
COMPUTE TRAVEL TIME      ID=4  REACH NO=2  NO VS=1  L=1079 FT
                                   SLP=0.0152

                               TRAVEL TIME TABLE
                                                REACH=  2.0

                               WATER        AVERAGE      FLOW         TRAVEL
                               DEPTH        AREA         RATE         TIME
                               FEET         SQ.FT.       CFS          HRS
                                  .084          .365          .45        .2443
                                  .168         1.459         2.84        .1539
                                  .253         3.283         8.38        .1175
                                  .337         5.836        18.04        .0970
                                  .421         9.118        32.71        .0836
                                  .505        13.129        53.52        .0735
                                  .589        17.483        85.62        .0612
                                  .674        21.877       123.49        .0531
                                  .758        26.387       162.42        .0487
                                  .842        31.238       204.85        .0457
                                  .926        36.446       253.02        .0432
                                 1.011        42.012       307.19        .0410
                                 1.095        47.935       367.60        .0391
                                 1.179        54.067       447.07        .0362
                                 1.263        60.284       525.19        .0344
                                 1.347        66.742       606.68        .0330
                                 1.432        73.448       694.46        .0317
                                 1.516        80.402       788.67        .0306
                                 1.600        87.605       889.44        .0295
*
ROUTE                    ID=4  HYD NO=202.1  INFLOW ID=3  DT=0.0
*
PRINT HYD                ID=4  CODE=1

                                     PARTIAL HYDROGRAPH   202.10


    RUNOFF VOLUME =        .46749 INCHES      =        .5687 ACRE-FEET
    PEAK DISCHARGE RATE =      12.84 CFS  AT   1.600 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B3
*
COMPUTE NM HYD           ID=1  HYD=203.0  AREA=0.04219 SQ MI
                                   PER A=20  PER B=50  PER C=0  PER D=30
                                   TP=0.16 HRS  MASS RAIN=-1

    K =    .087200HR    TP =    .160000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =   41.632    CFS   UNIT VOLUME =    .9993        B =   526.28
    AREA =       .012657 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =    .182680HR    TP =    .160000HR    K/TP RATIO =  1.141749     SHAPE
    UNIT PEAK =   53.527    CFS   UNIT VOLUME =    .9997        B =   289.99
    AREA =       .029533 SQ MI    IA =    .54286 INCHES    INF =   1.37000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
```

```
*
PRINT HYD                    ID=1  CODE=1

                                        PARTIAL HYDROGRAPH   203.00


    RUNOFF VOLUME =       .50469 INCHES      =       1.1356 ACRE-FEET
    PEAK DISCHARGE RATE =       31.57 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B4
*
COMPUTE NM HYD               ID=2  HYD=204.0  AREA=0.01625 SQ MI
                                        PER A=20  PER B=50  PER C=0  PER D=30
                                        TP=0.13 HRS  MASS RAIN=-1

    K =   .070850HR    TP =   .130000HR    K/TP RATIO =   .545000     SHAPE
    UNIT PEAK =   19.735    CFS   UNIT VOLUME =    .9994        B =   526.28
    AREA =       .004875 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =   .148427HR    TP =   .130000HR    K/TP RATIO =  1.141749     SHAPE
    UNIT PEAK =   25.374    CFS   UNIT VOLUME =    .9994        B =   289.99
    AREA =       .011375 SQ MI    IA =    .54286 INCHES    INF =   1.37000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=2  CODE=1

                                        PARTIAL HYDROGRAPH   204.00


    RUNOFF VOLUME =       .50469 INCHES      =        .4374 ACRE-FEET
    PEAK DISCHARGE RATE =       13.70 CFS  AT   1.500 HOURS   BASIN AREA =


*
*S       ADD BASIN B3 & B4
*
ADD HYD                      ID=5  HYD=220.0  ID I=1  ID II=2
*
PRINT HYD                    ID=5  CODE=1

                                        PARTIAL HYDROGRAPH   220.00


    RUNOFF VOLUME =       .50468 INCHES      =       1.5730 ACRE-FEET
    PEAK DISCHARGE RATE =       44.80 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S       ADD BASIN B3/B4 & BASIN B1/B2
*
ADD HYD                      ID=6  HYD=230.0  ID I=4  ID II=5
```

```
*
PRINT HYD                    ID=6   CODE=1

                                          PARTIAL HYDROGRAPH   230.00


    RUNOFF VOLUME =        .49423 INCHES      =        2.1417 ACRE-FEET
    PEAK DISCHARGE RATE =       56.27 CFS  AT   1.533 HOURS   BASIN AREA =



*
*S       ROUTE BASIN B1,B2,B3 & B4 FLOWS TO BASIN A2
*
COMPUTE RATING CURVE     CID=1  VS NO=1  NO SEGS=2
                                     MIN ELEV=0.0 FT  MAX ELEV=2.75 FT
                                     CH SLP=0.0108  FP SLP=0.0108  N=0.022
                                     DIST=20.0 FT  N=0.018  DIST=59 FT
```

DIST	ELEV	DIST	ELEV	DIST
0	2.75	11	0.0	17
23	1.12	29	1.24	38
53	0.88	54	1.55	59

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.00	.00
.14	.10	.13
.29	.42	.80
.43	.94	2.36
.58	1.68	5.08
.72	2.62	9.21
.87	3.77	14.97
1.01	5.73	22.64
1.16	9.83	34.42
1.30	16.30	66.21
1.45	23.28	113.80
1.59	30.40	171.50
1.74	38.00	236.40
1.88	45.99	320.02
2.03	54.07	415.33
2.17	62.23	521.08
2.32	70.48	636.87
2.46	78.81	762.38
2.61	87.22	897.37
2.75	95.72	1041.60

```
*
COMPUTE TRAVEL TIME      ID=3  REACH NO=3  VS NO=1  L=1069 FT
                                    SLP=0.0108
```

TRAVEL TIME TABLE

REACH= 3.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.145	.105	.13	.2469
.289	.419	.80	.1556
.434	.943	2.36	.1187

```
                    .579        1.676        5.08        .0980
                    .724        2.619        9.21        .0844
                    .868        3.771       14.97        .0748
                   1.013        5.728       22.64        .0751
                   1.158        9.833       34.42        .0848
                   1.303       16.298       66.21        .0731
                   1.447       23.279      113.80        .0607
                   1.592       30.397      171.50        .0526
                   1.737       37.999      236.40        .0477
                   1.882       45.991      320.02        .0427
                   2.026       54.070      415.33        .0387
                   2.171       62.232      521.08        .0355
                   2.316       70.479      636.87        .0329
                   2.461       78.809      762.38        .0307
                   2.605       87.222      897.37        .0289
                   2.750       95.720     1041.60        .0273
*
ROUTE                    ID=3  HYD NO=230.1  INFLOW ID=6  DT=0.0
*
PRINT HYD                ID=3  CODE=1

                                   PARTIAL HYDROGRAPH   230.10


    RUNOFF VOLUME =       .49424 INCHES     =       2.1417 ACRE-FEET
    PEAK DISCHARGE RATE =      47.27 CFS  AT   1.600 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN A1
*
COMPUTE NM HYD           ID=2  HYD=301.0  AREA=0.09058 SQ MI
                          PER A=100 PER B=0 PER C=0 PER D=0
                          TP=0.30 MASS RAIN=-1

    K =    .398843HR    TP =    .300000HR    K/TP RATIO =  1.329478     SHAPE
    UNIT PEAK =   77.489    CFS   UNIT VOLUME =    .9997        B =   256.64
    AREA =       .090580 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                ID=2 CODE=1

                                   HYDROGRAPH FROM AREA   301.00


    RUNOFF VOLUME =       .08856 INCHES     =        .4278 ACRE-FEET
    PEAK DISCHARGE RATE =       6.86 CFS  AT   1.700 HOURS   BASIN AREA =


*
*S                  ROUTE A1 THROUGH A2
*
COMPUTE RATING CURVE       CID=1   VS NO=1 NO SEGS=1
                                   MIN ELEV=109.0  MAX ELEV=110.0
                                   CH SLP=0.0152   FP SLP=0.0152 N=0.035
                                   DIST=100.0
                                   DIST    ELEV    DIST    ELEV
```

0	110.0	10	109.0
90	109.0	100	110.0

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
109.00	.00	.00
109.05	4.24	3.10
109.11	8.53	9.87
109.16	12.88	19.45
109.21	17.29	31.48
109.26	21.75	45.77
109.32	26.26	62.17
109.37	30.83	80.58
109.42	35.46	100.91
109.47	40.14	123.10
109.53	44.88	147.09
109.58	49.67	172.85
109.63	54.52	200.33
109.68	59.42	229.51
109.74	64.38	260.36
109.79	69.40	292.85
109.84	74.47	326.96
109.89	79.59	362.69
109.95	84.77	400.01
110.00	90.01	438.91

*

COMPUTE TRAVEL TIME ID=4 REACH NO=4 NO VS=1 L=1450
SLP=0.0152

TRAVEL TIME TABLE
REACH= 4.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	4.239	3.10	.5503
.105	8.532	9.87	.3481
.158	12.882	19.45	.2668
.211	17.287	31.48	.2212
.263	21.747	45.77	.1914
.316	26.262	62.17	.1701
.368	30.833	80.58	.1541
.421	35.460	100.91	.1415
.474	40.141	123.10	.1313
.526	44.879	147.09	.1229
.579	49.671	172.85	.1157
.632	54.519	200.33	.1096
.684	59.423	229.51	.1043
.737	64.382	260.36	.0996
.790	69.396	292.85	.0954
.842	74.465	326.96	.0917
.895	79.590	362.69	.0884
.947	84.771	400.01	.0854
1.000	90.007	438.91	.0826

*

ROUTE ID=4 HYD NO=301.1 INFLOW ID=2

*

PRINT HYD ID=4 CODE=1

```
                                        HYDROGRAPH FROM AREA   301.10

    RUNOFF VOLUME =       .08856 INCHES     =         .4278 ACRE-FEET
    PEAK DISCHARGE RATE =       3.52 CFS  AT   2.000 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN A2
*
COMPUTE NM HYD           ID=1  HYD=102.0  AREA=0.03953 SQ MI
                                PER A=100  PER B=0  PER C=0  PER D=0
                                TP=0.25 HRS  MASS RAIN=-1

    K =   .335352HR    TP =   .250000HR    K/TP RATIO =  1.341408     SHAPE
    UNIT PEAK =   40.290    CFS   UNIT VOLUME =    .9995        B =   254.81
    AREA =       .039530 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                ID=1  CODE=1

                                        PARTIAL HYDROGRAPH   102.00


    RUNOFF VOLUME =       .08856 INCHES     =         .1867 ACRE-FEET
    PEAK DISCHARGE RATE =       3.55 CFS  AT   1.633 HOURS   BASIN AREA =


*
*S                   ADD BASINS A1 & A2
*
ADD HYD                                 ID=5 HYD=301.2  ID I=4 ID II=1
*
PRINT HYD                     ID=5  CODE=1

                                        HYDROGRAPH FROM AREA   301.20

    RUNOFF VOLUME =       .08856 INCHES     =         .6145 ACRE-FEET
    PEAK DISCHARGE RATE =       5.81 CFS  AT   1.767 HOURS   BASIN AREA =


*
*S       ADD BASINS A1&A2 TO BASIN B1/B2/B3/B4
*
ADD HYD                  ID=2  HYD=240.0  ID I=3  ID II=5
*
PRINT HYD                ID=2  CODE=1

                                        PARTIAL HYDROGRAPH   240.00

    RUNOFF VOLUME =       .24450 INCHES     =       2.7562 ACRE-FEET
    PEAK DISCHARGE RATE =      51.81 CFS  AT   1.600 HOURS   BASIN AREA =
```

```
*
*S      ROUTE BASIN A2/B1/B2/B3/B4 FLOWS TO BASIN C1
*
COMPUTE RATING CURVE    CID=1  VS NO=1  NO SEGS=2
                                MIN ELEV=1.58 FT  MAX ELEV=5.58 FT
                                CH SLP=0.0108  FP SLP=0.0108  N=0.022
                                DIST=20.0 FT  N=0.018  DIST=86 FT
                                DIST    ELEV    DIST    ELEV    DIST
                                  0     5.58     16     1.58     22
                                 43      3.0     64     2.58     70
                                 86     5.58
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
1.58	.00	.00
1.79	.44	.76
2.00	1.77	4.83
2.21	3.99	14.23
2.42	7.09	30.65
2.63	11.20	50.14
2.84	19.00	85.57
3.05	31.45	161.32
3.26	45.47	286.78
3.47	59.86	443.19
3.69	74.59	628.34
3.90	89.68	840.79
4.11	105.13	1079.52
4.32	120.93	1343.78
4.53	137.09	1633.04
4.74	153.60	1946.86
4.95	170.46	2284.94
5.16	187.68	2647.03
5.37	205.25	3032.97
5.58	223.18	3442.61

```
*
COMPUTE TRAVEL TIME     ID=3  REACH NO=5  VS NO=1  L=2170 FT
                                SLP=0.0108
```

TRAVEL TIME TABLE

REACH= 5.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.211	.443	.76	.3514
.421	1.773	4.83	.2214
.632	3.989	14.23	.1689
.842	7.091	30.65	.1395
1.053	11.202	50.14	.1347
1.263	19.003	85.57	.1339
1.474	31.446	161.32	.1175
1.684	45.474	286.78	.0956
1.895	59.856	443.19	.0814
2.105	74.593	628.34	.0716
2.316	89.684	840.79	.0643
2.526	105.130	1079.52	.0587

```
                                    2.737      120.931      1343.78        .0542
                                    2.947      137.086      1633.04        .0506
                                    3.158      153.595      1946.86        .0476
                                    3.368      170.460      2284.94        .0450
                                    3.579      187.679      2647.03        .0427
                                    3.789      205.252      3032.97        .0408
                                    4.000      223.180      3442.61        .0391
*
ROUTE                    ID=3  HYD NO=240.1  INFLOW ID=2  DT=0.0
*
PRINT HYD                ID=3  CODE=1

                                     PARTIAL HYDROGRAPH   240.10


    RUNOFF VOLUME =        .24451 INCHES      =        2.7562 ACRE-FEET
    PEAK DISCHARGE RATE =       41.81 CFS  AT   1.733 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN C1
*
COMPUTE NM HYD           ID=1  HYD=301.0  AREA=0.01797 SQ MI
                                   PER A=50  PER B=0  PER C=0  PER D=50
                                   TP=0.17 HRS  MASS RAIN=-1

    K =    .092650HR    TP =    .170000HR    K/TP RATIO =   .545000     SHAPE
    UNIT PEAK =   27.815    CFS   UNIT VOLUME =    .9998        B =   526.28
    AREA =       .008985 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =    .228039HR    TP =    .170000HR    K/TP RATIO =  1.341408     SHAPE
    UNIT PEAK =   13.467    CFS   UNIT VOLUME =    .9985        B =   254.81
    AREA =       .008985 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                ID=1  CODE=1

                                     HYDROGRAPH FROM AREA   301.00


    RUNOFF VOLUME =        .66829 INCHES      =         .6405 ACRE-FEET
    PEAK DISCHARGE RATE =       16.26 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S       ADD BASIN C1 IN WITH OTHER BASINS
*
ADD HYD                  ID=2  HYD=250.0  ID I=3  ID II=1
*
PRINT HYD                ID=2  CODE=1

                                     PARTIAL HYDROGRAPH   250.00


    RUNOFF VOLUME =        .27771 INCHES      =        3.3966 ACRE-FEET
```

```
    PEAK DISCHARGE RATE =       50.66 CFS  AT   1.700 HOURS   BASIN AREA =


*
*S                    CALCULATE DRAINAGE FOR BASINS NORTH OF SAN YGNACIO
*
*S                    COMPUTE BASIN A3
*
COMPUTE NM HYD                ID=3 HYD NO=310.0  AREA=0.09259 SQ MI
                                     PER A=100 PER B=0 PER C=0 PER D=0
                                     TP=0.24 MASS RAIN=-1

    K =    .318870HR    TP =    .240000HR    K/TP RATIO =  1.328624     SHAPE
    UNIT PEAK =   99.061    CFS   UNIT VOLUME =    .9997        B =   256.77
    AREA =       .092590 SQ MI    IA =     .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                     ID=3 CODE=1

                                          HYDROGRAPH FROM AREA   310.00


    RUNOFF VOLUME =       .08856 INCHES     =        .4373 ACRE-FEET
    PEAK DISCHARGE RATE =        8.76 CFS  AT   1.633 HOURS   BASIN AREA =


*
*S ROUTE A3 THROUGH A4
*
COMPUTE RATING CURVE          CID=1 VS NO=1 NO SEGS=1
                                     MIN ELEV=85.6 MAX ELEV=86.0
                                     CH SLP=0.0147 FP SLP=0.0147 N=0.035
                                     DIST=250.0 FT
                                     DIST    ELEV    DIST    ELEV
                                     0       86.0    20      85.8
                                     125     85.6    230     85.8
                                     250     86.0

                                      RATING CURVE VALLEY SECTION  1.0
                                      WATER     FLOW      FLOW
                                     SURFACE    AREA      RATE
                                      ELEV      SQ FT     CFS
                                      85.60       .00       .00
                                      85.62       .23       .06
                                      85.64       .93       .37
                                      85.66      2.09      1.08
                                      85.68      3.72      2.32
                                      85.71      5.82      4.20
                                      85.73      8.37      6.84
                                      85.75     11.40     10.31
                                      85.77     14.89     14.72
                                      85.79     18.84     20.15
                                      85.81     23.21     27.34
                                      85.83     27.72     36.28
                                      85.85     32.32     46.25
                                      85.87     37.01     57.23
                                      85.89     41.78     69.20
```

85.92	46.64	82.13
85.94	51.60	96.02
85.96	56.64	110.85
85.98	61.77	126.62
86.00	66.98	143.31

```
*
COMPUTE TRAVEL TIME ID=1 REACH NO=6          VS=1 L=1630
                                   SLP=0.0147
```

TRAVEL TIME TABLE

REACH= 6.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.021	.233	.06	1.8315
.042	.930	.37	1.1538
.063	2.094	1.08	.8805
.084	3.722	2.32	.7268
.105	5.815	4.20	.6264
.126	8.374	6.84	.5547
.147	11.398	10.31	.5005
.168	14.887	14.72	.4579
.189	18.842	20.15	.4233
.210	23.214	27.34	.3844
.232	27.723	36.28	.3460
.253	32.321	46.25	.3164
.274	37.007	57.23	.2928
.295	41.782	69.20	.2734
.316	46.645	82.13	.2571
.337	51.597	96.02	.2433
.358	56.638	110.85	.2313
.379	61.767	126.62	.2209
.400	66.985	143.31	.2116

```
*
ROUTE                          ID=1    HYD NO=310.1    INFLOW ID=3 DT=0
*
PRINT HYD                   ID=1 CODE=1

                                   HYDROGRAPH FROM AREA   310.10

    RUNOFF VOLUME =       .08856 INCHES      =        .4373 ACRE-FEET
    PEAK DISCHARGE RATE =       3.63 CFS  AT   1.933 HOURS   BASIN AREA =


*
*S                  COMPUTE  BASIN A4
*
COMPUTE NM HYD              ID=4    HYD=310.2       AREA=0.06187 SQ MI
                                    PER A=100 PER B=0 PER C=0 PER D=0
                                    TP=0.27 MASS RAIN=-1

    K =   .362180HR    TP =   .270000HR    K/TP RATIO =  1.341408     SHAPE
    UNIT PEAK =   58.388    CFS   UNIT VOLUME =    .9996        B =   254.81
    AREA =       .061870 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
```

```
*S                    ADD A3 & A4
*
ADD HYD                                   ID=6 HYD NO=310.3 ID I=4 ID II=1
*
PRINT HYD             ID=6 CODE=1

                                                HYDROGRAPH FROM AREA   310.30


    RUNOFF VOLUME =        .08854 INCHES      =          .7294 ACRE-FEET
    PEAK DISCHARGE RATE =        7.84 CFS  AT   1.767 HOURS   BASIN AREA =



*
*S                    COMPUTE BASIN A5
*
COMPUTE NM HYD                ID=5   HYD NO=305.0    AREA=0.09021 SQ MI
                                     PER A=100 PER B=0 PER C=0 PER D=0
                                     TP=0.48 MASS RAIN=-1

    K =    .638225HR    TP =    .480000HR    K/TP RATIO =  1.329635     SHAPE
    UNIT PEAK =   48.228    CFS   UNIT VOLUME =    .9997          B =   256.62
    AREA =       .090210 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                     ID=5 CODE=1

                                                HYDROGRAPH FROM AREA   305.00


    RUNOFF VOLUME =        .08856 INCHES      =          .4261 ACRE-FEET
    PEAK DISCHARGE RATE =        4.27 CFS  AT   1.867 HOURS   BASIN AREA =



*
*S                    ADD A5 TO BASINS A3 & A4
*
ADD HYD                                   ID=3    HYD NO=320.0 ID I = 5   ID II=6
*
PRINT HYD                     ID=3 CODE=1

                                                HYDROGRAPH FROM AREA   320.00


    RUNOFF VOLUME =        .08855 INCHES      =         1.1555 ACRE-FEET
    PEAK DISCHARGE RATE =       11.93 CFS  AT   1.800 HOURS   BASIN AREA =



*
*S                    CALCULATE INFLOW INTO UNSER PLAYA
*
ADD HYD                                   ID=4 HYD=330.0  ID I=3 ID II=2
*
PRINT HYD                     ID=4 CODE=-1

                                                HYDROGRAPH FROM AREA   330.00
```

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	3.067	5.9	6.133	.7
.033	.0	3.100	5.7	6.167	.7
.067	.0	3.133	5.5	6.200	.7
.100	.0	3.167	5.2	6.233	.6
.133	.0	3.200	5.0	6.267	.6
.167	.0	3.233	4.8	6.300	.6
.200	.0	3.267	4.6	6.333	.6
.233	.0	3.300	4.4	6.367	.6
.267	.0	3.333	4.2	6.400	.6
.300	.0	3.367	4.1	6.433	.5
.333	.0	3.400	3.9	6.467	.5
.367	.0	3.433	3.8	6.500	.5
.400	.0	3.467	3.6	6.533	.5
.433	.0	3.500	3.5	6.567	.5
.467	.0	3.533	3.3	6.600	.5
.500	.0	3.567	3.2	6.633	.4
.533	.0	3.600	3.1	6.667	.4
.567	.0	3.633	3.0	6.700	.4
.600	.0	3.667	2.9	6.733	.4
.633	.0	3.700	2.8	6.767	.4
.667	.0	3.733	2.8	6.800	.4
.700	.0	3.767	2.7	6.833	.4
.733	.0	3.800	2.6	6.867	.4
.767	.0	3.833	2.5	6.900	.3
.800	.0	3.867	2.4	6.933	.3
.833	.0	3.900	2.4	6.967	.3
.867	.0	3.933	2.3	7.000	.3
.900	.0	3.967	2.2	7.033	.3
.933	.0	4.000	2.2	7.067	.3
.967	.0	4.033	2.1	7.100	.3
1.000	.0	4.067	2.1	7.133	.3
1.033	.0	4.100	2.0	7.167	.3
1.067	.0	4.133	1.9	7.200	.3
1.100	.0	4.167	1.9	7.233	.2
1.133	.0	4.200	1.9	7.267	.2
1.167	.0	4.233	1.8	7.300	.2
1.200	.0	4.267	1.8	7.333	.2
1.233	.1	4.300	1.7	7.367	.2
1.267	.4	4.333	1.7	7.400	.2
1.300	1.1	4.367	1.6	7.433	.2
1.333	2.6	4.400	1.6	7.467	.2
1.367	4.7	4.433	1.5	7.500	.2
1.400	7.7	4.467	1.5	7.533	.2
1.433	13.0	4.500	1.5	7.567	.2
1.467	20.7	4.533	1.4	7.600	.2
1.500	30.0	4.567	1.4	7.633	.2
1.533	39.1	4.600	1.4	7.667	.2
1.567	47.1	4.633	1.3	7.700	.2
1.600	53.5	4.667	1.3	7.733	.2
1.633	58.1	4.700	1.3	7.767	.2
1.667	60.7	4.733	1.3	7.800	.1
1.700	61.9	4.767	1.2	7.833	.1
1.733	62.0	4.800	1.2	7.867	.1
1.767	61.4	4.833	1.2	7.900	.1
1.800	60.1	4.867	1.2	7.933	.1
1.833	58.4	4.900	1.1	7.967	.1
1.867	56.4	4.933	1.1	8.000	.1

1.900	53.9	4.967	1.1	8.033	.1
1.933	51.2	5.000	1.1	8.067	.1
1.967	48.3	5.033	1.0	8.100	.1
2.000	45.5	5.067	1.0	8.133	.1
2.033	42.7	5.100	1.0	8.167	.1
2.067	40.0	5.133	1.0	8.200	.1
2.100	37.4	5.167	1.0	8.233	.1
2.133	34.7	5.200	1.0	8.267	.1
2.167	32.1	5.233	.9	8.300	.1
2.200	29.6	5.267	.9	8.333	.1
2.233	27.2	5.300	.9	8.367	.1
2.267	25.0	5.333	.9	8.400	.1
2.300	23.0	5.367	.9	8.433	.1
2.333	21.3	5.400	.9	8.467	.1
2.367	19.8	5.433	.9	8.500	.1
2.400	18.3	5.467	.9	8.533	.1
2.433	17.1	5.500	.8	8.567	.1
2.467	15.9	5.533	.8	8.600	.1
2.500	14.9	5.567	.8	8.633	.1
2.533	14.0	5.600	.8	8.667	.1
2.567	13.2	5.633	.8	8.700	.1
2.600	12.5	5.667	.8	8.733	.1
2.633	11.8	5.700	.8	8.767	.1
2.667	11.2	5.733	.8	8.800	.1
2.700	10.5	5.767	.8	8.833	.1
2.733	9.9	5.800	.8	8.867	.1
2.767	9.4	5.833	.8	8.900	.1
2.800	8.9	5.867	.8	8.933	.1
2.833	8.4	5.900	.8	8.967	.1
2.867	8.0	5.933	.8	9.000	.1
2.900	7.6	5.967	.8	9.033	.1
2.933	7.2	6.000	.7	9.067	.1
2.967	6.8	6.033	.7	9.100	.1
3.000	6.5	6.067	.7	9.133	.1
3.033	6.2	6.100	.7	9.167	.1

RUNOFF VOLUME = .18007 INCHES = 4.5521 ACRE-FEET
PEAK DISCHARGE RATE = 62.05 CFS AT 1.733 HOURS BASIN AREA =

```
*
*S      END CALCULATIONS
*
FINISH
```

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 11:13:16

```
AHYMO SUMMARY TABLE (AHYMO993) - AMAFCA VERSION OF HYMO - SEPTEMBER, 1993
INPUT FILE = c:\ahymo\sunset\sw2-d10.dat

                                  FROM  TO                        PEAK        RUNOF
                     HYDROGRAPH    ID   ID          AREA       DISCHARGE      VOLUM
COMMAND        IDENTIFICATION     NO.  NO.        (SQ MI)       (CFS)        (AC-F

START
*S       INPUT  FILE NAME:  SW2-D10.DAT
*S       OUTPUT FILE NAME:  SW2-D10.OUT
*S       PROJECT:           SUNSET WEST UNIT 2
*S       CONDITION:         DEVELOPED CONDITIONS; 10-YEAR STORM
*S                                  SAD 222 IN PLACE; SUNSET WEST UNIT 2
*S       LEEDSHILL-HERKENHOFF, INC.
RAINFALL  TYPE= 1
*S       COMPUTE BASIN B1 & PRINT VALUES
COMPUTE NM HYD        201.00   -     1        .00672        4.36        .13
*S       ROUTE BASIN B1 FLOWS TO BASIN B2
*S       COMPUTE TRAVEL TIME
*S       ROUTE THE FLOW & PRINT
ROUTE                 201.10    1    2        .00672        3.36        .13
*S       COMPUTE BASIN B2
COMPUTE NM HYD        202.00   -     1        .01609       13.57        .43
*S       ADD BASIN B1 & B2
ADD HYD               210.00  1& 2   3        .02281       16.41        .56
*S       ROUTE COMBINATION OF BASIN B1/B2 FLOWS TO BASIN B3/B4
ROUTE                 202.10    3    4        .02281       12.84        .56
*S       COMPUTE BASIN B3
COMPUTE NM HYD        203.00   -     1        .04219       31.57       1.13
*S       COMPUTE BASIN B4
COMPUTE NM HYD        204.00   -     2        .01625       14.40        .43
*S       ADD BASIN B3 & B4
ADD HYD               220.00  1& 2   5        .05844       44.90       1.57
*S       ADD BASIN B3/B4 & BASIN B1/B2
ADD HYD               230.00  4& 5   6        .08125       56.37       2.14
*S       ROUTE BASIN B1,B2,B3 & B4 FLOWS TO BASIN A2
ROUTE                 230.10    6    3        .08125       47.37       2.14
*S       COMPUTE BASIN A2
COMPUTE NM HYD        102.00   -     1        .03953        2.78        .18
*S       ADD BASIN A2 TO BASIN B1/B2/B3/B4
ADD HYD               240.00  3& 1   2        .12078       49.75       2.32
*S       ROUTE BASIN A2/B1/B2/B3/B4 FLOWS TO BASIN C1
ROUTE                 240.10    2    3        .12078       39.72       2.32
*S       COMPUTE BASIN C1
COMPUTE NM HYD        301.00   -     1        .01797       16.26        .64
*S       ADD BASIN C1 IN WITH OTHER BASINS
ADD HYD               250.00  3& 1   2        .13875       48.87       2.96
*S                   CALCULATE DRAINAGE FOR BASINS NORTH OF SAN YGNACIO
*S                   ASSUME SAD 222 IMPROVEMENTS ARE IN PLACE
*S                   COMPUTE BASIN A1
COMPUTE NM HYD         301.00   -     1        .09058        6.86        .42
*S                   ROUTE A1  ALONG SAN YGNACIO TO A3
ROUTE                  301.10    1    4        .09058        6.06        .42
*S                   COMPUTE BASIN A3
COMPUTE NM HYD         310.00   -     3        .09259        8.76        .43
*S                   ADD BASINS A1& A3
```

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOF VOLUM (AC-F
ADD HYD	315.00	3& 4	6	.18317	13.61	.86
*S	ROUTE BASINS A1 &A3 THRU A4					
ROUTE	320.00	6	1	.18317	7.08	.86
*S	COMPUTE BASIN A4					
COMPUTE NM HYD	320.10	-	4	.06187	5.17	.29
*S	ADD BASINS A1&3 TO BASIN A4					
ADD HYD	310.30	4& 1	6	.24504	10.20	1.15
*S	COMPUTE BASIN A5					
COMPUTE NM HYD	305.00	-	5	.09021	4.27	.42
*S	ADD BASINS A1,A3,A4 & A5					
ADD HYD	320.00	5& 6	1	.33525	14.46	1.58
*S	CALCULATE TOTAL INFLOW INTO UNSER PLAYA					
ADD HYD	330.00	1& 2	3	.47400	61.52	4.55
*S	END CALCULATIONS					
FINISH						

```
    AHYMO PROGRAM (AHYMO993) - AMAFCA VERSION OF HYMO - SEPTEMBER, 1993
         RUN DATE (MON/DAY/YR) = 04/15/1994
         START TIME (HR:MIN:SEC) = 15:33:02     USER NO.= G_NEMETH.S93
         INPUT FILE = c:\ahymo\sunset\sw2-d10.dat

START                    0.0
*
*S       INPUT  FILE NAME:  SW2-D10.DAT
*S       OUTPUT FILE NAME:  SW2-D10.OUT
*S       PROJECT:           SUNSET WEST UNIT 2
*S       CONDITION:         DEVELOPED CONDITIONS; 10-YEAR STORM
*S                                  SAD 222 IN PLACE; SUNSET WEST UNIT 2
*S       LEEDSHILL-HERKENHOFF, INC.
*
RAINFALL                 TYPE=1  RAIN QUARTER=0.0
                                    RAIN ONE=1.27 IN  RAIN SIX=1.48 IN
                                    RAIN DAY=0.00 IN  DT=0.033333 HRS

                 COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2
                 DT =     .033333 HOURS        END TIME =     5.999940 HOURS
                    .0000   .0010   .0020   .0030   .0040   .0051   .0062
                    .0073   .0084   .0096   .0108   .0120   .0133   .0146
                    .0159   .0173   .0187   .0201   .0217   .0232   .0248
                    .0265   .0283   .0301   .0320   .0340   .0360   .0382
                    .0405   .0429   .0454   .0490   .0527   .0567   .0654
                    .0847   .1144   .1570   .2152   .2917   .3892   .5106
                    .6588   .7959   .8532   .9017   .9448   .9840  1.0200
                   1.0536  1.0849  1.1142  1.1418  1.1679  1.1925  1.2158
                   1.2379  1.2588  1.2787  1.2975  1.3154  1.3195  1.3233
                   1.3269  1.3303  1.3335  1.3367  1.3397  1.3426  1.3453
                   1.3480  1.3506  1.3531  1.3556  1.3579  1.3602  1.3625
                   1.3646  1.3668  1.3688  1.3708  1.3728  1.3748  1.3766
                   1.3785  1.3803  1.3821  1.3838  1.3855  1.3872  1.3888
                   1.3905  1.3920  1.3936  1.3951  1.3967  1.3981  1.3996
                   1.4011  1.4025  1.4039  1.4053  1.4066  1.4080  1.4093
                   1.4106  1.4119  1.4132  1.4144  1.4157  1.4169  1.4181
                   1.4193  1.4205  1.4217  1.4228  1.4240  1.4251  1.4262
                   1.4273  1.4284  1.4295  1.4306  1.4317  1.4327  1.4338
                   1.4348  1.4358  1.4368  1.4378  1.4388  1.4398  1.4408
                   1.4418  1.4427  1.4437  1.4446  1.4456  1.4465  1.4474
                   1.4483  1.4492  1.4501  1.4510  1.4519  1.4528  1.4537
                   1.4545  1.4554  1.4562  1.4571  1.4579  1.4588  1.4596
                   1.4604  1.4612  1.4620  1.4628  1.4636  1.4644  1.4652
                   1.4660  1.4668  1.4676  1.4683  1.4691  1.4698  1.4706
                   1.4714  1.4721  1.4728  1.4736  1.4743  1.4750  1.4758
                   1.4765  1.4772  1.4779  1.4786  1.4793  1.4800

*
*S       COMPUTE BASIN B1 & PRINT VALUES
*
COMPUTE NM HYD           ID=1  HYD=201.0  AREA=0.00672 SQ MI
                                    PER A=75  PER B=0  PER C=0  PER D=25
                                    TP=0.11 HRS  MASS RAIN=-1

    K =    .059950HR    TP =    .110000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =    8.0377    CFS   UNIT VOLUME =    .9982        B =   526.28
    AREA =       .001680 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
```

```
K =    .147555HR     TP =    .110000HR     K/TP RATIO =  1.341408      SHAPE
UNIT PEAK =    11.675     CFS    UNIT VOLUME =     .9972          B =    254.81
AREA =       .005040 SQ MI     IA =     .65000 INCHES     INF =    1.67000 I
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=1  CODE=1

                                        PARTIAL HYDROGRAPH   201.00

RUNOFF VOLUME =        .37843 INCHES      =          .1356 ACRE-FEET
PEAK DISCHARGE RATE =        4.36 CFS  AT   1.500 HOURS   BASIN AREA =


*
*S       ROUTE BASIN B1 FLOWS TO BASIN B2
*
COMPUTE RATING CURVE     CID=1  VS NO=1  NO SEGS=1
                                        MIN ELEV=139.1 FT  MAX ELEV=140.7 FT
                                        CH SLP=0.0166  FP SLP=0.0166  N=0.018
                                        DIST=87 FT
                                        DIST  ELEV      DIST  ELEV      DIST  EL
                                          0   140.2      9   139.8      10   13
                                         35   139.6     36   140.3      43   14
                                         50   140.3     51   139.6      76   13
                                         77   139.8     87   140.2

                                         RATING CURVE VALLEY SECTION  1.0
                                             WATER       FLOW        FLOW
                                            SURFACE      AREA        RATE
                                             ELEV        SQ FT       CFS
                                            139.10        .00         .00
                                            139.18        .36         .47
                                            139.27       1.46        2.97
                                            139.35       3.28        8.75
                                            139.44       5.84       18.85
                                            139.52       9.12       34.18
                                            139.61      13.13       55.93
                                            139.69      17.48       89.48
                                            139.77      21.88      129.06
                                            139.86      26.39      169.73
                                            139.94      31.24      214.08
                                            140.03      36.45      264.42
                                            140.11      42.01      321.02
                                            140.19      47.93      384.15
                                            140.28      54.07      467.20
                                            140.36      60.28
```

AHYMO SUMMARY TABLE (AHYMO993) - AMAFCA VERSION OF HYMO - SEPTEMBER, 1993
INPUT FILE = c:\ahymo\sunset\sw2ii10.dat

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOF VOLUM (AC-F
START						
*S	INPUT FILE NAME: SW2ii10.DAT					
*S	OUTPUT FILE NAME: SW2ii10.OUT					
*S	PROJECT: SUNSET WEST UNIT 2					
*S	CONDITION: INTERIM II; 10-YEAR STORM					
*S	SAD 222 IN PLACE; SUNSET WEST UNIT 2					
*S	LEEDSHILL-HERKENHOFF, INC.					
RAINFALL	TYPE= 1					
*S	COMPUTE BASIN B1 & PRINT VALUES					
COMPUTE	NM HYD 201.00	-	1	.00672	4.36	.13
*S	ROUTE BASIN B1 FLOWS TO BASIN B2					
*S	COMPUTE TRAVEL TIME					
*S	ROUTE THE FLOW & PRINT					
ROUTE	201.10	1	2	.00672	3.36	.13
*S	COMPUTE BASIN B2					
COMPUTE	NM HYD 202.00	-	1	.01609	13.57	.43
*S	ADD BASIN B1 & B2					
ADD HYD	210.00	1& 2	3	.02281	16.41	.56
*S	ROUTE COMBINATION OF BASIN B1/B2 FLOWS TO BASIN B3/B4					
ROUTE	202.10	3	4	.02281	12.84	.56
*S	COMPUTE BASIN B3					
COMPUTE	NM HYD 203.00	-	1	.04219	24.06	.92
*S	COMPUTE BASIN B4					
COMPUTE	NM HYD 204.00	-	2	.01625	3.65	.07
*S	ADD BASIN B3 & B4					
ADD HYD	220.00	1& 2	5	.05844	27.43	1.00
*S	ADD BASIN B3/B4 & BASIN B1/B2					
ADD HYD	230.00	4& 5	6	.08125	39.27	1.56
*S	ROUTE BASIN B1,B2,B3 & B4 FLOWS TO BASIN A2					
ROUTE	230.10	6	3	.08125	32.76	1.56
*S	COMPUTE BASIN A2					
COMPUTE	NM HYD 102.00	-	1	.03953	2.78	.18
*S	ADD BASIN A2 TO BASIN B1/B2/B3/B4					
ADD HYD	240.00	3& 1	2	.12078	35.35	1.75
*S	ROUTE BASIN A2/B1/B2/B3/B4 FLOWS TO BASIN C1					
ROUTE	240.10	2	3	.12078	29.71	1.75
*S	COMPUTE BASIN C1					
COMPUTE	NM HYD 301.00	-	1	.01797	16.26	.64
*S	ADD BASIN C1 IN WITH OTHER BASINS					
ADD HYD	250.00	3& 1	2	.13875	37.74	2.39
*S	CALCULATE DRAINAGE FOR BASINS NORTH OF SAN YGNACIO					
*S	ASSUME SAD 222 IMPROVEMENTS ARE IN PLACE					
*S	COMPUTE BASIN A1					
COMPUTE	NM HYD 301.00	-	1	.09058	6.86	.42
*S	ROUTE A1 ALONG SAN YGNACIO TO A3					
ROUTE	301.10	1	4	.09058	5.80	.42
*S	COMPUTE BASIN A3					
COMPUTE	NM HYD 310.00	-	3	.09259	8.76	.43
*S	ADD BASINS A1& A3					

