

County of Bernalillo

State of New Mexico

BOARD OF COUNTY COMMISSIONERS

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2400 BROADWAY, S.E.
ALBUQUERQUE, NEW MEXICO 87102
PUBLIC WORKS (505) 848-1500

MARK CARRILLO, ASSESSOR
JUDY D. WOODWARD, CLERK
IRA ROBINSON, PROBATE JUDGE
JOE BOWDICH, SHERIFF
ORLANDO VIGIL, TREASURER

April 13, 2001

Kim R. Kemper
Kemper-Vaughan
3700 Coors Road NW
Albuquerque New Mexico 87120

**RE: Grading and Drainage Plan for Replat of Tract 34 (Q9-D3) (PWDN 147) Dated
September 19, 2000**

Dear Mr. Kemper:

The above referenced plan received September 21, 2000 is approved in compliance with the Floodplain Ordinance. The engineer has addressed Bernalillo County Public Works and AMAFCA's comments and provided the necessary documents.

If you have any questions please call me at 924-3982.

Sincerely,

A handwritten signature in black ink, appearing to read "Carlos A. Montoya", is written over a horizontal line.

Carlos A. Montoya
City/County Floodplain Administrator

C: Brian Kent, Bernalillo County
Lynn Mazur, AMAFCA

PWDN 147

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2400 BROADWAY, S.E.
ALBUQUERQUE, NEW MEXICO 87102
November 14, 2000
PUBLIC WORKS (505) 848-1500

Kim Kemper, PE
Kemper-Vaughan, Inc.
3700 Coors Blvd. NW
Albuquerque, NM 87120

Re: Tract 34, Atrisco Land Grant Grading and Drainage Plan
Engineer's Stamp dated 9-19-00 (Q9/D3) PWDN 147

Dear Mr. Kemper,

Following is a compilation of comments from AMAFCA, Bernalillo County Public Works and the City/County Floodplain Administrator with respect to your request for replatting.

- An executed, signed easement agreement with AMAFCA is required for the lot encumbered by the floodplain. Since this is a replat, add "Easement Dedication Language for Plat." Contact Marty Eckert at AMAFCA for an example.
- Please provide calculations for the 42' setback.
- Please provide the offsite basin map and quantify offsite runoff.
- Is water and sewer available? If not, you will need to show where the well and leach field will be located on the lot with the floodplain.
- Your road section shows a side road swale. Your write-up states that you are allowing offsite runoff to sheet flow across the road and continue in its historic path(s). Please clarify this.
- The grades you propose in Gun Club indicate a 12% grade. Does this adhere to County criteria regarding allowable street grades?

If you have any questions, you can contact me at 924-3986.

Sincerely,

A handwritten signature in black ink that reads "Bradley L. Bingham".

Bradley L. Bingham, PE
City/County Floodplain Administrator (Acting)

C: David Lorenzo, BCPW
Lynn Mazur, AMAFCA
file

REPLAT OF TRACT 34

GRADING PLAN & DRAINAGE PLAN

September 19, 2000

Prepared for:

