HYDROLOGY G21/D1 1 PLAN

G 21/D1

1 PLAN

DRAINAGE REPORT

FOR

BRIARWOOD TERRACE

A TOWN HOME DEVELOPMENT

ALBUQUERQUE, NEW MEXICO

REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR
STATE OF NEW MEXICO
5620
NEAL F. GODWIN

Prepared by:

GODWIN ENGINEERING CORPORATION
5/4/78 04-01

OBJECTIVE:

The objective of this report is to present a solution for drainage for the proposed development site. The solution presented will protect the dwelling units against flooding and will conform to the guidelines set forth by the AMAFCA resolution of July 1972-2.

PROJECT LOCATION:

The project is located in the northeast heights of Albuquerque. It is bounded on the north by a proposed park, on the east by tract H-5-A of La Reina De Los Altos, Unit Two (presently vacant, zoned O-1), on the south by Jane Place NE, a paved and guttered 40' face-to-face residential street, and on the west by tract H-8 of La Reina De Los Altos, Unit Two (a completed apartment complex), and bounded on the northwest by a drainage easement (arroyo). (see attached location map.)

NATURAL SITE DRAINAGE:

The site in its natural state slopes at about 3% toward the southwest. The natural drainage flows onto the adjacent tract and then is diverted to Jane Place NE. The runoff flows along Jane Place NE until the intersection of Jane and Candelaria where it turns west toward a curb opening on the north side of Candelaria. The curb opening allows the runoff to enter the concrete lined drainage easement. The drainage easement remains concrete lined for some ways downstream. A small area adjacent to the arroyo drains directly into it (see attached topographic map).

To comply with the AMAFCA resolution, some on-site retention of water is mandatory. It is proposed to retain, on-site, the difference between the natural volume (Gross Area x 0.40 x 2.4") and the developed volume (Gross Area x Composite C x 2.4"). This will be done by constructing retention ponds within designated drainage boundaries. The ponds will capture all runoff within that boundary. These boundaries and ponds will be designed in the

