December 14, 1984

Department of Engineering
City Hall-Seventh Floor
455 N. Main
Wichita, Ks. 67202

Subject: Floodway Plan--
New Western Addition

Att'n: Mr. Chris Breitenstein

Dear Chris:

Transmitted herewith is my report on research into the work done by others to map and define a Regulatory Floodway for upper Main Branch and lower East Branch of Dry Creek. That research provided very little justification for the location and width of the Floodway shown on the Flood Insurance Map for the reach between Orme and Kellogg, consequently a new location and width of Floodway is proposed across New Western Addition. Calculations to support the proposed Floodway are included for your review and consideration. Please call me if you wish to discuss the report or if you have questions.

Yours truly,

enc.
MSM/e

M. S. Mitchell
Flood Plain Management & Land Development Specialist
1215 Forest • Wichita, KS. 67203
(316) 265-9812

East Branch of Dry Creek
Floodway Plan for
New Western Addition

Research of past flood studies for Dry Creek downstream from Kellogg was of little value in determining a reasonable floodway width for the East Branch in the reach between Orme and Kellogg. Each draft of the Flood Insurance Study (USGS version circa 1980, Review Contractor version circa Oct. 1983, Review Contractor version circa Aug. 1984) has credited a Corps of Engineers "Flood Plain Information Report for Sedgwick County, Kansas-1973" (Their reference 7) with establishing 100 year and 500 year discharge values for the East and West Branches of Dry Creek. I have made telephone inquiries to the Tulsa District Office of the Corps, to the USGS Office at Lawrence, Kansas and to the FEMA Review Contractor and none of them has any record that such a report was ever made. To further confuse the matter, Page 9 of the Aug. 1984 draft FIS lists Dry Creek as one of the streams where flood frequency values were determined by the SCS TR-20 hydrology computer model. A Summary of Dry Creek discharges from the available reports is tabulated below:

Report	Location	Drainage Area	Discharge (cfs) 10 yr	50 yr	100 yr	500 yr
COE-1976	Pinecrest-RM 4.6 (also Kellogg)	1.4			5150	7300
USGS 1980	East Br @ Orme	1.27	1700*	2250*	2550*	3650*
USGS 1980	West Br @ Orme	1.44	1100	1800	2000	2350
G&O 1983 & 1984	East Br @ Orme	1.53	1700*	2250*	2550*	3650*
G&O 1983 & 1984	West Br @ Orme	1.27	1100*	1800*	2000*	2800*

* From COE published flood frequency data (Reference 7)

(cont.)

It is obvious that the discharges used by USGS and G&O for the Wichita FIS did not come from the Corps 1976 report; and telephone inquiries to the agencies responsible for the reports mentioned previously have done nothing to clear up the questions. G&O says that all FIS data on Dry Creek was taken directly from USGS which USGS says was taken directly from the Corps; however, G&O used 6 Sections from Lincoln to Kellogg while the Corps and USGS used only two--and those at locations different from any of the G&O Sections. The Corps provided a small scale model (Exhibit 1) showing the approximate location of cross sections used in their Floodway analysis and the enclosed HEC-2 Input Table lists cross section coordinates at Sections 57 and 58 (Exhibit 2) which are plotted on Exhibits 3 and 4. City-County Flood Control Office files produced a USGS E 431 Input Card Printout which lists coordinates for cross sections at River Miles 4.87 and 5.10 (Exhibit 5). The plots of these data are shown on Exhibits 6 and 7.

Although the Corps used City of Wichita elevations and USGS used Mean Sea Level elevations and different left bank zero points, the four cross sections were plotted for this report on City datum and Index Marks aid in correlating the plots. At Corps Section 57 a number of building encroachments are shown as non-effective flow areas and the extreme west end of the Section falls off into an imaginary creek at about the point east of Oliver where Eastwood turns south to intersect with Gilbert. USGS Section @ RM 4.87 obviously was intended to define the same valley as Corps Section 57, but was edited considerably and stopped short of the Eastwood creek. Corps Section 58 and USGS Section @ RM 5.10 are approximately 50 feet downstream from Kellogg and again their similarity is evident as is the effect of editing. A major difference however, is found in the shape of the East Branch channel as shown on Corps Section 58 (Vertical banks, 13 to 15 feet wide, area of 77 square feet) and on

(cont.)

USGS Section @ RM 5.10 (trapezoid w/top width of 165 feet, bottom of 15 feet, area of 384 square feet).

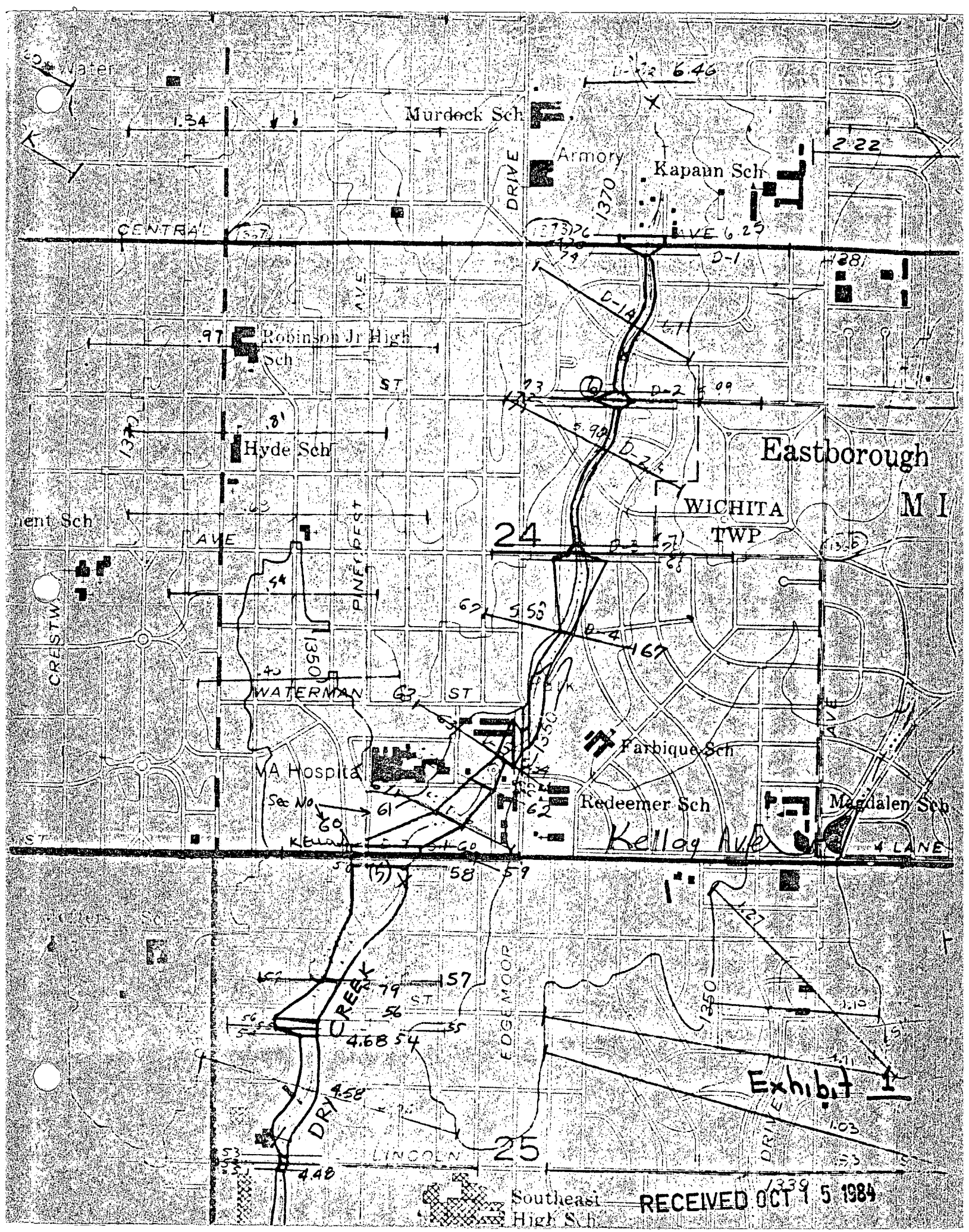
At Corps Section 57 - USGS Section @ RM 4.87 there is good correlation in locating and sizing the Regulatory Floodway (See Exhibits 3 and 6) to be 125 feet wide at elevation 153.6; however, at Kellogg there is again disagreement between the Regulatory Floodway location and width in the Corps Floodway Data Table (Exhibit 8) and the width scaled from USGS FIS Panel 30 (Exhibit 9) and elevation scaled from their Profile 04P (Exhibit 10). To further demonstrate the confusion in mapping and demensioning the Regulatory Floodway for Upper Main Branch and East Branch of Dry Creek, three transparencies were made to overlay the 1"=200' scale photoprint (Exhibit 11) showing the reach of Dry Creek between Gilbert and the Veteran's Administration grounds. Note that the latest FIS by G&O widens the RF from 60 feet @ Section Z to 400 feet at the confluence of the two branches and 370 feet on East Branch just south of Kellogg where it mysteriously disappears. Table 4 for East Branch (Exhibit 12) lists the RF width as 62 feet at the first section upstream from Edgemoor (RF reappears here).

From the above, it is obvious that a more reasonable approach to locating and establishing a width for the RF on both branches of Dry Creek is in order. Although the source is still in question, the 100 year discharges for West Branch (2000 cfs) and East Branch (2550) are used in each of the FIS reports and appear to be reasonable. The proposed floodway for East Branch was analyzed by the HEC-2 Water Surface Profile method starting at a surveyed cross-section of the Main Branch at the location of FIS Section Z (scaled from Panel 30 to be 141 feet south of the centerline of Orme) and continuing thru six cross sections to a point 50 feet downstream from Kellogg (See Run 1). Another run was made for the same conditions except at Section A-5 was improved and Bridged. That analysis is labeled Run 2.

(cont.)

What is the improvement? for what length?

The geometric model for the West Branch analysis is on a 1'=30' scale topo map by Baughman Co. (Exhibit 13) and each cross section is plotted on a separate page with its calculated section properties noted (Exhibits 16 and 17). The water surface profile calculations are shown on the HEC-2 program forms (Exhibits 14 and 15). Results of those calculations show that a floodway ranging from 60 feet @ Section Z to 42 feet at Section A-4 widening to 70 feet at the two sections upstream of Marvin Court will accomodate the 100 year discharge of 2550 cfs ending at approximately the same elevation calculated by the Corps and scaled from G&O FIS Profile 04P. A separate profile at expanded scale is provided for the reach from Section Z to Kellogg (Exhibit 18).


