HYDROLOGY F15/D6 TWO PLAN

F15-D6

2 PLANS

81 53431 DRAINAGE COVENANT 887

F15 DC 3

THIS COVENANT made this 8th day of September, 1981, by and between the City of Albuquerque, a municipal corporation, (City) and Mr. Clifford B. Wood (Owner, which term includes successors and assigns.)

RECITAL

The Owner is owner of certain real property located at 164 Sandia Rd. N.W. in Albuquerque, New Mexico, (the Property) and more particularly described as follows:

Lot 23 - Glendale Addition

That pursuant to City ordinances, regulations, and other applicable laws, the Owner is required to install and/or maintain certain drainage facilities on the Property, and the parties wish to provide for an agreement as to the obligations and responsibilities for same.

DESCRIPTION OF FACILITIES

The following facilities are to be constructed and/or maintained by the owner:

1. Drainage swale
2. Type Double "D" Inlet
3. 4" RCP to existing catch basin

CONSTRUCTION OF DRAINAGE FACILITIES

The Owner shall construct the drainage facilities in accordance with standards, plans, and specifications prescribed and approved by the City.

MAINTENANCE OF FACILITIES

The Owner shall, at his cost in accordance with the standards, plans, and specifications prescribed by the City, maintain said drainage facility. The City shall have the right to enter periodically upon the Property to inspect the drainage facility.

FAILURE TO COMPLY AND LIEN

In the event that the Owner shall fail to construct the drainage facility in accordance with standards, plans, and specifications prescribed and approved by the City or fail to adequately maintain said facilities, the City shall give the Owner notice in writing to construct, correct, or maintain said

facilities, and if the Owner fails to comply therewith within 15 days, the City may enter upon said property to perform the necessary construction or maintenance. The cost of the City's performing such construction or maintenance shall be paid by the Owner. In the event the Owner fails to pay said cost within thirty (30) days after being billed for same, the City may file a lien against the Property.

LIABILITY

The City shall not be liable for any damages to the Owner resulting from its construction, modification, or maintenance of said facilities.

NOTICE

The written notice provided for herein shall be accomplished by mailing same to:

Mr. Clifford Wood
741 Chavez Rd. N.W.
Albuquerque, New Mexico 87107

The Owner may change said address by giving written notice, certified mail, return receipt requested, to the City Engineer, City Hall, at 505 Marquette Street, Albuquerque, New Mexico, 87103.

INDEMNIFICATION AND HOLD HARMLESS

The Owner agrees to defend, indemnify, and hold harmless, the City, its officials, agents and employees from and against any and all claims, actions, suits, or proceedings of any kind brought against said parties for or on account of any matter arising from the drainage facility provided for herein or the Owner's failure to construct, maintain, or modify the drainage facility under this Covenant.

COVENANT RUNNING WITH THE PROPERTY

The obligation of the Owner set forth herein shall be binding upon the Owner, his heirs, and assigns, and the property of the Owner as described herein and will run with said property until released by the City.

REVIEWED BY HYDROLOGY SECTION
CITY ENGINEER'S OFFICE

By: Chas M Entsley
9/17/81

OWNER

By: Clifford B. Wood
Title: Owner

REVIEWED BY THE LEGAL DEPARTMENT:

Malcolm W. deVargas
Assistant City Attorney

CITY OF ALBUQUERQUE

James C. Fernandez
Chief Administrative Officer

Deputy City Clerk

ACKNOWLEDGEMENTS

STATE OF NEW MEXICO )
) ss.
COUNTY OF BERNALILLO )

The foregoing instrument was acknowledged before me this _____ day of _____, 1981, by _____, _____
(Name of Officer) (Title)
_____, a _____
(Name of Corporation) (State of Incorporation)
corporation, on behalf of said corporation.

_____
Notary Public

My Commission Expires:
_____

STATE OF NEW MEXICO )
) ss.
COUNTY OF BERNALILLO )

The foregoing instrument was acknowledged before me this _____ day of _____, 1981, by _____
(Name of Acknowledging Partner or Partners)
on behalf of _____,
(Name of Partnership)
a partnership.

_____
Notary Public

My Commission Expires:
_____

STATE OF NEW MEXICO )
) ss.
COUNTY OF BERNALILLO )

The foregoing instrument was acknowledged before me by Clifford B. Wood, on this 8th day of September 1981.

Pamela J. McHatch
Notary Public

My Commission Expires:
10/19/83

STATE OF NEW MEXICO )
) ss.
COUNTY OF BERNALILLO )

The foregoing instrument was acknowledged before me this 5th day of October, 1981, by James C. Jaramillo Chief Administrative Officer of the City of Albuquerque, municipal corporation, on behalf of said corporation.

Karen M. Aceves
Notary Public

My Commission Expires:
2/24/85

OFFICIAL SEAL
KAREN M. ACEVES
NOTARY PUBLIC - STATE OF NEW MEXICO
My Commission Expires 2/24/85

2027

HYDROLOGY

F15/D5

WOODS APTS.

F15—D5

2 PLANS

INFORMATION SHEET

PROJECT TITLE Woods Apts. TYPE OF SUBMITTAL Drainage & Grading Plan

ZONE ATLAS PAGE NO. F-15 CITY ADDRESS 164 Sandia Road

LEGAL DESCRIPTION Lot 23 Glendale Addition

ENGINEERING FIRM Burton, Leyendecker, & Leyendecker CONTACT Robert Molina

ADDRESS 3401 Carlisle PHONE 884-1330

OWNER Sunstate Corp. Inc. CONTACT Mrs. Wood

ADDRESS 174 Sandia Rd. NW PHONE 345-3409

ARCHITECT Mitchell & Associates CONTACT Ivor Williams

ADDRESS 2018 Coal Pl. SE PHONE 243-0878

SURVEYOR Forstbauer Surveying CONTACT Ron Forstbauer

ADDRESS 528 Chama NE, Ste. C PHONE 268-0248

CONTRACTOR City Services Plumbing CONTACT Ross Cox

ADDRESS 6204 2nd NW PHONE 345-8694

DATE SUBMITTED July 27, 1983

BY Richard L. Burton, Engineer

Use this Information Sheet when submitting the following:

Drainage report or plan, conceptual grading and drainage plan, engineer's certification plan, erosion plan and grading plan. Provide the information applicable to your submittal.

