HYDROLOGY E21/D14 NO DOCUMENTS ONE PLAN

E21/D14

1 PLAN

NO DOCUMENTS

1422

HYDROLOGY E21/D14 FIVE PLANS

E21/D14b

5 Plans

E21-D14

RECEIVED
AUG 11 1981
ENGINEERING

DRAINAGE REPORT
FOR
JUAN TABO TOWNHOUSES

JULY 1981

PREPARED BY

ACADEMY ENGINEERING INC.
5353 WYOMING BLVD. N.E. SUITE 3
ALBUQUERQUE, NEW MEXICO 87110
(505) 821-8008

INTRODUCTION

Crest Construction Company proposes to develop a 4.11 acre site designated as the JUAN TABO TOWNHOUSES into a 28 unit townhouse project. The subdivision is located East of Juan Tabo Blvd. and South of Malaguena and North of Guadalajara Streets N.E. The subdivision adjoins the Academy Place Unit 5-A subdivision on the North and East, and adjoins TRACT B-1 of the Academy Place Unit 5-A subdivision to the South. The land to the south is presently unplatted and vacant. (Tract B-1)

It is the intent of the report to provide a plan that will protect the site from flooding and to control storm water runoff under proposed developed conditions that will conform to applicable drainage resolutions, ordinances, and sector development plans. The storm drainage analysis is based on a 100-year frequency storms.

EXISTING CONDITIONS

A. GENERAL

Existing drainage conditions are shown on Map No. 2 of this report. The subdivision is presently undeveloped and the general slope of the area is from East to West at approximately 4.5 percent.

Juan Tabo Boulevard, an existing paved street bounds the area on the West, is downstream from the subdivision and receives the runoff from the site. Juan Tabo Boulevard intersects with Eubank Boulevard and the Bear Canyon Tributary approximately 800 feet to the North of the site. Runoff entering Juan Tabo Boulevard is discharged into the Bear Canyon Tributary at this point.

B. OFFSITE DRAINAGE

Historically, some of the offsite drainage from Tract B-1 has entered the proposed subdivision from the East. A diversion swale along the south property line is proposed to divert this historical runoff along the south property line to Juan Tabo Boulevard. An agreement with the owners of Tract B-1 will be executed with Crest Construction to obtain easement for this diversion. No other offsite flows enter the property.

C. ONSITE DRAINAGE

Existing onsite drainage consists of overland flow from the East to the West and are presently discharged into Juan Tabo Boulevard at the historical rate of 8.88 cfs. These storm waters are carried North in Juan Tabo Boulevard to Eubank Boulevard where they are intercepted by existing storm drain inlets and then discharged into the Bear Canyon Tributary Arroyo.

DEVELOPED CONDITIONS

The proposed subdivision lies within the Bear Tributary water shed. Because of the City of Albuquerque's recent reconstruction efforts of downstream storm drainage facilities, no major detention of storm waters will be required for this subdivision. However, rear lot ponding will be employed on all lots to minimize some of the runoff. This rear lot ponding will contain only that storm water which falls on the rear of lots. All roof drainage will be diverted to the front of the houses and allowed to runoff.

A small detention facility will be constructed in the front yards of Lots # 1, 28, 21, and 20 with a curb opening upstream of these detention facilities in order to detain trickle flows which result from over irrigation of front yards. An easement will be provided for on the final plat for these detention facilities.

It is also a requirement of the City of Albuquerque that no storm water flow across Eubank Boulevard, during the 10 year storm. This will be accomplished by the construction of an additional inlet at Juan Tabo and Eubank.

DESIGN CRITERIA

In analyzing the storm runoff, the rational formula, Q-CIA is used.

WHERE:

Q = Runoff quantity in cubic feet/second
A = Contributing Area in Acres
I = Intensity in inches/hour for a duration equal to the time of accumulation (duration) measured in minutes and obtained from Exhibit "D", intensity duration frequency curves, Albuquerque area 1961. (Note: Where a time of concentration (Tc) is less than ten minutes from Exhibit "E", the intensity value derived from the Tc equal to ten minutes is employed.)
C = Runoff coefficient (No unit). This coefficient represents the integrated effects of infiltration detention storage, evaporation, retention, flow routing and interception which all affect the time distribution and peak rate of runoff. (= 0.4 pervious and 0.9 impervious)

EXPLANATION OF RESULTS

Undeveloped runoff (100 year) = 8.88 cfs
Developed runoff (100 year) = 12.28 cfs
Undeveloped runoff (10 year) = 4.41 cfs
Developed runoff (10 year) = 6.09 cfs