Ross Howard Company

366 Ranchitos Road

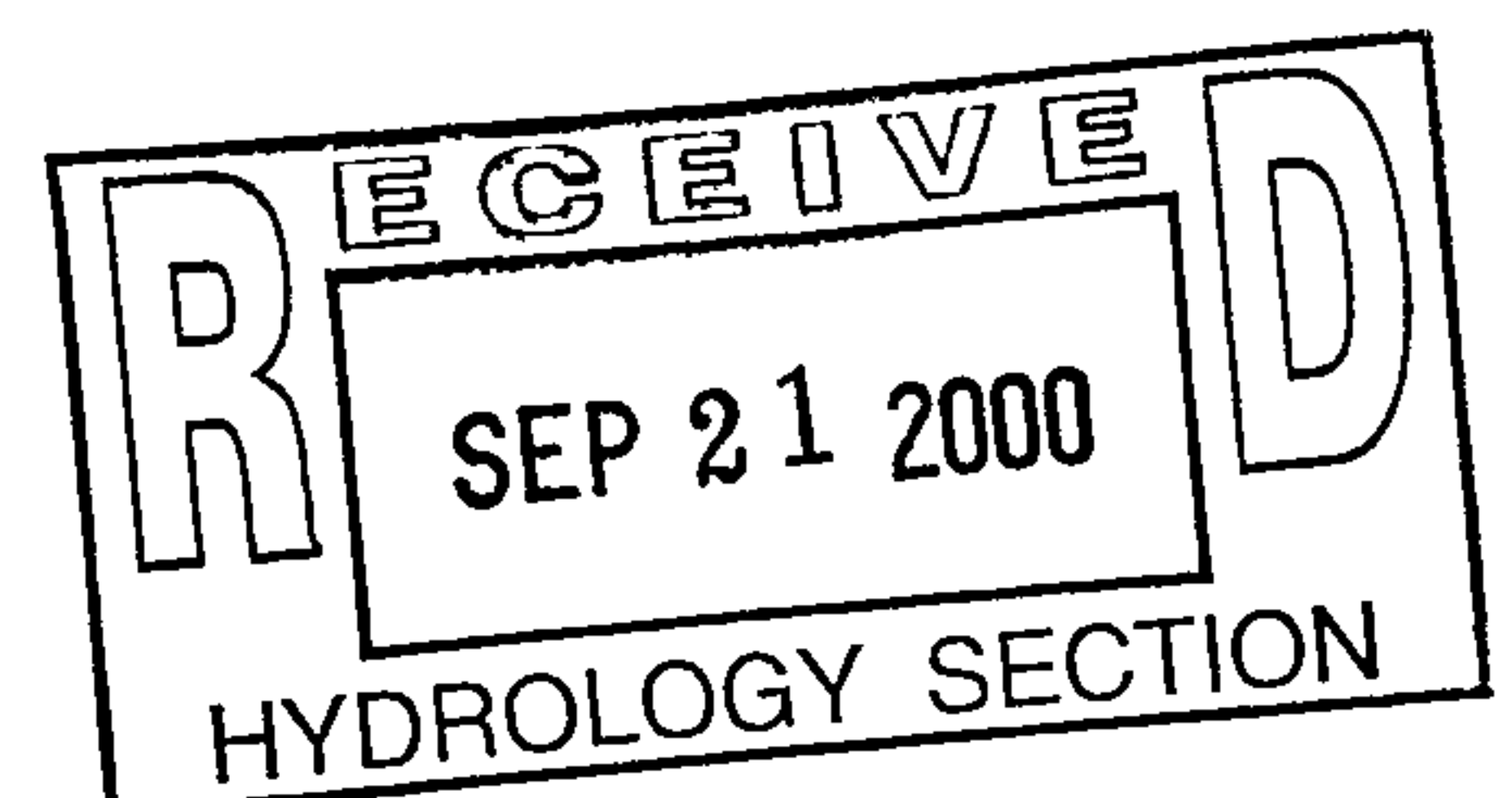
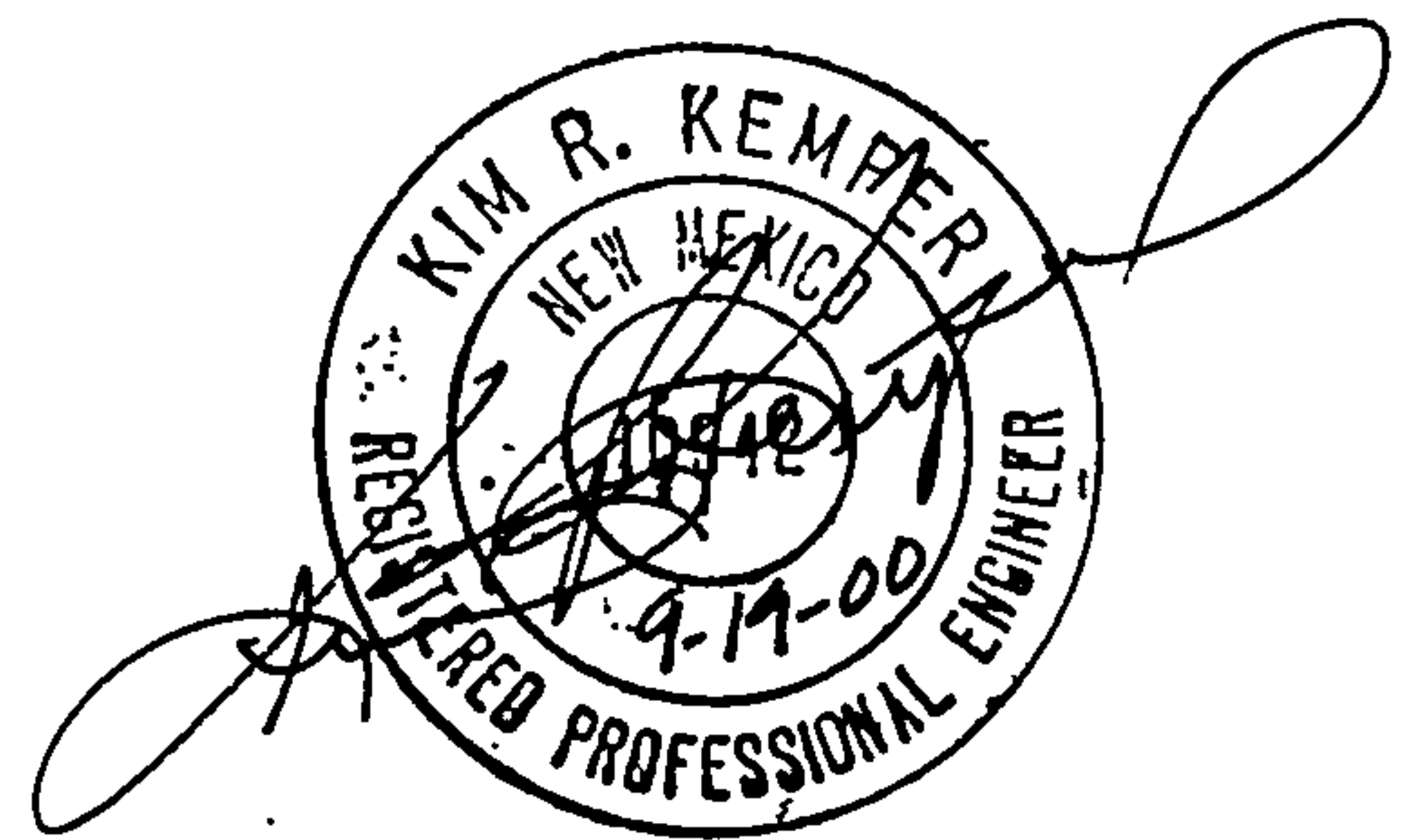
Corrales, New Mexico 87048

Prepared by:

KEMPER-VAUGHAN CONSULTING ENGINEERS

3700 Coors Road NW

Albuquerque, New Mexico 87120



LEGAL DESCRIPTION:

A certain tract of land situated within Section 16, T.9N., R.2E., N.M.P.M., Town of Atrisco grant, Bernalillo County, New Mexico, designated as Tract numbered Thirty-four (34), Row One (1) per Quitclaim Deed (Joint Tenants) recorded June 29, 2000 in Book 9969. Page 5624, Records of Bernalillo County, New Mexico.

