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

(505) 897-0000

LETTER OF TRANSMITTAL

DATE: November 24, 1978 | JOB NO.:

ATTENTION:

RE: Bentwood Ridge

RECEIVED
NOV 29 1978
CITY ENGINEERS

TO: Mr. Bruno Conegliano, AMAFCA
P.O. Box 1293
Albuquerque, New Mexico 87103

GENTLEMEN:

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

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change order XX ☐ Copy of Plat

COPIES	DATE	NO.	DESCRIPTION

THESE ARE TRANSMITTED as checked below:

☐ 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
XX For review and comment ☐ _____
☐ FOR BIDS DUE _____ 19_____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS: We will be requiring signatures in approximately 2 weeks.

COPY TO: _____

SIGNED: Georgia Sirotkes

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

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

(505) 897-0000

LETTER OF TRANSMITTAL

DATE 11/1/78 | JOB NO.

TO Bruno Conegliano
City Engineering

ATTENTION

RE:

GENTLEMEN:

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

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☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1			Bentwood Ridge Subd. - Drainage Management Plan

THESE ARE TRANSMITTED as checked below:

☒ 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 Grover Jones

SIGNED: Kent M. Whitmore

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

BENTWOOD RIDGE SUBDIVISION

DRAINAGE MANAGEMENT PLAN

Prepared For:

ECOS Building & Development Company

Prepared By:

Community Sciences Corporation

November 1978

Kent M. Whitman

Kent M. Whitman, P.E.

P. O. Box 1328
Cortez, New Mexico 87048
(505) 897-0000

SURVEYING
ENGINEERING
LAND PLANNING

BENTWOOD RIDGE SUBDIVISION

DRAINAGE MANAGEMENT PLAN

Prepared For:

ECOS Building & Development Company

Prepared By:

Community Sciences Corporation

November 1978

Kent M. Whitman

Kent M. Whitman, P.E.

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

P.O. Box 1328
Corrales, New Mexico 87048
(505) 897-0000

SURVEYING
ENGINEERING
LAND PLANNING

TABLE OF CONTENTS

A) PURPOSE AND SCOPE

ECOS Building and Development Company is currently planning development of approximately 3.7 acres in Southwest Albuquerque, into 20 R-1 units. The purpose of this report is to present a drainage management plan for the project (hereinafter called Bentwood Ridge) which is acceptable to the City of Albuquerque and to the Albuquerque Metropolitan Arroyo Flood Control Authority.

B) SITE LOCATION AND TOPOGRAPHY

Bentwood Ridge is located in Southwest Albuquerque immediately south of Central Avenue and east of 59th Street (See Plate 1). The land slopes from north to south at an average rate of 4%. Soils consist largely of fine silts and mixed amounts of well graded sands.

C) DESIGN CRITERIA

1) Engineering Parameters

For calculation of runoff rates and required storage volumes composite runoff coefficients were computed or assumed as follows:

a) Natural areas - 0.4
b) Overall lot area - 0.66
c) Portions of lots draining to street - 0.8
d) Off-site drainage areas - 0.65

All volume calculations have been based on a 100 year-6 hour rainfall of 2.2" (0.18') 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. Proposed easement channels were sized based on the Manning Equation for Uniform Flow. Street carrying capacities were calculated by means of the same equation using City of Albuquerque Standard Street Sections.

Hydrological flow rate calculations are based on the rational runoff method. Times of concentration were calculated using the Kirpich Nomagraph for Overland Flow and the Manning Equation for Estimating Street Flow Velocities. For flow convergence points having both developed and undeveloped areas contributing, composite runoff coefficients were calculated. Volume calculations for sizing individual lot ponds were performed by multiplication of the difference between developed and natural C factors times the 100 year - 6 hour rainfall (0.18) times the appropriate area to obtain cubic feet of water.

E) OFF-SITE DRAINAGE

Runoff will approach the site from a small area to the north which is occupied partially by brush and partially by an existing motel. This small drainage area has been divided into two parts for convenience of analysis. (See Plate 2) Runoff from both parts will be directed around or through the site via graded easement swales. Flows from Part A will be directed between Lots 10 and 11 and into 58th Court S.W. Flows from Part B will be directed along the east boundary of the site and into Churchill Road. Due to the brush and grass existing immediately north of the site, these small off-site drainage areas should yield runoff only during very severe storms.

F) ON-SITE DRAINAGE

The AMAFCA regulations will be met through the use of individual lot ponding areas. Plate 3 illustrates the lot grading scheme proposal as well as the overall platting plan. Flows in 58th Court for a 100 year rainfall will peak at less that 8 cfs - an amount easily accommodated by the street section below curb elevation.