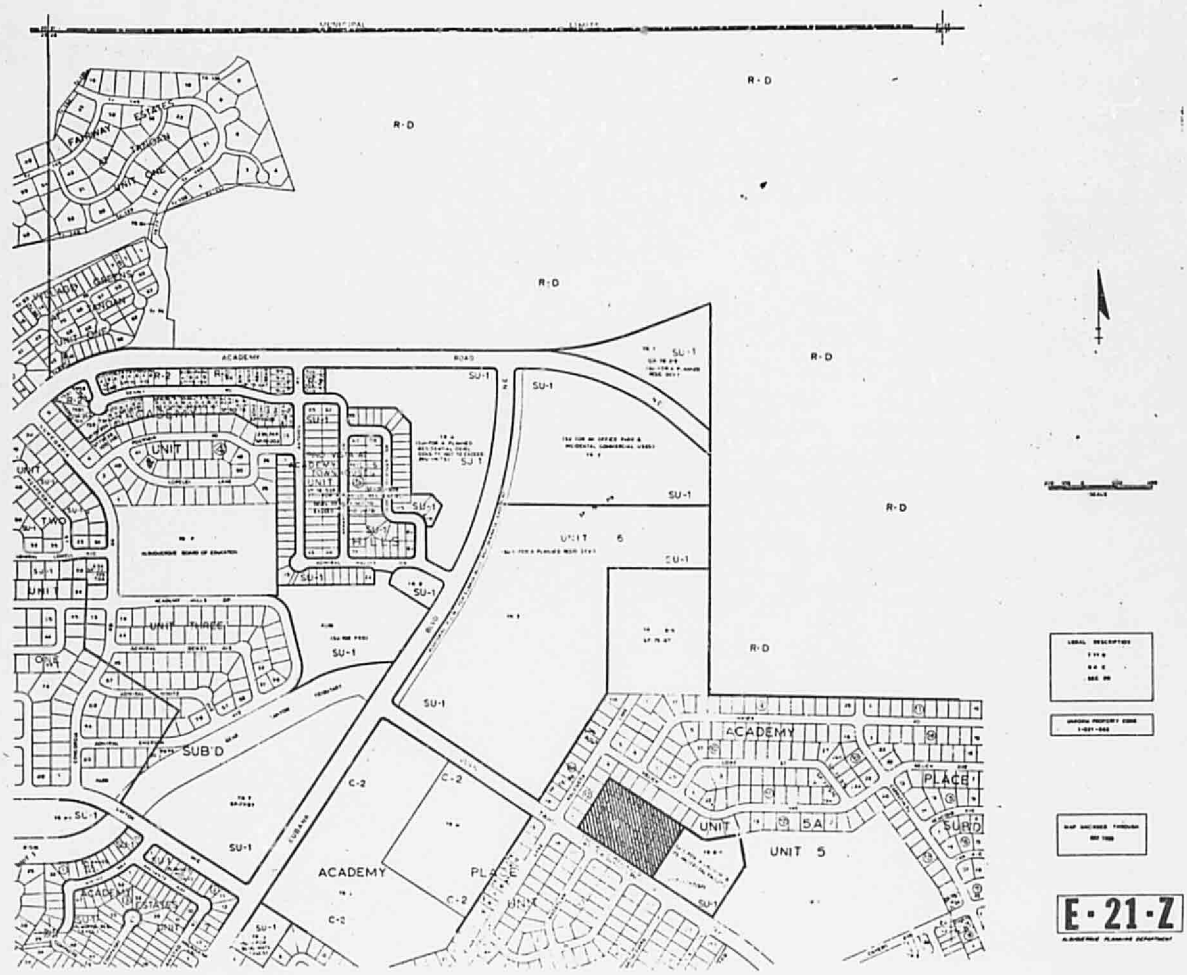
THIS DRAINAGE REPORT PREPARED FOR YOUR REVIEW

AND APPROVAL BY

7-27-81

JAMES E. BLACKWELL P.E. DATE

JAMES E. BLACKWELL
NEW MEXICO
7145
REGISTERED PROFESSIONAL ENGINEER



SITE LOCATION
FIGURE 1

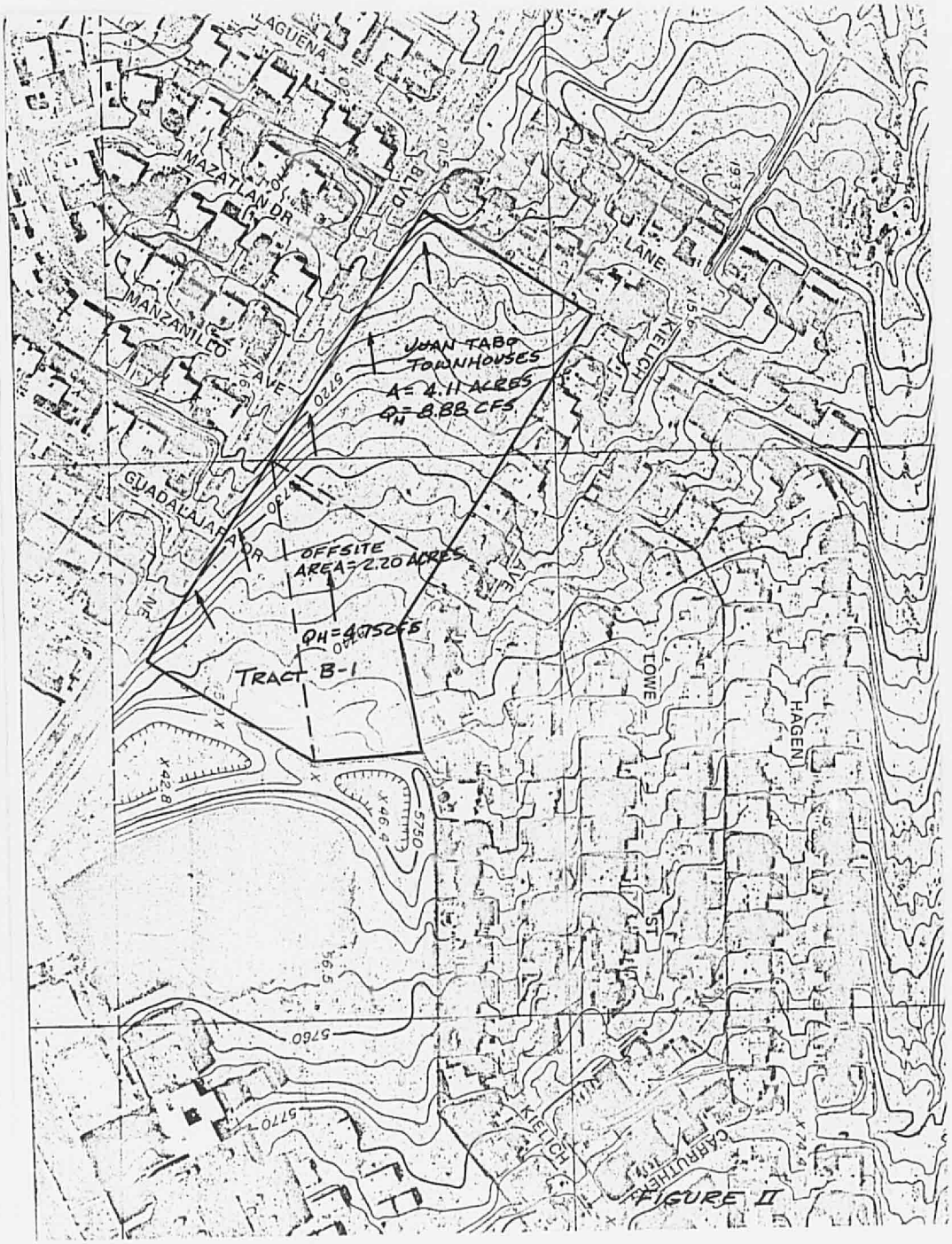
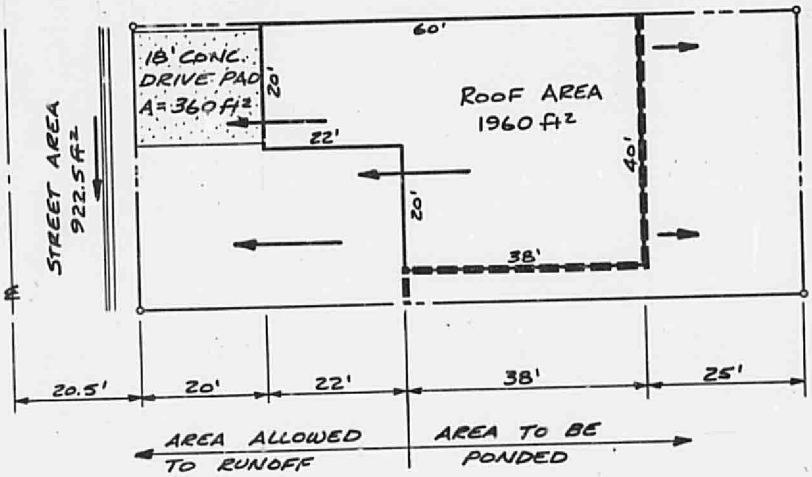