FLOOD BOUNDARY:

Attached is a copy of Panel 338 of the FIRM map. As shown, the southern edge of this site is within a designated flood hazard area, Zone AO, depth 1. A CLOMR for the Don Felipe Dam is on file at the City of Albuquerque which incorporates the area surrounding the subject property. Copies of the AHYMO results and a map exhibit are included herein for reference. Immediately upstream of this parcel are two Basins identified as Basins 804 and 805. The subject property is within basin 807. The combined hydrograph for Basin 804 and 805 resulted in a peak rate of discharge of approximately 625 cfs. The hydrograph for basin 807 reported a peak rate of discharge of approximately 80 cfs. Although this site is not located at the analysis point of Basin 807 (it is slightly upstream), conservatively the sum of these total peak discharges was used for this plan. This results in an estimated 705 cfs within the channel through the parcel.

DRAINAGE PLAN:

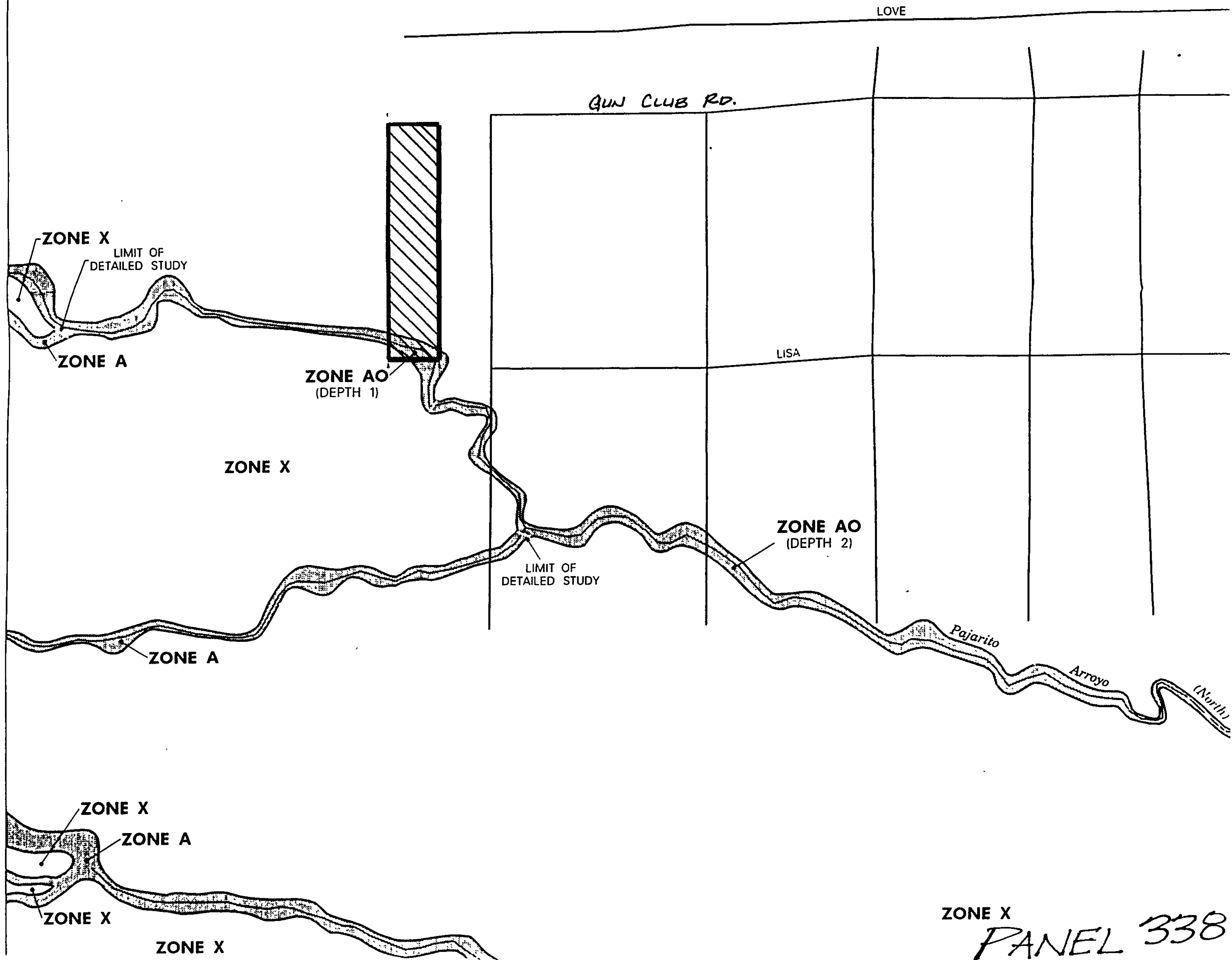
The purpose of the plan is to allow for the subdivision of the tract into three (3) individual lots. The parcel is family owned and it is proposed to create the individual lots for three (3) family members. Further, it is the intention of the land owner(s) to position manufactured homes on these newly created lots once the subdivision is complete.

