HYDROLOGY H16/D3 3 PLANS

H16/D3

3 PLANS

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

April 30, 1980

H16-03

John Robert
Andrews, Asbury &
Robert, Inc.
401 San Pedro N.E.
Albuquerque, N.M. 87108

Reference: Netherwood Towne Homes

Dear Mr. Robert:

I have reviewed the site grading plan for the referenced development, and I find it unacceptable.

The ponding areas as shown cannot provide the ponding volume indicated on the table at the top right side of the sheet. For example, the pond on Lot 8 can at best supply 300 cu. ft. of the 429 cu. ft. required if constructed with vertical side slopes. The note at the bottom left of the sheet, which talks about detention, is not adequate to explain the difference in the absence of any indication of how such detention would be accomplished and what would prevent the water from entering the residences.

Another problem that I anticipate with the configuration submitted, is the potential damage to the foundations, given the proximity of the ponding areas; such problem being most pronounced with the ponds that surround Lots 1, 2, and Lots 16, 17.

I want to call also your attention to the ponds on Lots 3, & 4, which cannot store any water with the configuration submitted. Mr. Conegliano, has reported to me of your intention to supply retaining walls, to absorb some of the difference in elevation. If this is the case, the pertinent information must be shown on the grading plan, more specifically the location, the dimensions, the top and bottom elevation of the walls; the corresponding information for any existing walls seperating this subdivision from the existing residences of Block 10, Miracerros Addition must also be provided. The impact of the ponds on the existing wall footings should be addressed as well.

Experiences with plans of this type induce me to require that any detention ponds, be designed with positive outflow at a sufficiently low rate of discharge, to preserve the intergrity of the purpose of the storage areas.

In view of the above, I recommend that positive discharge be provided for the storage areas on Lots 6 thru 12; that ponding areas on Lots 1 thru 5 and 13 thru 17 be eliminated in favor of a detention area on the island which seperates the private drive from Darthmouth Dr. without encroaching on the existing public R.O.W.

I will be able to sign the grading plan for this development if the problems noted above are corrected.

Mr. Conegliano, has also informed me of your displeasure for the delay in answering to your submittal. I want to assure you that we are endeavoring to meet your needs as well as the needs of the developers in the community in the most expeditious manner possible, within the constraints of the current workload and man power available. Of course, if the plans submitted to this office are prepared with the necessary care and thoughtfulness, our task would be made easier and faster replies to the submission of Consultants would be possible.

Very truly yours,

Richard S. Heller
City Engineer

RSH/lc

ANDREWS, ASBURY & ROBERT, INC.
Consulting Engineers
401 San Pedro, NE, Albuquerque, New Mexico 87108
(505) 265-6631

John A. Andrews, P.E.
Charles T. Asbury, P.E.
John B. Robert, P.E. & L.S.

April 9, 1980

H 16-D3

Mr. Fred J. Aguirre
Civil Engineer
Municipal Development Department
CITY OF ALBUQUERQUE
PO Box 1293
Albuquerque, New Mexico 87103

SUBJECT: DRAINAGE REPORT FOR NETHERWOOD TOWNHOMES - SITE IMPROVEMENTS

Dear Mr. Aguirre:

This letter is in response to your letter of March 28, 1980 on subject project. Below are the explanations and answers to your respective comments and questions:

1) The tract of land proposed for development has an area of 2.175 acres within the boundary of the property lines. The existing drainage areas include the area between the property line and back of curb, thus accounting for the difference in area.

2) Under the proposed developed conditions, only 1.493 acres of the site will drain to the existing streets, as stated on Pages 3 and 4 of the Report Narrative, Sheets 6 and 7 of the Drainage Analysis and as shown on Map No. 3. On the remainder of the area, it is proposed to retain 100% of the storm waters falling thereon and, therefore, will not contribute to the runoff from the site.

3) As stated on Page 4 of the Report Narrative and Sheet 6 of the Drainage Analysis, the builder is to provide for backyard and/or roof ponding in order to attain the minimum pond volumes, shown in the Report and on Map No. 3. Therefore, the yard pond size is dependent on the amount of water retained on the roof. This is the reason the size, depth and location is now shown on Map No. 3.

