00BREAK00

1) COUNTY: WEXFORD

2) STUDY NAME: WEXFORD, COUNTY

3) WATERCOURSE: CLAM RIVER

4) DOCUMENT TYPE: PROFILES

00BREAK00

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-----------------------------80/80 LIST OF INPUT DATA-----------------------------
WSP2       10.                                                                    1
TITLE      CLAM RIVER,PRESENT COND.,10-07-86, 2,10,50,100,500 YR.STORMS           2
TITLE      DISCHARGE FROM COUNTY LINE TO THE BALL DRAIN                           3
DISCHARGE  -1.       135.      230.      390.      460.      655.                 4
STARTS     9.9       .0083     .0083     .0083     .0083     .0083                5
TRIB       11.2      14.1      16.1      17.5      17.9      18.1                 6
TRIB       13.1      22.6                                                        6A
OUTPUT     PSK                                                                   7
REACH      9.9       1.        0.        0.                                     11
REACH 2    10.5      -5.04                                                       12
SEGMENT    9.9       1         N         -10.      1265.4                         13
NVALUE     .145                                                                  14
SEGMENT    9.9       2         C         14.       1265.7                         15
N VALUE    .08                                                                   16
SEGMENT    9.9       3         N         100.      1272.6                         17
N VALUE    .145                                                                  18
ROAD       10.       2.7       50.       50.                                    19
CULV 1     10.       2.        12333.                                           20
CULV 2     5.                  46.7      1258.     1257.8    .024                21
SECTION    10.                                                                   22
           -500.     1268.3    -500.     1267.1    -400.     1265.2               23
           -350.     1264.4    -300.     1264.2    -250.     1264.1               24
           -150.     1264.2    -50.      1265.     0.        1265.6               25
           50.       1265.7    75.       1268.4                                   26
ENDTABLE                                                                          27
REACH      10.1      1.        50.       50.                                    28
REACH 2    10.5      -4.97                                                       29
REACH      10.2      1.        2450.     2200.                                  30
REACH 2    10.5      -3.5                                                        31
REACH      10.3      1.        2500.     2300.                                  32
REACH 2    10.5      -1.75                                                       33
REACH      10.5      1.        2500.     2300.                                  34
SEGMENT    10.5      1         N         -10.      1265.4                         35
N VALUE    .145                                                                  36
SEGMENT    10.5      2         C         14.       1265.7                         37
N VALUE    .08                                                                   38
SEGMENT    10.5      3         N         100.      1272.6                         39
N VALUE    .145                                                                  40
SECTION    10.5                                                                  41
           -150.     1271.1    -100.     1264.6    -50.      1265.2               42
           -40.      1265.6    -20.      1265.4    -10.      1265.4               43
           -3.2      1264.6    -8.       1264.2    -5.       1263.3               44
           0.        1263.6    5.        1263.     9.        1263.4               45
           9.1       1264.6    14.       1265.7    20.       1265.7               46
           40.       1265.5    59.       1265.2    70.       1266.7               47
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-----------------------------80/80 LIST OF INPUT DATA-----------------------------
          80.       1263.3    100.      1272.6                                  48
ENDTABLE                                                                         49
REACH     10.6      1.        2500.     2000.                                   50
REACH 2   10.5      2.75                                                         51
REACH     10.7      1.        2500.     2000.                                   52
REACH 2   10.5      5.5                                                          53
REACH     10.8      1.        2500.     1900.                                   54
REACH 2   10.9      -3.8                                                         55
REACH     10.85     1.        2500.     1900.                                   56
REACH 2   10.9      -1.05                                                        57
REACH     10.9      1.        950.      900.                                    58
SEGMENT   10.9      1         N         -9.                                     59
NVALUE    .146                                                                   60
SEGMENT   10.9      2         C         25.                                     61
NVALUE    .0633                                                                  62
SEGMENT   10.9      3         N         110.                                    63
NVALUE    .146                                                                   64
SECTION   10.9                                                                   65
          -140.     1283.     -140.     1277.5    -50.      1278.4              66
          -9.       1277.7    -6.6      1276.5    -6.5      1275.9              67
          -5.       1275.8    0.        1275.1    5.        1275.4              68
          10.       1275.9    10.1      1276.5    25.       1278.5              69
          110.      1279.7    110.      1283.                                   70
ENDTABLE                                                                         71
ROAD      11.       2.7       50.       50.                                     72
CULV 1    11.       1.        33122.                                            73
CULV 2    5.5       7.8       46.3      1275.2    1275.2    .032                74
CULV 1    11.       1.        33122.                                            75
CULV 2    5.5       7.8       46.3      1275.4    1275.4    .032                76
SECTION   11.                                                                    77
          -2200.    1284.6    -2100.    1285.     -2000.    1284.7              78
          -1900.    1284.2    -1800.    1283.9    -1700.    1284.1              79
          -1600.    1283.7    -1500.    1283.5    -1400.    1283.6              80
          -1300.    1284.1    -1200.    1283.9    -1100.    1284.               81
          -1000.    1282.8    -900.     1282.2    -800.     1282.3              82
          -700.     1282.1    -600.     1281.7    -500.     1281.3              83
          -400.     1281.2    -400.     1284.4    -300.     1284.               84
          -200.     1283.4    -100.     1282.7    -50.      1282.5              85
          0.0       1282.2    50.       1281.9    150.      1281.4              86
          250.      1281.3    350.      1291.2    351.      1285.               87
ENDTABLE                                                                         88
REACH     11.1      1.        50.       50.                                     89
REACH 2   11.2      -1.45                                                        90
REACH     11.2      1.        2650.     2450.                                   91
SEGMENT   11.2      1         N         -14.      1279.6                        92
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-----------------------------80/80 LIST OF INPUT DATA-----------------------------
NVALUE    .13                                                                  93
SEGMENT   11.2      2         C         20.       1281.                        94
NVALUE    .055                                                                 95
SEGMENT   11.2      3         N         30.       1285.                        96
NVALUE    .13                                                                  97
SECTION   11.2                                                                 98
          -240.     1285.     -240.     1281.5    -120.     1280.9             99
          -14.      1279.6    -10.5     1278.5    -10.      1277.9            100
          -5.       1277.     0.        1276.5    5.        1277.1            101
          8.        1273.4    8.1       1278.5    20.       1281.             102
          30.       1280.6    30.       1285.                                 103
ENDTABLE                                                                      104
COMPUTE   9.9       11.2      9.9                                            104A
-----------------------------END OF 80/80 LIST------------------------------
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COMPUTE 9.9 11.2 9.9 104A

----------STARTING DATA FROM GIVEN SLOPES----------

RATING TABLE FOR SECTION 9.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1258.0	0.0	0.0						
BANK FULL	1260.4	61.4	121.3	.00	.00	.00			
*****WARNING-BANKFULL OR ZERO DAMAGE ELEV BELOW FIRST PROFILE. FLOW INTERPOLATED LINEARLY FROM CHANNEL BOTTOM*****									
1	1260.6	103.5	135.0	.00	.00	.00	135.00	1259.7	.00793
2	1261.0	167.8	230.0	.00	.00	.00	230.00	1260.2	.00819
3	1261.5	251.9	390.0	.00	.00	.00	390.00	1260.5	.00821
4	1261.7	284.7	460.0	.00	.00	.00	460.00	1260.6	.00820
5	1262.1	364.7	655.0	.00	.00	.00	655.00	1260.8	.00825

SEGMENT TABLE FOR SECTION 9.9

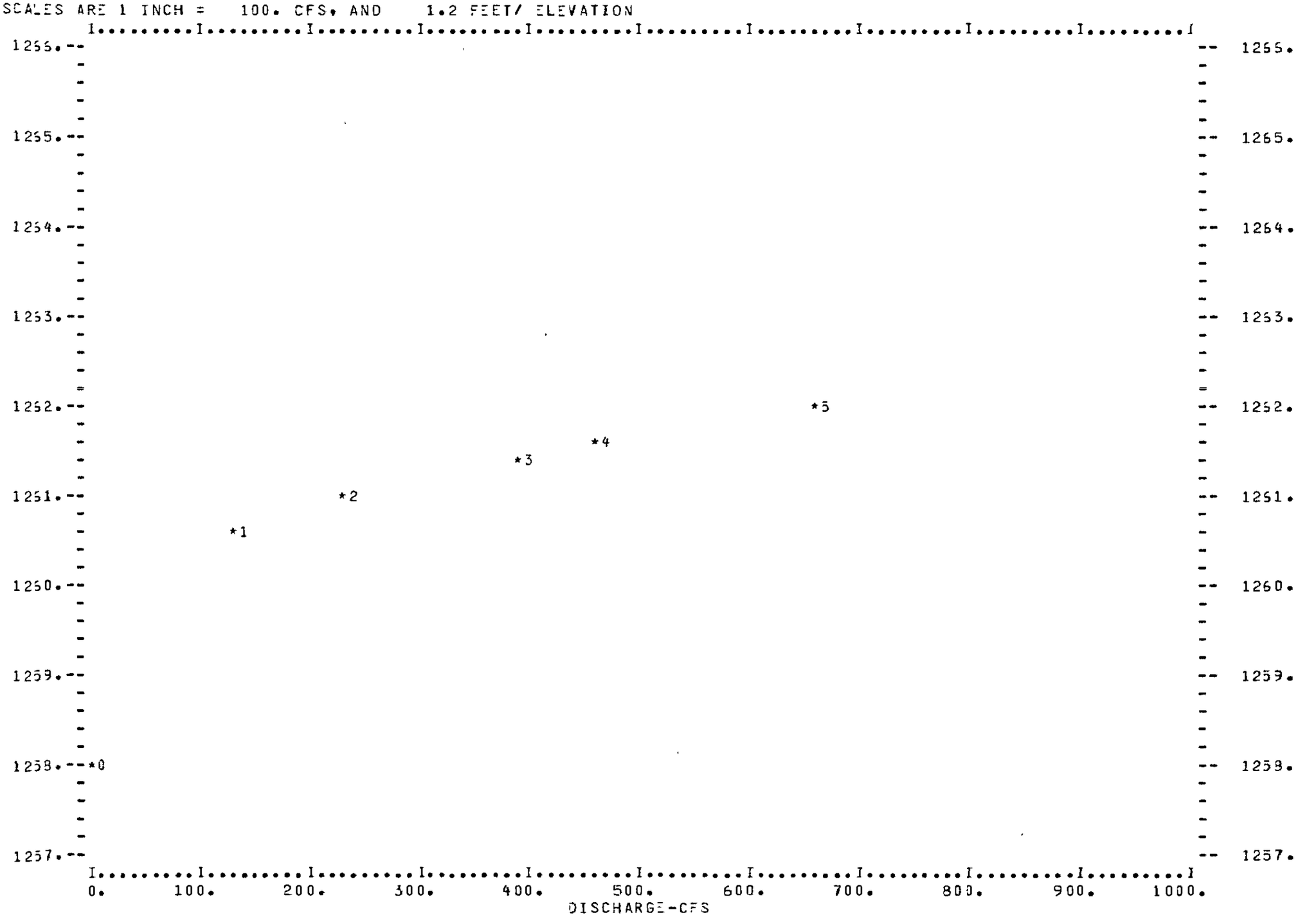
CSM		TOTAL	SEG NO 1 V	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	135.	33.	97.	6.
135.	VELOCITY FPS	2.06	.67	2.25	.50
2	DISCHARGE CFS	230.	73.	139.	18.
230.	VELOCITY FPS	2.17	.84	2.65	.64
3	DISCHARGE CFS	390.	148.	194.	48.
390.	VELOCITY FPS	2.30	1.10	3.04	.91
4	DISCHARGE CFS	460.	182.	215.	63.
460.	VELOCITY FPS	2.35	1.18	3.17	1.00
5	DISCHARGE CFS	655.	276.	274.	105.
655.	VELOCITY FPS	2.50	1.38	3.51	1.21
1	ELEV 1260.6 KD	1445.	296.	1131.	20.
2	ELEV 1261.0 KD	2528.	786.	1559.	184.
3	ELEV 1261.5 KD	4285.	1515.	2154.	516.
4	ELEV 1261.7 KD	5070.	1991.	2397.	681.
5	ELEV 1262.1 KD	7206.	3029.	3027.	1150.

KD TABLE FOR CROSS SECTION 9.9

ELEVATION	AREA	KD	KD BY SEGMENT		
1257.96	0.				
1258.	0.	2.	1.	1.	1.
1259.	11.	149.	1.	147.	1.
1260.	37.	671.	25.	640.	1.
1261.	162.	2443.	744.	1521.	170.
1262.	346.	6666.	2756.	2872.	1022.
1263.	544.	12795.	5777.	4549.	2461.
1264.	756.	20695.	9714.	6520.	4454.
1265.	979.	30302.	14546.	8768.	6985.
1266.	1215.	41559.	20267.	11273.	10017.
1267.	1460.	54992.	27419.	14021.	13551.
1268.	1709.	70162.	35409.	17002.	17748.
1269.	1959.	85421.	43242.	20137.	21974.
1270.	2209.	102237.	51900.	23503.	26706.
1271.	2459.	120622.	61390.	27095.	31957.

CROSS SECTION 9.9

SCALES ARE 1 INCH = 100. CFS, AND 1.2 FEET/ ELEVATION



ROAD SECTION 10.

NO.	HW	CFS	HL	TW	CSM
0	1258.00	0.00	0.00	0.00	0.00
1	1261.72	135.00	.88	1260.84	135.00
2	1263.10	230.00	1.84	1261.26	230.00
3	1264.39	390.00	2.64	1261.75	390.00
4	1264.50	460.00	2.56	1261.94	460.00
5	1264.70	655.00	2.32	1262.38	655.00

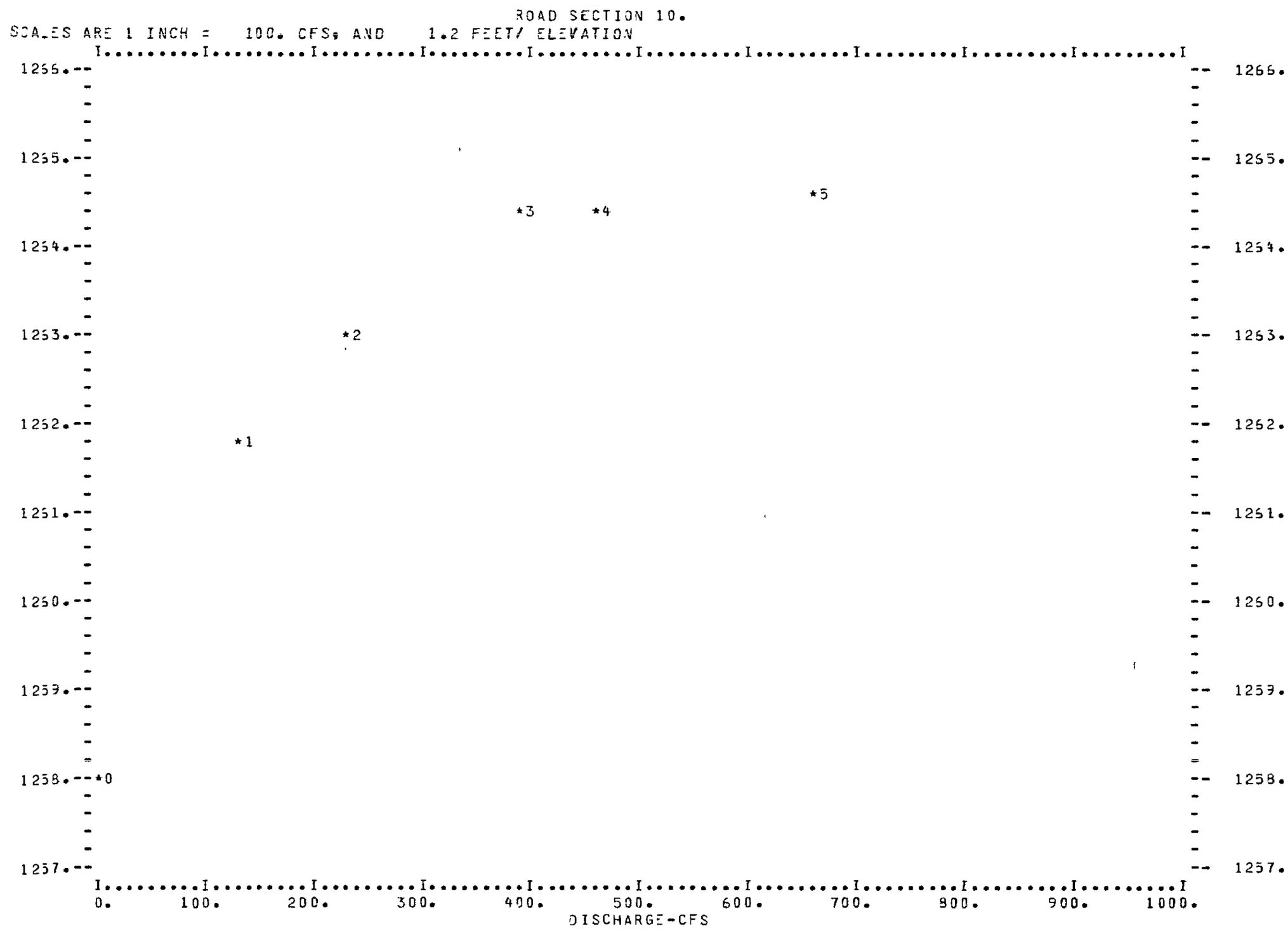
Δ 3.56

MIN ROAD ELEVATION 1264.10

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	2	12333.	5.00		46.70	1258.00	1257.30	.024

ROAD SECTION 10.

SCALES ARE 1 INCH = 100. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 10.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	CHANNEL	NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1258.0	0.0	0.0						
BANK FULL	1260.4	61.4	87.0	.00	.00	.00			
*****WARNING-BANKFULL OR ZERO DAMAGE ELEV BELOW FIRST PROFILE. FLOW INTERPOLATED LINEARLY FROM CHANNEL BOTTOM*****									
1	1261.8	286.1	135.0	.00	.00	.00	135.00	1259.7	.00070
2	1263.1	552.9	230.0	.00	.00	.00	230.00	1260.3	.00031
3	1264.4	828.3	390.0	.00	.00	.00	390.00	1260.5	.00027
4	1264.5	852.5	460.0	.00	.00	.00	460.00	1260.6	.00034
5	1264.7	901.9	655.0	.00	.00	.00	655.00	1260.8	.00060

SEGMENT TABLE FOR SECTION 10.1

CSM		TOTAL	SEG NO 1 V	2 C	3 N
1	DISCHARGE CFS	135.	53.	63.	19.
135.	VELOCITY FPS	.69	.35	.92	.29
2	DISCHARGE CFS	230.	104.	81.	45.
230.	VELOCITY FPS	.55	.34	.80	.31
3	DISCHARGE CFS	390.	185.	119.	86.
390.	VELOCITY FPS	.60	.40	.90	.37
4	DISCHARGE CFS	460.	218.	139.	103.
460.	VELOCITY FPS	.68	.46	1.03	.43
5	DISCHARGE CFS	655.	313.	194.	148.
655.	VELOCITY FPS	.92	.62	1.39	.58

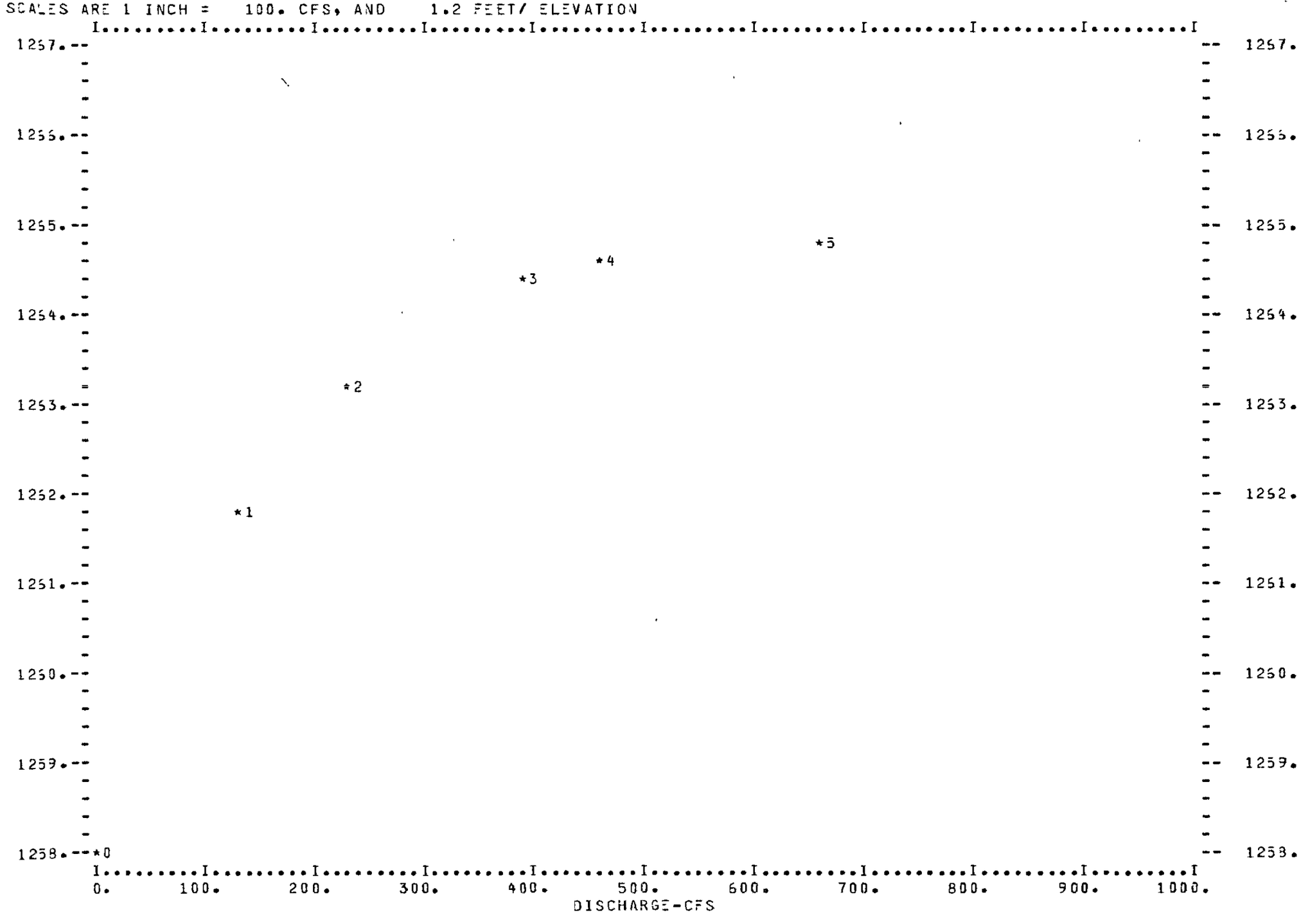
1	ELEV	1261.8	KD	5103.	2007.	2408.	688.
2	ELEV	1263.1	KD	13078.	5921.	4625.	2532.
3	ELEV	1264.4	KD	23760.	11254.	7246.	5260.
4	ELEV	1264.5	KD	24764.	11758.	7484.	5522.
5	ELEV	1264.7	KD	26842.	12802.	7973.	6056.

KD TABLE FOR CROSS SECTION 10.1

ELEVATION	AREA	KD	KD BY SEGMENT		
1258.03	0.				
1259.	10.	125.	1.	123.	1.
1260.	33.	618.	17.	598.	1.
1261.	150.	2241.	646.	1442.	129.
1262.	333.	6299.	2575.	2765.	939.
1263.	530.	12318.	5541.	4422.	2347.
1264.	740.	20087.	9409.	6373.	4296.
1265.	963.	29571.	14176.	8601.	6789.
1266.	1198.	40703.	19823.	11090.	9790.
1267.	1442.	53993.	26890.	13821.	13281.
1268.	1691.	69098.	34856.	16788.	17453.
1269.	1941.	84302.	42667.	19910.	21661.
1270.	2191.	101009.	51267.	23260.	26358.
1271.	2441.	119284.	60699.	26836.	31572.
1272.	2691.	139135.	70969.	30635.	37314.