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOF VOLUM (AC-F
ADD HYD	315.00	4& 3	6	.18317	13.12	.86
*S	ROUTE BASINS A1 &A3 THRU A4					
ROUTE	320.00	6	1	.18317	6.99	.86
*S	COMPUTE BASIN A4					
COMPUTE NM HYD	320.10	-	4	.06187	5.17	.29
*S	ADD BASINS A1&3 TO BASIN A4					
ADD HYD	310.30	4& 1	6	.24504	10.03	1.15
*S	COMPUTE BASIN A5					
COMPUTE NM HYD	305.00	-	5	.09021	4.27	.42
*S	ADD BASINS A1,A3,A4 & A5					
ADD HYD	320.00	5& 6	1	.33525	14.30	1.58
*S	CALCULATE TOTAL INFLOW INTO UNSER PLAYA					
ADD HYD	330.00	1& 2	3	.47400	51.09	3.97
*S	END CALCULATIONS					
FINISH						

```
    AHYMO PROGRAM (AHYMO993) - AMAFCA VERSION OF HYMO - SEPTEMBER, 1993
         RUN DATE (MON/DAY/YR) = 04/15/1994
         START TIME (HR:MIN:SEC) = 11:15:43     USER NO.= G_NEMETH.S93
         INPUT FILE = c:\ahymo\sunset\sw2ii10.dat

START                    0.0
*
*S       INPUT  FILE NAME:  SW2ii10.DAT
*S       OUTPUT FILE NAME:  SW2ii10.OUT
*S       PROJECT:           SUNSET WEST UNIT 2
*S       CONDITION:         INTERIM II; 10-YEAR STORM
*S                                  SAD 222 IN PLACE; SUNSET WEST UNIT 2
*S       LEEDSHILL-HERKENHOFF, INC.
*
RAINFALL                 TYPE=1  RAIN QUARTER=0.0
                                    RAIN ONE=1.27 IN  RAIN SIX=1.48 IN
                                    RAIN DAY=0.00 IN  DT=0.033333 HRS

                 COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2
                 DT =     .033333 HOURS        END TIME =     5.999940 HOURS
                    .0000   .0010   .0020   .0030   .0040   .0051   .0062
                    .0073   .0084   .0096   .0108   .0120   .0133   .0146
                    .0159   .0173   .0187   .0201   .0217   .0232   .0248
                    .0265   .0283   .0301   .0320   .0340   .0360   .0382
                    .0405   .0429   .0454   .0490   .0527   .0567   .0654
                    .0847   .1144   .1570   .2152   .2917   .3892   .5106
                    .6588   .7959   .8532   .9017   .9448   .9840  1.0200
                   1.0536  1.0849  1.1142  1.1418  1.1679  1.1925  1.2158
                   1.2379  1.2588  1.2787  1.2975  1.3154  1.3195  1.3233
                   1.3269  1.3303  1.3335  1.3367  1.3397  1.3426  1.3453
                   1.3480  1.3506  1.3531  1.3556  1.3579  1.3602  1.3625
                   1.3646  1.3668  1.3688  1.3708  1.3728  1.3748  1.3766
                   1.3785  1.3803  1.3821  1.3838  1.3855  1.3872  1.3888
                   1.3905  1.3920  1.3936  1.3951  1.3967  1.3981  1.3996
                   1.4011  1.4025  1.4039  1.4053  1.4066  1.4080  1.4093
                   1.4106  1.4119  1.4132  1.4144  1.4157  1.4169  1.4181
                   1.4193  1.4205  1.4217  1.4228  1.4240  1.4251  1.4262
                   1.4273  1.4284  1.4295  1.4306  1.4317  1.4327  1.4338
                   1.4348  1.4358  1.4368  1.4378  1.4388  1.4398  1.4408
                   1.4418  1.4427  1.4437  1.4446  1.4456  1.4465  1.4474
                   1.4483  1.4492  1.4501  1.4510  1.4519  1.4528  1.4537
                   1.4545  1.4554  1.4562  1.4571  1.4579  1.4588  1.4596
                   1.4604  1.4612  1.4620  1.4628  1.4636  1.4644  1.4652
                   1.4660  1.4668  1.4676  1.4683  1.4691  1.4698  1.4706
                   1.4714  1.4721  1.4728  1.4736  1.4743  1.4750  1.4758
                   1.4765  1.4772  1.4779  1.4786  1.4793  1.4800

*
*S       COMPUTE BASIN B1 & PRINT VALUES
*
COMPUTE NM HYD           ID=1  HYD=201.0  AREA=0.00672 SQ MI
                                    PER A=75  PER B=0  PER C=0  PER D=25
                                    TP=0.11 HRS  MASS RAIN=-1

    K =    .059950HR    TP =    .110000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =    8.0377    CFS   UNIT VOLUME =    .9982        B =   526.28
    AREA =       .001680 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
```

```
K =    .147555HR     TP =    .110000HR     K/TP RATIO =  1.341408      SHAPE
UNIT PEAK =    11.675     CFS    UNIT VOLUME =     .9972         B =    254.81
AREA =       .005040 SQ MI     IA =     .65000 INCHES     INF =    1.67000 I
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=1  CODE=1

                                        PARTIAL HYDROGRAPH   201.00


RUNOFF VOLUME =       .37843 INCHES      =         .1356 ACRE-FEET
PEAK DISCHARGE RATE =        4.36 CFS  AT   1.500 HOURS   BASIN AREA =



*
*S       ROUTE BASIN B1 FLOWS TO BASIN B2
*
COMPUTE RATING CURVE     CID=1  VS NO=1  NO SEGS=1
                                  MIN ELEV=139.1 FT  MAX ELEV=140.7 FT
                                  CH SLP=0.0166  FP SLP=0.0166  N=0.018
                                  DIST=87 FT
                                  DIST  ELEV      DIST  ELEV      DIST  EL
                                    0   140.2       9   139.8      10   13
                                   35   139.6      36   140.3      43   14
                                   50   140.3      51   139.6      76   13
                                   77   139.8      87   140.2

                                   RATING CURVE VALLEY SECTION  1.0
                                       WATER        FLOW        FLOW
                                      SURFACE       AREA        RATE
                                       ELEV         SQ FT       CFS
                                      139.10         .00         .00
                                      139.18         .36         .47
                                      139.27        1.46        2.97
                                      139.35        3.28        8.75
                                      139.44        5.84       18.85
                                      139.52        9.12       34.18
                                      139.61       13.13       55.93
                                      139.69       17.48       89.48
                                      139.77       21.88      129.06
                                      139.86       26.39      169.73
                                      139.94       31.24      214.08
                                      140.03       36.45      264.42
                                      140.11       42.01      321.02
                                      140.19       47.93      384.15
                                      140.28       54.07      467.20
                                      140.36       60.28      548.84
                                      140.45       66.74      634.00
                                      140.53       73.45      725.74
                                      140.62       80.40      824.19
                                      140.70       87.60      929.50
*
*S       COMPUTE TRAVEL TIME
*
COMPUTE TRAVEL TIME      ID=2  REACH NO=1  NO VS=1  L=772 FT
                                  SLP=0.0166
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.084	.365	.47	.1673
.168	1.459	2.97	.1054
.253	3.283	8.75	.0804
.337	5.836	18.85	.0664
.421	9.118	34.18	.0572
.505	13.129	55.93	.0503
.589	17.483	89.48	.0419
.674	21.877	129.06	.0364
.758	26.387	169.73	.0333
.842	31.238	214.08	.0313
.926	36.446	264.42	.0296
1.011	42.012	321.02	.0281
1.095	47.935	384.15	.0268
1.179	54.067	467.20	.0248
1.263	60.284	548.84	.0236
1.347	66.742	634.00	.0226
1.432	73.448	725.74	.0217
1.516	80.402	824.19	.0209
1.600	87.605	929.50	.0202

```
*
*S       ROUTE THE FLOW & PRINT
*
ROUTE                    ID=2  HYD NO=201.1  INFLOW ID=1  DT=0.0
*
PRINT HYD                ID=2  CODE=1

                                   PARTIAL HYDROGRAPH   201.10


    RUNOFF VOLUME =       .37847 INCHES      =        .1356 ACRE-FEET
    PEAK DISCHARGE RATE =        3.36 CFS  AT   1.567 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B2
*
COMPUTE NM HYD           ID=1  HYD=202.0  AREA=0.01609 SQ MI
                                   PER A=20  PER B=50  PER C=0  PER D=30
                                   TP=0.13 HRS  MASS RAIN=-1

    K =    .070850HR    TP =    .130000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =    19.541    CFS   UNIT VOLUME =     .9994        B =   526.28
    AREA =       .004827 SQ MI    IA =     .10000 INCHES    INF =     .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =    .148427HR    TP =    .130000HR    K/TP RATIO =  1.141749     SHAPE
    UNIT PEAK =    25.125    CFS   UNIT VOLUME =     .9994        B =   289.99
    AREA =       .011263 SQ MI    IA =     .54286 INCHES    INF =   1.37000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                ID=1  CODE=1
```

PARTIAL HYDROGRAPH 202.00

RUNOFF VOLUME = .50469 INCHES = .4331 ACRE-FEET
PEAK DISCHARGE RATE = 13.57 CFS AT 1.500 HOURS BASIN AREA =

```
*
*S      ADD BASIN B1 & B2
*
ADD HYD                 ID=3  HYD=210.0 ID I=1  ID II=2
*
PRINT HYD               ID=3  CODE=1
```

PARTIAL HYDROGRAPH 210.00

RUNOFF VOLUME = .46747 INCHES = .5687 ACRE-FEET
PEAK DISCHARGE RATE = 16.41 CFS AT 1.533 HOURS BASIN AREA =

```
*
*S      ROUTE COMBINATION OF BASIN B1/B2 FLOWS TO BASIN B3/B4
*
COMPUTE RATING CURVE    CID=1  VS NO=1  NO SEGS=1
                                MIN ELEV=139.1 FT  MAX ELEV=140.7 FT
                                CH SLP=0.0152  FP SLP=0.0152  N=0.018
                                DIST=87 FT
                                DIST    ELEV    DIST    ELEV    DIST
                                  0     140.2     9     139.8    10
                                 35     139.6    36     140.3    43
                                 50     140.3    51     139.6    76
                                 77     139.8    87     140.2
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
139.10	.00	.00
139.18	.36	.45
139.27	1.46	2.84
139.35	3.28	8.38
139.44	5.84	18.04
139.52	9.12	32.71
139.61	13.13	53.52
139.69	17.48	85.62
139.77	21.88	123.49
139.86	26.39	162.42
139.94	31.24	204.85
140.03	36.45	253.02
140.11	42.01	307.19
140.19	47.93	367.60
140.28	54.07	447.07
140.36	60.28	525.19
140.45	66.74	606.68
140.53	73.45	694.46
140.62	80.40	788.67

```
                                        140.70        87.60       889.44
*
COMPUTE TRAVEL TIME      ID=4  REACH NO=2  NO VS=1  L=1079 FT
                                   SLP=0.0152

                               TRAVEL TIME TABLE
                                                REACH=  2.0

                               WATER       AVERAGE     FLOW        TRAVEL
                               DEPTH       AREA        RATE        TIME
                               FEET        SQ.FT.      CFS         HRS
                                  .084        .365         .45        .2443
                                  .168       1.459        2.84        .1539
                                  .253       3.283        8.38        .1175
                                  .337       5.836       18.04        .0970
                                  .421       9.118       32.71        .0836
                                  .505      13.129       53.52        .0735
                                  .589      17.483       85.62        .0612
                                  .674      21.877      123.49        .0531
                                  .758      26.387      162.42        .0487
                                  .842      31.238      204.85        .0457
                                  .926      36.446      253.02        .0432
                                 1.011      42.012      307.19        .0410
                                 1.095      47.935      367.60        .0391
                                 1.179      54.067      447.07        .0362
                                 1.263      60.284      525.19        .0344
                                 1.347      66.742      606.68        .0330
                                 1.432      73.448      694.46        .0317
                                 1.516      80.402      788.67        .0306
                                 1.600      87.605      889.44        .0295
*
ROUTE                    ID=4  HYD NO=202.1  INFLOW ID=3  DT=0.0
*
PRINT HYD                ID=4  CODE=1

                                     PARTIAL HYDROGRAPH   202.10


    RUNOFF VOLUME =       .46749 INCHES      =        .5687 ACRE-FEET
    PEAK DISCHARGE RATE =      12.84 CFS  AT   1.600 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B3
*
COMPUTE NM HYD           ID=1  HYD=203.0  AREA=0.04219 SQ MI
                                   PER A=50  PER B=25  PER C=0  PER D=25
                                   TP=0.17 HRS  MASS RAIN=-1

    K =    .092650HR    TP =    .170000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =    32.652    CFS   UNIT VOLUME =    .9998        B =   526.28
    AREA =       .010548 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =    .212200HR    TP =    .170000HR    K/TP RATIO =  1.248233     SHAPE
    UNIT PEAK =    50.250    CFS   UNIT VOLUME =    .9995        B =   269.97
    AREA =       .031643 SQ MI    IA =    .60000 INCHES    INF =   1.53000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
```

```
*
PRINT HYD                    ID=1  CODE=1

                                        PARTIAL HYDROGRAPH   203.00

    RUNOFF VOLUME =       .41023 INCHES      =        .9231 ACRE-FEET
    PEAK DISCHARGE RATE =       24.06 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B4
*
COMPUTE NM HYD               ID=2  HYD=204.0  AREA=0.01625 SQ MI
                                        PER A=100  PER B=0  PER C=0  PER D=0
                                        TP=0.10 HRS  MASS RAIN=-1

    K =    .134141HR    TP =    .100000HR    K/TP RATIO =  1.341408     SHAPE
    UNIT PEAK =   41.406    CFS   UNIT VOLUME =    .9977        B =   254.81
    AREA =       .016250 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=2  CODE=1

                                        PARTIAL HYDROGRAPH   204.00

    RUNOFF VOLUME =       .08856 INCHES      =        .0768 ACRE-FEET
    PEAK DISCHARGE RATE =        3.65 CFS  AT   1.500 HOURS   BASIN AREA =


*
*S       ADD BASIN B3 & B4
*
ADD HYD                      ID=5  HYD=220.0  ID I=1  ID II=2
*
PRINT HYD                    ID=5  CODE=1

                                        PARTIAL HYDROGRAPH   220.00

    RUNOFF VOLUME =       .32078 INCHES      =        .9998 ACRE-FEET
    PEAK DISCHARGE RATE =       27.43 CFS  AT   1.533 HOURS   BASIN AREA =


*
*S       ADD BASIN B3/B4 & BASIN B1/B2
*
ADD HYD                      ID=6  HYD=230.0  ID I=4  ID II=5
*
PRINT HYD                    ID=6  CODE=1

                                        PARTIAL HYDROGRAPH   230.00
```

```
RUNOFF VOLUME =        .36196 INCHES      =        1.5685 ACRE-FEET
PEAK DISCHARGE RATE =       39.27 CFS  AT   1.567 HOURS   BASIN AREA =
```

```
*
*S       ROUTE BASIN B1,B2,B3 & B4 FLOWS TO BASIN A2
*
COMPUTE RATING CURVE     CID=1  VS NO=1  NO SEGS=2
                                MIN ELEV=0.0 FT  MAX ELEV=2.75 FT
                                CH SLP=0.0108  FP SLP=0.0108  N=0.022
                                DIST=20.0 FT  N=0.018  DIST=59 FT
                                DIST    ELEV    DIST    ELEV    DIST
                                  0     2.75     11      0.0     17
                                 23     1.12     29     1.24     38
                                 53     0.88     54     1.55     59
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.00	.00
.14	.10	.13
.29	.42	.80
.43	.94	2.36
.58	1.68	5.08
.72	2.62	9.21
.87	3.77	14.97
1.01	5.73	22.64
1.16	9.83	34.42
1.30	16.30	66.21
1.45	23.28	113.80
1.59	30.40	171.50
1.74	38.00	236.40
1.88	45.99	320.02
2.03	54.07	415.33
2.17	62.23	521.08
2.32	70.48	636.87
2.46	78.81	762.38
2.61	87.22	897.37
2.75	95.72	1041.60

```
*
COMPUTE TRAVEL TIME      ID=3  REACH NO=3  VS NO=1  L=1069 FT
                                SLP=0.0108
```

TRAVEL TIME TABLE

REACH= 3.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.145	.105	.13	.2469
.289	.419	.80	.1556
.434	.943	2.36	.1187
.579	1.676	5.08	.0980
.724	2.619	9.21	.0844
.868	3.771	14.97	.0748
1.013	5.728	22.64	.0751
1.158	9.833	34.42	.0848
1.303	16.298	66.21	.0731

```
                                    1.447      23.279      113.80        .0607
                                    1.592      30.397      171.50        .0526
                                    1.737      37.999      236.40        .0477
                                    1.882      45.991      320.02        .0427
                                    2.026      54.070      415.33        .0387
                                    2.171      62.232      521.08        .0355
                                    2.316      70.479      636.87        .0329
                                    2.461      78.809      762.38        .0307
                                    2.605      87.222      897.37        .0289
                                    2.750      95.720     1041.60        .0273
*
ROUTE                       ID=3  HYD NO=230.1  INFLOW ID=6  DT=0.0
*
PRINT HYD                   ID=3  CODE=1

                                         PARTIAL HYDROGRAPH   230.10


    RUNOFF VOLUME =       .36197 INCHES      =        1.5685 ACRE-FEET
    PEAK DISCHARGE RATE =      32.76 CFS  AT   1.633 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN A2
*
COMPUTE NM HYD              ID=1  HYD=102.0  AREA=0.03953 SQ MI
                                       PER A=100  PER B=0  PER C=0  PER D=0
                                       TP=0.32 HRS  MASS RAIN=-1

    K =    .429250HR    TP =    .320000HR    K/TP RATIO =  1.341408     SHAPE
    UNIT PEAK =   31.477    CFS   UNIT VOLUME =    .9994        B =   254.81
    AREA =       .039530 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                   ID=1  CODE=1

                                         PARTIAL HYDROGRAPH   102.00


    RUNOFF VOLUME =       .08856 INCHES      =         .1867 ACRE-FEET
    PEAK DISCHARGE RATE =       2.78 CFS  AT   1.733 HOURS   BASIN AREA =


*
*S       ADD BASIN A2 TO BASIN B1/B2/B3/B4
*
ADD HYD                     ID=2  HYD=240.0  ID I=3  ID II=1
*
PRINT HYD                   ID=2  CODE=1

                                         PARTIAL HYDROGRAPH   240.00


    RUNOFF VOLUME =       .27248 INCHES      =        1.7552 ACRE-FEET
    PEAK DISCHARGE RATE =      35.35 CFS  AT   1.633 HOURS   BASIN AREA =
```

```
*
*S       ROUTE BASIN A2/B1/B2/B3/B4 FLOWS TO BASIN C1
*
COMPUTE RATING CURVE    CID=1  VS NO=1  NO SEGS=2
                                MIN ELEV=1.58 FT  MAX ELEV=5.58 FT
                                CH SLP=0.0108  FP SLP=0.0108  N=0.022
                                DIST=20.0 FT  N=0.018  DIST=86 FT
                                DIST    ELEV    DIST    ELEV    DIST
                                  0     5.58     16     1.58     22
                                 43      3.0     64     2.58     70
                                 86     5.58
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
1.58	.00	.00
1.79	.44	.76
2.00	1.77	4.83
2.21	3.99	14.23
2.42	7.09	30.65
2.63	11.20	50.14
2.84	19.00	85.57
3.05	31.45	161.32
3.26	45.47	286.78
3.47	59.86	443.19
3.69	74.59	628.34
3.90	89.68	840.79
4.11	105.13	1079.52
4.32	120.93	1343.78
4.53	137.09	1633.04
4.74	153.60	1946.86
4.95	170.46	2284.94
5.16	187.68	2647.03
5.37	205.25	3032.97
5.58	223.18	3442.61

```
*
COMPUTE TRAVEL TIME     ID=3  REACH NO=4  VS NO=1  L=2170 FT
                                SLP=0.0108
```

TRAVEL TIME TABLE

REACH= 4.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.211	.443	.76	.3514
.421	1.773	4.83	.2214
.632	3.989	14.23	.1689
.842	7.091	30.65	.1395
1.053	11.202	50.14	.1347
1.263	19.003	85.57	.1339
1.474	31.446	161.32	.1175
1.684	45.474	286.78	.0956
1.895	59.856	443.19	.0814
2.105	74.593	628.34	.0716
2.316	89.684	840.79	.0643
2.526	105.130	1079.52	.0587
2.737	120.931	1343.78	.0542

```
                                    2.947      137.086      1633.04        .0506
                                    3.158      153.595      1946.86        .0476
                                    3.368      170.460      2284.94        .0450
                                    3.579      187.679      2647.03        .0427
                                    3.789      205.252      3032.97        .0408
                                    4.000      223.180      3442.61        .0391
*
ROUTE                     ID=3  HYD NO=240.1  INFLOW ID=2  DT=0.0
*
PRINT HYD                 ID=3  CODE=1

                                       PARTIAL HYDROGRAPH   240.10


    RUNOFF VOLUME =       .27248 INCHES      =       1.7552 ACRE-FEET
    PEAK DISCHARGE RATE =      29.71 CFS  AT   1.767 HOURS   BASIN AREA =


*
*S      COMPUTE BASIN C1
*
COMPUTE NM HYD            ID=1  HYD=301.0  AREA=0.01797 SQ MI
                                     PER A=50  PER B=0  PER C=0  PER D=50
                                     TP=0.17 HRS  MASS RAIN=-1

    K =   .092650HR    TP =   .170000HR    K/TP RATIO =   .545000     SHAPE
    UNIT PEAK =   27.815    CFS   UNIT VOLUME =    .9998        B =   526.28
    AREA =      .008985 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =   .228039HR    TP =   .170000HR    K/TP RATIO =  1.341408     SHAPE
    UNIT PEAK =   13.467    CFS   UNIT VOLUME =    .9985        B =   254.81
    AREA =      .008985 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                 ID=1  CODE=1

                                    HYDROGRAPH FROM AREA   301.00


    RUNOFF VOLUME =       .66829 INCHES      =        .6405 ACRE-FEET
    PEAK DISCHARGE RATE =      16.26 CFS  AT   1.533 HOURS   BASIN AREA =



*
*S      ADD BASIN C1 IN WITH OTHER BASINS
*
ADD HYD                   ID=2  HYD=250.0  ID I=3  ID II=1
*
PRINT HYD                 ID=2  CODE=1

                                       PARTIAL HYDROGRAPH   250.00


    RUNOFF VOLUME =       .32374 INCHES      =       2.3956 ACRE-FEET
    PEAK DISCHARGE RATE =      37.74 CFS  AT   1.733 HOURS   BASIN AREA =
```

```
*
*S                    CALCULATE DRAINAGE FOR BASINS NORTH OF SAN YGNACIO
*S                    ASSUME SAD 222 IMPROVEMENTS ARE IN PLACE
*
*S                    COMPUTE BASIN A1
*
COMPUTE NM HYD                ID=1 HYD NO=301.0  AREA=0.09058 SQ MI
                                     PER A=100 PER B=0 PER C=0 PER D=0
                                     TP=0.30 MASS RAIN=-1

    K =    .398843HR    TP =    .300000HR    K/TP RATIO =  1.329478     SHAPE
    UNIT PEAK =   77.489    CFS   UNIT VOLUME =    .9997        B =   256.64
    AREA =       .090580 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                     ID=1 CODE=1

                                          HYDROGRAPH FROM AREA   301.00


    RUNOFF VOLUME =       .08856 INCHES     =        .4278 ACRE-FEET
    PEAK DISCHARGE RATE =        6.86 CFS  AT   1.700 HOURS   BASIN AREA =


*
*S                    ROUTE A1  ALONG SAN YGNACIO TO A3
*
COMPUTE RATING CURVE          CID=1   NO VS=1  NO SEGS=1
                                      MIN ELEV=110.1 MAX ELEV=111.7
                                      CH SLP=0.0120   FP SLP=0.0120 N=0.017
                                      DIST=87 FT
                                      DIST    ELEV    DIST    ELEV    DIST
                                      0       111.2   9       110.8   10
                                      35      110.1   36      111.3   43
                                      50      111.3   51      110.6   76
                                      77      110.8   87      111.2

                                  RATING CURVE VALLEY SECTION  1.0
                                      WATER        FLOW        FLOW
                                     SURFACE       AREA        RATE
                                      ELEV         SQ FT       CFS
                                     110.10         .00         .00
                                     110.18        2.30        4.00
                                     110.27        4.97       13.16
                                     110.35        8.03       26.88
                                     110.44       11.47       45.17
                                     110.52       15.29       68.19
                                     110.61       19.49       96.44
                                     110.69       23.87      134.34
                                     110.77       28.29      177.11
                                     110.86       32.83      218.53
                                     110.94       37.70      262.22
                                     111.03       42.92      311.19
                                     111.11       48.50      365.68
                                     111.19       54.43      425.95
```

```
                                        111.28        60.57        506.62
                                        111.36        66.78        584.31
                                        111.45        73.24        664.49
                                        111.53        79.95        750.48
                                        111.62        86.90        842.39
                                        111.70        94.10        940.39
*
COMPUTE TRAVEL TIME ID=4   REACH NO=5  VS NO=1 L=1000 FT
                                 SLP=0.0120

                              TRAVEL TIME TABLE
                                                REACH=  5.0

                              WATER       AVERAGE     FLOW        TRAVEL
                              DEPTH       AREA        RATE        TIME
                              FEET        SQ.FT.      CFS         HRS
                                 .084        2.296        4.00       .1596
                                 .168        4.972       13.16       .1050
                                 .253        8.029       26.88       .0830
                                 .337       11.467       45.17       .0705
                                 .421       15.286       68.19       .0623
                                 .505       19.485       96.44       .0561
                                 .589       23.872      134.34       .0494
                                 .674       28.294      177.11       .0444
                                 .758       32.828      218.53       .0417
                                 .842       37.700      262.22       .0399
                                 .926       42.924      311.19       .0383
                                1.011       48.501      365.68       .0368
                                1.095       54.432      425.95       .0355
                                1.179       60.566      506.62       .0332
                                1.263       66.783      584.31       .0317
                                1.347       73.241      664.49       .0306
                                1.432       79.947      750.48       .0296
                                1.516       86.902      842.39       .0287
                                1.600       94.104      940.39       .0278
*
ROUTE                                ID=4 HYD NO=301.1 INFLOW ID=1   DT=0
*
PRINT HYD                      ID=4 CODE=1

                                        HYDROGRAPH FROM AREA   301.10

    RUNOFF VOLUME =       .08856 INCHES     =        .4278 ACRE-FEET
    PEAK DISCHARGE RATE =        5.80 CFS  AT   1.833 HOURS   BASIN AREA =


*
*S                   COMPUTE BASIN A3
*
COMPUTE NM HYD                 ID=3  HYD NO=310.0  AREA=0.09259 SQ MI
                                       PER A=100 PER B=0 PER C=0 PER D=0
                                       TP=0.24 MASS RAIN=-1

    K =   .318870HR    TP =   .240000HR    K/TP RATIO =  1.328624     SHAPE
    UNIT PEAK =   99.061    CFS   UNIT VOLUME =    .9997        B =   256.77
    AREA =       .092590 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
```

```
*
PRINT HYD                    ID=3 CODE=1

                                          HYDROGRAPH FROM AREA   310.00


    RUNOFF VOLUME =       .08856 INCHES     =        .4373 ACRE-FEET
    PEAK DISCHARGE RATE =       8.76 CFS  AT   1.633 HOURS   BASIN AREA =


*
*S                  ADD BASINS A1& A3
*
ADD HYD                              ID=6 HYD NO=315.0 ID I=4 ID II=3
*
PRINT HYD                    ID=6    CODE=1

                                          HYDROGRAPH FROM AREA   315.00


    RUNOFF VOLUME =       .08856 INCHES     =        .8651 ACRE-FEET
    PEAK DISCHARGE RATE =      13.12 CFS  AT   1.700 HOURS   BASIN AREA =


*
*S                  ROUTE BASINS A1 &A3 THRU A4
*
COMPUTE RATING CURVE         CID=1   NO VS=1  NO SEGS=1
                                     MIN ELEV=85.6   MAX ELEV=86.0
                                     CH SLP=0.0147   FP SLP=0.0147   N=0.035
                                     DIST=250.0 FT
                                     DIST    ELEV    DIST    ELEV
                                     0       86.0    20      85.8
                                     125     85.6    230     85.8
                                     250     86.0
```

RATING CURVE VALLEY SECTION 1.0

ELEV	WATER SURFACE SQ FT	FLOW AREA CFS	FLOW RATE
85.60	.00	.00	
85.62	.23	.06	
85.64	.93	.37	
85.66	2.09	1.08	
85.68	3.72	2.32	
85.71	5.82	4.20	
85.73	8.37	6.84	
85.75	11.40	10.31	
85.77	14.89	14.72	
85.79	18.84	20.15	
85.81	23.21	27.34	
85.83	27.72	36.28	
85.85	32.32	46.25	
85.87	37.01	57.23	
85.89	41.78	69.20	
85.92	46.64	82.13	
85.94	51.60	96.02	
85.96	56.64	110.85	

```
                                        85.98        61.77        126.62
                                        86.00        66.98        143.31
*
COMPUTE TRAVEL TIME ID=1 REACH NO=6 VS NO=1 L=1630 FT
                                   SLP=0.0147

                              TRAVEL TIME TABLE
                                          REACH=  6.0

                              WATER       AVERAGE     FLOW        TRAVEL
                              DEPTH       AREA        RATE        TIME
                              FEET        SQ.FT.      CFS         HRS
                                .021         .233         .06      1.8315
                                .042         .930         .37      1.1538
                                .063        2.094        1.08       .8805
                                .084        3.722        2.32       .7268
                                .105        5.815        4.20       .6264
                                .126        8.374        6.84       .5547
                                .147       11.398       10.31       .5005
                                .168       14.887       14.72       .4579
                                .189       18.842       20.15       .4233
                                .210       23.214       27.34       .3844
                                .232       27.723       36.28       .3460
                                .253       32.321       46.25       .3164
                                .274       37.007       57.23       .2928
                                .295       41.782       69.20       .2734
                                .316       46.645       82.13       .2571
                                .337       51.597       96.02       .2433
                                .358       56.638      110.85       .2313
                                .379       61.767      126.62       .2209
                                .400       66.985      143.31       .2116
*
ROUTE                                ID=1 HYD NO=320.0  INFLOW ID=6  DT=0.0
*
PRINT HYD                      ID=1 CODE=1

                                        HYDROGRAPH FROM AREA   320.00


    RUNOFF VOLUME =       .08856 INCHES     =        .8651 ACRE-FEET
    PEAK DISCHARGE RATE =       6.99 CFS  AT   2.033 HOURS   BASIN AREA =


*
*S                    COMPUTE BASIN A4
*
COMPUTE NM HYD                 ID=4 HYD NO=320.1 AREA=0.06187 SQ MI
                                       PER A=100 PER B=0 PER C=0 PER D=0
                                       TP=0.27 MASS RAIN=-1

    K =    .362180HR    TP =    .270000HR    K/TP RATIO =  1.341408     SHAPE
    UNIT PEAK =   58.388    CFS   UNIT VOLUME =    .9996        B =   254.81
    AREA =       .061870 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                      ID=4 CODE=1

                                        HYDROGRAPH FROM AREA   320.10
```

```
    RUNOFF VOLUME =       .08856 INCHES     =        .2922 ACRE-FEET
    PEAK DISCHARGE RATE =       5.17 CFS  AT   1.667 HOURS   BASIN AREA =


*
*S                    ADD BASINS A1&3 TO BASIN A4
*
ADD HYD                              ID=6 HYD NO=310.3       ID I=4 ID II=1
*
PRINT HYD                      ID=6 CODE=1

                                          HYDROGRAPH FROM AREA   310.30


    RUNOFF VOLUME =       .08855 INCHES     =       1.1572 ACRE-FEET
    PEAK DISCHARGE RATE =      10.03 CFS  AT   1.867 HOURS   BASIN AREA =


*
*S                    COMPUTE BASIN A5
*
COMPUTE NM HYD                 ID=5 HYD NO=305.0 AREA=0.09021 SQ MI
                                     PER A=100 PER B=0 PER C=0 PER D=0
                                     TP=0.48 MASS RAIN=-1

    K =    .638225HR    TP =    .480000HR    K/TP RATIO =  1.329635     SHAPE
    UNIT PEAK =   48.228    CFS   UNIT VOLUME =    .9997        B =   256.62
    AREA =       .090210 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                      ID=5 CODE=1

                                          HYDROGRAPH FROM AREA   305.00


    RUNOFF VOLUME =       .08856 INCHES     =        .4261 ACRE-FEET
    PEAK DISCHARGE RATE =       4.27 CFS  AT   1.867 HOURS   BASIN AREA =


*
*S                    ADD BASINS  A1,A3,A4 & A5
*
ADD HYD                              ID=1    HYD NO=320.0 ID I=5 ID II=6
*
PRINT HYD                      ID=1 CODE=1

                                          HYDROGRAPH FROM AREA   320.00


    RUNOFF VOLUME =       .08855 INCHES     =       1.5833 ACRE-FEET
    PEAK DISCHARGE RATE =      14.30 CFS  AT   1.867 HOURS   BASIN AREA =
```

```
*
*S                    CALCULATE TOTAL INFLOW INTO UNSER PLAYA
*
ADD HYD                                  ID=3 HYD NO=330.0 ID I=1 ID II=2
*
PRINT HYD             ID=3   CODE=1

                                                HYDROGRAPH FROM AREA   330.00


    RUNOFF VOLUME =        .15740 INCHES      =        3.9789 ACRE-FEET
    PEAK DISCHARGE RATE =       51.09 CFS  AT   1.767 HOURS   BASIN AREA =



*
*S       END CALCULATIONS
*
FINISH

    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 11:17:16
```

```
     AHYMO PROGRAM (AHYMO993) - AMAFCA VERSION OF HYMO - SEPTEMBER, 1993
          RUN DATE (MON/DAY/YR) = 04/15/1994
          START TIME (HR:MIN:SEC) = 15:33:02     USER NO.= G_NEMETH.S93
          INPUT FILE = c:\ahymo\sunset\sw2-d10.dat

START                    0.0
*
*S       INPUT  FILE NAME:  SW2-D10.DAT
*S       OUTPUT FILE NAME:  SW2-D10.OUT
*S       PROJECT:           SUNSET WEST UNIT 2
*S       CONDITION:         DEVELOPED CONDITIONS; 10-YEAR STORM
*S                                  SAD 222 IN PLACE; SUNSET WEST UNIT 2
*S       LEEDSHILL-HERKENHOFF, INC.
*
RAINFALL                 TYPE=1  RAIN QUARTER=0.0
                                    RAIN ONE=1.27 IN  RAIN SIX=1.48 IN
                                    RAIN DAY=0.00 IN  DT=0.033333 HRS

                    COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2
                    DT =     .033333 HOURS        END TIME =     5.999940 HOURS
                       .0000   .0010   .0020   .0030   .0040   .0051   .0062
                       .0073   .0084   .0096   .0108   .0120   .0133   .0146
                       .0159   .0173   .0187   .0201   .0217   .0232   .0248
                       .0265   .0283   .0301   .0320   .0340   .0360   .0382
                       .0405   .0429   .0454   .0490   .0527   .0567   .0654
                       .0847   .1144   .1570   .2152   .2917   .3892   .5106
                       .6588   .7959   .8532   .9017   .9448   .9840  1.0200
                      1.0536  1.0849  1.1142  1.1418  1.1679  1.1925  1.2158
                      1.2379  1.2588  1.2787  1.2975  1.3154  1.3195  1.3233
                      1.3269  1.3303  1.3335  1.3367  1.3397  1.3426  1.3453
                      1.3480  1.3506  1.3531  1.3556  1.3579  1.3602  1.3625
                      1.3646  1.3668  1.3688  1.3708  1.3728  1.3748  1.3766
                      1.3785  1.3803  1.3821  1.3838  1.3855  1.3872  1.3888
                      1.3905  1.3920  1.3936  1.3951  1.3967  1.3981  1.3996
                      1.4011  1.4025  1.4039  1.4053  1.4066  1.4080  1.4093
                      1.4106  1.4119  1.4132  1.4144  1.4157  1.4169  1.4181
                      1.4193  1.4205  1.4217  1.4228  1.4240  1.4251  1.4262
                      1.4273  1.4284  1.4295  1.4306  1.4317  1.4327  1.4338
                      1.4348  1.4358  1.4368  1.4378  1.4388  1.4398  1.4408
                      1.4418  1.4427  1.4437  1.4446  1.4456  1.4465  1.4474
                      1.4483  1.4492  1.4501  1.4510  1.4519  1.4528  1.4537
                      1.4545  1.4554  1.4562  1.4571  1.4579  1.4588  1.4596
                      1.4604  1.4612  1.4620  1.4628  1.4636  1.4644  1.4652
                      1.4660  1.4668  1.4676  1.4683  1.4691  1.4698  1.4706
                      1.4714  1.4721  1.4728  1.4736  1.4743  1.4750  1.4758
                      1.4765  1.4772  1.4779  1.4786  1.4793  1.4800

*
*S       COMPUTE BASIN B1 & PRINT VALUES
*
COMPUTE NM HYD           ID=1  HYD=201.0  AREA=0.00672 SQ MI
                                    PER A=75  PER B=0  PER C=0  PER D=25
                                    TP=0.11 HRS  MASS RAIN=-1

     K =    .059950HR    TP =    .110000HR    K/TP RATIO =    .545000     SHAPE
     UNIT PEAK =    8.0377    CFS   UNIT VOLUME =    .9982        B =   526.28
     AREA =       .001680 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
```

```
K =    .147555HR     TP =    .110000HR     K/TP RATIO =  1.341408      SHAPE
UNIT PEAK =    11.675     CFS    UNIT VOLUME =     .9972          B =    254.81
AREA =       .005040 SQ MI     IA =     .65000 INCHES     INF =    1.67000 I
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=1  CODE=1

                                          PARTIAL HYDROGRAPH   201.00


RUNOFF VOLUME =        .37843 INCHES      =          .1356 ACRE-FEET
PEAK DISCHARGE RATE =        4.36 CFS  AT   1.500 HOURS   BASIN AREA =



*
*S       ROUTE BASIN B1 FLOWS TO BASIN B2
*
COMPUTE RATING CURVE     CID=1  VS NO=1  NO SEGS=1
                                     MIN ELEV=139.1 FT  MAX ELEV=140.7 FT
                                     CH SLP=0.0166  FP SLP=0.0166  N=0.018
                                     DIST=87 FT
                                     DIST  ELEV       DIST  ELEV       DIST  EL
                                       0   140.2        9   139.8       10   13
                                      35   139.6       36   140.3       43   14
                                      50   140.3       51   139.6       76   13
                                      77   139.8       87   140.2

                                      RATING CURVE VALLEY SECTION  1.0
                                          WATER        FLOW        FLOW
                                         SURFACE       AREA        RATE
                                          ELEV         SQ FT       CFS
                                         139.10          .00         .00
                                         139.18          .36         .47
                                         139.27         1.46        2.97
                                         139.35         3.28        8.75
                                         139.44         5.84       18.85
                                         139.52         9.12       34.18
                                         139.61        13.13       55.93
                                         139.69        17.48       89.48
                                         139.77        21.88      129.06
                                         139.86        26.39      169.73
                                         139.94        31.24      214.08
                                         140.03        36.45      264.42
                                         140.11        42.01      321.02
                                         140.19        47.93      384.15
                                         140.28        54.07      467.20
                                         140.36        60.28      548.84
                                         140.45        66.74      634.00
                                         140.53        73.45      725.74
                                         140.62        80.40      824.19
                                         140.70        87.60      929.50
*
*S       COMPUTE TRAVEL TIME
*
COMPUTE TRAVEL TIME      ID=2  REACH NO=1  NO VS=1  L=772 FT
                                     SLP=0.0166
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.084	.365	.47	.1673
.168	1.459	2.97	.1054
.253	3.283	8.75	.0804
.337	5.836	18.85	.0664
.421	9.118	34.18	.0572
.505	13.129	55.93	.0503
.589	17.483	89.48	.0419
.674	21.877	129.06	.0364
.758	26.387	169.73	.0333
.842	31.238	214.08	.0313
.926	36.446	264.42	.0296
1.011	42.012	321.02	.0281
1.095	47.935	384.15	.0268
1.179	54.067	467.20	.0248
1.263	60.284	548.84	.0236
1.347	66.742	634.00	.0226
1.432	73.448	725.74	.0217
1.516	80.402	824.19	.0209
1.600	87.605	929.50	.0202