4) Existing contours and new finish grade contours are shown on Map No. 3. These contours intersect sidewalk or curb, depicting their elevation. Map No. 3 also shows the finished grade of each building pad. Pond elevations and details are not shown due to Item 3 above.

5) Ponds will not be located on any easements. Utility easements are along the front and side of all lots in this subdivision. The builder will fine grade the lot to provide for drainage to the pond.

6) Runoff from the subject site to the street will not be increased by development (see Sheet 5 and Sheet 10 of the Report Drainage Analysis). Under existing conditions, the runoff from the site is 5.501 cfs, and under developed conditions, the runoff is 5.476 cfs.

7) The finished grade contours shown on Map No. 3 of the Report are shown for site grading only and do not show the fine grading and block walls that will be constructed by the builder. By the construction of these walls and the fine grading that will be performed by the builder, no flow will be directed to the buildings.

8) Water collected in the small ponds that will be constructed in the backyards of lots will be disposed of by evaporation and percolation.

We hope this letter will successfully clarify your comments and answer your questions in order for you to make a timely approval of the subject Drainage Report. Should you desire anything further in order to make your approval, please telephone us in order to expedite the project as much as possible.

Very truly yours,

John A. Andrews

JOHN A. ANDREWS, P.E.

JAAsm

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

March 28, 1980

Andrews, Asbury & Robert, Inc.
Consulting Engineers
401 San Pedro, NE
Albuquerque, New Mexico 87108

Reference: Netherwood Townhomes

Dear Mr. Robert:

The following are my comments concerning the above referenced Drainage Report submitted to this office on March 14, 1980:

1. The sum of the existing drainage areas total to 2.455 acres. In the introduction it was stated that 2.175 acres was to be developed, why the difference?

2. The sum of the developed drainage acres total to 1.493 acres, what happens to the rest of the area?

3. Ponds are not shown on plan, cannot verify sizes, depths, or locations.

4. No top of curb elevations shown, no property elevations, no finished floor elevations, no pond details or elevations.

5. Are any of the ponds located within any easements? Will water actually flow to ponds?

6. Can the existing streets accommodate the additional runoff without problems?

7. Some of the contours indicate that the flow may in some cases be directed toward some of the buildings.

8. Positive drainage must be provided for all ponds.

If you have any questions concerning these comments, please feel free to contact me.

Sincerely,

Fred J. Aguirre
Civil Engineer

FJA/lc

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

March 24, 1980

Mr. Charles T. Asbury
Andrews, Asbury & Robert, Inc.
401 San Pedro NE
Albuquerque, New Mexico 87108

H16-03

Reference: Netherwood Townhomes

Dear Mr. Asbury:

Per our telephone conversation Friday, March 21, 1980 a letter will be forthcoming within the next couple of weeks with comments on the above referenced drainage report.

If you have any questions, please feel free to contact my office.

Very truly yours,

Lillian Caron
for Fred Aguirre
Civil Engineer

lc

ANDREWS, ASBURY & ROBERT, INC.
Consulting Engineers
401 San Pedro, NE, Albuquerque, New Mexico 87108
(505) 265-6631

John A. Andrews, P.E.
Charles T. Asbury, P.E.
John B. Robert, P.E. & L.S.

H16-D3

RECEIVED
MAR 14 1980
CITY ENGINEER

March 14, 1980

HAND-DELIVERED

Mr. Richard S. Heller
City Engineer
CITY OF ALBUQUERQUE
PO Box 1293
Albuquerque, New Mexico 87103

SUBJECT: DRAINAGE REPORT - NETHERWOOD TOWNHOMES SUBDIVISION

Dear Mr. Heller:

Transmitted herewith for your review and approval are two (2) copies of a Drainage Report for the proposed Netherwood Townhomes Subdivision.

For your information, during your review of this report, we are enclosing a print of the proposed Plat.

Very truly yours,

JOHN A. ANDREWS, P.E.

JAAsm
Enclosures
cc: J-M Properties, Inc. (w/encl.)