CROSS SECTION 10.1

SCALES ARE 1 INCH = 100. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 10.2 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1259.5	0.0	0.0						
BANK FULL	1261.9	61.4	85.3	.00	.00	.00			
*****WARNING-BANKFULL OR ZERO DAMAGE ELEV BELOW FIRST PROFILE. FLOW INTERPOLATED LINEARLY FROM CHANNEL BOTTOM*****									
1	1263.3	300.0	135.0	.00	.00	.00	135.00	1261.2	.00058
2	1264.2	465.6	230.0	.00	.00	.00	230.00	1261.7	.00047
3	1265.3	713.6	390.0	.00	.00	.00	390.00	1262.0	.00039
4	1265.6	763.3	460.0	.00	.00	.00	460.00	1262.1	.00045
5	1266.2	892.2	655.0	.00	.00	.00	655.00	1262.3	.00057

SEGMENT TABLE FOR SECTION 10.2

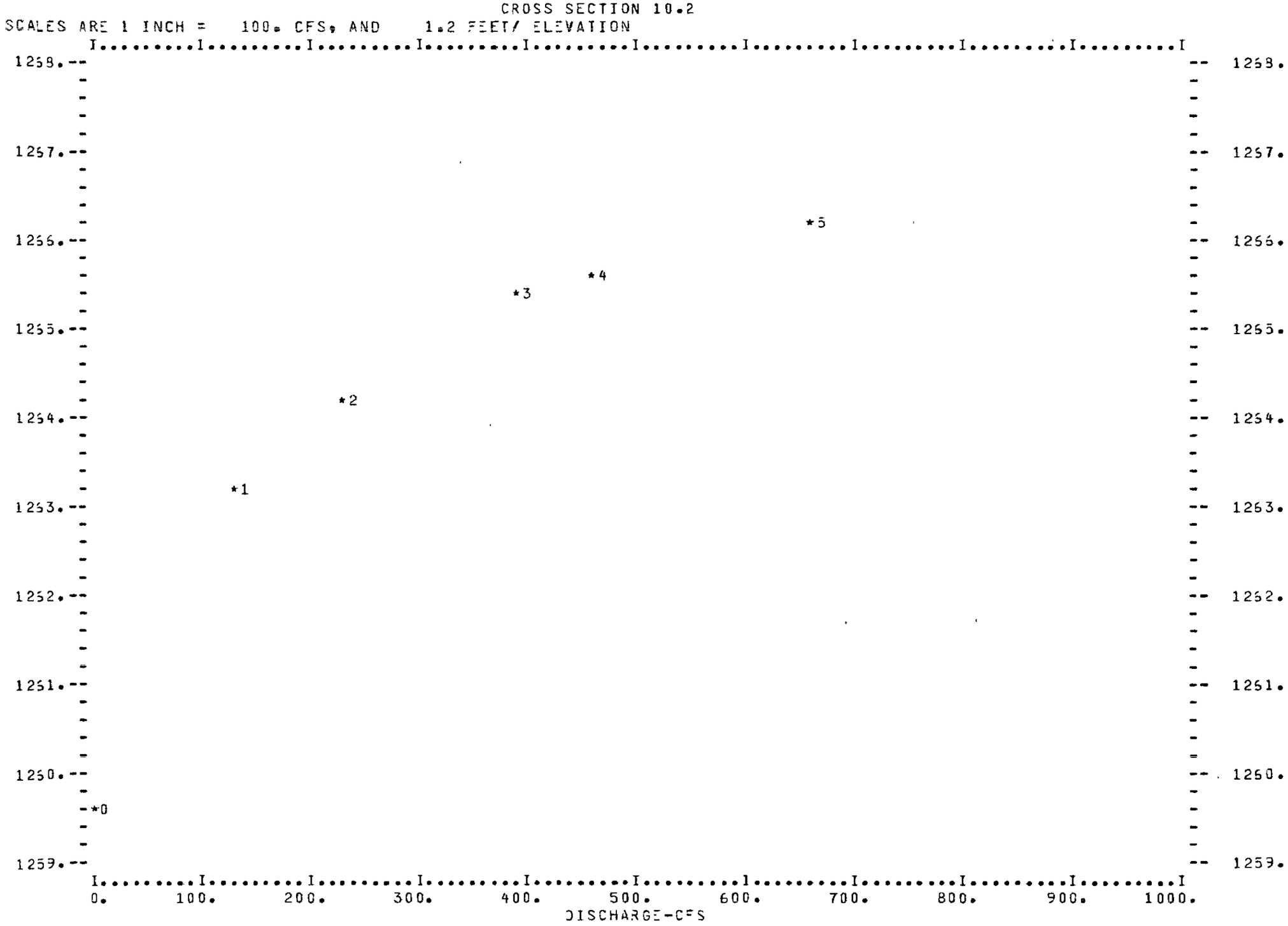
CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	135.	56.	60.	20.
135.	VELOCITY FPS	.63	.34	.85	.29
2	DISCHARGE CFS	230.	104.	84.	43.
230.	VELOCITY FPS	.64	.40	.93	.36
3	DISCHARGE CFS	390.	185.	120.	84.
390.	VELOCITY FPS	.68	.47	1.01	.43
4	DISCHARGE CFS	460.	220.	139.	101.
460.	VELOCITY FPS	.75	.52	1.11	.48
5	DISCHARGE CFS	655.	517.	187.	150.
655.	VELOCITY FPS	.90	.63	1.35	.59
1	ELEV 1263.3 KD	5594.	2285.	2511.	798.
2	ELEV 1264.2 KD	10568.	4756.	3866.	1947.
3	ELEV 1265.3 KD	19747.	9378.	6117.	4251.
4	ELEV 1265.6 KD	21794.	10414.	6595.	4785.
5	ELEV 1266.2 KD	27453.	13290.	7876.	6286.

KD TABLE FOR CROSS SECTION 10.2

ELEVATION	AREA	KD	KD BY SEGMENT		
1259.50	0.				
1260.	3.	20.	1.	17.	1.
1261.	19.	350.	1.	348.	1.
1262.	77.	1199.	191.	971.	7.
1263.	245.	4239.	1610.	2099.	502.
1264.	435.	9573.	4254.	3605.	1707.
1265.	639.	16832.	7303.	5423.	3500.
1266.	857.	25893.	12495.	7523.	5872.
1267.	1086.	36658.	17995.	9887.	8771.
1268.	1327.	49405.	24693.	12503.	12201.
1269.	1574.	64303.	32577.	15362.	16257.
1270.	1824.	80225.	41062.	19415.	20715.
1271.	2074.	96901.	49727.	21657.	25419.
1272.	2324.	115213.	59267.	25129.	30663.
1273.	2574.	135173.	69583.	28822.	36459.

CROSS SECTION 10.2

SCALES ARE 1 INCH = 100. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 10.3 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1261.3	0.0	0.0						
BANK FULL	1263.7	61.4	88.6	.00	.00	.00			
*****WARNING-BANKFULL OR ZERO DAMAGE ELEV BELOW FIRST PROFILE. FLOW INTERPOLATED LINEARLY FROM CHANNEL BOTTOM*****									
1	1264.9	273.8	135.0	.00	.00	.00	135.00	1263.0	.00075
2	1265.8	436.6	230.0	.00	.00	.00	230.00	1263.5	.00058
3	1266.8	641.5	390.0	.00	.00	.00	390.00	1263.8	.00054
4	1267.0	688.7	460.0	.00	.00	.00	460.00	1263.8	.00061
5	1267.7	853.4	655.0	.00	.00	.00	655.00	1264.1	.00066

SEGMENT TABLE FOR SECTION 10.3

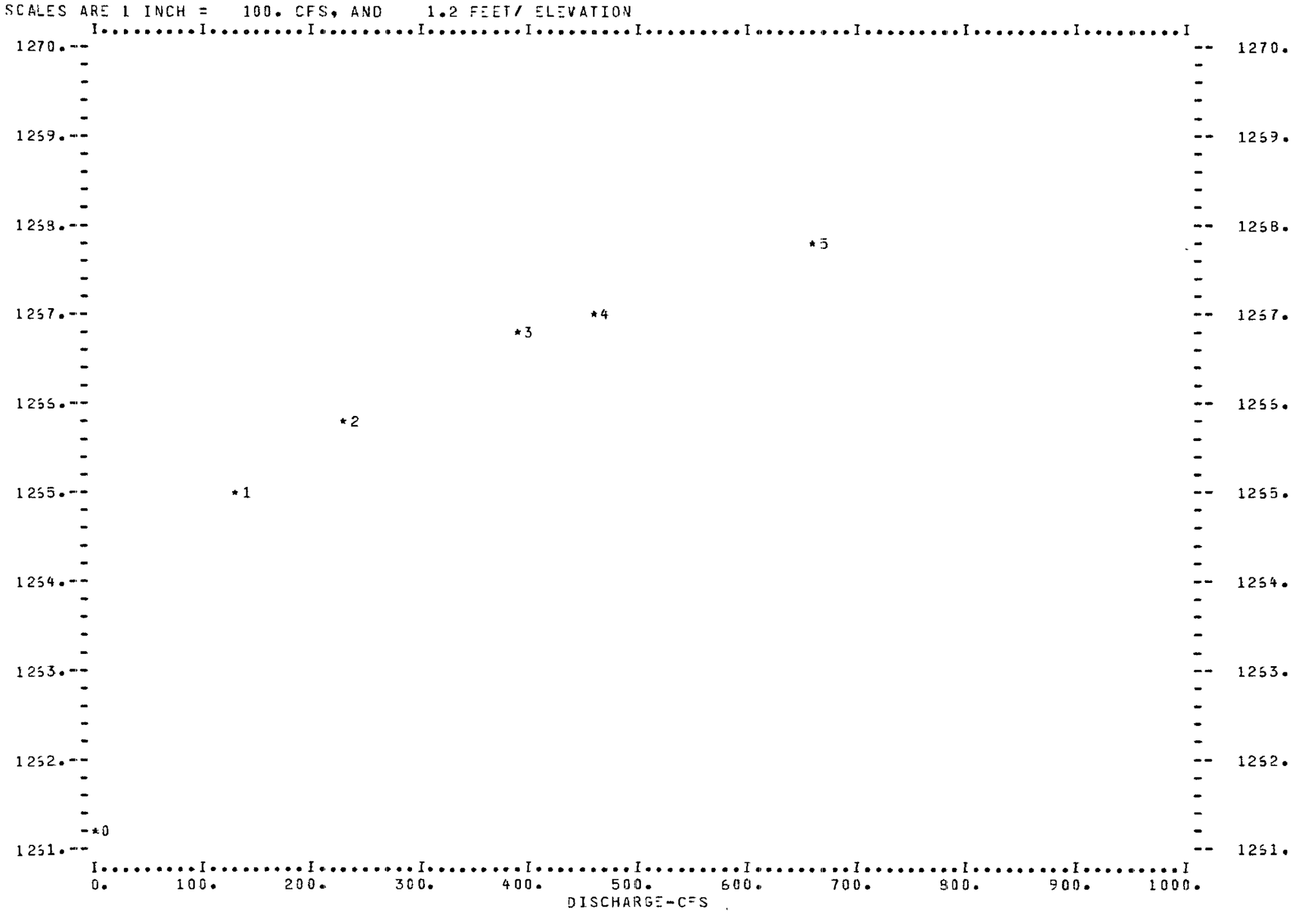
CSM		TOTAL	SEG NO 1 V	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	135.	54.	63.	18.
135.	VELOCITY FPS	.70	.36	.95	.31
2	DISCHARGE CFS	230.	102.	86.	41.
230.	VELOCITY FPS	.70	.43	1.00	.38
3	DISCHARGE CFS	390.	183.	126.	81.
390.	VELOCITY FPS	.77	.51	1.14	.47
4	DISCHARGE CFS	460.	217.	145.	98.
460.	VELOCITY FPS	.84	.57	1.25	.52
5	DISCHARGE CFS	655.	315.	192.	148.
655.	VELOCITY FPS	.95	.66	1.43	.61
1	ELEV 1264.9 KD	4931.	1954.	2318.	658.
2	ELEV 1265.8 KD	9534.	4222.	3616.	1696.
3	ELEV 1266.8 KD	16774.	7351.	5443.	3480.
4	ELEV 1267.0 KD	18612.	8777.	5885.	3950.
5	ELEV 1267.7 KD	25539.	12279.	7493.	5767.

KD TABLE FOR CROSS SECTION 10.3

ELEVATION	AREA	KD	KD BY SEGMENT		
1261.25	0.				
1262.	6.	64.	1.	62.	1.
1263.	26.	486.	4.	478.	1.
1264.	116.	1707.	382.	1209.	35.
1265.	291.	5352.	2152.	2445.	742.
1266.	485.	11154.	5031.	4035.	2085.
1267.	693.	18770.	8854.	5921.	3989.
1268.	913.	28160.	13506.	8088.	6460.
1269.	1146.	39271.	19282.	10519.	9465.
1270.	1389.	52484.	26293.	13197.	12989.
1271.	1637.	67701.	34406.	16113.	17176.
1272.	1886.	83458.	42627.	19204.	21578.
1273.	2136.	100376.	51403.	22504.	26357.
1274.	2386.	118917.	61045.	26030.	31574.
1275.	2636.	139089.	71559.	29781.	37537.

CROSS SECTION 10.3

SCALES ARE 1 INCH = 100. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 10.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1263.0	0.0	0.0						
BANK FULL	1265.4	61.4	89.6	.00	.00	.00			
*****WARNING-BANKFULL OR ZERO DAMAGE ELEV BELOW FIRST PROFILE. FLOW INTERPOLATED LINEARLY FROM CHANNEL BOTTOM*****									
1	1266.6	266.0	135.0	.00	.00	.00	135.00	1264.7	.00081
2	1267.3	405.3	230.0	.00	.00	.00	230.00	1265.2	.00072
3	1268.3	603.3	390.0	.00	.00	.00	390.00	1265.5	.00065
4	1268.7	679.2	460.0	.00	.00	.00	460.00	1265.6	.00064
5	1269.5	848.1	655.0	.00	.00	.00	655.00	1265.8	.00067

SEGMENT TABLE FOR SECTION 10.5

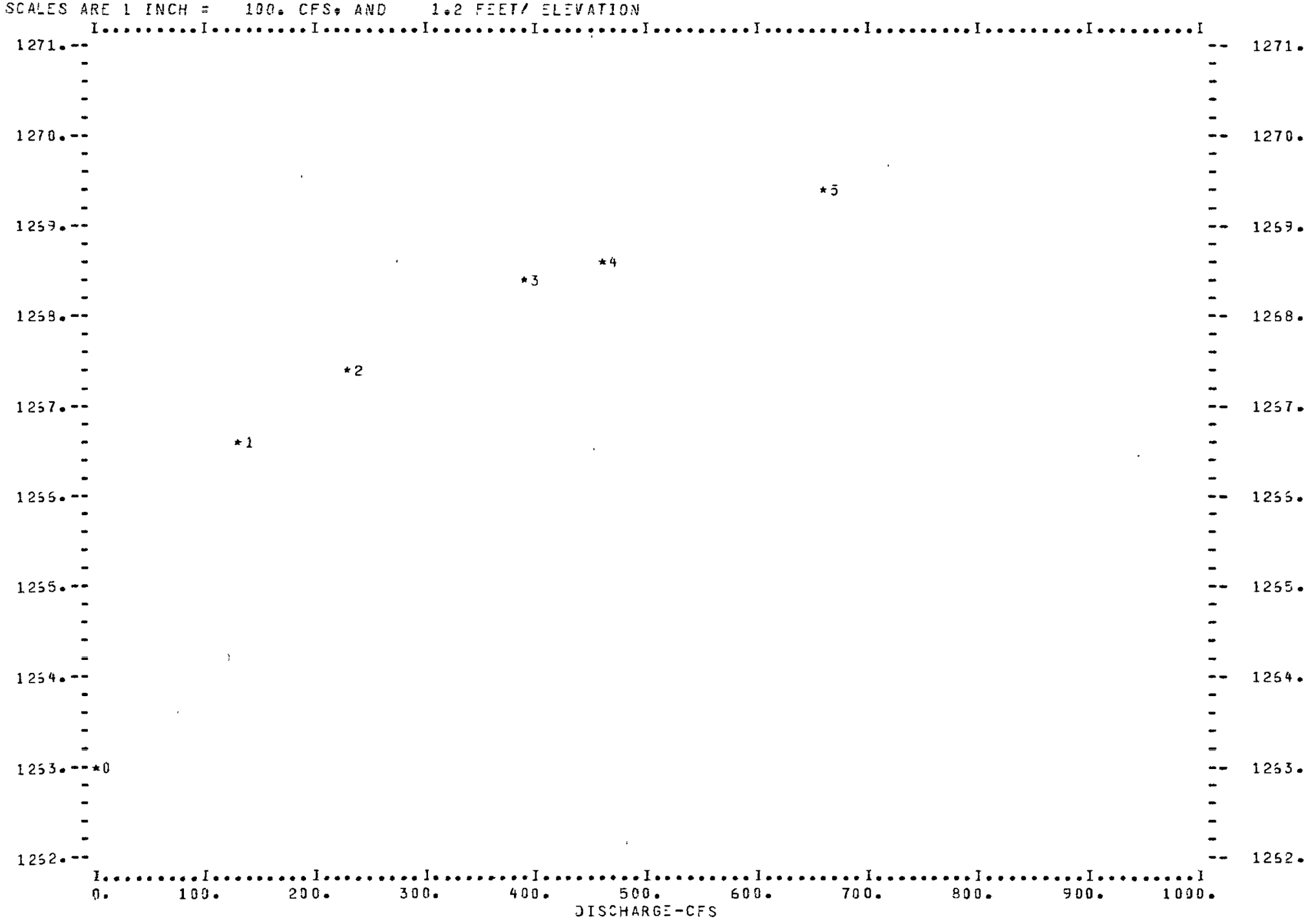
CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	135.	53.	64.	18.
135.	VELOCITY FPS	.72	.37	.98	.31
2	DISCHARGE CFS	230.	101.	89.	40.
230.	VELOCITY FPS	.76	.45	1.08	.40
3	DISCHARGE CFS	390.	182.	129.	80.
390.	VELOCITY FPS	.83	.54	1.21	.49
4	DISCHARGE CFS	460.	217.	146.	97.
460.	VELOCITY FPS	.85	.57	1.27	.53
5	DISCHARGE CFS	655.	315.	192.	148.
655.	VELOCITY FPS	.95	.65	1.44	.62
1	ELEV 1266.6 KD	4754.	1370.	2261.	623.
2	ELEV 1267.3 KD	8577.	3747.	3356.	1473.
3	ELEV 1268.3 KD	15273.	7094.	5082.	3097.
4	ELEV 1268.7 KD	18249.	8595.	5797.	3858.
5	ELEV 1269.5 KD	25314.	12164.	7441.	5708.

KD TABLE FOR CROSS SECTION 10.5

ELEVATION	AREA	KD	KD BY SEGMENT		
1263.00	0.				
1264.	10.	135.	1.	133.	1.
1265.	34.	638.	22.	615.	1.
1266.	155.	2362.	725.	1475.	161.
1267.	338.	6609.	2764.	2811.	1015.
1268.	536.	12864.	5882.	4475.	2497.
1269.	747.	20939.	9945.	5435.	4549.
1270.	970.	30785.	14944.	8672.	7165.
1271.	1205.	42339.	20860.	11169.	10311.
1272.	1450.	56151.	28277.	13907.	13967.
1273.	1699.	71827.	36508.	16881.	18338.
1274.	1949.	87536.	44740.	20007.	22723.
1275.	2199.	104859.	53732.	23364.	27636.
1276.	2449.	123807.	63591.	26947.	33088.

CROSS SECTION 10.5

SCALES ARE 1 INCH = 100. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 10.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1265.7	0.0	0.0						
BANK FULL	1268.1	61.4	95.9	.00	.00	.00			
*****WARNING-BANKFULL OR ZERO DAMAGE ELEV BELOW FIRST PROFILE. FLOW INTERPOLATED LINEARLY FROM CHANNEL BOTTOM*****									
1	1269.1	223.0	135.0	.00	.00	.00	135.00	1267.5	.00125
2	1269.8	342.2	230.0	.00	.00	.00	230.00	1268.0	.00108
3	1270.7	530.6	390.0	.00	.00	.00	390.00	1268.3	.00086
4	1271.0	577.4	460.0	.00	.00	.00	460.00	1268.3	.00094
5	1271.7	732.7	655.0	.00	.00	.00	655.00	1268.5	.00094

SEGMENT TABLE FOR SECTION 10.6

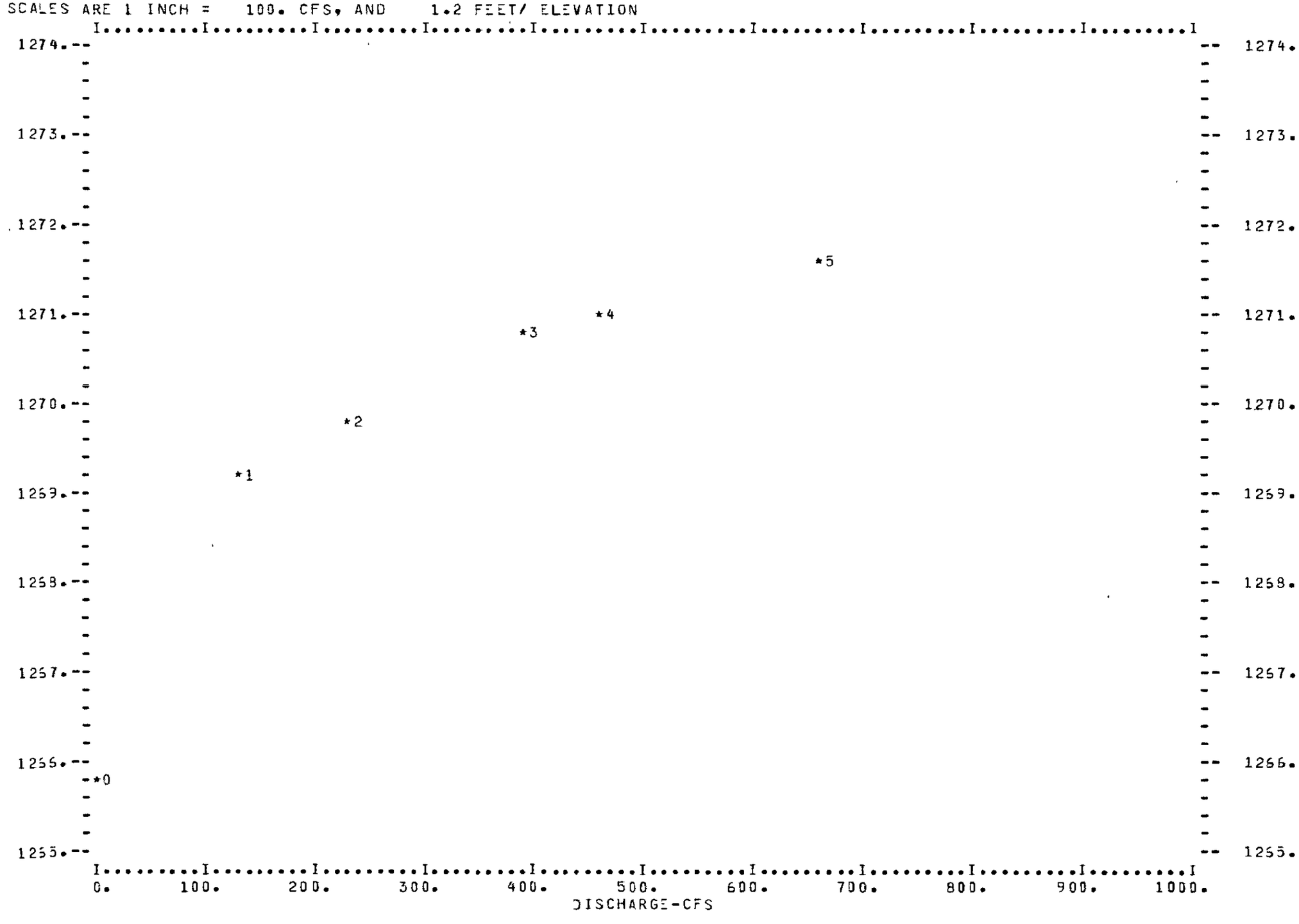
CSM		TOTAL	SEG NO 1 V	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	135.	52.	67.	16.
135.	VELOCITY FPS	.87	.44	1.12	.36
2	DISCHARGE CFS	230.	100.	92.	38.
230.	VELOCITY FPS	.89	.54	1.23	.47
3	DISCHARGE CFS	390.	183.	129.	78.
390.	VELOCITY FPS	.91	.62	1.32	.56
4	DISCHARGE CFS	460.	218.	147.	95.
460.	VELOCITY FPS	.98	.68	1.42	.62
5	DISCHARGE CFS	655.	318.	192.	145.
655.	VELOCITY FPS	1.08	.78	1.59	.72
1	ELEV 1269.1 KD	3775.	1426.	1937.	411.
2	ELEV 1269.8 KD	6980.	3023.	2842.	1116.
3	ELEV 1270.7 KD	13273.	5211.	4430.	2631.
4	ELEV 1271.0 KD	14995.	7088.	4644.	3052.
5	ELEV 1271.7 KD	21364.	10349.	6299.	4716.

KD TABLE FOR CROSS SECTION 10.6

ELEVATION	AREA	KD	KD BY SEGMENT		
1265.75	0.				
1266.	1.	5.	1.	3.	1.
1267.	14.	233.	1.	231.	1.
1268.	51.	875.	78.	778.	2.
1269.	200.	3291.	1169.	1772.	309.
1270.	386.	8377.	3727.	3202.	1445.
1271.	588.	15405.	7292.	4938.	3163.
1272.	801.	24432.	11922.	6972.	5533.
1273.	1027.	35288.	17530.	9274.	8482.
1274.	1266.	48023.	24220.	11827.	11969.
1275.	1512.	63138.	32430.	14525.	16077.
1276.	1761.	79799.	41352.	17641.	20789.
1277.	2011.	96842.	50302.	20825.	25631.
1278.	2261.	115604.	60177.	24239.	31043.
1279.	2511.	136094.	70984.	27878.	37036.

