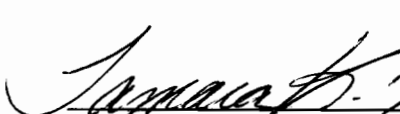


**VENTANA RANCH SUBDIVISION
DRAINAGE REPORT
Tracts 4A & 4B - Teresina Subdivision
Tracts 7A & 7B - Los Prados Subdivision**

Amended September 1996

I, Tamara K. Morgan, hereby certify that I am a Registered Professional Engineer, registered in the State of New Mexico, and that the following report was prepared under my direction and is true and correct to the best of my knowledge and belief.


Tamara K. Morgan, P.E.
NMPE No. 10995



I:\CDP\95228\A2441\DRAINAGE.RPT-9/11/96



September 11, 1996

Susan M. Cologne, P.E.
City/County Floodplain Administrator
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Revised Preliminary Grading Plan for Tract 4B-1 of Ventana Ranch

Dear Ms. Cologne:

This report is for rough grading approval of Tract 4B-1 and preliminary plat approval.

The revisions to the original Tract 4B-1 grading plan are as follows:

- The minimum lot dimensions have decreased to a 43' by 107' lot.
- Due to these lot size changes, the total number of lots in the subdivision has increased by ten.
- Also due to the minimum depth of the lots, the roadways have shifted slightly from their original position.
- The street slopes of Piedra Quemada Rd. changed slightly in order to tie in to La Rocca Rd. after the slight shift in the street location.

Although there have been some slight changes in the subdivision layout and street slopes, the drainage concept and drainage basins have not changed.

An analysis of the new layout has been done and has shown that due to the increased number of lots, and the increased density, the total amount of 100-year flow leaving Tract 4B-1 has increased by only 0.58 cfs. This is less than 1.9% of the original flow from the original layout. The flow entering the inlets at the northwest of Tract 4A has increased by 0.15 cfs. The increase in flow entering the inlets at the northeast corner of Tract 7A is only 0.43 cfs.

Also, an analysis was done on the depth of flow in Las Piedras Dr. and Tapatio Pl. It shows that the depth increases by less than 0.01' in both cases. This analysis indicates that there is sufficient capacity in the existing inlets in Tract 4A and Tract 7A to handle the additional flow of 0.58 cfs.

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LARRY W. HUSTON, C.P.
MICHAEL M. EMERY, P.E.
BRIAN G. BURNETT, P.E.

KERRY L. DAVIS, P.E.
LARRY A. LARRAÑAGA, P.E.
HOWARD C. STONE, P.E.

PRINCIPALS

GEORGE RADNOVICH, R.L.A.
SILAS V. SUAZO
JAMES R. TOPMILLER, P.E.

WILLIAM L. VREEKE, P.E.
GORDON A. WALHOOD, JR., P.E.
MARY E. CARTER

BOHANNAN-HUSTON INC.



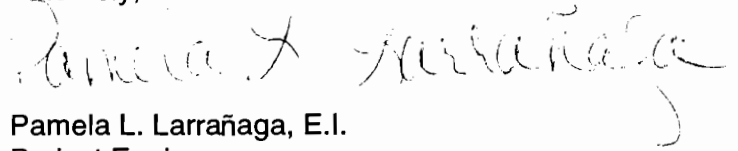
COURTYARD I, 7500 JEFFERSON STREET, NE ALBUQUERQUE, NM 87109-4355
TEL (505) 823-1000 FAX (505) 821-0892

Susan M. Cologne, P.E.
September 11, 1996
Page 2

Following is a copy of the original approved Drainage Report for Ventana Ranch Tracts 4A & 4B - Teresina Subdivision, Tracts 7A & 7B - Los Prados Subdivision, and a copy of the approval letter dated January 25, 1996.

If you have any further comments or questions please feel free to call.

Sincerely,

A handwritten signature in dark ink, appearing to read "Pamela L. Larrañaga". The signature is fluid and cursive, with a large initial "P" and a long, sweeping underline.

Pamela L. Larrañaga, E.I.
Project Engineer
Community Development
and Planning Group

PLL/rac

Enclosures

cc: Cleve Matthews, Sandia Properties LTD. (w/encl.)

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10. Sketch Plat - Teresina Subdivision - Unit II (Tract 4B-1)
11. AMAFCA Update Dated 9/9/96

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Ventana Ranch Subdivision
Drainage Report
Tracts 4A & 4B - Teresina Subdivision
Tracts 7A & 7B - Los Prados Subdivision

December 1995
Revised January 1995

**VENTANA RANCH SUBDIVISION
DRAINAGE REPORT
TRACTS 4A & 4B - TERESINA
SUBDIVISION
TRACTS 7A& 7B - LOS PRADOS
SUBDIVISION**

Prepared for:

**Sandia Properties Ltd.
#10 Tramway Loop NE
Albuquerque, NM 87122**



**VENTANA RANCH SUBDIVISION
DRAINAGE REPORT
Tracts 4A & 4B - Teresina Subdivision
Tracts 7A & 7B - Los Prados Subdivision**

I, Tamara K. Morgan, hereby certify that I am a Registered Professional Engineer, registered in the State of New Mexico, and that the following report was prepared under my direction and is true and correct to the best of my knowledge and belief.

Tamara K. Morgan
11/19/96

Tamara K. Morgan, P.E.
NMPE No. 10995

\\CDP\95228\A2441\DRAINAGE.RPT-1/19/96



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7. Preliminary Borrow Site Grading Plan - Tract 8

I. PURPOSE

The purpose of this report is to present the drainage management plan for preliminary plat and rough grading approval for the proposed Ventana Ranch Teresina Subdivision (Ventana Ranch, Tracts 4A & 4B) and Los Prados Subdivision (Ventana Ranch, Tracts 7A & 7B). The Drainage Ordinance and the Development Process Manual (D.P.M.) were utilized to develop this plan.

II. SITE LOCATION AND EXISTING CONDITIONS

The subdivisions are located west of Paradise Hills in the southeast corner of the proposed Ventana Ranch Subdivision (plat of Ventana Ranch, Albuquerque, New Mexico, filed November 30, 1995 as Document No. 95122531 in Volume 95C, Folio 430 of County records of Bernalillo County, New Mexico).

This area is included in the "Las Ventanas Subdivision Drainage Master Plan" prepared by Bohannon-Huston Inc., originally dated April 1995 and updated October 1995. The Master Drainage Plan shows that under existing conditions, the flows from Teresina Subdivision (Tracts 4A & 4B) and Los Prados Subdivision (Tracts 7A & 7B) currently drain to the Middle Branch Piedras Marcadas Arroyo, which is located northeast of the proposed subdivisions. The runoff from these two tracts is conveyed through a series of two storage playas: the "loop road playa", located partially in Tract 6; and the "main playa", located at the east end of Ventana Ranch (See Appendix I).

The development of Teresina Subdivision (Tracts 4A & 4B) and Los Prados Subdivision (Tracts 7A & 7B) are also discussed in the "Las Ventana Subdivision Interim Drainage Facilities Plan" prepared by Bohannon-Huston Inc., originally dated July 1995 and updated October 1995. Teresina Subdivision (Tracts 4A & 4B) is to be developed as part of subsystem 1; Los Prados is to be developed as part of subsystem 3. As stated in the plan, the "loop road playa" and the "main playa" are large enough to retain the flows from 450 developed lots before the construction of outfall reaches 6 & 8 (see Appendix I). The drainage plans for Teresina Subdivision (Tracts 4A & 4B) and Los Prados Subdivision (Tracts 7A & 7B) stated in this report are in accordance to the "Las Ventanas Subdivision Interim Drainage Facility Plan".

III. HYDROLOGIC/HYDRAULIC ANALYSIS

The August 1991 changes to the D.P.M. section 22.2 (Hydrology) were utilized to determine the hydrologic discharges and volume. The modified rational method was used to determine the volumes (see Appendix II). With the development of Teresina Subdivision (Tracts 4A & 4B) and Los Prados Subdivision (Tracts 7A & 7B) all flow is diverted to the "loop road playa" and the "main playa" (see Figure 1). Under fully developed conditions all flow is diverted to the North Branch of the Piedras

Marcadas Channel as outlined in the "Las Ventanas Subdivision Drainage Master Plan".

Teresina Subdivision (Tracts 4A & 4B)

Teresina Subdivision (Tracts 4A & 4B) existing on-site flow of 31 cfs currently flows to the Middle Branch of the Piedras Marcadas Arroyo as described in the "Las Ventanas Subdivision Drainage Master Plan", page 11.