```
*
*S       ROUTE THE FLOW & PRINT
*
ROUTE                    ID=2  HYD NO=201.1  INFLOW ID=1  DT=0.0
*
PRINT HYD                ID=2  CODE=1

                                   PARTIAL HYDROGRAPH   201.10


    RUNOFF VOLUME =       .37847 INCHES      =        .1356 ACRE-FEET
    PEAK DISCHARGE RATE =        3.36 CFS  AT   1.567 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B2
*
COMPUTE NM HYD           ID=1  HYD=202.0  AREA=0.01609 SQ MI
                                   PER A=20  PER B=50  PER C=0  PER D=30
                                   TP=0.13 HRS  MASS RAIN=-1

    K =    .070850HR    TP =    .130000HR    K/TP RATIO =    .545000     SHAPE
    UNIT PEAK =    19.541    CFS   UNIT VOLUME =     .9994        B =   526.28
    AREA =       .004827 SQ MI    IA =     .10000 INCHES    INF =     .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =    .148427HR    TP =    .130000HR    K/TP RATIO =  1.141749     SHAPE
    UNIT PEAK =    25.125    CFS   UNIT VOLUME =     .9994        B =   289.99
    AREA =       .011263 SQ MI    IA =     .54286 INCHES    INF =   1.37000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                ID=1  CODE=1
```

PARTIAL HYDROGRAPH 202.00

RUNOFF VOLUME = .50469 INCHES = .4331 ACRE-FEET
PEAK DISCHARGE RATE = 13.57 CFS AT 1.500 HOURS BASIN AREA =

```
*
*S      ADD BASIN B1 & B2
*
ADD HYD                 ID=3  HYD=210.0 ID I=1  ID II=2
*
PRINT HYD               ID=3  CODE=1
```

PARTIAL HYDROGRAPH 210.00

RUNOFF VOLUME = .46747 INCHES = .5687 ACRE-FEET
PEAK DISCHARGE RATE = 16.41 CFS AT 1.533 HOURS BASIN AREA =

```
*
*S      ROUTE COMBINATION OF BASIN B1/B2 FLOWS TO BASIN B3/B4
*
COMPUTE RATING CURVE    CID=1  VS NO=1  NO SEGS=1
                                MIN ELEV=139.1 FT  MAX ELEV=140.7 FT
                                CH SLP=0.0152  FP SLP=0.0152  N=0.018
                                DIST=87 FT
                                DIST    ELEV    DIST    ELEV    DIST
                                  0     140.2     9     139.8    10
                                 35     139.6    36     140.3    43
                                 50     140.3    51     139.6    76
                                 77     139.8    87     140.2
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
139.10	.00	.00
139.18	.36	.45
139.27	1.46	2.84
139.35	3.28	8.38
139.44	5.84	18.04
139.52	9.12	32.71
139.61	13.13	53.52
139.69	17.48	85.62
139.77	21.88	123.49
139.86	26.39	162.42
139.94	31.24	204.85
140.03	36.45	253.02
140.11	42.01	307.19
140.19	47.93	367.60
140.28	54.07	447.07
140.36	60.28	525.19
140.45	66.74	606.68
140.53	73.45	694.46
140.62	80.40	788.67

```
                                        140.70        87.60       889.44
*
COMPUTE TRAVEL TIME      ID=4  REACH NO=2  NO VS=1  L=1079 FT
                                   SLP=0.0152

                               TRAVEL TIME TABLE
                                                REACH=  2.0

                               WATER        AVERAGE      FLOW         TRAVEL
                               DEPTH        AREA         RATE         TIME
                               FEET         SQ.FT.       CFS          HRS
                                  .084          .365          .45        .2443
                                  .168         1.459         2.84        .1539
                                  .253         3.283         8.38        .1175
                                  .337         5.836        18.04        .0970
                                  .421         9.118        32.71        .0836
                                  .505        13.129        53.52        .0735
                                  .589        17.483        85.62        .0612
                                  .674        21.877       123.49        .0531
                                  .758        26.387       162.42        .0487
                                  .842        31.238       204.85        .0457
                                  .926        36.446       253.02        .0432
                                 1.011        42.012       307.19        .0410
                                 1.095        47.935       367.60        .0391
                                 1.179        54.067       447.07        .0362
                                 1.263        60.284       525.19        .0344
                                 1.347        66.742       606.68        .0330
                                 1.432        73.448       694.46        .0317
                                 1.516        80.402       788.67        .0306
                                 1.600        87.605       889.44        .0295
*
ROUTE                    ID=4  HYD NO=202.1  INFLOW ID=3  DT=0.0
*
PRINT HYD                ID=4  CODE=1

                                     PARTIAL HYDROGRAPH   202.10


    RUNOFF VOLUME =       .46749 INCHES      =        .5687 ACRE-FEET
    PEAK DISCHARGE RATE =      12.84 CFS  AT   1.600 HOURS   BASIN AREA =


*
*S       COMPUTE BASIN B3
*
COMPUTE NM HYD           ID=1  HYD=203.0  AREA=0.04219 SQ MI
                                     PER A=20  PER B=50  PER C=0  PER D=30
                                     TP=0.16 HRS  MASS RAIN=-1

    K =   .087200HR    TP =   .160000HR    K/TP RATIO =   .545000     SHAPE
    UNIT PEAK =   41.632    CFS   UNIT VOLUME =    .9993        B =   526.28
    AREA =      .012657 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =   .182680HR    TP =   .160000HR    K/TP RATIO =  1.141749     SHAPE
    UNIT PEAK =   53.527    CFS   UNIT VOLUME =    .9997        B =   289.99
    AREA =      .029533 SQ MI    IA =    .54286 INCHES    INF =   1.37000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
```

```
*
PRINT HYD                    ID=1  CODE=1

                                        PARTIAL HYDROGRAPH   203.00


    RUNOFF VOLUME =       .50469 INCHES      =        1.1356 ACRE-FEET
    PEAK DISCHARGE RATE =       31.57 CFS  AT   1.533 HOURS   BASIN AREA =



*
*S       COMPUTE BASIN B4
*
COMPUTE NM HYD               ID=2  HYD=204.0  AREA=0.01625 SQ MI
                                        PER A=20  PER B=50 PER C=0  PER D=30
                                        TP=0.12 HRS  MASS RAIN=-1


    K =   .065400HR    TP =   .120000HR    K/TP RATIO =   .545000     SHAPE
    UNIT PEAK =   21.380    CFS   UNIT VOLUME =    .9992        B =   526.28
    AREA =       .004875 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =   .137010HR    TP =   .120000HR    K/TP RATIO =  1.141749     SHAPE
    UNIT PEAK =   27.489    CFS   UNIT VOLUME =    .9995        B =   289.99
    AREA =       .011375 SQ MI    IA =    .54286 INCHES    INF =   1.37000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=2  CODE=1

                                        PARTIAL HYDROGRAPH   204.00


    RUNOFF VOLUME =       .50469 INCHES      =         .4374 ACRE-FEET
    PEAK DISCHARGE RATE =       14.40 CFS  AT   1.500 HOURS   BASIN AREA =



*
*S       ADD BASIN B3 & B4
*
ADD HYD                      ID=5  HYD=220.0  ID I=1  ID II=2
*
PRINT HYD                    ID=5  CODE=1

                                        PARTIAL HYDROGRAPH   220.00


    RUNOFF VOLUME =       .50468 INCHES      =        1.5730 ACRE-FEET
    PEAK DISCHARGE RATE =       44.90 CFS  AT   1.533 HOURS   BASIN AREA =



*
*S       ADD BASIN B3/B4 & BASIN B1/B2
*
ADD HYD                      ID=6  HYD=230.0  ID I=4  ID II=5
```

```
*
PRINT HYD                    ID=6   CODE=1

                                          PARTIAL HYDROGRAPH   230.00


    RUNOFF VOLUME =        .49423 INCHES      =        2.1417 ACRE-FEET
    PEAK DISCHARGE RATE =       56.37 CFS   AT    1.533 HOURS   BASIN AREA =



*
*S       ROUTE BASIN B1,B2,B3 & B4 FLOWS TO BASIN A2
*
COMPUTE RATING CURVE     CID=1  VS NO=1  NO SEGS=2
                                     MIN ELEV=0.0 FT  MAX ELEV=2.75 FT
                                     CH SLP=0.0108  FP SLP=0.0108  N=0.022
                                     DIST=20.0 FT  N=0.018  DIST=59 FT
                                     DIST    ELEV    DIST    ELEV    DIST
                                      0      2.75     11      0.0     17
                                     23      1.12     29     1.24     38
                                     53      0.88     54     1.55     59

                                     RATING CURVE VALLEY SECTION  1.0
                                         WATER        FLOW        FLOW
                                        SURFACE       AREA        RATE
                                         ELEV         SQ FT       CFS
                                          .00          .00         .00
                                          .14          .10         .13
                                          .29          .42         .80
                                          .43          .94        2.36
                                          .58         1.68        5.08
                                          .72         2.62        9.21
                                          .87         3.77       14.97
                                         1.01         5.73       22.64
                                         1.16         9.83       34.42
                                         1.30        16.30       66.21
                                         1.45        23.28      113.80
                                         1.59        30.40      171.50
                                         1.74        38.00      236.40
                                         1.88        45.99      320.02
                                         2.03        54.07      415.33
                                         2.17        62.23      521.08
                                         2.32        70.48      636.87
                                         2.46        78.81      762.38
                                         2.61        87.22      897.37
                                         2.75        95.72     1041.60
*
COMPUTE TRAVEL TIME      ID=3  REACH NO=3  VS NO=1  L=1069 FT
                                     SLP=0.0108

                                TRAVEL TIME TABLE
                                                   REACH=  3.0

                                WATER       AVERAGE     FLOW        TRAVEL
                                DEPTH       AREA        RATE        TIME
                                FEET        SQ.FT.      CFS         HRS
                                  .145        .105        .13        .2469
                                  .289        .419        .80        .1556
                                  .434        .943       2.36        .1187
```

```
                                  .579        1.676        5.08        .0980
                                  .724        2.619        9.21        .0844
                                  .868        3.771       14.97        .0748
                                 1.013        5.728       22.64        .0751
                                 1.158        9.833       34.42        .0848
                                 1.303       16.298       66.21        .0731
                                 1.447       23.279      113.80        .0607
                                 1.592       30.397      171.50        .0526
                                 1.737       37.999      236.40        .0477
                                 1.882       45.991      320.02        .0427
                                 2.026       54.070      415.33        .0387
                                 2.171       62.232      521.08        .0355
                                 2.316       70.479      636.87        .0329
                                 2.461       78.809      762.38        .0307
                                 2.605       87.222      897.37        .0289
                                 2.750       95.720     1041.60        .0273
*
ROUTE                     ID=3  HYD NO=230.1  INFLOW ID=6  DT=0.0
*
PRINT HYD                 ID=3  CODE=1

                                     PARTIAL HYDROGRAPH   230.10


    RUNOFF VOLUME =       .49424 INCHES     =       2.1417 ACRE-FEET
    PEAK DISCHARGE RATE =      47.37 CFS  AT   1.600 HOURS   BASIN AREA =



*
*S      COMPUTE BASIN A2
*
COMPUTE NM HYD            ID=1  HYD=102.0  AREA=0.03953 SQ MI
                                     PER A=100  PER B=0  PER C=0  PER D=0
                                     TP=0.32 HRS  MASS RAIN=-1

    K =   .429250HR    TP =   .320000HR    K/TP RATIO =  1.341408     SHAPE
    UNIT PEAK =   31.477    CFS   UNIT VOLUME =    .9994        B =   254.81
    AREA =       .039530 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                 ID=1  CODE=1

                                     PARTIAL HYDROGRAPH   102.00


    RUNOFF VOLUME =       .08856 INCHES     =        .1867 ACRE-FEET
    PEAK DISCHARGE RATE =       2.78 CFS  AT   1.733 HOURS   BASIN AREA =



*
*S      ADD BASIN A2 TO BASIN B1/B2/B3/B4
*
ADD HYD                   ID=2  HYD=240.0  ID I=3  ID II=1
*
PRINT HYD                 ID=2  CODE=1

                                     PARTIAL HYDROGRAPH   240.00
```

```
RUNOFF VOLUME =        .36146 INCHES      =        2.3284 ACRE-FEET
PEAK DISCHARGE RATE =       49.75 CFS  AT   1.600 HOURS   BASIN AREA =


*
*S       ROUTE BASIN A2/B1/B2/B3/B4 FLOWS TO BASIN C1
*
COMPUTE RATING CURVE    CID=1  VS NO=1  NO SEGS=2
                                MIN ELEV=1.58 FT  MAX ELEV=5.58 FT
                                CH SLP=0.0108  FP SLP=0.0108  N=0.022
                                DIST=20.0 FT  N=0.018  DIST=86 FT
                                DIST    ELEV    DIST    ELEV    DIST
                                  0     5.58     16     1.58     22
                                 43      3.0     64     2.58     70
                                 86     5.58

                                RATING CURVE VALLEY SECTION  1.0
                                   WATER        FLOW        FLOW
                                  SURFACE       AREA        RATE
                                   ELEV         SQ FT       CFS
                                    1.58          .00         .00
                                    1.79          .44         .76
                                    2.00         1.77        4.83
                                    2.21         3.99       14.23
                                    2.42         7.09       30.65
                                    2.63        11.20       50.14
                                    2.84        19.00       85.57
                                    3.05        31.45      161.32
                                    3.26        45.47      286.78
                                    3.47        59.86      443.19
                                    3.69        74.59      628.34
                                    3.90        89.68      840.79
                                    4.11       105.13     1079.52
                                    4.32       120.93     1343.78
                                    4.53       137.09     1633.04
                                    4.74       153.60     1946.86
                                    4.95       170.46     2284.94
                                    5.16       187.68     2647.03
                                    5.37       205.25     3032.97
                                    5.58       223.18     3442.61
*
COMPUTE TRAVEL TIME     ID=3  REACH NO=4  VS NO=1  L=2170 FT
                                   SLP=0.0108

                              TRAVEL TIME TABLE
                                              REACH=  4.0

                              WATER       AVERAGE     FLOW        TRAVEL
                              DEPTH       AREA        RATE        TIME
                              FEET        SQ.FT.      CFS         HRS
                                .211         .443        .76        .3514
                                .421        1.773       4.83        .2214
                                .632        3.989      14.23        .1689
                                .842        7.091      30.65        .1395
                               1.053       11.202      50.14        .1347
                               1.263       19.003      85.57        .1339
                               1.474       31.446     161.32        .1175
```

```
                                    1.684      45.474      286.78        .0956
                                    1.895      59.856      443.19        .0814
                                    2.105      74.593      628.34        .0716
                                    2.316      89.684      840.79        .0643
                                    2.526     105.130     1079.52        .0587
                                    2.737     120.931     1343.78        .0542
                                    2.947     137.086     1633.04        .0506
                                    3.158     153.595     1946.86        .0476
                                    3.368     170.460     2284.94        .0450
                                    3.579     187.679     2647.03        .0427
                                    3.789     205.252     3032.97        .0408
                                    4.000     223.180     3442.61        .0391
*
ROUTE                       ID=3  HYD NO=240.1  INFLOW ID=2  DT=0.0
*
PRINT HYD                   ID=3  CODE=1

                                        PARTIAL HYDROGRAPH   240.10


    RUNOFF VOLUME =       .36146 INCHES      =       2.3284 ACRE-FEET
    PEAK DISCHARGE RATE =      39.72 CFS  AT   1.733 HOURS   BASIN AREA =



*
*S      COMPUTE BASIN C1
*
COMPUTE NM HYD              ID=1  HYD=301.0  AREA=0.01797 SQ MI
                                       PER A=50  PER B=0  PER C=0  PER D=50
                                       TP=0.17 HRS  MASS RAIN=-1

    K =   .092650HR    TP =   .170000HR    K/TP RATIO =   .545000     SHAPE
    UNIT PEAK =   27.815    CFS   UNIT VOLUME =    .9998        B =   526.28
    AREA =       .008985 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


    K =   .228039HR    TP =   .170000HR    K/TP RATIO =  1.341408     SHAPE
    UNIT PEAK =   13.467    CFS   UNIT VOLUME =    .9985        B =   254.81
    AREA =       .008985 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                   ID=1  CODE=1

                                        HYDROGRAPH FROM AREA   301.00


    RUNOFF VOLUME =       .66829 INCHES      =        .6405 ACRE-FEET
    PEAK DISCHARGE RATE =      16.26 CFS  AT   1.533 HOURS   BASIN AREA =



*
*S      ADD BASIN C1 IN WITH OTHER BASINS
*
ADD HYD                     ID=2  HYD=250.0  ID I=3  ID II=1
*
PRINT HYD                   ID=2  CODE=1
```

```
                                        PARTIAL HYDROGRAPH   250.00

    RUNOFF VOLUME =       .40119 INCHES      =        2.9688 ACRE-FEET
    PEAK DISCHARGE RATE =       48.87 CFS  AT   1.700 HOURS   BASIN AREA =


*
*S                  CALCULATE DRAINAGE FOR BASINS NORTH OF SAN YGNACIO
*S                  ASSUME SAD 222 IMPROVEMENTS ARE IN PLACE
*
*S                  COMPUTE BASIN A1
*
COMPUTE NM HYD              ID=1 HYD NO=301.0  AREA=0.09058 SQ MI
                                     PER A=100 PER B=0 PER C=0 PER D=0
                                     TP=0.30 MASS RAIN=-1

    K =   .398843HR    TP =   .300000HR    K/TP RATIO =  1.329478     SHAPE
    UNIT PEAK =   77.489    CFS   UNIT VOLUME =    .9997        B =   256.64
    AREA =       .090580 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                   ID=1 CODE=1

                                         HYDROGRAPH FROM AREA   301.00


    RUNOFF VOLUME =       .08856 INCHES      =         .4278 ACRE-FEET
    PEAK DISCHARGE RATE =        6.86 CFS  AT   1.700 HOURS   BASIN AREA =


*
*S                  ROUTE A1  ALONG SAN YGNACIO TO A3
*
COMPUTE RATING CURVE        CID=1 NO VS=1 NO SEGS=1
                                     MIN ELEV=110.1 MAX ELEV=111.7
                                     CH SLP=0.0120   FP SLP=0.0120 N=0.017
                                     DIST=87 FT
DIST     ELEV     DIST     ELEV     DIST
0        111.2    9        110.8    10
35       110.6    36       111.3    43
50       111.3    51       110.6    76
77       110.8    87       111.2

 RATING CURVE VALLEY SECTION  1.0
     WATER        FLOW        FLOW
    SURFACE       AREA        RATE
     ELEV         SQ FT       CFS
    110.10          .00         .00
    110.18          .36         .42
    110.27         1.46        2.67
    110.35         3.28        7.88
    110.44         5.84       16.97
    110.52         9.12       30.77
    110.61        13.13       50.35
    110.69        17.48       80.55
```

110.77	21.88	116.18
110.86	26.39	152.80
110.94	31.24	192.72
111.03	36.45	238.04
111.11	42.01	289.00
111.19	47.93	345.83
111.28	54.07	420.59
111.36	60.28	494.09
111.45	66.74	570.76
111.53	73.45	653.34
111.62	80.40	741.97
111.70	87.60	836.77

```
*
COMPUTE TRAVEL TIME ID=4   REACH NO=5  VS NO=1 L=1000 FT
                                SLP=0.0120
```

TRAVEL TIME TABLE

REACH= 5.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.084	.365	.42	.2407
.168	1.459	2.67	.1516
.253	3.283	7.88	.1157
.337	5.836	16.97	.0955
.421	9.118	30.77	.0823
.505	13.129	50.35	.0724
.589	17.483	80.55	.0603
.674	21.877	116.18	.0523
.758	26.386	152.80	.0480
.842	31.238	192.72	.0450
.926	36.446	238.04	.0425
1.011	42.012	289.00	.0404
1.095	47.935	345.83	.0385
1.179	54.067	420.59	.0357
1.263	60.283	494.09	.0339
1.347	66.741	570.76	.0325
1.432	73.447	653.34	.0312
1.516	80.402	741.97	.0301
1.600	87.604	836.77	.0291

```
*
ROUTE                                ID=4 HYD NO=301.1 INFLOW ID=1   DT=0
*
PRINT HYD                     ID=4 CODE=1
```

HYDROGRAPH FROM AREA 301.10

```
    RUNOFF VOLUME =       .08856 INCHES      =        .4278 ACRE-FEET
    PEAK DISCHARGE RATE =       6.06 CFS  AT   1.800 HOURS   BASIN AREA =


*
*S                    COMPUTE BASIN A3
*
COMPUTE NM HYD                ID=3  HYD NO=310.0  AREA=0.09259 SQ MI
                                      PER A=100 PER B=0 PER C=0 PER D=0
                                      TP=0.24 MASS RAIN=-1
```

```
K =    .318870HR    TP =    .240000HR    K/TP RATIO =  1.328624     SHAPE
UNIT PEAK =   99.061    CFS   UNIT VOLUME =    .9997        B =   256.77
AREA =       .092590 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=3 CODE=1

                                        HYDROGRAPH FROM AREA   310.00


RUNOFF VOLUME =       .08856 INCHES     =        .4373 ACRE-FEET
PEAK DISCHARGE RATE =       8.76 CFS  AT   1.633 HOURS   BASIN AREA =


*
*S                  ADD BASINS A1& A3
*
ADD HYD                          ID=6  HYD NO=315.0  ID I=3  ID II=4
*
PRINT HYD                    ID=6    CODE=1

                                        HYDROGRAPH FROM AREA   315.00


RUNOFF VOLUME =       .08856 INCHES     =        .8651 ACRE-FEET
PEAK DISCHARGE RATE =      13.61 CFS  AT   1.700 HOURS   BASIN AREA =


*
*S                  ROUTE BASINS A1 &A3 THRU A4
*
COMPUTE RATING CURVE        CID=1 VS NO=1 NO SEGS=1
                                 MIN ELEV=85.6 MAX ELEV=86.0
                                 CH SLP=0.0147 FP SLP=0.0147 N=0.035
                                 DIST=250.0 FT
                                 DIST    ELEV    DIST    ELEV
                                 0       86.0    20      85.8
                                 125     85.6    230     85.8
                                 250     86.0

                                 RATING CURVE VALLEY SECTION  1.0
                                     WATER       FLOW        FLOW
                                    SURFACE      AREA        RATE
                                     ELEV        SQ FT       CFS
                                     85.60         .00         .00
                                     85.62         .23         .06
                                     85.64         .93         .37
                                     85.66        2.09        1.08
                                     85.68        3.72        2.32
                                     85.71        5.82        4.20
                                     85.73        8.37        6.84
                                     85.75       11.40       10.31
                                     85.77       14.89       14.72
                                     85.79       18.84       20.15
                                     85.81       23.21       27.34
                                     85.83       27.72       36.28
```

85.85	32.32	46.25
85.87	37.01	57.23
85.89	41.78	69.20
85.92	46.64	82.13
85.94	51.60	96.02
85.96	56.64	110.85
85.98	61.77	126.62
86.00	66.98	143.31

```
*
COMPUTE TRAVEL TIME ID=1 REACH NO=6 VS NO=1 L=1630 FT
                                    SLP=0.0147
```

TRAVEL TIME TABLE

REACH= 6.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.021	.233	.06	1.8315
.042	.930	.37	1.1538
.063	2.094	1.08	.8805
.084	3.722	2.32	.7268
.105	5.815	4.20	.6264
.126	8.374	6.84	.5547
.147	11.398	10.31	.5005
.168	14.887	14.72	.4579
.189	18.842	20.15	.4233
.210	23.214	27.34	.3844
.232	27.723	36.28	.3460
.253	32.321	46.25	.3164
.274	37.007	57.23	.2928
.295	41.782	69.20	.2734
.316	46.645	82.13	.2571
.337	51.597	96.02	.2433
.358	56.638	110.85	.2313
.379	61.767	126.62	.2209
.400	66.985	143.31	.2116

```
*
ROUTE                                ID=1 HYD NO=320.0  INFLOW ID=6  DT=0.0
*
PRINT HYD                      ID=1 CODE=1

                                   HYDROGRAPH FROM AREA   320.00


    RUNOFF VOLUME =       .08856 INCHES      =        .8651 ACRE-FEET
    PEAK DISCHARGE RATE =       7.08 CFS  AT   2.033 HOURS   BASIN AREA =


*
*S                  COMPUTE BASIN A4
*
COMPUTE NM HYD                 ID=4 HYD NO=320.1 AREA=0.06187 SQ MI
                                     PER A=100 PER B=0 PER C=0 PER D=0
                                     TP=0.27 MASS RAIN=-1

    K =    .362180HR    TP =    .270000HR    K/TP RATIO =  1.341408     SHAPE
    UNIT PEAK =   58.388    CFS   UNIT VOLUME =    .9996        B =   254.81
    AREA =       .061870 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
```

```
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=4 CODE=1

                                          HYDROGRAPH FROM AREA   320.10


    RUNOFF VOLUME =       .08856 INCHES     =         .2922 ACRE-FEET
    PEAK DISCHARGE RATE =       5.17 CFS  AT   1.667 HOURS   BASIN AREA =


*
*S                  ADD BASINS A1&3 TO BASIN A4
*
ADD HYD                              ID=6 HYD NO=310.3        ID I=4 ID II=1
*
PRINT HYD                    ID=6 CODE=1

                                          HYDROGRAPH FROM AREA   310.30


    RUNOFF VOLUME =       .08855 INCHES     =        1.1572 ACRE-FEET
    PEAK DISCHARGE RATE =      10.20 CFS  AT   1.867 HOURS   BASIN AREA =


*
*S                  COMPUTE BASIN A5
*
COMPUTE NM HYD               ID=5 HYD NO=305.0 AREA=0.09021 SQ MI
                                     PER A=100 PER B=0 PER C=0 PER D=0
                                     TP=0.48 MASS RAIN=-1

    K =    .638225HR    TP =    .480000HR    K/TP RATIO =  1.329635     SHAPE
    UNIT PEAK =   48.228    CFS   UNIT VOLUME =    .9997        B =   256.62
    AREA =       .090210 SQ MI    IA =    .65000 INCHES    INF =   1.67000 I
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

*
PRINT HYD                    ID=5 CODE=1

                                          HYDROGRAPH FROM AREA   305.00


    RUNOFF VOLUME =       .08856 INCHES     =         .4261 ACRE-FEET
    PEAK DISCHARGE RATE =       4.27 CFS  AT   1.867 HOURS   BASIN AREA =


*
*S                  ADD BASINS  A1,A3,A4 & A5
*
ADD HYD                              ID=1    HYD NO=320.0 ID I=5 ID II=6
*
PRINT HYD                    ID=1 CODE=1

                                          HYDROGRAPH FROM AREA   320.00
```

```
    RUNOFF VOLUME =        .08855 INCHES      =        1.5833 ACRE-FEET
    PEAK DISCHARGE RATE =       14.46 CFS  AT   1.867 HOURS   BASIN AREA =


*
*S                    CALCULATE TOTAL INFLOW INTO UNSER PLAYA
*
ADD HYD                                ID=3 HYD NO=330.0 ID I=1 ID II=2
*
PRINT HYD                      ID=3  CODE=1

                                            HYDROGRAPH FROM AREA   330.00


    RUNOFF VOLUME =        .18007 INCHES      =        4.5521 ACRE-FEET
    PEAK DISCHARGE RATE =       61.52 CFS  AT   1.733 HOURS   BASIN AREA =


*
*S       END CALCULATIONS
*
FINISH

    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 15:34:28
```

APPENDIX B

HYDRAULIC CALCULATIONS

LEEDSHILL · HERKENHOFF, INC. Albuquerque • San Diego • Santa Fe ENGINEERING COMPUTATIONS	NAME OF PROJECT Sunset West Unit 2			SHEET NUMBER OF
	COMPUTED BY: S Alvarez	CHECKED BY:	JOB NUMBER	DATE:

- Calc new drainage areas - planimeter

A1 - 10.23in², 9.97in², 10.10in² = 10.10in² = 57.97 Ac = 0.091mi²

A3 - 44.88 Ac - 2.98 Ac + 17.36 = 59.26 Ac = 0.093mi²
(0.05/2 × 500²/A) = 17.36 Ac
0.09259

A4 - 39.6 Ac = 0.062mi²
0.06187

A5 - 55.05 Ac - 1.38 + 4.10 = 57.77 Ac = 0.090mi²

Calc hyd lengths

Area A1 sheet 400', elev diff = 10', S = 0.025 k = 0.7
overland 550 elev diff = 12' S = 0.0218 k = 1.0
channel 900', elev diff = 16', S = 0.0178 k = 3.0
spread 1550', elev diff = 20', S = 0.0129 k = 2.0

Area A2 sheet 400', elev diff = 9', S = 0.0225, k = 0.7
overland 1050', elev diff. 13, S = 0.0124, k = 1.0

Area A3 channel 2600, elev diff = 56', S = 0.0215, k = 3.0
overland 1100, elev diff = 28', S = 0.0255, k = 1.0

Area A4 sheet 400', elev diff = 8', S = 0.0200, k = 0.7
overland 1230, elev diff = 16', S = 0.0130, k = 1.0

Area A5 sheet 400', elev diff = 6', S = 0.0150, k = 0.7
overland 2230', elev diff = 24', S = 0.0108, k = 1.0

B1 sheet 400', elev = 8', S = 0.0200 k = 0.7
overland 150, elev = 2, S = 0.0133 k = 1.0

B2 ok as prev calc'd

B3 ok as marked

B-4 Undev sheet 400', elev = 4, S = 0.0100 k = 0.7
overland 800' elev = 12, S = 0.0150 k = 1.0

LEEDSHILL · HERKENHOFF, INC. Albuquerque • San Diego • Santa Fe ENGINEERING COMPUTATIONS	NAME OF PROJECT Sunset West Unit 2			SHEET NUMBER OF
	COMPUTED BY: SAlvarez	CHECKED BY:	JOB NUMBER	DATE:

B-4D. sheet = 150', elev ≈ 2', S = 0.0133, k = 0.7
sheet = 1456, elev ≈ 16', S = 0.0110, k = 3.0

C-1 ok as prev calc'd

Routing of Area A1 under SAD construction ⇒
for 10year do culvert route from 94th to 86th
L = 2150 ft., assume 54" ϕ pipe
for 100year, assume culvert ineffective; do street route using 32' roadway X-section.

LEEDSHILL · HERKENHOFF, INC. Albuquerque • San Diego • Santa Fe ENGINEERING COMPUTATIONS	NAME OF PROJECT SUNSET WEST UNIT 2			SHEET NUMBER 1 OF
	COMPUTED BY: K REED	CHECKED BY:	JOB NUMBER 94005.11	DATE: 3/18/94

— CALCULATE DRAINAGE AREAS BY PLANIMETERING:

FROM A, A, & R MAP $1'' = 500' \Rightarrow IN^2 \times 250{,}000 \frac{FT^2}{IN^2}$

BASIN		
	A2	25.3 ACRES
	B1	4.3 ACRES
	B2	10.3 ACRES
	B3	27.0 ACRES
	B4	10.4 ACRES
	C1	11.5 ACRES

UNDEVELOPED CONDITION

BASIN	LENGTH	ΔELEV	K
A2-U	1450 LF	21 FT	0.7
B1-U	550 LF	10 FT	0.7
B2-U	150 LF	1 FT	0.7
	100 LF	3 FT	3.0
	800 LF	9 FT	3.0
	450 LF	8 FT	3.0
	125 LF	1 FT	3.0
B3-U	150 LF	1 FT	0.7
	50 LF	2 FT	3.0
	1700 LF	24 FT	3.0
	600 LF	12 FT	0.7
B4-U	1150 LF	18 FT	0.7
C1-U	2200 LF	14 FT	3.0

LEEDSHILL · HERKENHOFF, INC. Albuquerque • San Diego • Santa Fe ENGINEERING COMPUTATIONS	NAME OF PROJECT SUNSET WEST UNIT 2			SHEET NUMBER 2 OF
	COMPUTED BY: K REED	CHECKED BY:	JOB NUMBER 94005.11	DATE: 3/21/94

DEVELOPED CONDITION

BASIN	LENGTH (FT)	ΔELEV (FT)	K
A2-D	1450	21	0.7
B1-D	550	10	0.7
B2-D	150	1	0.7
	100	3	3.0
	800	9	3.0
	450	8	3.0
	125	1	3.0
B3-D	150	1	0.7
	50	2	3.0
	1700	24	3.0
	700	12	3.0
B4-D	75	2	0.7
	475	10	3.0
	950	8	3.0
C1-D	2200	14	3.0

USING THE UNDEVELOPED AND DEVELOPED CHARTS ABOVE, CREATE THE SPREADSHEET FOR t(c) AND t(p).

THEN ENTER INFO/INPUT INTO AHYMO FOR

- 10 yr.-6 hr. storm
- 100 yr.-6 hr. storm

FOR EXISTING/UNDEVELOPED AND FOR DEVELOPED CONDITIONS.

4 AHYMO RUNS TOTAL.

LEEDSHILL · HERKENHOFF, INC. Albuquerque • San Diego • Santa Fe ENGINEERING COMPUTATIONS	NAME OF PROJECT SUNSET WEST UNIT 2			SHEET NUMBER 3 OF
	COMPUTED BY: K REED	CHECKED BY:	JOB NUMBER 94005.11	DATE: 3/22/94

ROUTING OF FLOW REQUIRES CALCULATION OF THE RATING CURVE WHICH IS BASED ON STREET X-SECTIONS.
FROM THE SAGE ROAD AS-BUILTS (COA PROJ.# 4188.90), SET-UP RATING CURVE PARAMETERS. ROUTING BASIN B1 TO B2 (94TH ST.) USE X-SECTION STA 7+50 TO 94TH ST. (SHEET 8) AS STD. X-SECTION. AND X-SECTION STA 7+50 (SHEET 15) FOR ELEVS.

AREA DESCRIPTION	CUMUL. LENGTH	ELEV.
LEFT ROW	0'	140.2
T.O.C. LT	9'	139.8
F.L. C/G LT.	10'	139.1
FL C/G LT MEDIAN	35'	139.6
T.O.C. LT MEDIAN	36'	140.3
TOP OF MEDIAN	43'	140.7
T.O.C. RT MEDIAN	50'	140.3
FL C/G RT MEDIAN	51'	139.6
FL C/G RT	76'	139.1
T.O.C. RT	77'	139.8
RT ROW	87'	140.2

FLOODPLAIN / CHANNEL SLOPE: (GUTTER)

STA 7+50 +/- E = 39.11'
STA 17+67 +/- E = 22.25'
Δ = 1017' Δ = 16.86'

S = 0.0166 +/-

LEEDSHILL · HERKENHOFF, INC. Albuquerque • San Diego • Santa Fe ENGINEERING COMPUTATIONS	NAME OF PROJECT SUNSET WEST UNIT 2			SHEET NUMBER 4 OF
	COMPUTED BY: KC REED	CHECKED BY:	JOB NUMBER 94005.11	DATE: 3/22/94

ROUTE LENGTHS

- BASIN B1 → B2 = STA 10+36 (WEST SKY ST.) → STA 18+08 (94TH ST.) ≈ 772' (REACH #1)
- BASIN B1/B2 → B3/B4 = STA 18+08 (94TH ST.) → STA 28+87 (90TH ST.) ≈ 1079' (REACH #2)
- BASIN B1/B2/B3/B4 → A2 = STA 28+87 (90TH) → STA 39+56 (86TH) ≈ 1069' (REACH #3)
- BASIN B1/B2/B3/B4/A2 → C1 = STA 39+56 (86TH ST.) → 61+26 (UNSER) ≈ 2170' (REACH #4)

ROUTE SLOPES

REACH #1 (LEFT GUTTER) ⇒ $S = \frac{39.11 - 22.25}{1767 - 750} = 0.0166$ +/-

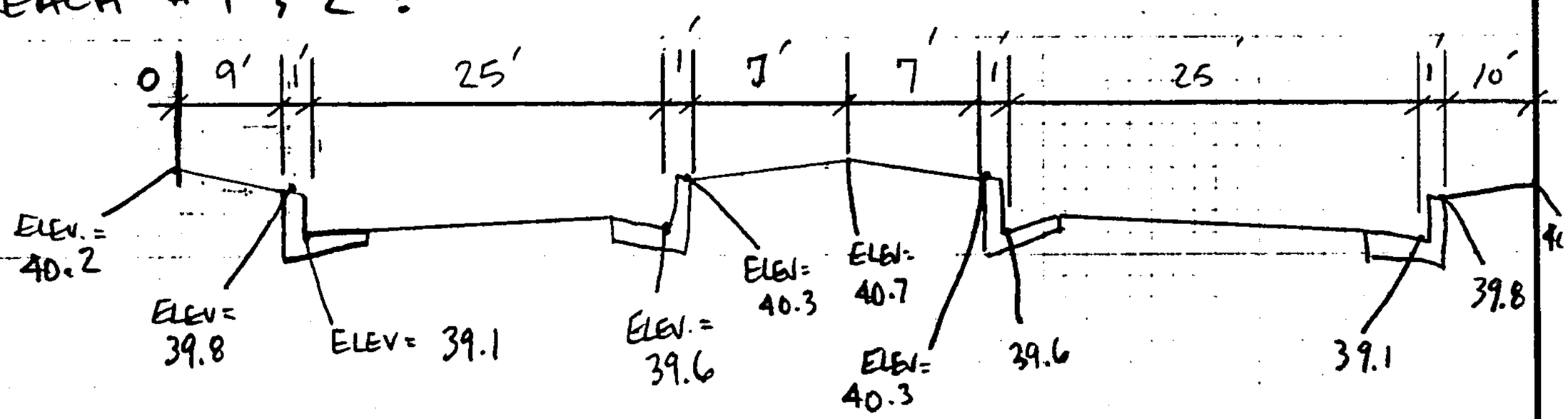
REACH #2 (MEDIAN LEFT) ⇒ $S = \frac{21.39 - 6.17}{2847 - 1848} = 0.0152$ +/-

REACH #3 (ROADWAY) ⇒ S = 0.0108 (FROM ROADWAY PROFILE)

REACH #4 ⇒ S = 0.0108 (ASSUMED FOR EXISTING).

ROUTING CURVE

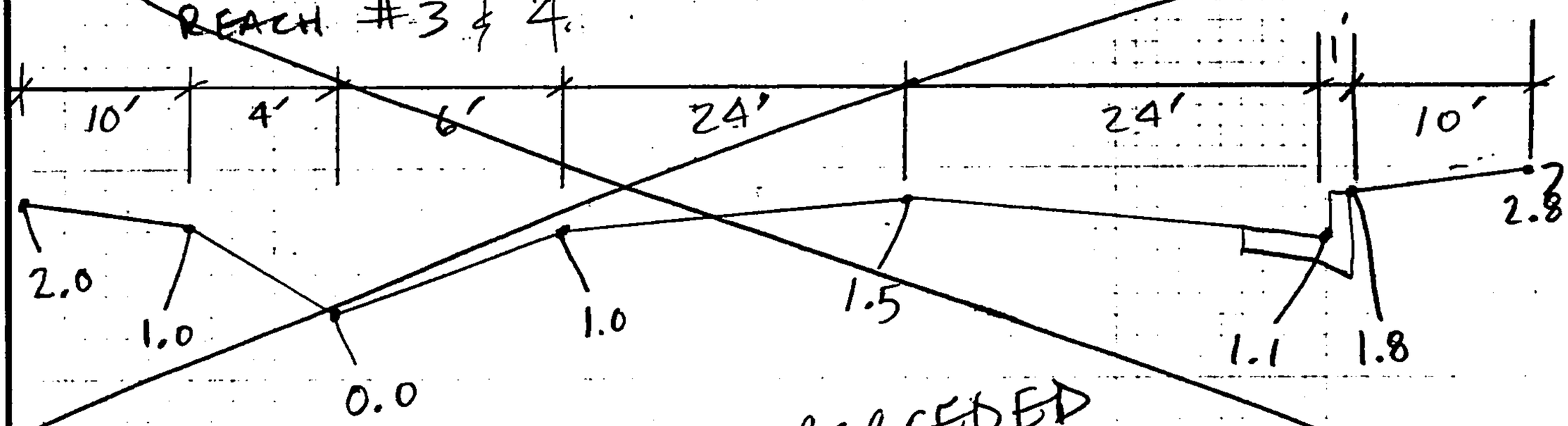
REACH #1 & 2 :



LEEDSHILL · HERKENHOFF, INC. Albuquerque • San Diego • Santa Fe ENGINEERING COMPUTATIONS	NAME OF PROJECT SUNSET WEST UNIT 2			SHEET NUMBER 5 OF
	COMPUTED BY: K REED	CHECKED BY:	JOB NUMBER 94005.11	DATE: 3/22/94

ROUTING CURVE (CONT.)