CROSS SECTION 10.5

SCALES ARE 1 INCH = 100. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 10.7 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	CHANNEL	NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1268.5	0.0	0.0						
BANK FULL	1270.9	61.4	96.8	.00	.00	.00			
*****WARNING-BANKFULL OR ZERO DAMAGE ELEV BELOW FIRST PROFILE. FLOW INTERPOLATED LINEARLY FROM CHANNEL BOTTOM*****									
1	1271.8	217.5	135.0	.00	.00	.00	135.00	1270.2	.00134
2	1272.5	345.7	230.0	.00	.00	.00	230.00	1270.7	.00105
3	1273.3	502.4	390.0	.00	.00	.00	390.00	1271.0	.00101
4	1273.6	546.4	460.0	.00	.00	.00	460.00	1271.1	.00110
5	1274.4	721.7	655.0	.00	.00	.00	655.00	1271.3	.00098

SEGMENT TABLE FOR SECTION 10.7

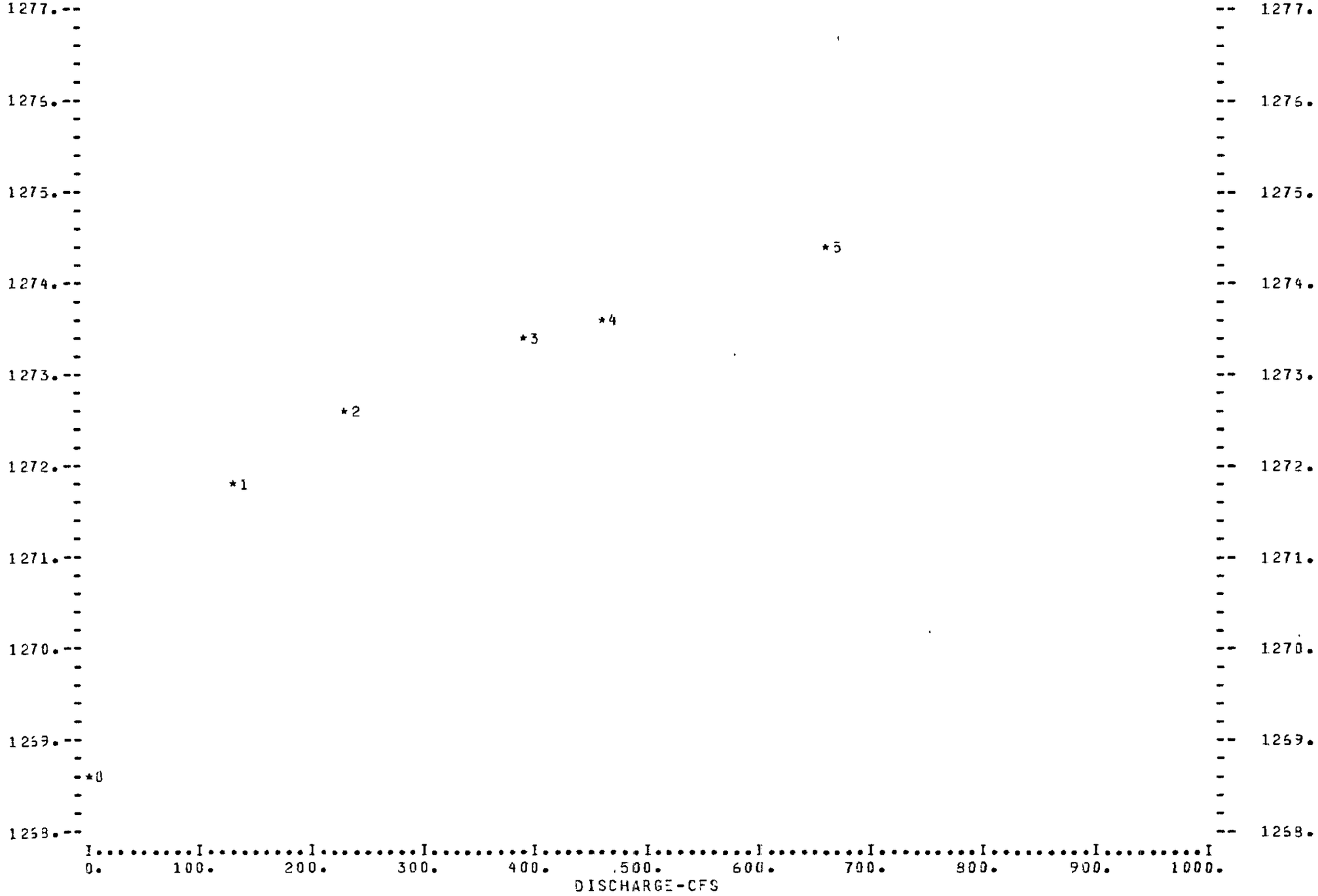
CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	135.	52.	67.	16.
135.	VELOCITY FPS	.90	.45	1.14	.37
2	DISCHARGE CFS	230.	100.	92.	38.
230.	VELOCITY FPS	.88	.53	1.22	.46
3	DISCHARGE CFS	390.	181.	133.	76.
390.	VELOCITY FPS	.97	.65	1.40	.59
4	DISCHARGE CFS	460.	216.	151.	93.
460.	VELOCITY FPS	1.04	.71	1.51	.65
5	DISCHARGE CFS	655.	317.	193.	145.
655.	VELOCITY FPS	1.09	.79	1.61	.73
1	ELEV 1271.8 KD	3644.	1362.	1897.	385.
2	ELEV 1272.5 KD	7089.	3077.	2870.	1141.
3	ELEV 1273.3 KD	12299.	5718.	4189.	2393.
4	ELEV 1273.6 KD	13839.	5499.	4568.	2772.
5	ELEV 1274.4 KD	20894.	10109.	6194.	4592.

KD TABLE FOR CROSS SECTION 10.7

ELEVATION	AREA	KD	KD BY SEGMENT		
1268.50	0.				
1269.	3.	20.	1.	17.	1.
1270.	19.	350.	1.	348.	1.
1271.	77.	1213.	203.	971.	7.
1272.	245.	4366.	1706.	2099.	532.
1273.	435.	9933.	4507.	3606.	1809.
1274.	639.	17510.	8373.	5423.	3708.
1275.	857.	26985.	13238.	7523.	6222.
1276.	1086.	38250.	19066.	9887.	9293.
1277.	1327.	51600.	26162.	12503.	12926.
1278.	1574.	67213.	34621.	15362.	17224.
1279.	1824.	83899.	43503.	18415.	21947.
1280.	2074.	101371.	52584.	21657.	26930.
1281.	2324.	120564.	62791.	25128.	32486.
1282.	2574.	141488.	73832.	28823.	38627.

CROSS SECTION 10.7

SCALES ARE 1 INCH = 100. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 10.8 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1271.3	0.0	0.0						
BANK FULL	1273.9	51.5	96.4	.00	.00	.00			
*****WARNING-BANKFULL OR ZERO DAMAGE ELEV BELOW FIRST PROFILE. FLOW INTERPOLATED LINEARLY FROM CHANNEL BOTTOM*****									
1	1274.9	179.4	135.0	.00	.00	.00	135.00	1273.0	.00116
2	1275.5	293.8	230.0	.00	.00	.00	230.00	1273.5	.00109
3	1276.2	463.0	390.0	.00	.00	.00	390.00	1274.3	.00105
4	1276.3	494.2	460.0	.00	.00	.00	460.00	1274.4	.00124
5	1277.0	670.8	555.0	.00	.00	.00	655.00	1274.6	.00106

SEGMENT TABLE FOR SECTION 10.8

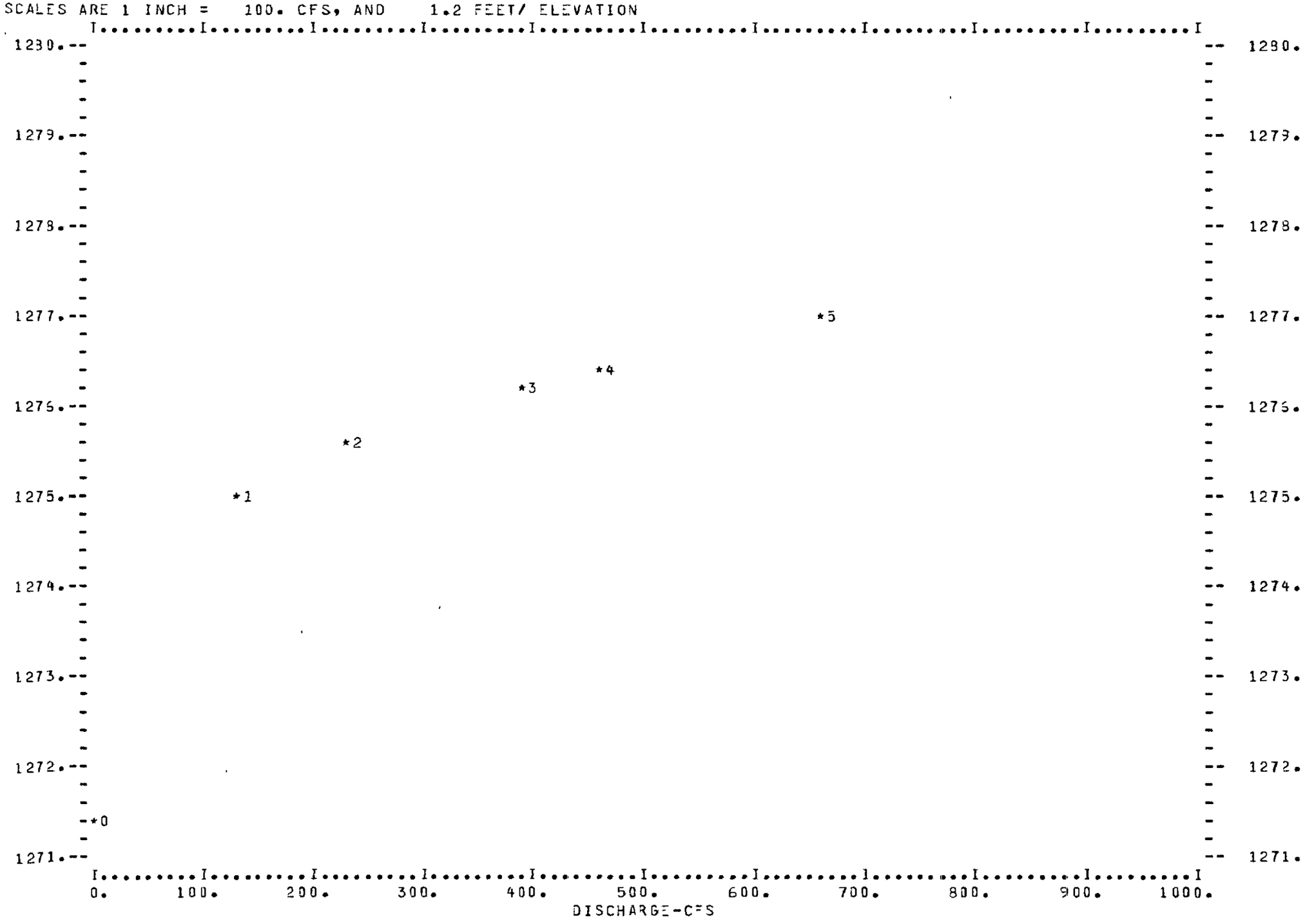
CSM		TOTAL	SEG NO 1 V	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	135.	33.	101.	0.
135.	VELOCITY FPS	1.17	.33	1.32	.15
2	DISCHARGE CFS	230.	81.	144.	5.
230.	VELOCITY FPS	1.23	.45	1.50	.22
3	DISCHARGE CFS	390.	159.	203.	28.
390.	VELOCITY FPS	1.30	.60	1.69	.37
4	DISCHARGE CFS	460.	189.	232.	38.
460.	VELOCITY FPS	1.43	.67	1.87	.44
5	DISCHARGE CFS	555.	282.	292.	81.
555.	VELOCITY FPS	1.43	.75	1.97	.55
1	ELEV 1274.9 KD	3956.	947.	3005.	5.
2	ELEV 1275.5 KD	6959.	2434.	4376.	148.
3	ELEV 1276.2 KD	12005.	4876.	6320.	809.
4	ELEV 1276.3 KD	13022.	5355.	6691.	976.
5	ELEV 1277.0 KD	20077.	8535.	8999.	2443.

KD TABLE FOR CROSS SECTION 10.8

ELEVATION	AREA	KD	KD BY SEGMENT		
1271.30	0.				
1272.	5.	65.	1.	64.	1.
1273.	22.	551.	1.	549.	1.
1274.	58.	1507.	13.	1450.	1.
1275.	191.	4219.	1049.	3129.	7.
1276.	411.	10345.	4059.	5703.	534.
1277.	660.	19665.	8435.	8858.	2355.
1278.	910.	31542.	13920.	12537.	5062.
1279.	1160.	45712.	20443.	15718.	8535.
1280.	1410.	60424.	27140.	21185.	12013.
1281.	1660.	76364.	34367.	26034.	15751.
1282.	1910.	94315.	42522.	31352.	20111.
1283.	2160.	114310.	51520.	37133.	25123.

CROSS SECTION 10.8

SCALES ARE 1 INCH = 100. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 10.85 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1274.1	0.0	0.0						
BANK FULL	1276.7	51.5	97.5	.00	.00	.00			
*****WARNING-BANKFULL OR ZERO DAMAGE ELEV BELOW FIRST PROFILE. FLOW INTERPOLATED LINEARLY FROM CHANNEL BOTTOM*****									
1	1277.7	170.8	135.0	.00	.00	.00	135.00	1275.7	.00127
2	1278.2	282.0	230.0	.00	.00	.00	230.00	1276.3	.00121
3	1279.0	468.5	390.0	.00	.00	.00	390.00	1277.1	.00102
100-yr. 4	1279.2	525.6	460.0	.00	.00	.00	460.00	1277.1	.00105
5	1279.8	676.9	655.0	.00	.00	.00	655.00	1277.3	.00104

SEGMENT TABLE FOR SECTION 10.85

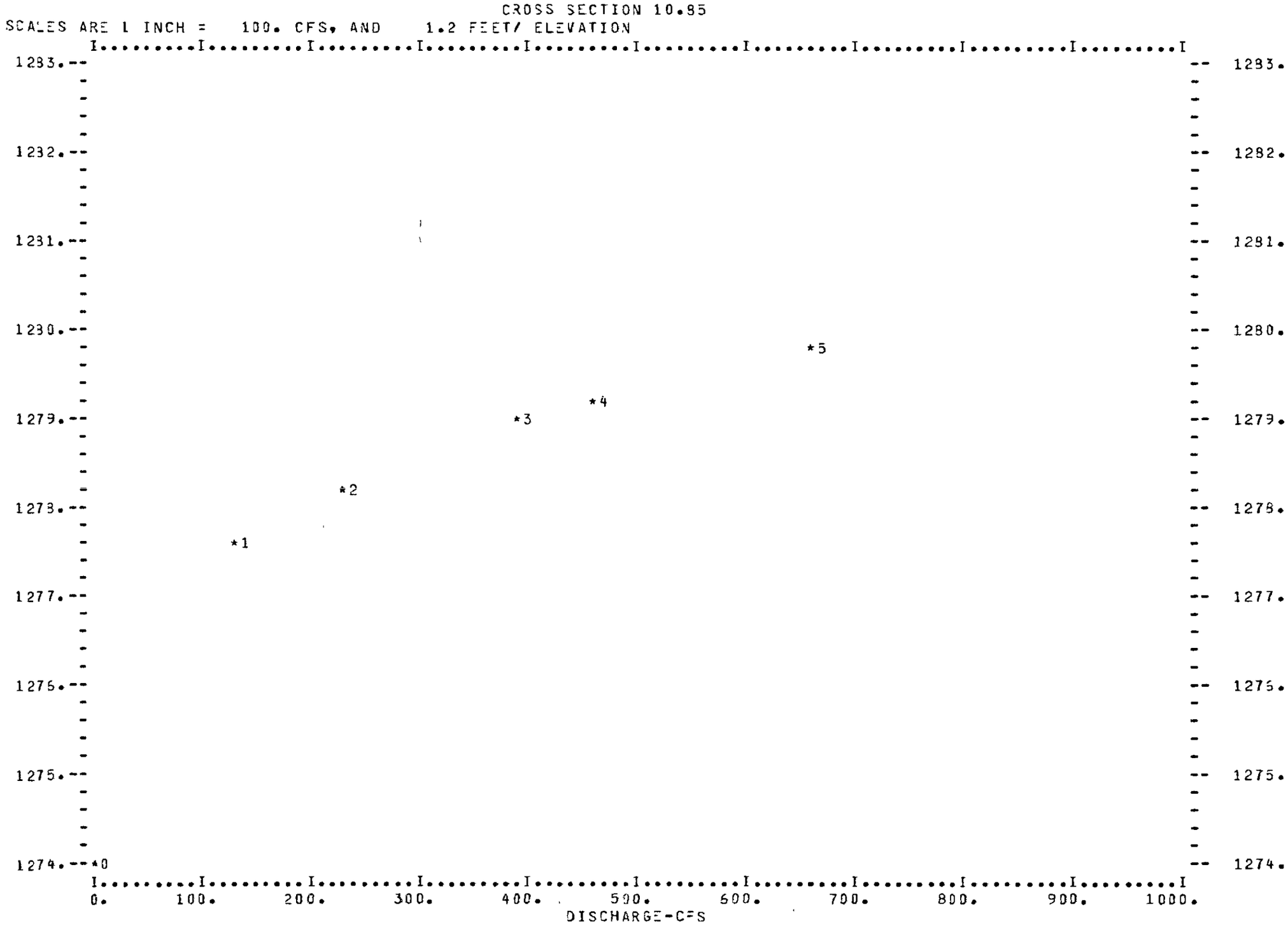
CSM		TOTAL	L 1 V	SEG ND C 2 C	R 3 N
1	DISCHARGE CFS	135.	31.	104.	0.
135.	VELOCITY FPS	1.22	.33	1.38	.09
2	DISCHARGE CFS	230.	79.	146.	5.
230.	VELOCITY FPS	1.28	.47	1.55	.22
3	DISCHARGE CFS	390.	159.	202.	29.
390.	VELOCITY FPS	1.29	.59	1.67	.37
4	DISCHARGE CFS	460.	192.	226.	43.
460.	VELOCITY FPS	1.34	.64	1.76	.43
5	DISCHARGE CFS	555.	282.	291.	82.
655.	VELOCITY FPS	1.42	.75	1.95	.55
1	ELEV 1277.7 KD	3795.	377.	2915.	4.
2	ELEV 1278.2 KD	6576.	2238.	4226.	111.
3	ELEV 1279.0 KD	12177.	4357.	6384.	835.
4	ELEV 1279.2 KD	14124.	5373.	7078.	1173.
5	ELEV 1279.8 KD	20328.	8751.	9082.	2495.

KD TABLE FOR CROSS SECTION 10.85

ELEVATION	AREA	KD	KD BY SEGMENT		
1274.05	0.				
1275.	9.	144.	1.	141.	1.
1276.	27.	723.	1.	721.	1.
1277.	75.	1887.	78.	1788.	1.
1278.	241.	5436.	1609.	3707.	33.
1279.	473.	12366.	5024.	6436.	859.
1280.	723.	22360.	9674.	9723.	2921.
1281.	973.	34886.	15461.	13537.	5866.
1282.	1223.	49636.	22250.	17844.	9538.
1283.	1473.	64222.	28860.	22354.	12891.
1284.	1723.	80662.	36318.	27320.	16782.
1285.	1973.	99122.	44708.	32754.	21302.
1286.	2223.	119631.	54044.	38650.	26481.

CROSS SECTION 10.85

SCALES ARE 1 INCH = 100. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 10.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1275.1	0.0	0.0						
BANK FULL	1277.7	51.5	97.1	.00	.00	.00			
*****WARNING-BANKFULL OR ZERO DAMAGE ELEV BELOW FIRST PROFILE. FLOW INTERPOLATED LINEARLY FROM CHANNEL BOTTOM*****									
1	1278.7	173.6	135.0	.00	.00	.00	135.00	1276.8	.00129
2	1279.3	301.5	230.0	.00	.00	.00	230.00	1277.3	.00112
3	1280.0	466.1	390.0	.00	.00	.00	390.00	1278.1	.00114
4	1280.2	520.9	460.0	.00	.00	.00	460.00	1278.2	.00119
5	1280.9	688.8	655.0	.00	.00	.00	655.00	1278.4	.00111

SEGMENT TABLE FOR SECTION 10.9

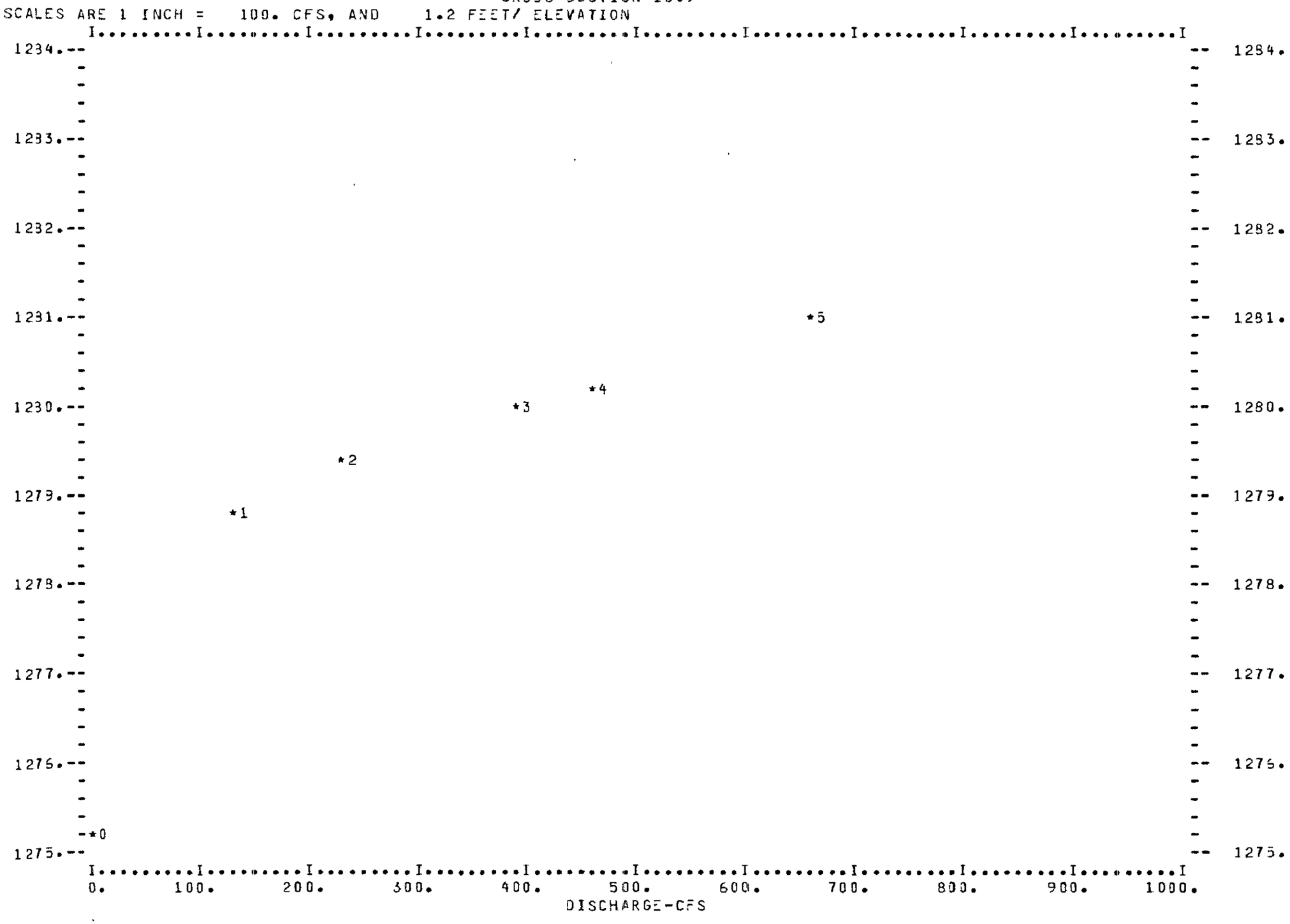
CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	135.	29.	106.	0.
135.	VELOCITY FPS	1.25	.30	1.39	.11
2	DISCHARGE CFS	230.	75.	149.	5.
230.	VELOCITY FPS	1.26	.43	1.53	.21
3	DISCHARGE CFS	390.	150.	213.	27.
390.	VELOCITY FPS	1.38	.56	1.77	.35
4	DISCHARGE CFS	460.	181.	239.	40.
460.	VELOCITY FPS	1.44	.61	1.87	.41
5	DISCHARGE CFS	655.	269.	306.	80.
655.	VELOCITY FPS	1.49	.70	2.03	.52
1	ELEV 1278.7 KD	3753.	805.	2944.	4.
2	ELEV 1279.3 KD	6859.	2258.	4456.	145.
3	ELEV 1280.0 KD	11502.	4408.	6356.	738.
4	ELEV 1280.2 KD	13230.	5189.	7019.	1022.
5	ELEV 1280.9 KD	19522.	8047.	9246.	2329.