With Teresina Subdivision - Unit I (Tract 4A) (58 lots) developed and Unit II (Tract 4B) (44 lots) graded the total flow generated from the site is 72 cfs. The site is, however designed for full development. With both Unit I and Unit II developed the total discharge generated from the site is 83 cfs. Approximately 47 cfs is directed to Ventana Ranch Road through Las Piedras Dr., picked up by inlets and diverted through a storm drain and a temporary corrugated metal pipe (located outside of the City utility right-of-way) to the "loop road playa" in the interim and ultimately to the North Branch of the Piedras Marcadas Channel; 28 cfs is diverted to Los Prados Subdivision (Tracts 7A & 7B) through Monteria St.; 12 cfs street flows down Paseo Del Norte to the North Branch of the Piedras Marcadas Channel through Universe Blvd. The grading and drainage plan for Teresina Subdivision (Tracts 4A & 4B) is designed to tie to both the existing and future Paseo del Norte Roads. For a more detailed analysis see the Drainage Basin Map in Appendix IV and the calculations in Appendices II and III.

Los Prados Subdivision (Tracts 7A & 7B)

Los Prados Subdivision (Tracts 7A & 7B) existing on-site flow of 25 cfs currently flows to the Middle Branch of the Piedras Marcadas Arroyo as described in the "Las Ventanas Subdivision Drainage Master Plan", page 11.

With Los Prados Subdivision - Unit I (Tract 7A) (62 lots) developed and Unit II (Tract 7B) (10 lots) graded the total flow generated from the site is 61 cfs. Like Teresina Subdivision (Tracts 4A & 4B), Los Prados Subdivision (Tracts 7A & 7B) is, designed for full development. With both Unit I and Unit II developed the total discharge generated from the site is 65 cfs. Approximately 6 cfs is directed to Ventana Ranch Road and street flows to the "loop road playa" in the interim and ultimately to the North Branch of the Piedras Marcadas Channel; 5 cfs sheet flows through the proposed park to the "loop road playa" in the interim and street flows to the North Branch of the Piedras Marcadas Channel after the channel is constructed; 50 cfs with the 28 cfs of off-site flow generated from Teresina Subdivision (Tracts 4A & 4B) street flows within the subdivision and is picked up by inlets in Tapatio Dr., diverted through a storm drain through a temporary corrugated metal pipe (located outside the City utility right-of-way) and a temporary channel (located in permanent channel right-of-way) to the "main playa" in the interim (ultimately the storm drain will end at the North Branch of the Piedras Marcadas Channel); 4 cfs and 14 cfs of off-site flow street flows to the North Branch of the Piedras Marcadas Channel through

Universe Blvd. For a more detailed analysis see the Drainage Basin Map in Appendix IV and the calculations in Appendices II and III.

No improvements are proposed to Paseo Del Norte with the development of this subdivision. The future drainage solution will be reviewed at the time the North side of the Paseo Del Norte is to be constructed thru the design review process. At this time two scenarios are sized. Alternate 1 is based on the extension of Paseo to the east alignment and drainage outfall being determined. Alternate 2 is collecting the storm drain from the Paseo Del Norte Right of way and conveying the flows down Universe to the Las Ventanas Drainage Facility.

IV. DRAINAGE MANAGEMENT PLAN

It is proposed that the 102 lots in Teresina Subdivision (Tracts 4A & 4B) be developed in two units. During development the entire site will be graded. The majority of the runoff will flow to inlets in Ventana Ranch Road and down Ventana Ranch Road to the "loop road playa". When the "North Branch Piedras Marcadas Channel" is constructed, the street and storm drain will be extended and the flow from the Teresina Subdivision (Tracts 4A & 4B) will enter the channel as outlined in the "Las Ventanas Subdivision Drainage Master Plan", page 19 (see Figure 1).

It is proposed that the 72 lots in Los Prados Subdivision (Tracts 7A & 7B) be developed in two units. During development the entire site will be graded. The majority of the runoff will flow to inlets in Tapatio Dr., through a temporary channel to the "main playa". When the "North Branch Piedras Marcadas Channel" is constructed the storm drain will be extended and the flow from the Los Prados Subdivision (Tracts 7A & 7B) will enter the channel as outlined in the "Las Ventanas Subdivision Drainage Master Plan", page 19 (see Figure 1).

With the development of Teresina Subdivision (Tracts 4A & 4B) and Los Prados Subdivision (Tracts 7A & 7B), Tract 1, and Tract 8 will be used as a borrow site and mass graded according the grading plans in Appendix IV. All temporary structures (i.e., channel, CMP) are located in appropriate easements and will be maintained by the owner until permanent facilities are constructed. Appropriate erosion control measures will be taken at all street cut-offs and storm drain discharge locations. Need for some erosion control will be determined during construction since no measures will need to be taken where existing basalt, not soil, exists.

V. CONCLUSIONS

The development of Teresina Subdivision (Tracts 4A & 4B) and Los Prados Subdivision (Tracts 7A & 7B) are governed by the "Las Ventanas Subdivision Drainage Master Plan" originally dated April 1995 and updated October 1995.

Increases in runoff, depth and velocity due to proposed development are within anticipated parameters for this area, and can be safely conveyed by the improvements proposed by this drainage plan. Erosion and dust control, consisting of erosion control berms, snow fencing, dumped rip rap and distillation basins, will be provided to prevent washing or blowing of sediment into paved streets and storm drains.

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APPENDIX II Hydrology

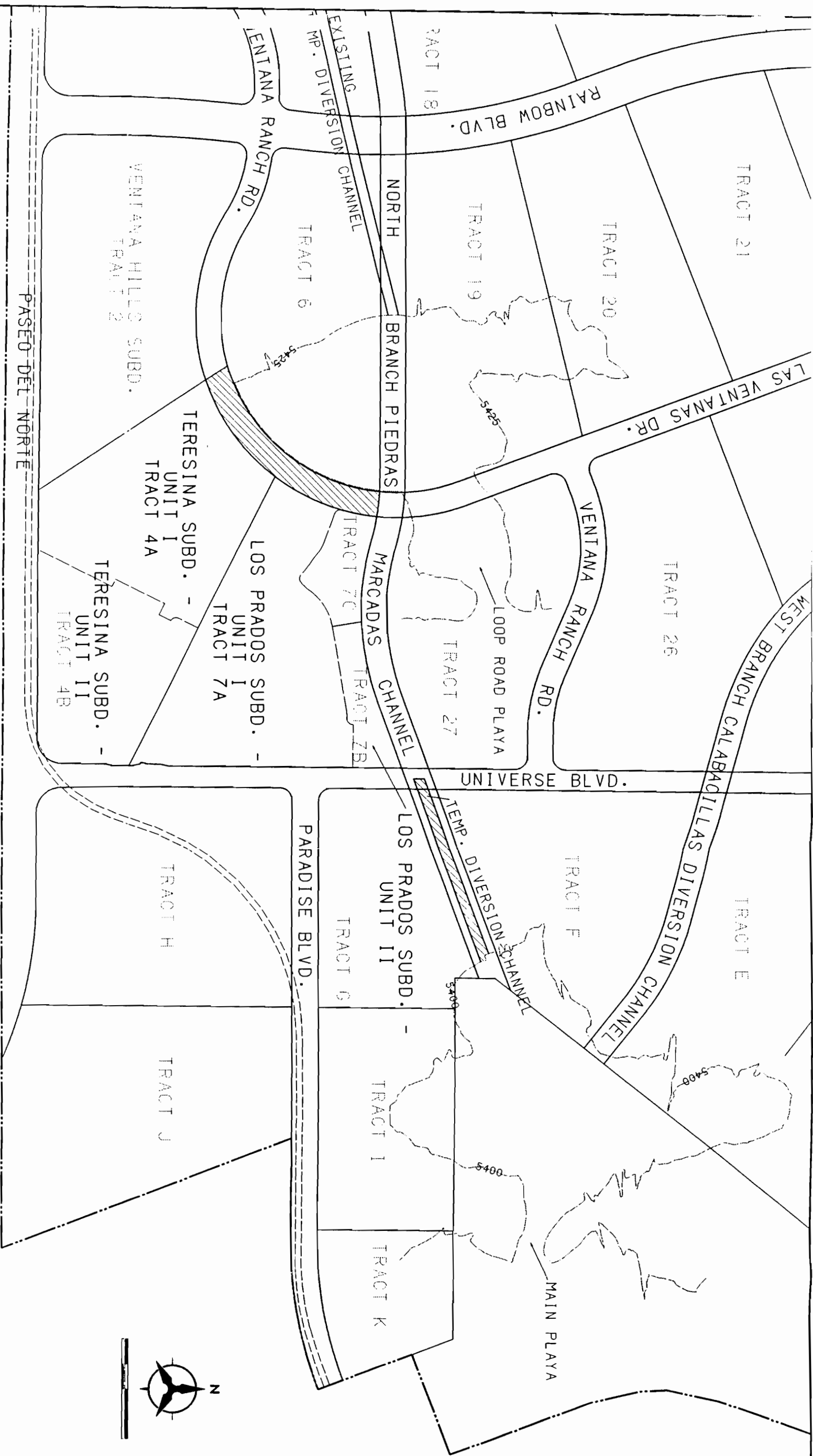
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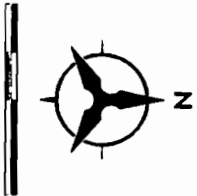
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7. Preliminary Borrow Site Grading Plan - Tract 8



LEGEND

SUBDIVISION TO BE DEVELOPED

OFFSITE ROADWAY OR TEMPORARY CHANNEL TO BE CONSTRUCTED WITH THIS PLAN SET



ENGINEER'S SEAL		SURVEY INFORMATION		BENCH MARKS		AS-BUILT INFORMATION	
NO. DATE		FIELD NOTES		ACS BRASS TABLET STAMPED "1-B10"		CONTRACTOR	
		NO. BY DATE		GEOGRAPHIC POSITION (NAD 1927)		STAKED BY	
				N.M. STATE PLANE COORDINATES (CENTRAL ZONE) X=357,526.69, Y=1,525,168.35		INSPECTOR'S ACCEPTANCE BY	
				GROUND-TO-GRID FACTOR = .9996640		DATE	
				Δα = -00°16'30"		DRAWINGS CORRECTED BY	
				NGVD 1929 ELEVATION = 5419.522		MICRO-FILM INFORMATION	
						RECORDED BY	
						DATE	
						NO.	

