Hydrology File No. A-14/D003

PLANS/PLATS ON FILE

FILE DESC: A-14/D003

PLANS/PLATS 5

INFORMATION SHEET

PROJECT TITLE Tract V of Seven Bar Ranch

ZONE ATLAS PAGE NO. A-14 TYPE OF SUBMITTAL Conceptual Grading & Drainage Plan

CITY ADDRESS N.M. 528 and Ellison Drive

LEGAL DESCRIPTION Tract C-2 of Seven Bar Ranch

ENGINEERING FIRM Leverton-Easterling, Inc.

ADDRESS 5629 Paradise Blvd., NW

PHONE 898-8021 CONTACT Chuck Easterling

OWNER Seven Bar Land & Cattle Co.

ADDRESS 3615 Rio Rancho Blvd., NW

PHONE 897-7227 CONTACT Greg Foltz

ARCHITECT De la Torre-Rainhart

ADDRESS 6121 Indian School Road NE, Suite 141

PHONE 881-0550 CONTACT Richard Dineen

SURVEYOR Hugg Surveying Co.

ADDRESS 1702 Grande Blvd. SE, Rio Rancho

PHONE 892-8800 CONTACT Garry Hugg

CONTRACTOR

ADDRESS

PHONE CONTACT

RECEIVED APR 02 1984 HYDROLOGY SECTION

PRE-DESIGN MEETING: X YES NO

COPY OF CONFERENCE RECAP SHEET PROVIDED w/Fred Aguirre 3-28-84

PLEASE CHECK TYPE OF APPROVAL EXPECTED WITH THIS SUBMITTAL:

	SKETCH PLAT APPROVAL		PRELIMINARY PLAT APPROVAL
X	SITE DEVELOPMENT PLAN APPROVAL	X	FINAL PLAT APPROVAL
	BUILDING PERMIT APPROVAL		CERT. OF OCCUPANCY APRVL.
	ROUGH GRADING PERMIT APPROVAL		GRAD./PAVING PERMIT APRVL.
	OTHER (SPECIFY)		

DATE SUBMITTED: April 2, 1984

BY: Leverton-Easterling, Inc.

INFORMATION SHEET

PROJECT TITLE Tract W of Seven Bar Ranch

ZONE ATLAS PAGE NO. A-14 84 TYPE OF SUBMITTAL Conceptual Grading & Drainage Plan

CITY ADDRESS N.M. 528 & Ellison Drive

LEGAL DESCRIPTION Tract C-1 of Seven Bar Ranch

ENGINEERING FIRM Leverton-Easterling, Inc.

ADDRESS 5629 Paradise Blvd., NW

PHONE 898-8021 CONTACT Chuck Easterling

OWNER Seven Bar Land & Cattle Co.

ADDRESS 3615 Rio Rancho Blvd., NW

PHONE 897-7227 CONTACT Greg Foltz

ARCHITECT De La Torre-Rainhart

ADDRESS 6121 Indian School Road NE, Suite 141

PHONE 881-0550 CONTACT Richard Dineen

SURVEYOR Hugg Surveying Co.

ADDRESS 1702 Grande Blvd. SE, Rio Rancho

PHONE 892-8800 CONTACT Garry Hugg

CONTRACTOR

ADDRESS

PHONE CONTACT

Amd 4-16-84

RECEIVED APR 02 1984 HYDROLOGY SECTION

PRE-DESIGN MEETING: X YES ___ NO

___ COPY OF CONFERENCE RECAP SHEET PROVIDED w/Fred Aguirre 3-28-84

PLEASE CHECK TYPE OF APPROVAL EXPECTED WITH THIS SUBMITTAL:

___	SKETCH PLAT APPROVAL	___	PRELIMINARY PLAT APPROVAL
X	SITE DEVELOPMENT PLAN APPROVAL	___	FINAL PLAT APPROVAL
___	BUILDING PERMIT APPROVAL	___	CERT. OF OCCUPANCY APRVL.
___	ROUGH GRADING PERMIT APPROVAL	___	GRAD./PAVING PERMIT APRVL.
___	OTHER ___		(SPECIFY)

DATE SUBMITTED: April 2, 1984

BY: Leverton-Easterling, Inc.