RSH ✓ ADM ____
HRO ____ SUR ____
CDS ____ COUN ____
DES ____ SEC ____
INSP ____ FILE ____
HYDRO ____ RETURN ____

November 10, 1975

H16-D3

Mr. Michial M. Emery
Bohannan,Westman,Huston & Assoc., Inc.
4125 Carlisle Blvd. N.E.
Albuquerque, New Mexico 87107

RE: DRAINAGE STUDY MAGUIRE TOWNHOUSES
NETHERWOOD PARK SUBDIVISION

Dear Mr. Emery:

The subject drainage report is approved and I will sign the development plat. I would suggest the front yard holding areas be reduced to a maximum depth of 6 inches.

Very truly yours,

Kleston H. Laws
Assistant City Engineer-Hydrology

KHL/fs

cc: John Robert

DRAINAGE REPORTS
FOR
NETHERWOOD TOWNHOMES
SITE IMPROVEMENTS

J-M PROPERTIES, INC.
ALBUQUERQUE, NEW MEXICO

RECEIVED
JUL 23 1980
CITY ENGINEER

DRAINAGE REPORT

FOR

NETHERWOOD TOWNHOMES
SITE IMPROVEMENTS

MARCH, 1980

ANDREWS, ASBURY & ROBERT, INC.
Consulting Engineers
401 San Pedro, NE
Albuquerque, New Mexico 87108

505-265-6631

DRAINAGE REPORT

FOR

NETHERWOOD TOWNHOMES
SITE IMPROVEMENTS

TABLE OF CONTENTS

		PAGE
I	Introduction	1
II	Existing Conditions	2
III	Developed Conditions	3
IV	Lot Ponding Requirements	4
	Location Map	MAP NO. 1
V	Drainage Analysis	5
		Sheets 1 through 10

MAPS

Existing Conditions	MAP NO. 2
Developed Conditions	MAP NO. 3

(See pocket at back of report for Map No. 2 and Map No. 3)

I

INTRODUCTION

J-M Properties, Inc. proposes to develop a 2.175-acre tract of land designated as Netherwood Townhomes. The Netherwood Townhomes are located within the Northeast quadrant of the City of Albuquerque, New Mexico, and lying within the Southeast Quarter (SE¼) of Section 10, Township 10 North, Range 3 East, N.M.P.M. (see enclosed Location Map No. 1 - Zone Atlas Map H-16).

The type of development proposed for this tract consists of zero lot line, single-family townhouse units.

It is the intent of this report to provide an acceptable method of controlling excess storm water runoff created by improvements in the event of a 100-year frequency storm. Guidelines for the analysis are based on the Albuquerque Metropolitan Arroyo Flood Control Authority's Drainage Resolution 1972-2 and the City of Albuquerque Drainage Ordinances.

II

EXISTING CONDITIONS

The subject property is presently undeveloped and the existing drainage conditions are shown on Map No. 2 enclosed herein.

Bounding the site on the east is an existing concrete block wall which serves as a backyard fence for single-family residential units to the east. The subject property is bounded on the north by Cutler Avenue, NE, on the west by Dartmouth Drive, NE, and on the south by Euclid Avenue, NE, all of which are improved streets with curb and gutter. Therefore, no off-site drainage reaches the site.

III

DEVELOPED CONDITIONS

The proposed method of drainage for the subject property under the developed conditions is shown on Map No. 3 enclosed herein.

As shown on Map No. 3, it is proposed to grade the site in such a manner so as not to appreciably change the existing onsite drainage pattern.

The guidelines to be used for controlling storm water runoff when developing the subdivision are stated in the drainage analysis, attached hereto, and are restated as follows:

1) Provide for infiltration and backyard and/or roof ponding of 100% of rainfall that falls on the area lying more than 55 feet back of the street right-of-way line or equivalent.

2) Rainfall that falls on the street right-of-way and to 55 feet back from the street right-of-way line or equivalent will be allowed to flow to the existing improved streets and away from the subdivision.

3) Total runoff rate from the developed subdivision will not be allowed to increase from the runoff under existing conditions.