REVISIONS		DESIGN	
NO.	DATE	REMARKS	BY
DESIGNED BY	PLL	DATE	12/95
DRAWN BY	PLL	DATE	12/95
CHECKED BY	TKM	DATE	12/95

BOHANNAN-HUSTON INC.

ENGINEERS • PLANNERS • PHOTOGRAPHIC SURVEYING • LANDSCAPE ARCHITECTS

ALBUQUERQUE LAS CRUCES SANTA FE

CITY OF ALBUQUERQUE

PUBLIC WORKS DEPARTMENT

ENGINEERING GROUP

VENTANA RANCH SUBD. DRAINAGE REPORT

FIGURE 1

APPROVALS

ENGINEER

DATE

APPROVALS

ENGINEER

DATE

TRANSPORTATION

WASTE WATER

HYDROLOGY

WATER

TRAFFIC OPER.

WATER

DRAWING NO.

XXXX.XX

MAP NO.

XXX

SHEET

XX

OF

XX

4.0 INTERIOR DRAINAGE FACILITIES

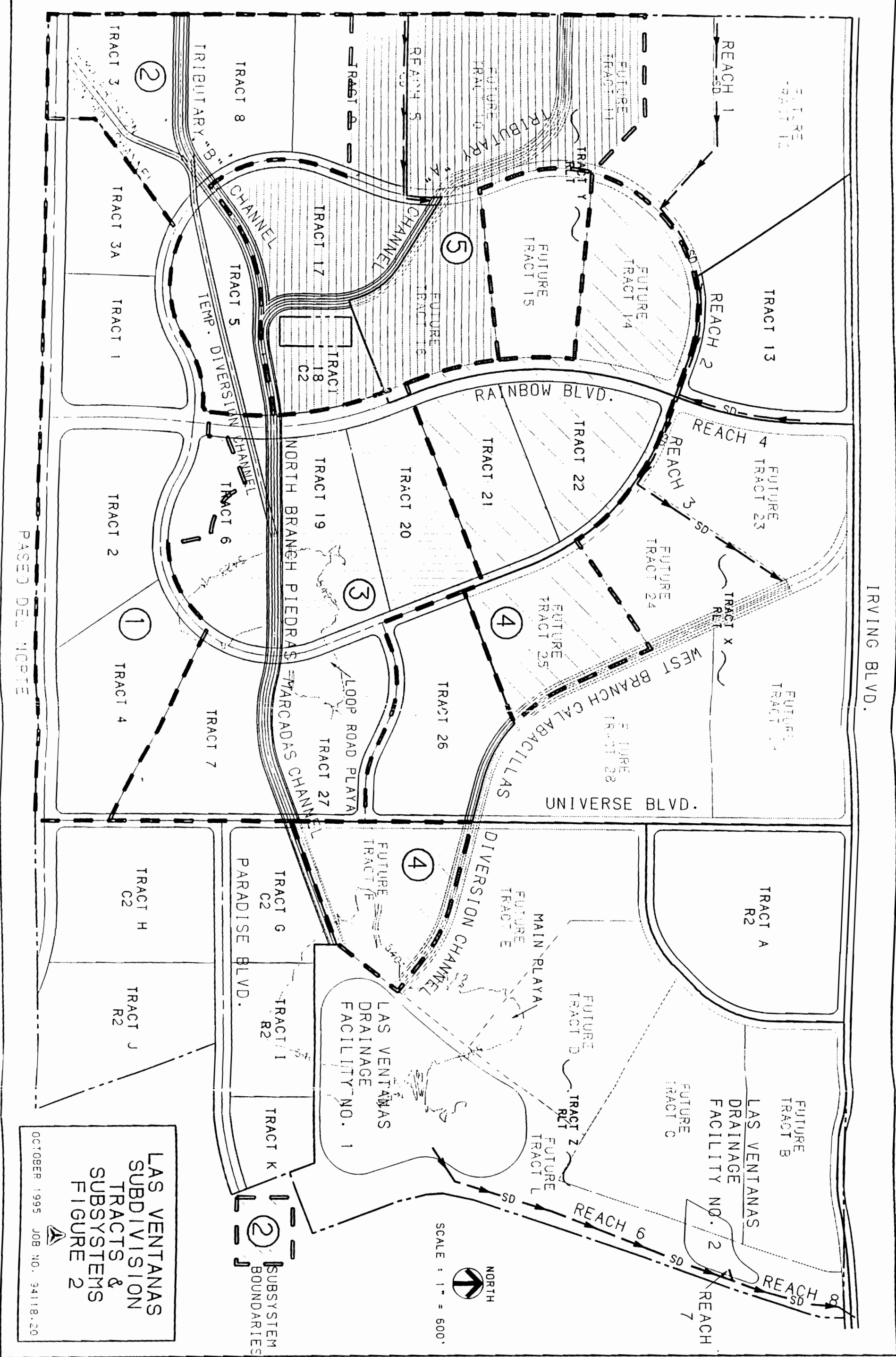
This section discusses the regional drainage facilities that must be constructed along with the development of the tracts in each of the systems. In all cases, the order of construction of the tracts in each subsystem is not significant. For Subsystems 1-3 and 5, the drainage facilities required for each subsystem must be constructed with the first tract that is developed. However, due to the more disjointed nature of Subsystem 4 the interim and permanent drainage facilities are described per each tract.

Table 3 shows the interim (temporary) and permanent drainage facilities that will have to be constructed with Subsystems 1, 2, 3, and 5. The drainage facilities associated with Subsystem 4 are described in Table 4.

Table 3
Interim and Permanent Regional Drainage Facilities
Subsystems 1, 2, 3, and 5

Subsystem	Tracts	Interim Facility	Permanent Regional Facility
1	1, 2, 4, 6, 3A	• Build temporary earthen channel for Tributary B North Branch Piedras Marcadas to Loop Rd. Playa. • Construct temporary erosion channel.	None required.
2	3, 5, 8, 9	• Remove temporary earthen channel to Rainbow Blvd. • Connect outlet of concrete channel to remaining portion of temporary earthen channel. • Remove temporary erosion channel.	Build Tributary B and North Branch Piedras Marcadas to Rainbow Boulevard.
3	6, 7, 19, 27	• Remove Loop Road Playa. • Remove remainder of temporary erosion channel.	Build North Branch Piedras Marcadas from Rainbow Blvd. to LVDF No. 1.
5	10, 11, 16, 17	None.	Build Tributary A North Branch Piedras Marcadas.

Note: Sandia Properties will construct all drainage facilities listed in Table 3.