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

April 16, 1984

Mr. Charles Easterling
Leverton-Easterling, Inc.
5629 Paradise Blvd. NW
Albuquerque, New Mexico 87114

RE: Tract V of 7 Bar Ranch A14D2; Tract W of 7 Bar Ranch A14D1

Dear Mr. Easterling:

The two drainage reports have been reviewed by me and the following are my questions and concerns regarding these two projects.

1. The rainfall volumes are not compatible with the flow rates. Either the flow rates derived are too high or the volumes are too low. It is my opinion that the curve numbers used are too low and the volumes must be raised to be more compatible with the flow rates derived.

2. How does the developed runoff rate and volume for the tracts compare with the undeveloped conditions? Need to relate the undeveloped flood plain volume to the developed conditions. Is the flood plain increased? Is the point of discharge and the rate of runoff increased? If rate is increased, is there adequate capacity downstream? What are the proposed facilities to insure that the downstream flood plain is not increased or that the downstream facilities (if any) are not exceeded?

3. Any facilities used or construction off-site will need review and approval by the respective agencies having jurisdiction. I foresee involvement with the NMSHD, AMAFCA and MRGCD.

I feel that a meeting with you may be in order to resolve the questions I have and to assist me in reviewing and facilitating approval of both these drainage reports.

Very truly yours,

Andre Houle
Engineer/Q.A. Section

AH/fs
cc: C. Dwayne Sheppard, City Engineer
Fred Aguirre, Design Hydrologist
Q. A. File

LEVERTON-EASTERLING, INC.

5629 PARADISE BLVD., N.W.
ALBUQUERQUE, NEW MEXICO 87114
(505) 898-8021

April 23, 1984

Mr. Andre Houle
Engineer/Q.A. Section
City of Albuquerque
P.O Box 1293
Albuq., NM 87103

RECEIVED
APR 25 1984
CITY ENGINEER

Re: TRACTS V & W OF 7-BAR RANCH
A14D2, A14D1

Dear Mr. Houle:

Thank you for your prompt response and for taking the time to go to the field with me last Friday, April 20, 1984. I hope that we were able to clarify the existing and proposed drainage situation on the north end of Black Ranch.

Your specific comments transmitted by letter on April 16, 1984, are addressed below:

Item 1. I agree with your statement concerning the incompatibility of the flow rates and runoff volumes. As we discussed, however, the charts in the DPM fix lower limits for peak rate 'C' factors no matter how low the runoff curve number gets, thus "requiring" incompatible rates and volumes on undeveloped west side sites. I do not agree with your statement concerning the runoff curve numbers being too low and offer the lack of evidence of runoff from much of the area as evidence to substantiate the CN's shown in the report.

Item 2. By looking at plates 1 of 3 and 2 of 3, both developed and undeveloped conditions may be compared. As we saw in the field, the existing flood plain shown in the Flood Insurance Study is no longer accurate due to activities of the NMSHD and, further, that activities described by this plan will not adversely impact the off-site flooding situation.

Item 3. As we discussed, the parties you mentioned in your letter are all either active participants in the planning and proposed construction or have been contacted and are supportive. AMAFCA has been the lead agency in Bernalillo County in ammending their drainage management plan for this area and proposing the Cabezon Channel.

I hope that our discussions, field observations and this letter have sufficiently addressed your concerns. If I can be of further assistance, please do not hesitate to contact me.

Sincerely,

Charles M. Easterling, P.E.