The property is located at the west end of Gun Club Road. The terrain slopes from west to east and then south to the identified floodplain. Within the limited drainage area upstream there appears to be a few "trails" which may allow storm waters to somewhat concentrate; however, the area generally sheet-flows across the subject parcel. It is proposed to construct the new private road at existing grade to continue to allow any excess precipitation from the west to sheet-flow across the site. Also, it appears that this site and the site to the east were once used as a borrow pit. The majority of the "pit" is located on the neighboring property and will pond storm waters in a large enough event.

An easement will be provided to AMAFCA for an area to include the energy grade line of the flow through the channel at the southern end of the property (floodplain). Shown on the plan are the approximate location of the existing flood boundary (from the FIRM), the energy grade line and the proposed easement location. Also shown is a erosion setback line forty-two feet away from the proposed AMAFCA drainage easement.

CALCULATIONS:

Attached are calculations analyzing both the existing and developed conditions within the proposed Subdivision. Developed areas were estimated as follows: landscape 0.33 ac and driveways at 1000 sf. All calculations are in accordance with City of Albuquerque DPM, Section 22.2. Also attached are normal depth calculations for the channel and flood boundary. Three (3) sections through the channel were analyzed to determine the depth of flow, energy head, and the width of the energy grade line. The south side of the channel is not as well defined as the northern side. Again, conservatively the channel side slope was mirrored to the provide the flow sections provided.



ZONE X
PANEL 338

DON FELIPE

SUPPLEMENT
TO
CLOMR FOR
DON FELIPE DAM **MICROFILMED**

Contains AHYMO392 output for:

100-yr. Storm Future Development Conditions

PMP for Existing Development Conditions

100-yr. Storm Existing Development Conditions (Modeled as 3 Basins)

PMP for Existing Development Conditions (Modeled as 3 Basins)

See Don Felipe CLOMR for 1975 for maps etc.

*Also, see Tiera Engineering's Don Felipe
Dam Emergency Action Plan*

Draft is in OMI files

HYDROGRAPH FROM AREA 805.70

RUNOFF VOLUME = .95192 INCHES = 6.9553 ACRE-FEET
 PEAK DISCHARGE RATE = 156.23 CFS AT 1.550 HOURS BASIN AREA = .1370 SQ. MI.

```
*
* C COMBINE HYD.'S 805.9 AND 904.9 AT 805.99
*
ADD HYD ID=5 HYD=805.99 ID I=5 ID II=6
*
PRINT HYD ID=5 CODE=1
```

HYDROGRAPH FROM AREA 805.99

RUNOFF VOLUME = .96897 INCHES = 27.3895 ACRE-FEET
 PEAK DISCHARGE RATE = 625.61 CFS AT 1.600 HOURS BASIN AREA = .5300 SQ. MI.

```
*
* C ROUTE HYD. 305.99 TO 305.3
*
* ACTUAL CROSS SECTION
COMPUTE RATING CURVE RC=-1 VS NO=1 NSESS=3
ELMIN=0 ELMAX=10 CH SLP=.0291 ft/ft FP SLP=.0291 ft/ft
N=.035 DIST=20 N=-.03 DIST=125 N=.035 DIST=145
DIST ELEV DIST ELEV DIST ELEV DIST ELEV
0 10 20 8 60 0 35 0
125 3 145 10
*
COMPUTE TRAVEL TIME ID=-2 REACH=1 NO VS=1
L=2440 ft SLP=.0291 ft/ft
*
ROUTE ID=2 HYD=305.3 INFLOW HYD ID=5 DT=.05
PRINT HYD ID=2 CODE=1
```

HYDROGRAPH FROM AREA 305.30

RUNOFF VOLUME = .96897 INCHES = 27.3895 ACRE-FEET
 PEAK DISCHARGE RATE = 537.33 CFS AT 1.650 HOURS BASIN AREA = .5300 SQ. MI.

```
*
COMPUTE NM HYD ID=1 HYD=307 DA=0.046 SQ MI
PER A=57 B=3 C=0 D=40
TP=.133 HRS RAIN=-1
```

K = .072485HR TP = .133000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 72.808 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.9700
 AREA = .019400 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .159326HR TP = .133000HR K/TP RATIO = 1.197937 SHAPE CONSTANT, N = 2.965886
 UNIT PEAK = 57.904 CFS UNIT VOLUME = .9984 B = 279.03 P60 = 1.9700
 AREA = .027600 SQ MI IA = .64250 INCHES INF = 1.64900 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

HYDROGRAPH FROM AREA 807.00

RUNOFF VOLUME = 1.29381 INCHES = 3.1741 ACRE-FEET
 PEAK DISCHARGE RATE = 79.66 CFS AT 1.500 HOURS BASIN AREA = .0460 SQ. MI.

*

*C DIVIDE HYD NO. 807
 DIVIDE HYD ID=1 PER=-112 ID I=1 HYD I=807
 ID II=20 HYD II=000

*** WARNING *** - PERCENTAGE OF -112.0 FOUND - A HYDROGRAPH BULKING FACTOR IS ASSUMED
 PRINT HYD ID=1 CODE=1

HYDROGRAPH FROM AREA 807.00

RUNOFF VOLUME = 1.44906 INCHES = 3.5550 ACRE-FEET
 PEAK DISCHARGE RATE = 89.22 CFS AT 1.500 HOURS BASIN AREA = .0460 SQ. MI.

*

*C COMBINE HYD.'S 807 AND 305.3 AT 207.9

*

ADD HYD ID=5 HYD=307.9 ID I=1 ID II=2

*

PRINT HYD ID=5 CODE=1

HYDROGRAPH FROM AREA 807.90

RUNOFF VOLUME = 1.00731 INCHES = 30.9445 ACRE-FEET
 PEAK DISCHARGE RATE = 537.21 CFS AT 1.650 HOURS BASIN AREA = .5750 SQ. MI.