KD TABLE FOR CROSS SECTION 10.9

ELEVATION	AREA	KD	KD BY SEGMENT		
1275.10	0.				
1276.	8.	124.	1.	122.	1.
1277.	25.	685.	1.	684.	1.
1278.	71.	1798.	49.	1719.	1.
1279.	231.	5010.	1325.	3587.	22.
1280.	460.	11364.	4332.	6289.	713.
1281.	710.	20525.	8434.	9546.	2508.
1282.	960.	32024.	13564.	13334.	5103.
1283.	1210.	45579.	19598.	17616.	8358.
1284.	1460.	59145.	25537.	22118.	11386.
1285.	1710.	74302.	32176.	27061.	14843.
1286.	1960.	91315.	39648.	32471.	18863.
1287.	2210.	110209.	47967.	38345.	23472.

CROSS SECTION 10.9

SCALES ARE 1 INCH = 100. CFS, AND 1.2 FEET/ ELEVATION



ROAD SECTION 11.

NO.	HW	CFS	HL	TW	CSM
0	1275.20	0.00	0.00	0.00	0.00
1	1279.03	135.00	.24	1278.79	135.00
2	1279.89	230.00	.48	1279.41	230.00
3	1281.28	390.00	1.20	1280.08	390.00
4	1281.43	460.00	1.12	1280.31	460.00
5	1281.69	655.00	.72	1280.97	655.00

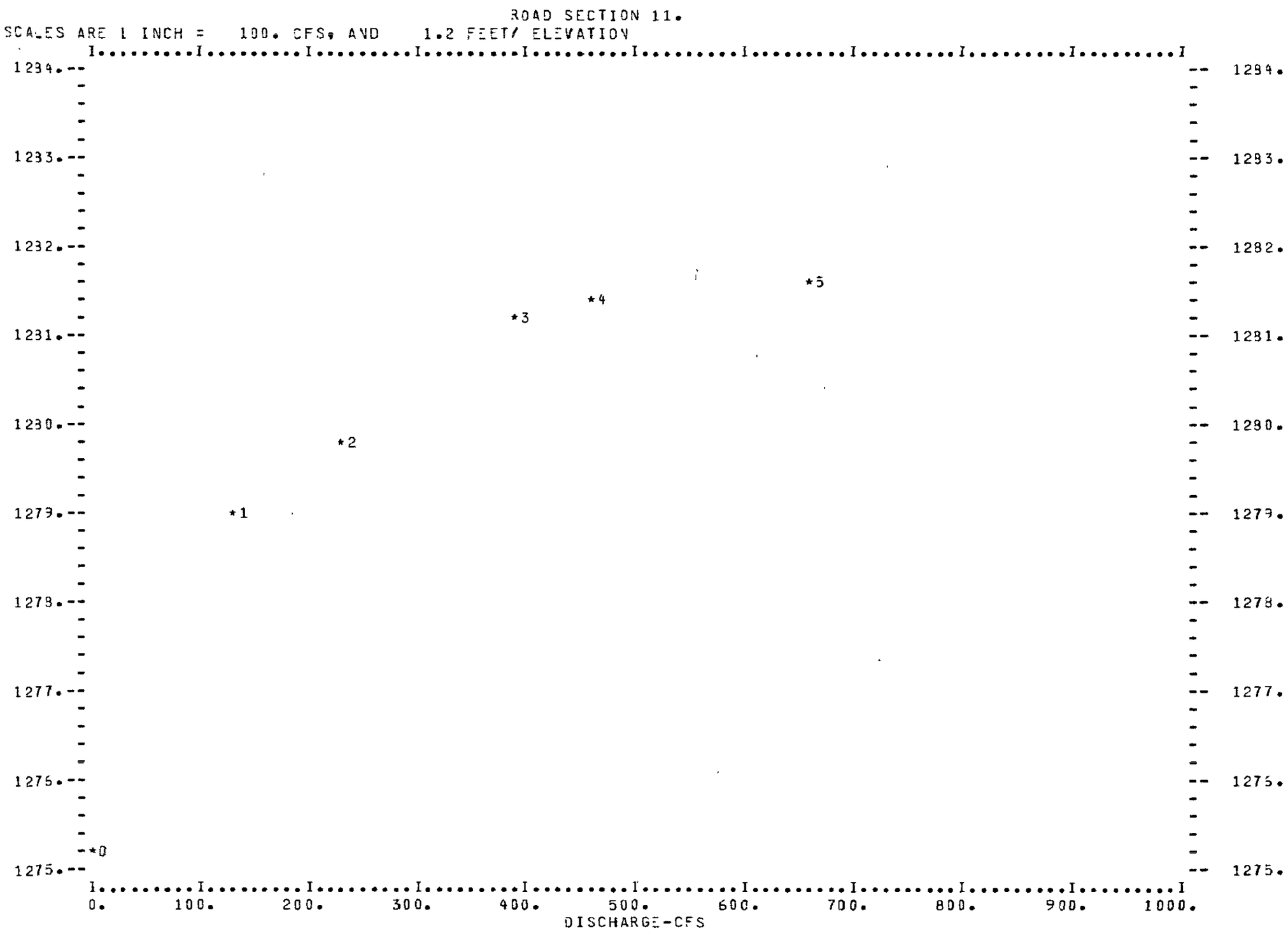
Actual weir flow is ROYS 1208 profile may be ~2' low

MIN ROAD ELEVATION 1281.20

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	33122.	5.42	7.70	46.30	1275.20	1275.20	.032
2	1	33122.	5.42	7.70	46.30	1275.40	1275.40	.032

ROAD SECTION 11.

SCALES ARE 1 INCH = 100. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 11.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	CHANNEL	NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1275.1	0.0	0.0						
BANK FULL	1278.1	49.7	102.7	.00	.00	.00			
*****WARNING-BANKFULL OR ZERO DAMAGE ELEV BELOW FIRST PROFILE. FLOW INTERPOLATED LINEARLY FROM CHANNEL BOTTOM*****									
1	1279.1	118.0	135.0	.00	.00	.00	135.00	1275.9	.00114
2	1279.9	257.5	230.0	.00	.00	.00	230.00	1277.5	.00098
3	1281.3	624.4	390.0	.00	.00	.00	390.00	1278.2	.00041
4	1281.5	663.7	460.0	.00	.00	.00	460.00	1278.7	.00048
5	1281.7	739.1	655.0	.00	.00	.00	655.00	1279.0	.00072

SEGMENT TABLE FOR SECTION 11.1

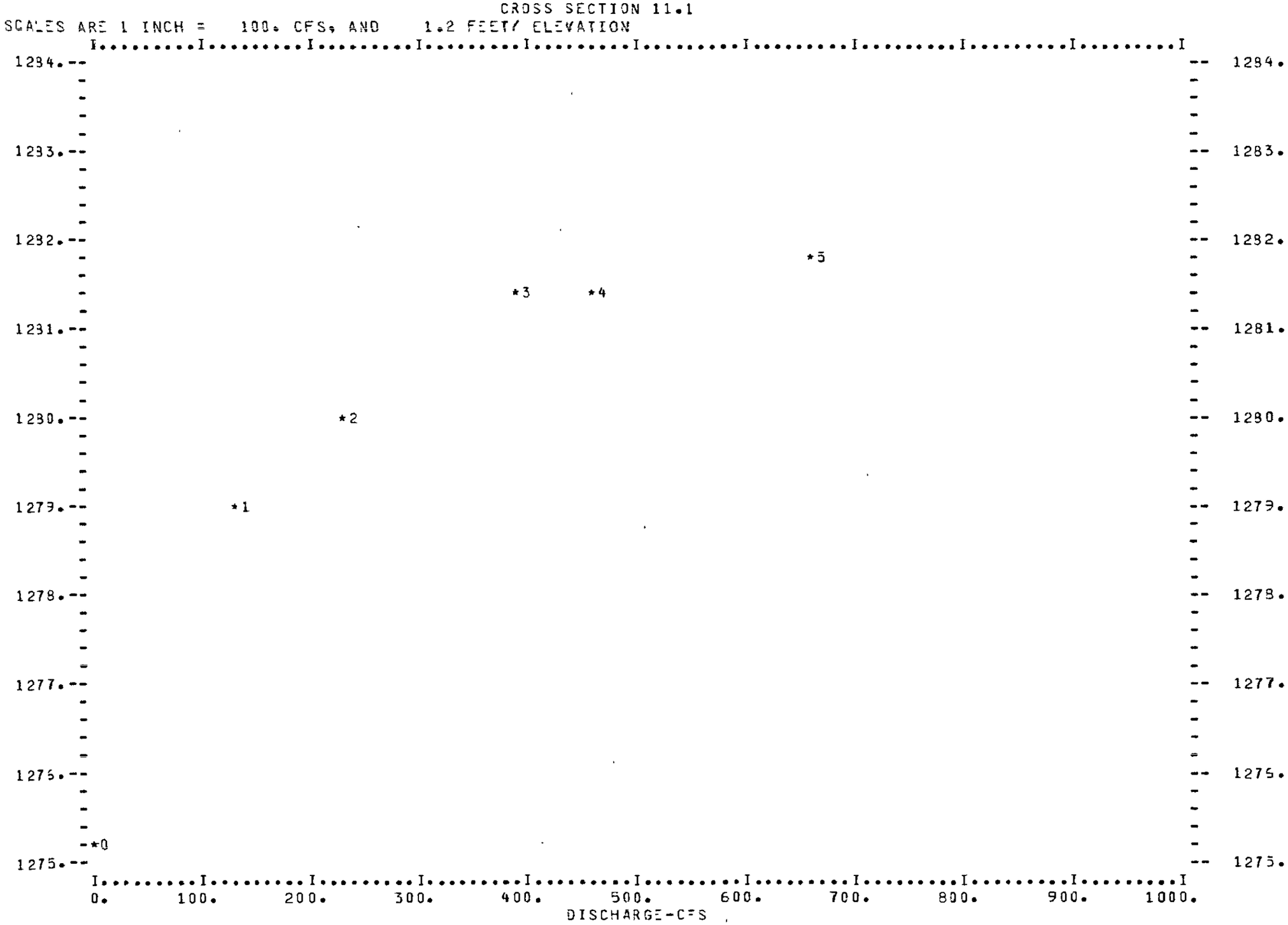
CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	135.	10.	125.	0.
135.	VELOCITY FPS	1.56	.26	1.60	.00
2	DISCHARGE CFS	230.	42.	187.	1.
230.	VELOCITY FPS	1.50	.29	1.77	.24
3	DISCHARGE CFS	390.	166.	218.	6.
390.	VELOCITY FPS	1.12	.37	1.43	.32
4	DISCHARGE CFS	460.	201.	251.	8.
460.	VELOCITY FPS	1.22	.41	1.60	.36
5	DISCHARGE CFS	655.	304.	340.	11.
655.	VELOCITY FPS	1.53	.55	2.04	.47
1	ELEV 1279.1 KD	3936.	224.	3710.	1.
2	ELEV 1279.9 KD	7339.	1322.	5973.	44.
3	ELEV 1281.3 KD	19239.	8010.	10929.	300.
4	ELEV 1281.5 KD	20981.	9105.	11537.	340.
5	ELEV 1281.7 KD	24303.	11170.	12720.	412.

KD TABLE FOR CROSS SECTION 11.1

ELEVATION	AREA	KD	KD BY SEGMENT		
1275.15	0.				
1276.	7.	123.	1.	120.	1.
1277.	24.	719.	1.	717.	1.
1278.	45.	1753.	1.	1751.	1.
1279.	108.	3728.	168.	3510.	1.
1280.	273.	7701.	1459.	6156.	51.
1281.	542.	16067.	6054.	9709.	229.
1282.	812.	27694.	13262.	13898.	485.
1283.	1082.	42038.	22553.	18672.	793.
1284.	1352.	58687.	33553.	23983.	1135.
1285.	1622.	75443.	44309.	29547.	1437.
1286.	1892.	93970.	56297.	35591.	1756.
1287.	2162.	114801.	70033.	42173.	2109.
1288.	2432.	137993.	85593.	49290.	2494.

CROSS SECTION 11.1

SCALES ARE 1 INCH = 100. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 11.2 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1276.6	0.0	0.0						
BANK FULL	1279.6	49.7	93.1	.00	.00	.00			
*****WARNING-BANKFULL OR ZERO DAMAGE ELEV BELOW FIRST PROFILE. FLOW INTERPOLATED LINEARLY FROM CHANNEL BOTTOM*****									
1	1281.0	174.0	135.0	.00	.00	.00	135.00	1278.4	.00063
2	1281.7	326.9	230.0	.00	.00	.00	230.00	1278.9	.00063
3	1282.6	593.3	390.0	.00	.00	.00	390.00	1279.7	.00045
4	1282.9	655.1	460.0	.00	.00	.00	460.00	1280.1	.00048
5	1283.4	791.8	655.0	.00	.00	.00	655.00	1280.5	.00058

SEGMENT TABLE FOR SECTION 11.2

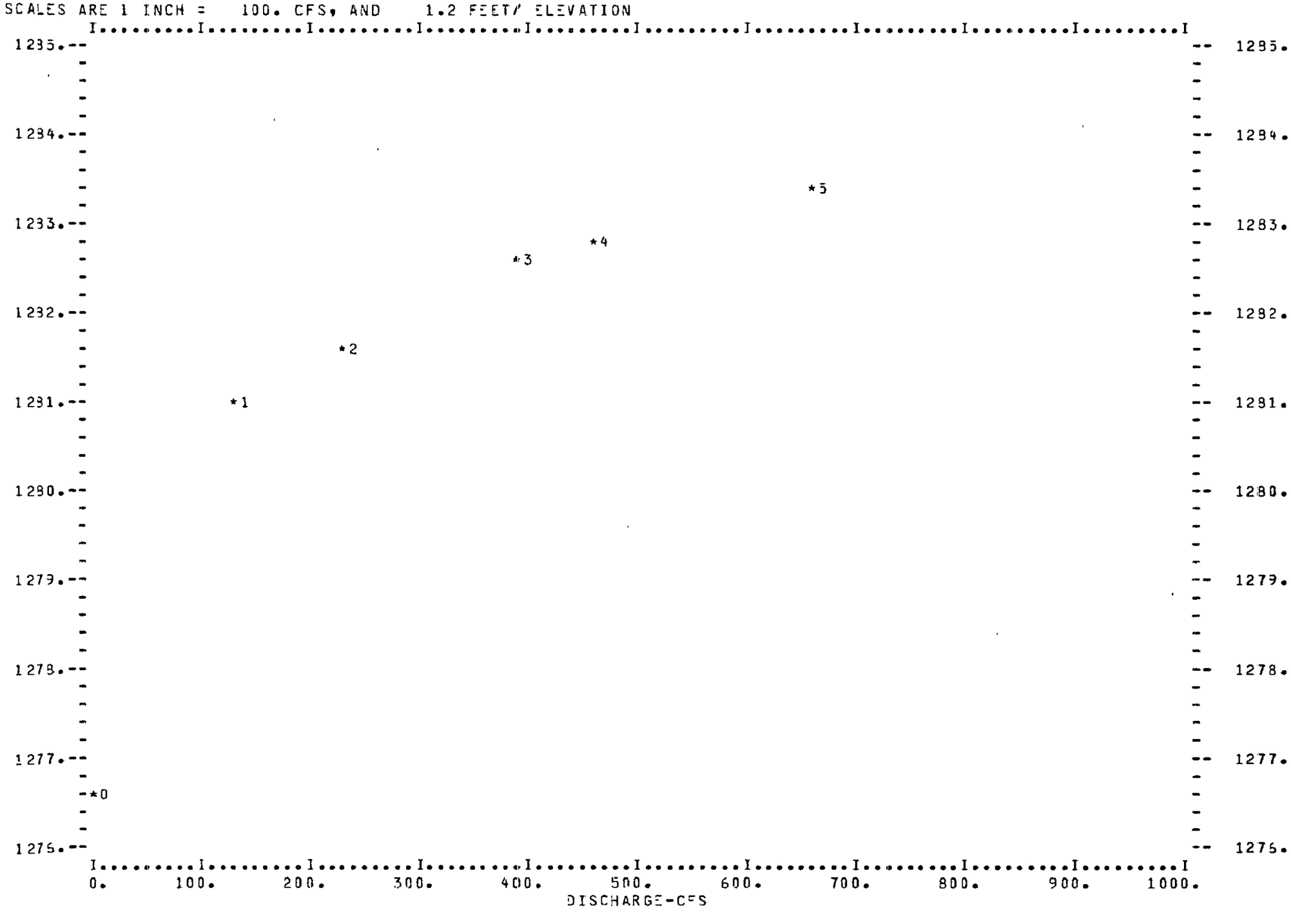
CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	135.	18.	117.	0.
135.	VELOCITY FPS	1.21	.22	1.28	.17
2	DISCHARGE CFS	230.	61.	167.	2.
230.	VELOCITY FPS	1.30	.30	1.45	.26
3	DISCHARGE CFS	390.	165.	219.	6.
390.	VELOCITY FPS	1.16	.39	1.48	.33
4	DISCHARGE CFS	460.	204.	248.	8.
460.	VELOCITY FPS	1.21	.43	1.59	.37
5	DISCHARGE CFS	655.	320.	323.	12.
655.	VELOCITY FPS	1.38	.54	1.86	.45
1	ELEV 1281.0 KD	5350.	554.	4693.	3.
2	ELEV 1281.7 KD	9007.	2124.	6808.	76.
3	ELEV 1282.6 KD	18256.	7512.	10462.	282.
4	ELEV 1282.9 KD	20955.	9209.	11402.	344.
5	ELEV 1283.4 KD	27222.	13169.	13570.	483.

KD TABLE FOR CROSS SECTION 11.2

ELEVATION	AREA	KD	KD BY SEGMENT		
1276.60	0.				
1277.	2.	19.	1.	17.	1.
1278.	15.	386.	1.	383.	1.
1279.	35.	1221.	1.	1219.	1.
1280.	71.	2673.	20.	2625.	1.
1281.	183.	5585.	711.	4824.	4.
1282.	420.	12008.	3674.	8022.	137.
1283.	690.	22642.	10303.	11956.	383.
1284.	950.	36043.	18889.	16456.	676.
1285.	1230.	52018.	29457.	21518.	1013.
1286.	1500.	69474.	41043.	27004.	1356.
1287.	1770.	87448.	52719.	32804.	1673.
1288.	2040.	107769.	66177.	39145.	2024.
1289.	2310.	130498.	81497.	46021.	2409.

CROSS SECTION 11.2

SCALES ARE 1 INCH = 100. CFS, AND 1.2 FEET/ ELEVATION



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-----------------------------80/80 LIST OF INPUT DATA-----------------------------
TITLE     DISCHARGE FROM THE BALL DRAIN TO SMITH ST.                          104B
CHANGE    DISCHARGE                                                           104C
DISCHARGE -1.       135.      230.      335.      350.      445.              104D
END                                                                           104E
REACH     11.3      1.        2800.     2500.                                105
REACH 2   11.2      1.4                                                       106
SEGMENT   11.3      1.        N         -14.      1279.6                    106A
NVALUE    .1                                                                106B
SEGMENT   11.3      2         C         20.       1281.                     106C
NVALUE    .045                                                              106D
SEGMENT   11.3      3         N         30.       1285.                     106E
NVALUE    .1                                                                106F
REACH     11.4      1.        3150.     2750.                                107
REACH 2   11.2      2.93                                                      108
SEGMENT   11.4      1.        N         -14.0     1279.6                    108A
NVALUE    .1                                                                108B
SEGMENT   11.4      2         C         20.       1281.                     108C
NVALUE    .045                                                              108D
SEGMENT   11.4      3         N         30.       1285.                     108E
NVALUE    .1                                                                108F
ROAD      12.       2.7       50.       50.                                  109
CULV 1    12.       1.        32111.                                         110
CULV 2    7.9       13.       32.3      1279.6    1279.4    .032             111
SECTION   12.                                                                112
          -401.     1293.     -400.     1291.8    -300.     1290.5           113
          -200.     1289.     -100.     1288.1    0.        1288.5           114
          100.      1283.5    132.      1288.7    200.      1289.            115
          300.      1289.8    400.      1290.9    500.      1292.1           116
          550.      1292.7    551.      1293.                                117
ENDTABLE                                                                     118
REACH     12.5      1.        100.      100.                                 119
SEGMENT   12.5      1         N         -30.      1286.5                    120
NVALUE    .13                                                               121
SEGMENT   12.5      2         C         20.       1285.8                    122
NVALUE    .05                                                               123
SEGMENT   12.5      3         N         105.      1290.                     124
NVALUE    .13                                                               125
SECTION   12.5                                                               126
          -70.      1290.     -70.      1285.4    -50.      1284.9           127
          -30.      1286.5    -19.      1284.3    -5.2      1280.9           128
          -5.       1280.8    0.        1279.7    4.        1280.3           129
          4.5       1280.9    10.       1284.5    20.       1285.8           130
          55.       1283.2    105.      1288.7    105.      1290.            131
ENDTABLE                                                                     132
ROAD      13.       2.7       100.      100.                                 133
```

WSEL@11.2 1282.9

K = 20955 Q = 460

L = 2500

Q = 360

$K_f = \left(\frac{360}{20955}\right)^2 = .0003$

$L_f = 2500 \times .0003 = .74$

1282.9 + .74

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
CULV 1    13.       1.        33122.                                          134
CULV 2    6.07      12.5      62.4      1279.9    1279.9    .032              135
SECTION   13.                                                                 136
          -425.     1290.     -305.     1288.     -165.     1287.5            137
          0.        1287.6    95.       1283.     240.      1289.4            138
          342.      1290.                                                     139
ENDTABLE                                                                      140
REACH     13.1      1.        50.       50.                                   141
REACH 2   12.5      .4                                                        142
COMPUTE   11.3      13.1      11.2                                            142A
-----------------------------END OF 80/80 LIST------------------------------
```

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 11.3 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1278.0	0.0	0.0						
BANK FULL	1281.0	49.7	96.1	.00	.00	.00			
*****WARNING-BANKFULL OR ZERO DAMAGE ELEV BELOW FIRST PROFILE. FLOW INTERPOLATED LINEARLY FROM CHANNEL BOTTOM*****									
1	1282.2	147.9	135.0	.00	.00	.00	135.00	1279.8	.00051
2	1282.9	287.7	230.0	.00	.00	.00	230.00	1280.3	.00052
3	1283.6	473.4	335.0	.00	.00	.00	335.00	1280.8	.00037
4	1283.8	534.3	360.0	.00	.00	.00	360.00	1280.9	.00032
5	1284.2	635.2	445.0	.00	.00	.00	445.00	1281.4	.00030

SEGMENT TABLE FOR SECTION 11.3

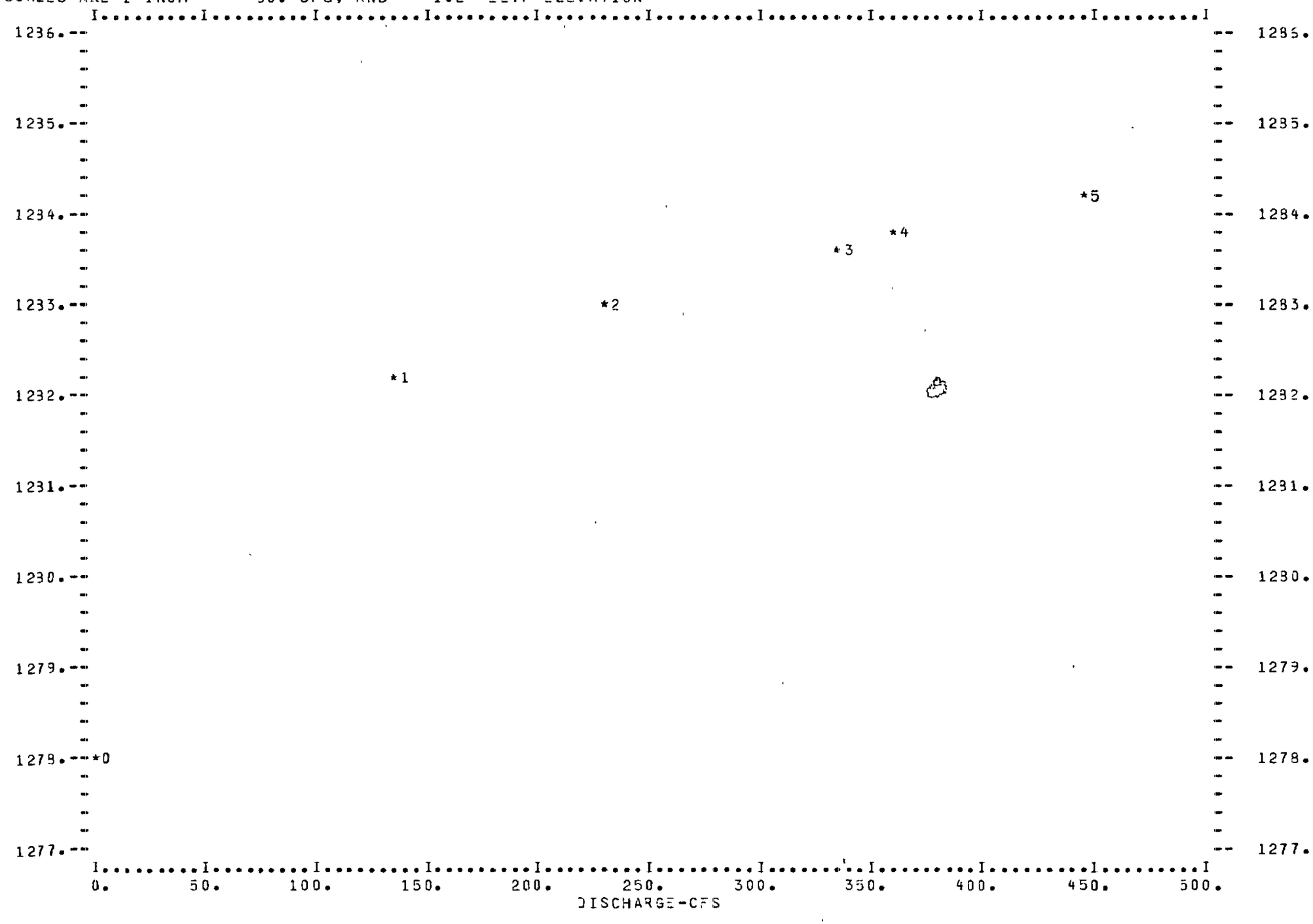
CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	135.	15.	119.	0.
135.	VELOCITY FPS	1.31	.25	1.38	.11
2	DISCHARGE CFS	230.	55.	173.	2.
230.	VELOCITY FPS	1.41	.32	1.58	.28
3	DISCHARGE CFS	335.	125.	205.	5.
335.	VELOCITY FPS	1.23	.38	1.54	.34
4	DISCHARGE CFS	360.	149.	206.	6.
360.	VELOCITY FPS	1.16	.39	1.45	.34
5	DISCHARGE CFS	445.	203.	234.	8.
445.	VELOCITY FPS	1.16	.44	1.52	.38
1	ELEV 1282.2 KD	5969.	675.	5292.	2.
2	ELEV 1282.9 KD	10026.	2208.	7741.	77.
3	ELEV 1283.6 KD	17491.	6530.	10713.	248.
4	ELEV 1283.8 KD	20169.	8121.	11741.	307.
5	ELEV 1284.2 KD	25407.	11420.	13560.	427.