CME/ae

cc: C. Dwayne Sheppard, City Engineer
Fred Aquirre, Design Hydrologist
Q.A. File

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

April 30, 1984

Mr. Chuck Easterling
5629 Paradise Blvd. N.W.
Albuquerque, N.M. 87114

RE: CONCEPTUAL DRAINAGE PLAN FOR TRACTS V & W, SEVEN BAR RANCH

Dear Mr. Easterling:

On behalf of the Hydrology Section of the Engineering Division I have reassessed your drainage analysis after our field inspection on April 20, 1984. Based upon our field investigation of the NMSHD project along S.R. 528, the detention pond, and the outfall to the M.R.G.C.D. corrales main canal, I concur with your conceptual analysis and hereby approved the proposed land use and terrain management scheme. I have recommended approval of the site development plan to Fred Aguirre, DRB Representative.

Final plat approval however will be contingent upon a detailed drainage plan and upon you providing to the City the financial commitments of the Agencies, both public and private for the installation of the Cabazon Channel.

In the event the Cabazon Channel is committed to development but not installed at the time of your request for development, temporary drainage facilities will be required and financial guarantee of these improvements will be required.

This approval supplements any DRB findings but does not supercede previous DRB comments.

If you have any questions as to this approval or require further information, don't hesitate to call me.

Very truly yours,

Andre Houle
Q.A., Design Section Engineer

AH/tsl
cc: C.D. Sheppard, City Engineer
Fred Aguirre, DRB Representative
Q.A. File

LEVERTON - EASTERLING, INC.

5629 PARADISE BLVD., N.W.
ALBUQUERQUE, NEW MEXICO 87114
(505) 898-8021

August 2, 1984

RECEIVED
AUG 03 1984
CITY ENGINEER

Mr. Fred Aguirre
Design Hydrologist
City of Albuquerque, MDD
P.O. Box 1293
Albuq., NM 87103

Re: CONCEPTUAL DRAINAGE PLAN FOR TRACTS V & W OF SEVEN-BAR RANCH A-14 D2, A-14 D1

Dear Fred:

Per our discussion of July 25, 1984, I offer the following additional information.

1. The basis of the 200 cfs fugure used in the plan for flows crossing under NM 528 east of Alameda Airport was an attempt at equitably dividing the current estimate of 450 cfs capacity within the Cabezon Channel. Additionally, the capacity of the crossing under NM 528 in its present condition is in the 175 cfs range and with inlet improvements it could be extended to approximately 200 cfs.

2. The Cabezon Channel is in design by this firm at present, and construction of the portion through Seven-Bar Ranch to NM 46 is planned for this fall. In the event that this does not take place, temporary measures will have to be constructed prior to any further development in the contributing basin. As you know, the Lovelace Urgent Care Drainage Plan required the expansion of the existing detention pond behind the Jemez Building, which has been accomplished.

3. The Seven-Bar Sector Plan Amendment submitted on July 27, 1984, incorporated the recommendations of the Conceptual Drainage Plan for Tracts V & W of Seven-Bar Ranch as they relate to the Cabezon Channel System. Upon completion of the design of Cabezon Channel, the drainage portion of the Sector Plan may require minor revisions.

4. As we discussed, there appears to be an inconsistency in the hydrology presented in the plan. The DPM sections on determining peak rate factors and runoff

volumes diverge at very low rainfall amounts and low runoff producing circumstances. This is a result of artificially fixing a lower limit for the rational formula "C" factor while allowing the runoff curve number to be calculated per SCS standards. A solution for this problem is to revise Plate 22.2 C-1 for low (less than 25%) imperviousness. Without such a revision, we are stuck with situations like the one which was evidenced by the hydrology table in this plan. I would gladly serve on a task group to help rectify this situation.

I hope that this correspondence has answered your concerns relative to this report. If I can be of further assistance, please do not hesitate to contact me.

Sincerely,

Charles M. Easterling, P.E.

CME/ae

cc: Brian Burnett, Bohannan-Huston
John Black, Seven-Bar Ranch

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

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

October 11, 1984

Mr. Chuck Easterling
Leverton-Easterling, Inc.
5629 Paradise Blvd.
Albuquerque, New Mexico 87114

RE: CONCEPTUAL GRADING & DRAINAGE PLAN FOR TRACTS V & W (A14-D3)
RECEIVED MARCH 29, 1984

Dear Chuck:

For the record, the conceptual grading and drainage plan for Tracts V and W are approved with the exception of the hydrologic data provided for basins 3A, 3B, and 3C. The data for these basins should be based on the 7-Bar Sector Plan Drainage Report.