LAGUENA
MAZATLAN DR
BLVD
LANE
MANZANILLO
AVE
KIELICH
JUAN TABO
TOWNHOUSES
A= 4.11 ACRES
QH= 8.88 CFS
GUADALAJARA
DR
OFFSITE
AREA= 2.20 ACRES
QH= 4.75 CFS
TRACT B-1
LOWE
HAGEN
ST
KIETICH
CARPINTERIA
5720
5760
5770
5750
5728
5746
5745
1933

FIGURE II



TYPICAL LOT PLAN

NO SCALE

BY JEB DATE 7-22-81 SUBJECT JUAN TABO TOWNHOUSE - SHEET NO. 1 OF
CHKD. BY DATE DRAINAGE CALC'S JOB NO. 81-02-01

TOTAL AREA OF SUBDIVISION = ± 4.11 ACRES = 179,189 FT²

HISTORIC RUNOFF (100 year STORM)

$Q_{100} = (4.11)(0.40)(5.4) = 8.88$ cfs

HISTORIC RUNOFF (10 year STORM)

$Q_{10} = (4.11)(0.40)(2.68) = 4.41$ cfs

DEVELOPED CONDITIONS

TOTAL AREA = 179,189 FT²
NON CONTRIBUTING AREA = - 48,880 FT² (BACK YARDS PONDED ONLY)

TOTAL CONTRIBUTING AREA 130,309 FT²

COMPOSITE C CALCULATION

TOTAL CONTRIBUTING AREA = 130,309 FT²
STREET AREA (INCLUDING SIDEWALKS) = 31,469
HOUSE AREA 52,260
DRIVEWAYS 10,080

TOTAL IMPERVIOUS AREA = 93,789 FT²
TOTAL PERVIOUS AREA = 36,520 FT²

$$C = \frac{(0.40)(36,520) + (0.90)(93789)}{130,309} = 0.76$$

BY JEB DATE 7-22-81 SUBJECT JUAN TABO TOWNHOUSE SHEET NO. 2 OF
CHKD. BY DATE DRAINAGE CALC'S JOB NO. 81-02-01

DEVELOPED RUNOFF

100 YEAR STORM

$$Q_{100} = \left[\frac{130,309}{43560}\right](0.76)(5.4) = 12.28 \text{ cfs}$$

10 YEAR STORM

$$Q_{10} = \left(\frac{130,309}{43,560}\right)(0.76)(2.68) = 6.09 \text{ cfs}$$

ADDITIONAL FLOW ENTERING JUAN TABO BLVD
AT 10 year STORM = 6.09 − 4.41 = 1.68 cfs

ADDITIONAL FLOW ENTERING JUAN TABO BLVD.
AT 100 year STORM = 12.28 cfs − 8.88 cfs = 3.40 cfs

ANALYSIS OF INLET CAPACITY AT JUAN TABO & EUBANK
DURING 10 year STORM.

CONTRIBUTING AREA TO INLETS = 19.44 ACRES
(FROM AMAFCA TOPO)

IMPERVIOUS AREA = 7.13 ACRES

PERVIOUS AREA = 12.31 ACRES

COMPOSITE C

$$C = \frac{(0.4)(12.31) + (0.9)(7.13)}{19.44} = 0.58$$

BY JEB DATE 7-22-81 SUBJECT JUAN TABO TOWNHOUSE SHEET NO. 3 OF 4
CHKD. BY DATE DRAINAGE CALC'S JOB NO. 81-02-01

HISTORIC RUNOFF Q= 10 YEAR STORM

$$Q = (0.58)(2.68)(19.44) = 30.22 \text{ cfs}$$

DEPTH OF FLOW IN STREET USING MODIFIED MANNING FORMULA FOR GUTTER FLOW:

$$Q = (0.56)\frac{z}{n} s^{1/2} y^{8/3}$$

z = RECIPROCAL OF CROSS SLOPE $= \frac{1}{.02} = 50$

n = 0.017

s = 2½%

y = depth of flow

$$y = \sqrt[8/3]{\frac{Qn}{(.56)(z)(s^{1/2})}}$$

$$y = \sqrt[8/3]{\frac{(30.22)(.017)}{(.56)(50)(.025)^{1/2}}}$$

$$y = 0.45'$$

WITH y = 0.45' AND GUTTER DEPRESSION = 3½", THE AVERAGE INLET CAPACITY PER FOOT OF LENGTH = 0.665 CFS

EXISTING INLET LENGTH = 18'

INLET CAPACITY = (18)(.665) = 11.97 cfs

BY JEB DATE 7-22-81 SUBJECT JUAN TABO TOWNHOUSES - DRAINAGE CALC'S SHEET NO 4 OF 4
CHKD. BY DATE JOB NO. 81-02-01

AMOUNT OF STORM WATER WHICH FLOWS PAST INLET DURING 10 YEAR STORM

$$Q = 30.22 - 11.97 = 18.25 \text{ cfs}$$

ADDITIONAL STORM WATER IN JUAN TABO AFTER DEVELOPMENT OF JUAN TABO TOWNHOUSES = 1.68 cfs

ADDITIONAL INLET LENGTH REQ'D TO PICK UP 10 year developed FLOW:

$$I = \frac{1.68}{0.665} = 2.52'$$

USE STANDARD 3' INLET.