KD TABLE FOR CROSS SECTION 11.3

ELEVATION	AREA	KD	KD BY SEGMENT		
1278.00	0.				
1278.	0.	0.	1.	0.	1.
1279.	9.	217.	1.	214.	1.
1280.	25.	1040.	1.	1038.	1.
1281.	50.	2387.	1.	2385.	1.
1282.	124.	5126.	365.	4685.	1.
1283.	313.	10949.	2580.	8110.	91.
1284.	582.	22636.	9569.	12584.	360.
1285.	852.	38624.	20024.	17821.	728.
1286.	1122.	58187.	33259.	23765.	1163.
1287.	1392.	80745.	48751.	30354.	1639.
1288.	1662.	102729.	63285.	37179.	2040.
1289.	1932.	127731.	80132.	44665.	2486.
1290.	2202.	155835.	99400.	52808.	2978.

CROSS SECTION 11.3

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 11.4 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1279.6	0.0	0.0						
BANK FULL	1282.6	49.7	97.1	.00	.00	.00			
*****WARNING-BANKFULL OR ZERO DAMAGE ELEV BELOW FIRST PROFILE. FLOW INTERPOLATED LINEARLY FROM CHANNEL BOTTOM*****									
1	1283.8	142.2	135.0	.00	.00	.00	135.00	1281.3	.00034
2	1284.4	271.4	230.0	.00	.00	.00	230.00	1281.9	.00037
3	1285.0	423.0	335.0	.00	.00	.00	335.00	1282.4	.00048
4	1285.2	482.6	360.0	.00	.00	.00	360.00	1282.5	.00040
5	1285.5	569.4	445.0	.00	.00	.00	445.00	1283.0	.00041

SEGMENT TABLE FOR SECTION 11.4

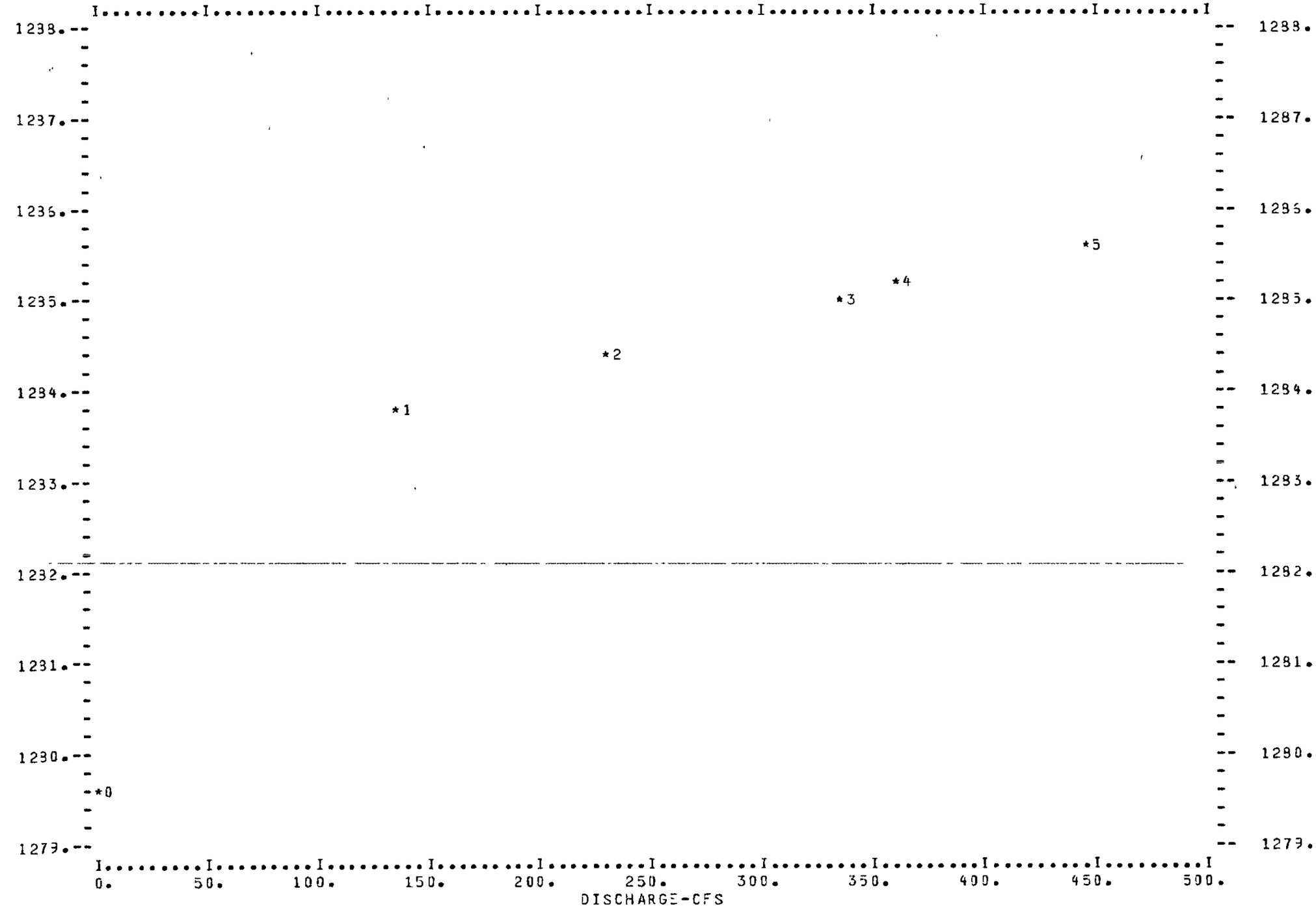
CSM		TOTAL	SEG NO 1 V	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	135.	15.	120.	0.
135.	VELOCITY FPS	1.34	.26	1.41	.00
2	DISCHARGE CFS	230.	50.	178.	2.
230.	VELOCITY FPS	1.48	.32	1.65	.27
3	DISCHARGE CFS	335.	118.	213.	4.
335.	VELOCITY FPS	1.40	.42	1.68	.37
4	DISCHARGE CFS	360.	138.	217.	5.
360.	VELOCITY FPS	1.29	.41	1.61	.37
5	DISCHARGE CFS	445.	193.	245.	7.
445.	VELOCITY FPS	1.32	.47	1.69	.41
1	ELEV 1283.8 KD	5783.	614.	5167.	2.
2	ELEV 1284.4 KD	9593.	2016.	7507.	70.
3	ELEV 1285.0 KD	15023.	4988.	9849.	186.
4	ELEV 1285.2 KD	17961.	6336.	10865.	260.
5	ELEV 1285.5 KD	21975.	9269.	12357.	349.

KD TABLE FOR CROSS SECTION 11.4

ELEVATION	AREA	KD	KD BY SEGMENT		
1279.58	0.				
1280.	2.	25.	1.	23.	1.
1281.	16.	487.	1.	484.	1.
1282.	35.	1518.	1.	1515.	1.
1283.	72.	3321.	29.	3253.	1.
1284.	187.	7019.	985.	5963.	7.
1285.	426.	15366.	5067.	9895.	189.
1286.	696.	29208.	13969.	14714.	519.
1287.	966.	46693.	25521.	20239.	913.
1288.	1236.	67546.	39714.	26431.	1365.
1289.	1506.	90254.	55197.	33140.	1822.
1290.	1776.	113676.	70864.	40243.	2247.
1291.	2046.	140179.	88917.	48005.	2717.
1292.	2316.	169844.	109463.	55423.	3234.

CROSS SECTION 11.4

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION



ROAD SECTION 12.

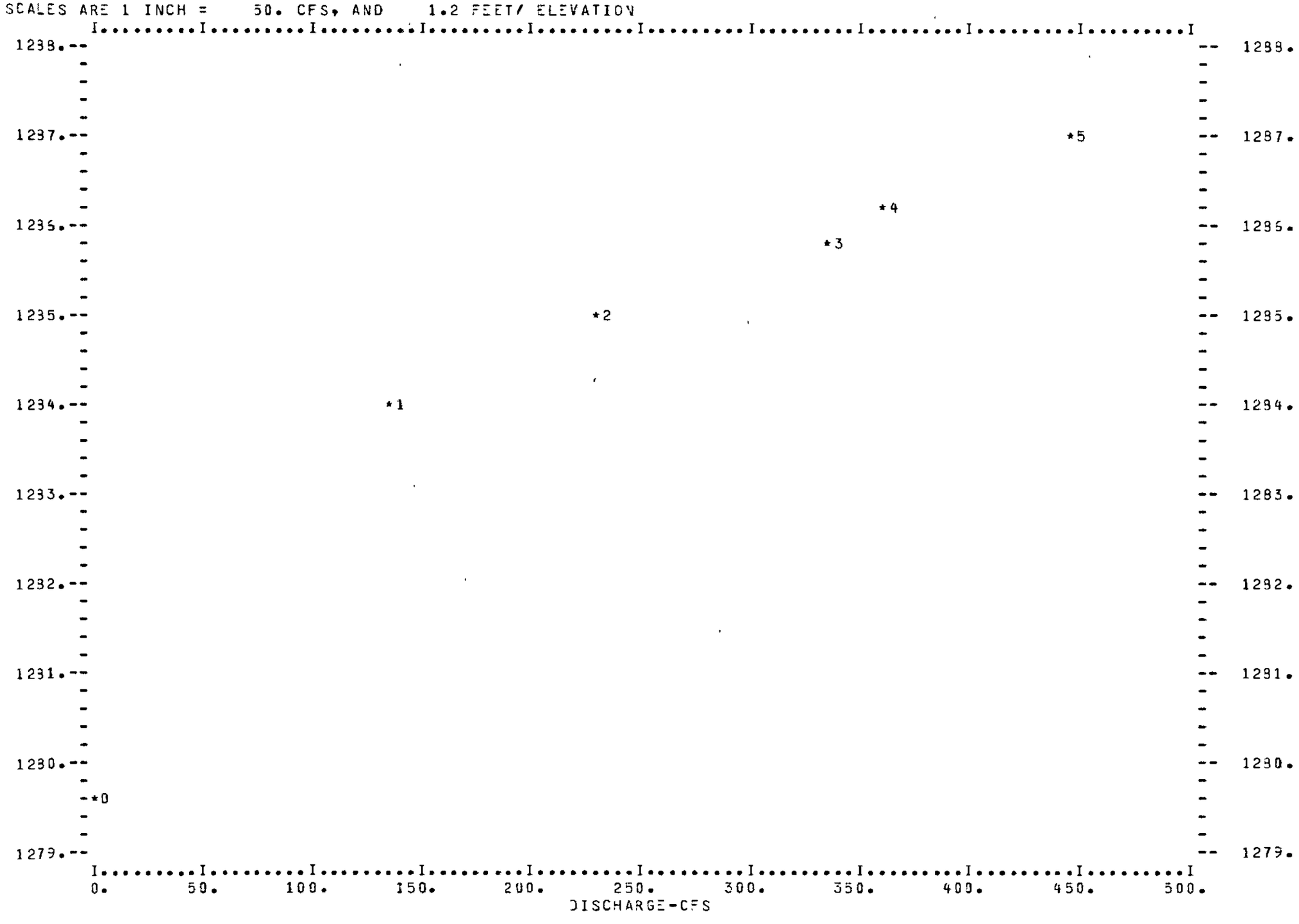
NO.	HW	CFS	HL	TW	CSM
0	1279.60	0.00	0.00	0.00	0.00
1	1284.02	135.00	.24	1283.78	135.00
2	1284.94	230.00	.48	1284.46	230.00
3	1285.89	335.00	.88	1285.01	335.00
4	1285.27 ✓	360.00	1.04	1285.23	360.00
5	1285.91	445.00	1.36	1285.55	445.00

MIN ROAD ELEVATION 1288.10

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32111.	8.12	12.70	32.30	1279.60	1279.40	.032

ELEV = 1287.6 ⇒ Low flow

ROAD SECTION 12.
SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 12.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1279.7	0.0	0.0						
1	1284.2	68.9	135.0	.00	.00	.00	135.00	1282.0	.00144
2	1285.1	103.3	230.0	.00	.00	.00	230.00	1282.6	.00177
BANK FULL	1285.8	148.1	306.1	.00	.00	.00			
3	1286.1	167.5	335.0	.00	.00	.00	335.00	1283.1	.00154
4	1286.4	200.2	360.0	.00	.00	.00	360.00	1283.2	.00123
5	1287.0	262.5	445.0	.00	.00	.00	445.00	1283.6	.00100

SEGMENT TABLE FOR SECTION 12.5

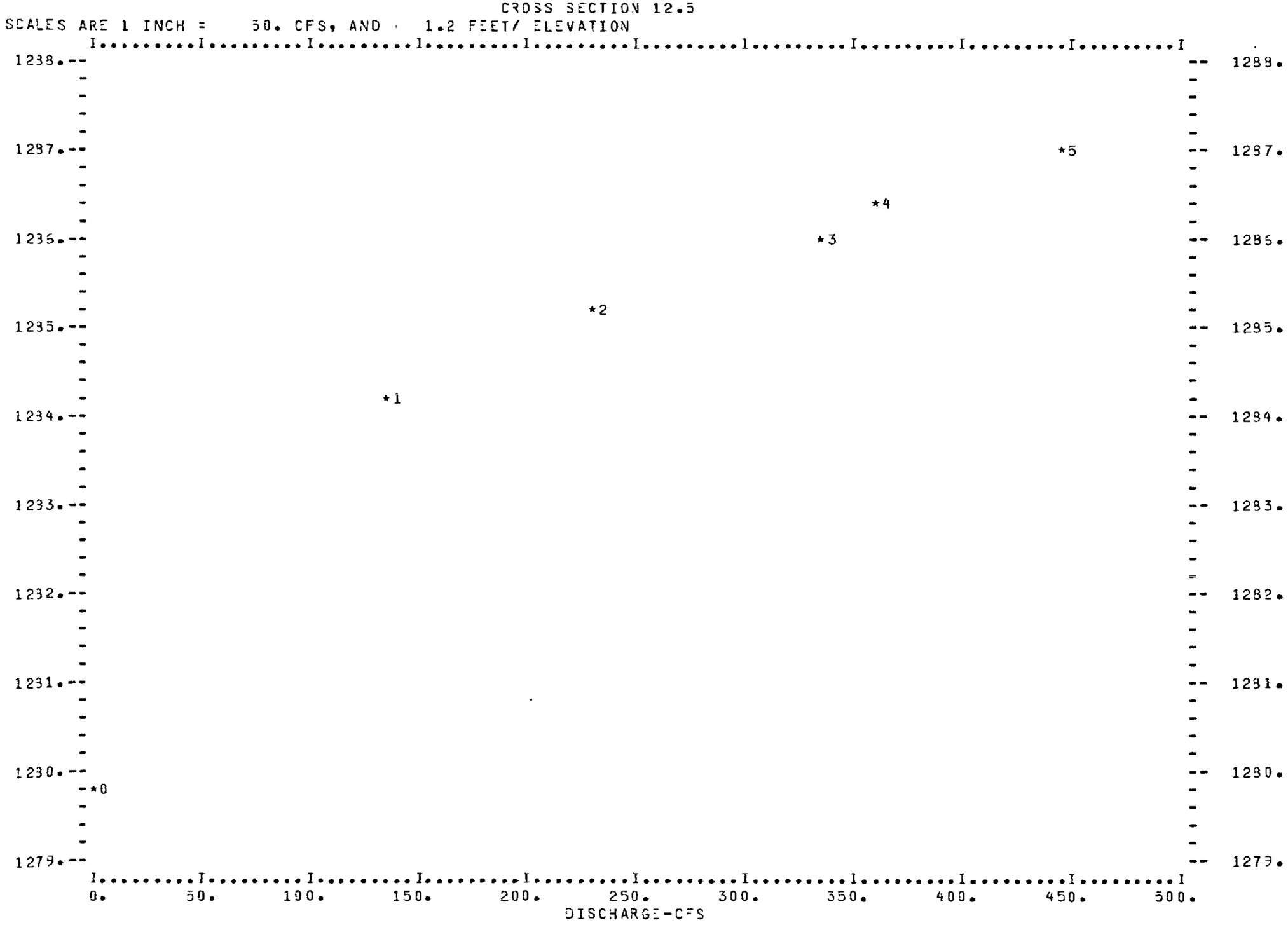
CSM		TOTAL	SEG NO 1 V	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	135.	0.	135.	0.
135.	VELOCITY FPS	1.97	.00	1.96	.00
2	DISCHARGE CFS	230.	1.	229.	0.
230.	VELOCITY FPS	2.30	.17	2.29	.00
3	DISCHARGE CFS	335.	10.	325.	0.
335.	VELOCITY FPS	2.29	.38	2.32	.13
4	DISCHARGE CFS	360.	17.	342.	1.
360.	VELOCITY FPS	2.15	.43	2.18	.25
5	DISCHARGE CFS	445.	31.	411.	3.
445.	VELOCITY FPS	2.12	.48	2.19	.28
1	ELEV 1284.2 KD	3555.	1.	3553.	1.
2	ELEV 1285.1 KD	5465.	9.	5455.	1.
3	ELEV 1286.1 KD	8531.	236.	8293.	2.
4	ELEV 1286.4 KD	10237.	424.	9805.	8.
5	ELEV 1287.0 KD	14067.	949.	13034.	84.

KD TABLE FOR CROSS SECTION 12.5

ELEVATION	AREA	KD	KD BY SEGMENT		
1279.70	0.				
1280.	1.	7.	1.	4.	1.
1281.	8.	197.	1.	195.	1.
1282.	21.	731.	1.	729.	1.
1283.	40.	1712.	1.	1710.	1.
1284.	64.	3235.	1.	3233.	1.
1285.	93.	5207.	6.	5196.	1.
1286.	163.	8321.	195.	8087.	2.
1287.	261.	13975.	935.	12944.	82.
1288.	380.	21700.	2084.	19200.	388.
1289.	527.	31275.	3577.	26461.	1101.
1290.	702.	43373.	5334.	34618.	3343.
1291.	877.	56784.	7203.	43377.	6054.
1292.	1052.	70282.	8951.	52307.	8396.
1293.	1227.	85551.	10936.	62159.	11332.
1294.	1402.	102663.	13168.	72947.	14966.

CROSS SECTION 12.5

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION



ROAD SECTION 13.

NO.	HW	CFS	HL	TW	CSM
0	1279.90	0.00	0.00	0.00	0.00
1	1284.65	135.00	.32	1284.33	135.00
2	1285.95	230.00	.64	1285.31	230.00
3	1287.26	335.00	1.04	1286.22	335.00
4	1287.65	360.00	1.12	1286.53	360.00
5	1287.92	445.00	.80	1287.12	445.00

may be 2' low

MIN ROAD ELEVATION 1287.60

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	33122.	7.09	10.92	62.40	1279.90	1279.90	.032

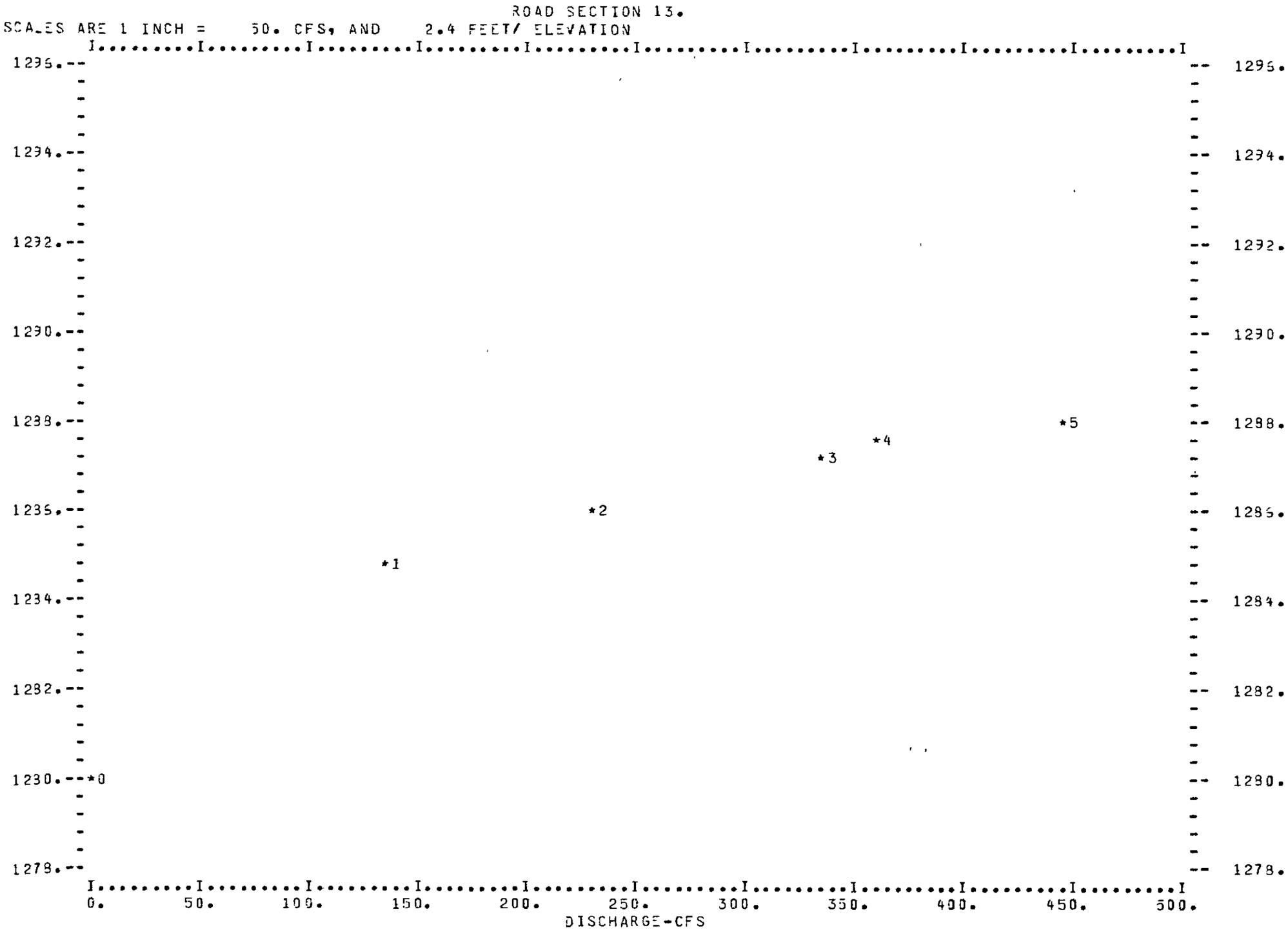
ELLC = 1286.99
ELRD = 1287.6

miter piper arch
7'1" 10'11"

$A = 60 ft^2$ $XKOR = 14.7 + \frac{29.1 (.032)^2 62}{(207)^{4/3}} = 2.40$

ROAD SECTION 13.