Also, the subsequent drainage plan required for each development within Tracts V and W will be subject to an interim plan until the Cabezon Channel has been constructed.

Sorry for the delay in formalizing our approval for the subject drainage submittal.

Sincerely yours,

Fred J. Aguirre

Fred J. Aguirre
Design Hydrologist

FJA/bm

A14/3

INFORMATION SHEET

PROJECT TITLE AMENDED CONCEPTUAL DRAINAGE & GRADING PLAN TRACT V - SEVEN BAR RANCH

ZONE ATLAS PAGE NO. A-14 TYPE OF SUBMITTAL FOR YOUR REFERENCE

CITY ADDRESS RIO RANCHO BLVD

LEGAL DESCRIPTION TRACT C-3, SEVEN BAR RANCH

ENGINEERING FIRM EASTERLING AND ASSOCIATES, INC.

ADDRESS 5643 PARADISE BLVD N.W.; ALBUQUERQUE 87114

PHONE 898-8021 CONTACT CHARLES EASTERLING

OWNER SEVEN BAR LAND & CATTLE CO.

ADDRESS 3605 RIO RANCHO BLVD. N.W.; ALBUQUERQUE 87048

PHONE 897-7227 CONTACT JOHN BLACK

ARCHITECT DE LA TORRE - RAINHART

ADDRESS 6121 INDIAN SCHOOL ROAD NE; ALBUQUERQUE 87110

PHONE 881-0550 CONTACT JORGE DE LA TORRE

SURVEYOR HUGG SURVEYING CO.

ADDRESS 1701 GRANDE BLVD S.E.; RIO RANCHO 87124

PHONE 892-8800 CONTACT GARRY HUGG

CONTRACTOR N/A

ADDRESS

PHONE CONTACT

RECEIVED APR 01 1985 HYDROLOGY SECTION

PRE-DESIGN MEETING: YES

COPY OF CONFERENCE RECAP SHEET PROVIDED

PLEASE CHECK TYPE OF APPROVAL EXPECTED WITH THIS SUBMITTAL:

SKETCH PLAT APPROVAL	PRELIMINARY PLAT APPROVAL
SITE DEVELOPMENT PLAN APPROVAL	FINAL PLAT APPROVAL
BUILDING PERMIT APPROVAL	CERT. OF OCCUPANCY APRVL.
ROUGH GRADING PERMIT APPROVAL	GRAD./PAVING PERMIT APRVL.
OTHER FOR YOUR REFERENCE	(SPECIFY)

DATE SUBMITTED: 3/29/85

Z-79-146-5 11/15/84
DRB-84-150 4/24/84

BY: EASTERLING & ASSOCIATES, INC.

A 14/03

DH0031
FJA

Greiner Engineering

RECEIVED
APR 19 1985
HYDROLOGY SECTION

TO: City Engineer's Office, Hydrology Section
Fred Aquirre, P.E.

Albuquerque Metropolitan Arroyo Flood Control Authority
Dan Sabo, P.E.

FROM: Greiner Engineering Sciences, Inc.
Agent for: Seven-Bar Land & Cattle Co.
(Contact D.L. Morehead)

SUBJECT: Current Proposed Development Phasing for Seven-Bar Ranch Tracts B-3, B-4, B-5, B-6 & B-7 (As Shown on DRB-85-143 - Bulk Land Plat) as it Relates to Drainage Improvements

I. Current proposed development sequence and supportive information -

A. Proposed, conceptual drainage patterns for Tracts B-3 thru B-7 have been developed in the "Drainage Management Plan for Salida del Sol" prepared by Community Sciences Corporation in August, 1983 and supplemental in October, 1983. The "Plan" directs onsite drainage generated on developed Tracts B-3 - B-7, via proposed street and storm drain systems, outfalling into the improved Black Arroyo and Seven-Bar Channel. Offsite drainage, which historically and ultimately passes thru Tracts B-3 - B-7, will be transported via a storm drain system to the Black Arroyo.