Gene Leyendecker
8.20.81 (10:00)

Had questions:

1. Surveyor - I indicated registered surveyor must sign (stamp)
2. Driveway can be used as a spillway.

BURTON, LEYENDECKER & LEYENDECKER, INC.
CONSULTING ENGINEERS
3401 CARLISLE, N.E. • ALBUQUERQUE, NEW MEXICO 87110 • (505) 884-1330

July 25, 1983

Received
8/01/83

Building Codes Office
123 Central Avenue, NW
Albuquerque, New Mexico 87105

**RE: Wood Apartments, Surface Drainage Inspection**

ATTENTION: Mr. Bernie Montoya (Hydrology Department)

Dear Mr. Montoya:

Our office has inspected the Wood Apartment Complex for surface drainage. We were informed by Mrs. Wood that your office has agreed with our client's wishes to install a sod drainage channel within the back yard of the apartment Complex in lieu of the concrete drainage channel this office had designed.

During my inspection of the Complex, I found that the sod had not been laid in the back yard but that all the other concrete lining had been constructed along with the asphalt parking lot, double "D" catch basin and the connection to the existing drop inlet on Sandia Road NW. The surface drainage of the Complex is as anticipated, therefore, I am approving the surface drainage plan for the Complex.

If there are any questions concerning this project, please do not hesitate to contact me.

Sincerely,

Richard L. Burton, P.E.

REGISTERED PROFESSIONAL ENGINEER
STATE OF NEW MEXICO
NO. 3947
RICHARD L. BURTON

RM/ds

cc: Mrs. Woods
164 Sandia Road NW
Albuquerque, NM

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

F15-D5

August 10, 1981

Mr. William E. Leyendecker
Burton Leyendecker & Leyendecker, Inc.
3401 Carlisle Blvd. N.E.
Albuquerque, New Mexico 87110

Re: WOOD APARTMENTS DRAINAGE REPORT

Dear Mr. Leyendecker:

A review of the referenced drainage report has resulted in the comments listed below. For final approval, these items should be addressed:

1. Will the engineer certify that the project is built in substantial compliance with the approved plan?
2. Is the engineer accepting responsibility for the survey data, or was it compiled by a licensed surveyor?
3. A statement identifying off-site conditions which directly affect the proposed drainage scheme. For example, does the existing building along the south property line contribute any runoff to the site?
4. How will runoff be conveyed through the landscaped areas to the parking lot pond? Will the swale continue through these areas? How will landscaping affect the runoff?
5. Is the area between the apartment complexes landscaped or paved? How will runoff generated in this area reach the pond or swale(s)?
6. What is the reference for the method outlined under XV - Pipe size (Page 3)?
7. What type of emergency spillway scheme is proposed?
8. What data was used to determine invert elevations at the existing storm sewer?
9. The following items should be placed on the drainage and grading plan:

   a. Engineer's stamp, signature, and date
   b. Surveyor's stamp, signature and date (if applicable)
   c. The delineation of the site on pertinent Flood Hazard Boundary Map
   d. Identification of the Albuquerque Control Survey Vertical Datum location
   e. The location and description of the temporary bench mark used for datum control
   f. Existing contours and spots elevation, especially in the proposed parking lot and the area between the apartment complexes

g. The approximate finished floor elevation of the existing building located on the southern boundary
h. The direction and location of roof drainage
i. The 50 year pond depth determined and outlined on the proposed pond
j. Finish building floor elevations identified to a five digit Mean Sea Level Designation

10. For the proposed construction within the public right-of-way, please comply with Special Order No. 19.

Be advised that the City is now requiring an owner's commitment to construct, operate and maintain drainage facilities in substantial compliance with the drainage and grading scheme. I have enclosed a copy of the current drainage packet which contains a copy of the covenant used for this purpose.

If I can answer any questions concerning the above items, please call.

Very truly yours,

Brian G. Burnett

Brian G. Burnett
Civil Engineer/Hydrology

BGB/fs
Enclosure
8004A

BURTON, LEYENDECKER & LEYENDECKER, INC.
CONSULTING ENGINEERS
ALBUQUERQUE
LAS CRUCES

RECEIVED
AUG 17 1981
CITY ENGINEER

August 14, 1981

Brian G. Burnett
City of Albuquerque
P.O. Box 1293
Albuquerque, N.M.

RE: WOOD APARTMENTS - YOUR LETTER OF 8/10/81.

Dear Brian:

The answers to the questions in your letter are as follows:

1. Q: Will the engineer certify that the project is built in substantial compliance with the approved plan?

   A: We would be more than happy to check compliance with the drainage plan, if some mechanism is set up to require it. For instance, if this is a city requirement imposed on the owner for an occupancy permit. You realize that when we are dealing with private clients, they do not seek us out for this type of inspection unless, they cannot go ahead with their plans otherwise. Fred Aguirre and I discussed this problem some months ago. The problem is that once the drainage plan is approved neither your office nor ours ever hears of it.

2. Q: Is the engineer accepting responsibility for the survey data, or was it compiled by a licensed surveyor?

   A: No, the survey data was provided to us by the architect. We understand that he used information from the city, county records, and did a minimal amount of field work.

3. Q: A statement identifying off-site conditions which directly affect the proposed drainage scheme. For example, does the existing building, along the south property line contribute any runoff to the site?

   A: The existing building on the south, does not contribute runoff to this property.

4. Q: How will runoff be conveyed through the landscaped areas to the parking lot pond? Will the swale continue through these areas? How will landscaping affect the runoff?

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RECEIVED
AUG 17 1981
CITY ENGINEER



A: The swale shown on the plans has been clarified on the plans and it continues through the landscaped area.

5. Q: Is the area between the apartment complexes landscaped or paved? How will runoff generated in this area reach the pond or swale(s)?

A: Plans that show landscaped and paved areas are being sent to you by the architect.

6. Q: What is the reference for the method outlined under XV - pipe size (page 3).

A: Manning.

7. Q: What type of emergency spillway scheme is proposed?

A: We don't understand the question. We will call you to discuss this, over the phone.

8. Q: What data was used to determine invert elevations at the existing storm sewer?

A: Inverts were furnished by the architect. His source was asbuilt plans.

9. Q: The following items should be placed on the drainage and grading plan:

a. Engineer's stamp, signature, and date.
b. Surveyor's stamp, signature, and date (if applicable).
c. The delineation of the site on pertinent Flood Hazard Boundary Map.
d. Identification of the Albuquerque Control Survey Vertical Datum location.
e. The location and description of the temporary bench mark used for datum control.
f. Existing contours and spots elevation, especially in the proposed parking lot and the area between the proposed area between the apartment complexes.

A:

a. Placed on plans.
b. Not applicable.
c. Included in revised report.
d. Shown on plans.
e. To be provided by the architect.

RECEIVED
AUG 17 1981
CITY ENGINEER

f. Provided by architect on his site plan.

If you have any questions, please do not hesitate to call.

Sincerely,

Richard L. Burton, P.E.