~~REACH #3 & 4.~~



SUPERCEDED

SEE SHEET 8 FOR X-SECTION ON SAGE BTWN. 90TH & 86TH FOR REACH #3

SEE SHEET 9 FOR X-SECTION OF SAGE BTWN. 86TH & UNSER. FOR REACH #4.

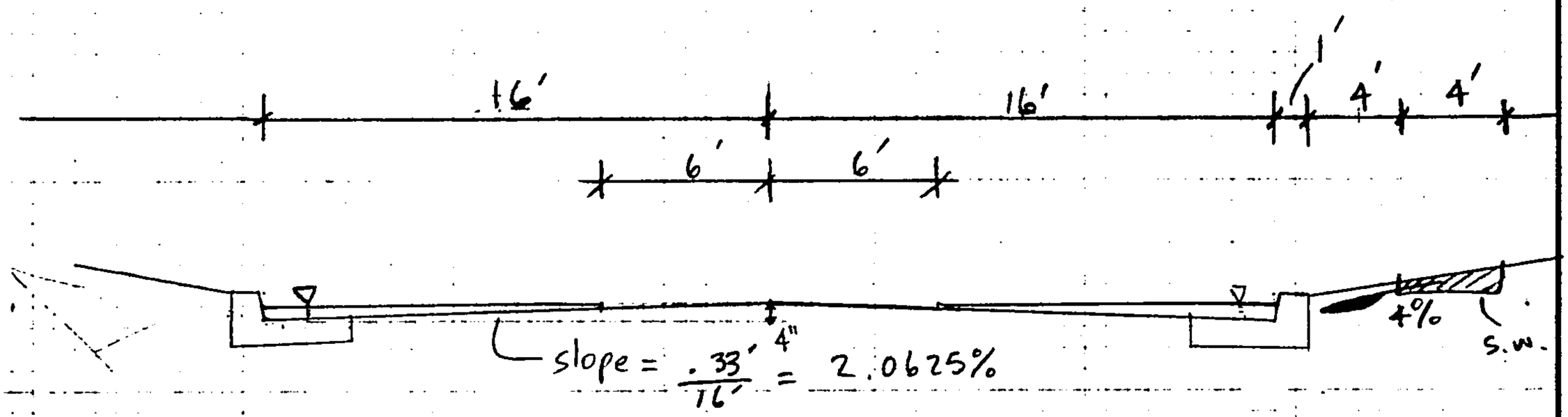
LEEDSHILL · HERKENHOFF, INC. Albuquerque • San Diego • Santa Fe ENGINEERING COMPUTATIONS	NAME OF PROJECT SUNSET WEST UNIT 2			SHEET NUMBER 6 OF
	COMPUTED BY: K REED	CHECKED BY:	JOB NUMBER 94005.11	DATE: 3/23/94

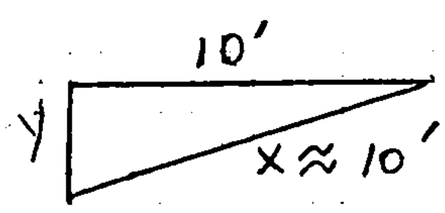
NOW THAT AHYMO RUNS HAVE BEEN COMPLETED, WE NEED TO CALCULATE THE Q FOR A 10-YR, 6-HR STORM FOR:

1. 90TH ST. BETWEEN SAN YGNACIO AND SAGE
2. SAGE BETWEEN 90TH AND 86TH
3. SAGE BETWEEN 86TH AND UNSER.

USE MANNING'S EQN. AND ASSUME ONLY 1/2 (OR 12') OF THE ROADWAY IS SUBMERGED.
COMPARE THIS Q WITH AHYMO RESULTS (10-YR, 6HR. STORM)

1. ROADWAY X-SECTION FOR 90TH BETWEEN SAN YGNACIO AND SAGE





$y = 10' * 2.0625\% = .20625' \approx \underline{.21'}$

$$Q = \frac{1.486}{n} A R^{2/3} S^{1/2} \quad \text{(MANNING'S EQN.)}$$

A = X-SECTIONAL AREA = $\frac{1}{2}(.21)(10') = \underline{1.05\ FT^2}$

n = MANNING'S NO. = $\underline{0.018}$

R = HYDRAULIC RADIUS = $\frac{A}{P} = \frac{\text{X-SECT. AREA}}{\text{WETTED PERIMETER}} = \frac{1.05\ FT^2}{10' + .21'} = \underline{0.10\ FT}$

(★) S = SLOPE = $\frac{16.08 - 6.96}{1016.32} = \underline{0.009}$

(★) FROM GRADING PLAN FOR SUNSET WEST UNIT 2 L = 1067.36 − 51.04 = 1016.32'
NORTH END OF 90TH ST. ℄ ELEV. 16.08
SOUTH END " " " ℄ ELEV. 6.96 (CURB RETURN)

LEEDSHILL · HERKENHOFF, INC. Albuquerque • San Diego • Santa Fe ENGINEERING COMPUTATIONS	NAME OF PROJECT SUNSET WEST UNIT 2			SHEET NUMBER 7 OF
	COMPUTED BY: K REED	CHECKED BY:	JOB NUMBER 94005.11	DATE: 3/23/94

1. 90TH ST. (CONTINUED)

$$Q = \frac{1.486}{0.018}(1.05\ FT^2)(0.10\ FT)^{2/3}(0.009)^{1/2} * 2 \text{ SIDES OF ROAD}$$

$$= \boxed{3.52\ CFS}$$

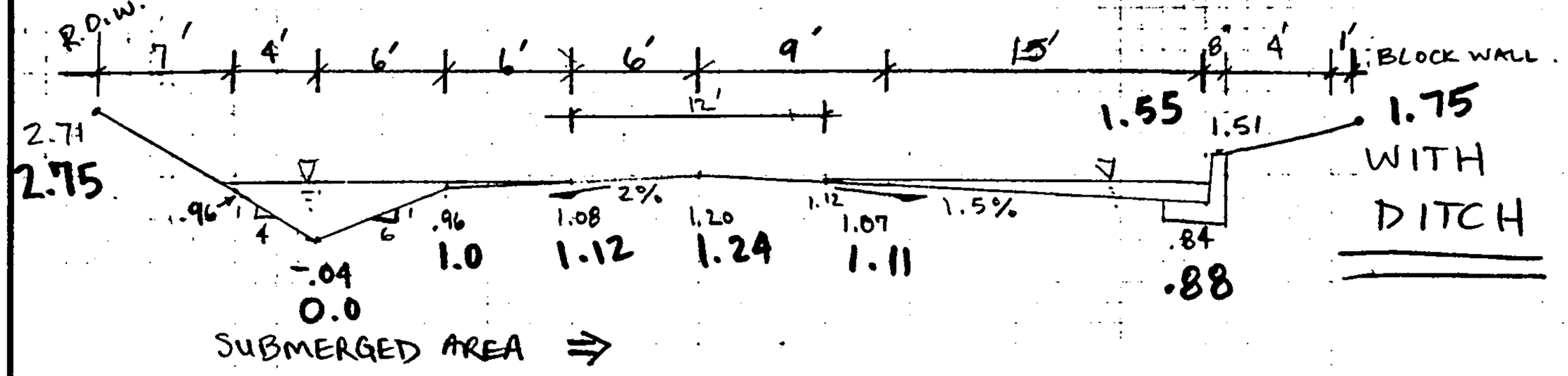
FROM AHYMO → DEVELOPED - 10-YR, 6-HR STORM

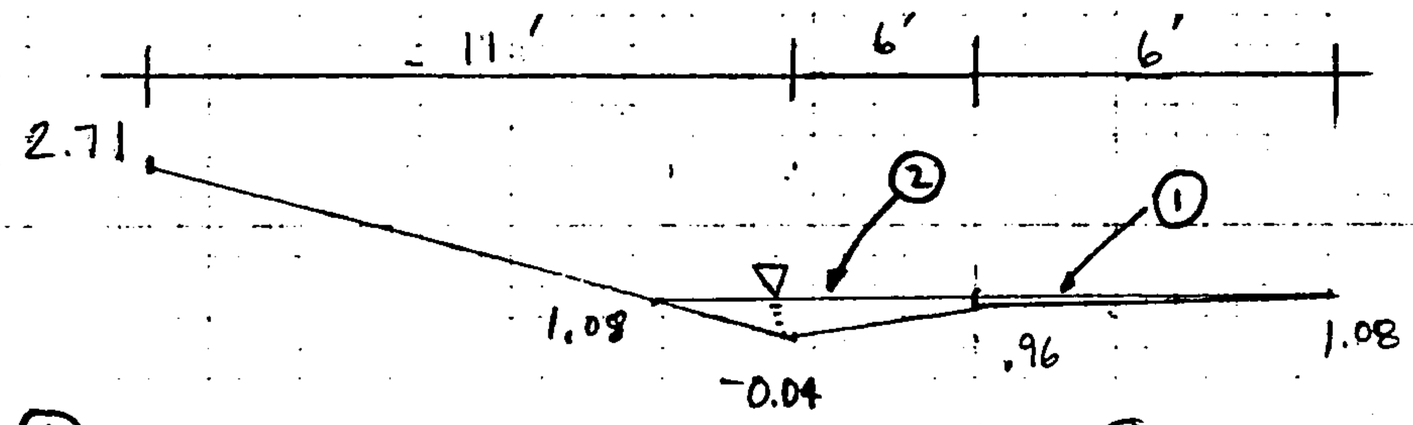
BASIN B4 PEAK DISCHARGE = Q = $\boxed{15.59\ CFS}$

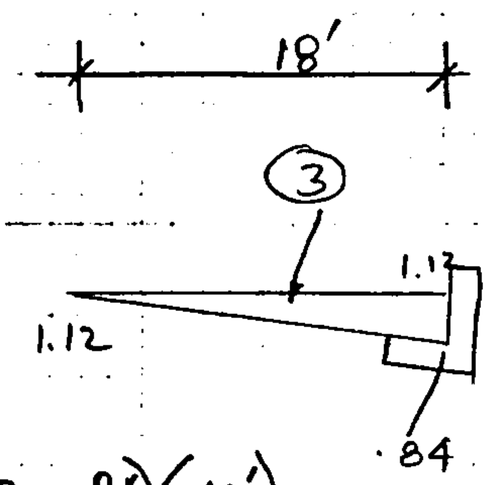
Q ⇒ 15.59 >> 3.52 NO GOOD

LEEDSHILL - HERKENHOFF, INC. Albuquerque • San Diego • Santa Fe ENGINEERING COMPUTATIONS	NAME OF PROJECT: SUNSET WEST UNIT 2			SHEET NUMBER 8 OF
	COMPUTED BY: K REED	CHECKED BY:	JOB NUMBER 94005.11	DATE: 3/23/94

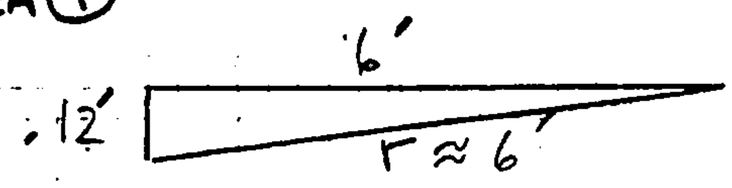
2. ROADWAY X-SECTION FOR SAGE BETWEEN 86TH & 90TH







AREA ①

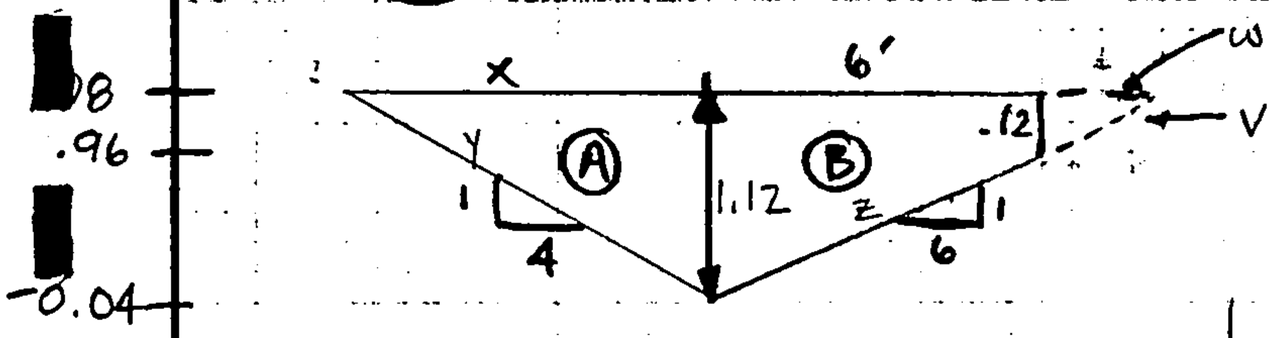


$A_{①} = \frac{1}{2}(.12')(6') = 0.36\ FT^2$

AREA ③

$A_{③} = \frac{1}{2}(1.12 - .84)(18') = 2.52\ FT^2$

AREA ②



$\frac{x}{1.12} = \frac{4}{1} \Rightarrow x = 4.48'$

$A_{②A} = \frac{1}{2}(4.48')(1.12') = 2.51\ FT^2$

$A_{②B} = (6 \times .12) + \frac{1}{2}(1)(6) = 3.72\ FT^2$

$Y = \sqrt{1.12^2 + 4.48^2} = 4.62\ FT$

FIND Z ⇒ $\frac{.12}{1} = \frac{w}{6} \Rightarrow w = 0.72$

$V = \sqrt{0.12^2 + 0.72^2} = 0.73\ FT.$

$Z + V = \sqrt{1.12^2 + (w+6')^2} = \sqrt{1.12^2 + 6.72^2}$

$Z = 6.81 - 0.73 = \underline{6.08'}$

$A_T = A_1 + A_{2A} + A_{2B} + A_3 = 9.11\ FT^2$

$R = \frac{A_T}{P} = \frac{9.11}{18 + 6 + 6.08 + 4.62} = 0.26\ FT$

$S = 0.0111$ (SHEET 4 PROFILE A, A, & R PLANS)

$Q = \frac{1.486}{0.022}(9.11)(0.26)^{2/3}(.0111)^{1/2}$

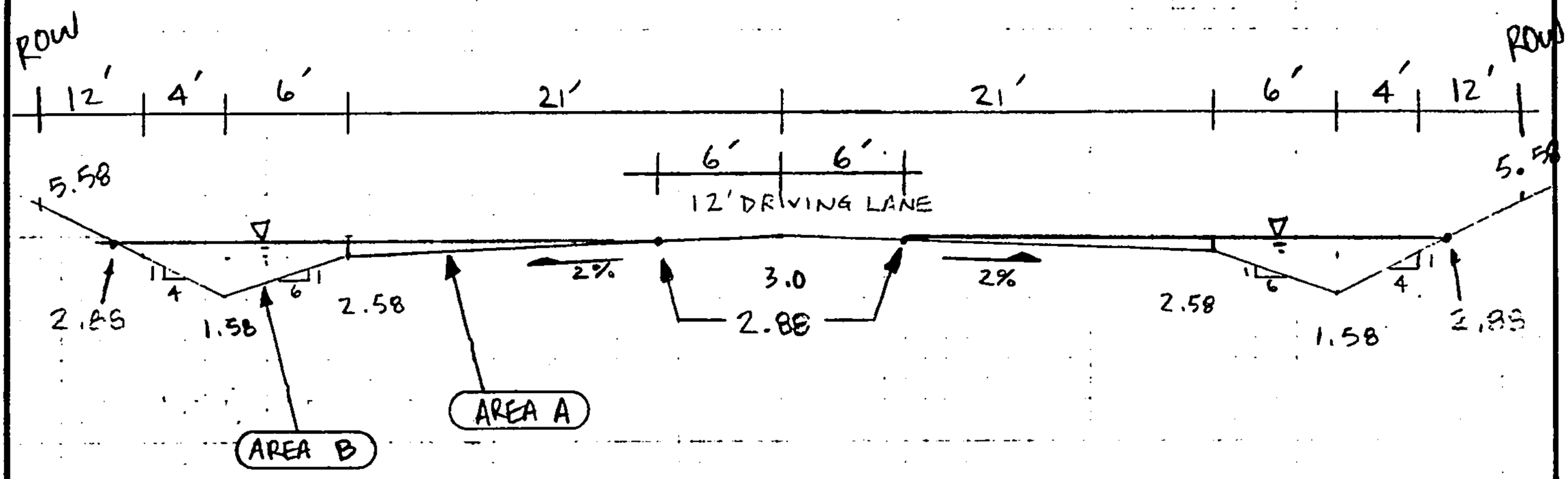
(*) $Q = 26.3\ CFS < 46.40\ CFS$

FROM AHYMO

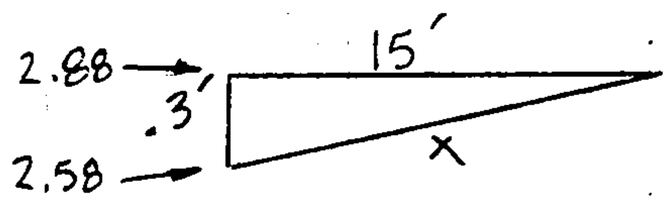
NO GOOD

LEEDSHILL · HERKENHOFF, INC. Albuquerque • San Diego • Santa Fe ENGINEERING COMPUTATIONS	NAME OF PROJECT: SUNSET WEST UNIT 2			SHEET NUMBER: 9 OF
	COMPUTED BY: K REED	CHECKED BY:	JOB NUMBER: 94005.11	DATE: 3/24/94

3. ROADWAY X-SECTION FOR SAGE BETWEEN 86TH & UNSER



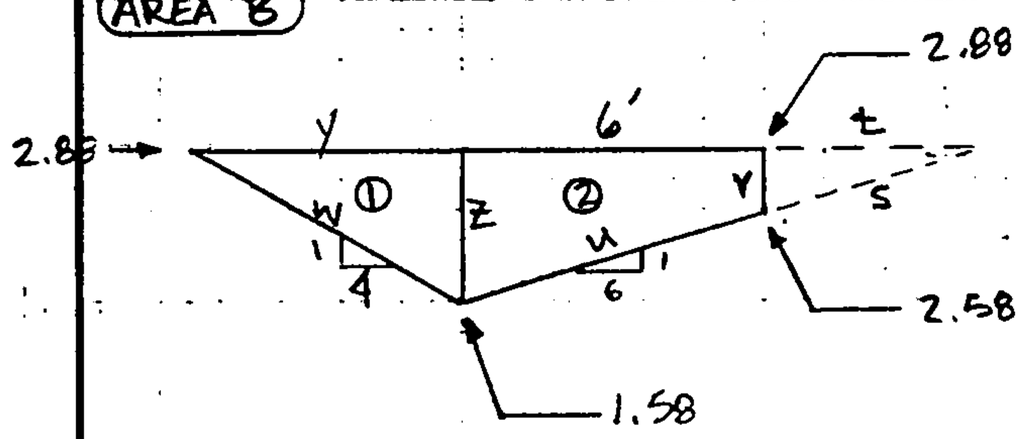
AREA A



$A_A = \frac{1}{2}(15')(.3') = 2.25\ FT^2$

$X = \sqrt{15^2 + .3^2} \approx 15\ FT$

AREA B



$z = 2.88 - 1.58 = \underline{1.30\ FT}$

$v = 2.88 - 2.58 = \underline{0.30\ FT}$

$y = 4z = \underline{5.2\ FT}$

$w = \sqrt{5.2^2 + 1.3^2} = \underline{5.36\ FT}$

$A_① = \frac{1}{2}(1.30)(5.2) = \underline{3.38\ FT^2}$

$t = 6v = \underline{1.8\ FT}$

$s = \sqrt{1.8^2 + .3^2} = \underline{1.82\ FT}$

$u + s = \sqrt{z^2 + (6+t)^2} = \sqrt{1.3^2 + 7.8^2} = 7.91$

$u = 7.91 - 1.82 = \underline{6.09\ FT}$

$A_② = \frac{1}{2}(v+z)(6') = \underline{4.8\ FT^2}$

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	COMPUTED BY: K REED	CHECKED BY:	JOB NUMBER 94005.11	DATE: 3/23/94

ROADWAY X-SECTION FOR SAGE BTWN. 86TH & UNSER (CONTINUED)

$$A_T = A_A + A_B = A_A + [A_{①} + A_{②}] = \underline{10.43 \text{ FT}^2}$$

$$R = \frac{A}{P} \Rightarrow P = w + u + x = 26.45 \text{ FT}$$

$$= \frac{10.43}{26.45} = \underline{0.39 \text{ FT}}$$

$S \approx \underline{0.0108}$ (ASSUMED FROM A, A, & R PLANS SHEET 5)

$$Q = \frac{1.486}{n} A R^{2/3} S^{1/2}$$

$$= \frac{1.486}{0.022}(10.43)(0.39)^{2/3}(0.0108)^{1/2}$$

$Q = 38.96$ CFS * 2 (2 SIDES OF ROAD) = 77.92 CFS.

AHYMO BASIN B1/B2/B3/B4/A2 PEAK DISCH. (10-YEAR, 6 HR - DEVELOPED)

$Q = 40.49$ CFS

$$\boxed{\therefore Q_{STREET} = 77.92 > Q_{AHYMO} = 40.49}$$

✓ OK

SUMMARY

LOCATION	Q_{STREET} (CFS)	Q_{AHYMO} (CFS)	COMPARISON
90TH ST. BTWN. SAN YGNACIO & SAGE	3.5	15.6	NG
SAGE RD. BTWN. 90TH & 86TH	26.3	46.4	NG
SAGE RD. BTWN. 86TH & UNSER	77.9	39.4	✓ OK

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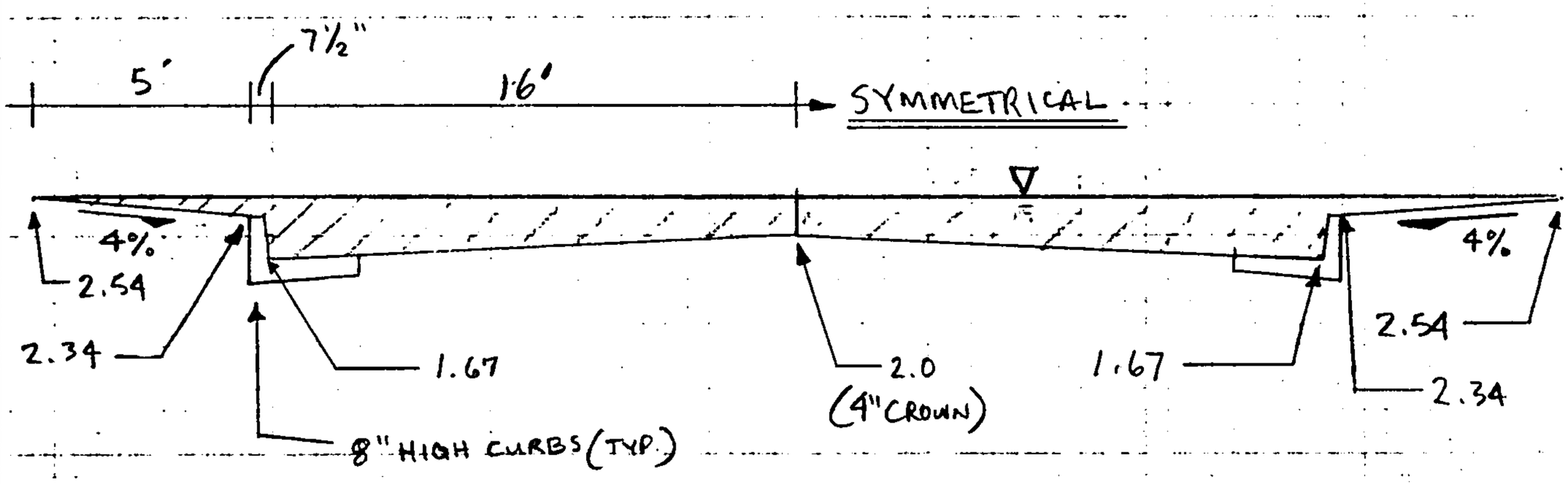
NOW CHECK STREET CAPACITY FOR 100-YR, 6-HR STORM EVENT WITH THE ASSUMPTION THAT THE WATER RUNOFF LEVEL IN THE STREET CAN EXCEED 0.2 FEET ABOVE TOP OF CURB FOR:

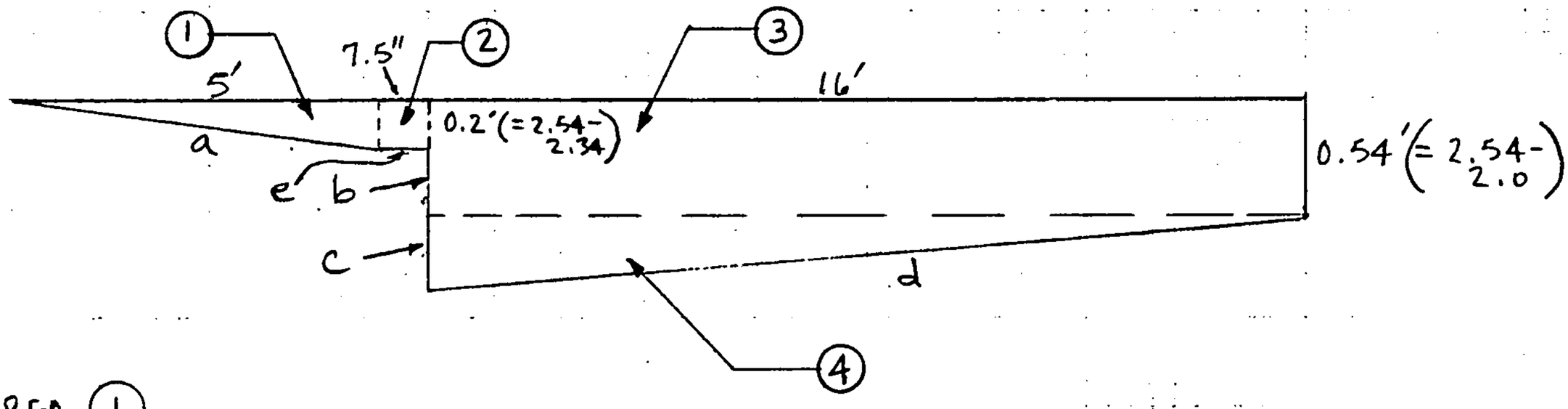
1. 90TH ST. BTWN. SAN YGNACIO & SAGE
2. SAGE RD. BTWN. 90TH & 86TH
3. SAGE RD. BTWN. 86TH & UNSER

THEN COMPARE Q_{STREET} WITH Q_{AHYMO} (PEAK DISCHARGE FOR SAME STORM EVENT).

1. 90TH STREET X-SECTION



AREA CALCULATIONS



AREA 1

$A_1 = \frac{1}{2}(5)(0.2) = \underline{0.5 \text{ FT}^2}$

$a = \sqrt{5^2 + 0.2^2} \approx \underline{5.00 \text{ FT}}$

1. 90TH ST. (CONTINUED)

AREA (2)

$A_2 = \frac{7.5''}{12}(0.2) = \underline{0.125\ FT^2}$

$e = 7.5'' = \underline{0.625'}$

AREA (3)

$A_3 = (0.54)(16') = \underline{8.64\ FT^2}$

$b = 0.54 - 0.2 = \underline{0.34\ FT}$

AREA (4)

$c = \underline{0.33'} \Rightarrow$ 4" CROWN

$A_4 = \frac{1}{2}(0.33)(16) = \underline{2.64\ FT^2}$

$d = \sqrt{.33^2 + 16^2} \approx \underline{16\ FT}$

CAPACITY CALCULATIONS

$A_T = \Sigma A_i = \underline{11.91\ FT^2}$

$R = \frac{A_T}{P} = \frac{11.91}{a+e+b+c+d} = \underline{0.534\ FT}$

$S = \underline{0.009}$ (SEE SHEET 6 CALCS)

$n = 0.018$ (")

$Q = \frac{1.486}{n} A R^{2/3} S^{1/2}$ (MANNING'S EQN.)

$Q_{STREET} = 61.27$ CFS $\times$ 2 (SYMMETRICAL) $= 122.54$ CFS

Q_{AHYMO} (100YR, 6HR-PEAK) $= 31.86$ CFS

$Q_{STREET} = 122.5$ CFS $> Q_{AHYMO} = 31.86$

$\therefore$ ✓ OK

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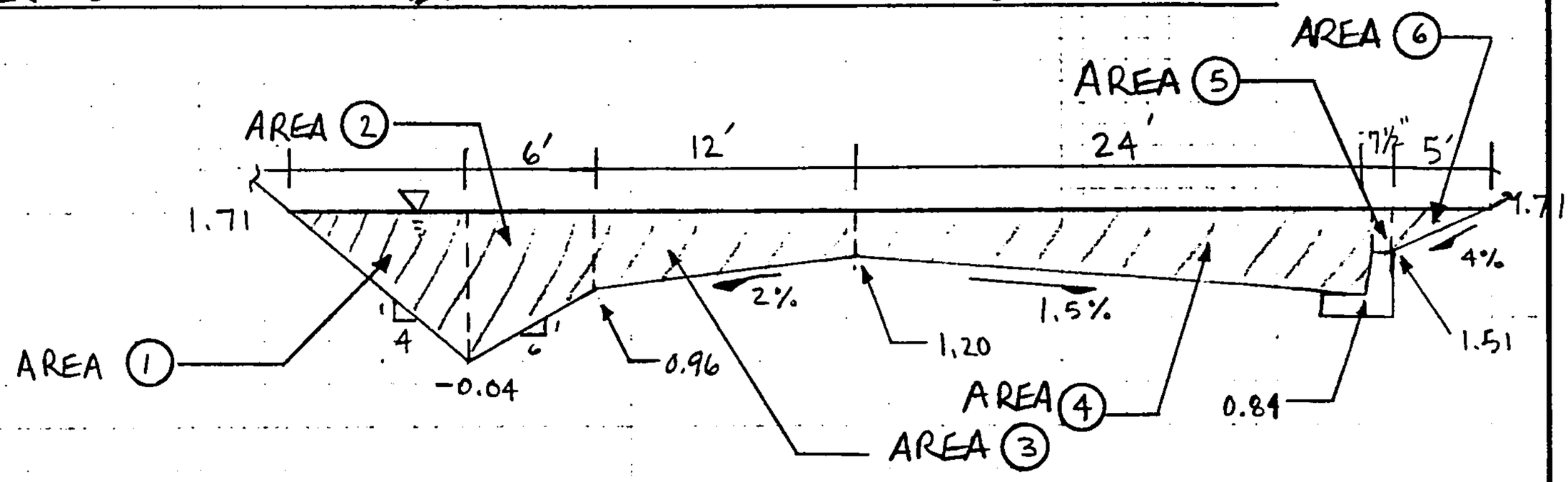
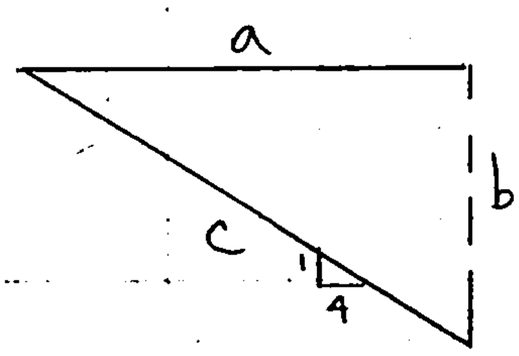
	COMPUTED BY: K REED	CHECKED BY:	JOB NUMBER 94005.11	DATE: 3/24/94

2. SAGE ROAD BETWEEN 90TH ST. & 86TH ST.



AREA CALCULATIONS

AREA 1



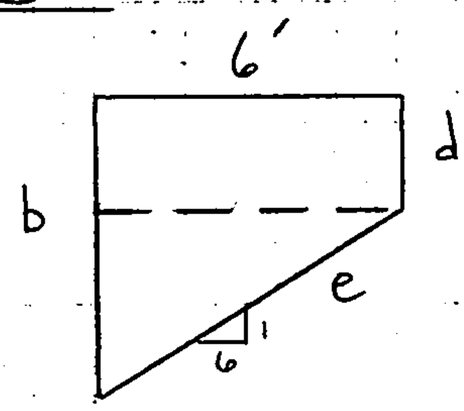
$b = 1.71 - (-0.04) = 1.75$ FT

$\frac{a}{4} = \frac{b}{1} \Rightarrow a = 4b = 7$ FT

$c = \sqrt{1.75^2 + 7^2} = 7.22$ FT

$A_1 = \frac{1}{2} ab = \underline{6.13 \text{ FT}^2}$

AREA 2



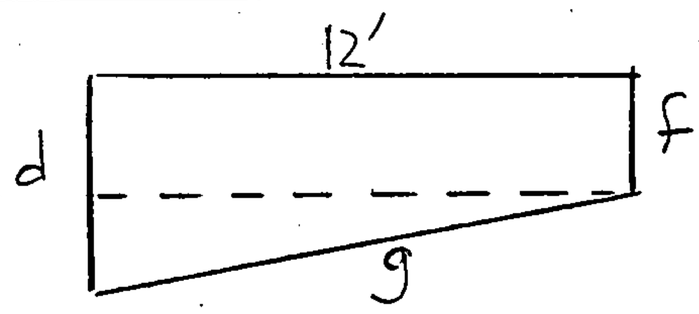
$b = 1.75$ FT (SEE AREA 1 CALC)

$d = 1.71 - 0.96 = 0.75$ FT

$e = \sqrt{6^2 + (b-d)^2} = 6.08$ FT

$A_2 = \frac{1}{2}(1)(6) + (6)(.75) = \underline{7.5 \text{ FT}^2}$

AREA 3



$d = 0.75$ FT (SEE AREA 2 CALCS.)

$f = 1.71 - 1.20 = 0.51$ FT

$g = \sqrt{12^2 + (d-f)^2} \approx 12$ FT

$A_3 = \frac{d+f}{2}(12') = \underline{7.56 \text{ FT}^2}$

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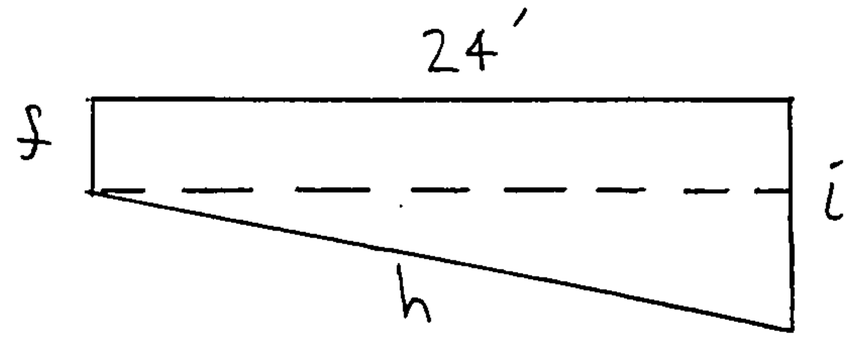
	COMPUTED BY: K REED	CHECKED BY:	JOB NUMBER 94005.11	DATE: 3/24/94

AREA ④



$f = 0.51$ FT (SEE AREA 3 CALC)

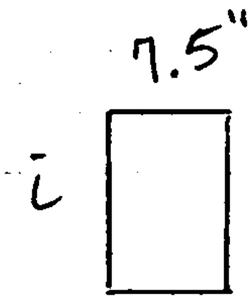
$i = 1.71 - 0.84 = 0.87$ FT

$h = \sqrt{24^2 + (i-f)^2} \approx 24$ FT

$A_4 = \frac{0.51 + 0.87}{2}(24)$

$= \underline{16.56 \text{ FT}^2}$

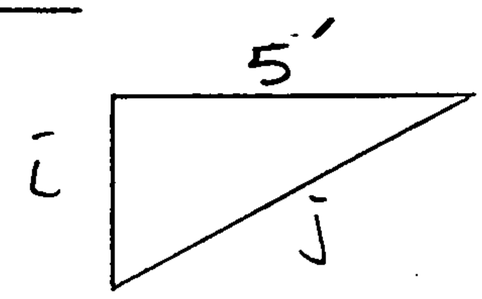
AREA ⑤



$i = 0.87$ FT (SEE AREA 4 CALC)

$A_5 = \frac{7.5''}{12}(0.87) = \underline{0.54 \text{ FT}^2}$

AREA ⑥



$i = 0.87$ FT (SEE AREA 4 CALC)

$j = \sqrt{0.87^2 + 5^2} = 5.08$ FT

$A_6 = \frac{1}{2}(0.87)(5) = \underline{2.18 \text{ FT}^2}$

CAPACITY CALCULATIONS

$A_T = \Sigma A_i = \underline{40.47 \text{ FT}^2}$

$R = \frac{A}{P} = \frac{40.47}{7.22 + 6.08 + 12 + 24 + .67 + .625 + 5.08} = \underline{0.73 \text{ FT}}$

$S = \underline{0.0111}$ (SEE SHEET 8 CALCS.)

$n = 0.022$

$Q_{STREET} = \frac{1.486}{n} A R^{2/3} S^{1/2} = \frac{1.486}{0.022}(40.47)(0.73)^{2/3}(0.0111)^{1/2}$

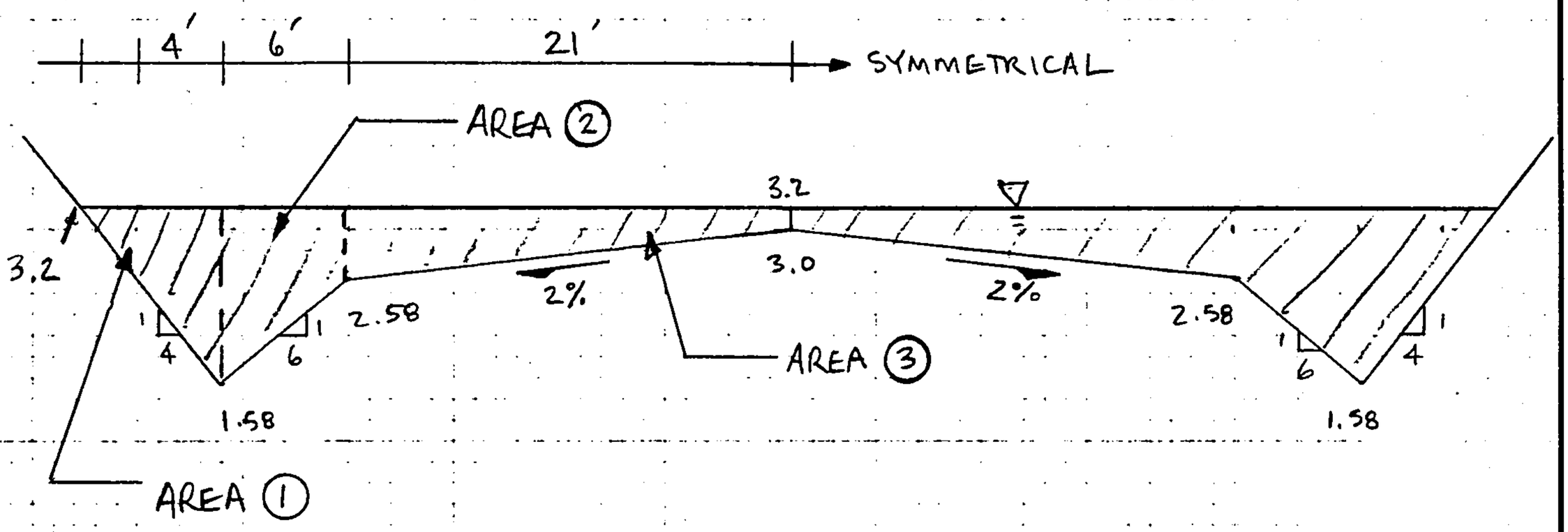
$Q_{STREET} = 233.25$ CFS.