IV

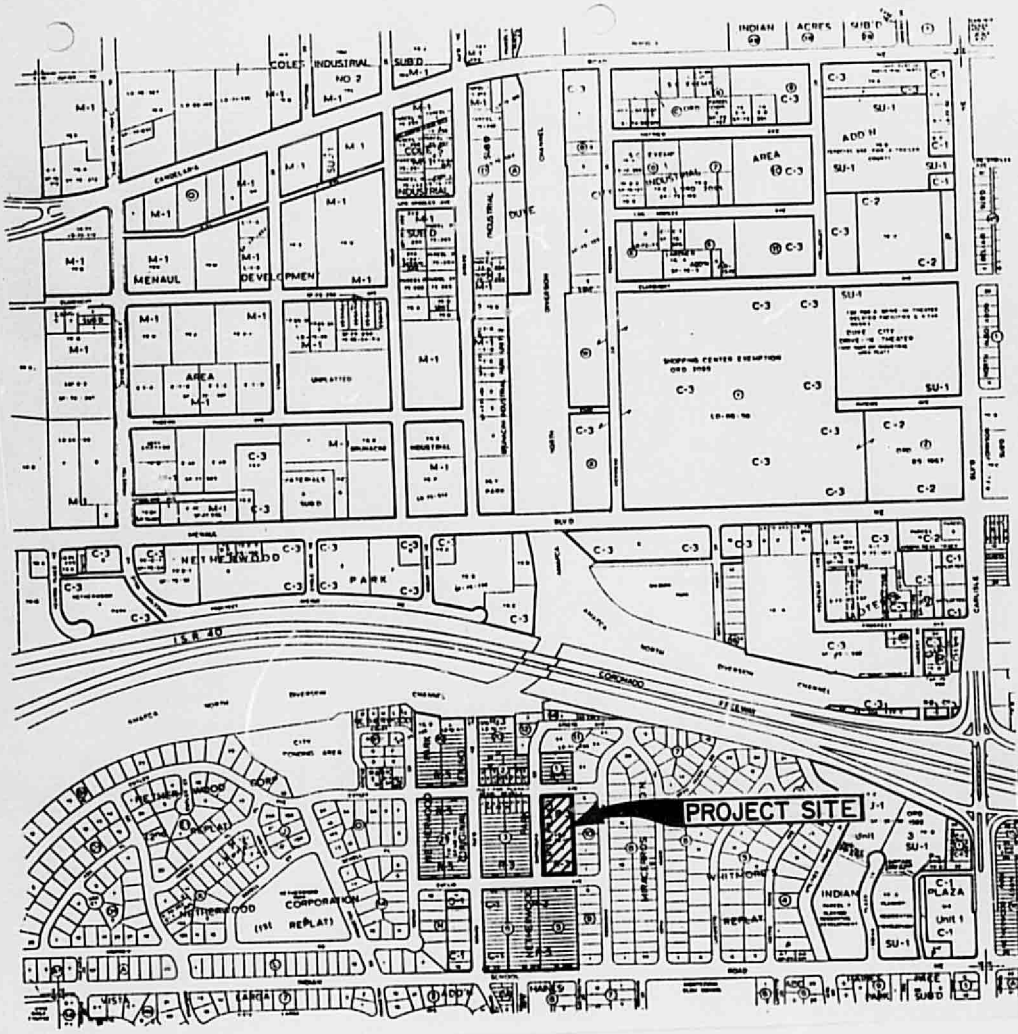
LOT PONDING REQUIREMENTS

As established previously in this report, ponding of one-hundred percent (100%) of rainfall that falls on the area lying more than fifty-five feet (55') back of the street right-of-way is to be provided by backyard and/or roof ponding or other acceptable means.