RLB/dlb

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

F15-D5

August 17, 1981

Mr. Richard L. Burton
Burton, Leyendecker & Leyendecker, Inc.
3401 Carlisle N.E.
Albuquerque, New Mexico 87110

RE: WOOD APARTMENTS DRAINAGE REPORT

Dear Mr. Burton:

A review of your letter dated August 14, 1981 has resulted in the following comments:

1. In the past, the City has only required notification from the engineer stating responsibility for compliance with the drainage plan. This is not intended to be a requirement imposed on the owner, but should be implemented when it is felt that engineer certification will be advantageous to the development timetable. This decision, of course, is between the engineer and the owner.

2. A statement addressing all off-site conditions which directly affect the proposed drainage scheme was requested in item #3. This office must be convinced that off-site conditions have been adequately addressed. If adjacent property does not contribute off-site flows, the reasons why should also be stated.

3. In the future, this office should be supplied with capacity and hydraulic grade line calculations when connecting discharge pipes to existing storm inlets.

4. The November 1979 Interim Drainage Guidelines require that an overflow spillway be provided to handle the 100 year developed runoff. This office should be supplied with the proposed scheme and supporting calculations.

5. A signed and dated registered surveyors stamp will be required on the plans since the Engineer is not responsible for the survey data.

6. Further review of the drainage report cannot be made until the additional information is received from the architect.

7. We would appreciate receiving a completed copy of the Drainage Report Information Sheet as soon as possible.

If I can answer any questions concerning the above matters, please call.

Sincerely,

Brian G. Burnett

Brian G. Burnett
Civil Engineer/Hydrology

BB:gc
8033A
cc f/Reading

BURTON, LEYENDECKER & LEYENDECKER, INC.
CONSULTING ENGINEERS
ALBUQUERQUE LAS CRUCES

August ~~21~~ 28, 1981

Brian G. Burnett
City of Albuquerque
Engineering Division
P.O. Box 1293
Albuquerque, N.M. 87103

RE: WOOD APARTMENTS DRAINAGE REPORT - YOUR LETTER OF August 17, 1981.

Dear Brian:
Enclosed are two (2) copies of the drainage plan for the above referenced project.

I have prepared calculations for the 100 year storm spillway and they are included in the drainage plan.

The plan elevations have been changed to the City datums. The plans has also been stamped by a licensed surveyor.

If you have any questions, please do not hesitate to call.

Sincerely,

Gene Leyendecker, P.E.

enclosures: two (2)

GL/dlb

RECEIVED
AUG 28 1981
ENGINEERING

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

F15-D5

September 8, 1981

Mr. Gene Leyendecker
Burton, Leyendecker & Leyendecker
3401 Carlisle N.E.
Albuquerque, New Mexico 87110

Re: WOOD APARTMENTS DRAINAGE REPORT

Dear Mr. Leyendecker:

This letter is a follow-up to your correspondence of August 14, 1981 and submittal of August 28, 1981. Please supply the following information:

1. A clarification of the swale through the landscaped area including spot elevations (Item #4, my letter of August 10, 1981).

2. A clarification of the drainage scheme in the area between apartments. The plans supplied by the architect do not answer Item #5.

3. The temporary bench mark used for the site listed on the plans. (Item #9e).

4. Spot elevations indicated at key locations on the plans (Item #9f).

5. Location of roof drains indicated(Item #9h).

6. Finish floor elevations indicated to five digits (Item #9j).

7. Please see that a completed copy of the drainage covenant is returned to this office as soon as possible.

8. In future submittals, please submit the Drainage Report Information Sheet (Item #7, my letter of August 17, 1981).

If I can be of further help on these matters, please call.

Very truly yours,

Brian G. Burnett

Brian G. Burnett
Civil Engineer/Hydrology

BGB/fs

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

F15-D5

September 9, 1981

Dear Ivor,

Encloned is a copy of the approval letter to Gene Leyendecker. Please see that a copy of the revised plans is placed in the construction set. Mr. Bernie Montoya will sign off for the Hydrology Section when this is done.

I appreciate your help and cooperation throughout the course of this project.

Very Truly Yours,

Brian G. Burnett

Brian G. Burnett
Civil Engineer/Hydrology

BGB/tm

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

F15-D5

September 9, 1981

Mr. Gene Leyendecker
Burton, Leyendecker & Leyendecker, Inc.
3401 Carlisle Blvd. N.E.
Albuquerque, New Mexico 87110

Re: WOOD APARTMENT DRAINAGE REPORTS

Dear Gene:

The referenced drainage report is hereby based on your submittal of September 9, 1981. Thank you for your cooperation throughout the course of the project.

Very truly yours,

Brian G. Burnett

Brian G. Burnett
Civil Engineer/Hydrology

BGB/fs

DRAINAGE CALCULATIONS

WOOD APARTMENTS

PREPARED BY

BURTON, LEYENDECKER & LEYENDECKER, INC.

Albuquerque Consulting Engineers Las Cruces

REGISTERED PROFESSIONAL ENGINEER
STATE OF
No.
5315
NEW MEXICO
WM. E. LEYENDECKER

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DRAINAGE CALCULATIONS

WOOD APARTMENTS

I. LOCATION: Valley

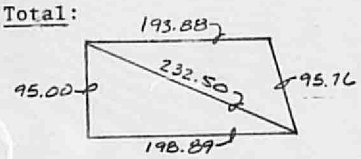
II. DRAINAGE REQUIREMENTS:

A. Pond Volume: $V_{50}$ - developed

B. Pond Discharge: $Q_1$ - developed

III. AREA:

A. Total:




$S_1$ = 232.5 + 193.88 + 95.76/2

= 261.07

$S_2$ = 232.5 + 95.0 + 198.89/2

= 263.20

$A_1$ = [(261.07)(261.07 - 252.5)(261.07 - 193.88)

(261.07 - 95.76)]$^{1/2}$

= 9101.97 SF

$A_2$ = [(263.20)(263.20 - 232.50)(263.20 - 198.89)

(263.20 - 95.00)]$^{1/2}$

= 9348.98 SF

A = 9348.98 + 9101.97 = 18450.95 SF = 0.42 Ac.

B. Impervious Areas:

Apt. - 5254 SF (from Arch.)

Landscaped Area

1) 20 X 20 = 400
2) 20 X 20 = 400
3) 90 X 5 = 450
4) 20 X 5 = 100

5) 10 X 7 = 70
6) 15 X 95 = 1425
7) 22 X 4/2 = 44
8) 22 X 4/2 = 44
9) 43 X 7/2 = 150
10) 97 X 5 = 485
11) 37 X 5 = 185
12) 10 X 10/2 = 50

TOTAL . . . . . 3803 SF

C. Parking & Walks: 18451 - 3803 - 5254

= 9394 SF

IV. SLOPE: 1%

V. VELOCITY: ½ dirt @ 1.0 fps

½ paved @ 2.0 fps

VI. Tc:- Total - 180'/90'dirt & 90' pavement

Tcd = 90/1 = 90 sec.