Murdock Sch
Armory
Kapaun Sch
DRIVE
CENTRAL
AVE
Robinson Jr High Sch
ST
Hyde Sch
Eastborough
WICHITA
TWP
MI
24
PINECREST
WATERMAN
ST
Fairbique Sch
VA Hospital
Redeemer Sch
Magdalen Sch
Kellog Ave
4 LANE
CRESTW
CREEK
EDGEMOOR
DRY
LINCOLN
25
Southeast
High Sch
Exhibit 1
RECEIVED OCT 15 1984

****
SEPT 1971 VERSION UPDATED JUNE 1974
ERROR CORRECTIONS 01,02,03,04,05,06,07
MODIFICATIONS 52,53,54,55,56,57
****

Encroachment Input

T1 BACKWATER WICHITA KANSAS EUGENE JONES
T2 FLOOD INSURANCE STUDY
T3 DRY CREEK

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	xSEL	FQ
	0.	2.	0.	0.	0.000000	0.00	0.0	0.	147.900	0.000

J2	NPROF	IPLOT	PRFVS	xSECV	xSECH	FN	ALLOC	IBW	CHNIM	ITRACE
	1.000	0.000	-1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

J3	1.000	34.000	36.000	4.000	27.000	28.000	9.000	0.000	0.000	0.000
NC	0.070	0.100	0.030	0.100	0.500	0.000	0.000	0.000	0.000	0.000
QT	2.000	5050.000	5050.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	10.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	4.46				158.5					
X1	23540.000	76.000	1925.000	2050.000	355.000	370.000	480.000	0.000	0.000	0.000
GR	200.000	999.000	158.800	1000.000	168.500	1060.000	200.000	1060.000	200.000	1100.000
GR	158.500	1100.000	158.500	1123.000	156.800	1165.000	156.400	1235.000	200.000	1235.000
GR	200.000	1280.000	155.600	1280.000	154.000	1300.000	154.300	1345.000	155.000	1346.000
GR	156.000	1390.000	200.000	1390.000	200.000	1445.000	155.600	1445.000	155.000	1500.000
GR	152.300	1560.000	200.000	1560.000	200.000	1605.000	151.700	1605.000	151.000	1643.000
GR	150.500	1644.000	150.000	1677.000	150.600	1678.000	151.400	1720.000	200.000	1720.000
GR	200.000	1755.000	151.400	1755.000	148.800	1830.000	149.000	1845.000	200.000	1845.000
GR	200.000	1910.000	149.300	1910.000	149.300	1925.000	141.400	1951.000	140.200	1952.000
GR	140.200	1968.000	142.500	1985.000	143.500	2018.000	146.600	2045.000	149.500	2050.000
GR	149.600	2051.000	200.000	2051.000	200.000	2110.000	150.600	2110.000	150.200	2134.000
GR	149.700	2135.000	149.800	2165.000	150.400	2166.000	151.200	2210.000	200.000	2210.000
GR	200.000	2245.000	151.300	2245.000	152.400	2341.000	153.000	2344.000	153.700	2365.000
GR	153.800	2380.000	200.000	2380.000	200.000	2485.000	153.800	2485.000	153.600	2520.000
GR	154.500	2605.000	200.000	2605.000	200.000	2800.000	155.000	2800.000	155.200	2840.000
GR	200.000	2840.000	200.000	2935.000	150.500	2935.000	150.500	2965.000	156.200	2980.000
GR	200.000	2981.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.077	0.077	0.031	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	4.70									
X1	24790.000	80.000	2030.000	2045.000	1025.000	1025.000	1250.000	0.000	0.000	0.000
GR	200.000	999.000	163.200	1000.000	162.300	1070.000	200.000	1070.000	200.000	1135.000
GR	161.500	1135.000	161.200	1160.000	200.000	1160.000	200.000	1235.000	160.100	1235.000
GR	157.800	1410.000	200.000	1410.000	200.000	1500.000	156.500	1500.000	155.100	1600.000
GR	200.000	1600.000	200.000	1670.000	154.500	1670.000	154.000	1730.000	200.000	1730.000
GR	200.000	1820.000	153.500	1820.000	152.900	2030.000	147.400	2031.000	147.400	2044.000
GR	152.900	2045.000	153.000	2135.000	201.000	2135.000	200.000	2185.000	153.000	2185.000
GR	153.000	2675.000	153.300	2765.000	200.000	2765.000	200.000	2855.000	154.500	2855.000
GR	154.800	2885.000	200.000	2885.000	200.000	2945.000	155.600	2945.000	156.400	3080.000
GR	200.000	3080.000	200.000	3140.000	159.500	3140.000	161.200	3225.000	200.000	3226.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