$Q_{AHYMO} = 104.7$ CFS $< Q_{STREET} = 233.25$ CFS ✓ OK

LEEDSHILL · HERKENHOFF, INC. Albuquerque • San Diego • Santa Fe ENGINEERING COMPUTATIONS	NAME OF PROJECT SUNSET WEST UNIT 2			SHEET NUMBER 15 OF
	COMPUTED BY: K REED	CHECKED BY:	JOB NUMBER 94005.11	DATE: 3/24/94

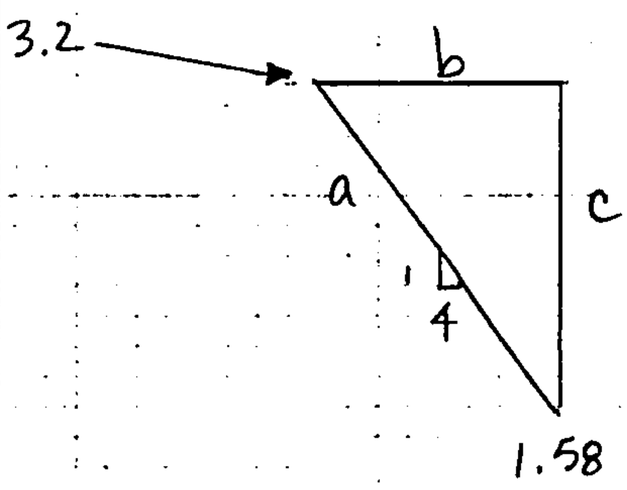
3. SAGE RD. BTWN. 86TH & UNSER

SINCE THIS ROADWAY SECTION CONTAINS NO CURB ASSUME THE ACCEPTABLE LEVEL IS 0.2' OVER THE CROWN OF THE ROAD.



AREA CALCULATIONS

AREA 1



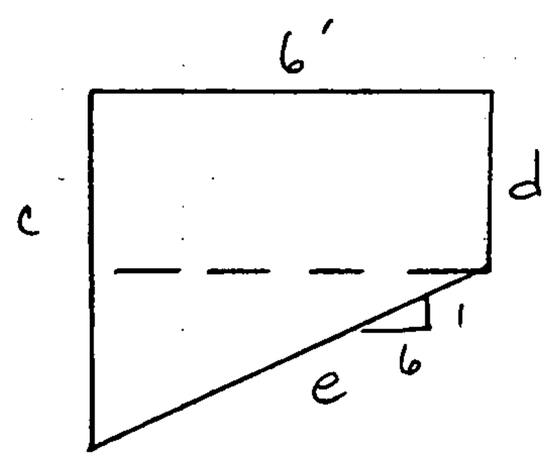
$c = 3.2 - 1.58 = 1.62$ FT

$b = 4c = 6.48$ FT

$a = \sqrt{1.62^2 + 6.48^2} = 6.68$ FT

$A_1 = \frac{1}{2}(1.62)(6.48) = \underline{5.25 \text{ FT}^2}$

AREA 2



$c = 1.62$ FT (SEE AREA 1 CALC)

$d = 3.2 - 2.58 = 0.62$ FT

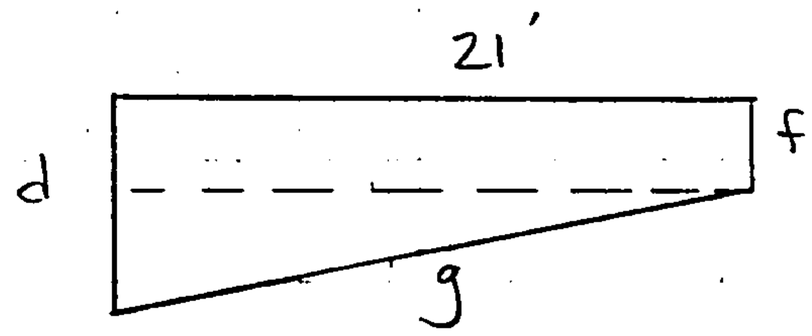
$e = \sqrt{6^2 + 1^2} = 6.08$ FT

$A_2 = \frac{1}{2}(1)(6) + 6(0.62) = \underline{6.72 \text{ FT}^2}$

LEEDSHILL · HERKENHOFF, INC. Albuquerque • San Diego • Santa Fe ENGINEERING COMPUTATIONS	NAME OF PROJECT SUNSET WEST UNIT 2			SHEET NUMBER 16 OF
	COMPUTED BY: K REED	CHECKED BY:	JOB NUMBER 94005.11	DATE: 3/24/94

3. SAGE BTWN 86TH & UNSER (CONTINUED)

AREA ③



$d = 0.62$ FT (SEE AREA 2 CALC)

$f = 3.2 - 3.0 = 0.2$ FT

$g = \sqrt{21^2 + (d-f)^2} \approx 21$ FT

$A_3 = 0.2(21) + \frac{1}{2}(.42)(21)$

$= \underline{8.61 \text{ FT}^2}$

CAPACITY CALCULATIONS

$A_T = \Sigma A_i = \underline{20.58 \text{ FT}^2}$

$R = \frac{A}{P} = \frac{20.58}{6.68 + 6.08 + 21} = \underline{0.61 \text{ FT}}$

$S = \underline{0.0108}$ (SEE SHEET 10 CALCS)

$n = 0.022$ (")

$Q = \frac{1.486}{n} A R^{2/3} S^{1/2} = \frac{1.486}{0.022}(20.58)(0.61)^{2/3}(0.0108)^{1/2}$

$Q_{STREET} = 103.7$ CFS X 2 (SYMMETRICAL

$= 207.4$ CFS

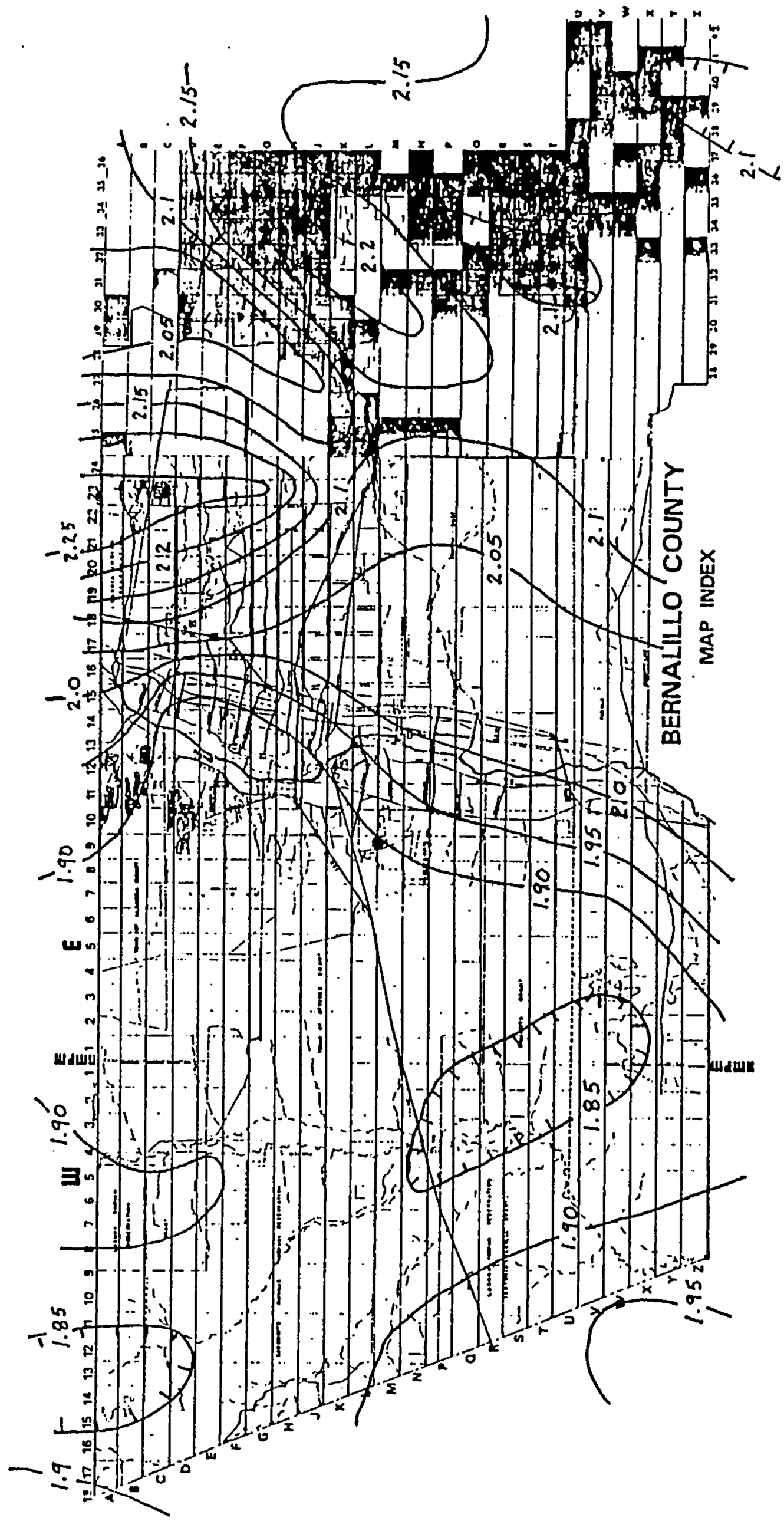
$Q_{AHYMO} = \underline{91.5 \text{ CFS}} < Q_{STREET} = 207.4$ CFS $\therefore$ ✓ OK

SUMMARY

LOCATION	Q_{STREET} (CFS)	Q_{AHYMO} (CFS)	COMPARISON
90TH ST. BTWN SANYGNACIO & SAGE	122.5	31.9	✓ OK
SAGE RD. BTWN. 90TH & 86TH	233.3	104.7	✓ OK
SAGE RD. BTWN. 86TH & UNSER	207.4	91.5	✓ OK

Figure C-1 - P_{60}

Isopluvials of 100-year, 1-hour precipitation.



From Figures 24 and 30, *NOAA Atlas 2, Volume IV*, and Y_{100} from equation on Table 11.

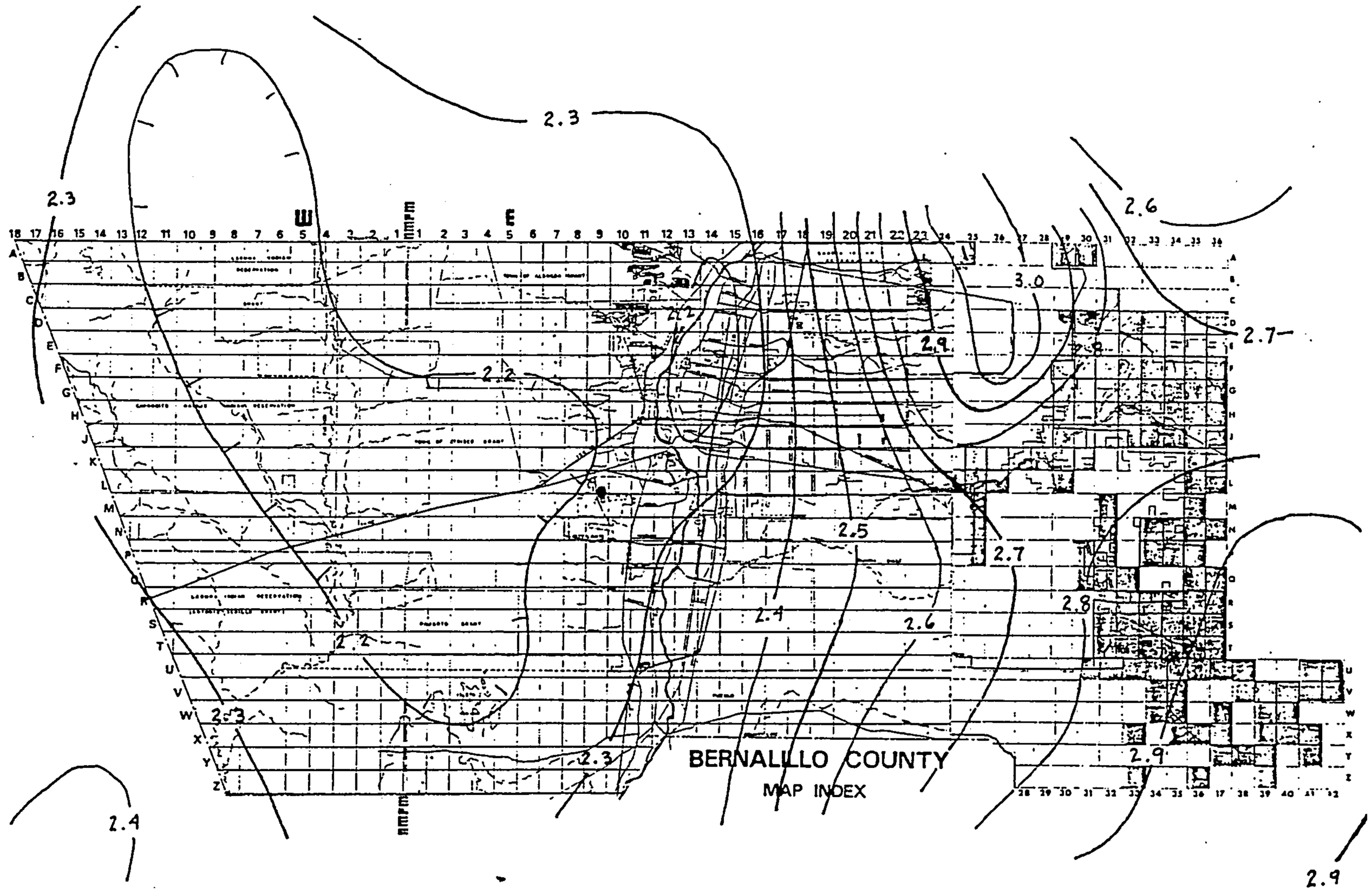


Figure C-2 - P_{360}

Isopluvials of 100-year, 6-hour precipitation.

From Figure 24, *NOAA Atlas 2, Volume IV*, with additional interpolated isopluvials.

MARK GOODWIN & ASSOCIATES
CONSULTING ENGINEERS

dmg

DRAINAGE REPORT

FOR

SUNSET WEST UNIT II

RECEIVED
AUG 24 1989
HYDROLOGY SECTION

Prepared for

FAIR PLAZA ASSOCIATES

August 1989

D. MARK GOODWIN
NEW MEXICO
8948
REGISTERED PROFESSIONAL ENGINEER

D. Mark Goodwin & Associates, P.A.
Consulting Engineers

P.O. BOX 21307, ALBUQUERQUE, NM 87154
(505) 265-0905

August 22, 1989

Public Works Department
Hydrology Section
CITY OF ALBUQUERQUE
PO Box 1293
Albuquerque, NM 87103

Re: Proposed Residential Subdivision: Sunset West Unit II, Phase I and Phase II

Gentlemen:

Please find enclosed the Drainage Report for the referenced project.

We wish to point out that this project will be developed in two phases. In addition to the detailed grading plan for Phase I, the conceptual plan for Phase II is included. Runoff and Capacity Calculations for both phases have been performed and are included.

If you should have questions, please call me.

Sincerely,

D. MARK GOODWIN AND ASSOCIATES, P.A.

Mark Goodwin

Mark Goodwin, P.E.

DMG/mbs

Enclosures

PROJECT LOCATION AND DESCRIPTION

The proposed Sunset West Unit II subdivision is planned for a 16 acre site located in southwest Albuquerque. The site is bounded by Sage Road on the south, San Ygnacio Road on the north, 90th Street on the east, and by the developed Sunset West Unit I on the west. The project was platted in 1980, therefore no platting action will be necessary to complete the project.

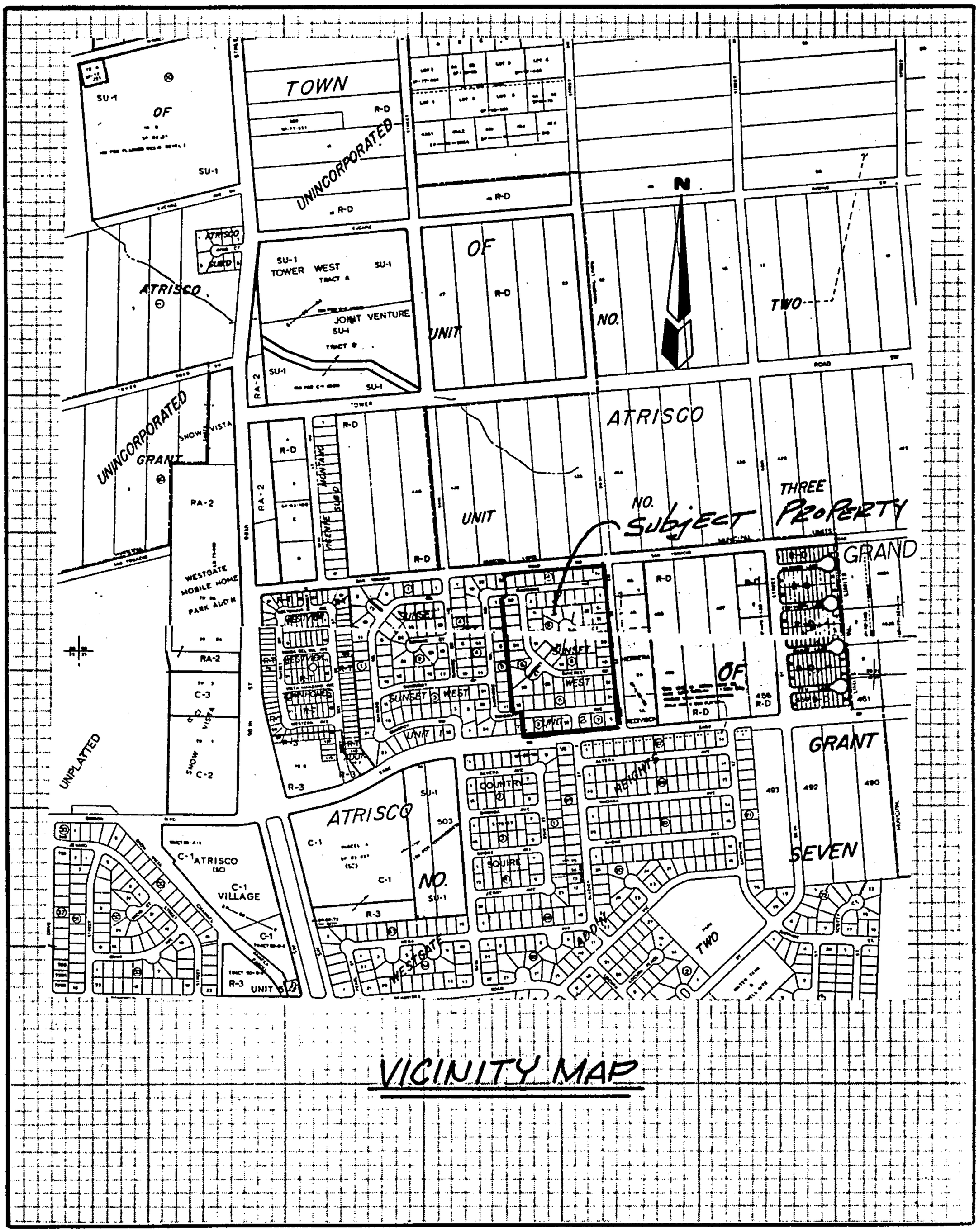
A drainage report entitled "Engineers Report on Storm Drainage for Sunset West Unit 2" was presented in February 1980 by Gordon Herkenhoff and Associates, (City File L9/D4). Due to the age of this report and changes in City policies and ordinances, a new report is deemed necessary.

The proposed site is relatively mild in slope, has medium cover, and is comprised of Bluepoint Soils (BCC). The difference in elevation from the northwest corner to the southeast corner is approximately 10 feet in 1300 feet. There is a small arroyo running through the project which was blocked off by construction of Unit I and no longer has any significance. Offsite flows currently enter this site at three locations. A 12.5 acre portion of Unit I discharges into Unit II from the west near the south boundary by means of a residential street, Sunbow Avenue. A one acre portion of Unit I discharges into Unit II from the west near the north boundary by way of a residential street, Sunridge Avenue. A 65 acre drainage area north and west of the site sheet flows to San Ygnacio Road where it is intercepted and conveyed to the road's terminus at the northwest corner of Unit II. Released runoff then sheet flows across Unit II. All offsite flows ultimately reach Sage Road for conveyance in a ditch section to the east.

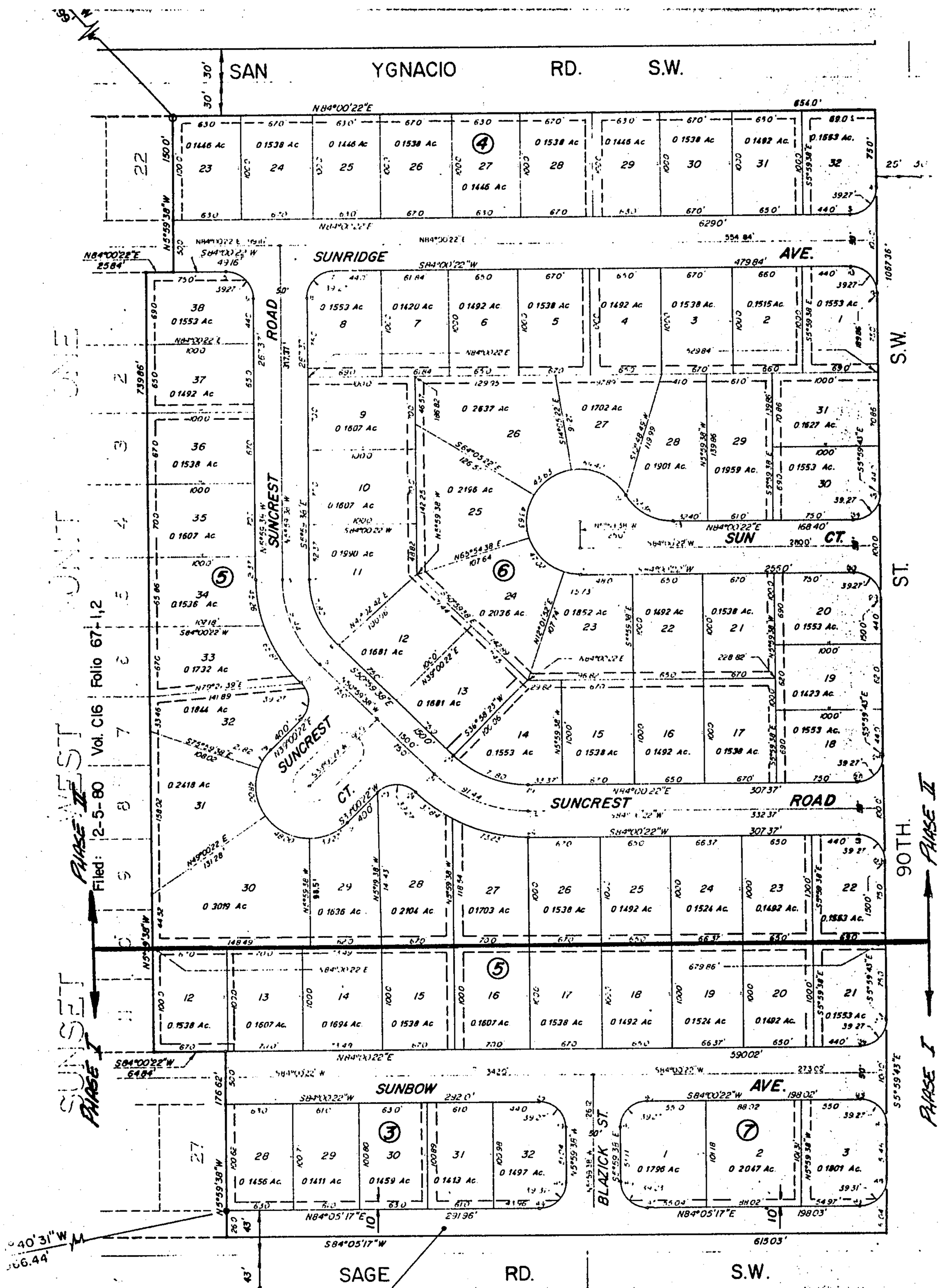
Development in the immediate area is typically residential and of an age such that tract and/or rear year ponding was specified and constructed under old Resolution 1972-2. FEMA panels 32 and 33 indicate that runoff from Unit II will contribute to a flood plain, however we will show in subsequent sections of this report that conditions have changed which would allow for free discharge of this particular site.

dmg D. MARK GOODWIN & ASSOC.
CONSULTING ENGINEERS

JOB Sunset WEST - Unit II
SUBJECT
JOB NO. SHEET OF
BY DATE
CHECKED DATE



VICINITY MAP


SAN YGNACIO RD. S.W.
SUNRIDGE AVE.
SUNCREST ROAD
SUNCREST CT.
SUN CT.
SUNBOW AVE.
BLAZICK ST.
90TH. ST.
SAGE RD. S.W.
PHASE I
PHASE II
Filed: 2-5-80 Vol. C16 Folio 67-1,2

PROPOSED DRAINAGE PROVISIONS

The intent of this plan is threefold:

1. To adequately intercept and/or convey offsite runoff to Sage Road. Sage is the natural collection point for these flows;
2. To collect onsite runoff by way of the interior streets and discharge directly to Sage Road; and
3. To provide a workable phasing scheme.

Offsite Flows

The offsite runoff generated by the 65 acres north of San Ygnacio Road would be intercepted by the extension of the existing half street section across the northern boundary of this project to the intersection with 90th street on the east boundary. An appropriate erosion control pad would be placed at the end of the pavement and stormwaters would be released at this point. Use of San Ygnacio for interception, and the ultimate release of stormwaters at the boundary of the project is just a continuation of the practice currently employed by the existing Unit to the west. Per the attached calculations, the peak rate of runoff from the 100 year - 6 hour event would be 76 cfs. Our calculations indicate that continuation of the existing street section will intercept this flow, and that there is adequate capacity to do so.

w/ i = 2.97"/HR

The offsite runoff generated by the 12.5 acres of the existing Unit I discharging at the end of Sunbow Avenue would be routed through Unit II with the extension of Sunbow to the east boundary at 90th Street. These flows would be collected by the proposed construction of one half of 90th and conveyed to Sage Road to the south for release. Calculations show this peak rate of runoff to be 34 cfs. Attached calculations show that Sunbow has adequate capacity for these flows.

The offsite runoff generated by the one acre of the existing Unit I carried by Sunridge Avenue would also be routed through Unit II by the extension of Sunridge to the east boundary at 90th Street. Again, 90th Street would be utilized to convey flows to Sage. The peak rate of runoff

from this area is anticipated to be 5 cfs. This is a negligible flow rate and can be easily accommodated.

The reader will note that all offsite flows have been determined and evaluated. Extensions of existing streets are all that will be necessary to convey this runoff through Unit II.

Onsite Flows

The primary purpose of this report is to show justification for direct discharge of onsite generated stormwaters. To accomplish this justification, we will show that direct discharge will not have an adverse impact on downstream systems.

As previously mentioned, FEMA panels 32 and 33 show that this site contributes runoff to a large flood zone. Per these maps, a large portion of the flood zone is due to contributory flows originating west of 98th Street, and from Westgate Heights via Gibson Blvd. This runoff ultimately reaches a large playa east of Sunset West at approximately Stinson Road.

In 1986/1987, the Albuquerque Metropolitan Flood Control Authority had constructed Phase III of the Snow Vista Channel approximately 1,000 feet west of 98th Street (see enclosed Drainage Map). The design analysis for this channel reach as prepared by Gordon Herkenhoff and Associates indicates interception and diversion away from the referenced flood zone of a peak 100 year flow rate of 844 cfs. and a volume of 2,800,00 cubic feet. In addition, the peak rate of runoff in Sage Road appears to have been reduced form 469 cfs. to 115 cfs. due to construction of a water block in Gibson at the Snow Vista crossing. Runoff from approximately 650 acres has been intercepted which gives us confidence in the cited figures.

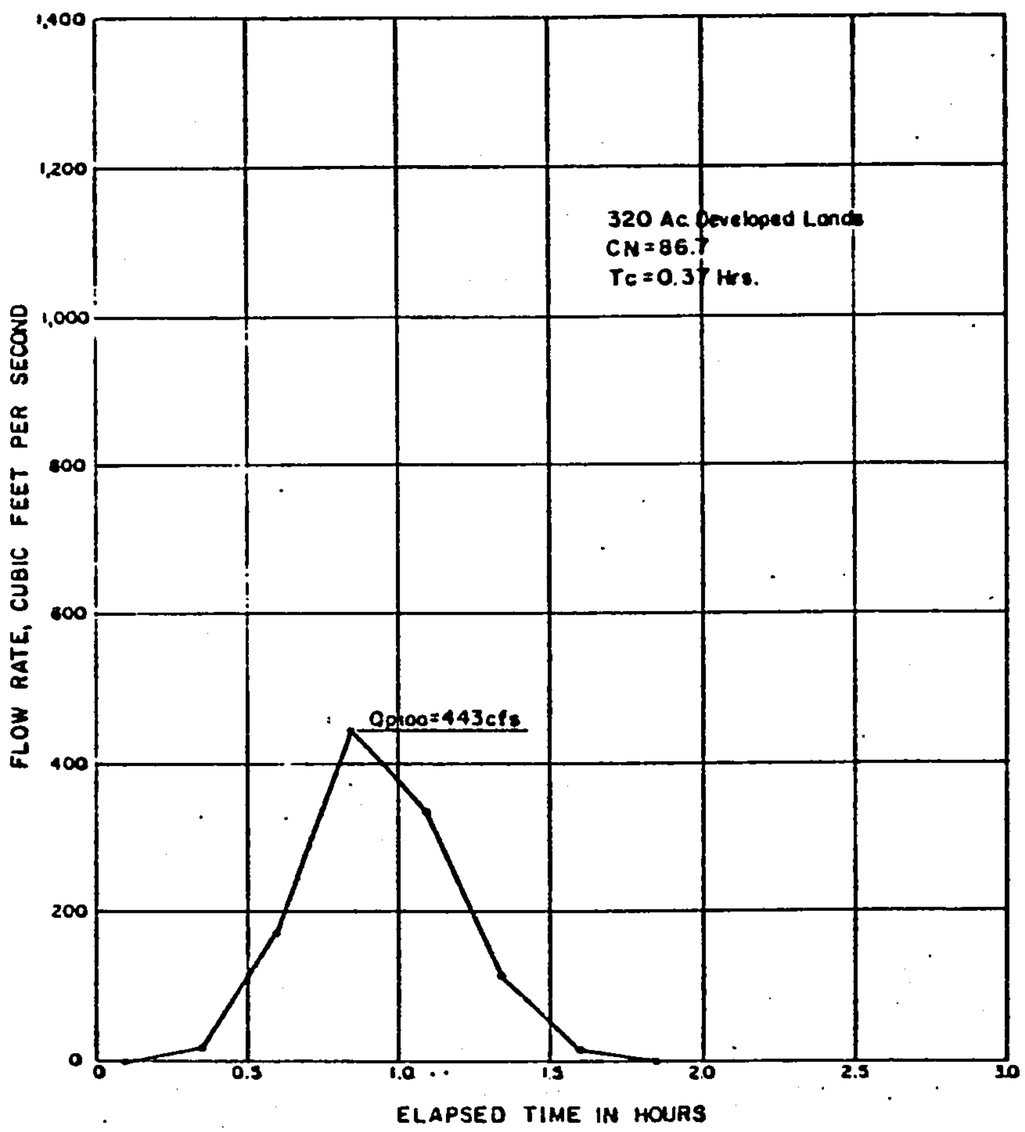
As with any natural depression or playa, the flood zone cannot be completely eliminated unless direct measures are taken to drain it. It is our understanding that the City ultimately intends to do this with the Amole storm drain. However, by removing 2,800,000 cubic feet of stormwater volume by construction of the Snow Vista Channel, a substantial portion of the flood zone has been removed.

Attached calculations indicate that direct discharge from Sunset West Unit II will increase the volume from a current level of 49,929 cubic feet to 87,375 cubic feet. This is an increase of 37,446 cubic feet. The increase would amount to 1.34% of the level removed by the Snow Vista Channel. In addition, taking into account the area of the flood zone, this increased volume would add approximately 0.02 feet to the water surface elevation. Those values are negligible, and should not prevent direct discharge for this project.

The other downstream system to consider is Sage Road and its ability to carry the proposed stormwaters. The peak rate of runoff in Sage just prior to 90th Street is 115 cfs., with a time of concentration of 29 minutes. The peak rate from Sunset West Unit II would be 45 cfs., at a time of concentration of 14 minutes. At worst case, the flows in Sage would be 160 cfs. Our calculations show the capacity of Sage to be 225 cfs. This is more than adequate, and would be increased when Sage is completed to its full section.

In conclusion, we have shown that in light of the Snow Vista Channel improvements, the FEMA maps are no longer valid. While the flood zone undoubtedly still exists, it cannot be near the size as shown, nor will the additional volume generated from Sunset West Unit II cause any measurable change. We feel that by demonstrating no adverse impact, that this site should be allowed free discharge. Furthermore, we have shown that Sage Road can accommodate the additional runoff without detriment.

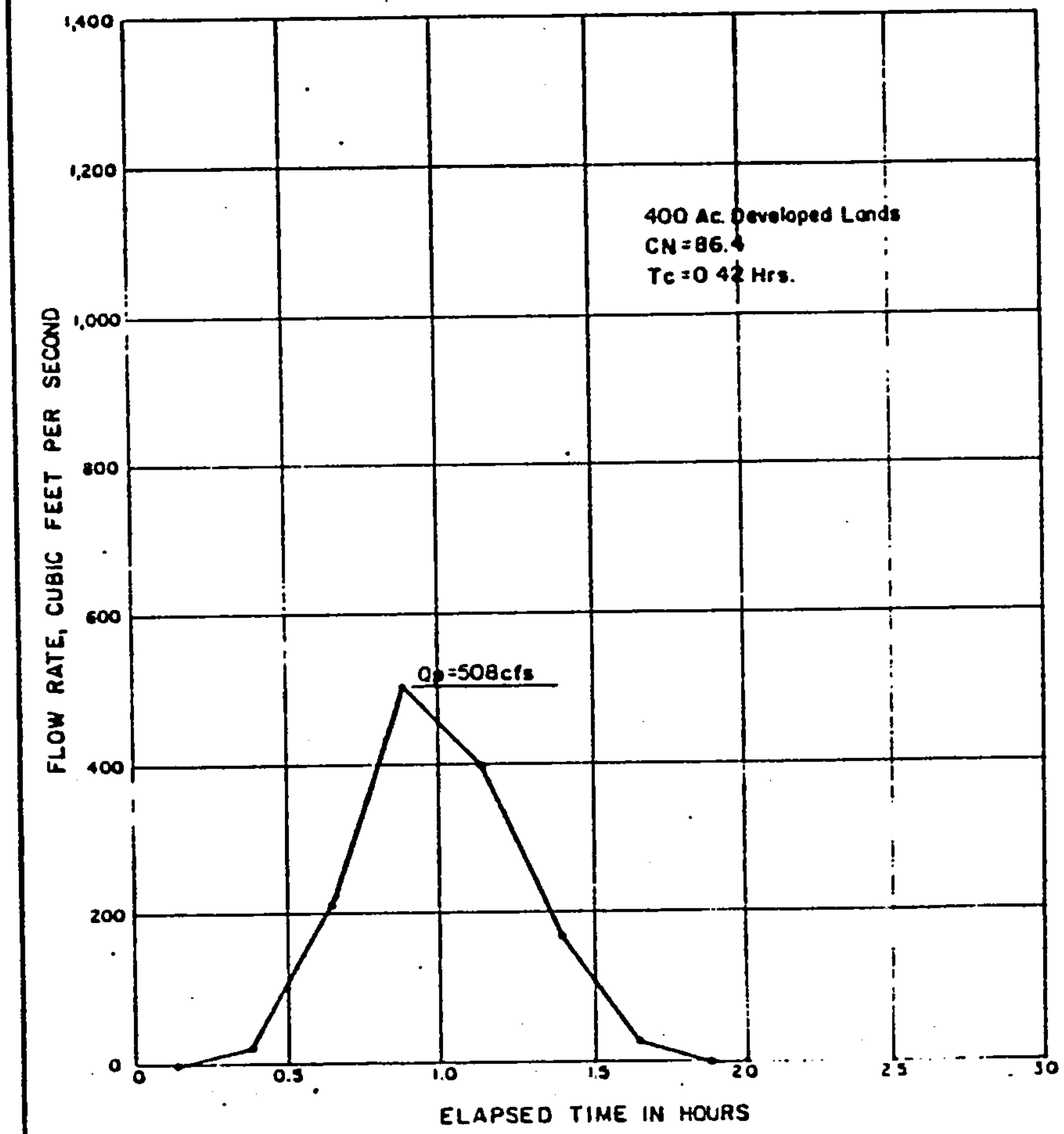
The developers propose to phase construction with Phase I being the south 18 lots fronting on Sunbow Avenue, and Phase II being the remaining 58 lots. Phase I would involve the construction of Sunbow and Blazick only. Sunbow would be barricaded at 90th Street while Blazick would connect with Sage for all weather access. Temporary erosion control would be provided at the end of Sunbow. Phase II would complete the subdivision including the extension of San Ygnacio to 90th Street, and the construction of the west half of 90th Street to Sage. This report provides detailed information for Phase I and enough conceptual information for Phase II to indicate the workability of this phasing scheme.



GORDON HERKENHOFF & ASSOCIATES, INC.
302 Eighth Street, N.W.
Albuquerque, New Mexico 87102
(505) 247-0294

Description: SNOW VISTA CHANNEL FLOW INTO EUCARIZ AVE.