Tcp = 90/2 = 45 sec.

= 135 sec = 2 min. :. Use 10 minutes.

VII. RUNOFF CURVE NO. (Table 2-1)

Soil - Gm - Glendale Clay Loam - Group D

CN for Landscape Areas (Table 2-1) 89.

CN for Paving & Roof 95.

Weighted CN = $\frac{3803}{18451}$ (89) + $\frac{14548}{18451}$ (95)

= 18.3 + 75.4 = 93.7

VII. 50 YEAR 24 HOUR RAINFALL (Exhibit 2-2):

$P_{24}$ = 2.4 inches

IX. DIRECT RUNOFF (Fig. 2-4):

$Q_{50}$ = 1.3 inches

X. DISTRIBUTION CURBE NO. (Exhibit 2-3):

DC = 75

XI. cfs./ac./in. (Fig. 2-5):

cfs./ac./in. = 1.5

XII. PEAK DISCHARGE:

$Q_{50}$ = AQ (cfs.)

= (0.42)(1.3)(1.5)

= 0.82 cfs.

XIII. STORM VOLUME:

$V_{50} = \frac{QA}{12} = \frac{(1.3)(0.42)}{12} = 0.046$ ac.-ft.

= 2004 CF

XIV. DISCHARGE TO STORM SEWER ($Q_1$):

A. 1 year 24 hour rainfall (exhibit 2-2):

$P_{24}$ = 1.0 inches

B. Direct runoff (Fig 2-4) $Q_1$ = 0.5 inches

C. DC (Exhibit 2-3) = 75

D. cfs./ac./in. (Fig. 2-5) = 1.5

E. Peak Discharge:

$q_1$ = AQ (cfs.)

= (0.42)(0.5)(1.5)

= 0.31 cfs.

= 140 gpm

XV. PIPE SIZE:

A. Length = 25 feet ;. Use full pipe hydraulics

B. N = 0.10 (CI)

C. Slope = 1.6%

D. Elevation drop inlet to invert = 0.4 feet.

XVI. POND VOLUME (TRIAL):

A. Volume = 2004 CF

Area = 400 SF

Depth = 5' (cannot get pipe into drop inlet)

Area = 900 SF

Depth = 2.2 Ft.

B. Actual Pond Volume:

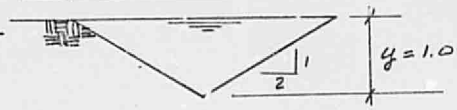
| Contour | Area | Volume | |
|---|---|---|---|
| 70 | 800 | (1)(800+1700/2) | = 1275 CF |
| 71 | 1750 | (1)(1750+385/2) | = 2800 CF |
| 72 | 3850 | | = 5075 CF |
| 73 | 6300 | | |
| TOTAL | | | 9150 CF |

Need 2004 CF

Eliminate 70 & 71 Contour - Storage Capacity 5075 CF

CHANNEL CAPACITY

X Section




Maximum Depth = 1.0

Slope = 1%

Material: Earth n = 0.02

$Q = VA$

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

$= \frac{1.49}{0.02}(0.45)^{2/3}(0.01)^{1/2}(2)$

$= 8.7$ cfs.

$R = A/P = \frac{ZY^2}{2(1+Z^2)^{1/2}}$

$= \frac{(2)(1)}{2(1+4)^{1/2}}$

$= \frac{2}{4.47}$

$= 0.45$

Velocity = 18.7/2 = 4.3 fps.

:. Required Grass.

N = 0.033

$Q = \frac{1.49}{0.033}(0.45)^{2/3}(0.01)^{1/2}(2)$

$= 5.3$ cfs.

Velocity = 2.6 fps :. ok

XV.

WOOD APARTMENTS

100 YEAR DEVELOPED SPILLWAY

It is proposed to use the driveway as the 100 year storm spillway.

A. TC = 10 minutes

B. Runoff Curve No.:

CN = 93.7

C. 100 Year 24 Hour Rainfall:

$P_{24}$ = 2.8 inches

D. Direct Runoff:

$Q_{100}$ = 2.2 inches

E. Distribution Curve:

DC = 75

F. cfs/ac/in = 1.5 inches

G. Peak Discharge:

$Q_{100} = (0.42)(1.5)(2.2)$

$= 1.39$ cfs say 1.4 cfs.

H. Spillway Calculations:

From Handbook of Hydraulics, by King, 6th Edition, pages 5-23.

$Q = CLH^{3/2}$ where L = 24 feet

For broad Crested Weir with sloping downstream face of 5/1:

$C = 3.1$

$Q = (3.1)(24)(H^{3/2})$

$H^{3/2} = Q/(3.1)(24)$

$$H = \frac{Q}{74.4}^{2/3}$$

$$H = \frac{1.4}{74.4}^{2/3}$$

$$= 0.07 \text{ feet}$$

Therefore, if the entire 100 year flow were to go out The driveway (inlet clogged), the height of the flow would be about 1 inch. The resulting water level would be 73.87 and the finish floors are set at elevation 74.67.

I. Offsite Flow:

1. Adjacent Property on Sides: The lots along the south side of Sandia, slope generally from back to front. The lots on either side were developed for single family residences. No contours or drainage strucutres cause any drainage onto lot 23.

2. Adjacent Property on Back: The lot to the south (back) of lot 23 contains a large warehouse. The structure's wall is only five feet from the property line of lot 23. All roof drainage is to the south, away from lot 23.