Academy Engineering, Inc.

E21-D14b
(First Submittal by K. Whitman)

May 22, 1981

RECEIVED
MAY 2 1981
CITY ENGINEER

Mr. Chuck Easternling
Principal City Engineer- Hydrology
Engineering Department
City of Albuquerque

Dear Chuck:

Please find enclosed the proposed Drainage Report for the Juan Tabo Townhouse Project.

The project site is located on Juan Tabo Boulevard between Malaguena and Guadalajara Streets N.E. (Zone Atlas No. E-21). On site ponding in accordance with the City of Albuquerque interim drainage criteria of November 1979 will be used to detain the difference in historic and developed runoff.

If you require any further information concerning this matter, please feel free to contact us.

Sincerely,

James E. Blackwell, P.E.
Chief Principal Engineer

JEB/rb

(505) 821-8008
ALBUQUERQUE, N.M. 87109
5151 WYOMING BLVD. NE. SUITE 3

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION

HYDROLOGY SECTION PROJ. NO. E-2 - DATE: 6/8/81

PLANNING DIVISION NO. _____

E21-014

CONFERENCE RECAP

SUBJECT: JUAN TABO TOWN HOUSES

ATTENDANCE:	WHO	REPRESENTING
	TED WITEK	ACADEMY ENGINEERING
	BRUNO CONEGLIANO	CITY
	CM EASTERLING	CITY

FINDINGS:
1. FLOWS FROM EAST MUST BE ADDRESSED
   a) QUANTITY
   b) EASEMENT FROM ADJACENT PROPERTY
   c) CROSS-SECTIONS AND PROFILE
   d) MAINTENANCE RESPONSIBILITIES ADDRESSE
2. PROPOSED CONTOURS & SPOTS WHERE IMPORTANT

The undersigned agrees that the above findings are summarized accurately and are only subject to change if further investigation reveals that they are not reasonable or that they are based on inaccurate information.

SIGNED: Carl M Establey
TITLE: PRIN. ASSIST. CITY ENGR
DATE: 6/8/81

SIGNED: Ted Witek
TITLE:
DATE: 6/8/81

Community Sciences Corporation
P. O. Box 1328
CORRALES, NEW MEXICO 87048

(505) 897-0000

LETTER OF TRANSMITTAL

DATE 3/31/78 JOB NO.
ATTENTION
RE

RECEIVED
APR 07 1978
CITY ENGINEERS

TO Bruno Caneglano
City of Albuquerque
Engineering Div.

GENTLEMEN:

WE ARE SENDING YOU ☐ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change order X Drainage Report

COPIES	DATE	NO.	DESCRIPTION
1			Drainage Report for ~~F~~ Haegelin Townhouse Project

THESE ARE TRANSMITTED as checked below:

X For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints
☐ For review and comment ☐ _____
☐ FOR BIDS DUE _____ 19 _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS

COPY TO C. Haegelin

SIGNED: Kent M. Whitman

If enclosures are not as noted, kindly notify us at once.

FORM 240-3 Available from NEBS Townsend, Mass. 01469

HAEGELIN TOWNHOUSE PROJECT

DRAINAGE MANAGEMENT PLAN

PREPARED FOR:

MR. CHARLES HAEGELIN

BY

COMMUNITY SCIENCES CORPORATION

MARCH, 1978

KENT M. WHITMAN
STATE OF NEW MEXICO
NO. 6170
REGISTERED PROFESSIONAL ENGINEER

Kent M. Whitman

KENT M. WHITMAN, P.E.

P.O. Box 1328
Corrales, New Mexico 87048
(505) 897-0600

SURVEYING
ENGINEERING
LAND PLANNING

TABLE OF CONTENTS

		PAGE
A)	PURPOSE AND SCOPE	1
B)	SITE LOCATION AND TOPOGRAPHY	1
C)	DESIGN CRITERIA	1
	1) Engineering Parameters	
	2) Flood Control Regulations	
D)	COMPUTATIONAL PROCEDURES	1
E)	OFF-SITE DRAINAGE	2
F)	ON-SITE DRAINAGE	2
	TABLE 1 - Flow Rates	3
	PLATE 1 - LOCATION MAP	4
	PLATE 2 - OFFSITE DRAINAGE MAP	5
	PLATE 3 - DRAINAGE PLAN	Pocket
	APPENDIX "A" - CALCULATIONS	6 & 7

A) PURPOSE & SCOPE

Mr. Charles Haegelin is currently planning to develop approximately 4.1 acres in northeast Albuquerque into a touwnhouse project consisting of 33 units. The purpose of this report is to present a drainage management plan for the development which is acceptable to the City of Albuquerque and to the Albuquerque Metropolitan Arroyo Flood Control Authority.

B) SITE LOCATION & TOPOGRAPHY

The Haegelin Townhouse Project is located in northeast Albuquerque on Juan Tabo Boulevard, opposite Mazatlan and Manzanillo Streets. (See Plate 1). The land slopes from east to west at an average rate of 4%. Soils consist largely of alluvial sands and silts, and decomposed granite is the major soil constituent.

C) DESIGN CRITERIA

1. ENGINEERING PARAMETERS

For calculation of runoff rates and required storage volumes a C of 0.82 has been used for developed areas, and a C of 0.35 was used for undeveloped areas.

All runoff calculations have been based on a 100 year-6 hour rainfall of 2.8" (0.23') per AMAFCA requirements.

Rate of runoff calculations have been based on the frequency - intensity - duration relationship for a 100 year storm as presented by Gordon Herkenhoff and Associates in their 1963 Master Plan of Drainage for the City of Albuquerque. This relationship is expressed by the following equation: $I = 189(Tc+25)$.

2. FLOOD CONTROL REGULATIONS

The drainage plan presented in this report has been designed to comply with the 1972 AMAFCA Resolution in regard to rate and volume of runoff leaving the site. That Resolution has been interpreted to say that the rate and volume of runoff allowed to leave the site after development shall be no greater than the rate and volume running off prior to development.

D) COMPUTATIONAL PROCEDURES

Appendix A contains samples of the various types of hydraulic calculations performed. Carrying capacities of streets and swales were determined using the Manning equation for uniform flow. Hydrological flow rate calculations are based on the rational runoff method. Volume calculations for determination of overall ponding requirements were performed by multiplication of the applicable C factor times the 100 year - 6 hour rainfall (0.23) times the appropriate area to obtain cubic feet of water.