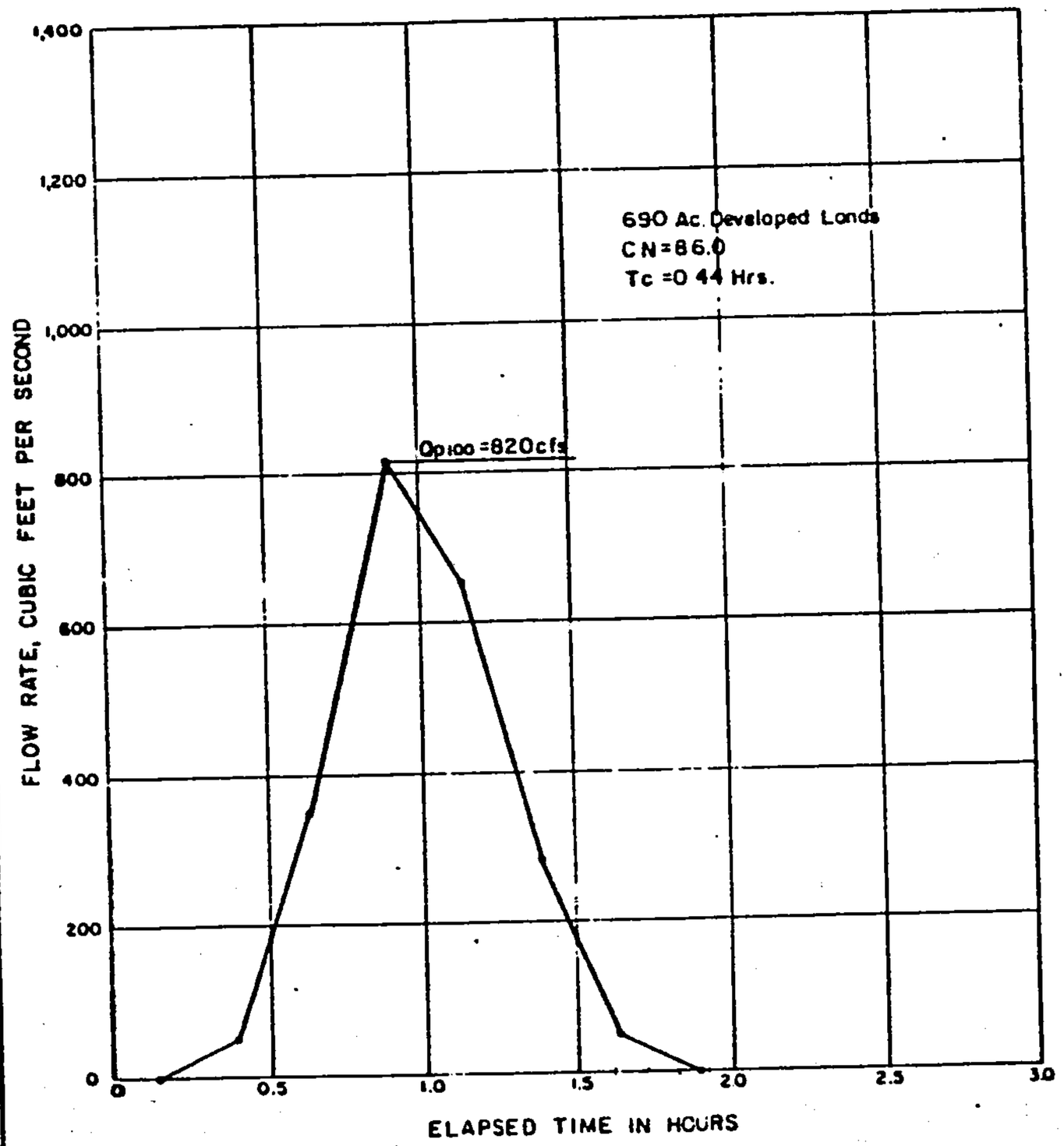
Date: DEC. 1980 | Drawing No. 1 | Page



GORDON HERKENHOFF & ASSOCIATES, INC.
302 Eighth Street, N.W.
Albuquerque, New Mexico 87102
(505) 247-0294

Description: SNOW VISTA CHANNEL FLOW AT SAN YGNACIO ROAD

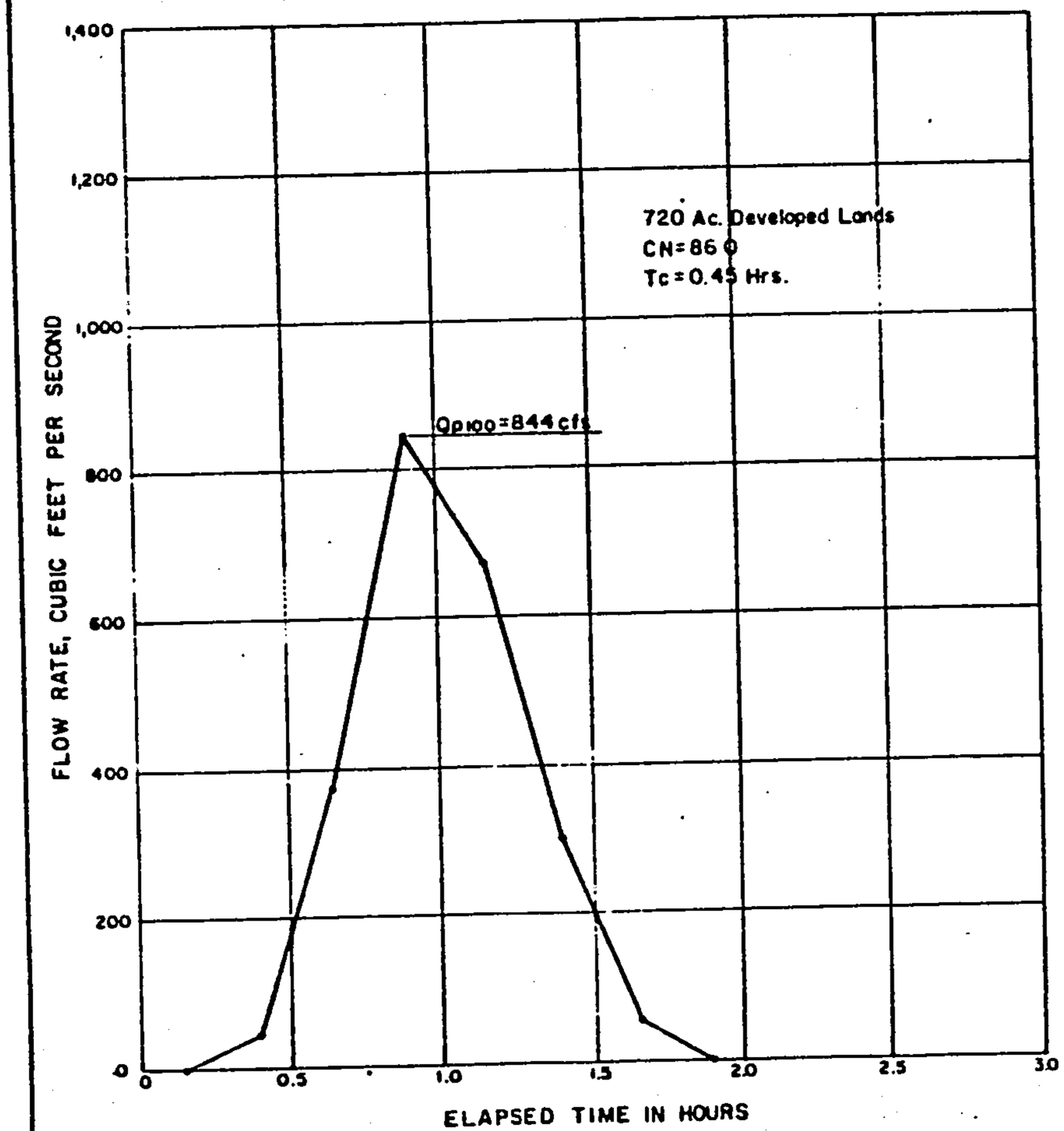
Date: DEC. 1980 | Drawing No. 2 | Page



GORDON HERKENHOFF & ASSOCIATES, INC.
302 Eighth Street, N.W.
Albuquerque, New Mexico 87102
(505) 247-8294

Description: SNOW VISTA CHANNEL FLOW ACROSS GIBSON BLVD.

Date DEC. 1980 | Drawing No. 3 | Page



GORDON HERKENHOFF & ASSOCIATES, INC.
302 Eighth Street, N.W.
Albuquerque, New Mexico 87102
(505) 247-8294

Description: SNOW VISTA CHANNEL FLOW INTO ENERGY DISSIPATOR

Date DEC 1980 | Drawing No. 4 | Page

D. MARK GOODWIN & ASSOC.
CONSULTING ENGINEERS

JOB Sunset West
SUBJECT Drainage
JOB NO. _____ SHEET 1 OF 10
BY MG DATE 8/16/89
CHECKED _____ DATE _____

Runoff Calculations

Off-site Runoff to San Ysidro:

D.A. (from Orthophoto) = 65 Ac.

P(100 yr - 6 hr) = 2.2 in.

Soil Type = A

10% developed (Mobile Home Park) → C = 0.42

Predominately Sheet Flow

Length = 5100'

ΔH = 5192 - 5109 = 83' → S = 0.016

$$T_c = 0.0078 \frac{(5100)^{.77}}{(.016)^{.385}} = 27 \text{ min.}$$

$$I = (2.2)(6.84)(27)^{-.51} = 2.80 \text{ in./hr.}$$

$$Q = CIA = 76 \text{ cfs}$$

dmg D. MARK GOODWIN & ASSOC.
CONSULTING ENGINEERS

JOB Sunset West
SUBJECT Drainage
JOB NO. _____ SHEET 2 OF 10
BY MG DATE 8/16/89
CHECKED _____ DATE _____

Off-Site Runoff to Sunbow:

D.A. = 12.5 Ac.
P = 2.2 in.
C = 0.66 from Herkenhoff Report
Length = 1525'
Slope (AVG. for Streets) = 1%

$T_c = \frac{0.0078\,(1525)^{.77}}{(.01)^{.385}} = 13$ min.

$I = 2.2\,(6.84)(13)^{-.51} = 4.07$ in/hr.

Q = 34 cfs

Vol. = 65,885 cu. ft.

Off-Site Runoff to Sunridge:

D.A. = 1 Ac.
P = 2.2 in.
C = 0.66
Length = 300'
Slope = 0.75 %

$T_c = 4$ min. $I = 7.42$ in/hr.

Q = 5 cfs

dmg D. MARK GOODWIN & ASSOC.
CONSULTING ENGINEERS

JOB Sunset West
SUBJECT Drainage
JOB NO. _____ SHEET 3 OF 10
BY MG DATE 8/16/8
CHECKED _____ DATE _____

On-Site Runoff - Phase I :

Existing :

D.A. = 3.3 Ac

P = 2.2

C = 0.40

Length = 715'

$\Delta H = 6' \longrightarrow S = 0.008'/'$

$$T_c = 0.0078 \frac{(715)^{.77}}{(.008)^{.385}} = 8 \text{ min.}$$

$$I = 2.2(6.84)(8)^{-.51} = 5.21 \text{ in/hr.}$$

Q (undeveloped) = 6.9 cfs

Vol. = CDA = 10,542 cu. ft.

Developed :

C = 0.70 all other parameters are same

Q (developed) = 12 cfs

Vol. = 18,448 cu. ft.

dmg D. MARK GOODWIN & ASSOC.
CONSULTING ENGINEERS

JOB Sunset West
SUBJECT Drainage
JOB NO. _____ SHEET 4 OF 10
BY MG DATE 8/14/89
CHECKED _____ DATE _____

On-site Runoff – Phase II :

Existing :

D.A. = 12.33 Ac.

P = 2.2 in.

C = 0.40

Length = 1300'

$\Delta H = 8'$ → S = 0.0062 %

$$T_c = 0.0078 \frac{(1300)^{.77}}{(.0062)^{.385}} = 14 \text{ min.}$$

$$I = 2.2(6.84)(14)^{-.51} = 3.92 \text{ in/hr.}$$

Q (undeveloped) = 19 cfs

Vol. = 39,387 cu. ft.

Developed :

C = 0.70

S = 0.75 %

L = 1539'

$$T_c = 0.0078 \frac{(1539)^{.77}}{(.0075)^{.385}} = 15 \text{ min.}$$

$$I = 2.2(6.84)(15)^{-.51} = 3.78 \text{ in/hr.}$$

Q = 33 cfs

Vol = 68,927 cu. ft.

dmg D. MARK GOODWIN & ASSOC.
CONSULTING ENGINEERS

JOB Sunset West
SUBJECT Drainage
JOB NO. _____ SHEET 5 OF 10
BY MG DATE 8/17/88
CHECKED _____ DATE _____

Runoff to SaGE:

D.A. = 58 Ac.

P = 2.2 in

C = 0.55

Since street flow is involved we will break T_c calculations into 2 components:

for Overland $T_c = 0.0078 \frac{L^{.77}}{S^{.385}}$

for Street flow $T_c = \frac{L}{60 V}$

Overland Flow:

L = 2200'

ΔH = 5192 − 5156 = 36' → S = 0.016 ft/ft

$T_{c_1} = 0.0078 \frac{(2200)^{.77}}{(.016)^{.385}}$ = 14 min.

Street Flow:

L = 3000'

ΔH = 5156 − 5108 = 48' → S = 0.016 ft/ft

V = 3.4 fps

dmg D. MARK GOODWIN & ASSOC.
CONSULTING ENGINEERS

JOB Sunset West
SUBJECT Drainage
JOB NO. _____ SHEET 6 OF 10
BY MG DATE 8/17/89
CHECKED _____ DATE _____

$T_{c_2} = \frac{3000}{3.4(60)} = 15$ min.

$T_{c_T} = 29$ min.

$I = (2.2)6.84(29)^{-.51} = 2.70$ in/hr.

$Q = 86$ cfs

Vol. = 254,753 cu. ft.

Runoff from Unit I to Sage:

D.A. = 12 Ac

P = 2.2 in

C = 0.66

L = 2004' S = 1% AVG.

$T_c = 0.0078 \frac{(2004)^{.77}}{(.01)^{.385}} = 16$ min.

$I = (2.2)(6.84)(16)^{-.51} = 3.66$ in/hr.

$Q = 29$ cfs

Vol. = 63,249 cu. ft.

$24' @ 1.5\% = 0.36'$

$0.67 - 0.36 = 0.31'$

$\text{AREA} = \frac{1}{2}(0.67 + 0.31)\ 24'$

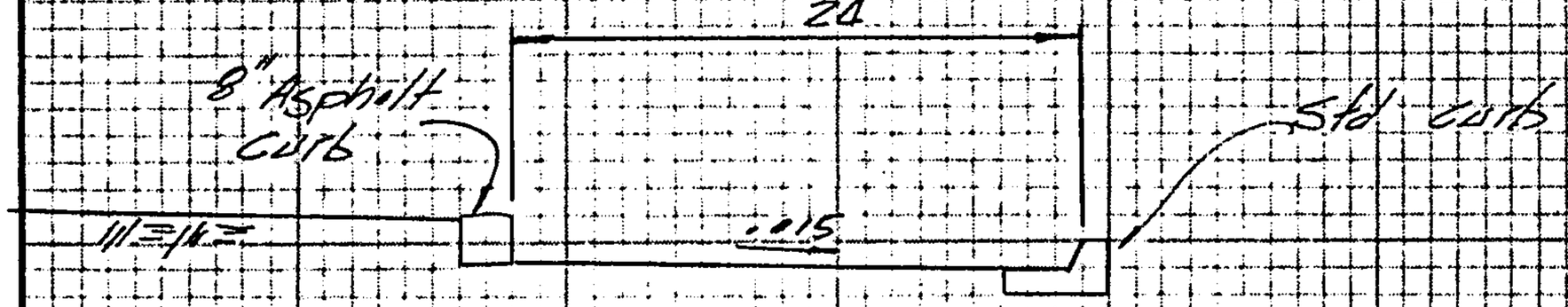
$= 11.76^{\#}$ OK

dmg D. MARK GOODWIN & ASSOC.
CONSULTING ENGINEERS

JOB Sunset West
SUBJECT Drainage
JOB NO. _____ SHEET 7 OF 10
BY MG DATE 8/18/89
CHECKED _____ DATE _____

STREET CAPACITIES

San Ygnacio : S = 2.25 %



S = 2.25% (field measurements)

n = 0.017

Area = 11.76 sq. ft. WP = 24.98 L.F.

$$V = \frac{1.486}{.017}\left(\frac{11.76}{24.98}\right)^{2/3}(.0225)^{1/2} = 7.93 \text{ fps}$$

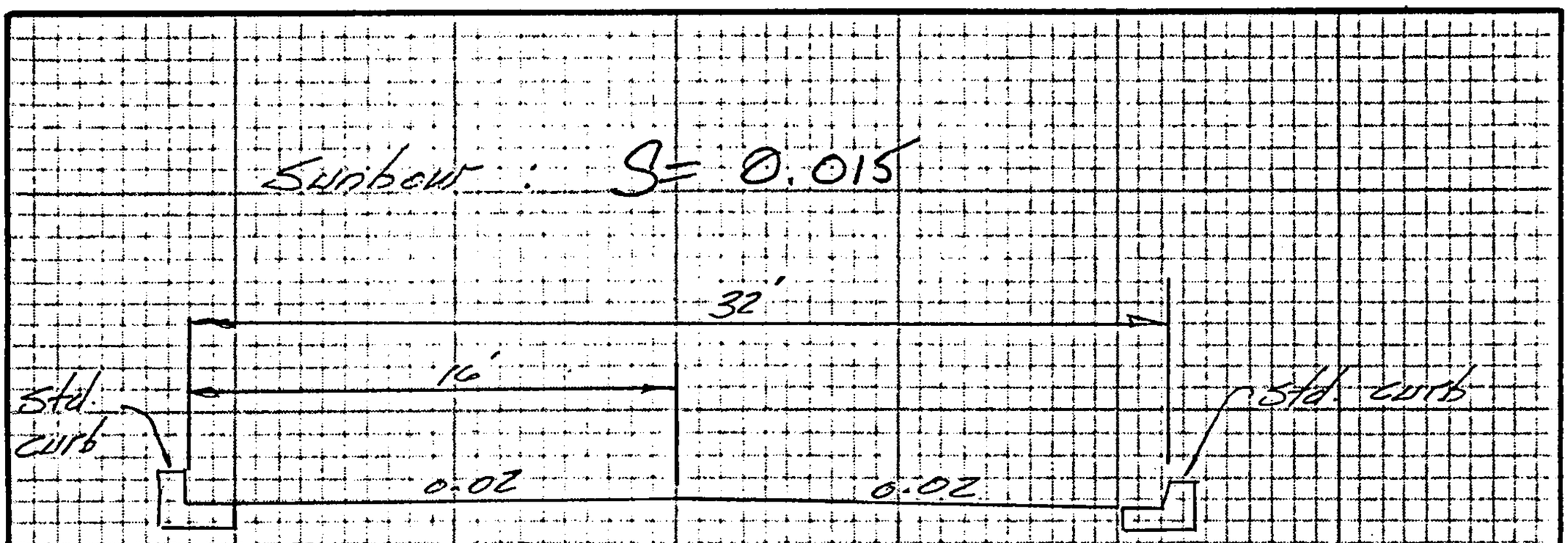
Q = 93 cfs ✓

Q reaching San Ygnacio = 76 cfs o.k.

dmg D. MARK GOODWIN & ASSOC.
CONSULTING ENGINEERS

JOB Sunset West
SUBJECT Drainage
JOB NO. _____ SHEET 8 OF 10
BY MG DATE 8/18/89
CHECKED _____ DATE _____

Sunbow : S= 0.015



S= 1.50%

n= 0.017

Area = 16.32 sq. ft. WP = 33.34'

$$V = \frac{1.486}{.017}\left(\frac{16.32}{33.34}\right)^{2/3}(.015)^{1/2} = 6.65 \text{ fps}$$

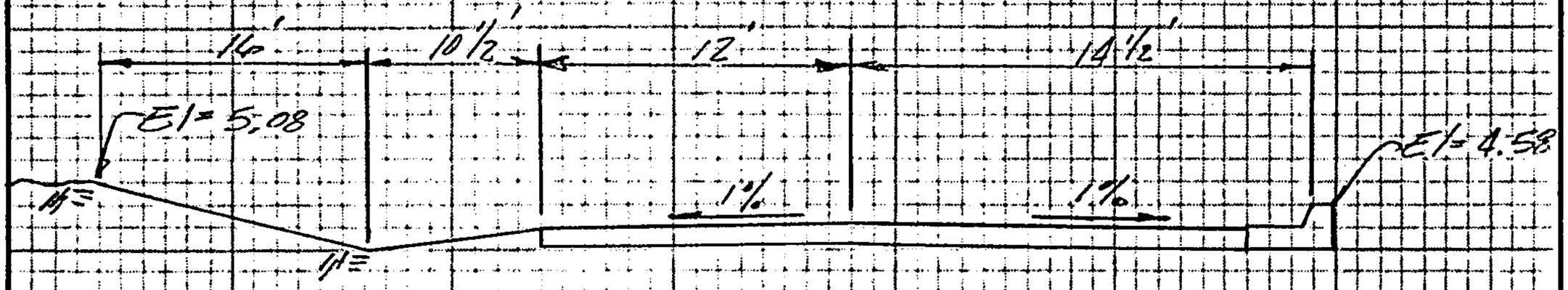
Q = 109 cfs

Q in Sunbow = 34 cfs o.k.

dmg D. MARK GOODWIN & ASSOC.
CONSULTING ENGINEERS

JOB Sunset West
SUBJECT Drainage
JOB NO. _____ SHEET 2 OF 10
BY _____ DATE _____
CHECKED _____ DATE _____

SAGE



From attached rating curve:

n (ditch) = 0.03
n (street) = 0.017
Q (ditch) = 147 cfs
Q (street) = 303 cfs → Q_T = 450 cfs

flow in Sage = 100 cfs

SECTION 2 - MAIN CHANNEL - CHANNEL - STA 1 + 0 - Q = 450

	FLOW RATE	AREA	VEL	CONVEY	n-VAL	RCH	WET PR
CHANNEL	146.5	34.7	4.2	2031	0.030	100	27
OVERBNK	303.5	38.5	7.9	4209	0.017	100	28

WSEL = 106.79 VEL HD = 0.741 JUMP ELEV = 0.00

CRWSEL = 106.79 EN LOSS = 1.500 STA JUMP = 0.00

TOP WID = 54 EN GD LN = 107.53 JMP LOSS = 0.000

CHNL SLP = 1.0000 % DEPTH = 1.85 RAPID FLOW

SECTION DATA

POINT	STATION	ELEVATION	POINT	STATION	ELEVATION
1	0.00	106.58	2	16.00	104.94
3	27.00	105.32	4	39.00	105.44
5	53.00	105.22	6	54.00	106.08

STA OF LEFT OVERBANK = 0 STA OF RIGHT OVERBANK = 27

City of Albuquerque
P. O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87
PUBLIC WORKS DEPARTMENT

July 20, 1995

CERTIFICATE OF COMPLETION AND ACCEPTANCE

Sunset West
P.O. Box 44698
Albuquerque, NM 87197

RE: PROJECT NO. 4991.80, SUNSET WEST, MAP NO. L&M-9

Dear Sir:

This is to certify that the City of Albuquerque accepts Project No. 4991.80 as being completed according to approved plans and construction specifications. Please be advised this certificate of completion and acceptance shall only become effective upon final plat approval and filing in the office of the Bernalillo County Clerk's Office.

The project is described as follows:

- Installed an 8" water line and placed 25' of paving on 90th Street, and 24' of paving on San Ignacio Street.
- Installed an 8" sanitary sewer outfall in Sage Road from 90th Street to Sapphire Street.
- Constructed sidewalks which included all wheel-chair ramps and approximately 70' of sidewalks along the north side of Sunbow Ave.
- Constructed a retention pond with concrete rundowns and a 6' chainlink fence was also installed.

RECEIVED
JUL 31 1995
HYDROLOGY DIVISION

The contractor's correction period began the date of this letter and is effective for a period of one (1) year.

Sincerely,

Rick Roybal, P.E.
City Engineer,
Engineering Group
Public Works Department

Sincerely,

Russell B. Givler, P.E.
Chief Construction Engineer,
Engineering Group
Public Works Department

cc: Leedshill-Herkenhoff
CCM, Inc.
Ryals Engineering
Fred Aguirre, Engineering Group, PWD
Theresa Lucero, Engineering Group, PWD
Terri Martin, Engineering Group, PWD
Martin Barker, Engineering Group, PWD
Steve Gonzales, Special Assessments, DFM
Sam Hall, Operations Group, PWD
Jim Fink, Operations Group, PWD
Dean Wall, Engineering Group, PWD
Stuart Reeder, Water/Wastewater Group, PWD
Ray Chavez, Traffic Engineering, PWD
Josie Gutierrez, New Meter Sales, Finance Group, PWD
Richard Zamora, Engineering Group, PWD
f/Project No. 4991.80
f/Readers
f/Warranty:Contract

95076330 3991

PERMANENT EASEMENT

Grant of Permanent Easement, between Sunset West ("Grantor"), whose address is PO Box 44698 Rio Rancho, NM 87174 and the City of Albuquerque, a New Mexico municipal corporation ("City"), whose address is P.O. Box 1293, Albuquerque, New Mexico, 87103.

Grantor grants to the City an exclusive, permanent easement ("Easement") in, over, upon and across the real property described on Exhibit "A" attached hereto ("Property")* for the construction, installation, maintenance, repair, modification, replacement and operation of Temporary Retention Pond, together with the right to remove trees, bushes, undergrowth and any other obstacles upon the Property if the City determines they interfere with the appropriate use of this Easement.

Grantor covenants and warrants that Grantor is the owner in fee simple of the Property, that Grantor has a good lawful right to convey the Property or any part thereof and that Grantor will forever warrant and defend the title to the Property against all claims from all persons or entities.

The grant and other provisions of this Easement constitute covenants running with the land for the benefit of the City and its successors and assigns until terminated.

WITNESS my hand and seal this _____ day of _____, 199__.

GRANTOR:

_____
(Individual)

GRANTOR:

By: Mark T. Taylor
Its: Agent
(Corporation or Partnership)

* Legal Description
Lots 16, 26 & 27, Sunset West Subdivision Unit II, Filed 10/31/80, Vol C-17, Pg 123

STATE OF NEW MEXICO
COUNTY OF BERNALILLO
FILED FOR RECORD

1995 AUG -2 AM 10: 22

BK 95-18 PG 3991-3993
JUDY D. WOODWARD
CO. CLERK & RECORDER
DEPUTY

153C

9/90

INDIVIDUAL

STATE OF New Mexico)
) ss
COUNTY OF Bernalillo)

The foregoing instrument was acknowledged before me this 12th day of July, 1995, by Mark F. Pagels.

Susan Rasinski
Notary Public

My Commission Expires:
9-3-96

OFFICIAL SEAL
SUSAN RASINSKI
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires 9-3-96

CORPORATION

STATE OF _____)
) ss
COUNTY OF _____)

The foregoing instrument was acknowledged before me this _____ day of _____, 199__, by _____, _____ of _____, a _____ corporation, on behalf of the corporation.

_____
Notary Public

My Commission Expires:

_____

PARTNERSHIP

STATE OF _____)
) ss
COUNTY OF _____)

The foregoing instrument was acknowledged before me this _____ day of _____, 199__, by _____, partner(s), on behalf of _____, a partnership.

_____
Notary Public

My Commission Expires:

_____

(EXHIBIT "A" ATTACHED)

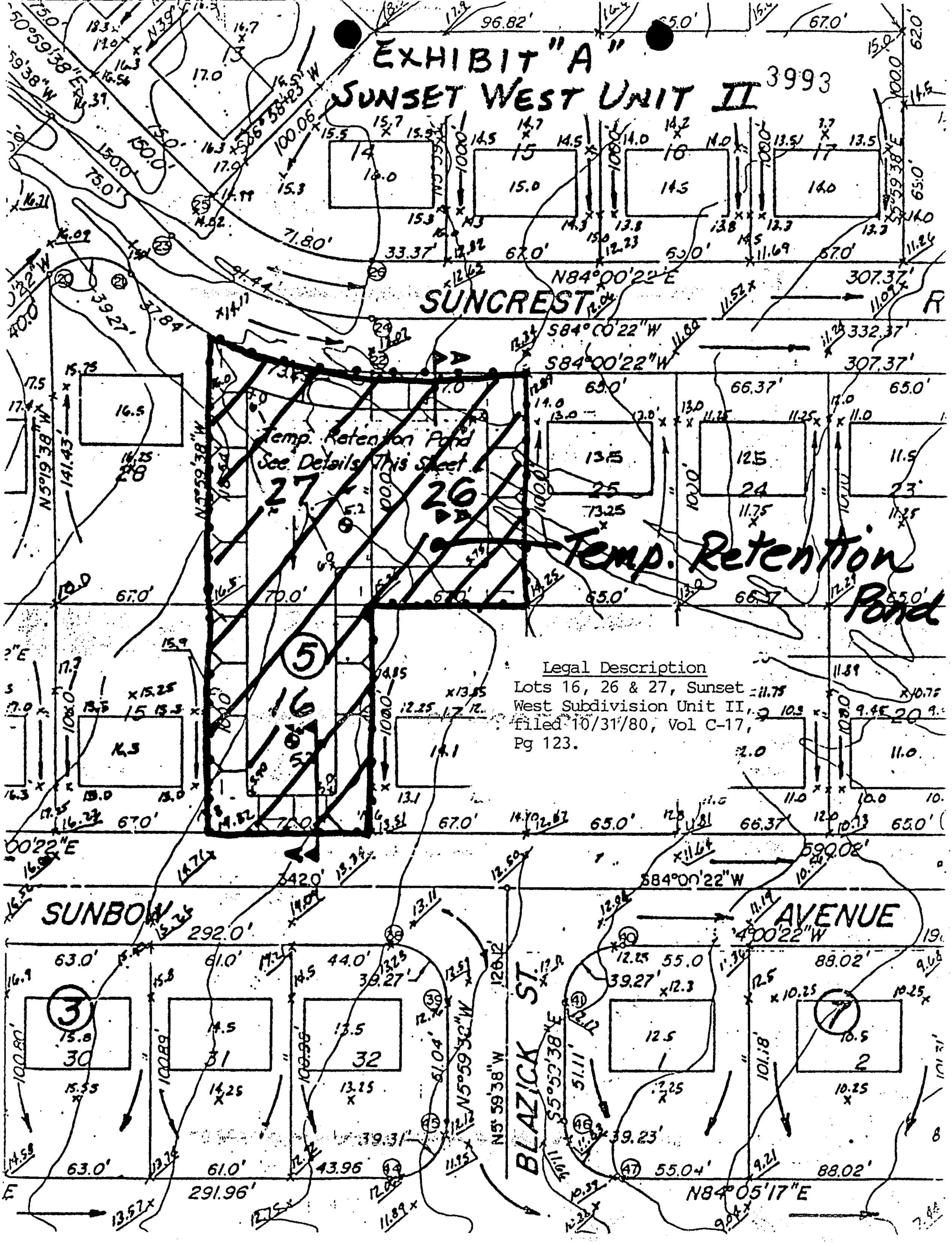


EXHIBIT "A"
SUNSET WEST UNIT II
3993
SUNCREST
SUNBOW
AVENUE
BLAZICK ST.
Temp. Retention Pond
See Details This Sheet
Temp. Retention Pond
N84°00'22"E
S84°00'22"W
N84°05'17"E
Legal Description
Lots 16, 26 & 27, Sunset West Subdivision Unit II, filed 10/31/80, Vol C-17, Pg 123.

AGREEMENT AND COVENANT

This Agreement and Covenant, between the City of Albuquerque, New Mexico ("City") and Sunset West, ("User") is made in Albuquerque, New Mexico and is entered into as of the date of recording this Agreement with the Bernalillo County Clerk.

1. Recital. The User is the owner of certain real property ("User's Property") located at Sunset West Unit II, in Albuquerque, New Mexico, and more particularly described as:

Lots 16, 26 & 27, Sunset West Subdivision Unit II
filed October 31, 1980, Vol C-17, Pg 123

The City is the owner of certain real property, easement or public right-of-way ("City's Property") in the vicinity of, contiguous to, abutting or within User's Property, and more particularly described as: Permanent Easement

Lots 16, 26 & 27, Sunset West Subdivision Unit II
filed October 31, 1980, Vol C-17, Pg 123

The User wishes to construct upon, improve or repair and to maintain the following "Improvement" on the City's Property (or already has done so):

Temporary Retention Pond

A sketch of the proposed or existing Improvement is attached as Exhibit A and made a part of this Agreement.

The City agrees to permit the Improvement to exist on the City's Property provided the User complies with the terms of this Agreement.

2. City Use of City's Property and City Liability. The City has the right to enter upon the City's Property at any time and perform whatever inspection, installation, maintenance, repair, modification or removal ("Work") it deems appropriate without liability to the User. If the Work affects the Improvement the City will not be financially or otherwise responsible for rebuilding or repairing the Improvement. The User promptly will repair the Improvement to the City's satisfaction. The cost of repairing the Improvement will be paid by User.

3. User's Responsibility for Improvement. The User will be solely responsible for constructing, maintaining, repairing and, if required, removing the Improvement, all in accordance with standards required by the City as per the approved Grading and Drainage Plan M-9/D4 on file at City Hydrology. The User will be solely responsible for paying all related costs. The User will not permit the Improvement to constitute a hazard to the health or safety of the general public or to interfere with the City's use of the City's Property. The User will conform with all

applicable laws, ordinances and regulations.

4. Use of the Improvement. If the City's Property is a public right-of-way, it shall be open to the use of the general public at all times, subject to reasonable curtailment during periods of construction, maintenance or repair.

5. Demand for Repair, Modification or Removal. The City may send written notice ("Notice") to the User requiring the User to repair, modify or remove the Improvement within 30 days ("Deadline") and the User will comply promptly with the requirements of the Notice. If removal is demanded, the City also may require the User to return the City's Property to its original condition by the Deadline. The User will perform all required work by the Deadline, at User's sole expense.

6. Failure to Perform by User and Emergency Work by City. If the User fails to comply with the terms of the Notice by the Deadline stated, or, if the City determines that an emergency condition exists, the City may perform the work itself. The City then may assess the User for the cost of the work and for any other expenses or damages which result from User's failure to perform. The User agrees promptly to pay the City the amount assessed. If the User fails to pay the City within thirty (30) days after the City gives the User written notice of the amount due, the City may impose a lien against User's Property for the total resulting amount.

7. Cancellation of Agreement and Release of Covenant. This Agreement may be cancelled and User's covenants released by the City at will by the City's mailing to the User notice of the City's intention to record a Cancellation and Release with the Bernalillo County Clerk. The Cancellation and Release will be effective thirty (30) days after the date of mailing the notice to the User unless a later date is stated in the notice or the Cancellation and Release. After the effective date, the City will record the Cancellation and Release with the Bernalillo County Clerk.

8. Condemnation. If any part of the User's Property is ever condemned by the City, the User will forego all claims to compensation for any portion of User's structure which encroaches on City Property and for severance damage to the remaining portion of User's structure on User's Property.

9. Assessment. Nothing in this Agreement shall be construed to relieve the User, his heirs, assigns and successors from an assessment against User's Property for improvements to the City Property under a duly authorized and approved Special Assessment District. The parties specifically agree that the value of the Improvement will not reduce the amount assessed by the City.

STATE OF NEW MEXICO
COUNTY OF BERNALILLO
FILED FOR RECORD

1995 AUG -2 AM 10: 22

BK 95-18 PG 3994-3999
JUDY D. WOODWARD
CO. CLERK & RECORDER
DEPUTY

j:\rpd4\agmcov.agm

Approved as to form by
Legal Department 2/23/95

10. Notice. For purposes of giving formal written notice to the User, User's address is:

Sunset West
c/o Mark Pagels
PO Box 44698
Rio Rancho, NM 87174

Notice may be given to the User either in person or by mailing the notice by regular U.S. mail, postage paid. Notice will be considered to have been received by the User within 3 days after the notice is mailed if there is no actual evidence of receipt. The User may change User's address by giving written notice of the change by certified mail, return receipt requested, to the City Engineer at P.O. Box 1293, Albuquerque, New Mexico 87103.

11. Indemnification. The User agrees to defend, indemnify and hold harmless the City, its officials, agents and employees from and against any and all claims, actions, suits or proceedings of any kind brought against said parties as a result of User's use of the City's Property. To the extent, if at all, Section 56-7-1 NMSA 1978 is applicable to this Agreement, this Agreement to indemnify will not extend to liability, claims, damages, losses or expenses, including attorney's fees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications by the indemnitee, or the agents or employees of the indemnitee; or (2) the giving of or the failure to give direction or instructions by the indemnitee, where such giving or failure to give directions or instructions is the primary cause of bodily injury to persons or damage to property.

12. Term. This Agreement shall continue until revoked by the City pursuant to Section 7 above.

13. Binding on User's Property. The covenants and obligations of the User set forth herein shall be binding on User, his heirs, assigns and successors and on User's Property and constitute covenants running with User's Property until released by the City.

14. Entire Agreement. This Agreement contains the entire agreement of the parties and supersedes any and all other agreements or understandings, oral or written, whether previous to the execution hereof or contemporaneous herewith.

15. Changes of Agreement. Changes to this Agreement are not binding unless made in writing, signed by both parties.

Approved as to form by
Legal Department 2/23/95

16. Construction and Severability. If any part of this Agreement is held to be invalid or unenforceable, the remainder of the Agreement will remain valid and enforceable if the remainder is reasonably capable of completion.

17. Captions. The captions to the sections or paragraphs of this Agreement are not part of this Agreement and will not affect the meaning or construction of any of its provisions.

CITY OF ALBUQUERQUE

By: _____
Lawrence Rael
Chief Administrative Officer
Dated: 7/31/95

USER: SUNSET WEST

By: _____
Its: New Mexico Agent
Dated: 7-20-95

APPROVED:

Robert E. Gurule, Director
Public Works Department
7/28/95

Reviewed by:

7/24/95
Rick Roybal, City Engineer
Construction Management/PWD
7-21-95

CITY'S ACKNOWLEDGEMENTS

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on August 1, 1995, 1995, by Lawrence Rael, Chief Administrative Officer for the City of Albuquerque, a New Mexico municipal corporation, on behalf of the corporation.

Diana M. Chavez
Notary Public

My Commission Expires:

August 19, 1998

OFFICIAL SEAL
DIANA M. CHAVEZ
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires Aug. 19, 1998

j:\rpd4\agmcov.agm

Approved as to form by
Legal Department 2/23/95

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on August 1st, 199 5, by Robert E. Gurule, Director, Public Works Department for the City of Albuquerque, a New Mexico municipal corporation, on behalf of the corporation.

Notary Public

My Commission Expires:

1-27-98

USER'S ACKNOWLEDGEMENT

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

OFFICIAL SEAL
SUSANNE RASINSKI
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires 9-3-96

This instrument was acknowledged before me on July 20, 19 95, by Mark Pagels, Sr., New Mexico Agent, on behalf of Sunset West.

Notary Public

My Commission Expires:

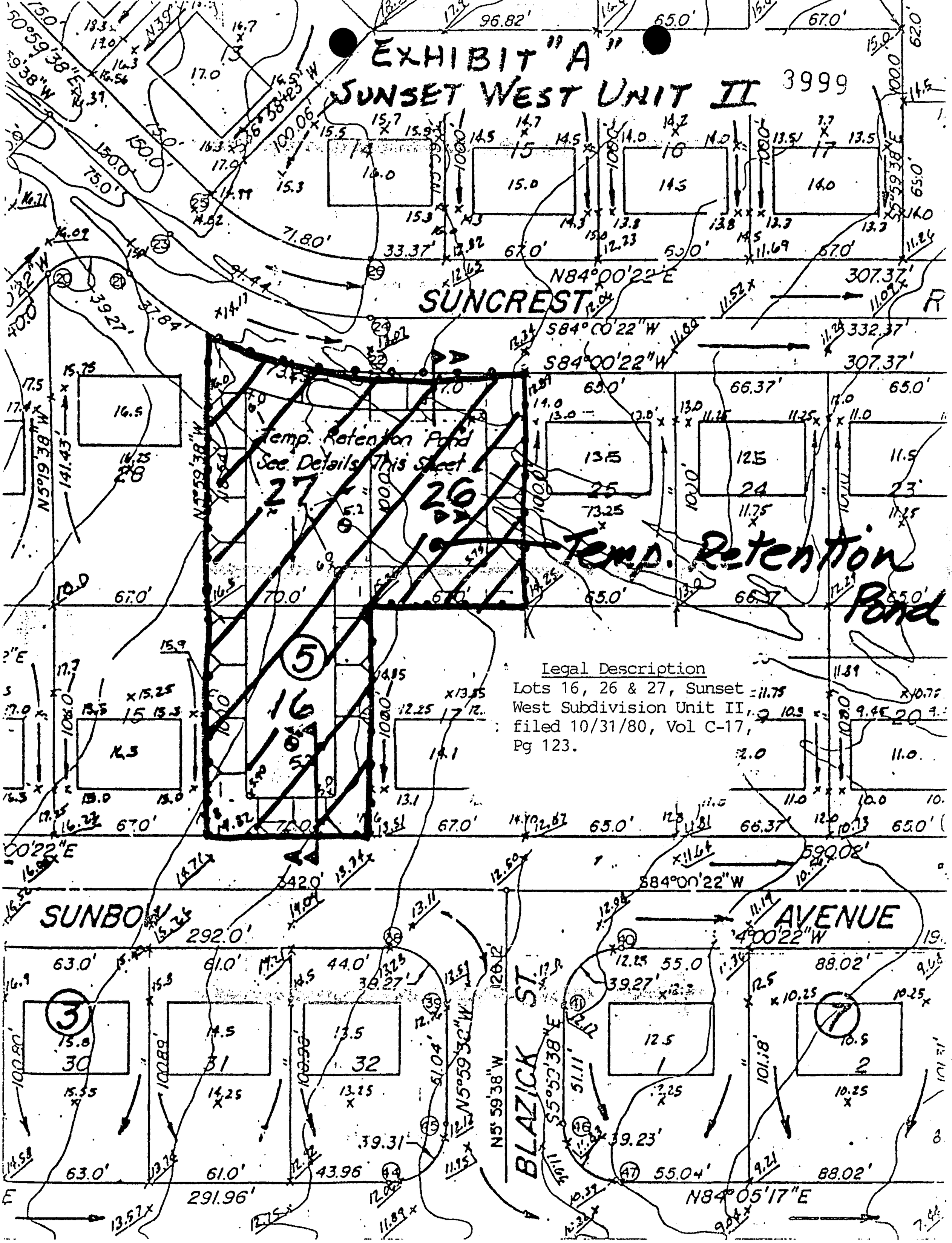
9/3/96

Approved as to form by
Legal Department 2/23/95

EXHIBIT "A"

SUNSET WEST UNIT II

3999



Legal Description

Lots 16, 26 & 27, Sunset West Subdivision Unit II, filed 10/31/80, Vol C-17, Pg 123.