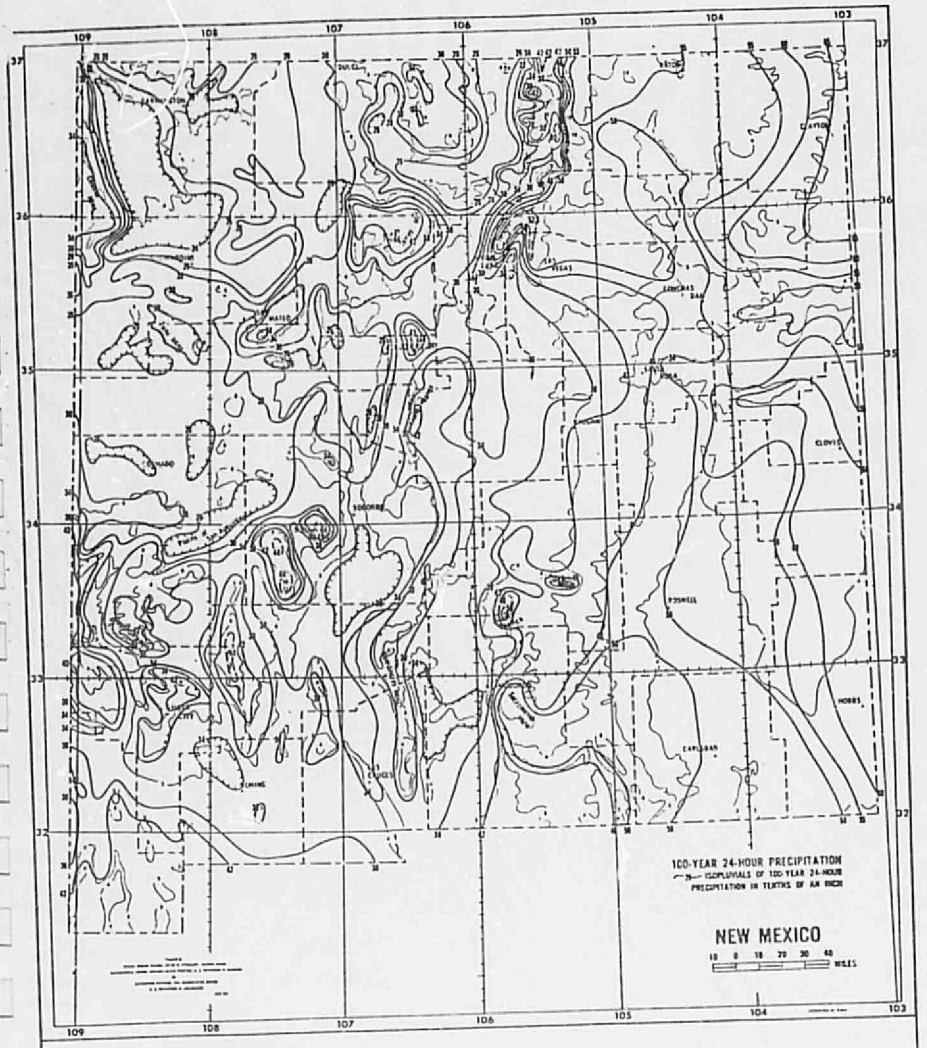
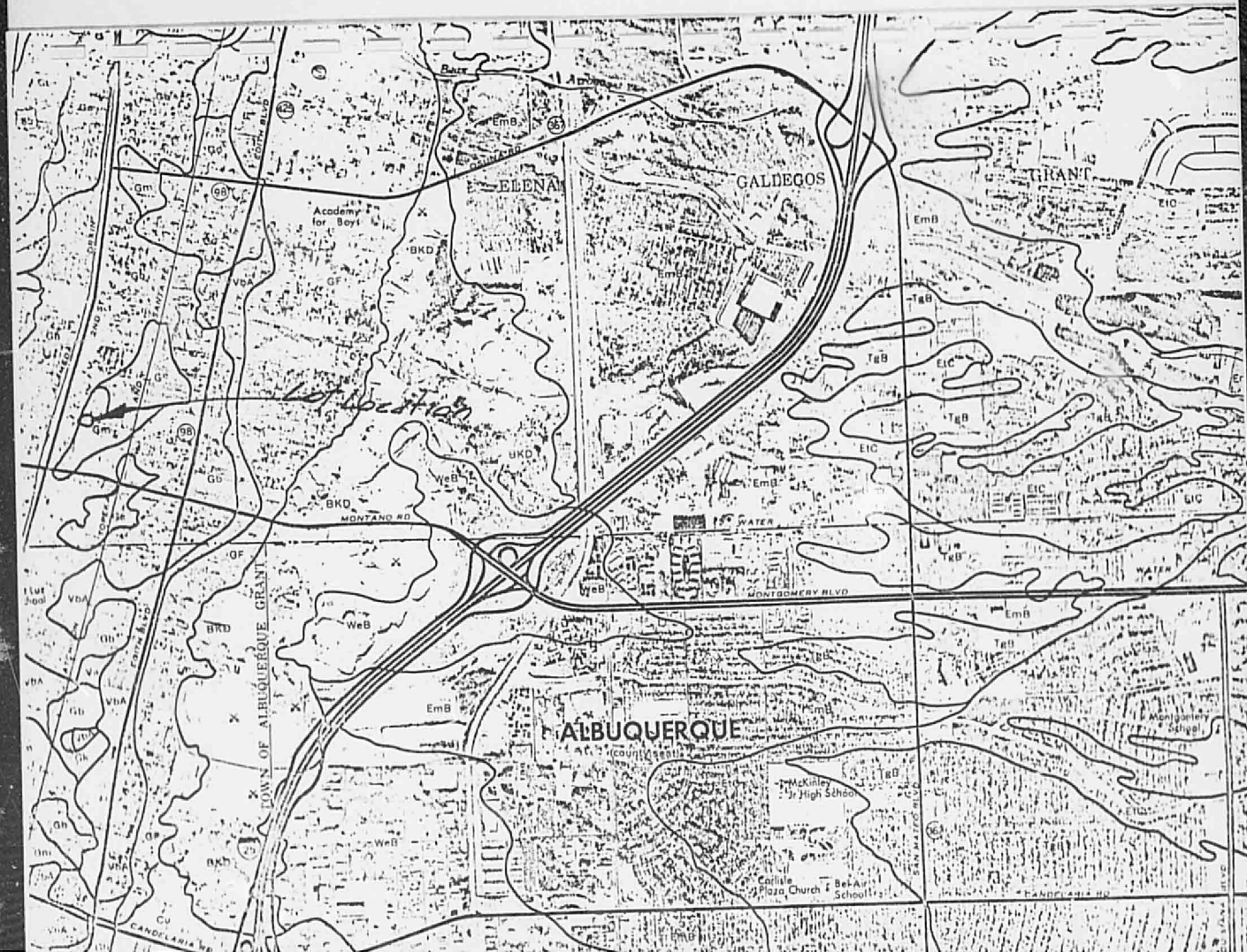



EXHIBIT 2-2

NM-N-0374
12 of 13
Jan 29-71


ELENA
GALDEGOS
GRANT
Academy for Boys
Location
MONTANO RD
WATER
MONTGOMERY BLVD
ALBUQUERQUE
TOWN OF ALBUQUERQUE GRANT
McKinley Jr High School
Carlisle Plaza Church
Bel-Air School
Montgomery School
CANDELARIA RD
EmB
BKD
UKD
WeB
TgB
EIC
GF
Gm
Gb