LAS VENTANAS
SUBDIVISION
TRACTS &
SUBSYSTEMS
FIGURE 2

OCTOBER 1995 JOB NO. 34118.20

LAND TREATMENT TYPES

TRACT #	BASIN (1)	DEVELOPED CONDITIONS (2)				NET AREA (ACRE)	GROSS AREA (ACRE)	TOTAL # UNITS	PAD, DRIVEWAY & PATIO (ACRE)	RIGHT -OF-WAY (ACRE)	DEVELOPED CONDITIONS(3)			
		A	B	C	D						A	B	C	D
4	317B	4.0%	20.0%	22.0%	54.0%	22.29	25.93	102	7.61	4.67	0.0%	21.4%	23.5%	55.1%
7	317B	4.0%	20.0%	22.0%	54.0%	15.50	19.91	72	4.92	3.96	0.0%	20.3%	22.4%	57.3%

STREET NAME	RIGHT-OF WAY (FT)	IMPERVIOUS, D DRIVING LANES (FT)	CURBS (FT)	SIDE WALK (FT)	TOTAL (FT)	DEVELOPED CONDITIONS (5)			
						A	B	C	D
RAINBOW BLVD.	156	68	2.5	12	82.5	0.0%	23.6%	23.6%	52.9%
UNIVERSE BLVD. - 1	43	28	0.625	4	32.625	0.0%	12.1%	12.1%	75.9%
UNIVERSE BLVD. - 2	43	38	0.625	4	42.625	0.0%	0.4%	0.4%	99.1%
PASEO DEL NORTE	78	24	0	0	24	0.0%	34.6%	34.6%	30.8%
VENTANA RANCH RD.	100	36	1.25	12	49.25	0.0%	25.4%	25.4%	49.2%

- NOTES:
- (1) Drainage Basin from the "Las Ventanas Subdivision Drainage Master Plan" that the tract lies in.
 - (2) From "Las Ventanas Subdivision Drainage Master Plan"
 - (3) Impervious percentage is based on the number of lots times the pad, driveway and patio areas plus the total right-of-way area divided by the net area. The percent A is zero because the entire area is graded. B and C are based on the relative percentages from the Master Plan.
 - (4) Tract 1 will be developed in Subsystem 1; the storage of the playa will be checked for tract 1 developed conditions, and the temporary channel will be designed for tract 1 developed conditions.
 - (5) For streets outside of the subdivision the Impervious percentage was calculated by dividing the total impervious length by the total r/w length. The percentages for B & C were divided equally.

TABLE 1: HYDROLOGIC VOLUMETRIC & DISCHARGE DATA

VENTANA RANCH TRACT 4 - UNIT 1 EXISTING & UNIT-2 EXISTING (TERESINA SUBDIVISION)
VENTANA RANCH TRACT 7 - UNIT 1 EXISTING & UNIT-2 EXISTING (LOS PRADOS SUBDIVISION)

BASIN I.D.	AREA (AC)	AREA (MI^2)	% LAND TREATMENT				RUNOFF (AC-FT)		DISCHARGE (CFS)	
			A	B	C	D	10 YR	100 YR	10 YR	100 YR
TRACT 4										
A-1	1.36	0.00213	98.0%	0.0%	2.0%	0.0%	0.01	0.05	0.36	1.80
A-2	2.21	0.00345	98.0%	0.0%	2.0%	0.0%	0.02	0.08	0.59	2.92
A-3	1.73	0.00270	98.0%	0.0%	2.0%	0.0%	0.01	0.07	0.46	2.29
A-4	3.89	0.00608	98.0%	0.0%	2.0%	0.0%	0.03	0.15	1.03	5.14
A-5	2.72	0.00425	98.0%	0.0%	2.0%	0.0%	0.02	0.10	0.72	3.59
A-6	0.96	0.00150	98.0%	0.0%	2.0%	0.0%	0.01	0.04	0.25	1.27
						sub total	0.10	0.49	3.41	17.01
B-1	2.68	0.00419	98.0%	0.0%	2.0%	0.0%	0.02	0.10	0.71	3.54
B-2	1.79	0.00280	98.0%	0.0%	2.0%	0.0%	0.01	0.07	0.47	2.37
B-3	1.94	0.00303	98.0%	0.0%	2.0%	0.0%	0.01	0.07	0.51	2.56
B-4	1.48	0.00231	98.0%	0.0%	2.0%	0.0%	0.01	0.06	0.39	1.96
						sub total	0.05	0.30	2.08	10.43
TRACT 7										
C-1	1.20	0.00188	98.0%	0.0%	2.0%	0.0%	0.01	0.05	0.32	1.59
						sub total	0.01	0.05	0.32	1.59
D-1	1.66	0.00259	98.0%	0.0%	2.0%	0.0%	0.01	0.06	0.44	2.19
D-2	2.01	0.00314	98.0%	0.0%	2.0%	0.0%	0.01	0.08	0.53	2.66
D-3	2.04	0.00319	98.0%	0.0%	2.0%	0.0%	0.01	0.08	0.54	2.70
D-4	1.29	0.00202	98.0%	0.0%	2.0%	0.0%	0.01	0.05	0.34	1.70
						sub total	0.04	0.27	1.85	9.25
D-5	3.60	0.00563	98.0%	0.0%	2.0%	0.0%	0.03	0.14	0.95	4.76
						sub total	0.03	0.14	0.95	4.76
D-6	0.73	0.00114	98.0%	0.0%	2.0%	0.0%	0.01	0.03	0.19	0.96
D-7	1.88	0.00294	98.0%	0.0%	2.0%	0.0%	0.01	0.07	0.50	2.48
D-8	1.07	0.00167	98.0%	0.0%	2.0%	0.0%	0.01	0.04	0.28	1.41
						sub total	0.03	0.14	0.97	4.85
E	1.98	0.00309	98.0%	0.0%	2.0%	0.0%	0.01	0.07	0.52	2.62
						sub total	0.01	0.07	0.52	2.62
ARTERIAL/COLLECTOR STREETS										
V-1	0.55	0.00086	98.0%	0.0%	2.0%	0.0%	0.00	0.02	0.15	0.73
V-2	0.50	0.00078	98.0%	0.0%	2.0%	0.0%	0.00	0.02	0.13	0.66
						sub total	0.00	0.04	0.28	1.39
U-1	0.42	0.00066	98.0%	0.0%	2.0%	0.0%	0.00	0.02	0.11	0.56
U-2	1.14	0.00178	98.0%	0.0%	2.0%	0.0%	0.01	0.04	0.30	1.51
						sub total	0.01	0.06	0.41	2.07
P-1	1.99	0.00311	98.0%	0.0%	2.0%	0.0%	0.01	0.07	0.53	2.63
						sub total	0.01	0.07	0.53	2.63

TABLE 2: HYDROLOGIC VOLUMETRIC & DISCHARGE DATA

VENTANA RANCH TRACT 4 - UNIT 1 DEVELOPED & UNIT-2 GRADED (TERESINA SUBDIVISION)
VENTANA RANCH TRACT 7 - UNIT 1 DEVELOPED & UNIT-2 GRADED (LOS PRADOS SUBDIVISION)

BASIN I.D.	AREA (AC)	AREA (MI^2)	% LAND TREATMENT				RUNOFF (AC-FT)		DISCHARGE (CFS)	
			A	B	C	D	10 YR	100 YR	10 YR	100 YR
TRACT 4										
A-1	1.36	0.00213	0.0%	50.0%	50.0%	0.0%	0.04	0.09	1.53	3.33
A-2	2.21	0.00345	0.0%	21.4%	23.5%	55.1%	0.15	0.27	4.65	7.77
A-3	1.73	0.00270	0.0%	21.4%	23.5%	55.1%	0.12	0.21	3.64	6.08
A-4	3.89	0.00608	0.0%	21.4%	23.5%	55.1%	0.27	0.47	8.19	13.68
A-5	2.72	0.00425	0.0%	21.4%	23.5%	55.1%	0.19	0.33	5.73	9.57
A-6	0.96	0.00150	0.0%	50.0%	50.0%	0.0%	0.03	0.07	1.08	2.35
						sub total	0.80	1.44	24.82	42.78
B-1	2.68	0.00419	0.0%	50.0%	50.0%	0.0%	0.07	0.19	3.02	6.57
B-2	1.79	0.00280	0.0%	50.0%	50.0%	0.0%	0.05	0.12	2.01	4.39
B-3	1.94	0.00303	0.0%	50.0%	50.0%	0.0%	0.05	0.13	2.18	4.75
B-4	1.48	0.00231	0.0%	21.4%	23.5%	55.1%	0.10	0.18	3.12	5.20
						sub total	0.27	0.62	10.33	20.91
TRACT 7										
C-1	1.20	0.00188	0.0%	23.6%	23.6%	52.9%	0.08	0.14	2.47	4.16
						sub total	0.08	0.14	2.47	4.16
D-1	1.66	0.00259	0.0%	23.6%	23.6%	52.9%	0.11	0.20	3.42	5.75
D-2	2.01	0.00314	0.0%	23.6%	23.6%	52.9%	0.14	0.24	4.14	6.97
D-3	2.04	0.00319	0.0%	23.6%	23.6%	52.9%	0.14	0.24	4.20	7.07
D-4	1.29	0.00202	0.0%	23.6%	23.6%	52.9%	0.09	0.15	2.66	4.47
						sub total	0.48	0.83	14.42	24.26
D-5	3.60	0.00563	0.0%	23.6%	23.6%	52.9%	0.24	0.43	7.41	12.48
						sub total	0.24	0.43	7.41	12.48
D-6	0.73	0.00114	0.0%	50.0%	50.0%	0.0%	0.02	0.05	0.82	1.79
D-7	1.88	0.00294	0.0%	23.6%	23.6%	52.9%	0.13	0.22	3.87	6.51
D-8	1.07	0.00167	0.0%	50.0%	50.0%	0.0%	0.03	0.07	1.20	2.62
						sub total	0.18	0.34	5.89	10.92
E	1.98	0.00309	0.0%	50.0%	50.0%	0.0%	0.05	0.14	2.23	4.85
						sub total	0.05	0.14	2.23	4.85
ARTERIAL/COLLECTOR STREETS										
V-OFF *									30.00	55.40
V-1	0.55	0.00086	0.0%	25.4%	25.4%	46.2%	0.03	0.06	1.05	1.79
V-2	0.50	0.00078	0.0%	25.4%	25.4%	49.2%	0.03	0.06	1.00	1.70
						sub total	0.06	0.12	32.05	58.89
U-1	0.42	0.00066	0.0%	50.0%	50.0%	0.0%	0.01	0.03	0.47	1.03
U-2	1.14	0.00178	0.0%	50.0%	50.0%	0.0%	0.03	0.08	1.28	2.79
						sub total	0.04	0.11	1.75	3.82
P-OFF *									4.20	5.95
P-1	1.99	0.00311	0.0%	34.6%	34.6%	30.8%	0.10	0.20	3.32	6.05
						sub total	0.10	0.20	7.52	12.00