157

158

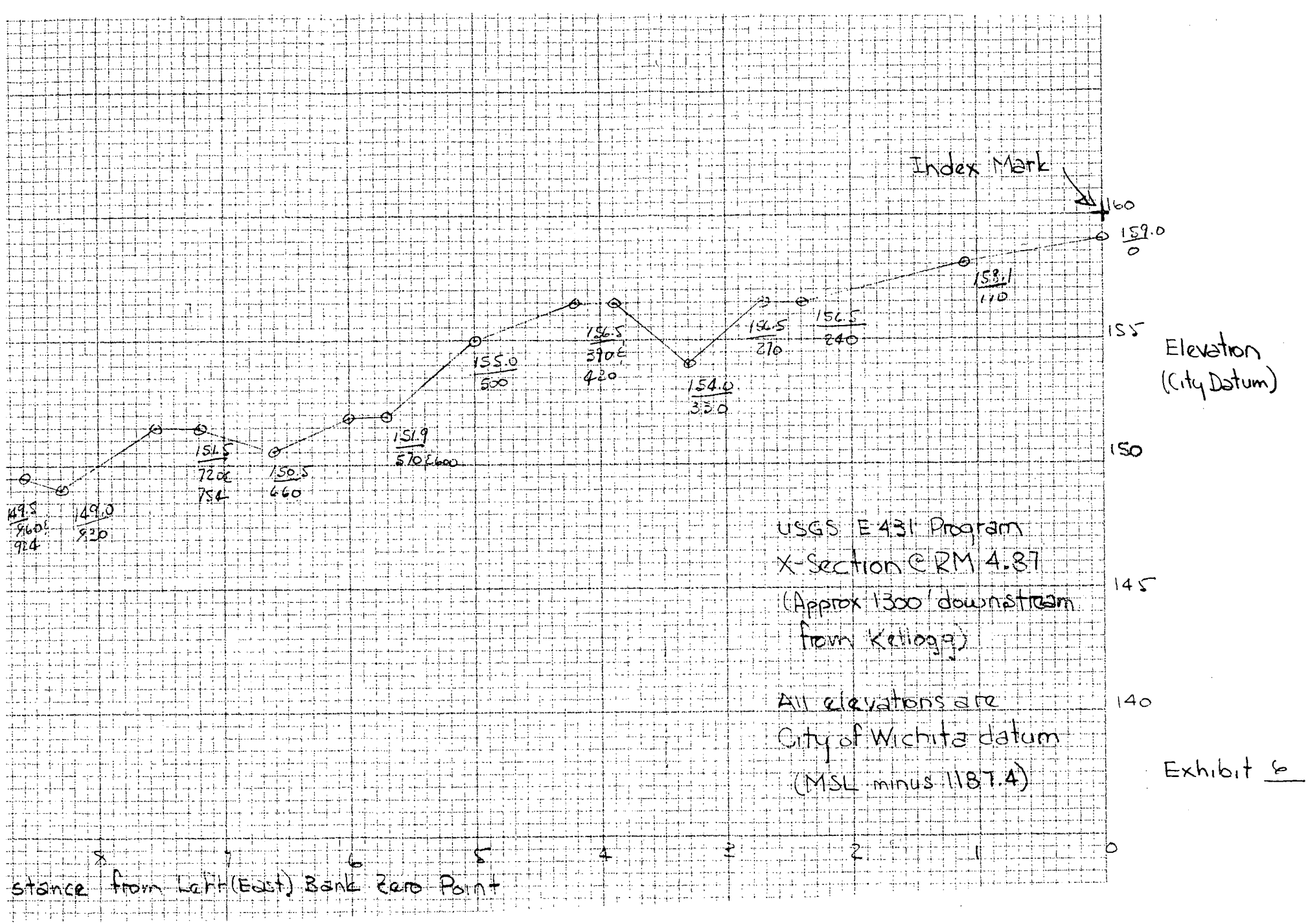
RECEIVED JUL 1 - 1974

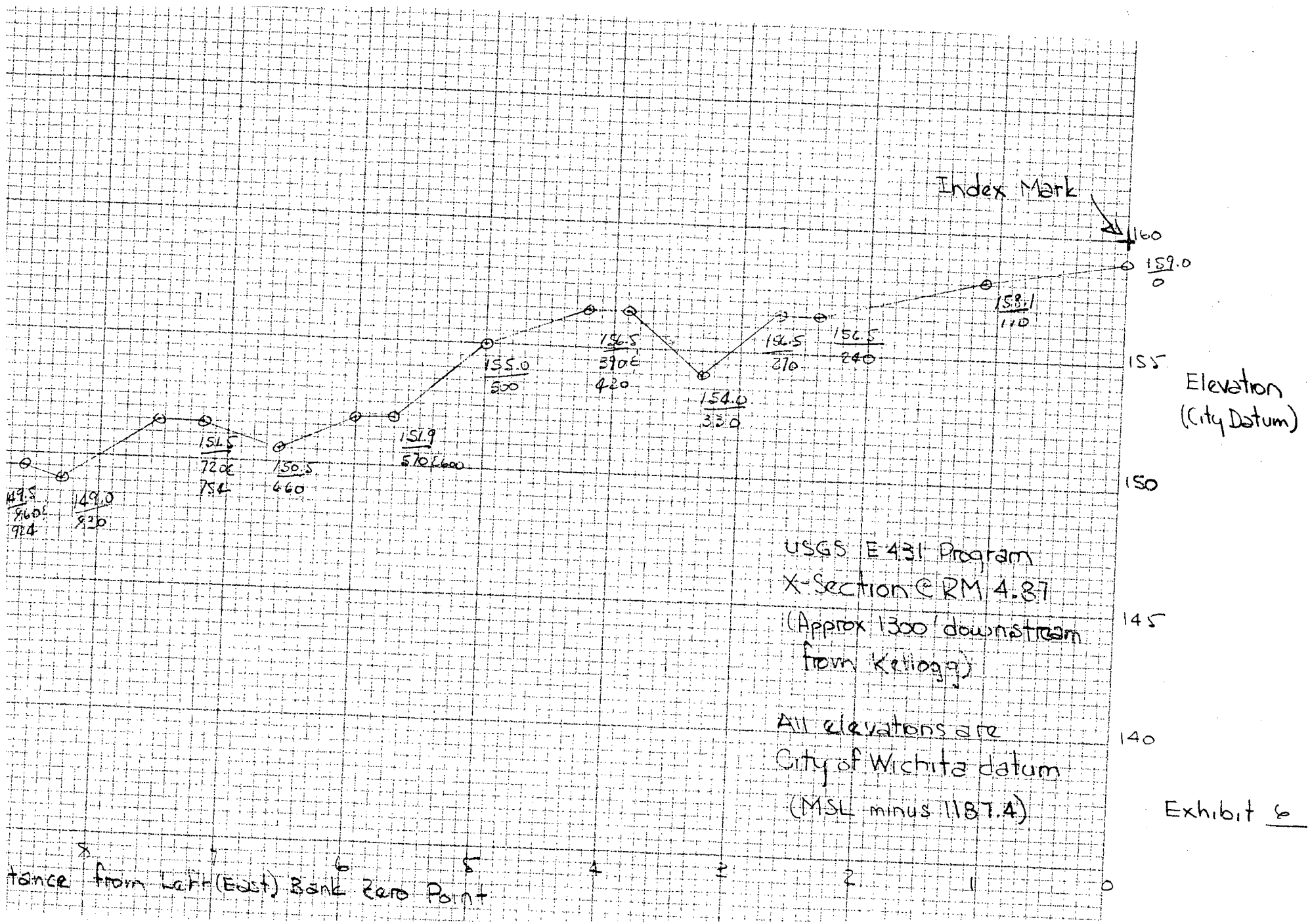
*** INPUT CARD PRINTOUT ***

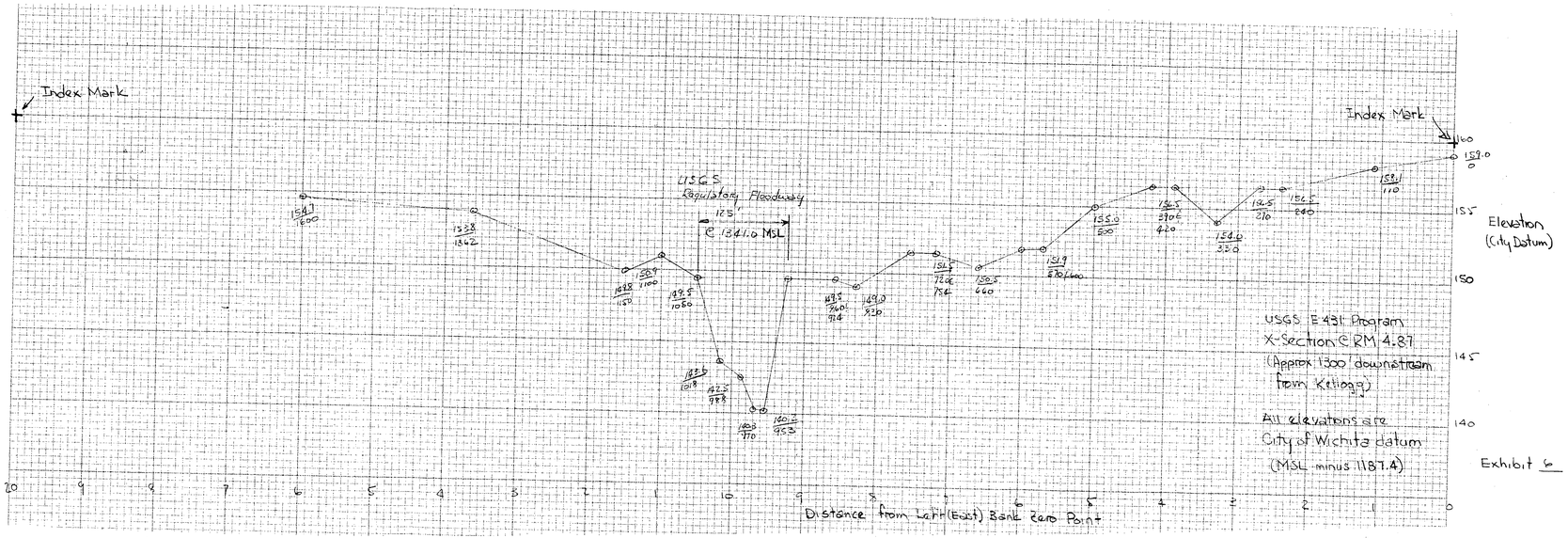
```
201 DRY CREEK WICHITA FLOOD INSURANCE STUDY                    90 10  5 02 20        X                    **ERROR(S)**
                                                                                     B
  3 1268 GBTBR 2   5  1 1328   29820          0        2 1
  5 1269       0  1 13344    0  1 13274   50  1 13274   50  1 13344    0 -9 13344
  6 1270  1  2 020 015  1  2 020 015  1  2 020 015
  3 1271 4.77 4  12  3   60   29820  1  3          1 1 1                        3
  5 1272       0  1 13502  180  1 13505  420  1 13493  660  1 13410  745  1 13418
  5 1273     830  1 13382  950  1 13380 1110  2 13355 1160  3 13358 1640  3 13363
  5 1274    1900  3 13404 1900  3 13504
  6 1275  1  2 020 015  1  2 020 015  1  2 020 015
  3 1276 4.77 5   9  3 1328   29870  1  3
  5 1277       0  1 13602    0  1 13502  950  1 13402 1080  2 13302 1110  2 13276
  5 1278    1160  2 13276 1180  3 13302 1900  3 13402 1900  3 13502
  6 1279 12 14 095 090  2  4 040 035 10 12 095 090
  3 1304  4.87 0  27  3 1328   30320 99 99
  5 1310       0  1 13564    0  1 13464  110  1 13455  240  1 13439  270  1 13439
  5 1311     330  1 13414  390  1 13439  420  1 13439  500  1 13424  570  1 13393
  5 1312     600  1 13393  660  1 13379  720  1 13389  754  1 13389  830  1 13364
  5 1313     860  2 13369  924  2 13369  953  2 13276  970  2 13277  988  2 13299
  5 1314    1018  2 13310 1050  3 13369 1100  3 13383 1150  3 13372 1362  3 13412
  5 1315    1600  3 13421 1600  3 13571
  6 1319 12 14 096 093  2  4 028 025 12 14 095 090
  3 1324  5.10 0  10  3 1335   31520 99 99
  5 1325       0  1 13620    0  1 13520  100  1 13500  900  1 13400 1010  2 13370
  5 1326    1030  2 13346 1045  2 13346 1065  3 13400 2100  3 13480 2100  3 13580
  6 1327  8 10 065 060  1  2 025 020  8 10 065 060
  3 1328 KLGBR 2   5  1 1335   31520          0        2 1
  5 1329       0  1 13382    0  1 13346   15  1 13346   15  1 13382    0 -9 13382
  6 1330  1  2 020 016
  3 1331 5.10 4  10  3  180   31520  1  3          1 1 1                        3
  5 1332       0  1 13606    0  1 13506  700  1 13416 1030  2 13402 1045  3 13402
  5 1333    1300  3 13404 1570  3 13402 1780  3 13410 2100  3 13462 2100  3 13562
  6 1334  1  2 020 015  1  2 020 015  1  2 020 015
  3 1335 5.10 5  10  3 1335   31535  1  3
  5 1336       0  1 13621    0  1 13521  100  1 13501  900  1 13401 1010  1 13371
  5 1337    1030  2 13347 1045  3 13346 1065  3 13401 2100  3 13481 2100  3 13581
  6 1338  8 10 065 060  1  2 025 020  8 10 065 060
  3 1340 5.20 0  12  3 1339   32070 99 99
  5 1341       0  1 13580    0  1 13480  235  1 14341  527  1 14339  580  2 13414
  5 1342     595  2 13384  610  2 13384  630  3 13414  910  3 13523 1100  3 13538
  5 1343    1400  3 13524 1400  3 13624
  6 1344  6  8 040 035  2  4 020 015  6  8 040 035
```

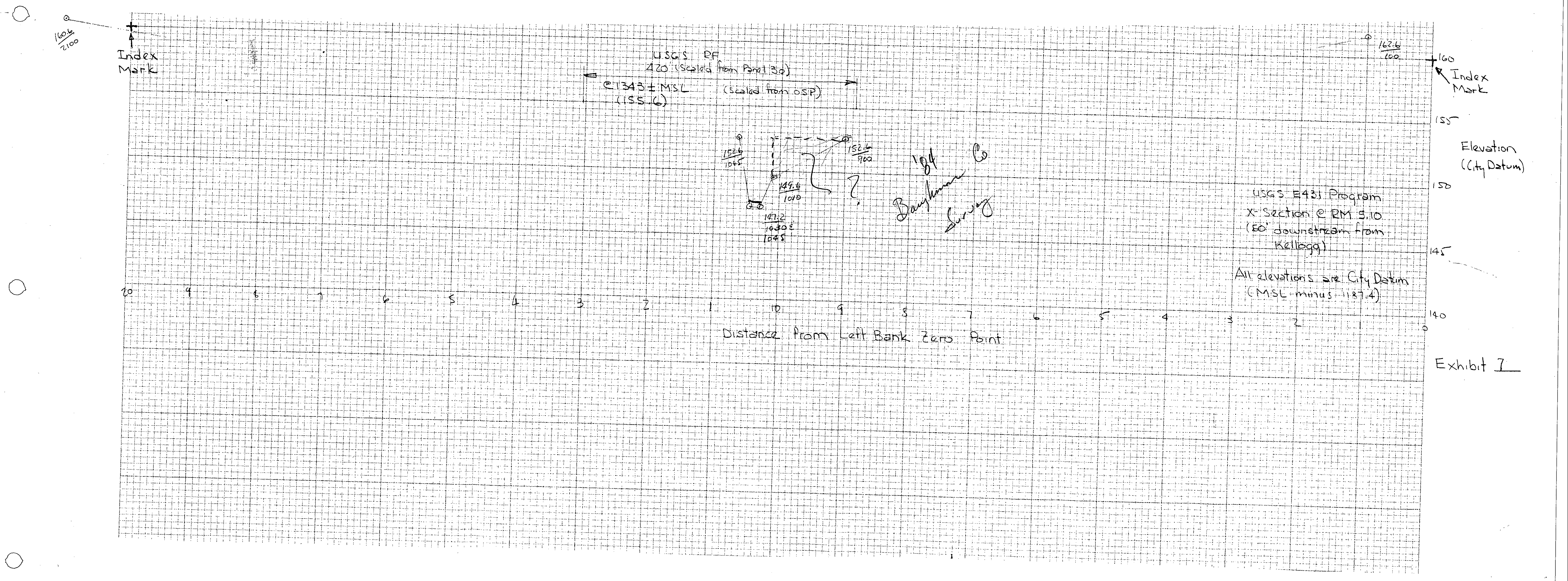
USGS E431 Input @ River Mile 4.87 on Main Branch of Dry Creek approx 1300' downstream from Kellogg

X-Sec @ River Mile 5.10 on East Br 50' downstream from Kellogg


Index Mark
160
155
150
145
140
159.0
0
158.1
110
156.5
240
156.5
270
155.0
500
156.5
390E
420
154.0
350
151.9
570E 600
154.5
720E
754
150.5
660
149.5
960E
924
149.0
830
Elevation
(City Datum)
USGS E431 Program
X-Section @ RM 4.87
(Approx 1300' downstream
from Ketlogg)
All elevations are
City of Wichita datum
(MSL minus 1187.4)
Exhibit 6
8
7
6
5
4
3
2
1
0
stance from Left (East) Bank Zero Point


Index Mark
160
159.0
0
158.1
110
155
156.5
390E
420
155.0
500
154.0
350
156.5
270
156.5
240
Elevation
(City Datum)
150
151.9
570E600
151.5
720E
750
150.5
460
149.5
960E
924
149.0
930
145
USGS E431 Program
X-Section @ RM 4.87
(Approx 1300' downstream
from Kellogg)
All elevations are
City of Wichita datum
(MSL minus 1187.4)
140
Exhibit 6
tance from Left (East) Bank Zero Point
6
5
4
3
2
1
0


Index Mark
USGS
Regulatory Floodway
125'
@ 1341.0 MSL
Index Mark
160
155
150
145
140
Elevation
(City Datum)
USGS E431 Program
X-Section @ RM 4.87
(Approx 1300' downstream
from Kellogg)
All elevations are
City of Wichita datum
(MSL minus 1187.4)
Exhibit 6
Distance from Left (East) Bank Zero Point



160.6 / 2100
Index Mark
USGS RF
420 (Scaled from Panel 130)
@1343± MSL (Scaled from OSP)
(155.6)
162.6 / 100
160
Index Mark
155
Elevation (City Datum)
150.6 / 1065
152.6 / 900
149.6 / 1010
147.2 / 1030± / 1045
'84 Baughman Co Survey
150
USGS E431 Program
X-Section @ RM 3.10
(60' downstream from Kellogg)
145
All elevations are City Datum
(MSL minus 1187.4)
140
Distance From Left Bank Zero Point