B. Further lot arrangement and layout has been done by Greiner (under Contract to American Services Corporation) to refine the lot arrangement shown in the Community Sciences "Plan" and to establish the bulk land tract boundaries shown on the proposed bulk land plat. The street alignment concept shown in the Community Sciences "Plan" has been maintained and is, in our opinion, functional.

C. The purchase of Tract B-3 is currently under contract with American Service Corporation (A.S.C.) (the developer of Salida del Sol Units 1 & 2 and the master planner for Tracts B-3 - B-7). Design and further subdivision of Tract B-3 is planned this year.

D. Tracts B-4 - B-7 are currently owned by Seven-Bar Land & Cattle Company; but, A.S.C. has options to purchase these tracts and plans to develop them as portions of the Salida del Sol project.

E. A.S.C. would propose the following development sequence for the remaining tracts: Tract B-4, Tract B-7, Tract B-6 followed by Tract B-5.

II. Drainage infrastructure required to facilitate development of each individual tract, per "Drainage Management Plan for Salida del Sol" by Community Sciences Corporation, using bulk land tracts established by DRB-85-143. --

Construction (or suitable guarantees for the construction) of drainage improvement will be required to further subdivide (or develop) these tracts. Particularly, it will be necessary to construct the remaining unimproved portion of the Black Arroyo to its confluence with the Seven-Bar Channel in order to subdivide (or develop) any of these tracts. The implementation of the development process will be as dictated by the Subdivision and Drainage Ordinances in effect at the time of development.

Following are the conceptual drainage requirements for each tract if developed separately from the remainder. It should be understood that these measures are based on the current understanding of proposed development and is intended to act as a guide for development.

A. Tract B-3:
   1. Construct the remaining portions of the N.W. side of the Black Arroyo to the confluence with the Seven-Bar Channel along with the crossing structure required for "Seven-Bar Loop".
   2. Street and storm drain improvements will transport surface drainage from undeveloped (developed) Tract B-5 & B-6 to the Black Arroyo. Interim provisions will be made to control this drainage at the "uphill" property line to minimize erosion and sedimentation effects.
   3. Drainage flows "offsite" to Tracts B-3 - B-7 will be transported via storm drains to the Black Arroyo.
   4. Street improvements will be required per the Drainage Ordinance.

B. Tract B-4:
   1. Seven-Bar Channel is improved. The adjacent portion of the Black Arroyo will be improved.
   2. Street and storm drain improvements will transport surface drainage from undeveloped (developed) Tracts B-6 & B-7 to the Seven-Bar Channel or Black Arroyo. Interim provisions will be made to control this drainage at the "uphill" property line to minimize erosion and sedimentation effects.
   3. There are no "offsite" flows to Tract B-3 - B-7 which must be transported via B-4.
   4. Street improvements will be required per the Drainage Ordinances.

C. Tract B-5:
   1. If developed prior to Tract B-3; drainage outfall will be via Tract B-3 to the Black Arroyo. Interim outfall improvements will be required across Tract B-3 to the Black Arroyo. These improvements must be consistent with the Community Sciences "Plan".
   2. Street and storm drain improvements will transport surface drainage from undeveloped (developed) Tract B-6 to the interim outfall improvement required.
   3. Drainage "offsite" to Tracts B-3 - B-7 will be transported via storm drains to the Black Arroyo.
   4. Street improvements will be required per the Drainage Ordinance.

D. Tract B-6:

1. If developed prior to Tracts B-3 and B-4; drainage outfall will be via Tracts B-3 and B-4 to the Black Arroyo. Interim outfall improvements will be required across Tract B-3 and/or B-4 to the Black Arroyo. These improvements must be consistent with the Community Sciences "Plan".
2. Street and storm drain improvements will transport surface drainage from portions of the undeveloped (developed) Tracts B-7 to the interim outfall improvement required.
3. Drainage "offsite" to Tracts B-3 - B-7 will be transported via storm drains to the Black Arroyo.
4. Street improvements will be required per the Drainage Ordinance.