CONTRACT CONTROL FORM

PRELIMINARY REVIEW

Project # 4991.E2 4991.A1

CCN # 9560698

~~New~~ or Ext. #

Contact Person Thomas

Phone No. 768-2505

Type of Agreement: Agreement and Covenant & Permanent Easement

Description/Project: Sunset West Unit II

Public Works/Div: Eng / Design

Developer: Sunset West

Contract Amount $ -0-

Contract Amount $

SIA Contract Period: -

SW'S Contract Period: -

Project Completed Date

DRAFT CONTRACT:

Recd by Legal: / Rejected/Returned to Dept: /

Returned to Legal: / Approved: Initials:

FINANCIAL GUARANTY:

Letter of Credit No. Date Attached: Yes ___ No ___ Initial ___

Other: Type No. Attached: Yes ___ No ___ Initial ___

FINAL CONTRACT REVIEW

APPROVALS REQUIRED:

	Date Delivered	Returned to Dept	Approved by	Approval Date
Purchasing:	/	/		
Asst. City Attorney:	/	/		
~~CIP:~~ Hydrology	7-21-95 TSL	/		
City Attorney:	/	/		
CAO:	/	/		
Other: Hydrology	7-18-95 TSL	7-19-95 JPC	~~Not Approved-Obsolete~~ JPC	
~~Council: Hydrology~~	~~7-21-95 TSL~~ EC No:	Approved:		Date: 7-21-95

DISTRIBUTION:

	Date:	By:
User Department		
Vendor		
City Clerk		
Treasury		

Revised 7/93
Doc. 1930/lvb

CONTRACT CONTROL FORM

PRELIMINARY REVIEW

Project # 4991.E2 4991.A1

CCN # 9560698

~~New~~ or Ext. #

Contact Person Thuan

Phone No. 768-2505

Type of Agreement: Agreement and Covenant & Permanent Easement

Description/Project: Sunset West Unit II

Public Works/Div: Eng / Design

Developer: Sunset West

Contract Amount $ -0-

Contract Amount $

SIA Contract Period: ___ - ___

SW'S Contract Period: ___ - ___

Project Completed Date ___

DRAFT CONTRACT:

Recd by Legal: ___ Rejected/Returned to Dept: ___/___

Returned to Legal: ___/___ Approved: ___ Initials: ___

FINANCIAL GUARANTY:

Letter of Credit No. ___ Date ___ Attached: Yes ___ No ___ Initial ___

Other: Type ___ No. ___ Attached: Yes ___ No ___ Initial ___

FINAL CONTRACT REVIEW

APPROVALS REQUIRED:

	Date Delivered	Returned to Dept	Approved by	Approval Date
Purchasing:	/	/		
Asst. City Attorney:	/	/		
CIP:	/	/		
City Attorney:	/	/		
CAO:	/	/		
Other: Hydrology	2-18-95 / TSC	7-19-95 / JPC	Not Approved-Obsole	
Council:	EC No:	Approved:	Date:	

DISTRIBUTION:

	Date:	By:
User Department		
Vendor		
City Clerk		
Treasury		

Revised 7/93
Doc. 1930/lvb

D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors
P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 345-2010

January 20, 1995

Mr. Scott Davis
Hydrology Department
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87199

Re: Sunset West Unit 2 (M9/D4)

Dear Mr. Davis:

Upon review of the subject work order drawings and the approved drainage report, we noted that there was not an analysis of the internal streets as to the type of curb (mountable vs. standard) that was appropriate from a drainage standpoint. Since there is a considerable cost difference between the two types of curb and driveway construction at a later date, it is far more preferable to utilize mountable curb wherever possible.

Attached you will find an analysis of the internal streets and a marked up grading plan that indicates which type of curb is appropriate. If you agree with this analysis we would like to make this a field change and "As-Built" said change.

Please feel free to contact me if you have any questions or comments.

Sincerely,

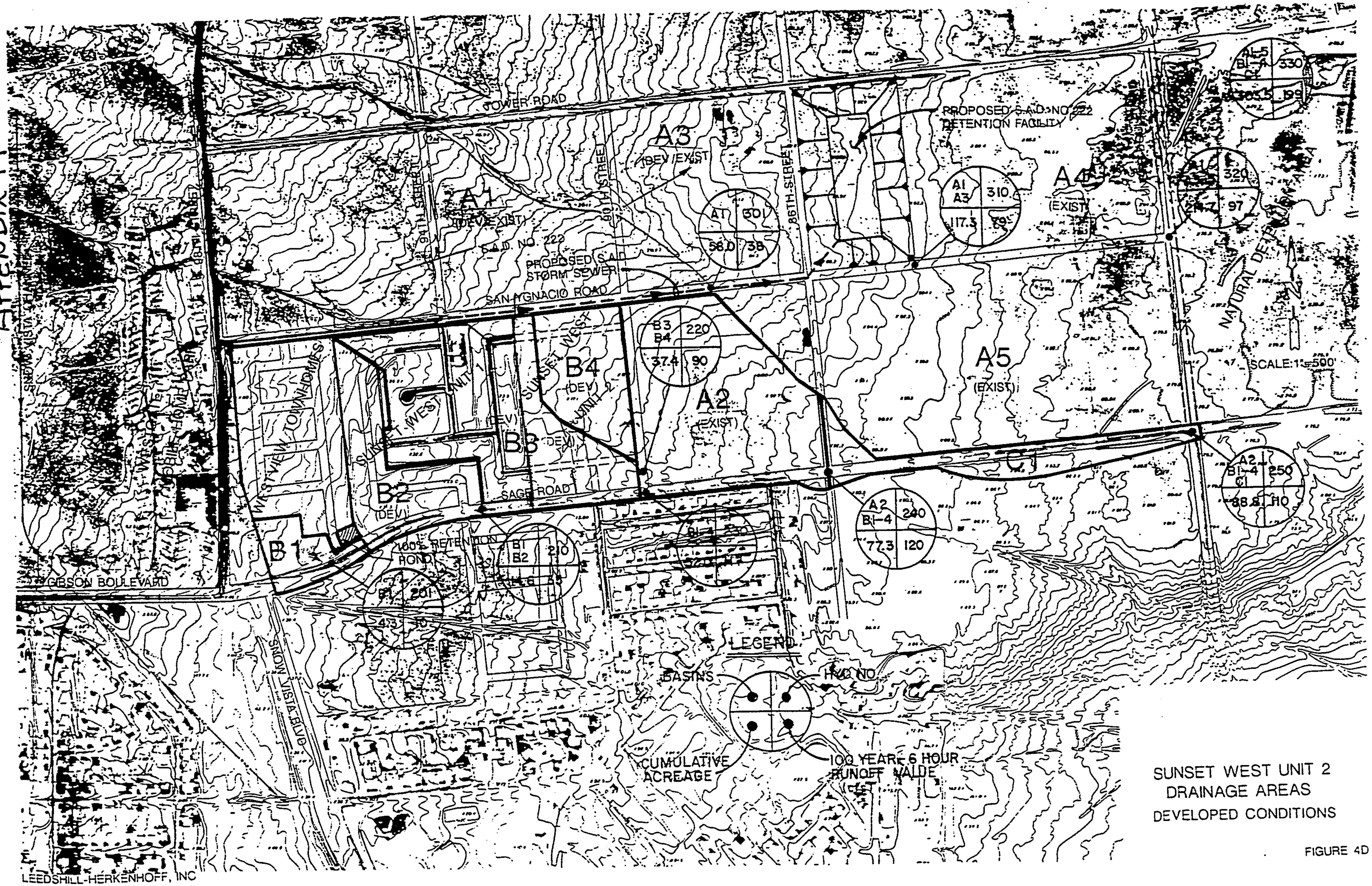
MARK GOODWIN AND ASSOCIATES, P.A.

Mark Goodwin, P.E.

DMG:smr

Attachment

APPENDIX A



SUNSET WEST UNIT 2
DRAINAGE AREAS
DEVELOPED CONDITIONS

FIGURE 4D

LEEDSHILL-HERKENHOFF, INC

PURPOSE

The pupose of this report is to determine street drainage capacity for Sunset West Unit Two. All applicable ordinances and the DPM were utilized to prepare this report.

EXISTING CONDITIONS

The project comprises an approximate area of 16.8525 acres bordered by San Ygnacio Road to the north and Sage Road to the south. The east border is 90th Street and its west boundary connects to the existing roads Sunridge and Sunbow (see Appendix A).

The flows from the off-site basin (see Appendix A) enter Sunset West Unit Two on Sunbow Road. The off-site basin comprises an approximate area of 20.5457 Acres.

HYDROLOGIC ANALYSIS

AHYMO and the Drainage Report for Sunset West Unit 2 by Leedshill - Herkenhoff, Inc. was utilized for this analysis. All of the pertinent hydrologic parameters and calculation methods are located in Appendix B of this report.

STREET CAPACITY ANALYSIS

OFF-SITE

The off-site basin has a Q=49.92 cfs entering on the south side of Sunbow Road. Assuming the flow remains in Sunridge Road in its change of direction from south to east prior to entering the site. The northern portion of Sunbow Road has a Q=6.93 cfs. Overall there is a Q=56.85 cfs entering the site on Sunbow Road. The flow is assumed to be equally divided on the street with a Q=28.43 cfs with land treatments Type "B" & "C" = 27% and Type "D" = 46%.

ON-SITE

The site has been divided into a Q=0.91 cfs per lot for this analysis (see Appendix B). The site generates a Q=69.35 cfs, assuming land treatment Type "B" & "C" = 27% and Type "D" = 46%.

CONCLUSIONS

SUNBOW AVENUE & BLAZICK STREET

A 10" standard curb and gutter is required to maintain the runoff on the both sides of Sunbow to 90th Street to include both sides of Blazick Street. The 10" curb will contain the flow and its velocity head in the right of way (see Appendix B). This also includes the flow generated by the onsite improvements.

SUNRIDGE AVENUE

The connection of Unit One to Unit Two on both sides of this street can begin with mountable curb and gutter. This can continue to lots 2 and 31. From this point to 90th Street standard curb and gutter is required.

SUNCREST ROAD

The intersection of Sunridge and Suncrest to lots 14 and 28 on Suncrest, this also includes Suncrest Court, can be mountable curb and gutter. Standard curb and gutter is required from these lots to 90th Street.

SUN COURT

This cul-de-sac can be mountable curb and gutter up to the curb returns at the intersection of Sun Court and 90th Street.

In conclusion, a large portion of this site can accomodate mountable curb and gutter. Another portion requires 10" standard curb and gutter.

APPENDIX B

D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

PROJECT SUNSET WEST UNIT TWO
SUBJECT DRAINAGE
BY RM DATE 16 JAN 95
CHECKED _____ DATE _____
SHEET 1 OF 6

• OFFSITE FLOWS

SUNBOW AVENUE

ATHYMO RESULTS

Q=56.85 cfs

SEE NOMOGRAPH PAGE 3

MIN SLOPE ON SUNBOW AVE

S = 1.26%

HALF STREET FLOW Q = 28.43 cfs

DEPTH OF FLOW = 0.61'

VELOCITY = 4.9 ft/s

VELOCITY HEAD = $d + V^2/2g$ = 0.98'

10" STD C&G +0.20' FROM TOP OF CURB FOR FLOW TO REMAIN IN RIGHT OF WAY

1.03' > 0.98'

10" STD C&G REQUIRED AT SUBDIVISION CONSTRUCTION

• ON-SITE

SUNBOW AVENUE

NO PROVISION MADE FOR SOUTH PORTION OF SUNBOW FLOW TO DIVERT INTO RETENTION POND IN NORTH SIDE

FLOW TO CONTINUE EAST ON SOUTH SIDE OF SUNBOW

UTILIZING Q = 0.91 cfs/LOT FOR NORTH SIDE ANALYSIS

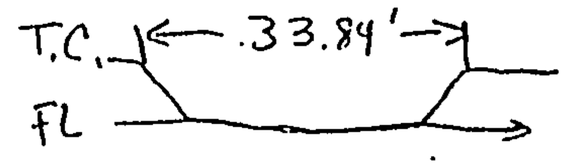
4 LOTS PRIOR TO RETENTION POND

Q = 4 * 0.91 = 3.64 cfs

Q = (28.43 + 3.64) cfs

Q = 32.07 cfs ON BOTH SIDES OF SUNBOW

CAPACITY OF POND INLET



$Q = 2.95 L H^{1.5} = 2.95(33.84)(.5)^{1.5}$

Q = 35.29 cfs

AFTER POND INLET ON SUNBOW FLOW IS REDUCED TO Q = 32.07 cfs AGAIN ASSUME FLOW IS EQUALLY DIVIDED ON STREET. SEE NOMOGRAPH ON NEXT PAGE

Q = 16.04 cfs

DEPTH OF FLOW = 0.37'

VELOCITY = 2.75 fps

VELOCITY HEAD = 0.49'

8" STD C&G WILL CONTAIN FLOW IN RIGHT OF WAY

THIS IS TO INCLUDE THE Q = 7.30 cfs REMAINING IN SUNBOW TO 90TH STREET (BOTH SIDES)

Q = 16.04 + 4.56

Q = 20.60 cfs

DEPTH OF FLOW = D = 0.55'

VELOCITY = 4.3 fps

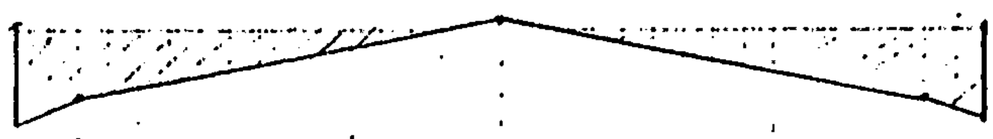
VELOCITY HEAD = 0.84'

THIS WILL ALSO INCLUDE BLAZICK ST WITH 8" C&G

STREET CAPACITIES

CAPACITY OF MOUNTABLE CURB & GUTTER

$$Q = \frac{K}{n} A R_H^{2/3} S^{1/2}$$



$$V = \frac{K}{n} R_H^{2/3} S^{1/2}$$

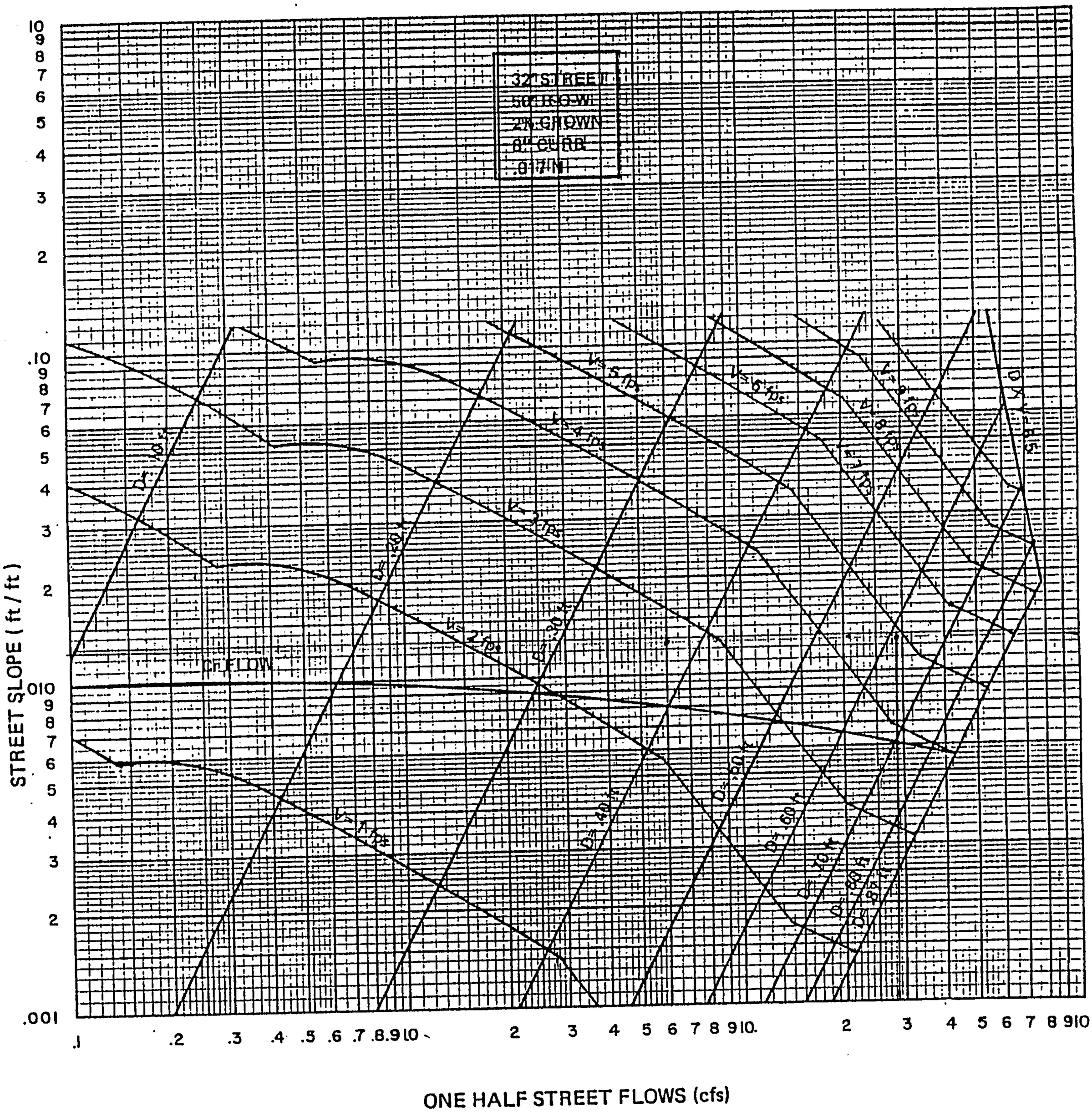
$$V\text{-HEAD} = d + V^2/2g$$

@ d = 0.30' Q = 8.18 cfs V HEAD = 0.55'
SLOPE = 1.75% V = 3.99 fps

@ d = 0.30' Q = 7.99 cfs V HEAD = 0.54'
SLOPE = 1.67% V = 3.90 fps

CONTINUED ON PAGE 4

STREET CAPACITY



STREET CAPACITIES (CONTINUED)

@ d = 0.33' Q = 7.05 cfs V HEAD = 0.45'
SLOPE = 0.76% V = 2.81 fps

@ d = 0.33' Q = 8.08 cfs V HEAD = 0.49'
SLOPE = 1.00% V = 3.23 fps

@ d = 0.28' Q = 7.38 cfs V HEAD = 0.55'
S = 2.10% V = 4.16 fps

@ d = 0.33' Q = 7.45 cfs V HEAD = 0.47'
S = 0.85% V = 2.98 fps

@ d = 0.33' Q = 5.18 cfs V HEAD = 0.40'
S = 0.41% V = 2.07 fps

SUNRIDGE AVENUE

- NORTH HALF OF STREET
  S = 1.75%
  DEPTH OF FLOW @ 0.30' VELOCITY HEAD = 0.55'
  Q = 8.18 cfs CAPACITY
  ∴ Q = 0.91/LOT CAN SAFELY CARRY UP TO 8 LOTS
  Q = 7.30 cfs
  8 LOTS, START STANDARD CURB & GUTTER @ WEST END OF LOT 31

- SOUTH HALF OF STREET
  S = 1.67%
  DEPTH OF FLOW @ 0.30' VELOCITY HEAD = 0.54'
  Q = 7.99 cfs CAPACITY
  ∴ Q = 0.91 cfs/LOT CAN SAFELY CARRY UP TO 8 LOTS
  Q = 7.30 cfs
  8 LOTS, START STANDARD CURB & GUTTER @ WEST END OF LOT 2

STREET CAPACITIES (CONTINUED)

SUNCREST ROAD

• EAST HALF OF STREET

S=1.67%

DEPTH OF FLOW @ 0.30' VELOCITY HEAD = 0.55'

Q=7.99cfs CAPACITY

∴ Q = 0.91/LOT CAN SAFELY CARRY UP TO 8 LOTS

STANDARD CURB & GUTTER @ NORTH END OF LOT 14

5 LOTS ON THIS SIDE OF STREET

Q=4.56cfs << CAPACITY Q=7.99cfs

• WEST HALF OF STREET WILL INCLUDE SUNCREST COURT

S=1.67%

DEPTH OF FLOW @ 0.30' VELOCITY HEAD = 0.55'

Q=7.99cfs CAPACITY

∴ Q=0.91/LOT CAN SAFELY CARRY UP TO 8 LOTS

Q=7.30cfs ACTUAL FLOW

8 LOTS ON THIS HALF OF STREET INCLUDES NORTHERN HALF OF SUNCREST COURT, WHICH WILL FLOW ONTO SUNCREST. THE SOUTHERN HALF OF SUNCREST COURT CONTAINS 3 LOTS Q=2.74cfs MOUNTABLE CURB & GUTTER CAN SAFELY CARRY THIS TO SUNCREST. THE POINT WHERE THESE FLOWS MEET MUST BE STANDARD CURB & GUTTER. THE FLOWS COMBINE @ LOT 28. FROM THIS LOT TO 90TH STREET MUST BE STANDARD CURB & GUTTER

STREET CAPACITIES (CONTINUED)

SUN COURT

4.5 LOTS/HALF OF STREET

Q = 4.11 cfs GENERATED FLOW

CALCULATED Q'S @ S = 0.76 %

Q = 7.05 cfs DEPTH OF FLOW = 0.33'

VELOCITY HEAD 0.45'

Q(GENERATED) < Q (CAPACITY)

FLOW WILL REMAIN IN RIGHT OF WAY

MOUNTABLE CURB & GUTTER CONTAINS CAPACITY FOR ENTIRE COURT.

FLOW INTO POND

- Q FROM SUNBOW
  Q = 32.07 cfs

- Q FROM SUNCREST
  Q = 9.12 cfs + 7.30 cfs = 16.42 cfs
  SOUTH HALF NORTH HALF

OFFSITE AHYMO RESULTS
V_{PK} = 1.8988 ACRE-FEET

ONSITE AHYMO RESULTS
V_{PK} = 2.3175 ACRE-FEET

2.3175/76 = 0.0305 ACRE-FEET/LOT

HALF OF FLOW IS DIVERTED TO POND FROM OFFSITE
V_{OFF} = 0.9494 ACRE-FEET

LOTS WHOSE FLOW DIVERTED TO POND
V_{ON} 23 * 0.0305 = 0.7013 ACRE-FEET

VOLUME OF FLOW DIVERTE TO POND
$V_{IN\ POND}$ = 0.9494 + 0.7013

V = 1.6507 ACRE-FEET

3 LOT POND CAPACITY PROVIDED
V = 2.9 ACRE-FEET => 0.9667 ACRE-FEET/LOT

POND ON TWO LOTS
CAPACITY 1.933 ACRE-FEET

```
START                    TIME=0.0
*****
***** HYDROGRAPH FOR SUNSET WEST UNIT TWO
*****

RAINFALL                 TYPE=1 RAIN QUARTER=0.0 IN
                         RAIN ONE=1.90 IN RAIN SIX=2.20 IN
                         RAIN DAY=2.70 IN DT=0.03333 HR

*OFFSITE BASIN ENTERING SUNBOW SOUTH
COMPUTE NM HYD           ID=1 HYD NO=101.1 AREA=0.0231 SQ MI
                         PER A=0.0 PER B=27.0 PER C=27.0 PER D=46.0
                         TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD                ID=1 CODE=1

*OFFSITE BASIN ENTERING SUNBOW NORTH
COMPUTE NM HYD           ID=2 HYD NO=101.2 AREA=0.0032 SQ MI
                         PER A=0.0 PER B=27.0 PER C=27.0 PER D=46.0
                         TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD                ID=2 CODE=1

*ONSITE BASIN TO BE DIVIDED ON A PER LOT 0
COMPUTE NM HYD           ID=3 HYD NO=101.3 AREA=0.0321 SQ MI
                         PER A=0.0 PER B=27.0 PER C=27.0 PER D=46.0
                         TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD                ID=3 CODE=1

FINISH
```

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AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
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      START TIME (HR:MIN:SEC) = 12:49:58      USER NO.= M_GOODWN.I01
      INPUT FILE = SNSETWST.DAT


START                    TIME=0.0

*****

***** HYDROGRAPH FOR SUNSET WEST UNIT TWO

*****


RAINFALL                 TYPE=1 RAIN QUARTER=0.0 IN

                         RAIN ONE=1.90 IN RAIN SIX=2.20 IN

                         RAIN DAY=2.70 IN DT=0.03333 HR


                         COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2
- PEAK AT 1.40 HR.
                         DT =      .033330 HOURS        END TIME =      5.999400 HOURS
                            .0000    .0013    .0027    .0041    .0055    .0069    .0084
                            .0099    .0115    .0131    .0147    .0164    .0181    .0199
                            .0217    .0236    .0256    .0276    .0296    .0318    .0340
                            .0363    .0387    .0412    .0438    .0465    .0493    .0523
                            .0554    .0587    .0622    .0675    .0731    .0791    .0920
                            .1208    .1651    .2289    .3159    .4302    .5759    .7574
                            .9790   1.1846   1.2704   1.3429   1.4074   1.4661   1.5201
                           1.5702   1.6171   1.6610   1.7023   1.7413   1.7781   1.8130
                           1.8460   1.8774   1.9071   1.9353   1.9621   1.9681   1.9736
                           1.9789   1.9839   1.9887   1.9932   1.9976   2.0018   2.0059
                           2.0098   2.0136   2.0172   2.0208   2.0242   2.0275   2.0308
                           2.0339   2.0370   2.0400   2.0430   2.0458   2.0486   2.0514
                           2.0540   2.0567   2.0592   2.0617   2.0642   2.0666   2.0690
                           2.0714   2.0737   2.0759   2.0781   2.0803   2.0825   2.0846
                           2.0867   2.0887   2.0907   2.0927   2.0947   2.0966   2.0985
                           2.1004   2.1023   2.1041   2.1059   2.1077   2.1095   2.1112
                           2.1130   2.1147   2.1164   2.1180   2.1197   2.1213   2.1229
                           2.1245   2.1261   2.1277   2.1292   2.1307   2.1322   2.1337
                           2.1352   2.1367   2.1382   2.1396   2.1410   2.1425   2.1439
                           2.1452   2.1466   2.1480   2.1494   2.1507   2.1520   2.1533
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                           2.1720   2.1731   2.1743   2.1754   2.1766   2.1777   2.1789
                           2.1800   2.1811   2.1822   2.1833   2.1844   2.1855   2.1866
                           2.1876   2.1887   2.1897   2.1908   2.1918   2.1929   2.1939
                           2.1949   2.1960   2.1970   2.1980   2.1990   2.2000

*OFFSITE BASIN ENTERING SUNBOW SOUTH

COMPUTE NM HYD           ID=1 HYD NO=101.1 AREA=0.0231 SQ MI
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P60 = 1.9000
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P60 = 1.9000
AREA = .012474 SQ MI IA = .42500 INCHES INF = 1.04000 INCHES PER HOUR
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PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 101.10

RUNOFF VOLUME = 1.35371 INCHES = 1.6678 ACRE-FEET
PEAK DISCHARGE RATE = 49.92 CFS AT 1.500 HOURS BASIN AREA = .0231 SQ. MI.

*OFFSITE BASIN ENTERING SUNBOW NORTH

COMPUTE NM HYD ID=2 HYD NO=101.2 AREA=0.0032 SQ MI

PER A=0.0 PER B=27.0 PER C=27.0 PER D=46.0

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K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 5.8115 CFS UNIT VOLUME = .9973 B = 526.28
P60 = 1.9000
AREA = .001472 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

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UNIT PEAK = 4.5960 CFS UNIT VOLUME = .9975 B = 354.54
P60 = 1.9000
AREA = .001728 SQ MI IA = .42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PARTIAL HYDROGRAPH 101.20

RUNOFF VOLUME = 1.35372 INCHES = .2310 ACRE-FEET
PEAK DISCHARGE RATE = 6.93 CFS AT 1.500 HOURS BASIN AREA =
.0032 SQ. MI.

*ONSITE BASIN TO BE DIVIDED ON A PER LOT Q

COMPUTE NM HYD ID=3 HYD NO=101.3 AREA=0.0321 SQ MI

PER A=0.0 PER B=27.0 PER C=27.0 PER D=46.0

TP=0.1333 HR MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE
CONSTANT, N = 7.106420
UNIT PEAK = 58.297 CFS UNIT VOLUME = .9992 B = 526.28
P60 = 1.9000
AREA = .014766 SQ MI IA = .10000 INCHES INF = .04000 I
NCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
= .033330

K = .118483HR TP = .133300HR K/TP RATIO = .888844 SHAPE
CONSTANT, N = 3.990548
UNIT PEAK = 46.103 CFS UNIT VOLUME = 1.000 B = 354.54
P60 = 1.9000
AREA = .017334 SQ MI IA = .42500 INCHES INF = 1.04000 I
NCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT
= .033330

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 101.30

RUNOFF VOLUME = 1.35371 INCHES = 2.3175 ACRE-FEET
PEAK DISCHARGE RATE = 69.35 CFS AT 1.500 HOURS BASIN AREA =
.0321 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 12:50:23

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

August 3, 1994

Ms. Susan Alvarez
Leedshill Herkenhoff
500 Copper Ave NW
Albuquerque, NM 87103

RE: DRAINAGE REQUIREMENTS & GRADING PERMIT FOR SUNSET WEST, UNIT 2 (M-9/D4)
ENGINEER'S STAMP DATED 4/18/94

Dear Ms. Alvarez:

Based upon the material presented in your 7/12/94 submittal, the referenced project is approved for Grading Permit.

Since your temporary Drainage Management Plan calls for the routing of storm flows in Suncrest Road into the retention facility, I believe a Type 'A' inlet is needed on the north side of Suncrest adjacent to the pond. A lateral line from the inlet would then deliver the collected flows to the facility. As we discussed during the DRC meeting and again in a phone conversation earlier today, this appears more feasible than a superelevated roadway since this is meant to be a temporary facility.

Please keep in mind that a Topsoil Disturbance Permit will be required from Environmental Health prior to commencing with the grading of the site. Also, a copy of this letter should be attached to the approved construction drawings for Hydrology signoff.

Cordially,

Scott Davis
PWD, Hydrology Division

c: Larry Caudill
Andrew Garcia
File

(wp+8531)

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

DRAINAGE INFORMATION SHEET

PROJECT TITLE: SUNSET WEST, UNIT 2 ZONE ATLAS/DRNG. FILE #: M-9-Z14

DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: PLAT OF UNIT TWO OF SUNSET WEST, WITHIN ATRISCO GRANT

CITY ADDRESS: AS FILED IN BERN COUNTY RECORDS VOL-17, Folio 123, recorded 10/31/1980

ENGINEERING FIRM: LEEDSHILL HERKENHOFF CONTACT: SUSAN ALVAREZ

ADDRESS: 500 COPPER AVE NW PHONE: 247-0294

OWNER: TOM NEILSON CONTACT: TOM NEILSON

ADDRESS: 9950 CAMPO ROAD SPRING VALLEY, CA 92077 PHONE: 619-590-8111

ARCHITECT: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

CONTRACTOR: N/ TBA CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

✓ DRAINAGE REPORT
___ DRAINAGE PLAN
___ CONCEPTUAL GRADING & DRAINAGE PLAN
✓ GRADING PLAN
___ EROSION CONTROL PLAN
___ ENGINEER'S CERTIFICATION
___ OTHER

PRE-DESIGN MEETING:

✓ YES, NO NOTES PROVIDED
___ NO
___ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL
___ PRELIMINARY PLAT APPROVAL
___ S. DEV. PLAN FOR SUB'D. APPROVAL
___ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
___ SECTOR PLAN APPROVAL
___ FINAL PLAT APPROVAL
___ FOUNDATION PERMIT APPROVAL
___ BUILDING PERMIT APPROVAL
___ CERTIFICATE OF OCCUPANCY APPROVAL
✓ GRADING PERMIT APPROVAL
___ PAVING PERMIT APPROVAL
___ S.A.D. DRAINAGE REPORT
✓ DRAINAGE REQUIREMENTS
✓ OTHER DRC Review (SPECIFY)

PLAT PREVIOUSLY APPROVED AND FILED

RECEIVED JUL 12 1994 HYDROLOGY DIVISION

DATE SUBMITTED: 4/26/94 / 7/1/94

BY: Susan M. Alvarez

RECEIVED JUL

LEEDSHILL-HERKENHOFF, INC.
500 Copper Avenue N.W.
P. O. Box 1217
Albuquerque, New Mexico 87103
(505) 247-0294

887-94005.11-94

July 1, 1994

Mr. Fred Aguirre, P.E.
PWD/Utility Development/Hydrology Section
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

RE: SUNSET WEST UNIT 2
ZONE ATLAS NO. M-9-Z

On behalf of Mr. Tom Neilson, Leedshill-Herkenhoff, Inc. (LH) has prepared the attached supplemental information to the Drainage Report for the above referenced project. Included with this report, you will find the Drainage Information Sheet, and the drainage calculations performed in accordance with Section 22.2 of the Development Process Manual for the City of Albuquerque. This site is a tract of land situated in Tracts 450,451,452,453, and the westerly five feet of 90th Street in Unit No. Seven of the Town of Atrisco Grant in Bernalillo County, New Mexico, a plat of which was filed for record in the office of the County Clerk of said Bernalillo County in Volume D, Folio 117, on December 5, 1944.

As we have discussed previously, this project was originally designed, and was platted and recorded on October 31, 1980 (Bernalillo County Records, Vol C-17, Folio 123). Our original drainage analysis was accomplished for conditions with and without the Sunset West Unit 2 construction in place, and for conditions with and without the SAD #222 improvements in place. In addition, cumulative impacts to the downstream playa located east of Unser Boulevard were also investigated.

The supplemental design analysis has been performed subsequent to our meetings of May 31, and June 3, 1994 and in response to the letter from Scott Davis dated May 19 1994, (also attached), regarding the original Drainage Report. With this analysis, we feel that we have addressed the concerns of the City's PWD Hydrology Division regarding this project.

RECEIVED
JUL 12 1994
HYDROLOGY SECTION

We have provided a temporary retention pond located on Lots 16, 26 and 27 of Block 5 (along Suncrest Road). This pond was sized to contain the 100-year, 10-day runoff volume as calculated based upon Section 22.2 of the DPM. The required volume so calculated is 2.8 acre feet of storage; the pond occupies approximately 0.49 acres. The actual volume provided at an approximate 8 feet of depth is 2.9 acre-feet, this allows approximately 0.75 feet of freeboard. The pond will be fenced, and chamiso planted along the fenceline closest to the public roadway right-of-way.

The pond was then analyzed with respect to the 100-year 24-hour storm to verify that the peak runoff values immediately downstream of the project site are equal to or less than those found under the existing site conditions. As we discussed, in our meeting, the pond captures runoff entering Sunset West Unit Two from the previously developed Unit One; the remaining portion of Sunset West drains freely eastward towards 90th Street and Sage Road. The total 100-year runoff at this point for existing conditions is 60 cfs; upon construction of Unit Two, and the proposed temporary retention pond, this peak runoff value is reduced to 56 cfs.

The effects of this retention pond on downstream drainage conditions are that the developed conditions flows from this project will not impact the downstream landowners any more than under existing conditions; neither the peak runoff rates or volumes, nor the frequency of runoff will increase due to this development. It is understood that the City intends to construct downstream infrastructure at a future date; upon that construction, it will be possible to reclaim the lots utilized for this temporary retention facility.

The other concern which was discussed, related to the timing of this project with respect to the adjacent construction planned by SAD # 222. We have met and discussed the project with the City's consultant for this project. While the SAD #222 project is planned to be implemented in the near future, it is most likely that Sunset West Unit Two will be constructed prior to the SAD #222 storm drainage improvements. Under existing conditions, the runoff from the areas north of San Ygnacio generally runs southward to San Ygnacio, and thence eastward along the roadway rights-of-way towards 90th Street; at this point it generally runs southward towards Sage Road. We are proposing the construction of a swale located immediately east of the portion of 90th Street being constructed in this project, as a temporary measure until the SAD #222 storm drainage improvements along San Ygnacio are constructed. Upon construction of the SAD #222 improvements, and the remaining portion of 90th Street, this channel can be filled.

Copies of the design calculations for this pond are attached along with the final construction plans for this project for your review. LH requests your approval for DRC review, and trust

that the information provided meets your needs. As I'm sure you are aware, there is a need for expediency concerning your review. If you have any questions, please call me at 247-0294.

SUSAN M. ALVAREZ, P.E.
Project Manager

sma/bz

Enc.

cc: Mr. Tom Neilson, Sunset West, Unit 2

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 19, 1994

RECEIVED
MAY 23 1994
LEEDSHILL - HERKENHOFF, INC.
ALBUQUERQUE

Ms. Susan Alvarez
Leedshill Herkenhoff
500 Copper Ave NW
Albuquerque, NM 87103

RE: DRAINAGE REQUIREMENTS FOR SUNSET WEST, UNIT 2 (M-9/D4) ENGINEER'S STAMP DATED 4/18/94

Dear Ms. Alvarez:

Per our meeting held earlier today, the following items represent outstanding issues relating to your project:

1. The existing playa east of Unser is on privately owned land. Per your development plans, drainage easements would have to be obtained prior to the City allowing your developed storm flows to impact that site.

2. As Lee Lunsford (City SAD Engr.) pointed out in our meeting, the SAD 222 project appears to be a year or more away from construction. Since that report is not yet finalized, it may be helpful if a meeting were arranged with that consultant to review their plans and how they relate to your project.

3. As discussed, it appears that your developed storm flows in addition to the offsite flows impacting your site will have to be retained temporarily. Once downstream improvements are in place which can accept your flows, the ponding site can be reclaimed for development.

Again, once you have arranged a meeting with the SAD consultant I would be happy to attend if you wish.