To determine the minimum ponding requirements per lot, the area of each lot lying fifty-five feet (55') back of the street right-of-way was computed with respect to contributing roof area and open or landscaped areas. The volume of runoff generated from these areas was computed to determine the Lot Ponding Requirements shown on the following tabulation:

NETHERWOOD TOWNHOMES
LOT PONDING REQUIREMENTS

Lot No.	Storage Volume (CF)
1,17	331 per lot
6,8,10,11	429 per lot
7,9,12	351 per lot
2,16	307 per lot
13,15	336 per lot
14	414
3,5	339 per lot
4	417



Note : This map is prepared from Zone Atlas Sheet H-16

NETHERWOOD TOWNHOMES

DRAINAGE ANALYSIS

LOCATION MAP

Map No. I

V

DRAINAGE ANALYSIS

Following is the Drainage Analysis (computations) for the Netherwood Townhomes Site Improvements for both the Existing Conditions and the Developed Conditions.

ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS
401 San Pedro, NE., Albuquerque, N.M. 87108
Telephone (505) 265-6631

Drainage Analysis

Criteria

Design Storm - 100 year frequency

AMAFCA Drainage Resolution 1972-2

City of Albuquerque - Drainage Ordinance

Reference Material

1. Albuquerque Area (1961) Intensity - Duration - Frequency Curves.
2. 100 year - 6 hour precipitation, Rainfall Frequency Map, U.S. Weather Bureau
3. Time of concentration nomograph, p. 2, Kirpich.

Design Parameters

Peak runoff rate - Rational Formula, $Q = CIA$

Runoff Volume = V = Runoff coefficient x Rainfall x Area

Runoff Coefficients:

Existing Ground Surface	= 0.400
Open Areas (developed landscaping)	= 0.400
Paved Areas	= 0.900
Roof Areas (flat roofs)	= 0.825

ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS
401 San Pedro, NE., Albuquerque, N.M. 37108
Telephone (505) 265-6631

Existing Conditions

Peak Flows & Volumes
(Refer to Map No 2 for Drainage Area designations)

Drainage Area E-1

Total Area = 0.616 ac.

Paved Area = 0.016 ac.
Open Area = 0.600 ac.

H = Elev. difference = 10 ft
L = Length of drainage area = 335 ft.
TC = Time of concentration = 2.8 ∠ 10 use 10 min.
I = Intensity = 5.4 in/hr.

$$C_{combined} = \frac{0.016 \times 0.900 + 0.600 \times 0.400}{0.616}$$

$$= 0.413$$

$$Q = CIA = 0.413 \times 5.4 \times 0.616 = \underline{\underline{1.374 \text{ cfs}}}$$

$$V = 0.413 \times 2.5''/12 \times 0.616 = 0.053 \text{ ac-ft}$$

$$= \underline{\underline{2309 \text{ ft}^3}}$$

ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS
401 San Pedro, NE., Albuquerque, N.M. 87108
Telephone (505) 265-6631

DRAINAGE AREA E-2

TOTAL AREA = 0.674 AC.

PAVED AREA = 0.020 AC
OPEN AREA = 0.654 AC.

H = ELEV. DIFFERENCE = 5 FT
L = LENGTH OF DRAINAGE AREA = 290 FT.
TC = TIME OF CONCENTRATION = 2.5 L USE MINS.
I = INTENSITY = 5.4 IN/HR.

$$C_{COMBINED} = \frac{0.020 \times 0.900 + 0.654 \times 0.400}{0.674}$$

$$= 0.415$$

$$Q = CIA = 0.415 \times 5.4 \times 0.674 = \underline{1.510 \text{ CFS}}$$

$$V = 0.415 \times 2.5''/12 \times 0.674 = 0.058 \text{ AC-FT}$$

$$= \underline{2540 \text{ FT}^3}$$

ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS
401 San Pedro, NE., Albuquerque, N.M. 87108
Telephone (505) 265-6631

DRAINAGE AREA E-3

TOTAL AREA = 1.165 AC.

PAVED AREA = 0.038 AC.
OPEN AREA = 1.127 AC.