Exhibit 7

SWD Form 263-R
Rev 16 Nov 51

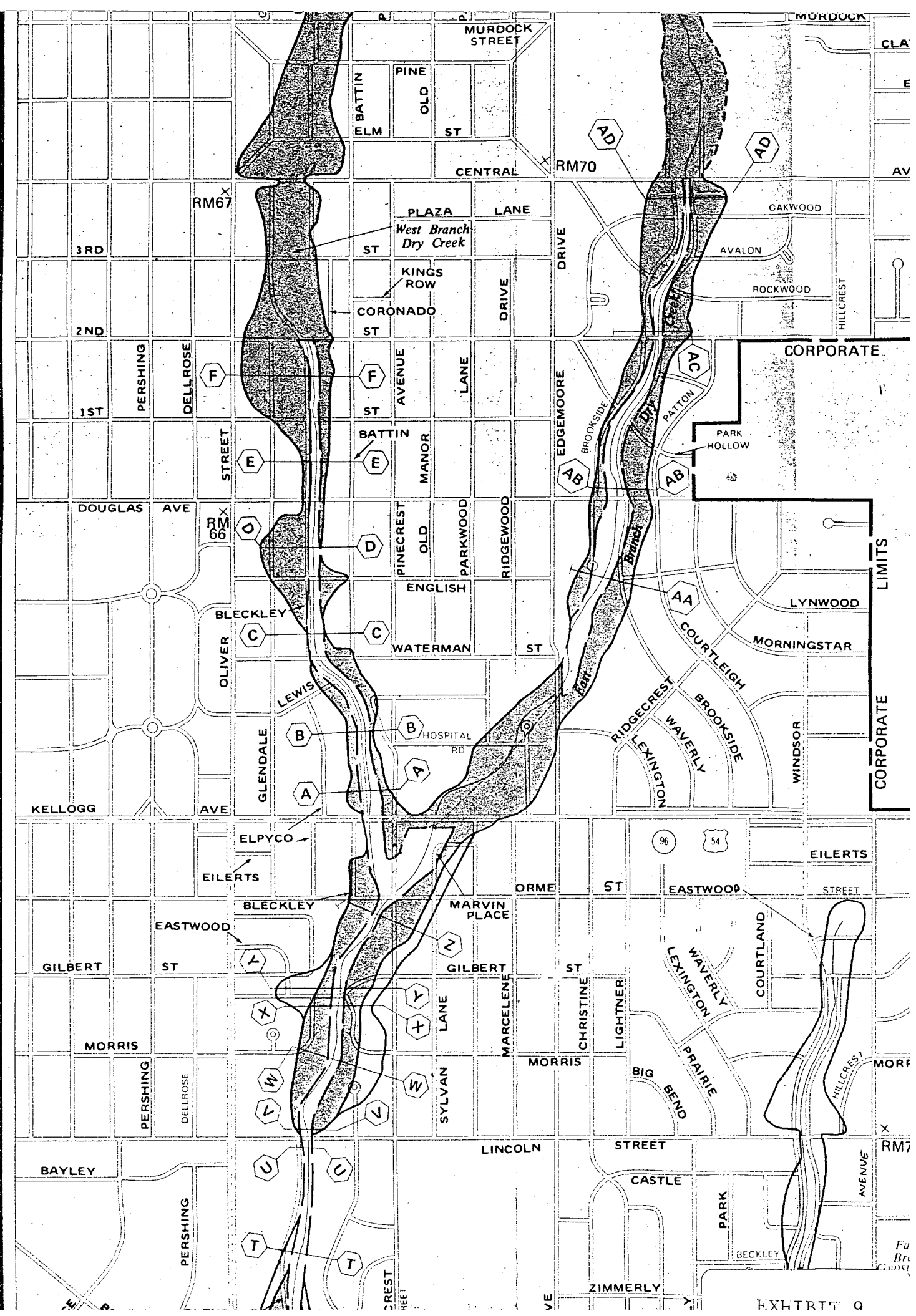
SEC. NO. STATIONING

COMPUTATION SHEET

Subject DRY CREEK (HEC PROGRAM) File

Project WICHITA, KANSAS Computed by SEJ Date 11/4/84 Checked By Date Book No

	SEC NO.	STA	R.M.	NAT. 100YR.	INCR BT ENCR	L.B. STA	L.B. ENCR.	R.B. STA.	R.B. ENCR.	Floodway width
MT. VERNON	36	130+70	2.48	1316.8	1.0	2118	2118	2180.1	2180	
	37	131+20	2.49	1316.9	.9	2118	2118	2181	2181	
	38	140+90	2.67	1317.4	.9	1874	1722	1893	2003	
	39	166+25	3.15	1319.7	.8	1625	1625	1670	1685	
	40	185+35	3.51	1324.2	1.1	2734	2400	2787	3100	
OLIVER	41	185+85	3.52	1324.2	.6	2734	2734	2785.1	2785	
	42	186+35	3.53	1324.6	.9	2734	2734	2787	2787	
	43	189+50	3.59	1325.3	.8	2470	2470	2523	2523	
HARRY	44	190+00	3.60	1325.2	.9	2470	2470	2521.1	2521	
	45	190+50	3.61	1325.6	.7	2470	2470	2523	2523	
	46	192+25	3.64	1327.2	.1	535	535	615	647	
	47	199+30	3.77	1328.4	1.0	2248	2128	2285	2285	
BOSTON	48	200+20	3.79	1328.4	2.0	1862	1862	1913.1	1913	
	49	201+10	3.81	1329.7	1.4	2150	2150	2250	2250	
	50	210+65	3.99	1332.1	.6	2065	2065	2185	2185	
	51	217+15	4.11	1334.0	.2	2682	2682	2727	2727	
LINCOLN	52	217+65	4.12	1334.0	.2	2682	2682	2725.1	2725.1	
	53	218+15	4.13	1335.3	1.0	2682	2682	2727	2727	
C	54	229+60	4.35	1338.4	1.0	2108	2099	2159	2278	
GILBERT	55	230+10	4.36	1339.1	1.2	2108	2108	2157.1	2480	
	56	230+60	4.37	1339.1	1.1	2108	2094	2159	2495	
	57	235+40	4.46	1339.8	1.2	1925	1925	2050	2050	
	58	247+90	4.70	1341.9	1.0	2030	2030	2045	2527	497'
KELLOGG	59	248+40	4.71	1391.9	1.0	2030	1915	2043.1	2532	
	60	248+90	4.72	1343.3	1.0	2030	1915	2045	2532	
	61	253+90	4.81	1345.1	.2	1290	1290	1528	1528	
	62	258+00	4.89	1347.2	.6	1290	1290	1528	1528	
	63	260+90	4.94	1347.3	.8	1205	1205	1282	1282	
	64	262+75	4.98	1348.8	.2	1260	1100	1285	1500	
EDGEMOOR	65	263+25	4.99	1348.8	1.0	1260	1203	1283.1	1387	
	66	263+45	5.00	1349.0	1.0	1260	1203	1285	1387	
	67	273+15	5.17	1351.3	0.7	1593	1593	1655	1655	
	68	280+40	5.31	1354.0	1.1	2326	2100	2360	2570	
DOUGLAS	69	280+90	5.32	1354.7	0.9	2326	2309	2358.1	2422	Exhibit
	70	281+40	5.33	1354.7	0.7	2326	2326	2360	2360	8


MURDOCK STREET
BATTIN
PINE
OLD
ELM
ST
CENTRAL
RM70
RM67
PLAZA
LANE
West Branch Dry Creek
3RD
ST
KINGS ROW
CORONADO
2ND
ST
DRIVE
AD
AD
OAKWOOD
AVALON
ROCKWOOD
HILLCREST
CORPORATE
AC
PATTON
PARK HOLLOW
EDGEMOORE
BROOKSIDE
Dry
AB
AB
1ST
PERSHING
DELLROSE
F
F
AVENUE
LANE
ST
STREET
BATTIN
E
E
MANOR
DOUGLAS
AVE
RM66
D
D
PINECREST
OLD
PARKWOOD
RIDGEWOOD
ENGLISH
East Branch
AA
LYNWOOD
LIMITS
BLECKLEY
C
C
WATERMAN
ST
COURTLEIGH
MORNINGSTAR
OLIVER
LEWIS
B
B
HOSPITAL
RD
RIDGECREST
WAVERLY
BROOKSIDE
LEXINGTON
WINDSOR
CORPORATE
A
A
KELLOGG
AVE
GLENDALE
ELPYCO
96
54
EILERTS
EILERTS
ORME
ST
EASTWOOD
STREET
BLECKLEY
MARVIN PLACE
N
EASTWOOD
Y
GILBERT
ST
GILBERT
ST
WAVERLY
LEXINGTON
COURTLAND
X
Y
X
MORRIS
LANE
MARCELENE
CHRISTINE
LIGHTNER
MORRIS
BIG
BEND
PRAIRIE
HILLCREST
W
W
V
V
PERSHING
DELLROSE
SYLVAN
LINCOLN
STREET
RM7
U
U
BAYLEY
CASTLE
PARK
AVENUE
T
T
PERSHING
BECKLEY
ZIMMERLY
EXHIBIT 9

FOLD

OCT 1983

04P

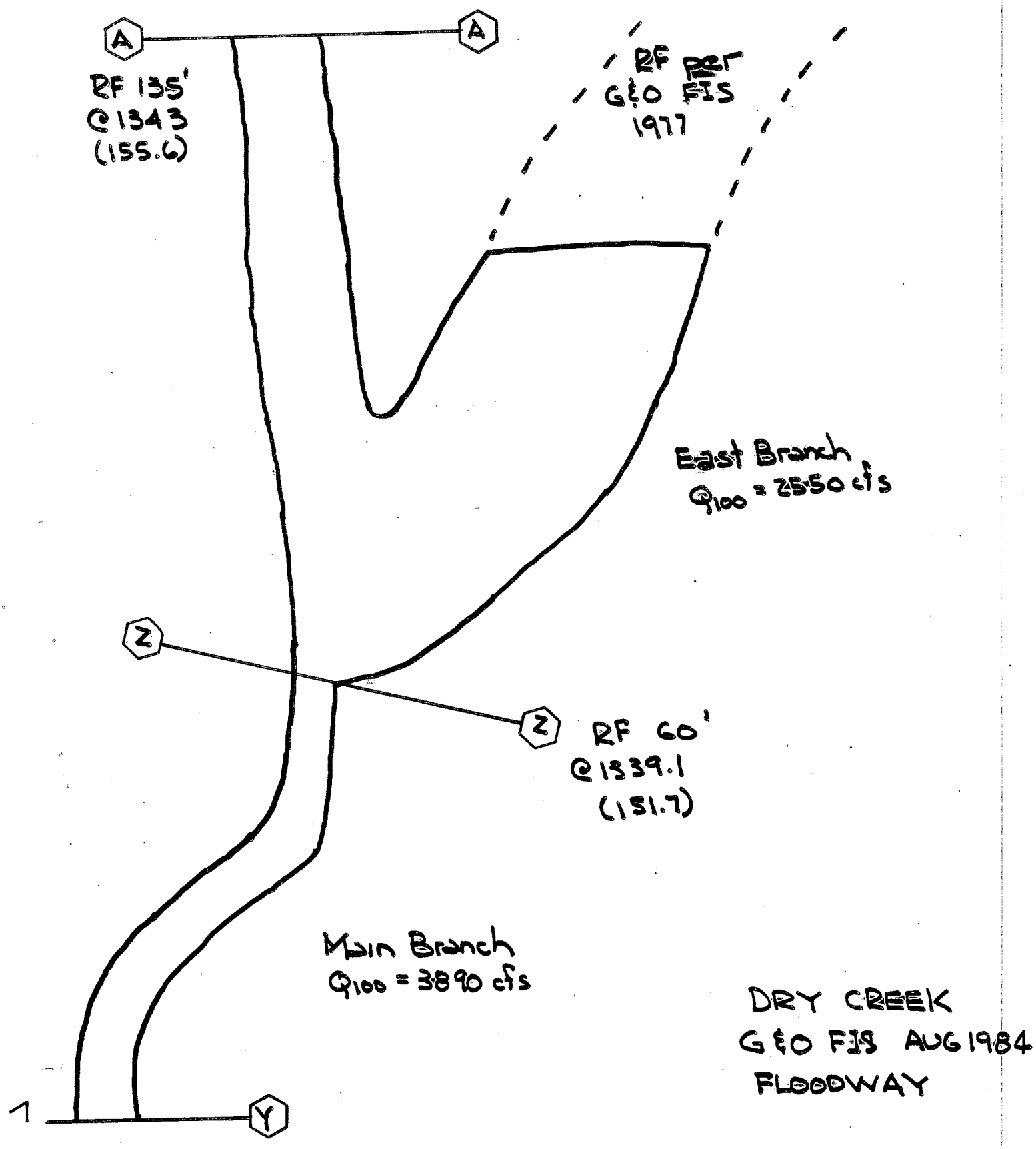
FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF WICHITA, KS

