HYDROLOGY G16/D9 TWO PLANS

G 16/D9

2 PLANS

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DRAINAGE STUDY FOR:

BEAVER DEVELOPMENT CORPORATION. PROPERTY LOCATED AT THE NORTHWEST CORNER OF AZTEC ROAD AND LAFAYETTE DRIVE, ALBUQUERQUE, NEW MEXICO.

This drainage study was prepared to determine the quantity of water which will flow into an existing drainage channel located on the west side of the above property and its effect if any to neighboring property.

The following criteria was used as a basis for hydrological calculations:

A. A Storm Frequency of 100 Years
B. The Rational Formula Approach ($Q = C \times I \times A$) Is Used In This Study
C. Runoff Coefficient Curves Shown Herein Have Been Developed From Curves For Similar Soil Types In Other Western States.
D. Rainfall Intensity vs. Duration Curves Shown Herein Have Been Developed Using "Precipitation-Frequency Atlas Of The Western United States, Volume IV- New Mexico". Published By The National Weather Service, U.S. Department of Commerce, Dated 1973.
E. Time Of Concentration - Initial Times of 10 Minutes Are Assumed.

The air photo exhibit enclosed shows the neighborhood drainage patterns and the drainage system sub-areas.

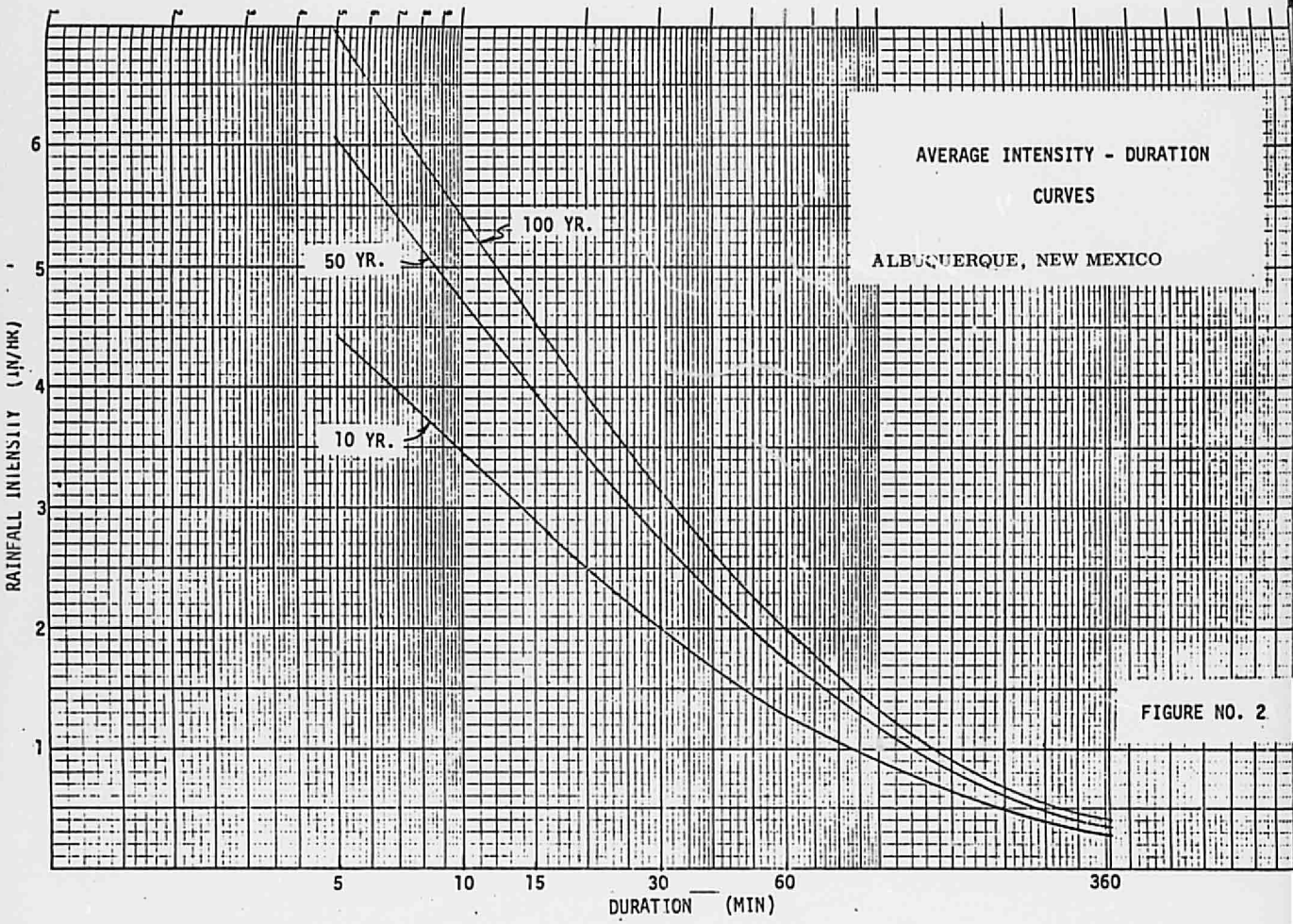
AVERAGE INTENSITY - DURATION
CURVES
ALBUQUERQUE, NEW MEXICO
100 YR.
50 YR.
10 YR.
RAINFALL INTENSITY (IN/HR)
6
5
4
3
2
1
5
10
15
30
60
360
DURATION (MIN)