* VALUES TAKEN FROM THE "VENTANA RANCH SUBDIVISION REVISED
REVISED DRAINAGE REPORT TRACT 2 & TRACT 6-UNIT 1

TABLE 3: HYDROLOGIC VOLUMETRIC & DISCHARGE DATA

VENTANA RANCH TRACT 4 - UNIT 1 DEVELOPED & UNIT-2 DEVELOPED (TERESINA SUBDIVISION)
VENTANA RANCH TRACT 7 - UNIT 1 DEVELOPED & UNIT-2 DEVELOPED (LOS PRADOS SUBDIVISION)

BASIN I.D.	AREA (AC)	AREA (MI^2)	% LAND TREATMENT				RUNOFF (AC-FT)		DISCHARGE (CFS)	
			A	B	C	D	10 YR	100 YR	10 YR	100 YR
TRACT 4										
A-1	1.36	0.00213	0.0%	21.4%	23.5%	55.1%	0.09	0.17	2.86	4.78
A-2	2.21	0.00345	0.0%	21.4%	23.5%	55.1%	0.15	0.27	4.65	7.77
A-3	1.73	0.00270	0.0%	21.4%	23.5%	55.1%	0.12	0.21	3.64	6.08
A-4	3.89	0.00608	0.0%	21.4%	23.5%	55.1%	0.27	0.47	8.19	13.68
A-5	2.72	0.00425	0.0%	21.4%	23.5%	55.1%	0.19	0.33	5.73	9.57
A-6	0.96	0.00150	0.0%	21.4%	23.5%	55.1%	0.07	0.12	2.02	3.38
						sub total	0.89	1.57	27.09	45.26
B-1	2.68	0.00419	0.0%	21.4%	23.5%	55.1%	0.19	0.33	5.64	9.42
B-2	1.79	0.00280	0.0%	21.4%	23.5%	55.1%	0.12	0.22	3.77	6.29
B-3	1.94	0.00303	0.0%	21.4%	23.5%	55.1%	0.13	0.24	4.08	6.82
B-4	1.48	0.00231	0.0%	21.4%	23.5%	55.1%	0.10	0.18	3.12	5.20
						sub total	0.54	0.97	16.61	27.73
TRACT 7										
C-1	1.20	0.00188	0.0%	23.6%	23.6%	52.9%	0.08	0.14	2.47	4.16
						sub total	0.08	0.14	2.47	4.16
D-1	1.66	0.00259	0.0%	23.6%	23.6%	52.9%	0.11	0.20	3.42	5.75
D-2	2.01	0.00314	0.0%	23.6%	23.6%	52.9%	0.14	0.24	4.14	6.97
D-3	2.04	0.00319	0.0%	23.6%	23.6%	52.9%	0.14	0.24	4.20	7.07
D-4	1.29	0.00202	0.0%	23.6%	23.6%	52.9%	0.09	0.15	2.66	4.47
						sub total	0.48	0.83	14.42	24.26
D-5	3.60	0.00563	0.0%	23.6%	23.6%	52.9%	0.24	0.43	7.41	12.48
						sub total	0.24	0.43	7.41	12.48
D-6	0.73	0.00114	0.0%	23.6%	23.6%	52.9%	0.05	0.09	1.50	2.53
D-7	1.88	0.00294	0.0%	23.6%	23.6%	52.9%	0.13	0.22	3.87	6.51
D-8	1.07	0.00167	0.0%	23.6%	23.6%	52.9%	0.07	0.13	2.20	3.71
						sub total	0.25	0.44	7.57	12.75
E	1.98	0.00309	0.0%	50.0%	50.0%	0.0%	0.05	0.14	2.23	4.85
						sub total	0.05	0.14	2.23	4.85
ARTERIAL/COLLECTOR STREETS										
V-OFF *									30.00	55.40
V-1	0.55	0.00086	0.0%	25.4%	25.4%	46.2%	0.03	0.06	1.05	1.79
V-2	0.50	0.00078	0.0%	25.4%	25.4%	49.2%	0.03	0.06	1.00	1.70
						sub total	0.06	0.12	32.05	58.89
U-1	0.42	0.00066	0.0%	12.1%	12.1%	75.9%	0.04	0.06	1.04	1.64
U-2	1.14	0.00178	0.0%	12.1%	12.1%	75.9%	0.10	0.16	2.81	4.46
						sub total	0.14	0.22	3.85	6.10
P-OFF *									4.20	5.95
P-1	1.99	0.00311	0.0%	34.6%	34.6%	30.8%	0.10	0.20	3.32	6.05
						sub total	0.10	0.20	7.52	12.00

* VALUES TAKEN FROM THE "VENTANA RANCH SUBDIVISION REVISED
REVISED DRAINAGE REPORT TRACT 2 & TRACT 6-UNIT 1

VENTANA RANCH TRACT 4 - UNIT 1 DEVELOPED & UNIT-2 DEVELOPED (TERESINA SUBDIVISION)
VENTANA RANCH TRACT 7 - UNIT 1 DEVELOPED & UNIT-2 DEVELOPED (LOS PRADOS SUBDIVISION)

ANALYSIS POINT	FLOW (CFS)		NAME	STREET		SLOPE
	10-YEAR	100-YEAR		WIDTH		
1	27	45	LAS PIEDRAS DR.	48' F-F W/ 6' MED		0.50%
2	17	28	PIEDRA COLINA CT.	26' F-F		1.35%
3	31	52	TAPATIO PL.	32' F-F		0.81%
4	38	64	TAPATIO PL.	32' F-F		0.67%
5	46	77	TAPATIO PL.	28' F-F		0.67%
6	59	104	VENTANA RANCH RD	36' F-F		0.50%
7	62	108	VENTANA RANCH RD	36' F-F		0.50%
8	8	12	PASEO DEL NORTE	104' F-F W/28' MED (1/2 OF STREET)		1.00%
9	11	18	UNIVERSE BLVD.	36' F-F (1/2 OF STREET)		0.76%

100-YR

$$Q_{100} = 64 \text{ CFS}$$

(NEED TO PICK UP 23 CFS)
($Q_{\text{REMAIN}} = 41 \text{ CFS}$)

$$S = 0.67\%$$

$$@ Q = 64 \text{ CFS} \quad d = 0.6'$$

$$Q_{\text{INLET 1}} = 8.5 \text{ CFS} \rightarrow$$

$$Q_{\text{REMAIN}} = 64 - 2(8.5) = 47 \text{ CFS}$$

$$@ Q = 47 \text{ CFS} \quad d = 0.55'$$

$$Q_{\text{INLET 2}} = 7 \text{ CFS}$$

$$Q_{\text{REMAIN}} = 47 - 2(7) = 33 \text{ CFS} \leq 41 \quad \checkmark$$

$$Q_{\text{IN SD}} = 2(8.5) + 2(7) = 31 \text{ CFS}$$

10-YEAR

$$Q_{10} = 38 \text{ CFS}$$

$$@ Q = 38 \quad d = 0.5'$$

$$Q_{\text{INLET 1}} = 6.5 \text{ CFS}$$

$$Q_{\text{REMAIN}} = 38 - 2(6.5) = 25 \text{ CFS} \rightarrow d = 0.4'$$

$$Q_{\text{INLET 2}} = 4 \text{ CFS}$$

$$Q_{\text{REMAIN}} = 25 - 2(4) = 17 \text{ CFS} \quad Q_{\text{IN SD}} = 21 \text{ CFS}$$



BOHANNAN-HUSTON INC.