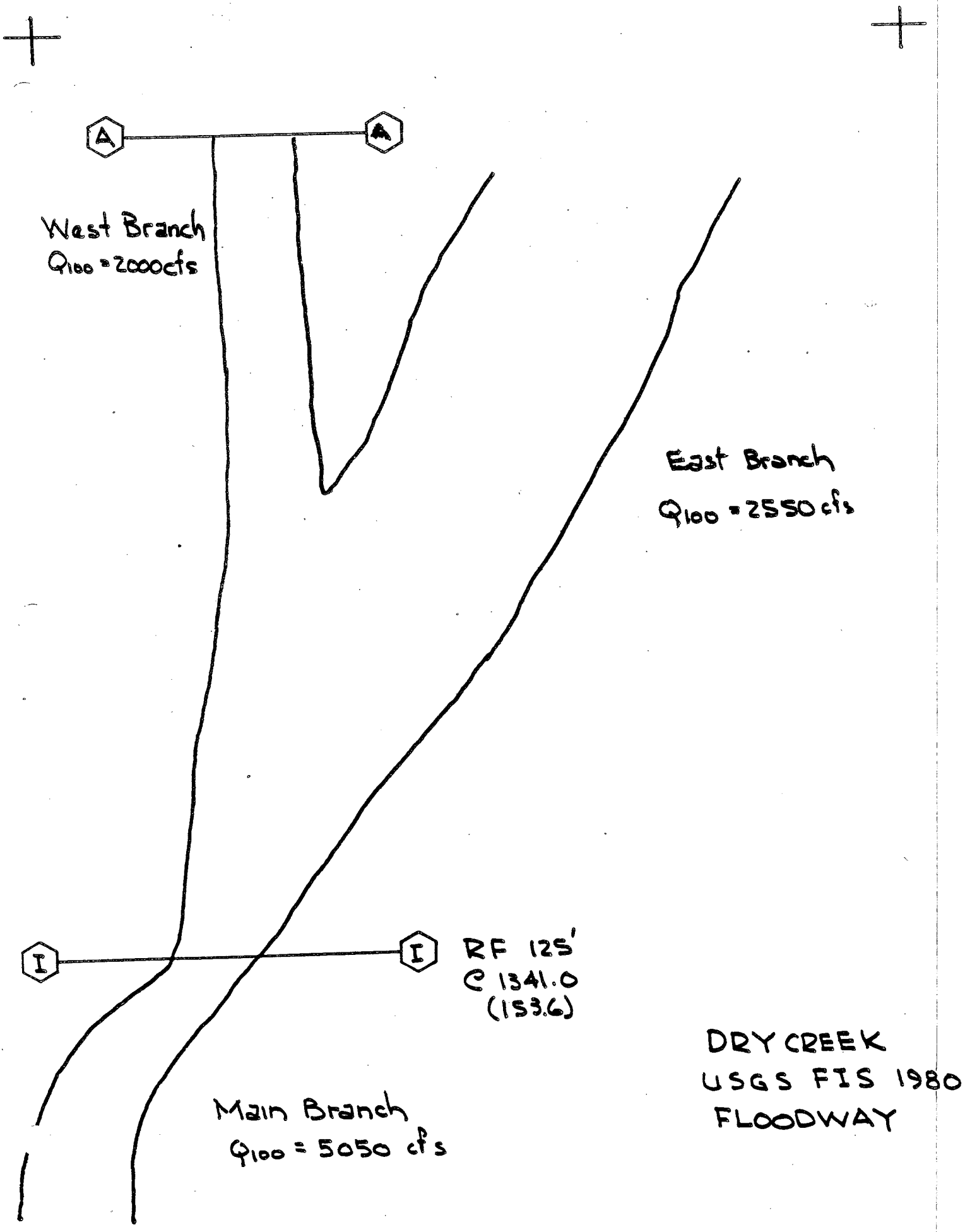
(SEDGWICK CO.)

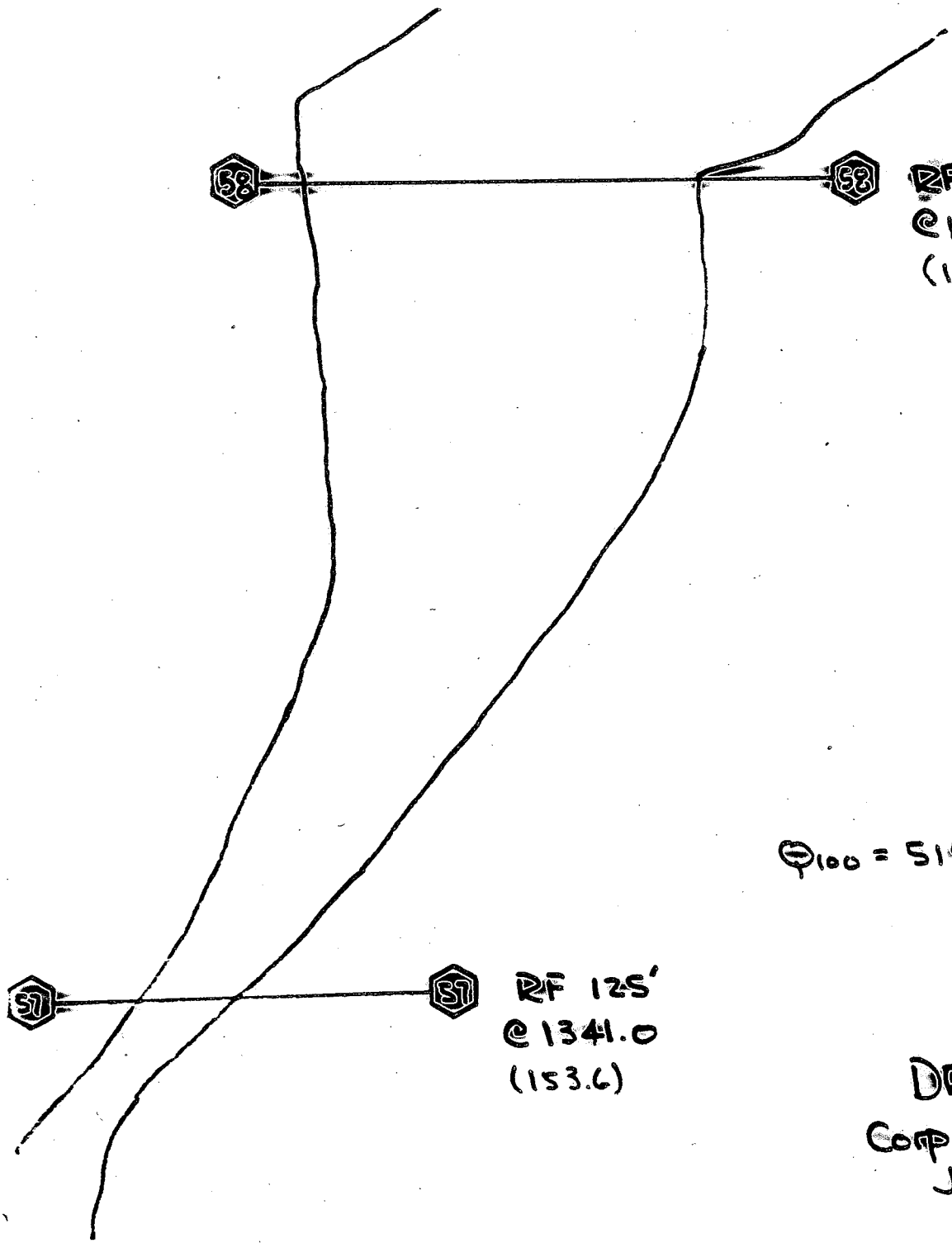
FLOOD PROFILES

DRY CREEK — EAST BRANCH DRY CREEK



DRY CREEK
G&O FIS AUG 1984
FLOODWAY


A
A
West Branch
Q100 = 2000cfs
East Branch
Q100 = 2550 cfs
I
I
RF 125'
℄ 1341.0
(153.6)
Main Branch
Q100 = 5050 cfs
DRY CREEK
USGS FIS 1980
FLOODWAY



DRY CREEK
Corps Floodway
June 1974

Exhibit 11

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
DRY CREEK								
V	14,780	94	683	6.1	1335.5	1335.5	1335.5	0.0
W	15,430	95	668	6.2	1336.5	1336.5	1336.5	0.0
X	15,919	100	641	6.5	1336.8	1336.8	1337.2	0.4
Y	16,081	103	566	7.4	1336.9	1336.9	1337.5	0.6
Z	16,731	60	440	8.9	1338.9	1338.9	1339.1	0.2
EAST BRANCH DRY CREEK								
AA	20,163	62	203	11.3	1351.3	1351.3	1352.0	0.7
AB	21,008	80	226	9.5	1354.7	1354.7	1355.4	0.7
AC	22,380	150	376	5.7	1359.9	1359.9	1360.9	1.0
AD	23,595	100	129	13.6	1364.4	1364.4	1364.4	0.0

[1] FEET ABOVE MOUTH

TABLE 4

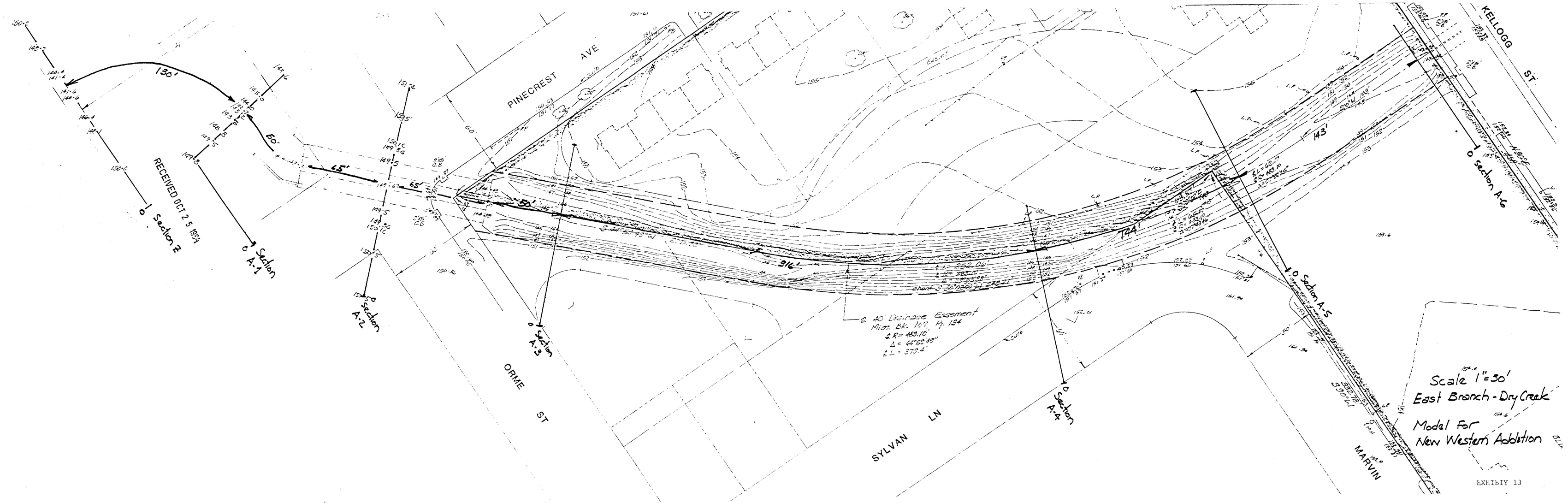
FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF WICHITA, KS

(SEDGWICK CO.)

FLOODWAY DATA

DRY CREEK — EAST BRANCH DRY CREEK


PINECREST AVE
KELLOGG ST
ORME ST
SYLVAN LN
MARVIN
RECEIVED OCT 2 5 1974
Section Z
Section A-1
Section A-2
Section A-3
Section A-4
Section A-5
Section A-6
130'
65'
65'
50'
60'
316'
124'
143'
Existing 10' Drainage Easement
Misc. Bk. 147, Pg. 134
R = 489.10'
Δ = 44°50'49"
L = 382.64'
Existing 10' Drainage Easement
Misc. Bk. 147, Pg. 134
R = 489.10'
Δ = 44°50'49"
L = 379.4'
Scale 1"=30'
East Branch - Dry Creek
Model For
New Western Addition
EXHIBIT 13

FOLD TO HERE

HEC-2 WATER SURFACE PROFILE CALCULATIONS

Run 1- Existing Sections

DISCHARGE 100 YR 2550 cfs STREAM East Branch - Dry Creek PROJECT Floodway Plan for New Western Addition

Note: All elevations are City of Wichita datum (MSL minus 1187.4)