FIGURE NO. 2

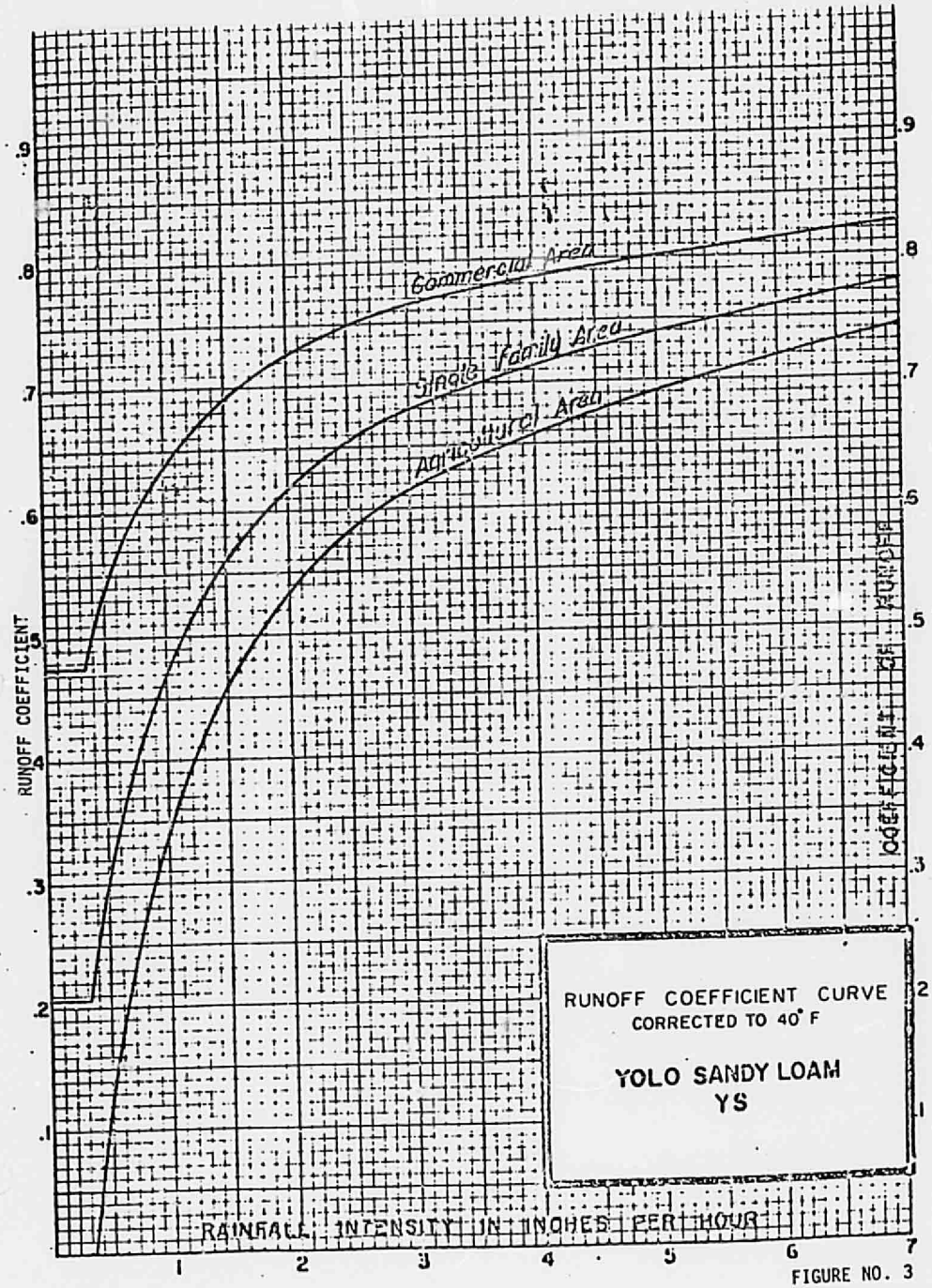
Commercial Area
Single Family Area
Agricultural Area
RUNOFF COEFFICIENT
.9
.8
.7
.6
.5
.4
.3
.2
.1
RAINFALL INTENSITY IN INCHES PER HOUR
1
2
3
4
5
6
7
RUNOFF COEFFICIENT CURVE
CORRECTED TO 40° F
YOLO SANDY LOAM
YS