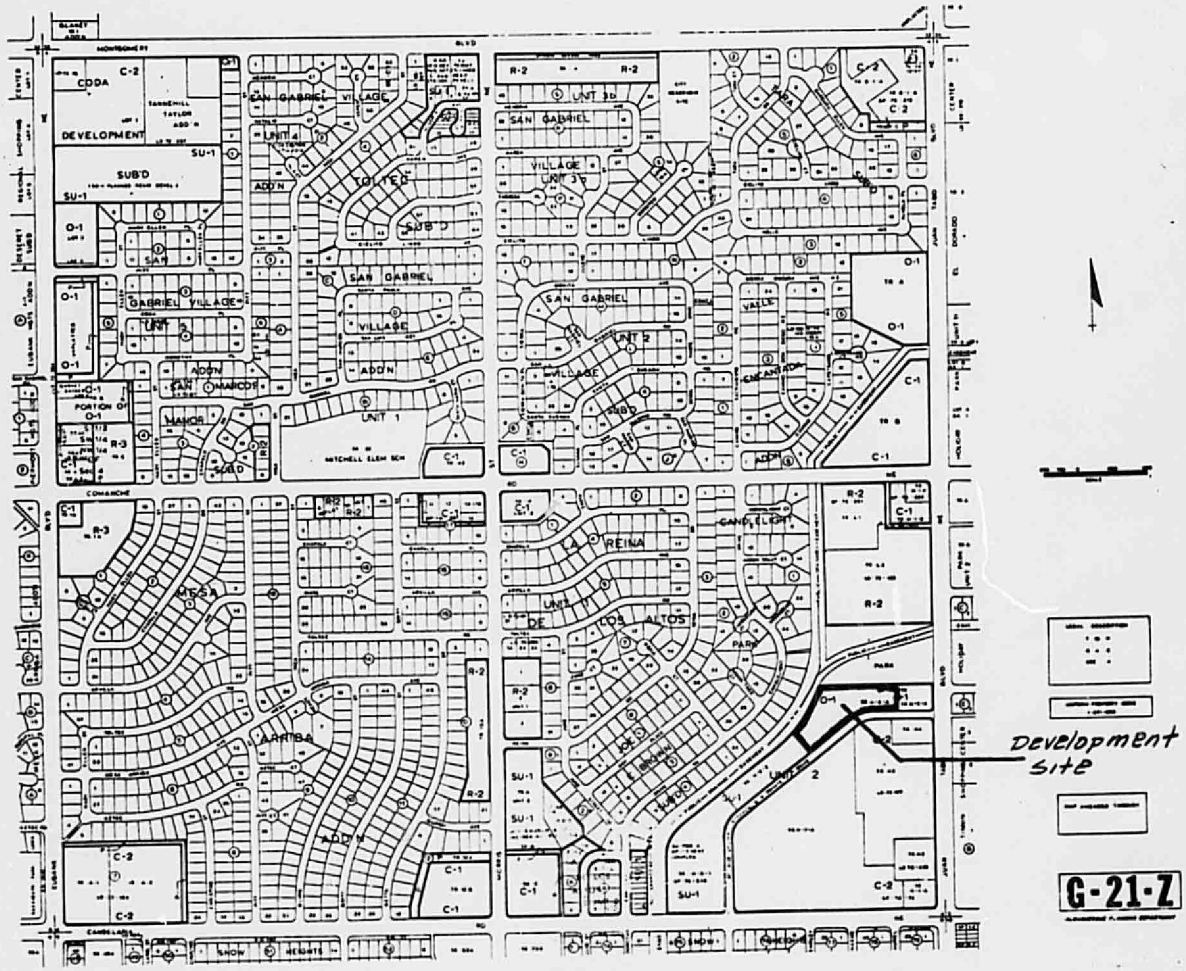
most feasible locations. Otherwise, the runoff will be allowed to sheet flow away from the pads into adjacent street or swales. The runoff generated from driveways and Briarwood Terrace (street) will flow into Jane Place NE. No routing thru a retention pond is economically feasible.

To control the grade along the west property line, a concrete block retaining wall is proposed. The retaining wall will also allow the construction of a swale to handle the minimal runoff in that area. (see attached drainage and development plan).