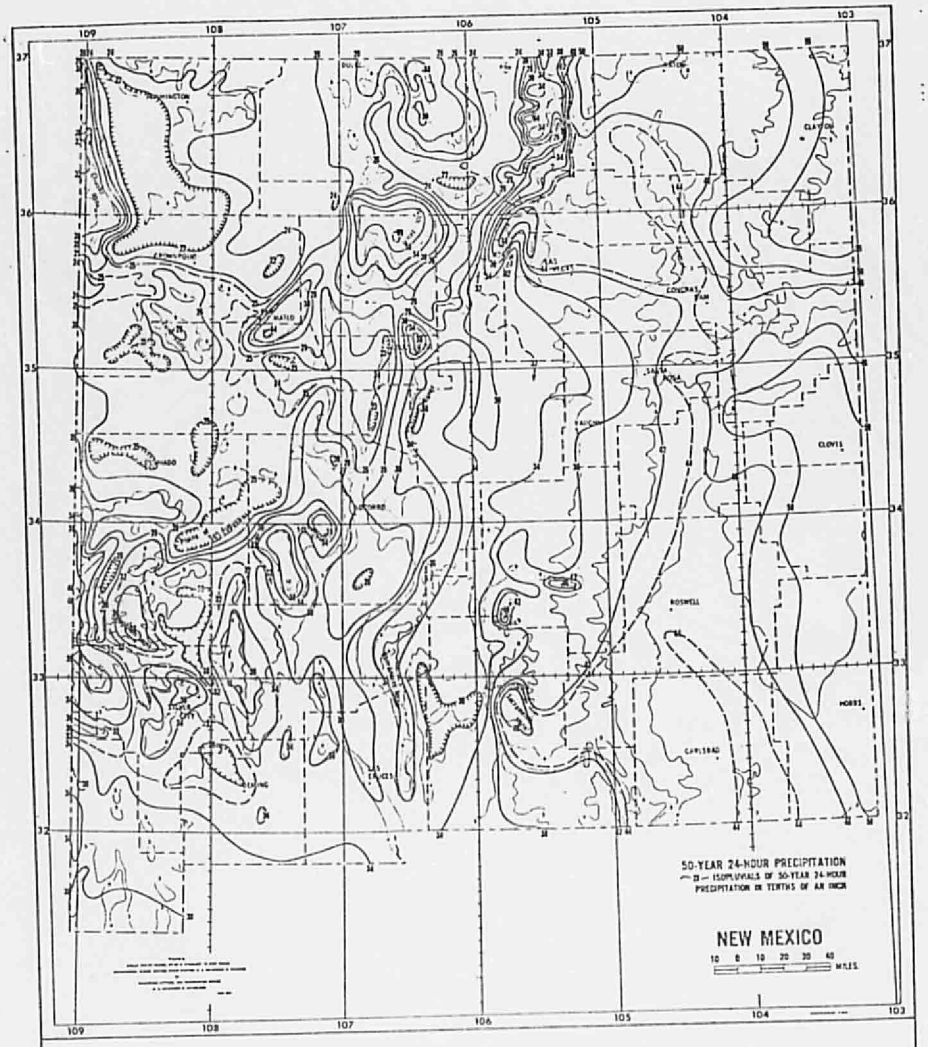



EXHIBIT 2-2

NM-N-0374
10 of 13
Jan 29-71

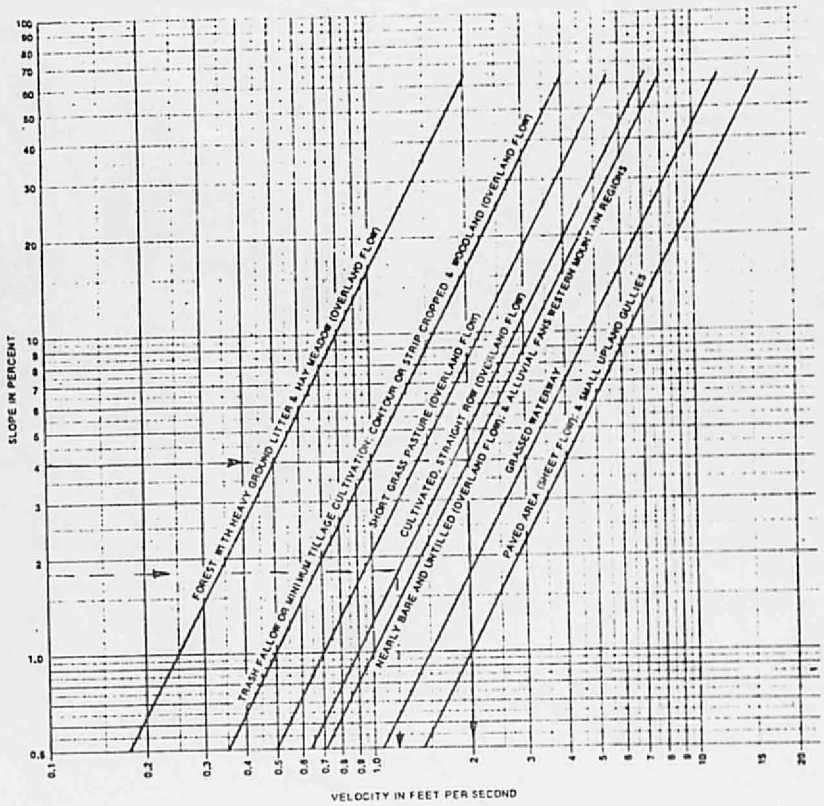


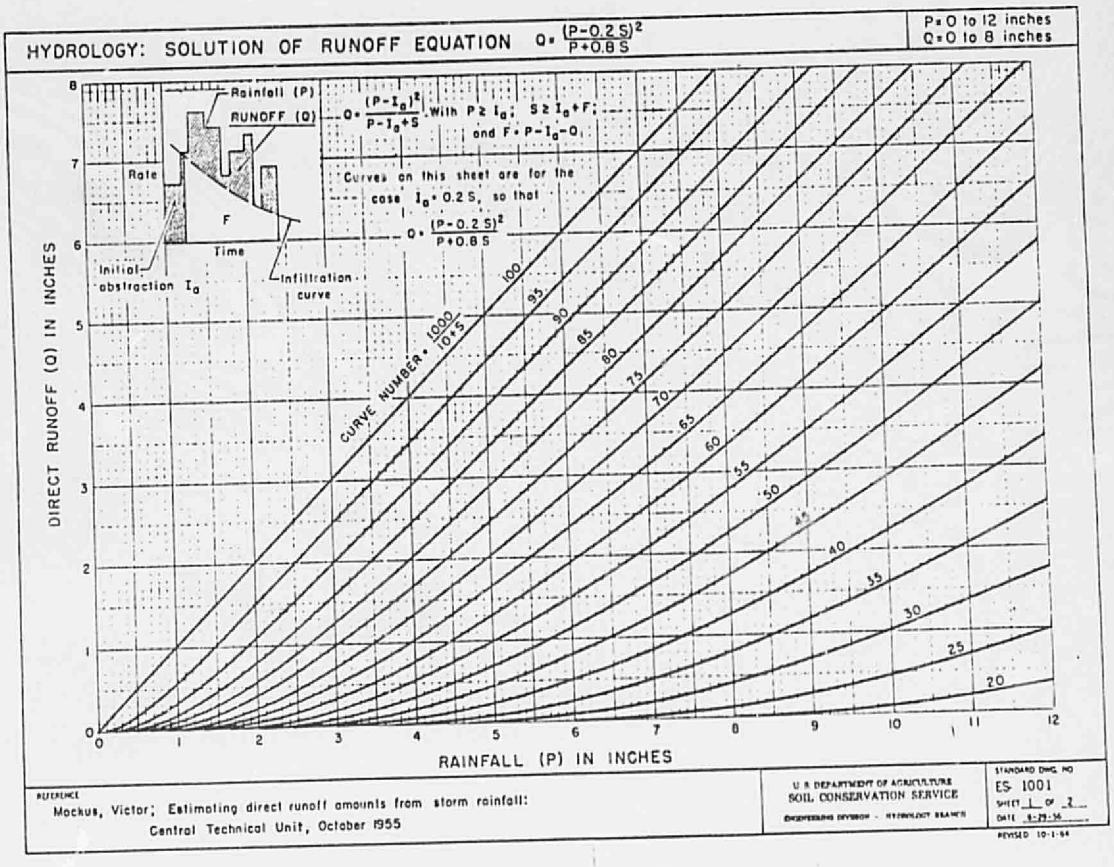

Figure 2-3 -Velocities for upland method of estimating $T_c$

Table 2-1 - Runoff Curve Numbers for Hydrologic Soil-Cover Complexes

(Average antecedent moisture condition and $I_a = 0.2\ S$)

| Land Use | Cover Treatment or Practice | Hydrologic Condition | Hydrologic Soil Group A | B | C | D |
|---|---|---|---|---|---|---|
| Fallow | Straight row | ---- | 77 | 86 | 91 | 94 |
| Row crops | " | Poor | 72 | 81 | 88 | 91 |
| | " | Good | 67 | 78 | 85 | 89 |
| | Contoured | Poor | 70 | 79 | 84 | 88 |
| | " | Good | 65 | 75 | 82 | 86 |
| | " and terraced | Poor | 66 | 74 | 80 | 82 |
| | " " " | Good | 62 | 71 | 78 | 81 |
| Small Grain | Straight row | Poor | 65 | 76 | 84 | 88 |
| | | Good | 63 | 75 | 83 | 87 |
| | Contoured | Poor | 63 | 74 | 82 | 85 |
| | | Good | 61 | 73 | 81 | 84 |
| | " and terraced | Poor | 61 | 72 | 79 | 82 |
| | | Good | 59 | 70 | 78 | 81 |