E) OFFSITE DRAINAGE

Plate 2 outlines the total offsite acreage which drains toward and on to the site. A visual inspection of the property has revealed that all lands immediately to the north have been subdivided into R-1 lots. These lots are fully developed and occupied, having been equipped with rear yard retention ponds and block walls. In addition, the Albuquerque Public School site, located approximately 400 feet to the east, has also been provided with two large retention ponds. As a result, the only offsite drainage approaching the site originates from a portion of the tract which is immediately adjacent to the easterly boundary. Flows from this are can easily be directed to Juan Tabo via a small swale as shown on Plate 3.

F) ON-SITE DRAINAGE

All on-site flows with the exception of those from area (6) will be directed via swales and inverted paving sections to the southwestern corner of the property. The flows will empty into a 19,700 cubic foot pond, which will satisfy the retention requirement of the Amafca Resolution as shown in Appendix "A." Plate 3 illustrates the drainage plan, while Table 1 which follows, itemizes the expected flow rates at key locations.

T A B L E 1

FLOW RATES

Area/Point Designation	Area (Acres)	Areas Contributing	Gross Area (Acres)	Composite C	Tc (min)	Inches /Hour	Q (cfs)
1	0.37	1	0.37	0.82	< 10	5.4	1.64
2	1.14	1,2	1.51	0.82	< 10	5.4	5.94
3	0.29	1-3	1.8	0.82	< 10	5.4	7.97
4	1.36	4	1.36	0.82	< 10	5.4	6.02
5	0.60	5	0.60	0.82	< 10	5.4	2.66
6	0.14	6,A	2.84	0.37	< 10	5.4	5.67
7	N/A	1-4	3.16	0.82	< 10	5.4	13.99
A	2.7	-	-	-	-	-	-

PLATE I

LOCATION MAP

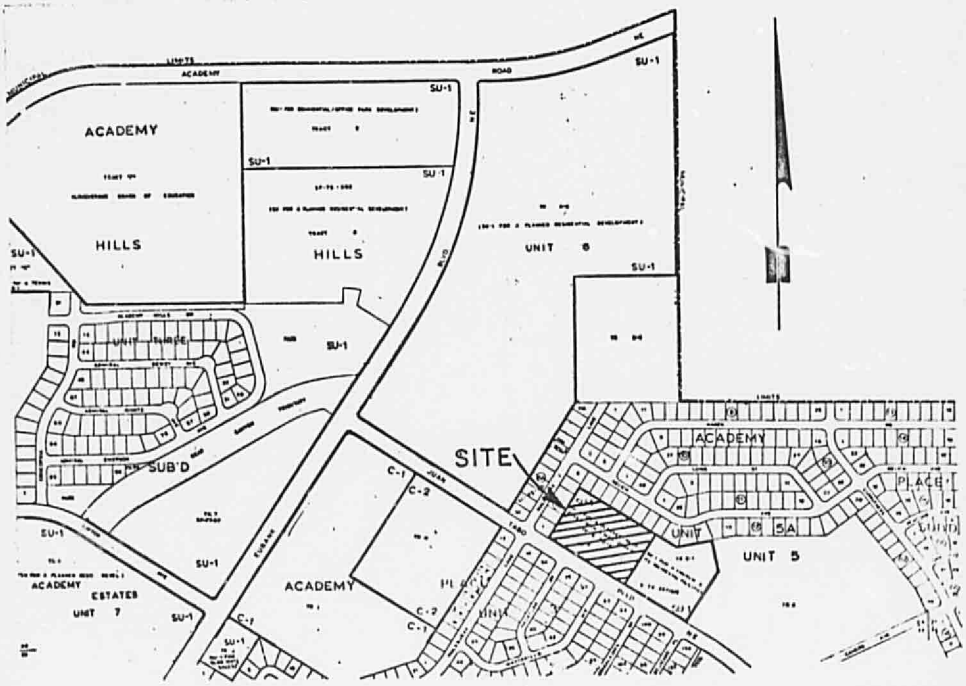
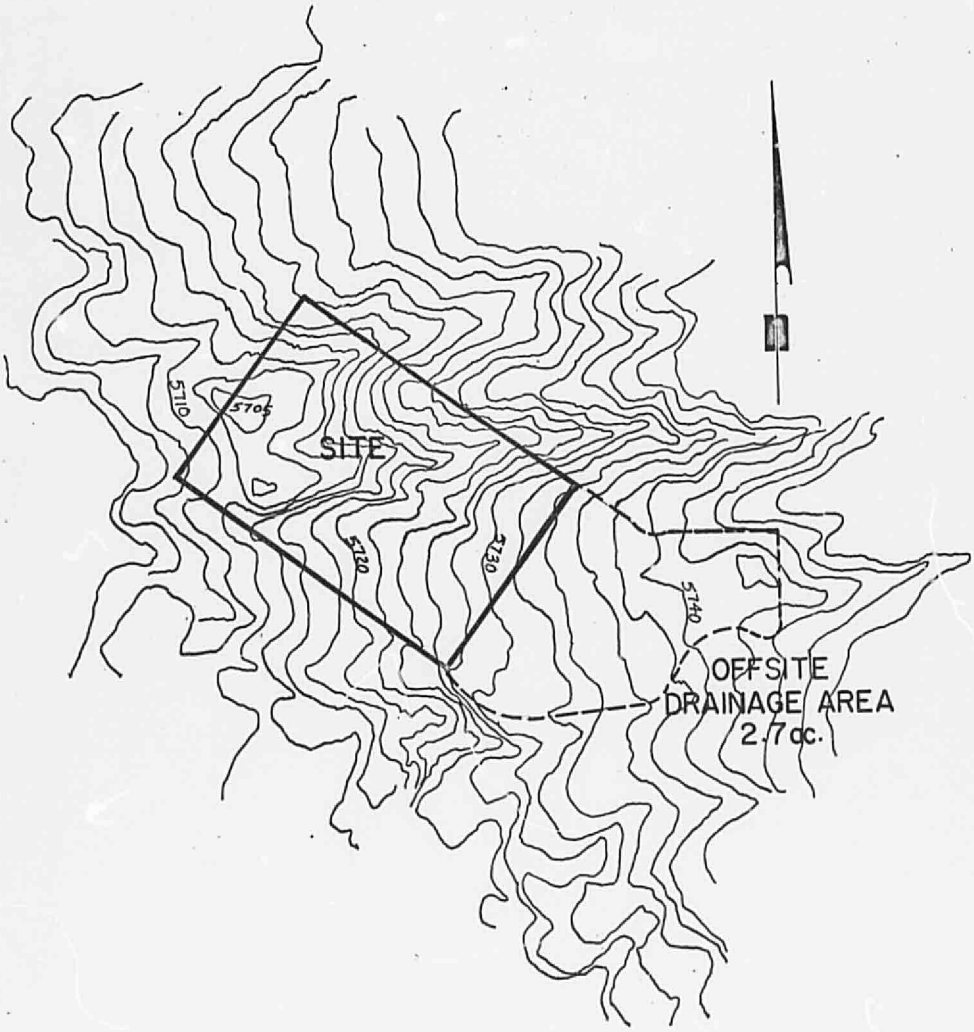