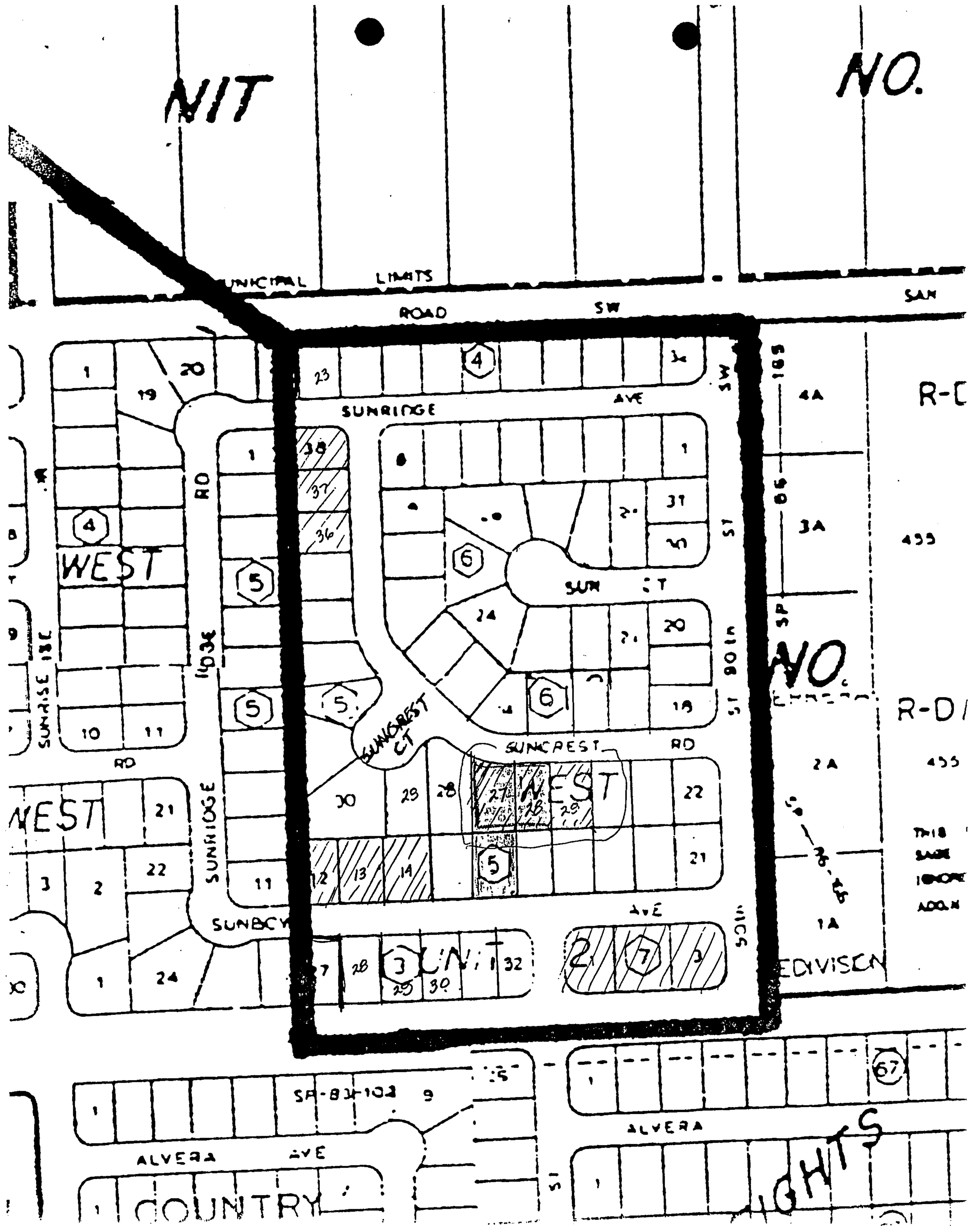
If I can be of further assistance, feel free to contact me at 768-3622.

Cordially,

Scott Davis
PWD, Hydrology Division

(WP+8531)
c: File

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER


NIT
NO.
LIMITS
ROAD
SW
SUNRIDGE
AVE
SUN CT
SUNCREST CT
SUNCREST RD
WEST
SUNRIDGE RD
SUNBCY
SUNRISE RD
EDIVISCN
ALVERA AVE
COUNTRY
R-D
R-D/
NO
SP-81-102

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
INPUT FILE = C:\AHYMO\SUNSET\SW2-P100.DAT

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOF VOLUM (AC-F
START						
*S	INPUT FILE NAME: SW2-P100.DAT					
*S	OUTPUT FILE NAME: SW2-P100.OUT					
*S	PROJECT: SUNSET WEST UNIT 2					
*S	CONDITION: DEVELOPED CONDITIONS; 100-YR 6-HR					
*S	Pond volume calculations					
*S	LEEDSHILL-HERKENHOFF, INC.					
RAINFALL	TYPE= 1					
*S	COMPUTE BASIN B1 & PRINT VALUES					
COMPUTE	NM HYD 201.00	-	1	.00672	10.14	.30
*S	ROUTE BASIN B1 FLOWS TO BASIN B2					
*S	COMPUTE TRAVEL TIME					
*S	ROUTE THE FLOW & PRINT					
ROUTE	201.10	1	2	.00672	8.28	.30
*S	COMPUTE BASIN B2					
COMPUTE	NM HYD 202.00	-	1	.01609	27.42	..87
*S	ADD BASIN B1 & B2					
ADD HYD	210.00	1& 2	3	.02281	34.83	1.18
*S	ROUTE COMBINATION OF BASIN B1/B2 FLOWS TO BASIN B3/B4					
ROUTE	202.10	3	4	.02281	29.19	1.18
*S	COMPUTE BASIN SW1 (SUNSET WEST UNIT 1)					
COMPUTE	NM HYD 501.00	-	1	.03300	49.68	1.80
*S	COMPUTE BASIN SW2 (SUNSET WEST UNIT 2)					
COMPUTE	NM HYD 502.00	-	2	.02550	63.64	1.87
*S	ADD BASIN B3 & B4					
ADD HYD	220.00	1& 2	5	.05850	107.59	3.67
*S	ADD BASIN B3/B4 & BASIN B1/B2					
ADD HYD	230.00	4& 5	6	.08131	129.21	4.85
*S	ROUTE BASIN B1,B2,B3 & B4 FLOWS TO BASIN A2					
ROUTE	230.10	6	3	.08131	119.65	4.85
*S	COMPUTE BASIN A2					
COMPUTE	NM HYD 102.00	-	1	.03953	15.20	.95
*S	ADD BASIN A2 TO BASIN B1/B2/B3/B4					
ADD HYD	240.00	3& 1	2	.12084	131.39	5.81
*S	ROUTE BASIN A2/B1/B2/B3/B4 FLOWS TO BASIN C1					
ROUTE	240.10	2	3	.12084	101.25	5.81
*S	COMPUTE BASIN C1					
COMPUTE	NM HYD 301.00	-	1	.01797	29.04	1.17
*S	ADD BASIN C1 IN WITH OTHER BASINS					
ADD HYD	250.00	3& 1	2	.13881	121.07	6.98
*S	CALCULATE DRAINAGE FOR BASINS NORTH OF SAN YGNACIO					
*S	ASSUME SAD 222 IMPROVEMENTS ARE IN PLACE					
*S	COMPUTE BASIN A1					
COMPUTE	NM HYD 301.00	-	1	.09058	37.64	2.19
*S	ROUTE A1 ALONG SAN YGNACIO TO A3					
ROUTE	301.10	1	4	.09058	35.68	2.19
*S	COMPUTE BASIN A3					
COMPUTE	NM HYD 310.00	-	3	.09259	47.73	2.24
*S	ADD BASINS A1& A3					

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOF VOLUM (AC-F
ADD HYD	315.00	3& 4	6	.18317	78.74	4.44
*S	ROUTE BASINS A1 &A3 THRU A4					
ROUTE	320.00	6	1	.18317	52.44	4.44
*S	COMPUTE BASIN A4					
COMPUTE NM HYD	320.10	-	4	.06187	28.01	1.50
*S	ADD BASINS A1&3 TO BASIN A4					
ADD HYD	310.30	4& 1	6	.24504	73.16	5.94
*S	COMPUTE BASIN A5					
COMPUTE NM HYD	305.00	-	5	.09021	23.71	2.18
*S	ADD BASINS A1,A3,A4 & A5					
ADD HYD	320.00	5& 6	1	.33525	96.57	8.13
*S	CALCULATE TOTAL INFLOW INTO UNSER PLAYA					
ADD HYD	330.00	1& 2	3	.47406	205.61	15.11
*S	END CALCULATIONS					
FINISH						

LEEDSHILL · HERKENHOFF, INC.
Albuquerque • San Diego • Santa Fe
ENGINEERING COMPUTATIONS

NAME OF PROJECT			SHEET NUMBER
SUNSET WEST SUB			1 OF 2
COMPUTED BY: T BLAINE	CHECKED BY:	JOB NUMBER	DATE: JUNE 9

POND VOLUME CALCULATIONS FOR 10 DAY 100 YR EVENT

LAND TREATMENT
TOTAL AREA = 16.3± # LOTS = 76, N = 76/16.3 = 4.67
CHECK VALUE OF "N" IF N ≤ 6 USE EQUATION

% LAND TREATMENT $D = 7((N^2) + 5N)^{1/2}$

N = NUMBER OF UNITS PER ACRE = 76/16.3 = 4.66

N = 4.66 ≤ 6.0 OK

∴ $\% D = 7((4.66)^2 + 5(4.66))^{1/2} =$

% D = 46.98%

ASSUME ½ OF THE LOTS WILL HAVE DESERT LANDSCAPING — TREATMENT C

ASSUME ½ OF THE LOTS WILL HAVE IRRIGATED YARDS — TREATMENT B

∴

TREATMENT	% AREA	AREA (AC)
B	26.5	4.32
C	26.5	4.32
D	47.0	7.66

SUBDIVISION IS LOCATED IN ZONE 1
(TABLE A-8)

$E_B = 0.67$
$E_C = 0.99$
$E_D = 1.97$

WEIGHTED $E = [(4.32 \times 0.67) + (4.32 \times 0.99) + (7.66 \times 1.97)]$ / 16.3

E = 22.26/16.3 = 1.37

LEEDSHILL · HERKENHOFF, INC. Albuquerque • San Diego • Santa Fe ENGINEERING COMPUTATIONS	NAME OF PROJECT Sunset West			SHEET NUMBER 2 OF 2
	COMPUTED BY:	CHECKED BY:	JOB NUMBER	DATE:

CALCULATE VOLUME OF RUNOFF FROM TOTAL SUBDIVISION:

$$V_{10day} = (V_{360} + A_D)(P_{10day} - P_{360})/12$$

FROM NOAA ATLAS 2

CALCULATE 2YR 1HR EVENT

$$Y_2 = -0.011 + 0.942\left[(2yr\text{-}6Hr)^2/(2yr\text{-}24Hr)\right]$$

CALCULATE 100YR 1-HR EVENT

$$Y_{100} = 0.494 + 0.755\left[(100yr\text{-}6HR)^2/(100yr\text{-}24HR)\right]$$

FROM TABLE A-2

$P_{360} = 2.20$

$P_{10day} = 3.67$

$V_{360} = 1.37(16.3)/12 = 1.86$ AF (EQ A-6)

$V_{10\,day} = 1.86 + (7.66(3.67-2.20))/12$ (EQ A-9)

$V_{10day} = 2.8$ AF

Sunset West, Unit 2
Calculation of Time of Concentration
June 8,1994

Length	Elev Diff	Slope	K	Velocity	T(c)	T(p)
120	2.52	0.0210	0.7	0.10	0.33	0.22
1020	15.27	0.0150	3.0	0.37	0.77	0.51
410	3.00	0.0073	3.0	0.26	0.44	0.30
Total						1.03

LEEDSHILL - HERKENHOFF, I	NAME OF PROJECT			SHEET NUMBER
Albuquerque • San Diego • Santa Fe	Sunset West			OF
ENGINEERING COMPUTATIONS	COMPUTED BY: sma	CHECKED BY:	JOB NUMBER 91005.11	DATE: 4/9/94

Calculate 100-year, 10-day runoff volume from Sunset West Unit 2:

$$\boxed{V_{10d} = V_{360} + A_D * (P_{10day} - P_{360}) / 12 \text{ in/ft}}$$

(Eq a-9 from DPM, Section 22.2)

V_{360} = Volume for 6hr storm

A_D = Impervious Area in acres

$P_{10} = 10.0 - (24.9 / P_{1440})^{1.4} = 3.67$ in

P_{360} = 6hr rainfall in inches = 2.22 in

P_{1440} = 24hr rainfall in inches = 2.66 in

Total Area = 16.3 Ac

% D = 30% A_T = 4.89 Ac

Calc V_{360} for Sunset West Only

Input Parameters ⇒ A = 16.3 Ac = 0.0255 sq mi

Tc ⇒ see attached spreadsheet =

Tp ⇒ 2/3 Tc = 1.03 hrs

A = 26

B = 50

C = 0

D = 30

Tc Spreadsheet input

S	L	K
2.02	120	0.7
15.27	1020	3.0
3.0	410	3.0

LEEDSHILL - HERKENHOFF, I

Albuquerque • San Diego • Santa Fe

ENGINEERING COMPUTATIONS

NAME OF PROJECT			SHEET NUMBER OF
COMPUTED BY:	CHECKED BY:	JOB NUMBER	DATE:

B3 - 27.0 Acres
B4 - 10.4 Acres

37.4 Acres

Sunset West Unit 2 = 16.3 Ac
Sunset West Unit 1 = 21.1 Ac = 0.0330 sq mi

```
    AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994          RUN DATE (MON/DAY/YR)
=06/30/1994
    INPUT FILE = SW2.DAT                                                                          USER NO.=
STOCKTON.S94

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

    *S                   LEEDSHILL-HERKENHOFF, INC.
    *S                   INPUT FILE NAME:  SW2.DAT
    *S                   OUTPUT FILE NAME: SW2.OUT
    *S                   PROJECT:          SUNSET WEST UNIT 2
    *S                   CONDITIONS:             UNDEVELOPED CONDITIONS RUNOFF FROM SUDVISION
    *S                                     AREA ONLY.
    *S                                     THE RUNOFF FROM THE SUBDIVISION IS CALCULATED
    *S                                     TO DETERMINE IF THE POND LOCATIONS ARE SITUATED
    *S                                     TO CAPTURE ADAQUATE RUNOFF TO OFFSET THE
    *S                                     DEVELOPED CONDITIONS RUNOFF.
    *S                                     100 YEAR 24 HOUR EVENT
    START
   TIME=       .00
    RAINFALL  TYPE= 1
   RAIN6=    2.220
    *S                   COMPUTE RUNOFF FROM UNDEVELOPED SUBDIVIDED AREA
    COMPUTE NM HYD        101.00   -     1        .02550       25.85       .619       .45484    1.500    1.584
PER IMP=    .00
    *S                   CONDITIONS:             DEVELOPED CONDITIONS RUNOFF FROM SUDVISION
    *S                                     AREA ONLY.
    *S                                     THE RUNOFF FROM THE SUBDIVISION IS CALCULATED
    *S                                     TO DETERMINE IF THE POND LOCATIONS ARE SITUATED
    *S                                     TO CAPTURE ADAQUATE RUNOFF TO OFFSET THE
    *S                                     DEVELOPED CONDITIONS RUNOFF.
    *S                   COMPUTE RUNOFF FROM DEVELOPED SUBDIVIDED AREA
    COMPUTE NM HYD        102.00   -     2        .02550       60.29      1.873      1.37732    1.500    3.694
PER IMP=  47.00
    *S                   CONDITION:        CALCULATE THE RUNOFF FROM THE AREA THAT WILL
    *S                                     CONTRIBUTE TO THE POND LOCATED ON LOTS 16, 26 AND 27.
    COMPUTE NM HYD        103.00   -     3        .00890       21.05       .654      1.37732    1.500    3.696
PER IMP=  47.00
    *S                   CONDITIONS:             CALCULATE THE RUNOFF FROM SUNSET WEST UNIT I
    *S                                     THAT WILL CONTRIBUTE TO THE POND VOLUME VIA
    *S                                     LOT 16.
    COMPUTE NM HYD        104.00   -     4        .01300       34.26      1.138      1.64145    1.500    4.118
PER IMP=  70.00
    *S  THE ADDITION OF ID 1 AND 4 WILL GIVE YOU THE NATURAL CONDITIONS OF SUBDIVISI
    *S  ADDED TO THE FLOW OUT OF A PORTION OF UNIT 1.
    ADD HYD              100.14  1& 4   5        .03850       60.12      1.757       .85551    1.500    2.440
    *S                      THIS SECTION WILL CALCULATE THE RUNOFF FROM THAT PORTION OF
    *S                      THE SUBDIVISION THAT IS NOT ROUTED TO POND.
    COMPUTE NM HYD        106.00   -     6        .01660       39.25      1.219      1.37732    1.500    3.695
PER IMP=  47.00
    *S                      THIS SECTION WILL DIVIDE 50% OF THE FLOW FROM UNIT 1
    *S                      50% OF THE FLOW WILL GO INTO THE POND AND 50% WILL
    *S                      CONTINUE TO FLOW THROUGH THE SITE.
    DIVIDE HYD           107.00    4    7        .00650       17.13       .569      1.64144    1.500    4.118
                          108.00  AND    8        .00650       17.13       .569      1.64144    1.500    4.118
    *S                  ECTION WILL ADD THE RUNOFF OF THE CALCULATED DEVELOPED FLOWS
    ADD HYD              108.00  6& 8   8        .02310       56.38      1.788      1.45162    1.500    3.814
    FINISH
```

```
    AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994          RUN DATE (MON/DAY/YR)
=06/30/1994
    INPUT FILE = SW2.DAT                                                                          USER NO.=
STOCKTON.S94

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

    *S                   LEEDSHILL-HERKENHOFF, INC.
    *S                   INPUT FILE NAME:  SW2.DAT
    *S                   OUTPUT FILE NAME: SW2.OUT
    *S                   PROJECT:          SUNSET WEST UNIT 2
    *S                   CONDITIONS:             UNDEVELOPED CONDITIONS RUNOFF FROM SUDVISION
    *S                                     AREA ONLY.
    *S                                     THE RUNOFF FROM THE SUBDIVISION IS CALCULATED
    *S                                     TO DETERMINE IF THE POND LOCATIONS ARE SITUATED
    *S                                     TO CAPTURE ADAQUATE RUNOFF TO OFFSET THE
    *S                                     DEVELOPED CONDITIONS RUNOFF.
    *S                                     100 YEAR 24 HOUR EVENT
    START
   TIME=       .00
    RAINFALL  TYPE= 1
   RAIN6=    2.220
    *S                   COMPUTE RUNOFF FROM UNDEVELOPED SUBDIVIDED AREA
    COMPUTE NM HYD        101.00   -    1        .02550       25.85       .619       .45484    1.500    1.584
PER IMP=    .00
    *S                   CONDITIONS:             DEVELOPED CONDITIONS RUNOFF FROM SUDVISION
    *S                                     AREA ONLY.
    *S                                     THE RUNOFF FROM THE SUBDIVISION IS CALCULATED
    *S                                     TO DETERMINE IF THE POND LOCATIONS ARE SITUATED
    *S                                     TO CAPTURE ADAQUATE RUNOFF TO OFFSET THE
    *S                                     DEVELOPED CONDITIONS RUNOFF.
    *S                   COMPUTE RUNOFF FROM DEVELOPED SUBDIVIDED AREA
    COMPUTE NM HYD        102.00   -    2        .02550       60.29      1.873      1.37732    1.500    3.694
PER IMP=  47.00
    *S                   CONDITION:        CALCULATE THE RUNOFF FROM THE AREA THAT WILL
    *S                                     CONTRIBUTE TO THE POND LOCATED ON LOTS 16, 26 AND 27.
    COMPUTE NM HYD        103.00   -    3        .00890       21.05       .654      1.37732    1.500    3.696
PER IMP=  47.00
    *S                   CONDITIONS:             CALCULATE THE RUNOFF FROM SUNSET WEST UNIT I
    *S                                     THAT WILL CONTRIBUTE TO THE POND VOLUME VIA
    *S                                     LOT 16.
    COMPUTE NM HYD        104.00   -    4        .01300       34.26      1.138      1.64145    1.500    4.118
PER IMP=  70.00
    *S  THE ADDITION OF ID 1 AND 4 WILL GIVE YOU THE NATURAL CONDITIONS OF SUBDIVISI
    *S  ADDED TO THE FLOW OUT OF A PORTION OF UNIT 1.
    ADD HYD              100.14  1& 4   5        .03850       60.12      1.757       .85551    1.500    2.440
    *S                      THIS SECTION WILL CALCULATE THE RUNOFF FROM THAT PORTION OF
    *S                      THE SUBDIVISION THAT IS NOT ROUTED TO POND.
    COMPUTE NM HYD        106.00   -    6        .01660       39.25      1.219      1.37732    1.500    3.695
PER IMP=  47.00
    *S                      THIS SECTION WILL DIVIDE 50% OF THE FLOW FROM UNIT 1
    *S                      50% OF THE FLOW WILL GO INTO THE POND AND 50% WILL
    *S                      CONTINUE TO FLOW THROUGH THE SITE.
    DIVIDE HYD           107.00    4    7        .00650       17.13       .569      1.64144    1.500    4.118
                          108.00  AND    8        .00650       17.13       .569      1.64144    1.500    4.118
    *S                  ECTION WILL ADD THE RUNOFF OF THE CALCULATED DEVELOPED FLOWS
    ADD HYD              108.00  6& 8   8        .02310       56.38      1.788      1.45162    1.500    3.814
    FINISH
```

THIS VALUE IS LESS THAN RATE OF 60.12 ∴ CONDITIONS OF RATE IMPROVED

THE VOLUME IS APPROXIMATELY THE SAME ∴ CONDITIONS UNCHANGED.

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 19, 1994

Ms. Susan Alvarez
Leedshill Herkenhoff
500 Copper Ave NW
Albuquerque, NM 87103

RE: DRAINAGE REQUIREMENTS FOR SUNSET WEST, UNIT 2 (M-9/D4) ENGINEER'S STAMP DATED 4/18/94

Dear Ms. Alvarez:

Per our meeting held earlier today, the following items represent outstanding issues relating to your project:

1. The existing playa east of Unser is on privately owned land. Per your development plans, drainage easements would have to be obtained prior to the City allowing your developed storm flows to impact that site.

2. As Lee Lunsford (City SAD Engr.) pointed out in our meeting, the SAD 222 project appears to be a year or more away from construction. Since that report is not yet finalized, it may be helpful if a meeting were arranged with that consultant to review their plans and how they relate to your project.

3. As discussed, it appears that your developed storm flows in addition to the offsite flows impacting your site will have to be retained temporarily. Once downstream improvements are in place which can accept your flows, the ponding site can be reclaimed for development.

Again, once you have arranged a meeting with the SAD consultant I would be happy to attend if you wish.

If I can be of further assistance, feel free to contact me at 768-3622.

Cordially,

Scott Davis
PWD, Hydrology Division

(WP+8531)
c: File

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

DRAINAGE INFORMATION SHEET

M9/D4

PROJECT TITLE: SUNSET WEST, UNIT 2 ZONE ATLAS/DRNG. FILE #: M-9-Z

DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: PLAT OF UNIT TWO OF SUNSET WEST, WITHIN ATRISCO GRANT

CITY ADDRESS: AS FILED IN BERN COUNTY RECORDS VOL C-17, Folio 123, recorded 10/31/1980

ENGINEERING FIRM: LEEDSHILL HERKENHOFF CONTACT: SUSAN ALVAREZ

ADDRESS: 500 COPPER AVE NW PHONE: 247-0294

OWNER: TOM NEILSON CONTACT: TOM NEILSON

ADDRESS: 9950 CAMPO ROAD SPRING VALLEY, CA 92077 PHONE: 619-590-8111

ARCHITECT: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

CONTRACTOR: TBA CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

✓ DRAINAGE REPORT
____ DRAINAGE PLAN
____ CONCEPTUAL GRADING & DRAINAGE PLAN
____ GRADING PLAN
____ EROSION CONTROL PLAN
____ ENGINEER'S CERTIFICATION
____ OTHER

PRE-DESIGN MEETING:

✓ YES, NO NOTES PROVIDED
____ NO
____ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL
____ PRELIMINARY PLAT APPROVAL
____ S. DEV. PLAN FOR SUB'D. APPROVAL
____ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
____ SECTOR PLAN APPROVAL
____ FINAL PLAT APPROVAL
____ FOUNDATION PERMIT APPROVAL
____ BUILDING PERMIT APPROVAL
____ CERTIFICATE OF OCCUPANCY APPROVAL
____ GRADING PERMIT APPROVAL
____ PAVING PERMIT APPROVAL
____ S.A.D. DRAINAGE REPORT
✓ DRAINAGE REQUIREMENTS
✓ OTHER DRC Review/Drainage Concept Approval (SPECIFY)

PLAT PREVIOUSLY APPROVED AND FILED

RECEIVED
APR 22 1994
HYDROLOGY DIVISION

DATE SUBMITTED: 4/21/94

BY: Susan M. Alvarez

LEEDSHILL-HERKENHOFF, INC.
500 Copper Avenue N.W.
P. O. Box 1217
Albuquerque, New Mexico 87103
(505) 247-0294

555-94005.11-94

April 20, 1994

Mr. Fred Aguirre, P.E.
PWD/Utility Development/Hydrology Section
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

RE: SUNSET WEST UNIT 2
ZONE ATLAS NO. M-9-Z

On behalf of Mr. Tom Neilson, Leedshill-Herkenhoff, Inc. (LH) has prepared the attached Drainage Report for the above referenced project. Included with this report, you will find the Drainage Information Sheet, and the drainage calculations performed in accordance with Section 22.2 of the Development Process Manual for the City of Albuquerque. This site is a tract of land situated in Tracts 450,451,452,453, and the westerly five feet of 90th Street in Unit No. Seven of the Town of Atrisco Grant in Bernalillo County, New Mexico, a plat of which was filed for record in the office of the County Clerk of said Bernalillo County in Volume D, Folio 117, on December 5, 1944.

As we have discussed previously, this project was originally designed, and was platted and recorded on October 31, 1980 (Bernalillo County Records, Vol C-17, Folio 123). Our drainage analysis was accomplished for conditions with and without the Sunset West Unit 2 construction in place, and for conditions with and without the SAD #222 improvements in place. In addition, cumulative impacts to the downstream playa located east of Unser Boulevard were also investigated.

LH requests your approval for DRC review, and for definition of any further project drainage for the above referenced project, and trust that the information provided meets your needs. As I'm sure you are aware, there is a need for expediency concerning your review. If you have any questions, please call me at 247-0294.

Susan M. Alvarez

Susan M. Alvarez, P.E.
Project Manager
sma/bz
Enc.
cc: Mr. Tom Neilson, Sunset West, Unit 2

RECEIVED
APR 22 1994
HYDROLOGY DIVISION

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

KEN SCHULTZ
MAYOR

October 3, 1989

D. Mark Goodwin, P.E.
D. Mark Goodwin & Associates
Post Office Box 21307
Albuquerque, New Mexico 87154

RE GRADING AND DRAINAGE PLAN FOR SUNSET WEST UNIT II, SUBMITTED SEPTEMBER 26, 1989, FOR GRADING/PAVING PERMIT AND WORK ORDER APPROVALS (M-9/D4; W.O. 3914)

Dear Mr. Goodwin,

Your submittal, referred to above, with your engineer's stamp dated 9/18/89, is approved for grading and paving permit for Phase I, and Work Order sign-off for same.

If you have any questions, please call me at 768-2650.

Cordially,

Stuart Reeder

G. Stuart Reeder, P.E.
C.E./Hydrology Section

GSR/bsj
(WP+1275)

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

KEN SCHULTZ
MAYOR

October 3, 1989

D. Mark Goodwin, P.E.
D. Mark Goodwin & Associates
Post Office Box 21307
Albuquerque, New Mexico 87154

RE CONCEPTUAL GRADING PLAN FOR SUNSET WEST UNIT II, PHASE II, SUBMITTED SEPTEMBER 26, 1989, FOR REVIEW AND COMMENT (M-9/D4)

Dear Mr. Goodwin,

Your submittal, referred to above, is approved as a concept for the development of Phase II.

Final Grading and Drainage approval and Work Order approval will require a detailed grading plan.

If you have any questions, please call me at 768-2650.

Cordially,

Stuart Reeder

G. Stuart Reeder, P.E.
C.E./Hydrology Section

GSR
(WP+1275)

DRAINAGE INFORMATION SHEET

PROJECT TITLE: SUNSET WEST UNIT II ZONE ATLAS/DRNG. FILE #: M-9/D4

LEGAL DESCRIPTION: Sunset West Unit II

CITY ADDRESS: Sage and Blazick SW

ENGINEERING FIRM: D.Mark Goodwin & Assoc, P.A. CONTACT: Mark Goodwin, P.E.

ADDRESS: PO Box 21307, Alb, NM 87154 PHONE: 505/265-0905

OWNER: Fair Plaza Associates CONTACT: John McMullen

ADDRESS: 7109 Prospect NE PHONE: 505/883-1100

ARCHITECT: n/a CONTACT: ____

ADDRESS: ____ PHONE: ____

SURVEYOR: D.Mark Goodwin & Assoc, P.A. CONTACT: Stewart Maida, L.S.

ADDRESS: PO Box 21307, Alb, NM 87154 PHONE: 505/265-0905

CONTRACTOR: n/a CONTACT: ____

ADDRESS: ____ PHONE: ____

PRE-DESIGN MEETING:

X YES

___ NO

___ COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO. ____

EPC NO. ____

PROJ. NO. ____

TYPE OF SUBMITTAL:

X DRAINAGE REPORT

___ DRAINAGE PLAN

___ CONCEPTUAL GRADING & DRAINAGE PLAN

X GRADING PLAN

___ EROSION CONTROL PLAN

___ ENGINEER'S CERTIFICATION

RECEIVED
SEP 2 6 1989
HYDROLOGY SECTION

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL

___ PRELIMINARY PLAT APPROVAL

___ SITE DEVELOPMENT PLAN APPROVAL

___ FINAL PLAT APPROVAL

___ BUILDING PERMIT APPROVAL

___ FOUNDATION PERMIT APPROVAL

___ CERTIFICATE OF OCCUPANCY APPROVAL

___ ROUGH GRADING PERMIT APPROVAL

X GRADING/PAVING PERMIT APPROVAL

___ OTHER ____ (SPECIFY)

DATE SUBMITTED: 9/25/89

BY: Mark Goodwin Mark Goodwin, P.E.

D. Mark Goodwin & Associates, P.A.
Consulting Engineers

P.O. BOX 21307, ALBUQUERQUE, NM 87154
(505) 265-0905

September 22, 1989

Mr. Stuart Reeder
CITY OF ALBUQUERQUE
Hydrology Section
PO Box 1293
Albuquerque, NM 87103

RECEIVED
SEP 26 1989
HYDROLOGY SECTION

Re: Sunset West Subdivision (M9/D4; 3914)

Dear Mr. Reeder:

In response to your letter of 9/11/89, we offer the following:

1. Since ponding will be required for this subdivision, we propose to provide rear yard ponds as originally proposed by Gordon Herkenhoff and Associates. Attached calculations indicate that the developed flow rate will not exceed the undeveloped.

2. Per the attached grading plan, the lots have been elevated an average of two feet and a small ditch placed to divert flows to the east. This should resolve any concerns with offsite flows.

3. We do not propose to grade Phase II at this time. The earthwork was designed such that each phase could be constructed independently, thus avoiding the creation of additional problems. For Phase II, all we request at this time is conceptual approval.

4. Attached you will find the appropriate calculations and details for the erosion control pad for Phase I. Phase II pads would be detailed at a later date.

This should resolve any concerns that the City may have concerning this project. As always, we appreciate your efforts and, should you have any questions, please call.

Sincerely,

D. MARK GOODWIN AND ASSOCIATES, P.A.

Mark Goodwin

Mark Goodwin, P.E.

DMG/mbs

Attachments

dmg D. MARK GOODWIN & ASSOC.
CONSULTING ENGINEERS

JOB Sunset West
SUBJECT Drainage
JOB NO.
SHEET 1 OF 4
BY MG DATE 9/19/89
CHECKED DATE

RECEIVED SEP 2 0 1989 HYDROLOGY SECTION

On-Site Runoff - Phase I

utilizing Rear Yard Ponds

D.A. = 1.85 Ac. incl. Streets

P = 2.2 in

C = 0.70

Length = 715'

ΔH = 6'

T_c = 8 min. USE 10 min.

$I = 2.2(6.84)10^{-.51} = 4.65$ in/hr

Q (dev.) = 6.02 cfs

Q (undev.) = 6.9 cfs from orig. report

Since Q (dev.) < Q (undev.) → scheme holds

On-Site Runoff - Phase II

utilizing Rear Yard Ponds

D.A. = 7.17 Ac. incl. Streets

P = 2.2 in

C = 0.70

dmg D. MARK GOODWIN & ASSOC.
CONSULTING ENGINEERS

JOB Sunset West
SUBJECT Drainage
JOB NO. _____ SHEET 2 OF 4
BY MG DATE 9/19/89
CHECKED _____ DATE _____

Length = 1300'

$\Delta H = 8'$

$T_c = 15$ min.

$I = 2.2(6.84)(15)^{-.51} = 3.78$ in/hr.

Q (dev.) = 19 cfs

Q (undev.) = 19 cfs from orig. report

Since Q (dev.) = Q (undev.) ⟹ scheme holds

From attached nomograph V = 3.75 fps when stormwater exits Phase I via Sunbow.

D = 0.51' Q = 34 cfs

R = 33.02'

$\frac{V^2}{R^{1/3}} = 4.38$ ⟹ does not fall on chart

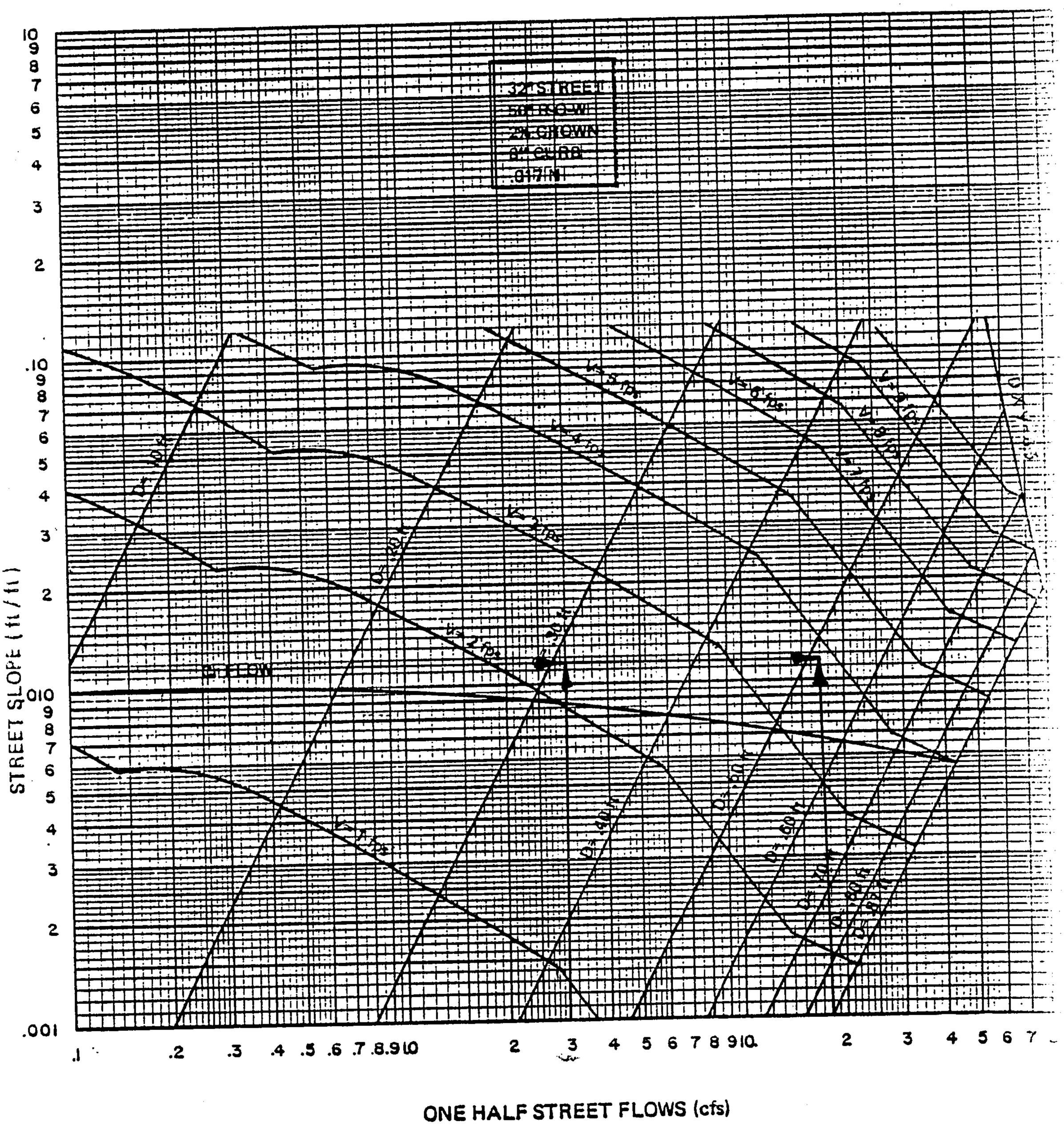
W = 32'

H = 0.51

$\frac{Q}{WH} = 2.22$ ⟹ Type C rip-rap $K_m = 9''$

$A_c = \frac{Q}{V} = 13^{\phi}$

STREET CAPACITY



dmg D. MARK GOODWIN & ASSOC.
CONSULTING ENGINEERS

JOB Sunset West
SUBJECT Drainage
JOB NO. _____ SHEET 4 OF 4
BY MG DATE 9/19/89
CHECKED _____ DATE _____

$Y_c = 0.50'$

$f_c = 2$

$L = 2\left[\frac{13}{0.50} - 32\right] = 12'$

$\Rightarrow$ 9" stone, 34' wide (back to back), 12' long, thickness = 18"

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

KEN SCHULTZ
MAYOR

September 11, 1989

D. Mark Goodwin, P.E.
D. Mark Goodwin & Associates
Post Office Box 21307
Albuquerque, New Mexico 87154

RE GRADING AND DRAINAGE PLAN FOR SUNSET WEST UNIT II, SUBMITTED AUGUST 24, 1989, FOR ROUGH GRADING PERMIT AND WORK ORDER APPROVALS (M-9/D4; W.O. 3914)

Dear Mr. Goodwin,

I have reviewed your submittal, referred to above, and offer the following comments:

1. Although your analysis of the diversion of the offsite flows seems correct, the downstream conditions remain the same in that the outfall for flows from this area is a playa on private land. Storm runoff must be limited to the undeveloped state in both amount and frequency. This requirement, unfortunately, will require some sort of ponding onsite until an acceptable solution is in place downstream.

2. The grading plan should address the offsite flows from the undeveloped Unit II - Phase II. The new lots in block five (Lots 12-21) should be protected by a berm which directs the flows away from the property, or grading which slopes the ground to the north (away from the common lot line), or by any other means you deem appropriate.

3. Please address the erosion and silt control problems. If it is your plan to rough grade the Phase II area at the same time as the Phase I area, but not to develop that area immediately, you will need to reseed the area or provide some sort of erosion control which satisfies the Environmental Health Department. In addition, you will need to address the problem of erosion caused by the storm runoff traveling down the graded but unasphalted streets.

4. For Work Order approval, please provide the street grades for Sage Road on both sides of the intersection of Blazick St., and the details of the erosion control pads with design calculations.

If you have any questions, please call me at 768-2650.

Cordially,

Stuart Reeder

G. Stuart Reeder, P.E.
C.E./Hydrology Section

GSR
(WP+1275)

DRAINAGE INFORMATION SHEET

PROJECT TITLE: SUNSET WEST UNIT II ZONE ATLAS/DRNG. FILE #: M-9 L04

LEGAL DESCRIPTION: Sunset West Unit II

CITY ADDRESS: Sage and Blazick SW

ENGINEERING FIRM: D.Mark Goodwin & Assoc, P.A. CONTACT: Mark Goodwin, P.E.

ADDRESS: PO Box 21307, Alb, NM 87154 PHONE: 505/265-0905

OWNER: Fair Plaza Associates CONTACT: John McMullen

ADDRESS: 7109 Prospect NE PHONE: 505/883-1100

ARCHITECT: n/a CONTACT: ____

ADDRESS: ____ PHONE: ____

SURVEYOR: D.Mark Goodwin & Assoc, P.A. CONTACT: Stewart Maida, L.S.

ADDRESS: PO Box 21307, Alb, NM 87154 PHONE: 505/265-0905

CONTRACTOR: n/a CONTACT: ____

ADDRESS: ____ PHONE: ____

RECEIVED
AUG 24 1989
HYDROLOGY SECTION

PRE-DESIGN MEETING:

X YES

____ NO

____ COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO. ____

EPC NO. ____

PROJ. NO. ____

TYPE OF SUBMITTAL:

X DRAINAGE REPORT

____ DRAINAGE PLAN

____ CONCEPTUAL GRADING & DRAINAGE PLAN

X GRADING PLAN

____ EROSION CONTROL PLAN

____ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL

____ PRELIMINARY PLAT APPROVAL

____ SITE DEVELOPMENT PLAN APPROVAL

____ FINAL PLAT APPROVAL

____ BUILDING PERMIT APPROVAL

____ FOUNDATION PERMIT APPROVAL

____ CERTIFICATE OF OCCUPANCY APPROVAL

X ROUGH GRADING PERMIT APPROVAL

____ GRADING/PAVING PERMIT APPROVAL

____ OTHER ____ (SPECIFY)

DATE SUBMITTED: 8/25/89

BY: Mark Goodwin Mark Goodwin, P.E.