PLATE 1

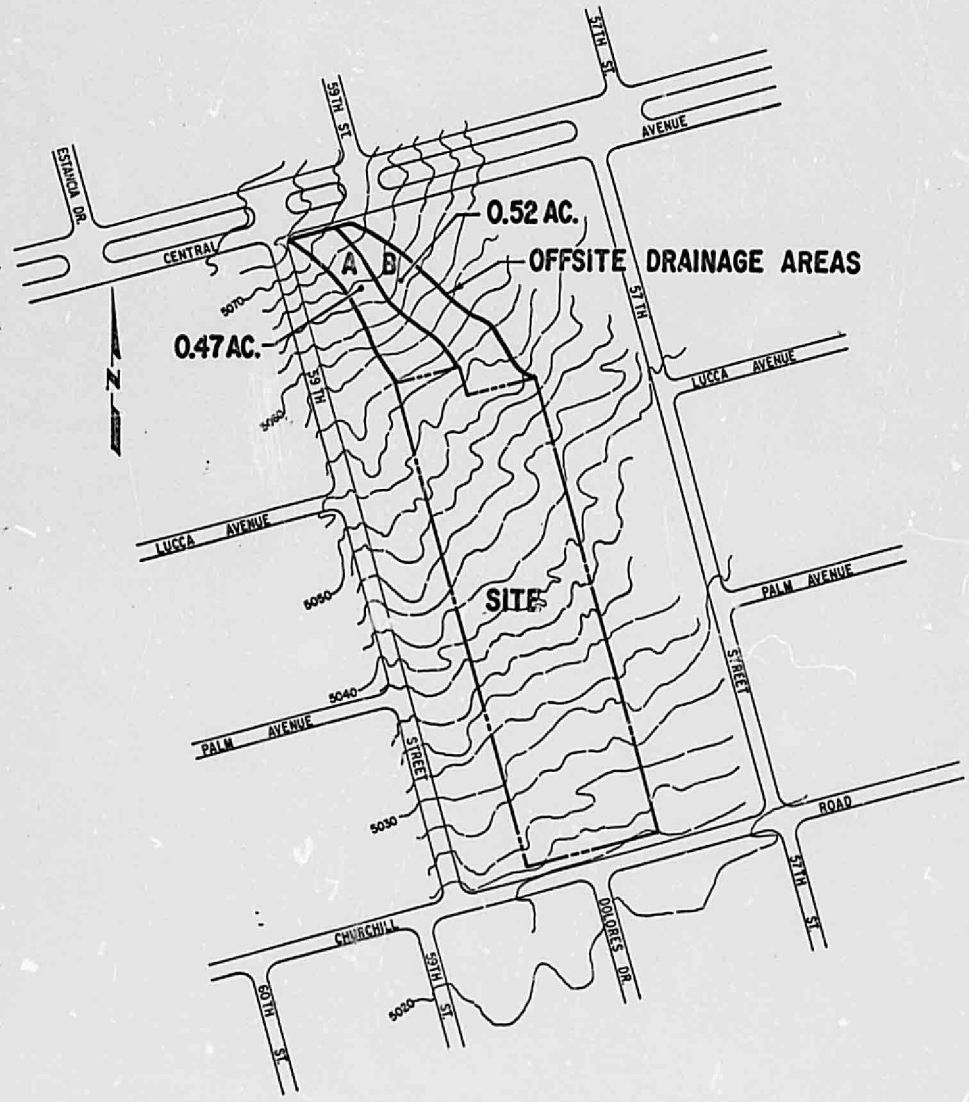
LOCATION MAP

SCALE : 1" = 800'(APPROX.)

PLATE 2

OFFSITE DRAINAGE MAP

FROM A.M.A.F.C.A. 1" = 200' TOPOGRAPHY



APPENDIX "A" CALCULATIONS

1) Off-site Flow Rates

Assume 50% natural (vegetated) and 50% hardsurfaced.

$C = (0.5 \times 0.35) + (0.5 \times 0.95) = 0.65$

$I_{100} = 5.4$ in/hr

a) Basin A area = 0.47 acres

$Q_{100} = 0.65 \times 5.4 \times 0.47 = 1.65$ cfs

b) Basin B area = 0.52 acres

$Q_{100} = 0.65 \times 5.4 \times 0.52 = 1.83$ cfs

2) Capacity Section A Swale

Bottom width = 2'

Sideslopes = 3:1

Slope (min) = 2%

Depth = 0.5'

n = 0.035 (grass)

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

= 5.1 cfs ?? 1.83

Maximum velocity based on maximum slope of 5%, earth bottom at n = 0.025, and 1.83 cfs = 3.9 fps - stable

3) Composite C - Typical Lot

Gross Area = 7,510 S.F.

Roof Area @ C = 0.95 = 1,500 S.F. = 20%

Paved Areas @ C = 0.95 = 1,860 S.F. = 25%

Area in SW Landscaping @ C = 0.7 = 1,000 S.F. = 13%

Area in Lawn @ C = 0.25 = 1,500 S.F. = 20%

Area left natural @ C = 0.4 = 1,650 S.F. = 22%

C_{COMP} = (0.45 x 0.95) + (0.13 x 0.7) + (0.2 x 0.25) + (0.1 x 0.22)

= 0.66

4) Required Ponding Volume - Typical Lot

R (100 year - 6 hour) = 2.2" = 0.183'

A = 7,510 S.F.

Volume Required = (0.66 - 0.4) (0.183) (7,510)

= 360 cf

5) Actual Pond Volume

$$\text{Volume} = \left[\frac{5 + (2x6) + (0.6x4)}{2}\right] \times 0.6 \times 69$$

= 402 cf

6) Peak Street Flow Rate

On-site Area = 1,505' (perimeter of ROW) x 41' = 61,705 S.F. = 1.42 acres

C = 0.8

I = 5.4 in/hr (Tc < 10 min)

Off-site area = 0.47 acres

C = 0.65

I = 5.4 (Tc < 10 min)

$Q_{100} = 5.4 \times [(0.8 \times 1.42) + (0.65 \times 0.47)]$

= 7.8 cfs