PLATE 2

OFFSITE DRAINAGE MAP

(TOPO FROM AMAFCA 1" = 200' MAPS)



APPENDIX "A"

CALCULATIONS

1) COMPOSITE C

Gross area = 179,200 SF
Building areas = 52[illegible] SF = 29%
Paved street areas = [illegible]7,372 SF = 21%
Miscellaneous walks, patios and parking areas = 23,650 SF = 13%
S.W. Landscaping = 33,000 SF = 18%
Lawn = 33,030 SF = 19%

Composite C = (.29+.21+.13+.18) (.95) + (.19) (0.25) = 0.82

2) REQUIRED PONDING VOLUME

R (100yr.-6hr) = 2.8" = 0.23'
Gross Area = 179,200 SF
Cnat = 0.35
Cdev = 0.82

Vol = (0.82-0.35) (0.23) (179,200)
= 19,370 cf.

3) ACTUAL POND VOLUME

Bottom area = 2748 SF
Surface area = 6017 SF
Depth = 4.5'

$$\text{Volume} = \frac{6017+2748}{2} (4.5)$$

$$= 19721 \text{ cf} \geq 19370 \quad \text{OK}$$

4) STREET FLOW CAPACITY

Bottom width - 0
Sideslopes = 36:1
Slope (min) = 1%
Depth = 0.33'
n = 0.015

$$Q = A \left(\frac{1.49}{n}\right) R^{2/3} \; S^{1/2}$$

$$= 11.64 \geq 7.97 \quad \text{OK}$$

5) <u>EAST BOUNDARY - SWALE CAPACITY</u>

Bottom width = 0
Sideslopes = 3:1
Slope (min) = 2%
depth = 0.8'
n = 0.025

$$Q = A \left(\frac{1.49}{n}\right) R^{2/3} S^{1/2}$$

$$= 8.46 \text{ cfs.} > 5.67 \quad \text{OK}$$

AEI

DRAINAGE REPORT
FOR
JUAN TABO TOWNHOUSES

MAY, 1981

Academy Engineering Inc.
5353 WYOMING BLVD. NE, SUITE 3
ALBUQUERQUE, NEW MEXICO 87109
(505) 821-8008

ENGINEERS • PLANNERS • DEVELOPMENT CONSULTANTS

DRAINAGE REPORT

FOR

JUAN TABO TOWNHOUSES

MAY 1981

PREPARED BY

ACADEMY ENGINEERING INC.
5353 WYOMING BLV. N.E. SUITE 3
ALBUQUERQUE, NEW MEXICO 87110
(505) 821-8008

RECEIVED
MAY 2 - 1981
CITY ENGINEER

INTRODUCTION

Crest Construction Company proposes to develop a 4.11 acre site designated as the JUAN TABO TOWNHOUSES into a 28 unit townhouse project. The subdivision is located East of Juan Tabo Blvd. and South of Malaguena and North of Guadalajara Streets N.E. The subdivision adjoins the Academy Place Unit 5-A subdivision on the North and East, and adjoins TRACT B-1 of the Academy Place Unit 5-A subdivision to the South. The land to the south is presently unplatted and vacant. (Tract B-1)

It is the intent of the report to provide a plan that will protect the site from flooding and to control storm water runoff under proposed developed conditions that will conform to applicable drainage resolutions, ordinances, and sector development plans. The storm drainage analysis is based on a 100-year frequency storms.

EXISTING CONDITIONS

A. GENERAL

Existing drainage conditions are shown on Map No. 2 of this report. The subdivision is presently undeveloped and the general slope of the area is from East to West at approximately 4.5 percent.

Juan Tabo Boulevard, an existing paved street bounds the area on the West, is downstream from the subdivision and receives the runoff from the site. Juan Tabo Boulevard intersects with Eubank Boulevard and the Bear Canyon Tributary approximately 800 feet to the North of the site. Runoff entering Juan Tabo Boulevard is discharged into the Bear Canyon Tributary at this point.

B. OFFSITE DRAINAGE

Historically, some of the offsite drainage from Tract B-1 has entered the proposed subdivision from the East. A diversion swale along the south property line is proposed to divert this historical runoff along the south property line to Juan Tabo Boulevard. An agreement with the owners of Tract B-1 will be executed with Crest Construction to obtain easement for this diversion. No other offsite flows enter the property.

C. ONSITE DRAINAGE

Existing onsite drainage consists of overland flow from the East to the West and are presently discharged into Juan Tabo Boulevard at the historical rate of 8.88 cfs. These storm waters are carried North in Juan Tabo Boulevard to Eubank Boulevard where they are discharged into the Bear Canyon Tributary Arroyo

DEVELOPED CONDITIONS

The total runoff rate in the developed state will not be allowed to increase from the existing conditions. As development occurs, the impervious area increases and thereby the amount of runoff also increases. To offset this increase, onsite restrictions of flow must be incorporated into the development. While this can take different forms, the most practical solution for this type of development is to utilize onsite ponding.

DESIGN CRITERIA

In analyzing the storm runoff, the rational formula, Q-CIA is used.