SCALES ARE 1 INCH = 50. CFS, AND 2.4 FEET/ ELEVATION



RATING TABLE FOR SECTION 13.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	CHANNEL	NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1280.1	0.0	0.0						
1	1284.7	72.7	135.0	.00	.00	.00	135.00	1282.4	.00125
2	1286.0	132.8	230.0	.00	.00	.00	230.00	1283.0	.00113
BANK FULL	1286.2	148.1	246.5	.00	.00	.00			
3	1287.3	248.2	335.0	.00	.00	.00	335.00	1283.5	.00064
4	1287.7	291.3	360.0	.00	.00	.00	360.00	1283.6	.00061
5	1287.9	322.0	445.0	.00	.00	.00	445.00	1284.0	.00061

SEGMENT TABLE FOR SECTION 13.1

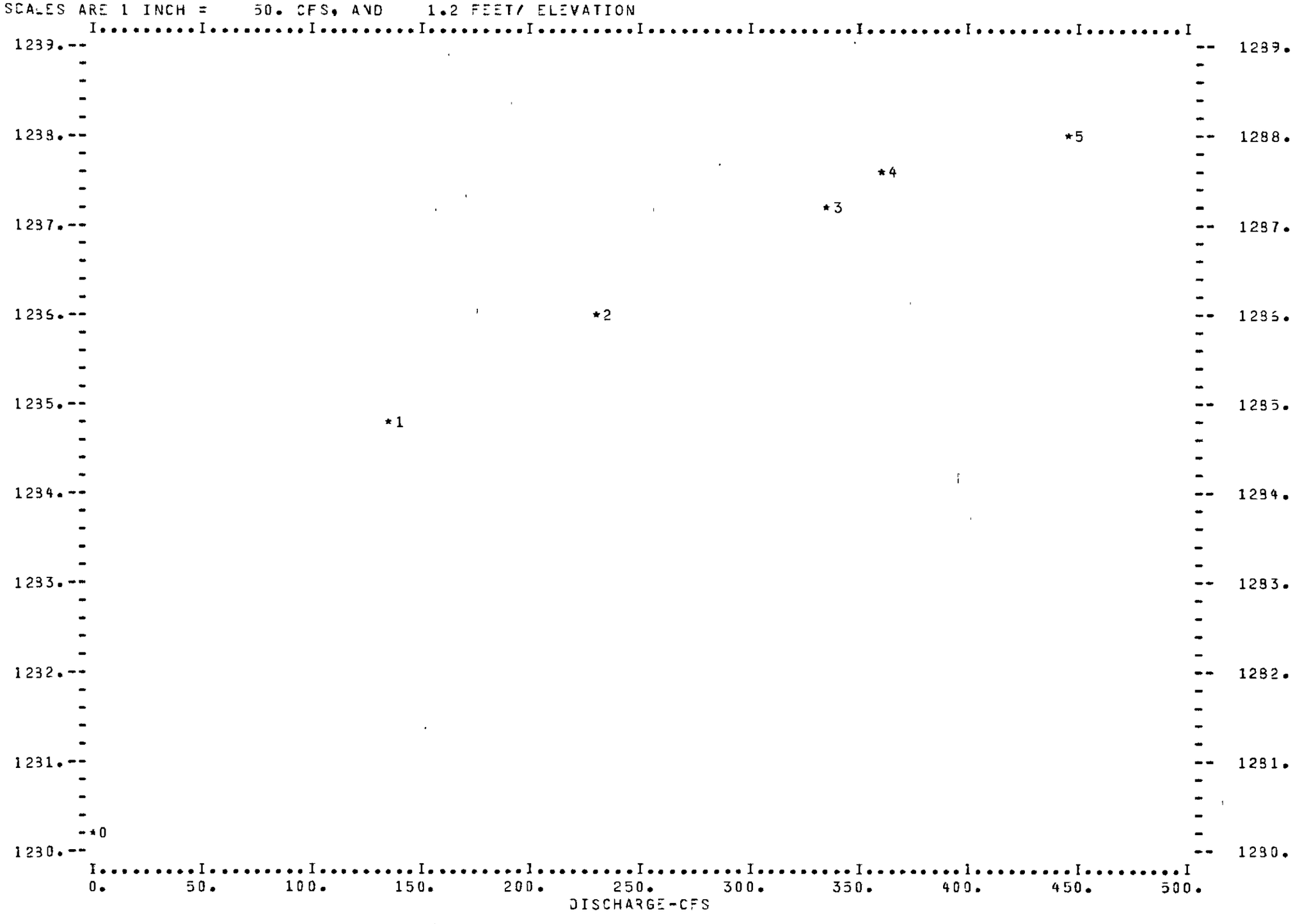
CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	135.	0.	135.	0.
135.	VELOCITY FPS	1.86	.00	1.86	.00
2	DISCHARGE CFS	230.	4.	226.	0.
230.	VELOCITY FPS	1.90	.28	1.89	.00
3	DISCHARGE CFS	335.	21.	312.	2.
335.	VELOCITY FPS	1.67	.36	1.72	.19
4	DISCHARGE CFS	360.	28.	328.	4.
360.	VELOCITY FPS	1.58	.38	1.64	.23
5	DISCHARGE CFS	445.	38.	401.	6.
445.	VELOCITY FPS	1.79	.45	1.87	.26
1	ELEV 1284.7 KD	3817.	1.	3815.	1.
2	ELEV 1286.0 KD	6786.	49.	6736.	1.
3	ELEV 1287.3 KD	13220.	337.	12319.	54.
4	ELEV 1287.7 KD	15967.	1198.	14533.	136.
5	ELEV 1287.9 KD	18006.	1323.	16261.	223.

KD TABLE FOR CROSS SECTION 13.1

ELEVATION	AREA	KD	KD BY SEGMENT		
1280.10	0.				
1281.	4.	81.	1.	79.	1.
1282.	15.	470.	1.	468.	1.
1283.	32.	1259.	1.	1257.	1.
1284.	54.	2556.	1.	2554.	1.
1285.	82.	4407.	1.	4403.	1.
1286.	133.	6841.	49.	6744.	1.
1287.	220.	11426.	564.	10790.	19.
1288.	328.	18456.	1591.	16599.	244.
1289.	461.	27121.	2959.	23473.	674.
1290.	632.	38337.	4614.	31274.	2369.
1291.	807.	51602.	6511.	39943.	5108.
1292.	982.	64675.	8224.	48625.	7396.
1293.	1157.	79227.	10113.	58105.	10079.
1294.	1332.	95593.	12245.	68518.	13422.
1295.	1507.	113844.	14630.	79876.	17522.

CROSS SECTION 13.1

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION



```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
LINK                                                                          1428
REACH      13.2       1.         550.       550.                               143
REACH 2    13.8       -.5                                                       144
REACH      13.8       1.         800.       800.                               145
SEGMENT    13.8       1          N          -20.       1287.9                  146
NVALUE     .11                                                                  147
SEGMENT    13.8       2          C          25.        1289.2                  148
NVALUE     .045                                                                 149
SEGMENT    13.8       3          N          200.       1290.                   150
NVALUE     .085                                                                 151
SECTION    13.8                                                                 152
           -400.      1290.      -205.      1288.5     -55.       1288.        153
           -20.       1287.9     -13.       1283.8     -5.        1281.7       154
           -5.        1281.4     0.         1280.8     5.         1281.        155
           11.        1281.7     14.        1283.5     20.        1288.        156
           25.        1289.2     200.       1290.                               157
ENDTABLE                                                                      158
REACH      13.9       1.         300.       300.                               159
REACH 2    13.8       .3                                                        160
ROAD       14.        2.7        50.        50.                                161
SPR        14.        A          1.                                            162
GIRDER     1286.9     1286.4     0.         .8         2.7                    163
           -3.        1283.7     -8.        1286.4     8.         1286.4       164
           8.         1283.7                                                   165
ENDTABLE                                                                      166
SECTION    14.                                                                 167
           -260.      1290.      -260.      1288.2     -235.      1288.        168
           -225.      1288.      -135.      1288.      -8.        1288.7       169
           -3.        1281.2     8.         1281.1     8.         1283.7       170
           95.        1289.      190.0      1290.0                             170A
ENDTABLE                                                                      171
REACH      14.1       1.         50.        50.                                172
REACH 2    13.3       .3                                                        173
COMPUTE    13.2       14.1       13.1                                         173A
-----------------------------END OF 80/80 LIST------------------------------
```

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 13.2 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	CHANNEL	NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1280.3	0.0	0.0						
1	1284.9	104.9	135.0	.00	.00	.00	135.00	1281.9	.00034
2	1286.2	149.4	230.0	.00	.00	.00	230.00	1282.4	.00037
BANK FULL	1287.4	195.9	327.9	.00	.00	.00			
3	1287.5	199.5	335.0	.00	.00	.00	335.00	1282.9	.00035
4	1287.9	267.1	360.0	.00	.00	.00	360.00	1282.9	.00032
5	1288.2	328.0	445.0	.00	.00	.00	445.00	1283.3	.00040

SEGMENT TABLE FOR SECTION 13.2

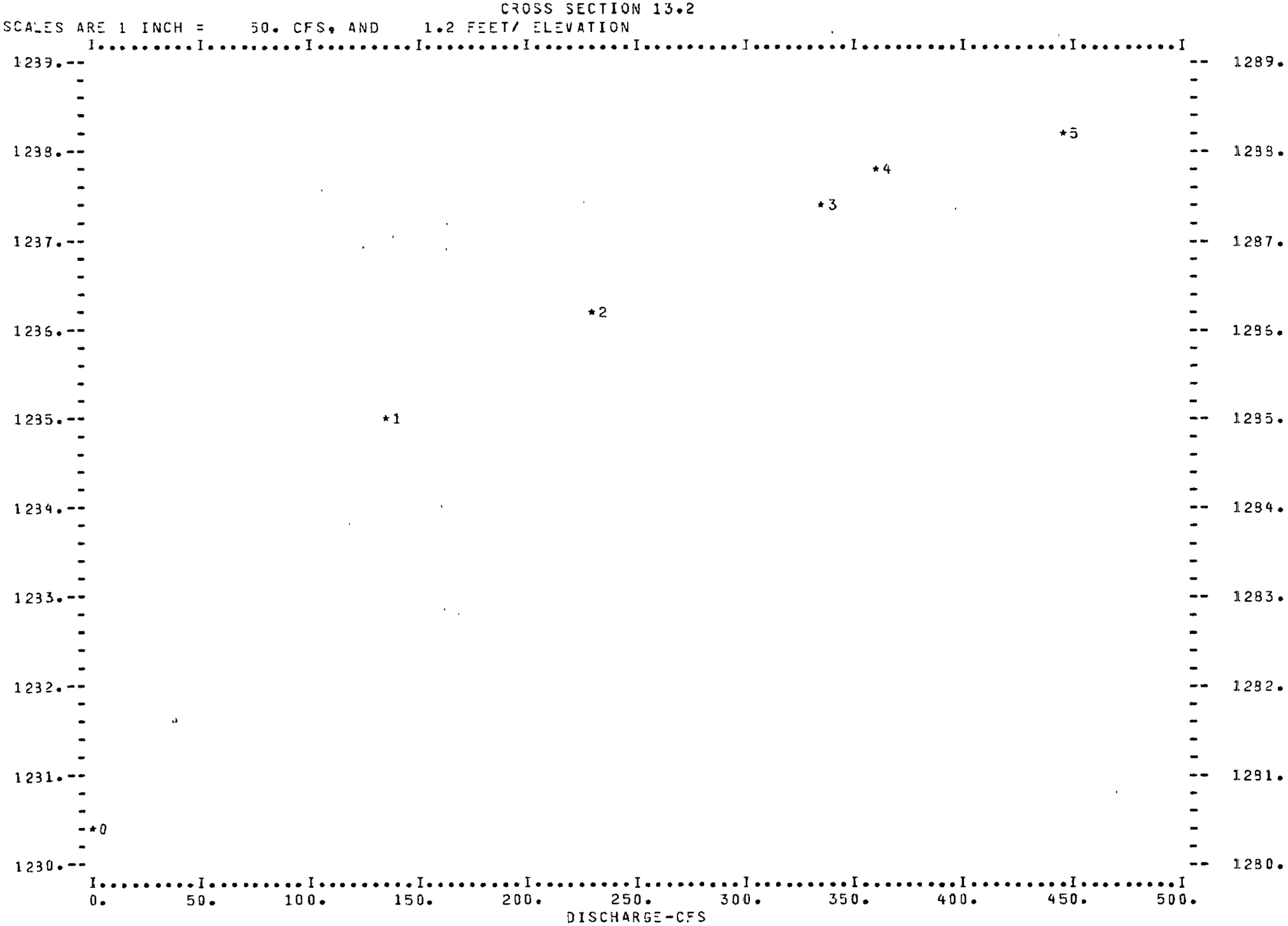
CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	135.	0.	135.	0.
135.	VELOCITY FPS	1.29	.00	1.29	.00
2	DISCHARGE CFS	230.	0.	230.	0.
230.	VELOCITY FPS	1.54	.00	1.54	.00
3	DISCHARGE CFS	335.	0.	335.	0.
335.	VELOCITY FPS	1.70	.03	1.70	.00
4	DISCHARGE CFS	360.	9.	351.	0.
360.	VELOCITY FPS	1.64	.16	1.65	.00
5	DISCHARGE CFS	445.	18.	427.	0.
445.	VELOCITY FPS	1.86	.18	1.89	.00
1	ELEV 1284.9 KD	7278.	1.	7276.	1.
2	ELEV 1286.2 KD	12036.	1.	12034.	1.
3	ELEV 1287.5 KD	17862.	4.	17857.	1.
4	ELEV 1287.9 KD	19765.	51.	19713.	1.
5	ELEV 1288.2 KD	21873.	464.	21408.	1.

KD TABLE FOR CROSS SECTION 13.2

ELEVATION	AREA	KD	KD BY SEGMENT		
1280.30	0.				
1281.	6.	113.	1.	111.	1.
1282.	25.	882.	1.	879.	1.
1283.	48.	2332.	1.	2330.	1.
1284.	76.	4554.	1.	4552.	1.
1285.	107.	7491.	1.	7489.	1.
1286.	141.	11116.	1.	11114.	1.
1287.	179.	15464.	2.	15461.	1.
1288.	295.	21125.	144.	20487.	1.
1289.	613.	31333.	3716.	26797.	59.
1290.	1140.	50693.	12791.	34649.	1952.
1291.	1738.	74417.	23109.	43007.	5982.
1292.	2338.	101865.	33945.	51965.	9750.
1293.	2938.	135889.	48313.	61821.	15265.
1294.	3538.	177359.	66948.	72585.	23101.

CROSS SECTION 13.2

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 13.8 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1280.8	0.0	0.0						
1	1285.3	99.8	135.0	.00	.00	.00	135.00	1282.4	.00040
2	1286.6	143.7	230.0	.00	.00	.00	230.00	1282.9	.00041
3	1287.8	191.8	335.0	.00	.00	.00	335.00	1283.4	.00039
BANK FULL	1287.9	195.9	342.0	.00	.00	.00			
4	1288.2	229.5	360.0	.00	.00	.00	360.00	1283.4	.00036
5	1288.5	299.7	445.0	.00	.00	.00	445.00	1283.8	.00044

SEGMENT TABLE FOR SECTION 13.8

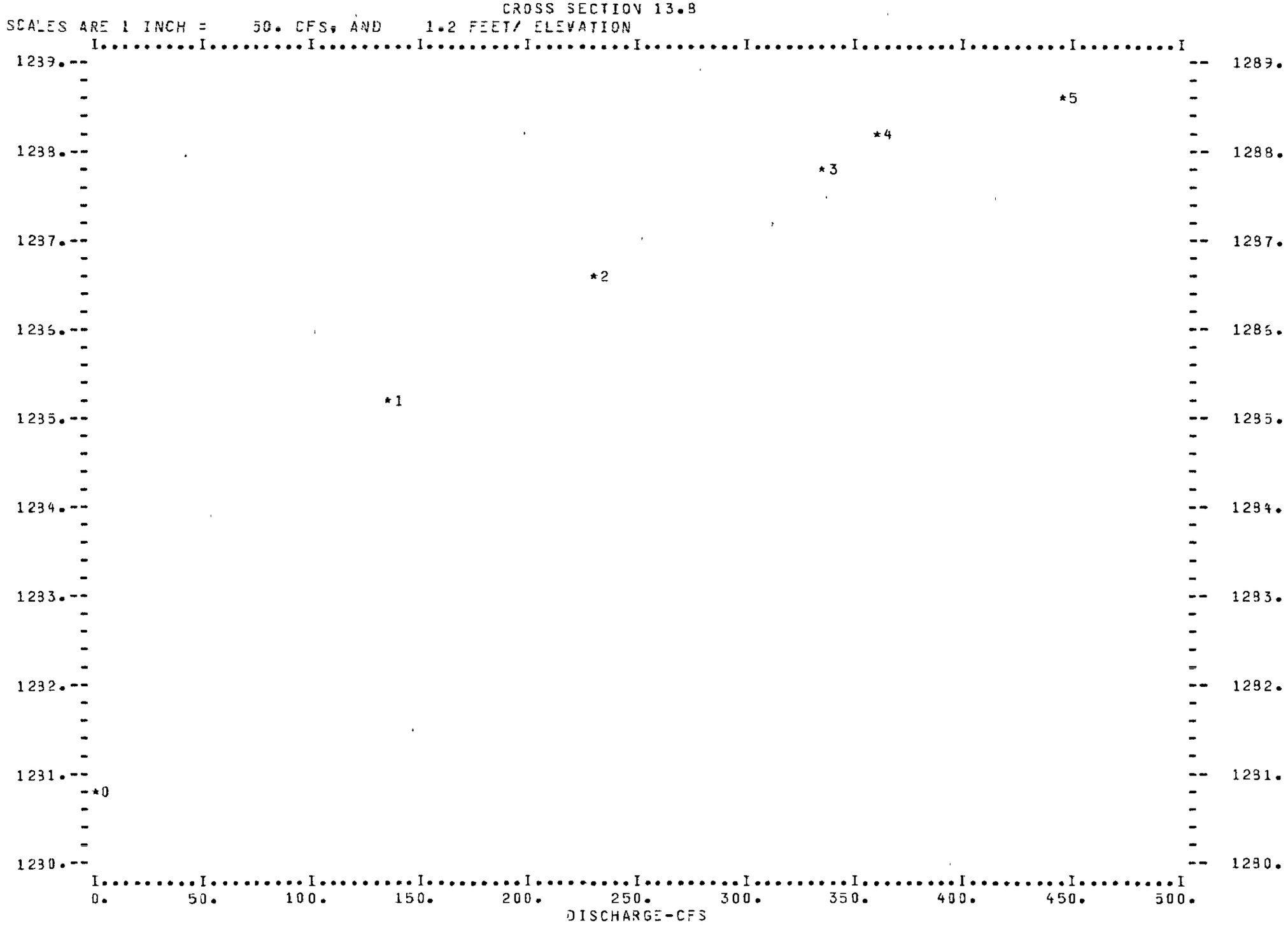
CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	135.	0.	135.	0.
135.	VELOCITY FPS	1.36	.00	1.35	.00
2	DISCHARGE CFS	230.	0.	230.	0.
230.	VELOCITY FPS	1.60	.00	1.60	.00
3	DISCHARGE CFS	335.	0.	335.	0.
335.	VELOCITY FPS	1.76	.04	1.76	.00
4	DISCHARGE CFS	360.	4.	356.	0.
360.	VELOCITY FPS	1.74	.15	1.74	.00
5	DISCHARGE CFS	445.	15.	430.	0.
445.	VELOCITY FPS	1.93	.19	1.96	.00
1	ELEV 1285.3 KD	6766.	1.	6764.	1.
2	ELEV 1286.6 KD	11402.	1.	11400.	1.
3	ELEV 1287.8 KD	16927.	3.	16923.	1.
4	ELEV 1288.2 KD	18718.	13.	18704.	1.
5	ELEV 1288.5 KD	20782.	169.	20612.	1.

KD TABLE FOR CROSS SECTION 13.8

ELEVATION	AREA	KD	KD BY SEGMENT		
1280.80	0.				
1281.	1.	7.	1.	5.	1.
1282.	15.	409.	1.	407.	1.
1283.	35.	1521.	1.	1519.	1.
1284.	62.	3338.	1.	3336.	1.
1285.	91.	5940.	1.	5938.	1.
1286.	124.	9215.	1.	9213.	1.
1287.	159.	13191.	1.	13188.	1.
1288.	200.	17937.	4.	17932.	1.
1289.	427.	25336.	1559.	23391.	3.
1290.	844.	39324.	7590.	30531.	530.
1291.	1438.	62899.	18808.	38862.	4605.
1292.	2038.	87372.	28128.	47374.	7679.
1293.	2638.	118002.	40644.	56780.	12256.
1294.	3238.	155638.	57049.	67089.	18853.

CROSS SECTION 13.8

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 13.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	CHANNEL	NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1281.1	0.0	0.0						
1	1285.4	94.7	135.0	.00	.00	.00	135.00	1282.7	.00046
2	1286.7	137.8	230.0	.00	.00	.00	230.00	1283.2	.00046
3	1287.9	184.6	335.0	.00	.00	.00	335.00	1283.7	.00043
BANK FULL	1288.2	195.9	354.6	.00	.00	.00			
4	1288.3	199.0	360.0	.00	.00	.00	360.00	1283.7	.00041
5	1288.7	269.8	445.0	.00	.00	.00	445.00	1284.1	.00048

SEGMENT TABLE FOR SECTION 13.9

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	135.	0.	135.	0.
135.	VELOCITY FPS	1.43	.00	1.43	.00
2	DISCHARGE CFS	230.	0.	230.	0.
230.	VELOCITY FPS	1.67	.00	1.67	.00
3	DISCHARGE CFS	335.	0.	335.	0.
335.	VELOCITY FPS	1.83	.05	1.83	.00
4	DISCHARGE CFS	360.	0.	360.	0.
360.	VELOCITY FPS	1.83	.04	1.83	.00
5	DISCHARGE CFS	445.	11.	434.	0.
445.	VELOCITY FPS	2.02	.19	2.04	.00
1	ELEV 1285.4 KD	6280.	1.	6278.	1.
2	ELEV 1286.7 KD	10759.	1.	10757.	1.
3	ELEV 1287.9 KD	16087.	2.	16084.	1.
4	ELEV 1288.3 KD	17806.	4.	17801.	1.
5	ELEV 1288.7 KD	19846.	57.	19788.	1.

KD TABLE FOR CROSS SECTION 13.9

ELEVATION	AREA	KD	KD BY SEGMENT		
1281.10	0.				
1282.	9.	205.	1.	204.	1.
1283.	29.	1117.	1.	1115.	1.
1284.	53.	2707.	1.	2705.	1.
1285.	82.	5086.	1.	5083.	1.
1286.	114.	8161.	1.	8159.	1.
1287.	148.	11924.	1.	11922.	1.
1288.	188.	16431.	2.	16427.	1.
1289.	333.	22487.	558.	21556.	1.
1290.	688.	33996.	5188.	28234.	179.
1291.	1259.	55910.	15643.	36382.	3227.
1292.	1858.	79422.	25026.	44727.	6620.
1293.	2458.	108117.	36514.	53864.	10696.
1294.	3058.	143560.	51675.	63902.	16626.
1295.	3658.	186627.	71257.	74848.	25006.