E. Tract B-7:

1. If developed prior to Tracts B-6 and/or B-4; drainage outfall will be via Tracts B-6 and B-4 to the Black Arroyo and the Seven-Bar Channel. Interim outfall improvements will be required across Tract B-6 and/or B-4 to the channels. These improvements must be consistent with the Community Sciences "Plan".
2. Street improvements will transport only surface drainage developed on Tract B-7 to the interim outfall improvements required.
3. Portions of drainage "offsite" to Tracts B-3 - B-7 will be transported via storm drains to the Black Arroyo. The remaining portion of drainage "offsite" to Tracts B-3 - B-7 will be transported via street flow to the Seven-Bar Channel.
4. Street improvements will be required per the Drainage Ordinance.

cc: Steve Tomita, American Services Corporation
John Black, Seven-Bar Land & Cattle Company

Job #0640928

RECEIVED
APR 19 1985
HYDROLOGY SECTION

TO WHOM IT MAY CONCERN:

NOTICE OF SUBDIVISION PLAT CONDITIONS:

Pursuant to Section 7 of the City of Albuquerque Subdivision Ordinance, a variance or waiver from certain subdivision requirements has been granted by the City and the Albuquerque Metropolitan Arroyo Flood Control Authority in connection with this plat: Seven-Bar Ranch Tracts B-3, B-4, B-5, B-6, B-7 & B-8.

Future subdivision of lands within this plat, zoning site development plan approvals, and development permits may be conditioned upon dedication of rights-of-way and easements, and/or upon infrastructure improvements by the owner for water, sanitary sewer, streets, drainage, grading and parks in accordance with current resolutions, ordinances and policies in effect at the time for any specific proposal. This will be the case for drainage improvements if Tracts B-5, B-6 and/or B-7 are subdivided (or developed) prior to Tracts B-3 and/or B-4.

Certain easements for access, utilities and drainage control, which may be shown hereon, may be modified, replaced or removed, at the option of the City of Albuquerque, pending future platting and submittals which conform to a more complete or improved routing of those facilities. These easements may not only be located on the tract being subdivided (or developed), but may be located on an adjacent tract(s) on which public improvements are necessary to allow development of the tract being subdivided (or developed).

By its approval the City makes no representation or warranties as to availability of utilities, or final approval of all requirements including (but not limited to) the following items: Water and sanitary sewer availability; future street dedications and/or improvements; park and open space requirements; drainage requirements and/or improvements; and, excavation, filling or grading requirements. Any person intending development of lands within this subdivision is cautioned to investigate the status of these items.

At such time as all such conditions have been satisfactorily met, the City Engineer shall approve a recordable document, removing such conditions from all of from a portion of the area within the subject subdivision.

ACKNOWLEDGED:

x John F. Black

SEVEN-BAR LAND AND CATTLE COMPANY (date)
RANCOR LAND COMPANY, LTD.
John F. Black, General Partner

Chairman (date)
Development Review Board

STATE OF NEW MEXICO
ss.
COUNTY OF SANDOVAL

The foregoing instrument was acknowledged before me this 19th day of April, 1985 by John F. Black on behalf of said Corporation.

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

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

May 30, 1985

Mr. Chuck Easterling
Easterling & Associates
5643 Paradise Boulevard NW
Albuquerque, NM 87114

REF: AMENDED CONCEPTUAL DRAINAGE PLAN FOR TRACT V SEVEN BAR RANCH (A14-D3) RECEIVED APRIL 1, 1985

Dear Mr. Easterling:

I have reviewed the referenced plan and forward the following comments:

1. Please submit the background information and documentation to show how the flows under NM 528 were reduced. The sector plan for the Seven Bar Ranch is in the process of being reviewed and submitting the background information will expedite the review.

2. The appropriate easements and ponding requirements will still be necessary till the downstream improvements are completed.