FIGURE NO. 3

SAMPLE
HYDROLOGY CALCULATION SHEET

TRICO INTERNATIONAL INC.
SCOTTSDALE, ARIZONA

HYDROLOGY CALCULATION SHEET

DATE 4-12-78 PAGE
BY

PROPERTY AT NW. CORNER OF AZTEC ROAD AND LAFAYETTE DRIVE — 100 YEAR STORM

AREA DESIG.	DEVELOPMENT	SOIL TYPE	AREA ACREAGE	RAINFALL INTENSITY (IN./HR.)	RUNOFF	Δ Q (CFS)	Σ Q (CFS)	SLOPE	SECTION	L (ft)	VELOCITY (ft/sec)	Δ T (min)	Σ T (min)	COMMENT
1	—	YS	5.44	5.40	.73	21.44	21.44						4:=10	
2	MR	YS	13.90	5.40	.80	60.05	60.05							
3	MR	YS	9.81	5.40	.80	42.38	42.38							
4	SF	YS	14.17	5.40	.75	57.39	57.39							
TOTAL OF AREAS 1 THRU 4							181.26							

COMPUTATIONS FOR CHANNEL SIZE NEEDED

Manning Formula

$$Q = a \times \frac{1.486}{n} \times R^{2/3} \times S^{1/2}$$

n = .025

Assuming a 6' flat bottom channel with 2 to 1 side slopes

(ft) Depth	a(sf)	P(lf)	R	$R^{2/3}$	*1 $S^{1/2}$	*2 $S^{1/2}$	1 Q(cfs)	2 Q(cfs)	2 V(ft/sec)
1.0	8.0	10.47	.764	.836	.1265	.0837	50.29	33.27	4.15
2.0	20.0	14.94	1.338	1.214	.1265	.0837	182.57	120.80	6.04
2.5	27.5	17.18	1.600	1.368	.1265	.0837	282.95	187.16	6.81

Assuming the worst condition where the channel has a slope of .70%. The trapezoidal channel above with an end area of 27.5 sq. ft. will carry 187 cfs. with a velocity of 6.8 ft./sec.. The existing channel has a minimum end area of 50 sq. ft. at the property line on the north side of Aztec Road.**

It is our conclusion that the calculated Q for a 100 year storm as computed does not approach the maximum carrying capacity of the existing channel. We feel the existing channel is more than adequate to carry the calculated Q without any further provisions.

* The flowline of the existing channel has a slope of 1.60% for the first 200 lf. Then a slope of .70% - Both cases are considered.

** Existing profiles along the drainage ditch are included.