PROJECT NAME VENTANA RANCH T4+T7 SHEET _____ OF _____
PROJECT NO. _____ BY BCF DATE 10-95
SUBJECT INLET ANALYSIS (TAPATIO PL) CH'D _____ DATE _____

10-yr DOUBLE GATES

$$@ Q = 104 \text{ cfs} \quad d = 0.67'$$

$$\text{SG } Q_{\text{INLET1}} = 9 \text{ cfs} \rightarrow Q_{\text{REMAIN}} = 95 \text{ cfs}$$

$$@ Q = 95 \text{ cfs} \quad d = 0.67'$$

$$\text{DG } Q_{\text{INLET2}} = 14 \text{ cfs} \rightarrow Q_{\text{REMAIN}} = 81 \text{ cfs}$$

$$@ Q = 81 \text{ cfs} \quad d = 0.67'$$

$$\text{DG } Q_{\text{INLET3}} = 14 \rightarrow Q_{\text{REMAIN}} = 67 \text{ cfs}$$

$$@ Q = 67 \text{ cfs} \quad d = 0.67'$$

$$\text{SG } Q_{\text{INLET4}} = 9 \text{ cfs} \quad Q_{\text{REMAIN}} = 58 \text{ cfs}$$

$$Q_{\text{STREET}} = 58 \text{ cfs}$$

$$Q_{\text{SD}} = 46 \text{ cfs}$$

10-yr

$$@ Q = 59 \text{ cfs} \quad d = 0.67'$$

$$\text{SG } Q_{\text{INLET1}} = 9 \text{ cfs} \rightarrow Q_{\text{REMAIN}} = 50 \text{ cfs}$$

$$@ Q = 50 \text{ cfs} \quad d = 0.6'$$

$$\text{DG } Q_{\text{INLET2}} = 10 \text{ cfs} \rightarrow Q_{\text{REMAIN}} = 40 \text{ cfs}$$

$$@ Q = 40 \text{ cfs} \quad d = 0.55'$$

$$\text{DG } Q_{\text{INLET3}} = 8.5 \text{ cfs} \rightarrow Q_{\text{REMAIN}} = 31.5 \text{ cfs}$$

$$@ Q = 31.5 \text{ cfs} \quad d = 0.5'$$

$$\text{SG } Q_{\text{INLET4}} = 5.5 \text{ cfs} \rightarrow Q_{\text{REMAIN}} = 26 \text{ cfs}$$

$$Q_{\text{STREET}} = 26 \text{ cfs}$$

$$Q_{\text{SD}} = 33 \text{ cfs}$$

BOHANNAN-HUSTON INC.

PROJECT NAME VENTANA RANCH T4 & T7 SHEET _____ OF _____
PROJECT NO. _____ BY BCF DATE 10-95
SUBJECT INLET ANALYSIS (VENTANA RANCH) DATE _____

STORM DRAIN FOR T4 + T7

$$Q = 31 \text{ CFS}$$

$$S = 0.67\%$$

$$n = 0.013$$

$$D = 30'' \rightarrow \text{for a } 27'' \quad S = 1.06\%$$

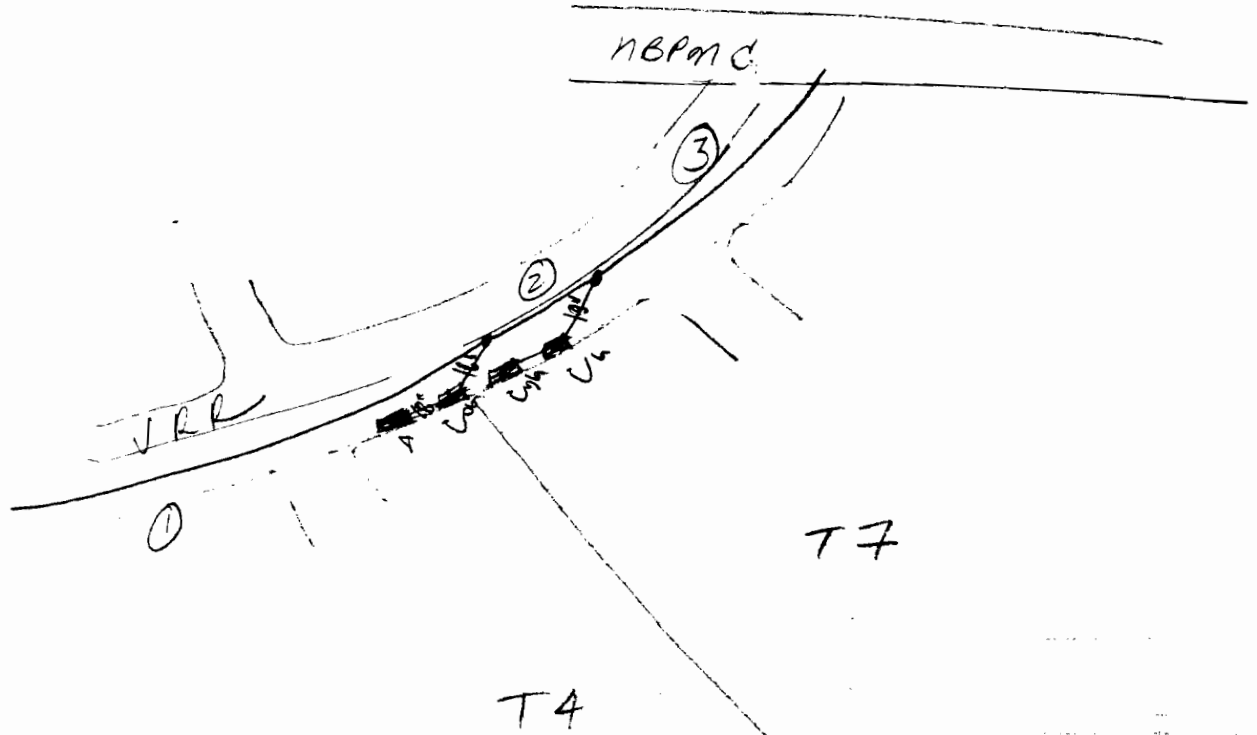
$$\text{for a } 24'' \quad S = 1.98\%$$



BOHANNAN-HUSTON INC.

PROJECT NAME VENTANA RANCH T4+T7 SHEET _____ OF _____
PROJECT NO. _____ BY BCF DATE 10-95
SUBJECT TAPALITO PL CH'D _____ DATE _____

SD DESIGN FOR VENTANA RANCH RD



SD	Q_{100}	S	D
①	10 CFS	0.74%	24"
②	33 CFS	0.74%	30"
③	56 CFS	0.74%	36"

Based on $n=0.013$ (MANNINGS)



BOHANNAN-HUSTON INC.

PROJECT NAME Ventana Ranch T4+T7 SHEET _____ OF _____
 PROJECT NO. _____ BY RCF DATE 10-25
 SUBJECT VRR STORM DRAIN CH'D _____ DATE _____

Faseo Del Norte

Area: 0.95 Ac

Percent Land Treatments:

<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
0%	27%	29.7%	43.4%

Area in Land Treatments: (Ac)

<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
0	0.256	0.282	0.412

Peak Discharge:

$$Q_{10} = (0.24)(0) + (0.76)(0.256) + (1.49)(0.282) + (2.89)(0.412)$$

$$Q_{10} = 1.81 \text{ cfs}$$

$$Q_{100} = (1.29)(0) + (2.03)(0.256) + (2.87)(0.282) + (4.37)(0.412)$$

$$Q_{100} = 3.13 \text{ cfs}$$



BOHANNAN-HUSTON INC.

PROJECT NAME W. J. H. P. 111 SHEET 1 OF 1
PROJECT NO. _____ BY PLL DATE _____
SUBJECT 11111111111111111111 CH'D _____ DATE _____

@ Universe & Channel

Sta.: ~ 17+00.00

Top of Pipe: ~ 5412 max Inv: ~ 5406 min

@ 0.5% slope for SD

@ Universe & Paseo

Sta: ~ 1+00

Top of Pipe: ~ 5420 Inv: ~ 5414 min



BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET _____ OF _____
PROJECT NO. _____ BY _____ DATE _____
SUBJECT _____ CH'D _____ DATE _____

VENTANA RANCH - PHASE I - PLAYA STORAGE

"LOOP ROAD PLAYA"			
ELEVATION	AREA (ACRE)	VOLUME (ACRE-FEET)	CUMULATIVE VOLUME (ACRE-FEET)
5416	0.0227		
5417	0.0853	0.051	0.051
5418	0.1666	0.124	0.174
5419	0.264	0.213	0.388
5420	6.3559	2.638	3.026
5421	8.898	7.591	10.618
5422	11.098	9.978	20.595
5423	13.0781	12.075	32.670
5424	15.5796	14.311	46.981
5425	19.4131	17.461	64.442