*

COMPUTE NM HYD ID=1 HYD=306 DA=0.108 SQ MI
 PER A=80 B=5 C=0 D=15
 TP=.176 HRS RAIN=-1

K = .096713HR TP = .176000HR K/TP RATIO = .549508 SHAPE CONSTANT, N = 7.031905
 UNIT PEAK = 48.118 CFS UNIT VOLUME = .9996 B = 522.75 P40 = 1.7700
 AREA = .015200 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .203436HR TP = .176000HR K/TP RATIO = 1.155889 SHAPE CONSTANT, N = 3.065806
 UNIT PEAK = 149.77 CFS UNIT VOLUME = .9996 B = 287.14 P40 = 1.9700
 AREA = .091800 SQ MI IA = .64119 INCHES INF = 1.64529 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

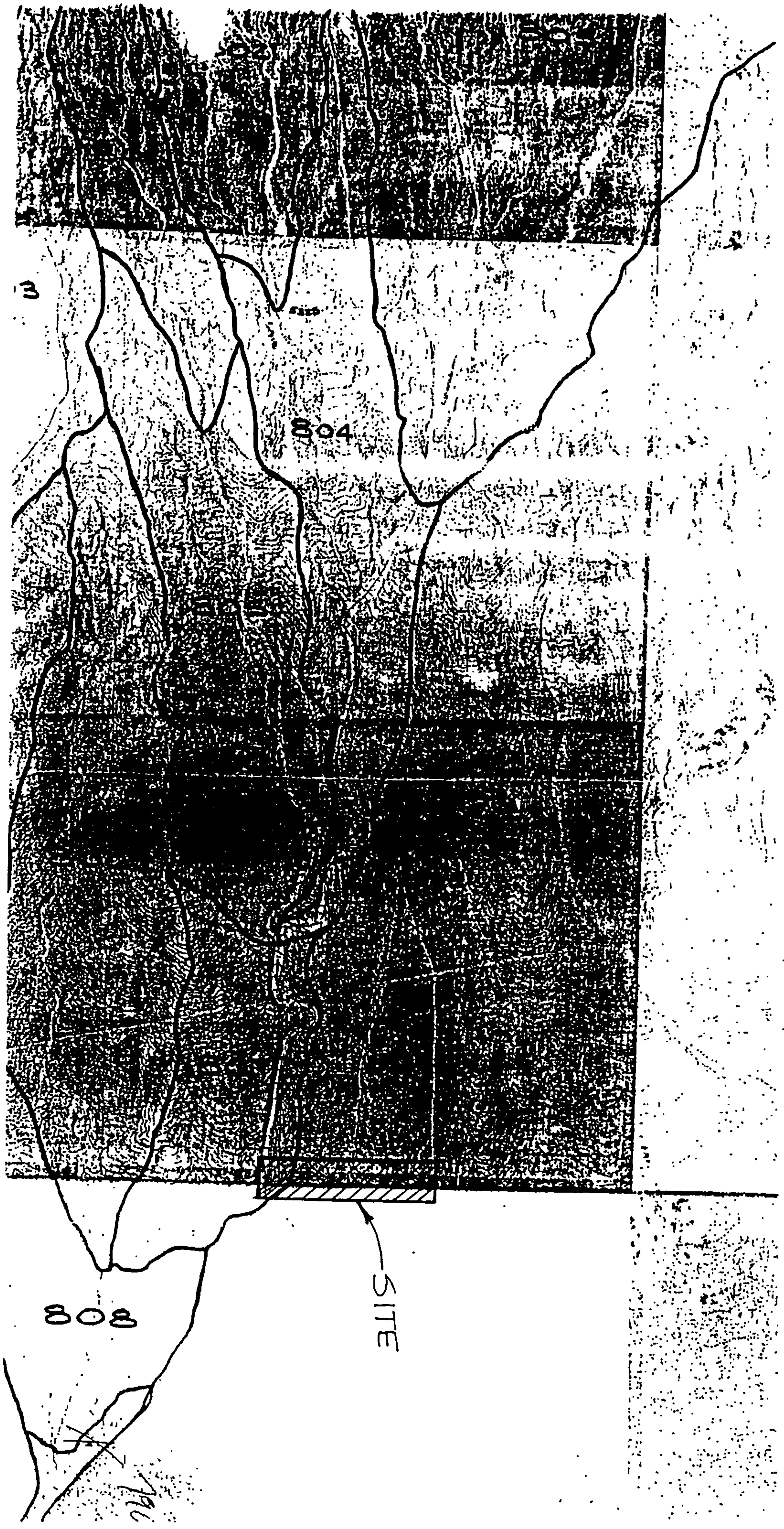
PRINT HYD

ID=1 CODE=1

HYDROGRAPH FROM AREA 806.00

RUNOFF VOLUME = .80639 INCHES = 4.6447 ACRE-FEET

PEAK DISCHARGE RATE = 112.00 CFS AT 1.500 HOURS BASIN AREA = .1200 SQ. MI.



TOTAL SITE AREA = 5.00 ac.

DRAINAGE ZONE 1

PRECIPITATION: 360 = 2.20 in.
1140 = 2.66 in.
10day = 3.67 in.

EXCESS PRECIPITATION:

PEAK DISCHARGE:

TREATMENT A	0.44 in.	1.29	cfs/ac.
TREATMENT B	0.67 in.	2.03	cfs/ac.
TREATMENT C	0.99 in.	2.87	cfs/ac.
TREATMENT D	1.97 in.	4.37	cfs/ac.