RM/ X-SEC	Reach 1 Length	Flowline 2 Elev.	Trial W.S. Elev 3	Area 4 'A'	5 R^2/3	6 n	7 K	8 K_T	9 Sf	10 hf	11 K_A/K_A+10	12 α	13 V	14 V²/2g	15 α(V²/2g)	16 Δhv	17 ho	18 H	Final W.S. Elev.	20 Remarks
1	The City of Wichita Flood Insurance Study by Greenhorne & O'Mara ends the Main Branch of Dry Creek Analysis @ Section Z w/Q100 = 3890 cfs @ Elev 1339.1																		MSL-Table 4, FIS	
Z 2		141.4		416	3.56	.035	62,877					1	9.55	1.36	1.36				151.7 =	1339.1 MSL
3																				
A-1 4	130	142.7	152.6	382	3.72	.035	60,333	61,605	.00171	.22		1	6.68	.69	.69	+.67	.07	+.96	152.66	ΔH=+.96 OK
5																				
A-2 6	115	143.85	152.7	311	1.70	.015	52,317	56,355	.00205	.24		1	8.20	1.04	1.04	−.35	.11	0	152.66	ΔH=-.04 OK
7																				
A-3 8	115	144.0	153.0	296	3.20	.035	40,215	46,296	.00303	.35		1	8.61	1.15	1.15	−.11	.03	+.27	152.93	ΔH=-.07 OK
9																				
A-4 10	316	145.0	154.1	284	3.38	.035	40,755	40,485	.00397	1.25		1	8.98	1.25	1.25	-.10	.03	+1.18	154.11	ΔH=+.01 OK
11																				
A-5 12	144	146.0	155.0	336	2.75	.035	39,230	39,993	.00407	.59		1	7.59	.89	.89	+.36	.04	+.99	155.10	ΔH=+.10 OK
13																				
A-6 14	143	147.0	155.5	316	2.65	.035	35,553	37,392	.00465	.67		1	8.07	1.01	1.01	−.12	.04	+.59	155.69	ΔH=+.19 OK
15																			(156.5 Min Pad)	
16	Section A-6 is @ same location as Corps of Engineers Section 58 which had a Floodway Elevation of 1349.1 MSL = 155.5 City Datum																			
17																			1342.9	
18																				
19																				
20																				
21																				
22																				
23																				
24																				
25																				
26																				
27																				
28																				
29																				
30																				
31																				

EXHIBIT 14

$K = \frac{C_m}{n} A R^{2/3}$ $C_m = 1.486$ $R_T = \frac{1}{2}(K_{us} + K_{ds})$ $S_f = (Q/K_T)^2$ $h_f = L S_f$ $\alpha = (A_T)^2 \Sigma (k^3/A^2) \div (K_T)^3$ $V = Q/A$ $\Delta h_v = \alpha(V^2/2g)_{ds} - \alpha(V^2/2g)_{us}$ $h_o = C_e(-\Delta h_v)$ or $C_c(+\Delta h_v)$ $H = h_f + \Delta h_v + h_o$

EFFICIENCY LINE 22-211

FOLD TO HERE

HEC-2 WATER SURFACE PROFILE CALCULATIONS

Run 2
Improved Section & Bridge @ A-5

DISCHARGE 100 YR = 2550 cfs STREAM East Branch of Dry Creek PROJECT Floodway Plan for New Western Addition

Note: All elevations are City of Wichita datum (MSL minus 1187.4)

RM/ X-SEC	1 Reach Length	2 Flowline Elev.	3 Trial W.S. Elev.	4 Area 'A'	5 $R^{2/3}$	6 'n'	7 K	8 Kr	9 'Sf'	10 'hf'	11 K/ΔL×10⁶	12 'α'	13 'V'	14 $V^2/2g$	15 α($V^2/2g$)	16 Δhv	17 h_o	18 H	Final W.S. Elev.	Remarks
																			1339.1	
Z 2		141.4		416	3.56	.035	62,817					1	9.35	1.36	1.36				151.7	See Table 4 GFO FIS
A-1 4	130	142.7	152.6	382	3.72	.035	60,333	61,605	.00171	.22		1	6.68	.69	.69	+.67	.07	+.96	152.66	ΔH = +.06 OK
5																				
A-2 6	115	143.85	152.7	311	1.70	.015	52,377	56,355	.00205	.24		1	8.20	1.04	1.04	-.35	.11	0	152.66	ΔH = -.04 OK
7																				
A-3 8	115	144.0	153.0	296	3.20	.035	40,215	46,296	.00303	.35		1	8.61	1.15	1.15	-.11	.03	+.27	152.93	ΔH = -.07 OK
9																				
A-4 10	316	145.0	154.1	284	3.38	.055	40,755	40,485	.00397	1.25		1	8.98	1.25	1.25	-.10	.03	+1.18	154.11	ΔH = +.9 OK
11																				
* A-5 12	144	146.0	155.0	310	1.59	.018	40,781	40,743	.00392	.56		1	8.23	1.05	1.05	+.20	.02	+.78	154.89	ΔH = -.11 OK
13																				
A-6 14	143	147.0	155.5	316	2.65	.035	35,553	38,142	.00447	.64		1	8.07	1.01	1.01	+.04	—	+.68	155.57	ΔH = +.07 OK
15																				

16 * Channel @ A-5 improved; lined w/ bag rip-rap and spanned w/ private bridge.

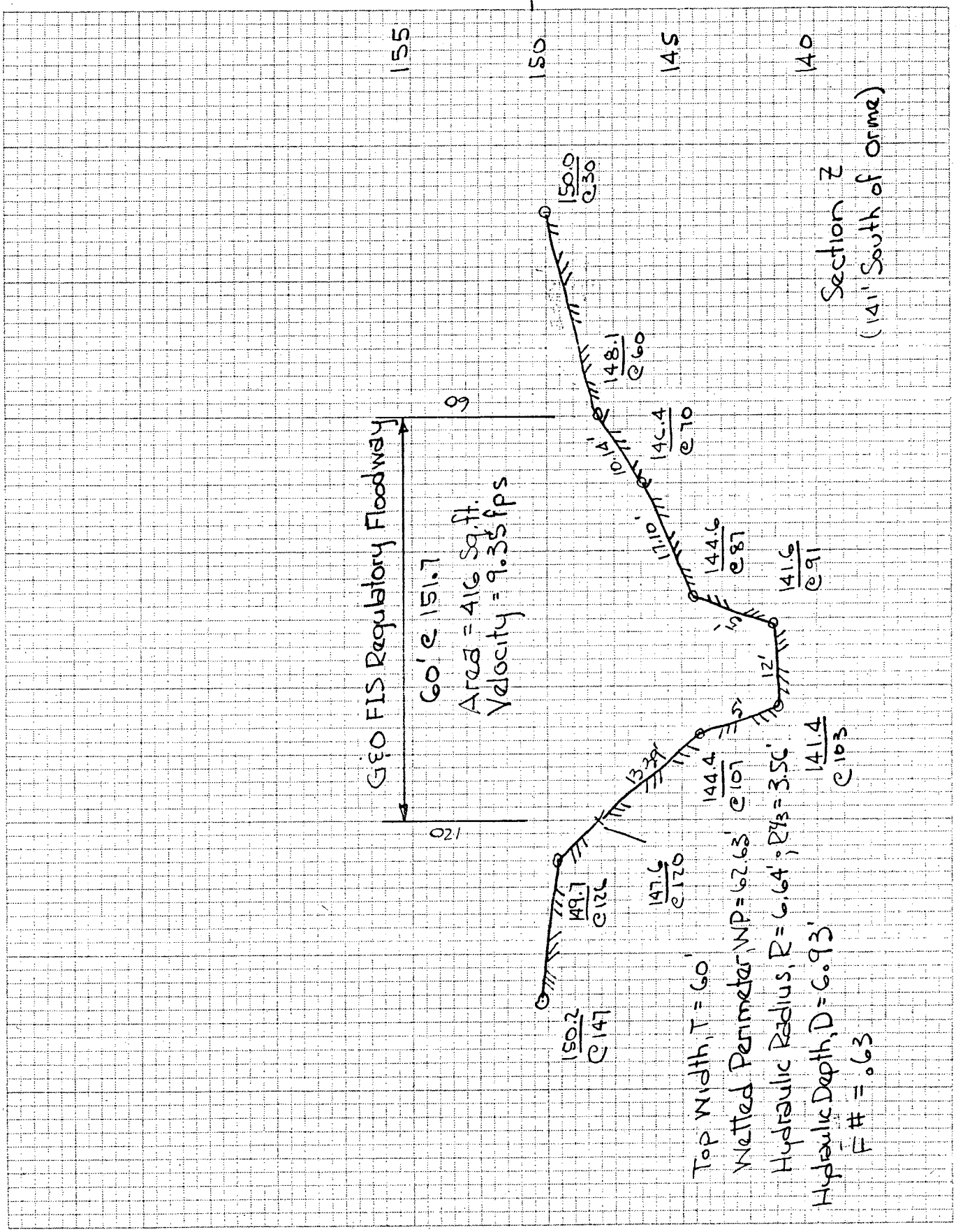
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

EXHIBIT 15

$K = \frac{C_m}{n} A R^{2/3}$ $C_m = 1.486$ $R_T = \frac{1}{2}(K_{us} + K_{ds})$ $S_f = (Q/R_T)^2$ $h_f = L S_f$ $\alpha = (A_T)^2 \varepsilon (k^3/A^3) \div (K_T)^3$ $V = Q/A$ $\Delta hv = \alpha(V^2/2g)_{ds} - \alpha(V^2/2g)_{us}$ $h_o = C_e(-\Delta hv)$ or $C_c(+\Delta hv)$ $H = h_f + \Delta hv + h_o$

East Branch of Dry Creek

DATE Nov 1984 PAGE 1 of 8 Floodway Encroachment Plan for New Western Addn



DATE Nov 1984 PAGE 2 of 8

East Branch of Dry Creek:

Encroachment Plan for New Western Addn

Exhibit K

East Branch of Dry Creek

Encroachment Plan for New Western Addn

DATE Nov, 1984

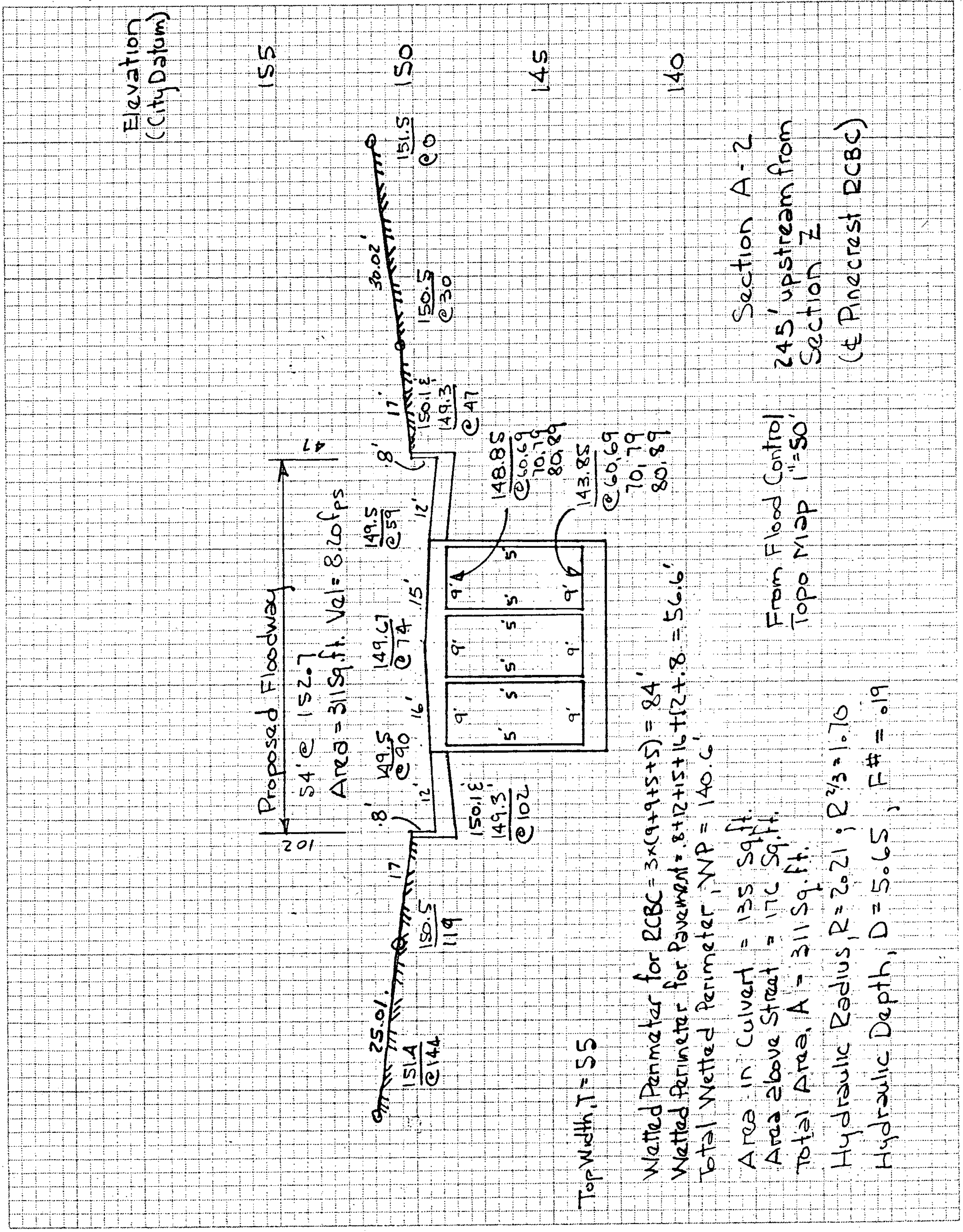
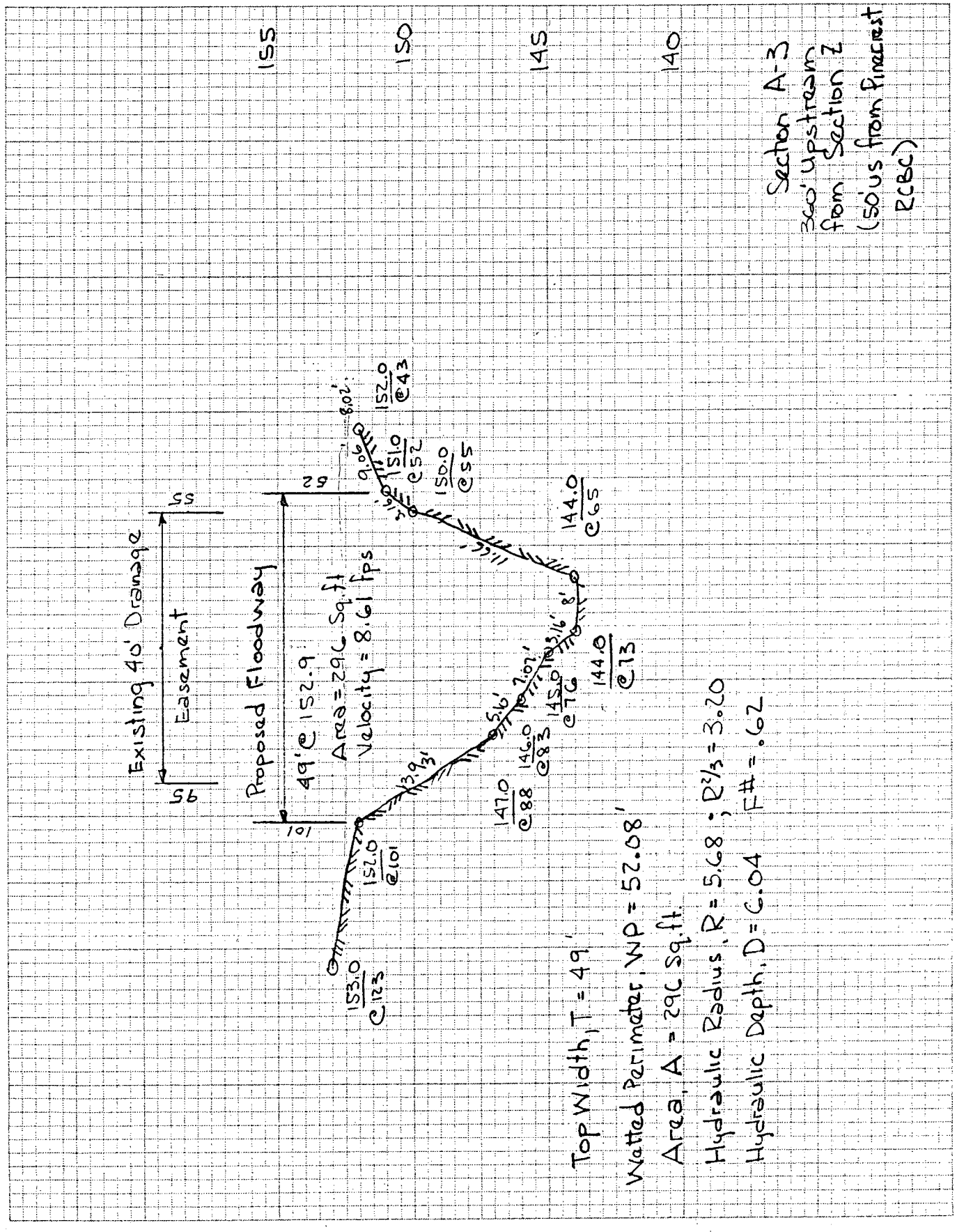


Exhibit 16

East Branch of Dry Creek

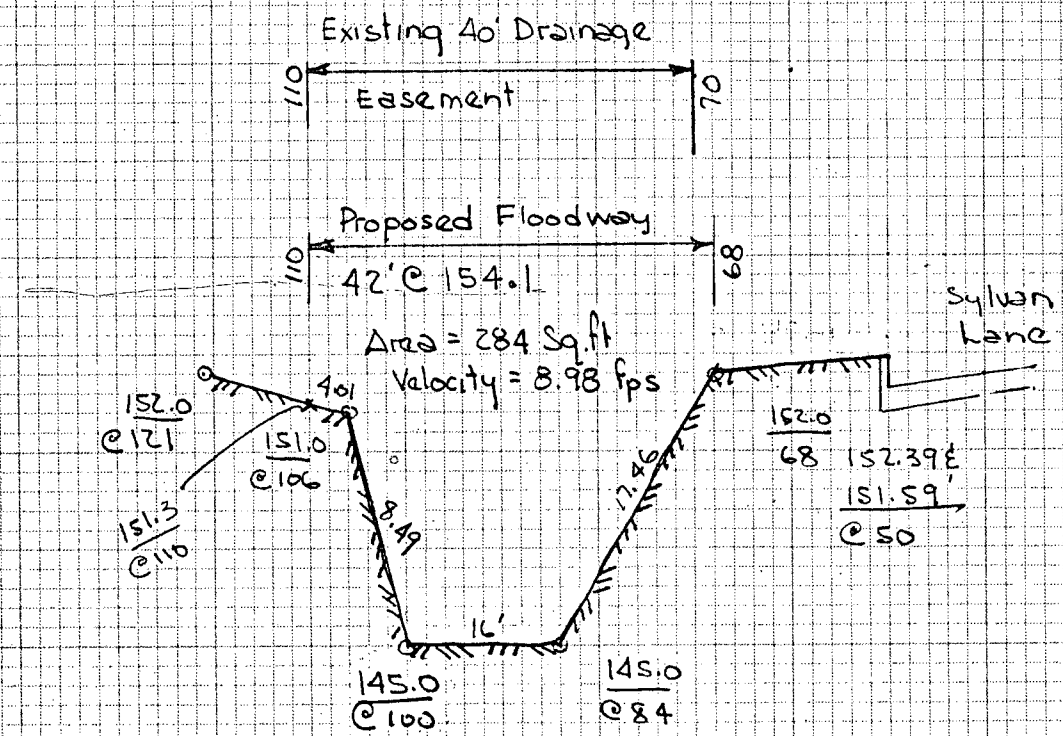
DATE Nov 1984 PAGE 4 of 8 Encroachment Plan for New Western Addn



East Branch of Dry Creek

Encroachment Plan for New Western Addition

DATE Nov 1984 PAGE 5 of 8



Elevation (City Datum)

155

150

145

140

Top Width, W = 42'

Wetted Perimeter = 45.96'

Area, A, = 284 Sq.ft.

Hydraulic Radius, R = 6.17 ; $R^{2/3}$ = 3.38

Hydraulic Depth, D = 6.76 F# = .61

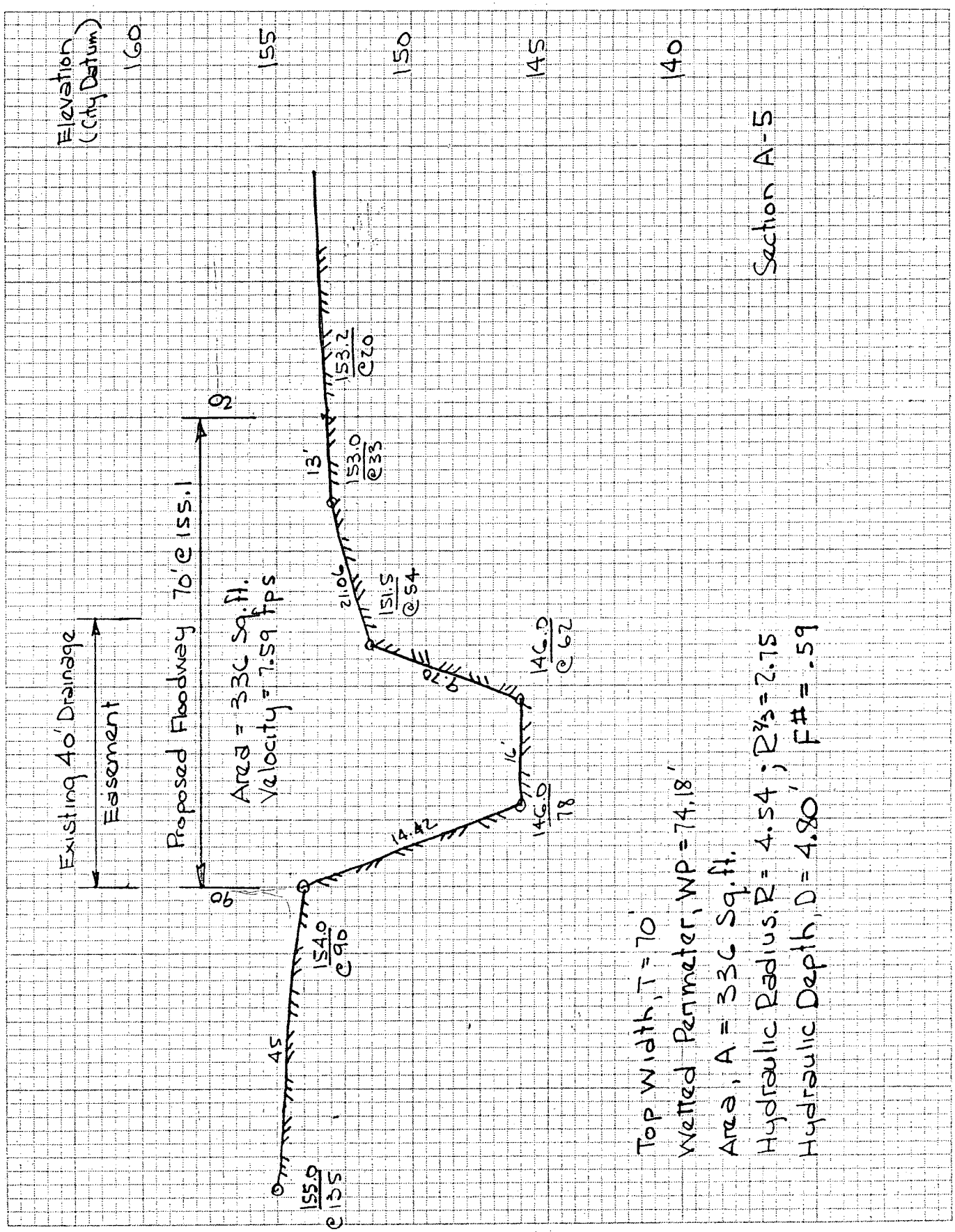
Section A-4
676' upstream from Section Z