If you should have any questions, please feel free to call me at 766-7644.

Sincerely,

Carlos A. Montoya

Carlos A. Montoya
City/County Flood Plain Admin.

CAM:mrk

HYDROGRAPH COMPUTATION WORKSHEET

DATE 7/23/84
COMPUTED BY
CHECK BY

PROJECT Seven Bar

LOCATION

ANALYSIS POINT # 3a

(DR. AREA) A = 76 ACRES

T_c 19.8 MIN

POINT RAINFALL 2.2 IN. FROM PLATE 22.2 D-1

CN = 54 FROM PLATES 22.2 C-2, 22.2 C-3

RUNOFF VOLUME R = .05 IN. FROM PLATE 22.2 C-4

COMPUTED T_p = 20 MIN. $T_p = T_c$
(Rounded to even minute)

$q_p = \frac{45.4A}{T_p}$ = 172.5 CFS./INCH OF RUNOFF

$(R \times q_p) = Q_{peak}$ = 8.6 CFS

$t(\text{COLUMN}) = (t/T_p)$ $t = T_p(t/T_p)$

$y = \frac{Q}{Q_{peak}}$ $Q = y(Q_{peak})$

	(t/T_p)	t (min.)	y	Q (cfs)
1	0	0	0	0
2	.1	2	.03	.3
3	.2	4	.10	.9
4	.3	6	.190	1.6
5	.4	8	.310	2.7
6	.5	10	.470	4.0
7	.6	12	.660	5.7
8	.7	14	.820	7.1
9	.8	16	.930	8.0
10	.9	18	.990	8.5
11	1.0	20	1.00	8.6
12	1.1	22	.990	8.4
13	1.2	24	.930	8.0
14	1.3	26	.860	7.4
15	1.4	28	.780	6.7
16	1.5	30	.680	5.8
17	1.6	32	.560	4.8
18	1.7	34	.460	4.0
19	1.8	36	.390	3.3
20	1.9	38	.330	2.8
21	2.0	40	.280	2.4
22	2.2	44	.207	1.8
23	2.4	48	.147	1.3
24	2.6	52	.107	0.9
25	2.8	56	.077	.7
26	3.0	60	.055	
27	3.2	64	.040	.3
28	3.4	68	.029	
29	3.6	72	.021	.2
30	3.8	76	.015	
31	4.0	80	.011	
32	4.5	90	.005	
33	5.0	100	.000	

$C = \frac{44.9}{(3.28)(76)} = .18$

$C = \frac{8.6}{(3.28)(76)} = .035$

PLATE 22.2 F-1

$$\frac{2\,CF}{sec} \times \frac{10\,min}{1} \times \frac{60\,sec}{1\,min} = 1200\ \frac{CF}{in^2}$$