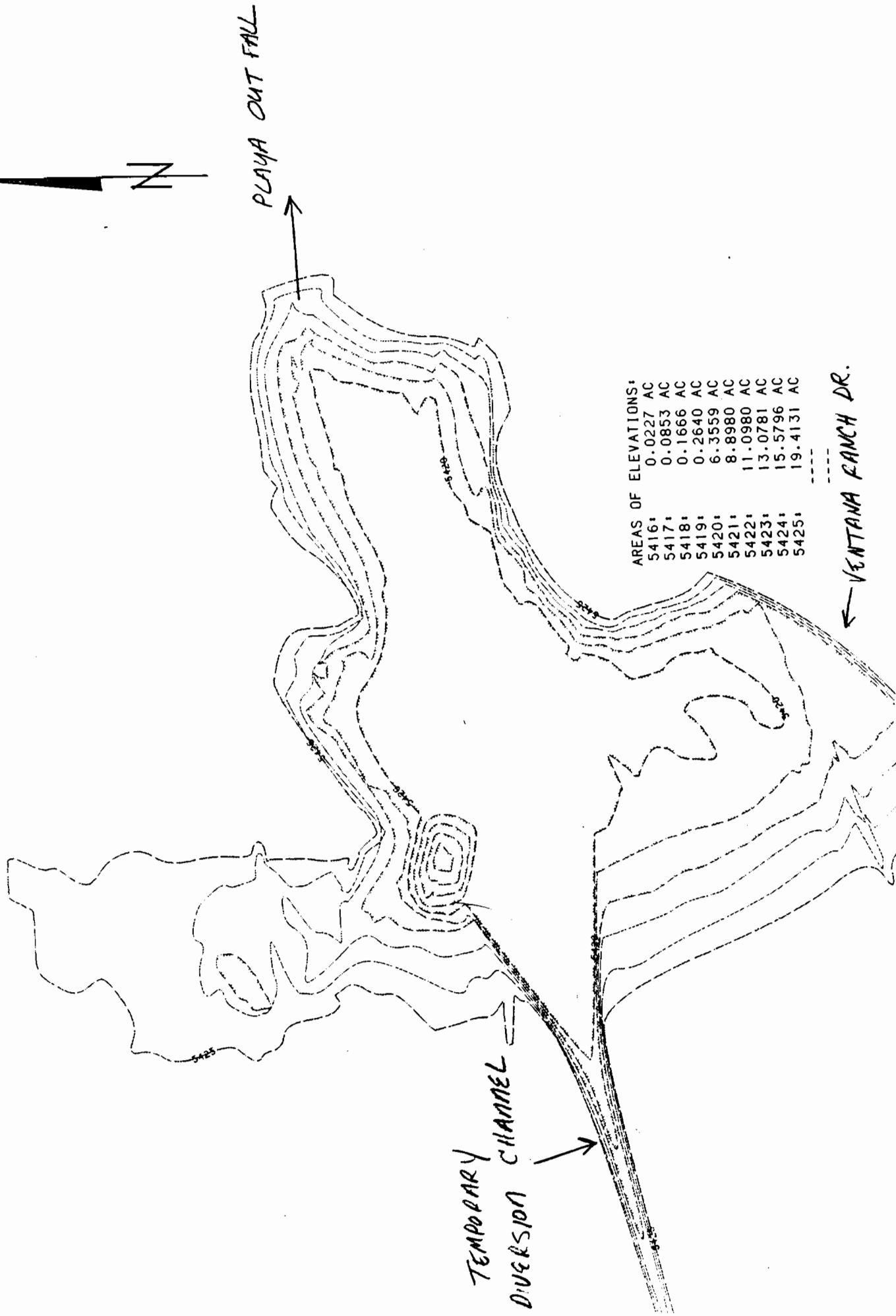
"MAIN PLAYA"			
ELEVATION	AREA (ACRE)	VOLUME (ACRE-FEET)	CUMULATIVE VOLUME (ACRE-FEET)
5395	0.361		
5396	1.9627	1.055	1.055
5397	4.4778	3.135	4.190
5398	9.3113	6.749	10.939
5399	14.8889	11.992	22.930
5400	19.4444	17.116	40.046

$$VOLUME = (H/3) * [At + Ab + (At * Ab)^{(1/2)}]$$

At = AREA OF TOP CONTOUR IN ACRES
 Ab = AREA OF BOTTOM CONTOUR IN ACRES
 H = ELEVATION DIFFERENCE IN FEET

NOTE: CONTOURS GENERATED FROM BOHANNAN-HUSTON INC., PHOTOGRAMMETRY
 PHOTO DATE: 8/10/94
 FLIGHT HEIGHT: 1800 FEET
 PHOTO SCALE: 1"=3600"

"Loop Road Playa"

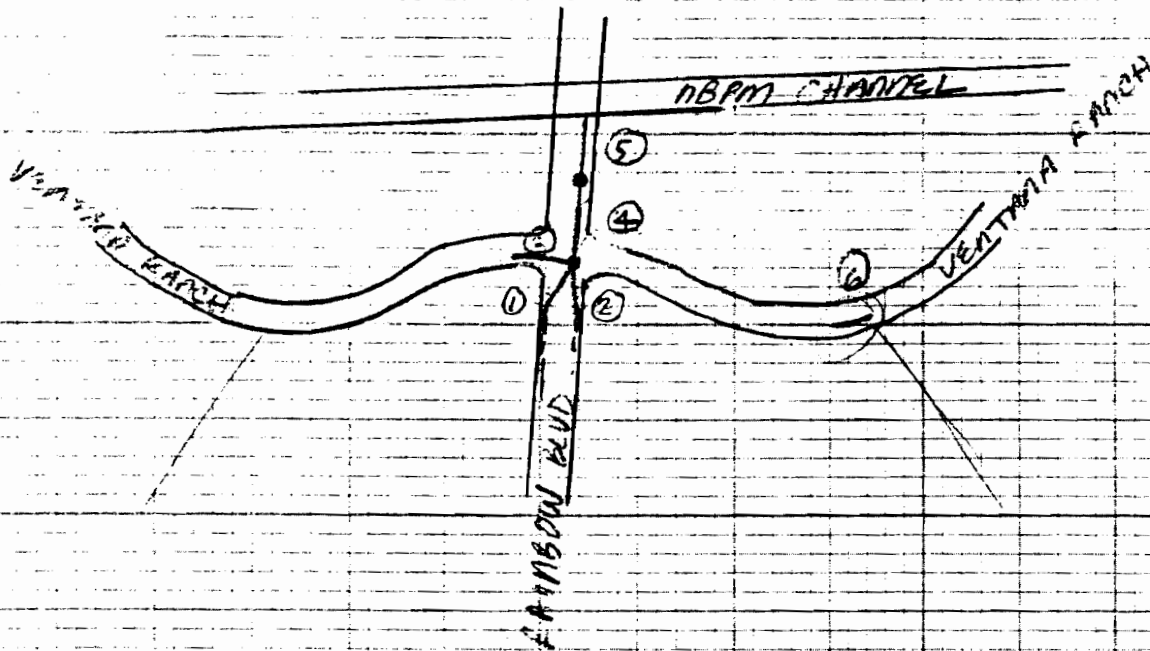


AREAS OF ELEVATIONS:	
5416:	0.0227 AC
5417:	0.0853 AC
5418:	0.1666 AC
5419:	0.2640 AC
5420:	6.3559 AC
5421:	8.8980 AC
5422:	11.0980 AC
5423:	13.0781 AC
5424:	15.5796 AC
5425:	19.4131 AC

← VENTANA RANCH DR.