140 120 100 80 60 40 20 0

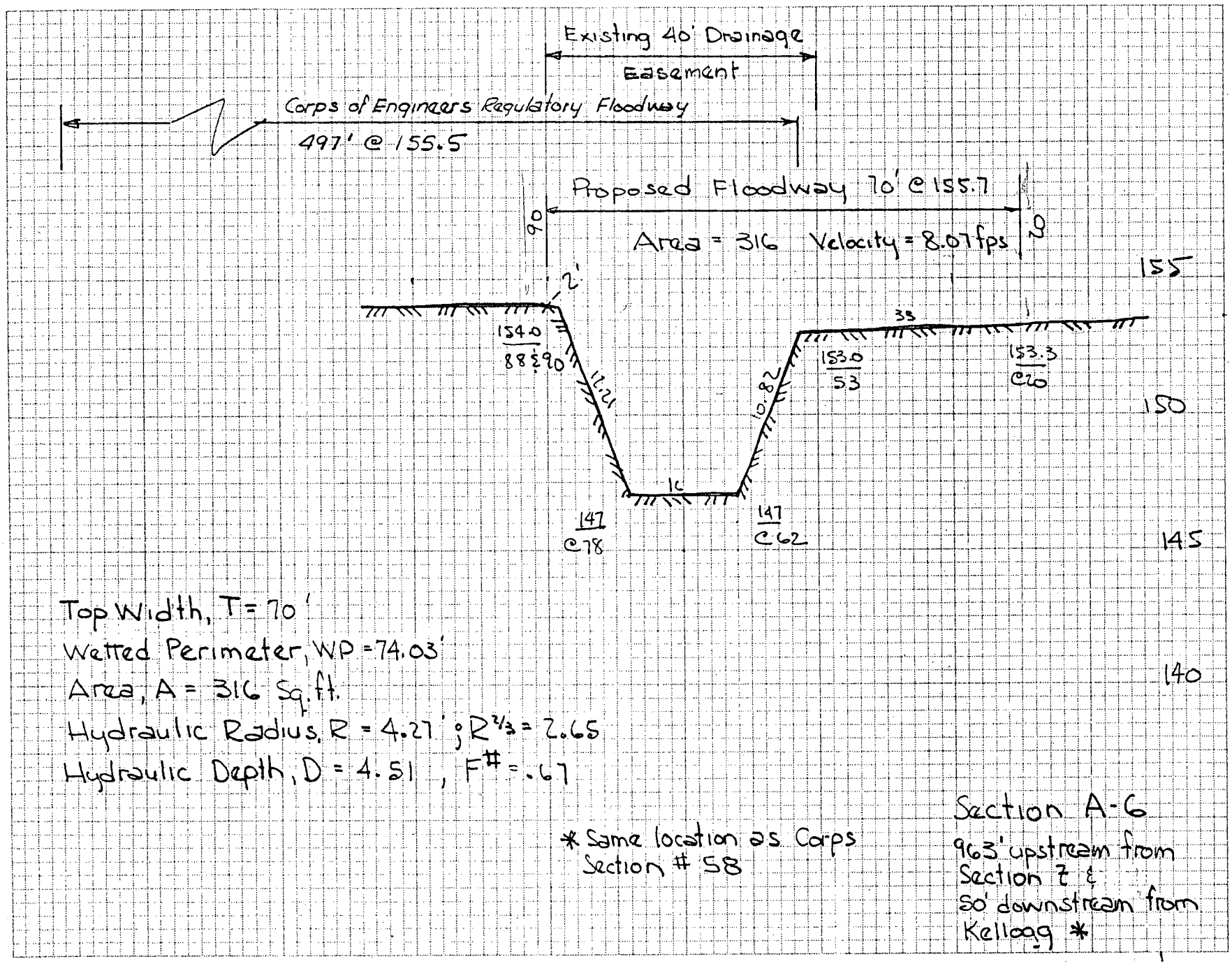
Distance from Left Branch Zero Point - See Model

East Branch of Dry Creek

DATE Dec 1984 PAGE 6 of 8 Encroachment Plan for New Western Addn



Exhibit



Top Width, T = 70'
Wetted Perimeter, WP = 74.03'
Area, A = 316 Sq. ft.
Hydraulic Radius, R = 4.27' ; $R^{2/3}$ = 2.65
Hydraulic Depth, D = 4.51 , $F^{\#}$ = .67

* Same location as Corps Section # 58

Section A-6
963' upstream from Section 7 &
50' downstream from Kellogg *

East Branch of Dry Creek

Encroachment Plan for New Western Addition

DATE Dec 1984 PAGE 7 of 8

Exhibit 16

DATE Dec 1984 PAGE 8 of 8

East Branch of Dry Creek

Encroachment Plan for New Western Addition

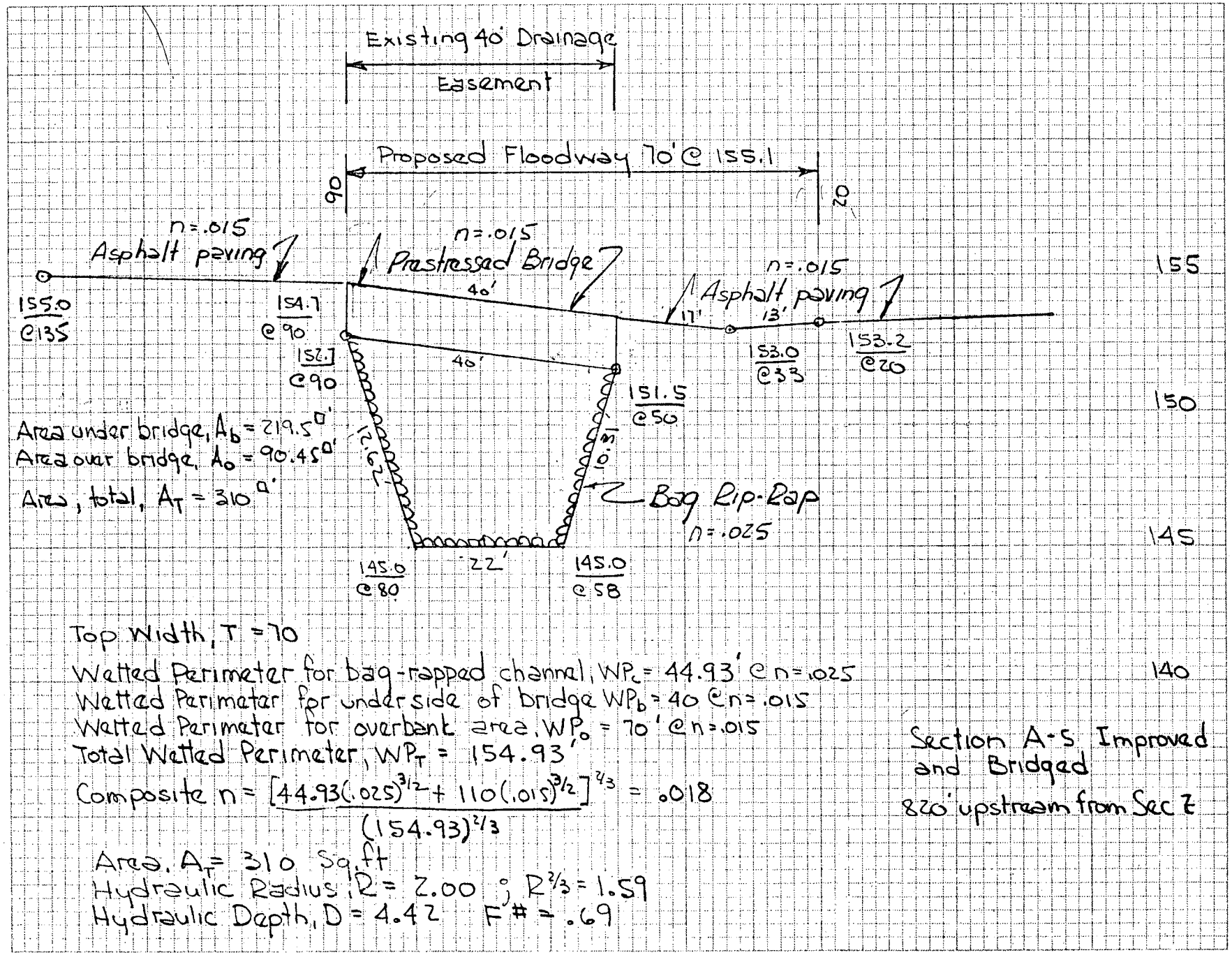


Exhibit C

EAST BRANCH OF DRY CREEK
FLOODWAY ENCROACHMENT PLAN FOR
NEW WESTERN ADDITION

Wichita FIS
SECTION Z

	1.	
Elev	151.7	
	151.7	
	120.	
	151.7	
	60.	
	148.1	
	60.	
	146.4	
	70.	
	144.6	
	87.	
	141.6	
	91.	
	141.4	
	103.	
	144.4	
	107.	
	147.6	
	120.	
	0.	
	2.	
Area	416.	
	416.	+
	62.63 WP	=
6.642184257		
6.642184257 R		Y×
	0.67	=
3.555889983 R2/3		

SECTION A-1

	1.	
		CLR
Elev	152.6	
	152.6	
	152.	
	152.6	
	98.	
	148.8	
	98.	
	143.8	
	108.	
	143.2	
	114.	
	142.7	
	116.	
	144.	
	120.	
	145.	
	130.	
	148.6	
	152.	
	0.	
	2.	
Area	382.5	
		CLR
	53.66 WP	1/X
.0186358554		
.0186358554 R		×
	382.	=
7.118896757 R		
7.118896757		Y×
	0.67	=
3.724916188 R2/3		

SECTION A-2

	1.	
Elev	152.7	
	152.7	
	103.	
	152.7	
	47.	
	149.3	
	47.	
	149.5	
	59.	
	149.67	
	74.	
	149.5	
	90.	
	149.3	
	102.	
	0.	
	2.	
Area$_s$	175.765	
	3.	(
		CLR
	0.	(
	3.	×
	45.	)
Area$_b$	135.	
	135.	+
	175.765	=
Area	310.765	
Total	310.765	÷
	140.6 WP	=
2.210277383 R		
2.210277383		Y×
	0.67	=
1.70129389 R2/3		

EAST BRANCH OF DRY CREEK
FLOODWAY ENCROACHMENT PLAN FOR
NEW WESTERN ADDITION

SECTION A-3

	1.	
Elev	153.	
	153.	
	101.	
	153.	
	52.	
	151.	
	52.	
	150.	
	55.	
	144.	
	65.	
	144.	
	73.	
	145.	
	76.	
	146.	
	63.	
	147.	
	88.	
	152.	
	101.	
	0.	
	2.	
Area	295.5	
	52.08	WP 1/>
.0192012289		
.0192012289		×
	296.	=
5.683563748		R
5.683563748		Y×
	0.67	=
3.203287307		R2/3

SECTION A-4

Elev	154.1	
	154.1	
	110.	
	154.1	
	68.	
	152.	
	68.	
	145.	
	84.	
	145.	
	100.	
	151.	
	106.	
	151.3	
	110.	
	0.	
	2.	
Area	283.6	
	283.6	÷
	45.96	WP =
6.170583116		R
6.170583116		Y×
	0.67	=
3.384687351		R2/3

SECTION A-5

	1.	
Elev	155.	
	155.	
	90.	
	155.	
	20.	
	153.2	
	20.	
	153.	
	33.	
	151.5	
	54.	
	146.	
	62.	
	146.	
	78.	
	154.	
	90.	
	0.	
	2.	
Area	336.45	
	336.45	÷
	74.18	WP =
4.535589108		R
4.535589108		Y×
	0.67	=
2.75387727		R2/3

EAST BRANCH OF DRY CREEK
FLOODWAY ENCROACHMENT PLAN FOR
NEW WESTERN ADDITION

SECTION A-6

	1.	
Elev	155.5	
	155.5	
	90.	
	155.5	
	20.	
	153.3	
	20.	
	153.	
	53.	
	147.	
	62.	
	147.	
	78.	
	154.	
	88.	
	154.	
	90.	
	0.	
	2.	
Area	316.05	
	316.05	+
	74.	WP =
4.270945946		R
4.270945946		Y×
	0.67	=
2.645155027		R2/3

SECTION A-5
IMPROVED

	1.	
Elev	152.7	
	90.	
	151.5	
	50.	
	145.	
	58.	
	145.	
	80.	
	0.	
	2.	
Area	219.5	
under bridge		
	1.	
Elev	155.	
	155.	
	90.	
	155.	
	20.	
	153.2	
	20.	
	153.	
	33.	
	153.5	
	50.	
	154.7	
	90.	
	0.	
Overflow	2.	
Area	90.45	
	90.45	+
	219.5	=
Total	309.95	Area
		CLR
	310.	÷
	154.93	WP =
2.000903634		R
2.000903634		Y×
	0.67	=
1.591554577		R2/3
1.591554577		×

East Branch of Dry Creek

DATE Dec 1984 PAGE 1 of 1

Floodway Encroachment Plan - New Western Addition