EXISTING CONDITIONS:

PROPOSED CONDITIONS:

	AREA	AREA
TREATMENT A	5.00 ac.	3.31 ac.
TREATMENT B	0.00 ac.	1.00 ac.
TREATMENT C	0.00 ac.	0.57 ac.
TREATMENT D	0.00 ac.	0.12 ac.

EXISTING EXCESS PRECIPITATION:

$$\text{Weighted E} = (0.44) \times (5.00) + (0.67) \times (0.00) + (0.99) \times (0.00) + (1.97) \times (0.00) / 5.00 \text{ ac.} \\ = 0.44 \text{ in.}$$

$$V_{100-360} = (0.44) \times (5.00) / 12 = 0.183333 \text{ ac-ft} = 7986 \text{ cf}$$

EXISTING PEAK DISCHARGE:

$$Q_{100} = (1.29) \times (5.00) + (2.03) \times (0.00) + (2.87) \times (0.00) + (4.37) \times (0.00) = 6.45 \text{ cfs}$$

PROPOSED EXCESS PRECIPITATION:

$$\text{Weighted E} = (0.44) \times (3.31) + (0.67) \times (1.00) + (0.99) \times (0.57) + (1.97) \times (0.12) / 5.00 \text{ ac.} \\ = 0.59 \text{ in.}$$

$$V_{100-360} = (0.59) \times (5.00) / 12.0 = 0.243925 \text{ ac-ft} = 10625 \text{ cf}$$

$$V_{100-1440} = (0.24) + (0.12) \times (2.66 - 2.20) / 12 = 0.248525 \text{ ac-ft} = 10826 \text{ cf}$$

$$V_{100-10\text{day}} = (0.24) + (0.12) \times (3.67 - 2.20) / 12 = 0.258625 \text{ ac-ft} = 11266 \text{ cf}$$

PROPOSED PEAK DISCHARGE:

$$Q_{100} = (1.29) \times (3.31) + (2.03) \times (1.00) + (2.87) \times (0.57) + (4.37) \times (0.12) = 8.46 \text{ cfs}$$

LOT 34-A AREA = 2.50 ac.

DRAINAGE ZONE 1

PRECIPITATION: 360 = 2.20 in.
 1140 = 2.66 in.
 10day = 3.67 in.

EXCESS PRECIPITATION:

PEAK DISCHARGE:

TREATMENT A	0.44 in.	1.29	cfs/ac.
TREATMENT B	0.67 in.	2.03	cfs/ac.
TREATMENT C	0.99 in.	2.87	cfs/ac.
TREATMENT D	1.97 in.	4.37	cfs/ac.

EXISTING CONDITIONS:

AREA

PROPOSED CONDITIONS:

AREA

TREATMENT A	2.50 ac.	1.82 ac.
TREATMENT B	0.00 ac.	0.33 ac.
TREATMENT C	0.00 ac.	0.31 ac.
TREATMENT D	0.00 ac.	0.04 ac.

EXISTING EXCESS PRECIPITATION:

$$\text{Weighted E} = (0.44) \times (2.50) + (0.67) \times (0.00) + (0.99) \times (0.00) + (1.97) \times (0.00) / 2.50 \text{ ac.} \\ = 0.44 \text{ in.}$$

$$V_{100-360} = (0.44) \times (2.50) / 12 = 0.091667 \text{ ac-ft} = 3993 \text{ cf}$$

EXISTING PEAK DISCHARGE:

$$Q_{100} = (1.29) \times (2.50) + (2.03) \times (0.00) + (2.87) \times (0.00) + (4.37) \times (0.00) = 3.23 \text{ cfs}$$

PROPOSED EXCESS PRECIPITATION:

$$\text{Weighted E} = (0.44) \times (1.82) + (0.67) \times (0.33) + (0.99) \times (0.31) + (1.97) \times (0.04) / 2.50 \text{ ac.} \\ = 0.56 \text{ in.}$$

$$V_{100-360} = (0.56) \times (2.50) / 12.0 = 0.117300 \text{ ac-ft} = 5110 \text{ cf}$$

$$V_{100-1440} = (0.12) + (0.04) \times (2.66 - 2.20) / 12 = 0.118833 \text{ ac-ft} = 5176 \text{ cf}$$

$$V_{100-10\text{day}} = (0.12) + (0.04) \times (3.67 - 2.20) / 12 = 0.122200 \text{ ac-ft} = 5323 \text{ cf}$$

PROPOSED PEAK DISCHARGE:

$$Q_{100} = (1.29) \times (1.82) + (2.03) \times (0.33) + (2.87) \times (0.31) + (4.37) \times (0.04) = 4.08 \text{ cfs}$$

LOT 34-B AREA = 1.00 ac.

DRAINAGE ZONE 1

PRECIPITATION: 360 = 2.20 in.
 1140 = 2.66 in.
 10day = 3.67 in.

EXCESS PRECIPITATION:

PEAK DISCHARGE:

TREATMENT A	0.44 in.	1.29	cfs/ac.
TREATMENT B	0.67 in.	2.03	cfs/ac.
TREATMENT C	0.99 in.	2.87	cfs/ac.
TREATMENT D	1.97 in.	4.37	cfs/ac.

EXISTING CONDITIONS:

PROPOSED CONDITIONS:

	AREA	AREA
TREATMENT A	1.00 ac.	0.45 ac.
TREATMENT B	0.00 ac.	0.33 ac.
TREATMENT C	0.00 ac.	0.18 ac.
TREATMENT D	0.00 ac.	0.04 ac.