CROSS SECTION 13.9

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION

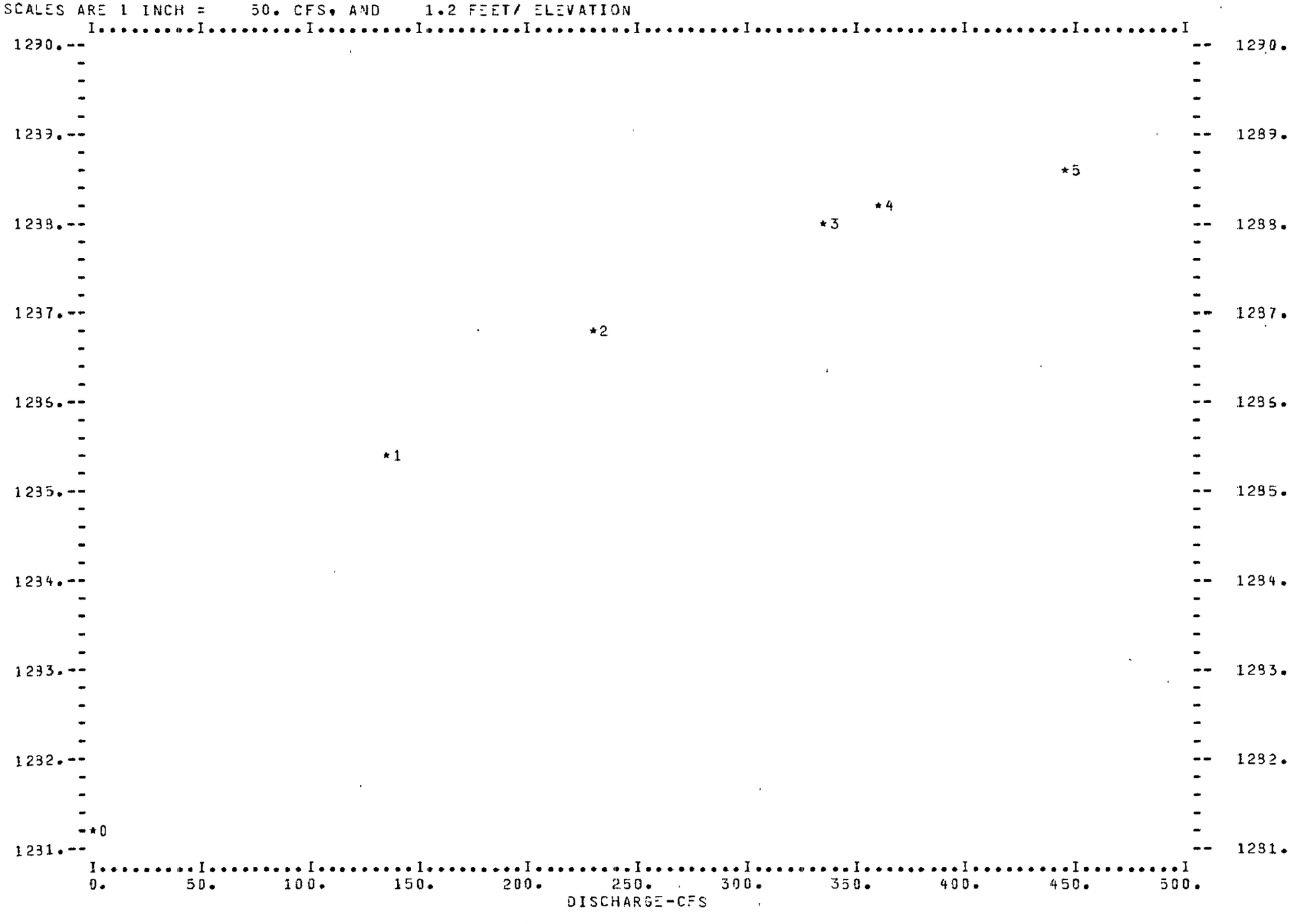


TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.2340	.2340	.0000	.0000	.0000	.0000	.8096	1.0000	1.0000	68.6060	96.0746	95.4358
DCRIT	1282.44	KBCRIT=									
.3368	.3368	.0000	.0000	.0000	.0000	.7606	1.0000	1.0000	84.0000	140.8407	138.6506
DCRIT	1283.00	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	1.0000	84.0000	140.8407	138.6506
DCRIT	-1.00	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	1.0000	84.0000	140.8407	138.6506
DCRIT	-1.00	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	1.0000	84.0000	140.8407	138.6506
DCRIT	-1.00	KBCRIT=									

ROAD SECTION 14.

NO.	HW	CFS	HL	TW	CSM
0	1281.10	0.00	0.00	0.00	0.00
1	1285.44	135.00	.00	1285.44	135.00
2	1286.77	230.00	.04	1286.73	230.00
3	1288.23	335.00	.28	1287.95	335.00
4	1288.43	360.00	.14	1288.29	360.00
5	1288.77	445.00	.08	1288.69	445.00

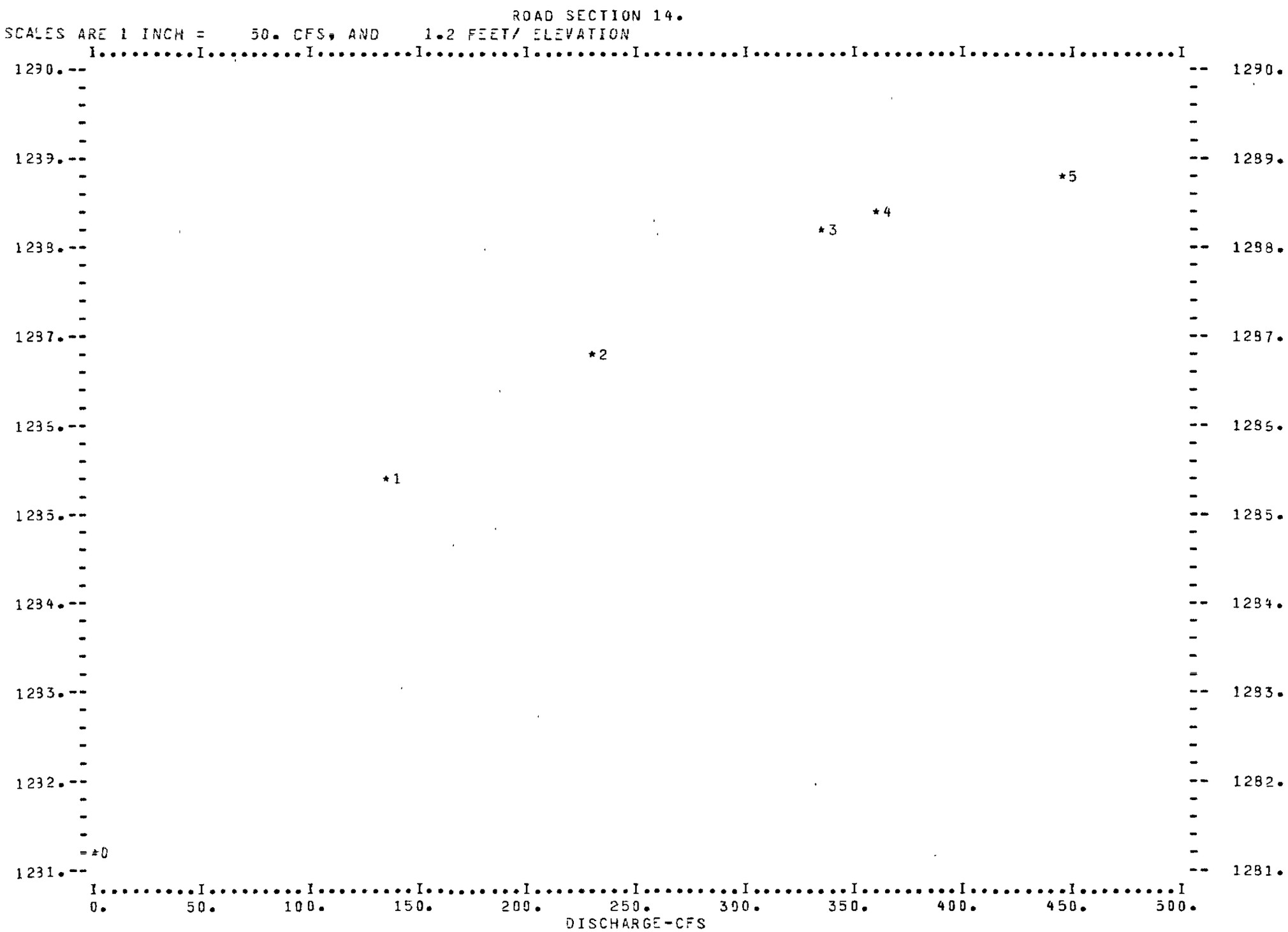
appear road in "cut" profile may be 2-3' low

MIN ROAD ELEVATION 1288.00

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 1286.40 OPENING NO.= 1

ROAD SECTION 14.

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 14.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1281.1	0.0	0.0						
1	1285.5	96.2	135.0	.00	.00	.00	135.00	1282.7	.00044
2	1286.8	140.9	230.0	.00	.00	.00	230.00	1283.2	.00043
BANK FULL	1288.2	195.9	331.4	.00	.00	.00			
3	1288.2	198.0	335.0	.00	.00	.00	335.00	1283.7	.00036
4	1288.5	229.3	360.0	.00	.00	.00	360.00	1283.7	.00036
5	1288.8	293.9	445.0	.00	.00	.00	445.00	1284.1	.00045

SEGMENT TABLE FOR SECTION 14.1

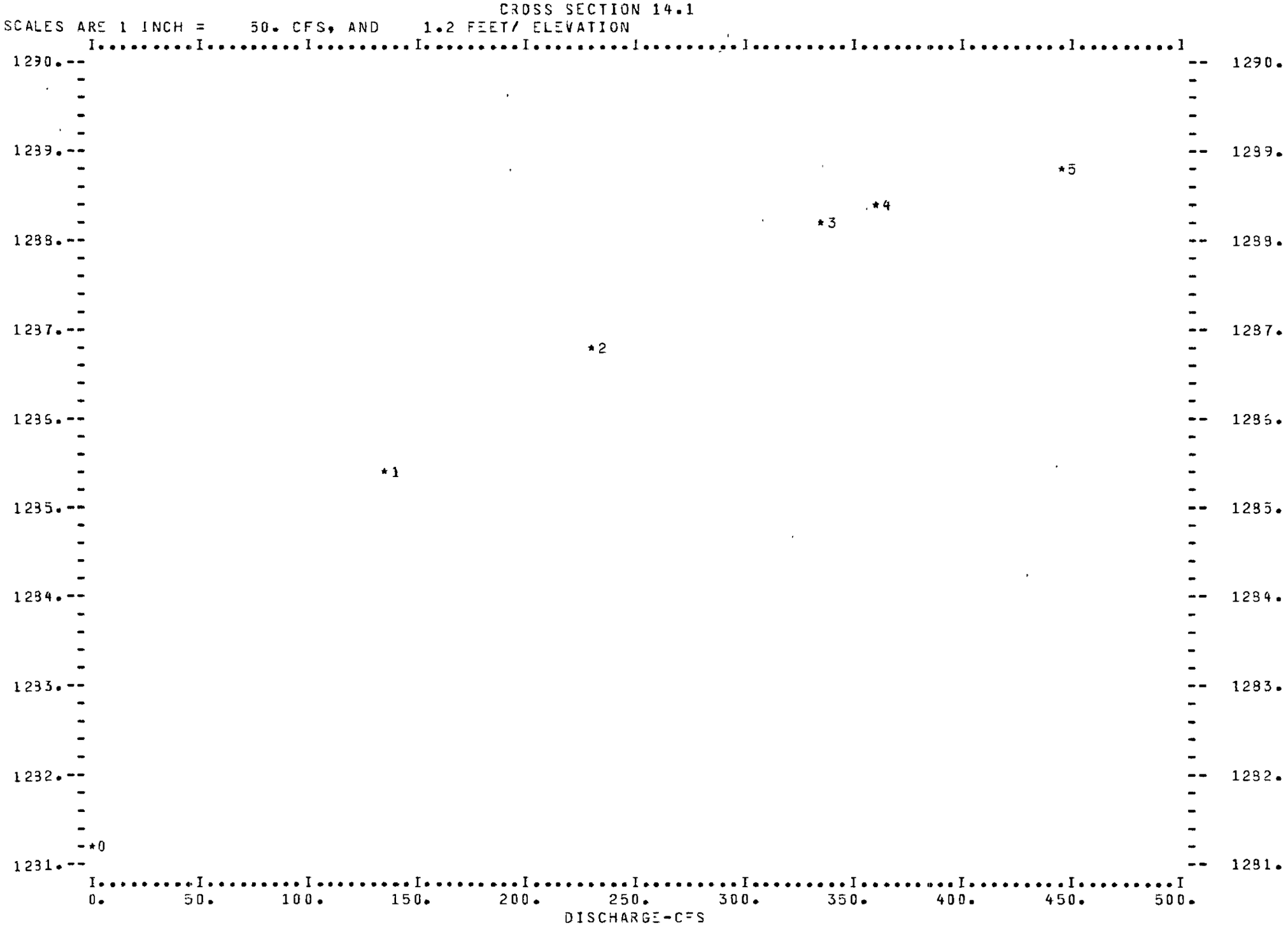
CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	135.	0.	135.	0.
135.	VELOCITY FPS	1.41	.00	1.40	.00
2	DISCHARGE CFS	230.	0.	230.	0.
230.	VELOCITY FPS	1.63	.00	1.63	.00
3	DISCHARGE CFS	335.	0.	335.	0.
335.	VELOCITY FPS	1.71	.04	1.71	.00
4	DISCHARGE CFS	360.	4.	356.	0.
360.	VELOCITY FPS	1.74	.16	1.74	.00
5	DISCHARGE CFS	445.	14.	431.	0.
445.	VELOCITY FPS	1.95	.19	1.97	.00
1	ELEV 1285.5 KD	6418.	1.	6416.	1.
2	ELEV 1286.8 KD	11092.	1.	11090.	1.
3	ELEV 1288.2 KD	17578.	4.	17674.	1.
4	ELEV 1288.5 KD	18711.	13.	18697.	1.
5	ELEV 1288.8 KD	20588.	137.	20451.	1.

KD TABLE FOR CROSS SECTION 14.1

ELEVATION	AREA	KD	KD BY SEGMENT		
1281.10	0.				
1282.	9.	206.	1.	204.	1.
1283.	29.	1117.	1.	1115.	1.
1284.	53.	2707.	1.	2705.	1.
1285.	82.	5086.	1.	5083.	1.
1286.	114.	8161.	1.	8159.	1.
1287.	148.	11924.	1.	11922.	1.
1288.	188.	16431.	2.	16427.	1.
1289.	333.	22487.	558.	21556.	1.
1290.	688.	33996.	5188.	28234.	179.
1291.	1259.	55910.	15543.	36382.	3227.
1292.	1858.	79422.	25026.	44727.	6620.
1293.	2458.	108117.	36514.	53864.	10696.
1294.	3058.	143560.	51575.	63902.	16526.
1295.	3658.	186627.	71257.	74848.	25006.

CROSS SECTION 14.1

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION



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-----------------------------80/80 LIST OF INPUT DATA-----------------------------
TITLE     DISCHARGE FROM SMITH ST. TO POWER ST.                                173B
CHANGE    DISCHARGE                                                            173B
DISCHARGE -1.       120.      195.      275.      305.      375.               173D
END                                                                            173E
REACH     14.8      1.        700.      700.                                    174
SEGMENT   14.8      1         N         -25.      1287.1                          175
NVALUE    .04                                                                    176
SEGMENT   14.8      2         C         40.       1288.3                          177
NVALUE    .045                                                                   178
SEGMENT   14.8      3         N         160.      1290.                           179
NVALUE    .035                                                                   180
SECTION   14.8                                                                   181
          -375.     1290.     -240.     1288.     -140.     1287.5                182
          -100.     1287.1    -75.      1287.3    -55.      1287.                 183
          -25.      1287.1    -18.      1285.8    -13.      1285.1                184
          -9.       1282.8    -8.       1282.     -5.       1281.7                185
          0.        1281.5    5.        1281.8    7.        1282.                 186
          13.       1283.3    25.       1284.7    32.       1287.5                187
          40.       1283.3    160.      1290.                                     188
ENDTABLE                                                                         189
REACH     14.9      1.        150.      150.                                    190
REACH 2   14.8      1.1                                                           191
ROAD      15.       2.7       50.       50.                                     192
CULV 1    15.       1.        32133.                                            193
CULV 2    5.        8.2       54.       1283.     1282.2    .032                194
CULV 1    15.       1.        32133.                                            195
CULV 2    5.        8.2       54.       1282.9    1282.8    .032                196
SECTION   15.                                                                    197
          -990.     1293.3    -890.     1292.     -745.     1290.5                198
          -550.     1290.     -410.     1289.5    -235.     1289.5                199
          -135.     1290.     0.0       1291.3    180.      1292.               200.
          315.      1294.                                                         201
ENDTABLE                                                                         202
REACH     15.1      1.        50.       50.                                     203
REACH 2   15.7      .5                                                            204
REACH     15.7      1.        370.      370.                                    205
SEGMENT   15.7      1         N         -20.      1287.2                          206
NVALUE    .035                                                                   207
SEGMENT   15.7      2         C         20.       1287.7                          208
NVALUE    .045                                                                   209
SEGMENT   15.7      3         N         100.      1292.                           210
NVALUE    .035                                                                  210A
SECTION   15.7                                                                   211
          -240.     1292.     -240.     1286.     -20.      1287.2                212
          -17.      1286.7    -14.      1284.5    -11.      1283.5                213
```

1289.)

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
          -5.       1282.6    0.        1282.7    5.        1282.6          214
          15.       1283.5    15.       1285.7    20.       1287.7          215
          55.       1290.     100.      1292.                               216
ENDTABLE                                                                    217
REACH     15.8      1.        230.      230.                                218
REACH 2   15.7      .8                                                      219
ROAD      15.       2.7       50.       50.                                 220
BPR       15.       A         3.                                            221
GIRDER    1289.9    1289.4    30.       .8        2.7                       222
          -12.      1291.5    -12.      1285.9    -5.       1288.4          223
          0.        1289.4    6.        1288.7    12.       1285.           224
          12.       1291.3                                                 224A
ENDTABLE                                                                    225
SECTION   15.                                                               225   1289.1
          -720.     1290.     -575.     1289.6    -510.     1289.3          227
 -412     -330.     1288.8    -180.     1290.7    -12.      1291.5          228
          -12.      1283.9    0.0       1283.5    12.       1284.           229
          12.       1291.3    100.      1292.     190.      1294.           230
ENDTABLE                                                                    231
REACH     15.1      1.        50.       50.                                 232
REACH 2   15.7      .8                                                      233
COMPUTE   14.8      16.1      14.1                                         233A
-----------------------------END OF 80/80 LIST------------------------------
```

COMPUTE 14.8 16.1 14.1 233A

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 14.8 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1231.5	0.0	0.0						
1	1235.7	110.9	120.0	.00	.00	.00	120.00	1282.9	.00031
2	1237.0	173.2	195.0	.00	.00	.00	195.00	1283.4	.00027
BANK FULL	1237.1	177.7	200.2	.00	.00	.00			
3	1238.4	460.8	275.0	.00	.00	.00	275.00	1283.7	.00010
4	1238.6	522.0	305.0	.00	.00	.00	305.00	1283.9	.00010
5	1288.9	650.6	375.0	.00	.00	.00	375.00	1284.1	.00009

SEGMENT TABLE FOR SECTION 14.8

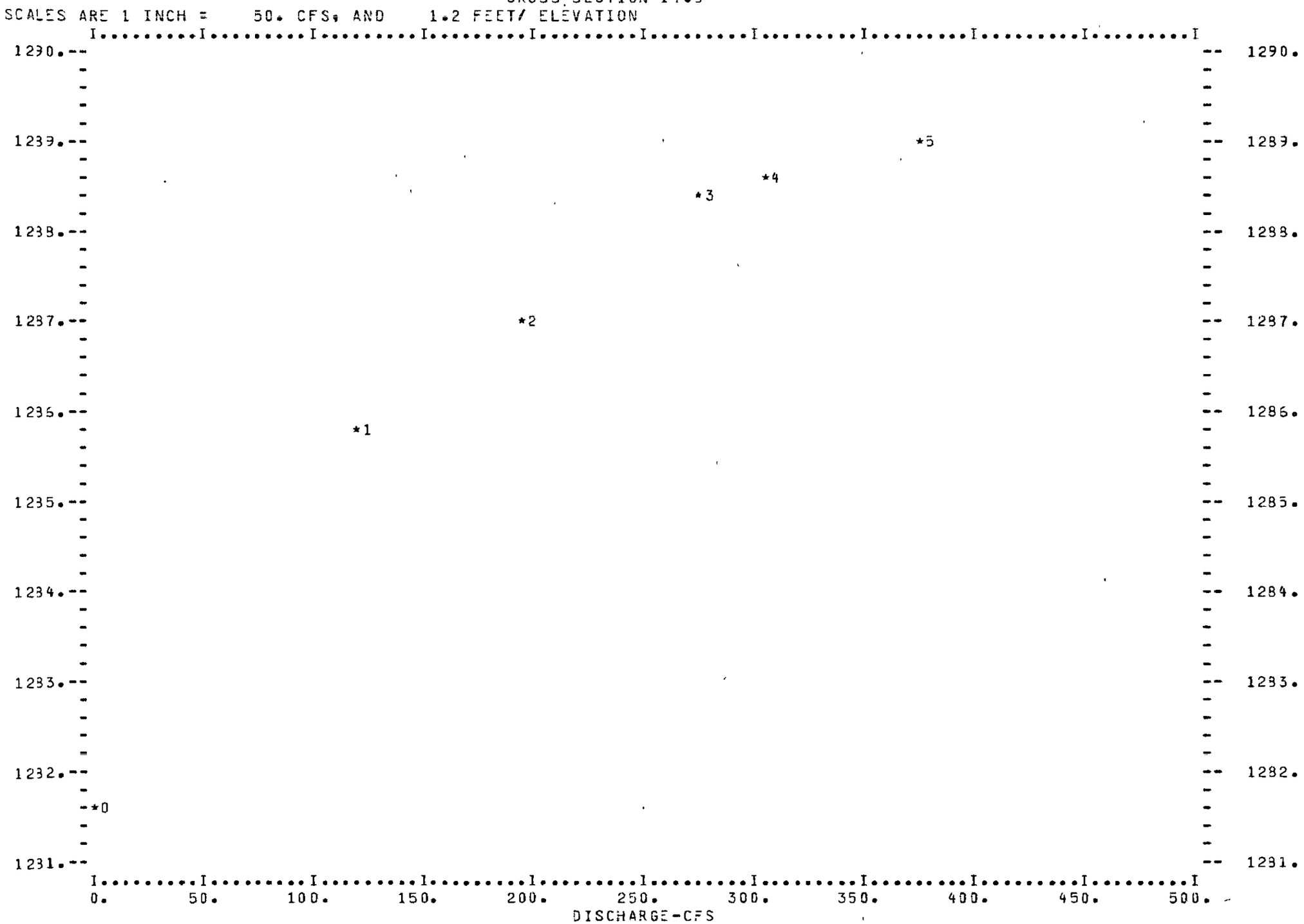
CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	120.	0.	120.	0.
120.	VELOCITY FPS	1.08	.00	1.08	.00
2	DISCHARGE CFS	195.	0.	195.	0.
195.	VELOCITY FPS	1.14	.08	1.14	.00
3	DISCHARGE CFS	275.	73.	201.	0.
275.	VELOCITY FPS	.74	.36	.80	.05
4	DISCHARGE CFS	305.	93.	211.	0.
305.	VELOCITY FPS	.71	.37	.80	.05
5	DISCHARGE CFS	375.	142.	232.	2.
375.	VELOCITY FPS	.70	.41	.81	.09
1	ELEV 1285.7 KD	6820.	1.	6818.	1.
2	ELEV 1287.0 KD	11874.	7.	11866.	1.
3	ELEV 1288.4 KD	26219.	5381.	20331.	8.
4	ELEV 1288.6 KD	30551.	8565.	21869.	17.
5	ELEV 1288.9 KD	39163.	14227.	24868.	57.

KD TABLE FOR CROSS SECTION 14.8

ELEVATION	AREA	KD	KD BY SEGMENT		
1281.50	0.				
1282.	4.	67.	1.	65.	1.
1283.	22.	760.	1.	758.	1.
1284.	48.	2093.	1.	2091.	1.
1285.	83.	4437.	1.	4435.	1.
1286.	124.	7957.	1.	7955.	1.
1287.	173.	11824.	7.	11815.	1.
1288.	350.	20849.	2835.	17721.	2.
1289.	687.	41963.	15694.	25702.	94.
1290.	1151.	77782.	39758.	35921.	1355.
1291.	1678.	122645.	70569.	46884.	3991.
1292.	2213.	170390.	101578.	58412.	6420.
1293.	2748.	229742.	141443.	71333.	9892.
1294.	3283.	302139.	191588.	85671.	14701.