| Close-seeded Legumes 1/ or Rotation Meadow | Straight row | Poor | 66 | 77 | 85 | 89 |
| | " | Good | 58 | 72 | 81 | 85 |
| | Contoured | Poor | 64 | 75 | 83 | 85 |
| | " | Good | 55 | 69 | 78 | 83 |
| | " and terraced | Poor | 63 | 73 | 80 | 83 |
| | " " " | Good | 51 | 67 | 76 | 80 |
| Irrigated Pasture | | ---- | 30 | 58 | 71 | 78 |
| Range | | Poor | 68 | 79 | 86 | 89 |
| | | Fair | 49 | 69 | 79 | 84 |
| | | Good | 39 | 61 | 74 | 80 |
| Farmsteads | | ---- | 59 | 74 | 82 | 86 |
| Roads (dirt) 2/ | | ---- | 72 | 82 | 87 | 89 |
| (hard surface) 2/ | | ---- | 74 | 84 | 90 | 92 |
| Commercial and Impervious Areas | | ---- | 95 | 95 | 95 | 95 |
| Residential Areas 3/ High Density (50% to 75% impervious) Multiple Family | | | 82 | 87 | 90 | 92 |
| Medium Density (21% to 27% impervious) Single Family | | (Common Lots = 1/4 ac.) | 79 | 84 | 88 | 90 |
| Low Density (15% to 18% impervious) Single Family | | (Common Lots = 1/2 ac. or larger) | 76 | 81 | 86 | 89 |

1/ Close-drilled or broadcast.
2/ Including right-of-way.
3/ Includes streets, etc.