STORM DRAIN SIZING

TOTAL BUILD OUT 100-YR 6-HR

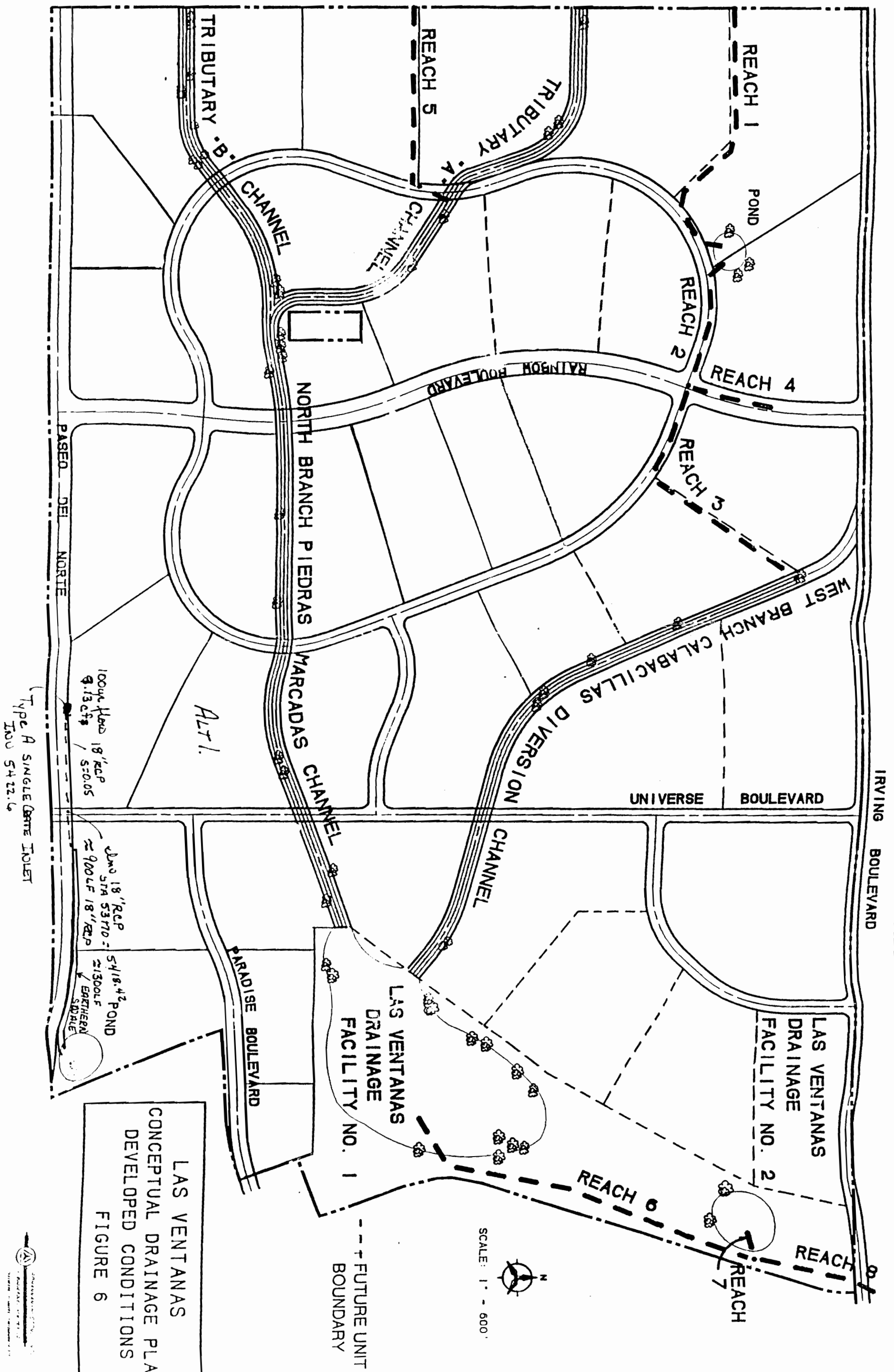


SD	Q(CFS)	SLOPE	DIAM(IN)
①	5.5	3%	24" 18"
②	17.5	3%	24" 18"
③	97.6	1%	42"
④	111.8	1.5%	42"
⑤	111.8	0.53%	48"
⑥	55.4 10	0.73% 0.50%	36" 24"



BOHANNAN-HUSTON INC.

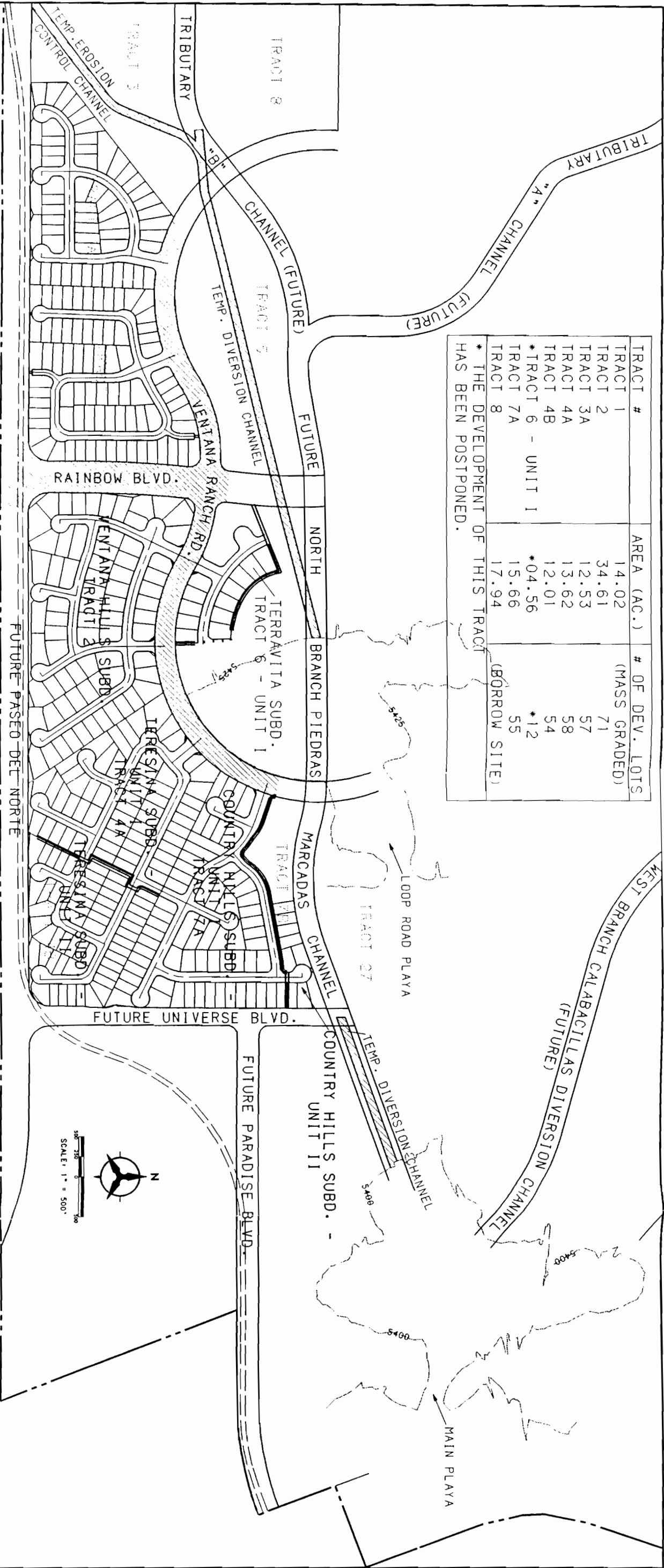
PROJECT NAME VENTANA RANCH SHEET 1 OF 7
 PROJECT NO. 9526201 BY ECF DATE 4-23-95
 SUBJECT STORM DRAIN SIZING CH'D _____ DATE _____



LAS VENTANAS
 CONCEPTUAL DRAINAGE PLAN
 DEVELOPED CONDITIONS
 FIGURE 6

TRACT #	AREA (AC.)	# OF DEV. LOTS (MASS GRADED)
TRACT 1	14.02	71
TRACT 2	34.61	57
TRACT 3A	12.53	58
TRACT 4A	13.62	54
TRACT 4B	12.01	*12
*TRACT 6 - UNIT 1	*04.56	55
TRACT 7A	15.66	
TRACT 8	17.94	(BORROW SITE)

* THE DEVELOPMENT OF THIS TRACT HAS BEEN POSTPONED.



LEGEND

OFFSITE ROADWAY OR TEMPORARY CHANNEL TO BE CONSTRUCTED WITH SUBSYSTEM 1.

TOTAL AVAILABLE VOLUME	3000 AC-FT.
TRACT 2 VOLUME	287 AC-FT.
TRACT 3A VOLUME	136 AC-FT.
TRACT 6 - UNIT 1 VOLUME	120 AC-FT.
TRACT 4A (DEV.) & 4B (DEV.) VOLUME	145 AC-FT.
TRACT 7A (DEV.) & 7B (UNDEV.) VOLUME	014 AC-FT.
TRACT 1 (DEV.) VOLUME	171 AC-FT.
MAIN ROADWAYS (w/ TRACT 2) VOLUME	136 AC-FT.
MAIN ROADWAYS (w/ TRACTS 4A & 4B) VOLUME	012 AC-FT.
TOTAL UNDEVELOPED VOLUME	2349 AC-FT.
TOTAL VOLUME IN PLAYA	3370 AC-FT.
VOLUME FLOWING TO MAIN PLAYA	370 AC-FT.
WATER SURFACE ELEVATION	54230

TOTAL AVAILABLE VOLUME	4004 AC-FT.
TRACT 4A (DEV.) & 4B (DEV.) VOLUME	064 AC-FT.
TRACT 7A (DEV.) & 7B (UNDEV.) VOLUME	174 AC-FT.
MAIN ROADWAYS (w/ TRACTS 4A & 4B) VOLUME	031 AC-FT.
TOTAL UNDEVELOPED VOLUME	607 AC-FT.
EXCESS VOLUME FLOWING FROM LOOP ROAD PLAYA	369 AC-FT.
TOTAL VOLUME IN PLAYA	1245 AC-FT.
REMAINING VOLUME IN PLAYA	2759 AC-FT.
WATER SURFACE ELEVATION	53986

9/9/96 - TO BE REVISED WITH EACH SUCCESSIVE SUBDIVISION SUBMITTAL

FILENAME: C:\P5\103526201\TRACT4B.PAD\JANAFCA.GRF