EXISTING EXCESS PRECIPITATION:

$$\text{Weighted E} = (0.44) \times (1.00) + (0.67) \times (0.00) + (0.99) \times (0.00) + (1.97) \times (0.00) / 1.00 \text{ ac.} \\ = 0.44 \text{ in.}$$

$$V_{100-360} = (0.44) \times (1.00) / 12 = 0.036667 \text{ ac-ft} = 1597 \text{ cf}$$

EXISTING PEAK DISCHARGE:

$$Q_{100} = (1.29) \times (1.00) + (2.03) \times (0.00) + (2.87) \times (0.00) + (4.37) \times (0.00) = 1.29 \text{ cfs}$$

PROPOSED EXCESS PRECIPITATION:

$$\text{Weighted E} = (0.44) \times (0.45) + (0.67) \times (0.33) + (0.99) \times (0.18) + (1.97) \times (0.04) / 1.00 \text{ ac.} \\ = 0.68 \text{ in.}$$

$$V_{100-360} = (0.68) \times (1.00) / 12.0 = 0.056342 \text{ ac-ft} = 2454 \text{ cf}$$

$$V_{100-1440} = (0.06) + (0.04) \times (2.66 - 2.20) / 12 = 0.057875 \text{ ac-ft} = 2521 \text{ cf}$$

$$V_{100-10\text{day}} = (0.06) + (0.04) \times (3.67 - 2.20) / 12 = 0.061242 \text{ ac-ft} = 2668 \text{ cf}$$

PROPOSED PEAK DISCHARGE:

$$Q_{100} = (1.29) \times (0.45) + (2.03) \times (0.33) + (2.87) \times (0.18) + (4.37) \times (0.04) = 1.94 \text{ cfs}$$

LOT 34-C AREA = 1.50 ac.

DRAINAGE ZONE 1

PRECIPITATION: 360 = 2.20 in.
1140 = 2.66 in.
10day = 3.67 in.

EXCESS PRECIPITATION:

PEAK DISCHARGE:

TREATMENT A	0.44 in.	1.29	cfs/ac.
TREATMENT B	0.67 in.	2.03	cfs/ac.
TREATMENT C	0.99 in.	2.87	cfs/ac.
TREATMENT D	1.97 in.	4.37	cfs/ac.

EXISTING CONDITIONS:

AREA

PROPOSED CONDITIONS:

AREA

TREATMENT A	1.50 ac.	1.05 ac.
TREATMENT B	0.00 ac.	0.33 ac.
TREATMENT C	0.00 ac.	0.08 ac.
TREATMENT D	0.00 ac.	0.04 ac.

EXISTING EXCESS PRECIPITATION:

$$\text{Weighted E} = (0.44) \times (1.50) + (0.67) \times (0.00) + (0.99) \times (0.00) + (1.97) \times (0.00) / 1.50 \text{ ac.} \\ = 0.44 \text{ in.}$$

$$V_{100-360} = (0.44) \times (1.50) / 12 = 0.055000 \text{ ac-ft} = 2396 \text{ cf}$$

EXISTING PEAK DISCHARGE:

$$Q_{100} = (1.29) \times (1.50) + (2.03) \times (0.00) + (2.87) \times (0.00) + (4.37) \times (0.00) = 1.94 \text{ cfs}$$

PROPOSED EXCESS PRECIPITATION:

$$\text{Weighted E} = (0.44) \times (1.05) + (0.67) \times (0.33) + (0.99) \times (0.08) + (1.97) \times (0.04) / 1.50 \text{ ac.} \\ = 0.56 \text{ in.}$$

$$V_{100-360} = (0.56) \times (1.50) / 12.0 = 0.070092 \text{ ac-ft} = 3053 \text{ cf}$$

$$V_{100-1440} = (0.07) + (0.04) \times (2.66 - 2.20) / 12 = 0.071625 \text{ ac-ft} = 3120 \text{ cf}$$

$$V_{100-10\text{day}} = (0.07) + (0.04) \times (3.67 - 2.20) / 12 = 0.074992 \text{ ac-ft} = 3267 \text{ cf}$$

PROPOSED PEAK DISCHARGE:

$$Q_{100} = (1.29) \times (1.05) + (2.03) \times (0.33) + (2.87) \times (0.08) + (4.37) \times (0.04) = 2.43 \text{ cfs}$$