WHERE:

Q = Runoff quantity in cubic feet/second
A = Contributing Area in Acres
I = Intensity in inches/hour for a duration equal to the time of accumulation (duration) measured in minutes and obtained from Exhibit "D", intensity duration frequency curves, Albuquerque area 1961. (Note: Where a time of concentration (Tc) is less than ten minutes from Exhibit "E", the intensity value derived from the Tc equal to ten minutes is employed.)
C = Runoff coefficient (No unit). This coefficient represents the integrated effects of infiltration detention storage, evaporation, retention, flow routing and interception which all affect the time distribution and peak rate of runoff. (= 0.4 pervious and 0.9 impervious)

EXPLANATION OF RESULTS

Undeveloped Runoff

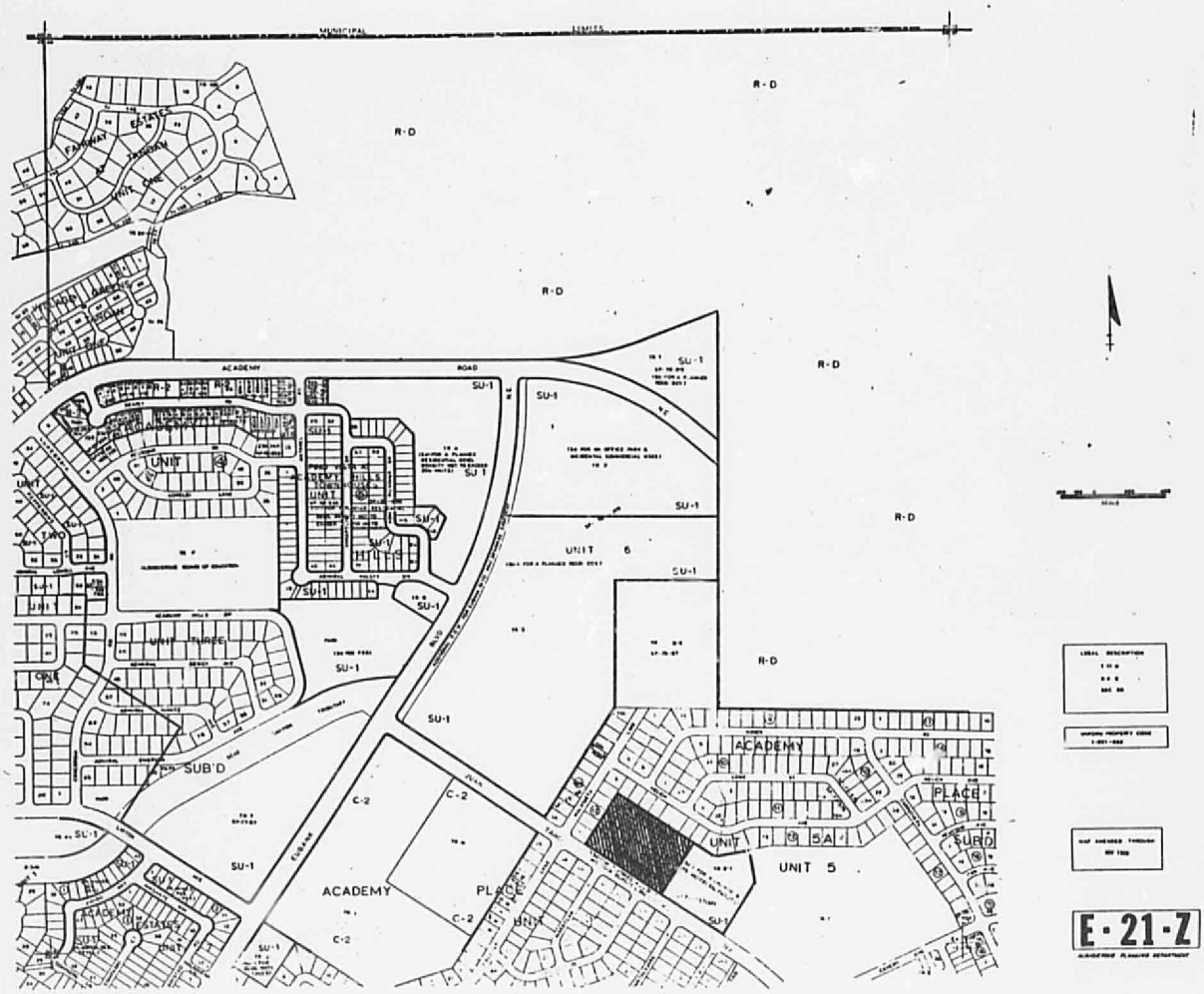
Total flow = 8.88 cfs

Developed Runoff

Total flow = 6.93 cfs

Volume of Ponds

Ponded Lot Volume = 312 ft^3 per townhouse



SITE LOCATION
FIGURE 1

AGUENA
MAZATLAN DR
MANZANILLO AVE
GUADALAJARA DR
BLVD
LANE
KELLICH
COWE
HAGEN
ST
KELLICH
CARRUTHERS
JOAN TABO
TOWNHOUSES
A= 4.11 ACRES
Q= 8.88 CFS
OFFSITE
AREA=2.20 ACRES
QH=4.75 CFS
TRACT B
5720
5760
5770
5750
5740
5730
5760
5770
5745
5728
5696
5695
5730
5745

FIGURE II

JUAN TABO TOWNHOUSE CALCULATIONS

OFFSITE DRAINAGE (TRACT B-1)

CONTRIBUTING AREA = 2.20 ACRES

$C = 0.40$

$i = 5.4$ IN./hr.

$Q = CiA = (0.40)(5.4)(2.20) = \underline{\underline{4.75 \text{ cfs.}}}$

ONSITE DRAINAGE

ALLOWABLE DISCHARGE FROM SITE:

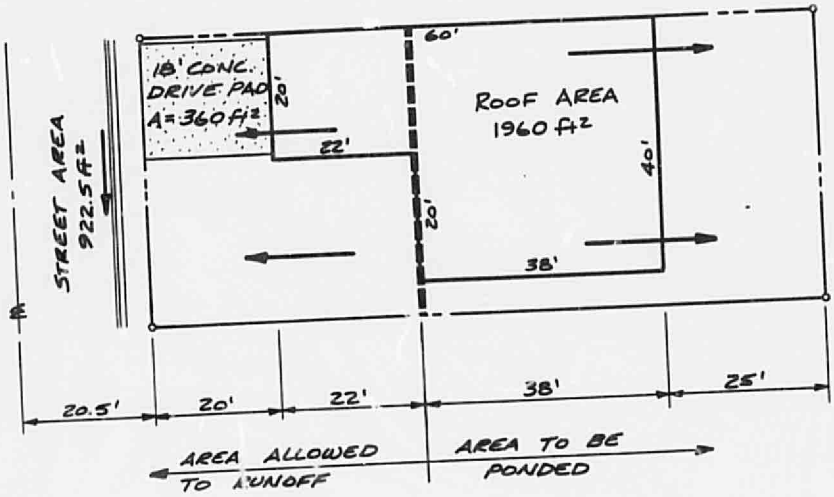
100 year STORM DURATION = T_c = 10 min.