H = ELEV. DIFFERENCE = 8 FT.
L = LENGTH OF DRAINAGE AREA = 265 FT.
TC = TIME OF CONCENTRATION = 24 MINUTES
I = INTENSITY = 5.4 in/hr.

$$C_{combined} = \frac{0.038 \times 0.900 + 1.127 \times 0.400}{1.165}$$

$$= 0.416$$

$$Q = CIA = 0.416 \times 5.4 \times 1.165 = \underline{\underline{2.61 \text{ cfs}}}$$

$$V = 0.416 \times 2.5''/12 \times 1.165 = 0.101 \text{ ac-ft}$$

$$= \underline{\underline{4398 \text{ ft}^3}}$$

ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS
401 San Pedro, NE., Albuquerque, N.M. 87108
Telephone (505) 265-6631

Summary - Existing Conditions

Drainage Area	Q (cfs)	V (ft³)
E-1	1.374	2309
E-2	1.510	2540
E-3	2.617	4398
Total	5.501 cfs	9247 ft³

ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS
401 San Pedro, NE., Albuquerque, N.M. 87108
Telephone (505) 265-6631

DEVELOPED CONDITIONS

PEAK FLOWS & VOLUMES
(REFER TO MAP Nº 3 FOR DRAINAGE AREA DESIGNATIONS)

NOTES:

1. DUE TO THE CHARACTERISTICS OF THE DEVELOPED DRAINAGE AREAS CONSIDERED IN THIS ANALYSIS, THE TIME OF CONCENTRATION FOR ALL DEVELOPED DRAINAGE AREAS WILL BE LESS THAN 10 MINUTES, THEREFORE A MAXIMUM INTENSITY OF 5.4 IN./HR. WILL BE USED IN ALL RUNOFF COMPUTATIONS HEREIN.

2. AS A METHOD OF CONTROLLING VOLUME AND RATE OF STORM WATER RUNOFF FROM THE SUBDIVISION UNDER DEVELOPED CONDITIONS DUE TO THE CONSTRUCTION OF HARD SURFACE AREAS, THE FOLLOWING DESIGN CONCEPTS ARE PROPOSED:

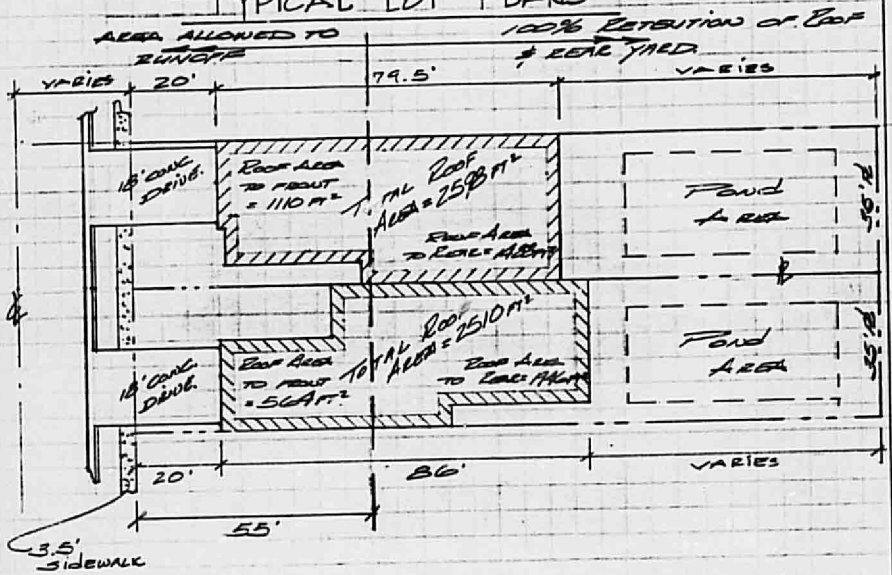
   A. PROVIDE FOR BACKYARD AND/OR ROOF AREA PONDING OF 100% OF THE RAINFALL THAT FALLS ON THE AREA LYING 55 FT. BACK OF THE STREET RIGHT-OF-WAY LINE OR EQUIVALENT.

   B. RAINFALL THAT FALLS ON THE STREET RIGHT-OF-WAY AND TO 55 FT. BACK FROM THE STREET RIGHT-OF-WAY LINE OR EQUIVALENT WILL BE ALLOWED TO FLOW TO THE EXISTING IMPROVED STREETS AND AWAY FROM THE SUBDIVISION.