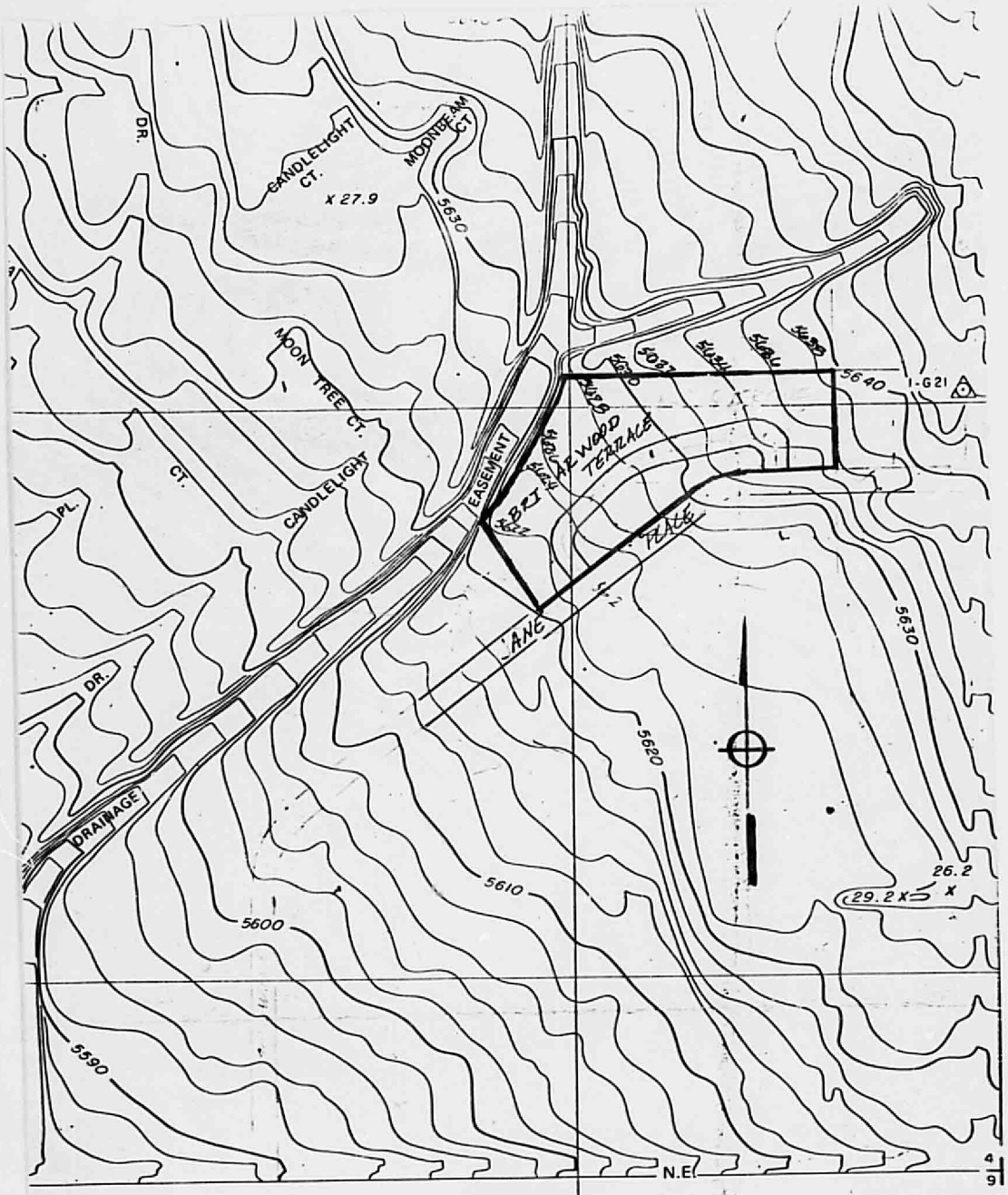
Drainage boundaries were drawn, gross areas, composite runoff factors, and volume of ponds required to capture all runoff were computed (see computation sheets attached). Total volume of water retained, as derived by summing all calculated pond volumes, is greater than the required volume calculated by subtracting the natural volume from the developed volume. Pond volumes, as shown, are equal to the required volume calculated for each drainage boundary. Pond volumes may be verified by scaling and computing bottom areas then multiplying by the depth (1.0').

CONCLUSION:

Actual rainfall volume captured is greater than the computed required. Therefore, the runoff from the site after development should be less than in the natural state. The foregoing drainage solution is recommended as it protects against flooding and complies with the AMAFCA resolution of July 1972-2.



LOCATION MAP



TOPOGRAPHIC MAP

JT-2 · 5618.0

Computations

Total Volume required to retain on site
= Volume developed − Volume natural

using C(natural) = 0.40 = C(pervious)
C(impervious) = 0.95
Total rainfall = 2.4" = 0.20'

AREAS OF USE	
Total	138,415 s.f.
(Lots Dwellings)	48,730 s.f.
street	14,533 s.f.
driveways	14,830 s.f.
Pedestrian Path	2,010 s.f.
open (landscaped)	54,312 s.f.

A Gross = 138,415 s.f.
A @ C=0.95 = 84,103 s.f.
A @ C=0.40 = 54,312 s.f.

Composite C:

$$C = \frac{54{,}103(0.95) + 54{,}312(0.40)}{138{,}415} = 0.73$$

Volume (dev.) = 0.73(138,415) 0.20 = 20,209 cu.ft.
Volume (nat.) = 0.40 (138,415) 0.20 = 11,073 cu.ft.

Volume required to be retained = 9,136 cu.ft.

Drainage
Boundary

I

A gross = 5346 s.f.
A @ c=0.95 = 3323 s.f.
A @ c=0.40 = 2023 s.f.