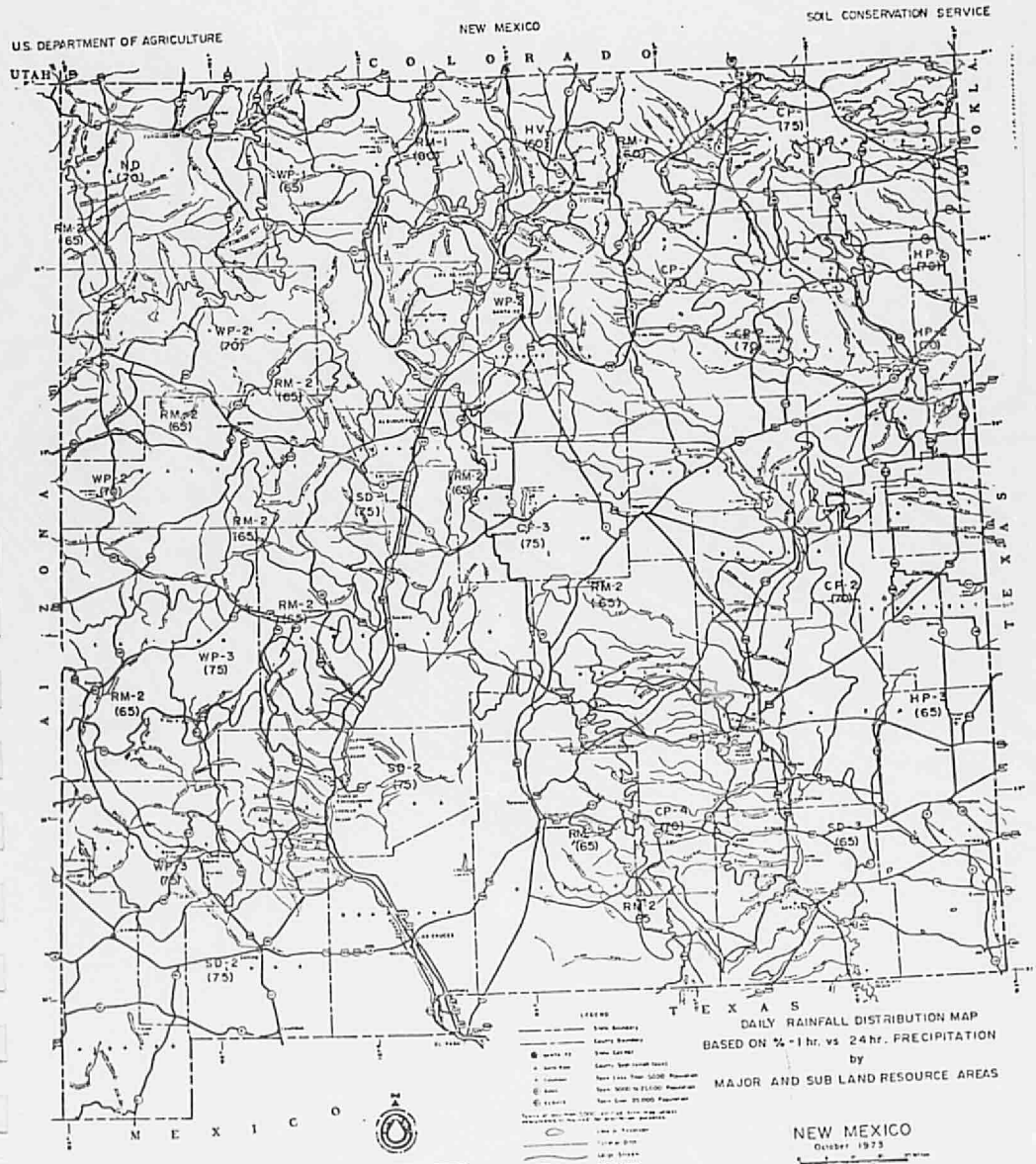



REFERENCE
Mockus, Victor; Estimating direct runoff amounts from storm rainfall: Central Technical Unit, October 1955

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ENGINEERING DIVISION - HYDROLOGY BRANCH

STANDARD DWG. NO
ES- 1001
SHEET 1 OF 2
DATE 4-29-54
REVISED 10-1-64

Figure 2-4




| % of 1hr/24hr | MAJOR AND SUB LAND RESOURCE AREAS |
|---|---|
| 60 | HV, RM-1 |
| 65 | HP 3, CP 4, SD 2, WP 1, RM 2 |
| 70 | HP 1, HP 2, CP 2, CP 3, WP 2, ND |
| 75 | CP 1, SD 1, SD 2, WP 3 |

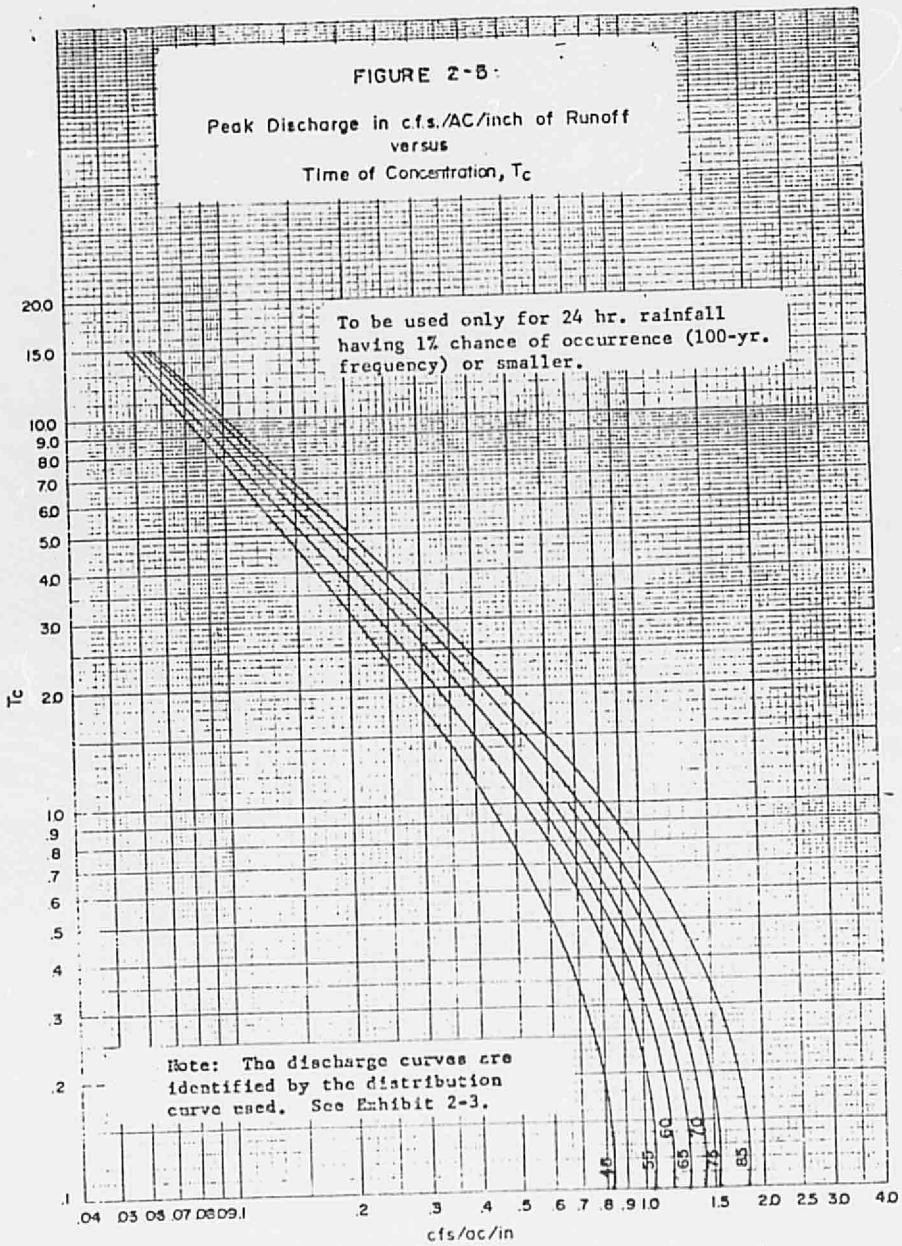



FIGURE 2-5:

Peak Discharge in c.f.s./AC/inch of Runoff
versus
Time of Concentration, $T_c$

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