$C = 0.40$

$A = 4.11$ ACRES

$i = 5.4$ IN./hr

$Q_H = (0.40)(5.4)(4.11) = 8.88$ cfs



TYPICAL LOT PLAN

NO SCALE

DETERMINATION OF COMBINED RUNOFF COEFFICIENT FOR AREAS DRAINING TO STREET.

TOTAL AREA allowed to RUNOFF = 45' x 62.5'
= 2812.50 FT.^{2}

(Combined AREA FROM CENTERLINE TO 42 FT back of R.O.W.)

ROOF & PAVED AREA = 1722.50 FT^2
LANDSCAPED AREA = 1090.0 FT^2

Coefficient of Runoff

$$= \frac{(1722.5)(0.90) + (1090.0)(0.40)}{2812.50}$$

$$= \underline{\underline{0.71}}$$

DEVELOPED FLOW

$$Q_{100} = \frac{(0.71)(5.4)(2812.50)}{43,560} = 0.248 \text{ cfs / LOT}$$

TOTAL FLOW = 28 x 0.248 = <u>6.93 cfs</u>

POND VOLUME REQUIREMENTS

Coefficient of Runoff

ROOF AREA = 38'x40' = 822 FT^2

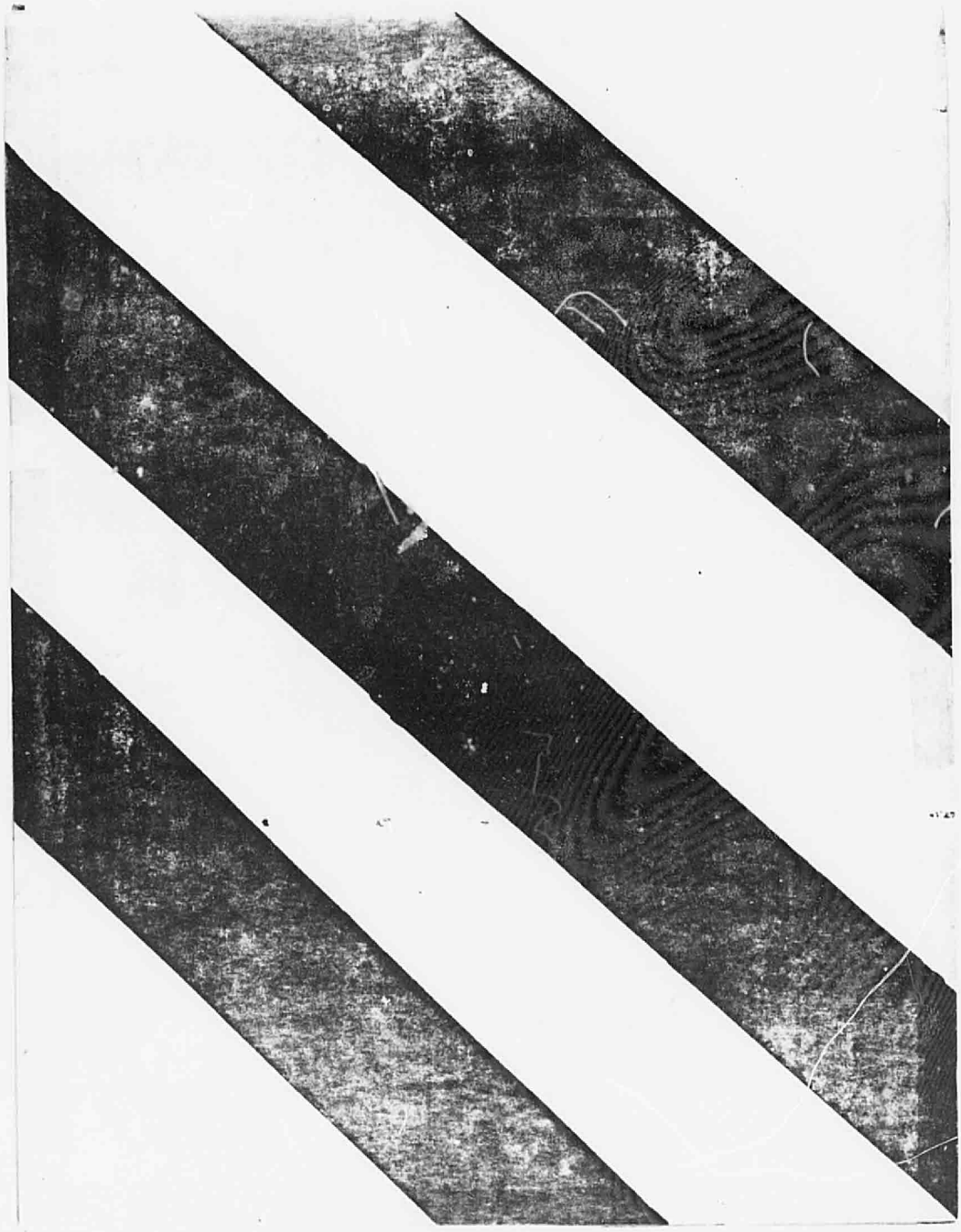
LANDSCAPED AREA = 63'x45' − 822 = 2013 FT^2

TOTAL AREA = 822 + 2013 = 2835 FT^2

$$C = \frac{(822)(0.90) + (2013)(0.40)}{2835} = \underline{\underline{0.55}}$$

Volume of Runoff

$$V_{100} = (0.55)\left(\frac{2.4}{12}\right)(2835) = \underline{\underline{312 \text{ FT}^3/\text{LOT}}}$$

∴ EACH LOT REQUIRES A MINIMUM OF 312 FT^3 PONDED VOLUME.

1474