Composite C =

$$\frac{3323(.95) + 2023(.40)}{5346} = 0.74$$

Pond volume required = 0.74 (5346) 0.20 = 791 cu.ft.

II

A gross = 9130 s.f.
A @ c=.95 = 4430 s.f.
A @ c=.40 = 4700 s.f.

Composite C =

$$\frac{4430(.95) + 4700(.40)}{9130} = 0.67$$

Pond volume required = 0.67 (9130) 0.20 = 1223 cu.ft.

III

A gross = 4518 s.f.
A @ c=.95 = 2668 s.f.
A @ c=.40 = 1850 s.f.

Composite C =

$$\frac{2668(.95) + 1850(.40)}{4518} = 0.72$$

Pond volume required = 0.72 (4518) 0.20 = 651 cu.ft.

IV

A gross = 6579 s.f.
A @ c=.95 = 4430 s.f.
A @ c=.40 = 2149 s.f.

Composite C =

$$\frac{4430(.95) + 2149(.40)}{6579} = 0.77$$

Pond Volume required = 0.77 (6579) 0.20 = 1013 cu.ft.

Drainage
Boundary

V

Agross = 12,258 s.f.
A@C=.95 = 4430 s.f.
A@C=.40 = 7828 s.f.

Composite C =

$$\frac{4430(.95) + 7828(.40)}{12\,258} = 0.60$$

Pond volume required = 0.60 (12,258) 0.20 = 1471 cu.ft.

VI

A gross = 8186 s.f.
A@C=.95 = 4430 s.f.
A@C=.40 = 3756 s.f.

Composite C =

$$\frac{4430(.95) + 3756(.40)}{8186} = 0.70$$

Pond volume required = 0.70 (8186) 0.20 = 1146 cu.ft.

VII

Agross = 9729 s.f.
A@C=.95 = 4430 s.f.
A@C=.40 = 5299 s.f.

Composite C =

$$\frac{4430(.95) + 5299(.40)}{9729} = 0.65$$

Pond volume required = 0.65 (9729) 0.20 = 1265 cu.ft.

VIII

Agross = 7974 s.f.
A@C=.95 = 4430 s.f.
A@C=.40 = 3544 s.f.

Composite C =

$$\frac{4430(.95) + 3544(.40)}{7974} = 0.71$$

Pond volume required = 0.71 (7974) 0.20 = 1132 cu.ft.

Drainage
Boundary

IX

A gross = 4752 s.f.
A @ C=.95 = 2215 s.f.
A @ C=.40 = 2537 s.f.

Composite C =

$$\frac{2215(.95)+2537(.40)}{4752} = 0.66$$

Pond volume required = 0.66(4752) 0.20 = 627 cu.ft.

X

A gross = 3893 s.f.
A @ C=.95 = 2215 s.f.
A @ C=.40 = 1678 s.f.

Composite C =

$$\frac{2215(.95)+1678(.40)}{3893} = 0.71$$

Pond volume required = 0.71 (3893) 0.20 = 553 cu.ft.

Sumation of all volumes required = 9872 cu.ft.

Volume required to be retained = 9136 cu.ft.

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

September 26, 1978

621-D1

Mr. Neal F. Godwin
Godwin Engineering Corporation
3820 Academy Parkway North
Albuquerque, New Mexico 87109

SUBJECT: TEST TURNKEY PROJECT WORK AUTHORIZATION #T-17
BRIARWOOD TERRACE ADDITION

Dear Mr. Godwin:

Under the provisions of the Test Turnkey Project procedures, this letter is the Work Authorization to begin field work on the project.

Very truly yours,

C. D. Sheppard, P.E.

C. D. Sheppard
Acting City Engineer

CDS/fs

cc - H. R. Orr
Kent Nowlin Construction Inc.
Ray Dawson
Water Resources
Dwayne Sheppard
Bob Kielich
LaMonte Urban
Bruno Conegliano
Bill Mueller