$$11.4\,in^2 \times 1200\ \frac{CF}{in^2} = 13{,}680\ CF$$

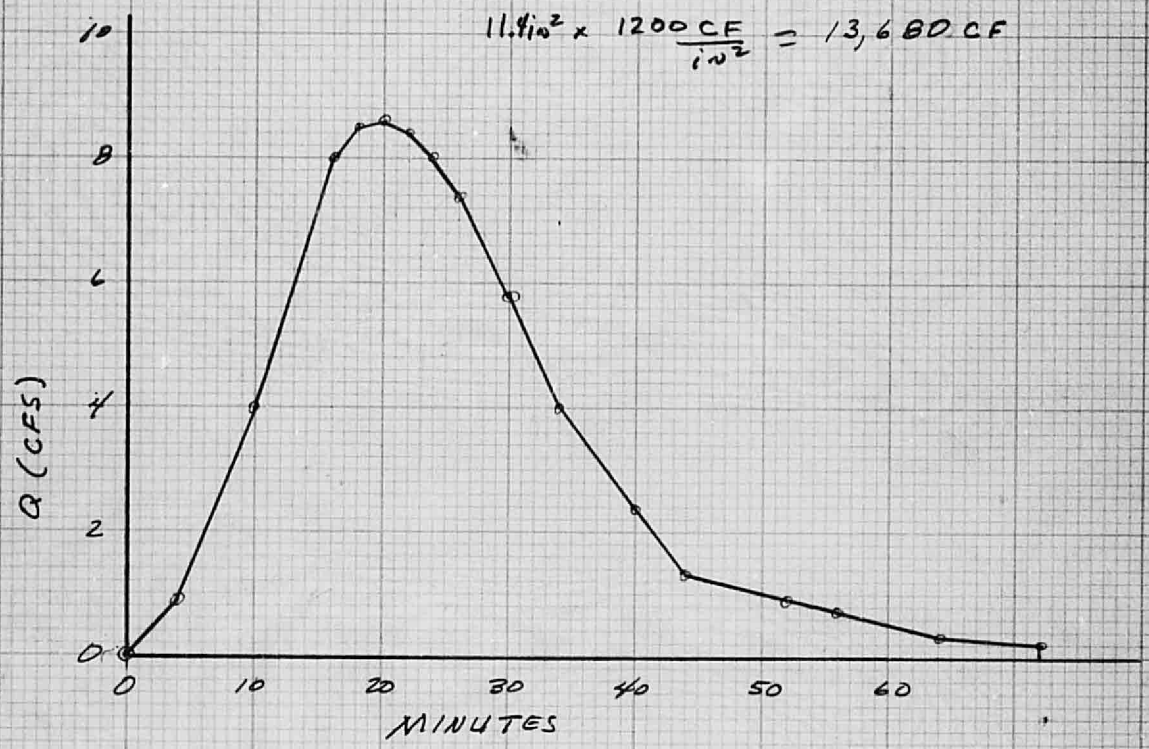

TABLE 5. COMPUTATION SHEET FOR CHART METHOD

PROJECT _____ Computed By _____ Date _____
_____ Checked By _____ Date _____

1. Required Input

A = 6 Acres : Drainage Area
T = 100 Years : Design Frequency (return period)
P = 3.2 Inches: Rainfall depth for 24-hour, T-year event
Y = 9 % : Average watershed slope
CN = 83 : Runoff Curve Number

2. Compute Volume of Runoff, Q

Q = 1.0 Inches: Use CN and P as input to Fig. 5

3. Watershed Shape Adjustment (Optional: if adjustment is not made, set EA = A)

HL = _____ feet : Hydraulic Length
EA = 6 Acres : Equivalent Drainage Area (use Fig. 10)
HF = _____ : HF = A/EA

4. Obtain Unit Peak Discharge, QU

QU = 13 cfs/inch Q : Use EA with Fig. 11 (Sheet 1, 2, and 3 for flat, moderate, and steep slopes, respectively)

5. Watershed Slope Interpolation Factor, SF (Optional: if adjustment is not made, set SF = 1.0)

SF = 1 : Use Y and EA with Table 7

6. Ponding and Swamp Storage Adjustment Factor, PF (Optional: if adjustment is not made, set PF = 1.0)

PPS = 5 % : % of Ponds and Swampy Area (Based on actual drainage area A)

Location in watershed (check one):
Design Point (6-a) ✓ Center or Spread out (6-b)___; Upper Reaches (6-c)___

PF = .89 : Use PPS and T with Table 6-a, 6-b, or 6-c.

7. Peak Discharge QP, Calculation with Adjustments

QP = QU x Q x HF x SF x PF
= 13 x 1.0 x 1.0 x 1 x .89
= 11.6 cfs

8. Modifications for Urbanization

IMP = 54 % : Percentage of Impervious Area (based on actual drainage area A)
IMPF = 1.28 : Impervious Area Adjustment Factor (Fig. 12)
HLM = _____ % : Percentage of Hydraulic Length Modified
HLMF = 1 : Hydraulic Length Modified Factor (Fig. 13)

QPU = QP x IMPF x HLMF
= 11.6 x 1.28 x _____
= 14.8 cfs

PLAN/PLATS

ON

FILE