   C. TOTAL RUNOFF RATE FROM THE DEVELOPED SUBDIVISION WILL NOT BE ALLOWED TO INCREASE FROM THE EXISTING CONDITIONS.

ANDREWS, ASBURY & ROBERT, INC. CONSULTING ENGINEERS 401 San Pedro, NE., Albuquerque, N.M. 87108 Telephone (505) 265-6631	Project Northwood Townhomes Sheet 7 of 10 Drainage Analysis Job No. 180 By BSF Chk'd JA Date 3-7-80

TYPICAL LOT PLANS



NOTE: ACTUAL POND CONFIGURATION WILL VARIES DUE TO THE DIFFERENCE IN THE SIZE OF THE REAR YARDS. SEE TABULATION ON SHEET — FOR MINIMUM POND VOLUME FOR EACH LOT.

ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS
401 San Pedro, NE., Albuquerque, N.M. 87108
Telephone (505) 265-6631

Drainage Area D-1

Total Area = 0.192 ac.

Roof Area = 0.051 ac.
Paved Area = 0.040 ac.
Open Area = 0.101 ac.

$$C_{combined} = \frac{0.051 \times 0.825 + 0.040 \times 0.900 + 0.101 \times 0.400}{0.192}$$

$$= 0.617$$

$$Q = CIA = 0.617 \times 5.4 \times 0.192 = \underline{0.640 \text{ cfs}}$$

$$V = 0.617 \times 2.5''/12 \times 0.192 = 0.025 \text{ ac-ft}$$

$$= \underline{1075 \text{ ft}^3}$$

Drainage Area D-2

Total Area = 0.627 ac.

Roof Area = 0.144 ac.
Paved Area = 0.250 ac.
Open Area = 0.233 ac.

$$C_{combined} = \frac{0.144 \times 0.825 + 0.250 \times 0.900 + 0.233 \times 0.400}{0.627}$$

$$= 0.697$$

$$Q = CIA = 0.697 \times 5.4 \times 0.627 = \underline{2.360 \text{ cfs}}$$

$$V = 0.697 \times 2.5''/12 \times 0.627 = 0.091 \text{ ac-ft.}$$

$$= \underline{3966 \text{ ft}^3}$$

ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS
401 San Pedro, NE., Albuquerque, N.M. 87108
Telephone (505) 265-6631

Drainage Area D-3

Total Area = 0.494 ac.

Roof Area = 0.120 ac.
Paved Area = 0.192 ac.
Open Area = 0.182 ac.

$$C_{combined} = \frac{0.120 \times 0.825 + 0.192 \times 0.900 + 0.182 \times 0.400}{0.494}$$

$$= 0.698$$

$$Q = CIA = 0.698 \times 5.4 \times 0.494 = \underline{1.862 \text{ cfs}}$$

$$V = 0.698 \times 2.5''/12 \times 0.494 = 0.072 \text{ ac-ft}$$

$$= \underline{3129 \text{ ft}^3}$$

Drainage Area D-4

Total Area = 0.180 ac.

Roof Area = 0.051 ac.
Paved Area = 0.040 ac.
Open Area = 0.089 ac.

$$C_{combined} = \frac{0.051 \times 0.825 + 0.040 \times 0.900 + 0.089 \times 0.400}{0.180}$$

$$= 0.632$$

$$Q = CIA = 0.632 \times 5.4 \times 0.180 = \underline{0.614 \text{ cfs}}$$

$$V = 0.632 \times 2.5''/12 \times 0.180 = 0.024 \text{ ac-ft}$$

$$= \underline{1032 \text{ ft}^3}$$

ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS
401 San Pedro, NE., Albuquerque, N.M. 87108
Telephone (505) 265-6631

Summary - Developed Conditions

Drainage Area	Q (cfs)	V (ft³)
D-1	0.640	1075
D-2	2.360	3966
D-3	1.862	3129
D-4	0.614	1032
Total	5.476 cfs OK	9202 ft³ OK

from Sheet 5

Existing Discharge = 5.501 cfs

Existing Volume = 9247 > 9202 OK