SECTION 1

TOP OF BANK

SECTION 2

FLOWLINE

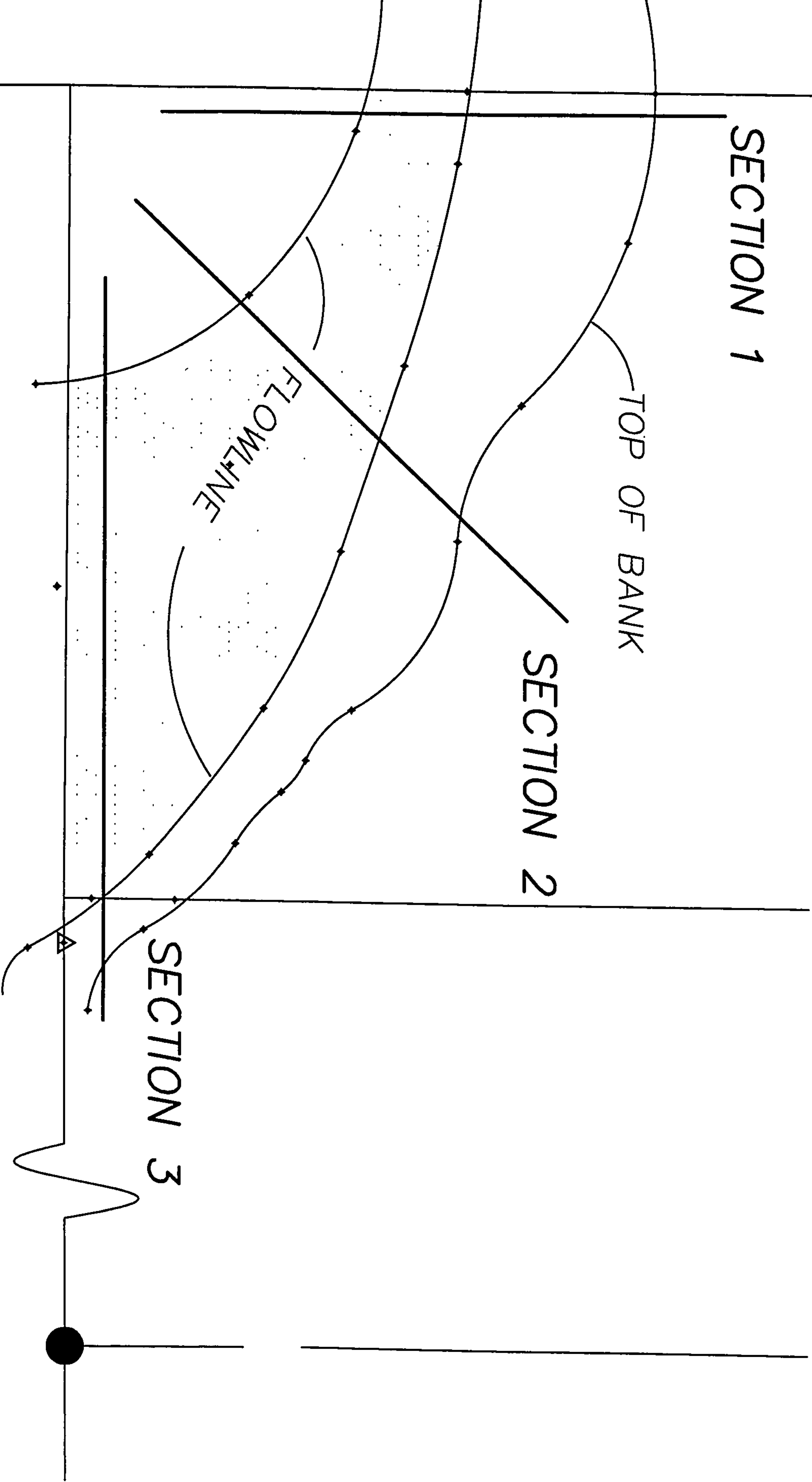
SECTION 3

LISA ROAD S.W.

60' R/W

CHANNEL SECTIONS

SCALE - 1"=40'



TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION

September 18, 2000
TRACT 34 REPLAT
CHANNEL FLOWS
SECTION 1

PROGRAM INPUT DATA:
DESCRIPTION

	VALUE
Flow Rate (cubic feet per second).....	705.0
Channel Bottom Slope (feet per foot).....	0.0120
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	8.70
Channel Side Slope - Right Side (horizontal/vertical)...	8.70
Channel Bottom Width (feet).....	27.0

PROGRAM RESULTS:
DESCRIPTION

	VALUE
Normal Depth (feet).....	2.15
Flow Velocity (feet per second).....	7.17
Froude Number (Flow is Super-Critical).....	1.023
Velocity Head (feet).....	0.80
Energy Head (feet).....	2.95
Cross-Sectional Area of Flow (square feet).....	98.29
Top Width of Flow (feet).....	64.42

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION

September 18, 2000
TRACT 34 REPLAT
CHANNEL FLOWS
SECTION 2

=====

PROGRAM INPUT DATA:
DESCRIPTION

	VALUE
Flow Rate (cubic feet per second).....	705.0
Channel Bottom Slope (feet per foot).....	0.0120
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	7.80
Channel Side Slope - Right Side (horizontal/vertical)...	7.80
Channel Bottom Width (feet).....	51.0

=====

PROGRAM RESULTS:
DESCRIPTION

	VALUE
Normal Depth (feet).....	1.65
Flow Velocity (feet per second).....	6.69
Froude Number (Flow is Super-Critical).....	1.006
Velocity Head (feet).....	0.70
Energy Head (feet).....	2.34
Cross-Sectional Area of Flow (square feet).....	105.37
Top Width of Flow (feet).....	76.74

=====

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION

September 18, 2000
TRACT 34 REPLAT
CHANNEL FLOWS
SECTION 3

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PROGRAM INPUT DATA:
DESCRIPTION

	VALUE
Flow Rate (cubic feet per second).....	705.0
Channel Bottom Slope (feet per foot).....	0.0120
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	9.00
Channel Side Slope - Right Side (horizontal/vertical)...	9.00
Channel Bottom Width (feet).....	134.0

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PROGRAM RESULTS:
DESCRIPTION

	VALUE
Normal Depth (feet).....	0.97
Flow Velocity (feet per second).....	5.11
Froude Number (Flow is Sub-Critical).....	0.942
Velocity Head (feet).....	0.40
Energy Head (feet).....	1.37
Cross-Sectional Area of Flow (square feet).....	138.10
Top Width of Flow (feet).....	151.42

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