CROSS SECTION 14.3

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 14.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1282.6	0.0	0.0						
1	1285.8	73.0	120.0	.00	.00	.00	120.00	1284.0	.00105
2	1287.1	123.3	195.0	.00	.00	.00	195.00	1284.5	.00061
BANK FULL	1288.2	177.7	262.7	.00	.00	.00			
3	1288.4	213.4	275.0	.00	.00	.00	275.00	1284.8	.00040
4	1288.6	248.6	305.0	.00	.00	.00	305.00	1285.0	.00039
5	1288.9	310.3	375.0	.00	.00	.00	375.00	1285.2	.00040

SEGMENT TABLE FOR SECTION 14.9

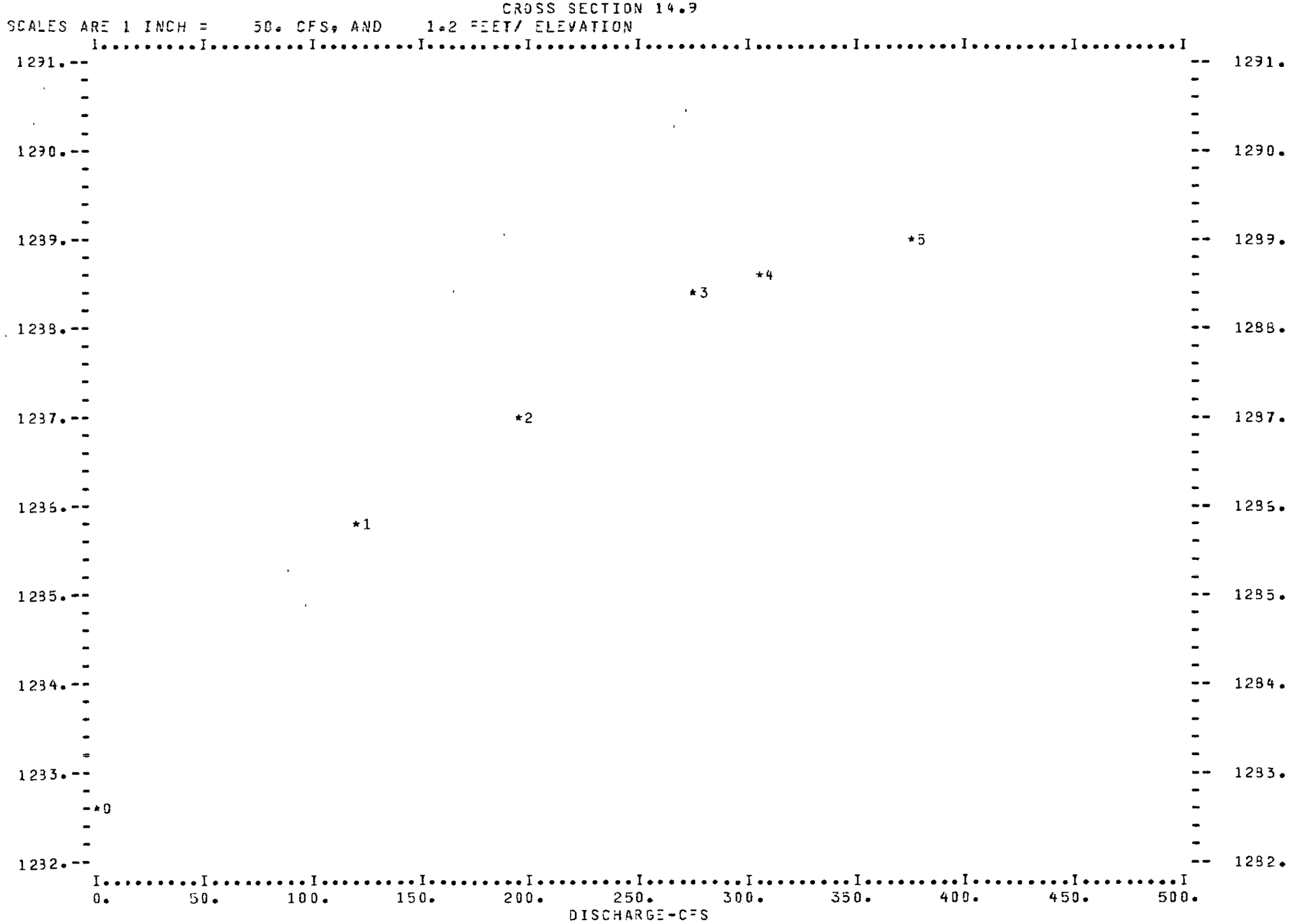
CSM		TOTAL	SEG NO 1 V	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	120.	0.	120.	0.
120.	VELOCITY FPS	1.65	.00	1.64	.00
2	DISCHARGE CFS	195.	0.	195.	0.
195.	VELOCITY FPS	1.59	.00	1.58	.00
3	DISCHARGE CFS	275.	12.	263.	0.
275.	VELOCITY FPS	1.40	.44	1.41	.00
4	DISCHARGE CFS	305.	22.	283.	0.
305.	VELOCITY FPS	1.40	.45	1.42	.00
5	DISCHARGE CFS	375.	43.	332.	0.
375.	VELOCITY FPS	1.45	.47	1.52	.00
1	ELEV 1285.8 KD	3711.	1.	3709.	1.
2	ELEV 1287.1 KD	7918.	1.	7916.	1.
3	ELEV 1288.4 KD	13375.	40.	13335.	1.
4	ELEV 1288.6 KD	14562.	159.	14502.	1.
5	ELEV 1288.9 KD	18321.	1632.	16688.	1.

KD TABLE FOR CROSS SECTION 14.9

ELEVATION	AREA	KD	KD BY SEGMENT		
1282.60	0.				
1283.	3.	39.	1.	37.	1.
1284.	20.	660.	1.	658.	1.
1285.	44.	1920.	1.	1918.	1.
1286.	79.	4141.	1.	4139.	1.
1287.	119.	7559.	1.	7557.	1.
1288.	167.	11434.	5.	11426.	1.
1289.	320.	19340.	2301.	17038.	1.
1290.	646.	39241.	14057.	24767.	65.
1291.	1100.	73435.	36772.	34840.	1142.
1292.	1624.	118455.	67904.	45807.	3795.
1293.	2159.	165117.	98102.	57197.	6135.
1294.	2694.	223245.	137019.	69977.	9490.
1295.	3229.	294272.	186069.	84173.	14150.

CROSS SECTION 14.9

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION



ROAD SECTION 15.

NO.	HW	CFS	HL	TW	CSM
0	1282.90	0.00	0.00	0.00	0.00
1	1285.05	120.00	.16	1285.89	120.00
2	1287.36	195.00	.24	1287.12	195.00
3	1288.74	275.00	.32	1288.42	275.00
4	1289.02	305.00	.40	1288.62	305.00
5	1289.61	375.00	.64	1288.97	375.00

MIN ROAD ELEVATION 1289.50

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32133.	5.93	8.62	54.00	1283.00	1282.20	.032
2	1	32133.	5.93	8.62	54.00	1282.90	1282.80	.032

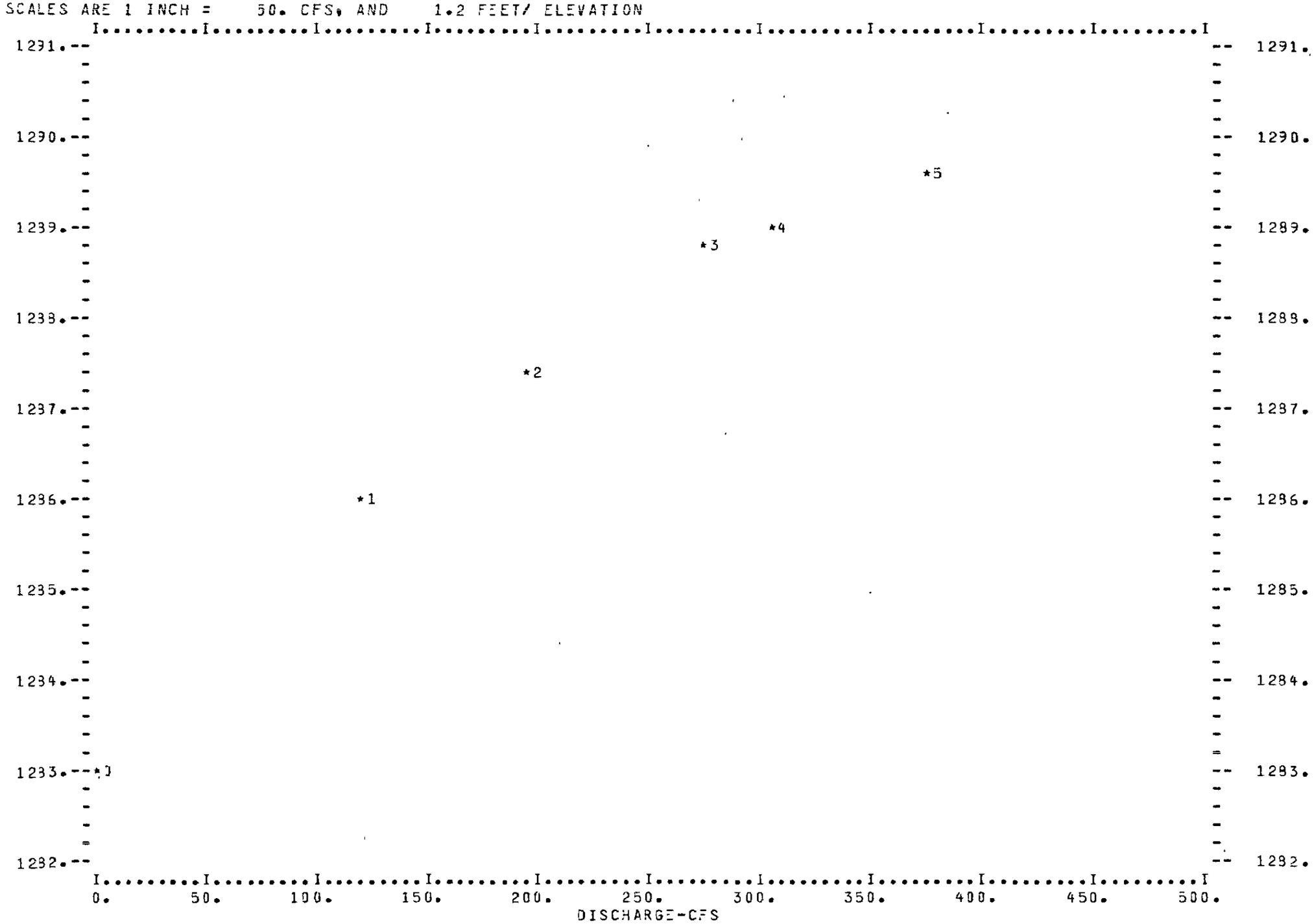
pipe arch w/ headwall

Twin $40 ft^2 = 80 ft^2$

$$14.5 ft \frac{29.1 (.032)^2 54}{(1.71)^{9/3}} = 2.29 \quad \Delta = .5$$

ROAD SECTION 15.

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 15.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	CHANNEL	NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1283.1	0.0	0.0						
1	1286.1	72.5	120.0	.00	.00	.00	120.00	1284.3	.00084
2	1287.4	187.7	195.0	.00	.00	.00	195.00	1284.7	.00050
BANK FULL	1287.7	262.8	213.8	.00	.00	.00			
3	1288.7	532.6	275.0	.00	.00	.00	275.00	1285.0	.00015
4	1289.0	608.5	305.0	.00	.00	.00	305.00	1285.1	.00013
5	1289.6	771.1	375.0	.00	.00	.00	375.00	1285.3	.00010

SEGMENT TABLE FOR SECTION 15.1

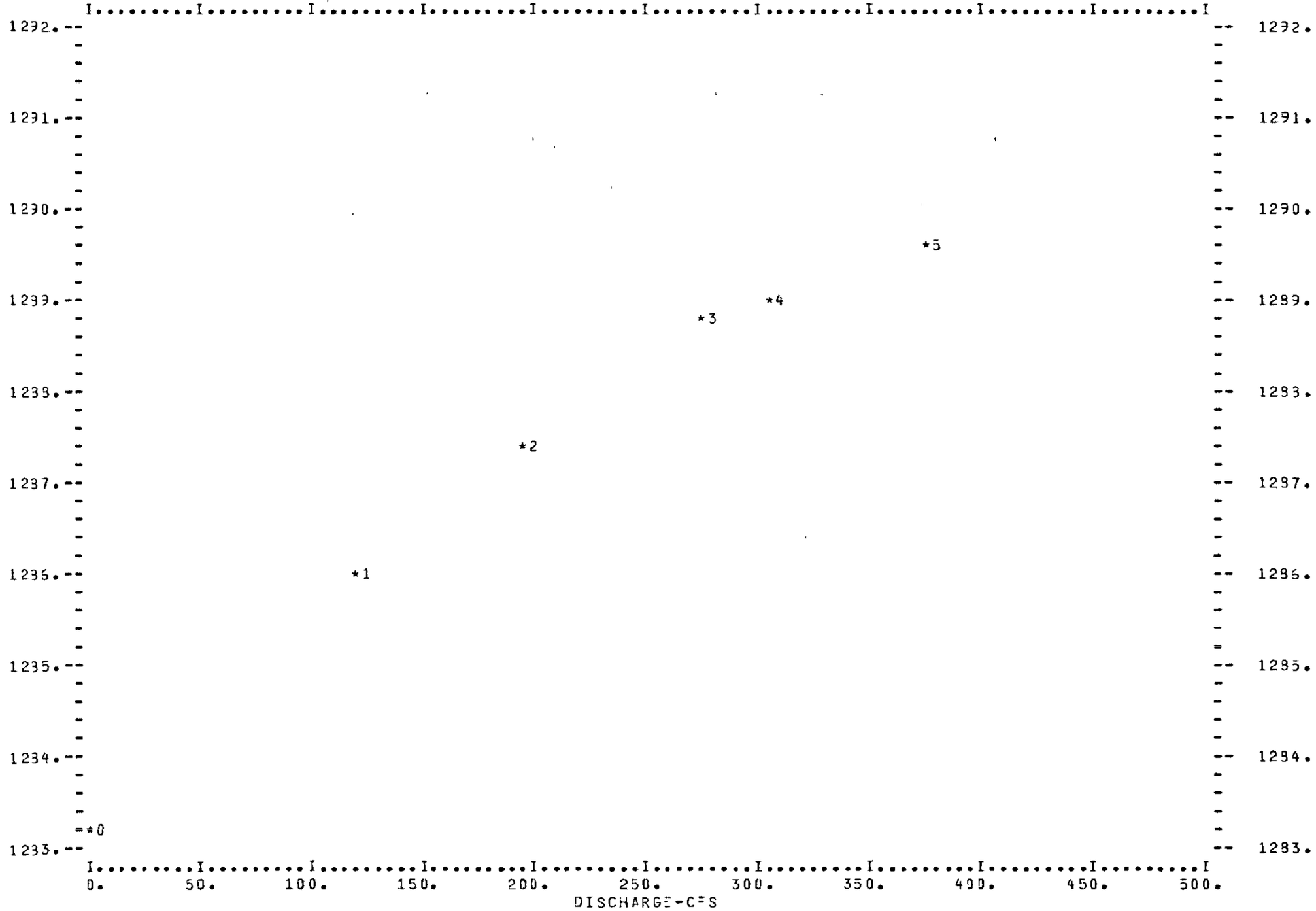
CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	120.	0.	120.	0.
120.	VELOCITY FPS	1.65	.00	1.65	.00
2	DISCHARGE CFS	195.	18.	177.	0.
195.	VELOCITY FPS	1.49	.25	1.55	.00
3	DISCHARGE CFS	275.	108.	167.	0.
275.	VELOCITY FPS	.81	.30	1.00	.10
4	DISCHARGE CFS	305.	131.	173.	1.
305.	VELOCITY FPS	.77	.31	.97	.12
5	DISCHARGE CFS	375.	181.	191.	2.
375.	VELOCITY FPS	.72	.33	.95	.13
1	ELEV 1286.1 KD	4137.	1.	4135.	1.
2	ELEV 1287.4 KD	8546.	586.	7959.	1.
3	ELEV 1288.7 KD	22485.	8745.	13727.	14.
4	ELEV 1289.0 KD	26432.	11136.	15262.	35.
5	ELEV 1289.6 KD	36521.	17543.	18794.	183.

KD TABLE FOR CROSS SECTION 15.1

ELEVATION	AREA	KD	KD BY SEGMENT		
1283.10	0.				
1284.	15.	360.	1.	358.	1.
1285.	41.	1708.	1.	1706.	1.
1286.	70.	3906.	1.	3903.	1.
1287.	133.	7030.	94.	6773.	1.
1288.	335.	13233.	3080.	10050.	1.
1289.	601.	26152.	10882.	15108.	32.
1290.	881.	43913.	22247.	21230.	341.
1291.	1176.	65923.	36601.	28164.	1126.
1292.	1494.	91942.	53422.	35844.	2635.
1293.	1830.	122434.	72539.	44249.	5493.
1294.	2170.	153369.	91379.	53025.	8154.
1295.	2510.	187705.	112118.	62480.	11364.
1296.	2850.	226013.	135311.	72652.	15419.
1297.	3190.	268388.	161024.	83533.	20450.

CROSS SECTION 15.1

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 15.7 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	CHANNEL	NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1282.6	0.0	0.0						
1	1286.3	102.4	120.0	.00	.00	.00	120.00	1283.8	.00039
BANK FULL	1287.2	262.8	177.6	.00	.00	.00			
2	1287.5	331.2	195.0	.00	.00	.00	195.00	1284.2	.00022
3	1288.8	678.9	275.0	.00	.00	.00	275.00	1284.5	.00008
4	1289.1	754.6	305.0	.00	.00	.00	305.00	1284.5	.00007
5	1289.6	921.8	375.0	.00	.00	.00	375.00	1284.8	.00006

SEGMENT TABLE FOR SECTION 15.7

CSM		TOTAL	SEG NO 1 V	2 C	3 N
1	DISCHARGE CFS	120.	1.	119.	0.
120.	VELOCITY FPS	1.27	.14	1.27	.00
2	DISCHARGE CFS	195.	48.	147.	0.
195.	VELOCITY FPS	.96	.25	1.08	.00
3	DISCHARGE CFS	275.	126.	148.	1.
275.	VELOCITY FPS	.61	.26	.79	.10
4	DISCHARGE CFS	305.	146.	157.	2.
305.	VELOCITY FPS	.60	.27	.79	.11
5	DISCHARGE CFS	375.	195.	177.	4.
375.	VELOCITY FPS	.59	.29	.79	.13
1	ELEV 1286.3 KD	6063.	20.	6042.	1.
2	ELEV 1287.5 KD	12983.	3004.	9977.	1.
3	ELEV 1288.8 KD	30544.	13799.	16767.	78.
4	ELEV 1289.1 KD	35525.	17018.	18441.	166.
5	ELEV 1289.6 KD	46781.	24176.	22179.	426.

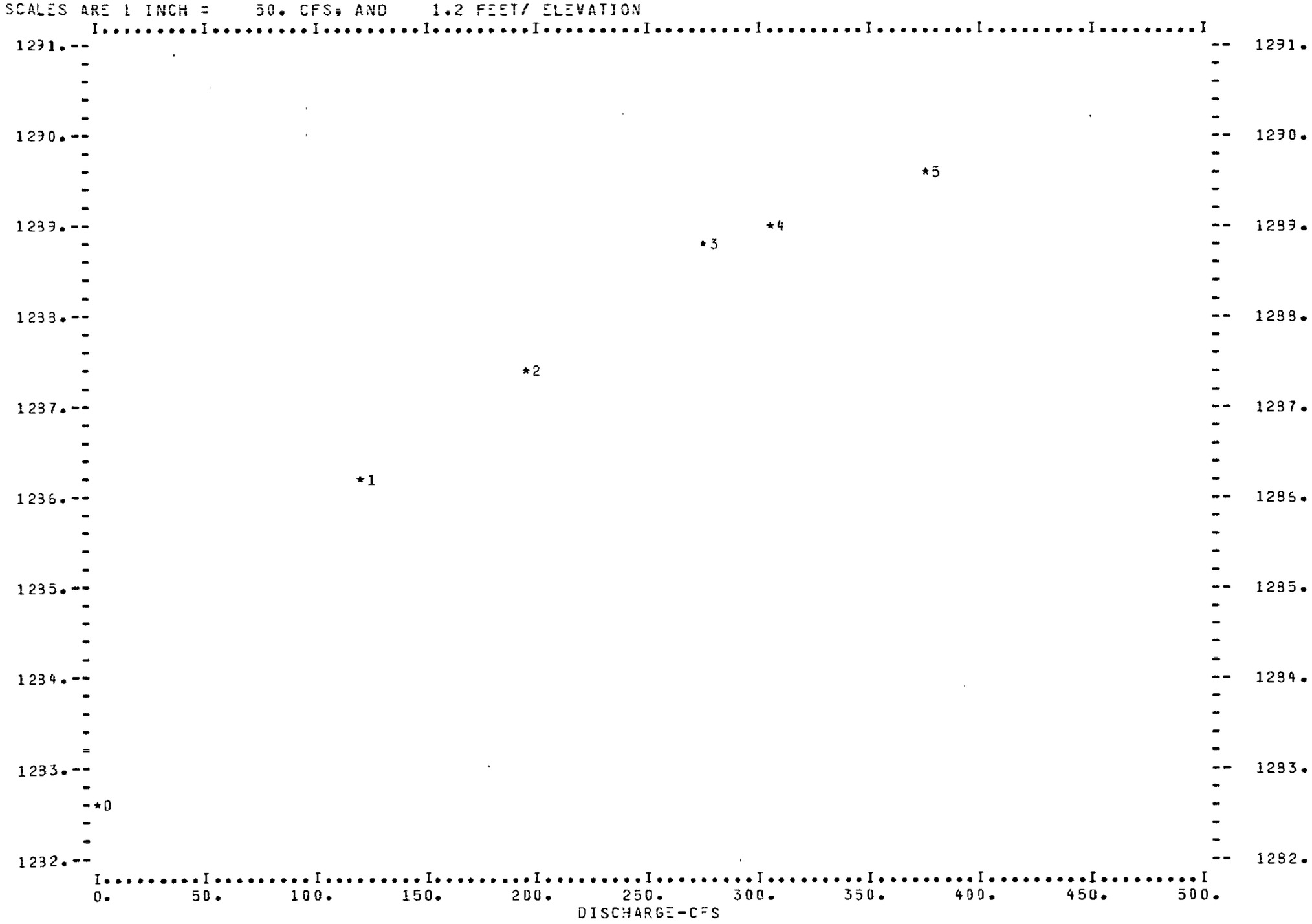
290' into

KD TABLE FOR CROSS SECTION 15.7

ELEVATION	AREA	KD	KD BY SEGMENT		
1282.60	0.				
1283.	5.	71.	1.	69.	1.
1284.	27.	920.	1.	918.	1.
1285.	55.	2714.	1.	2712.	1.
1286.	88.	5284.	6.	5274.	1.
1287.	216.	9492.	955.	8336.	1.
1288.	467.	19052.	6372.	12431.	7.
1289.	738.	34640.	16402.	18087.	151.
1290.	1027.	54421.	29099.	24600.	672.
1291.	1334.	78316.	44570.	31897.	1754.
1292.	1661.	106557.	62643.	39946.	3846.
1293.	2000.	137657.	81907.	48569.	6827.
1294.	2340.	170047.	101446.	57662.	9661.
1295.	2680.	206355.	123403.	67477.	13278.
1296.	3020.	246685.	147848.	78004.	17804.

CROSS SECTION 15.7

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 15.8 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1283.4	0.0	0.0						
1	1286.4	74.2	120.0	.00	.00	.00	120.00	1284.5	.00079
2	1287.6	168.7	195.0	.00	.00	.00	195.00	1285.0	.00056
BANK FULL	1288.0	262.8	221.5	.00	.00	.00			
3	1288.8	473.1	275.0	.00	.00	.00	275.00	1285.3	.00020
4	1289.1	544.6	305.0	.00	.00	.00	305.00	1285.4	.00017
5	1289.7	702.4	375.0	.00	.00	.00	375.00	1285.5	.00014

SEGMENT TABLE FOR SECTION 15.8

CSM		TOTAL	SEG NO 1 V	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	120.	0.	120.	0.
120.	VELOCITY FPS	1.62	.00	1.62	.00
2	DISCHARGE CFS	195.	13.	182.	0.
195.	VELOCITY FPS	1.59	.22	1.64	.00
3	DISCHARGE CFS	275.	99.	176.	0.
275.	VELOCITY FPS	.93	.32	1.11	.09
4	DISCHARGE CFS	305.	122.	183.	0.
305.	VELOCITY FPS	.87	.33	1.08	.12
5	DISCHARGE CFS	375.	174.	200.	1.
375.	VELOCITY FPS	.80	.35	1.04	.13
1	ELEV 1286.4 KD	4261.	1.	4258.	1.
2	ELEV 1287.6 KD	8228.	528.	7699.	1.
3	ELEV 1288.8 KD	19162.	6597.	12558.	7.
4	ELEV 1289.1 KD	23072.	9093.	13963.	16.
5	ELEV 1289.7 KD	32179.	14792.	17286.	102.

KD TABLE FOR CROSS SECTION 15.8

ELEVATION	AREA	KD	KD BY SEGMENT		
1283.40	0.				
1284.	8.	158.	1.	156.	1.
1285.	33.	1212.	1.	1210.	1.
1286.	61.	3166.	1.	3164.	1.
1287.	95.	5888.	14.	5874.	1.
1288.	263.	10812.	1606.	8963.	1.
1289.	519.	21837.	8364.	13461.	12.
1290.	795.	38170.	18580.	19312.	210.
1291.	1086.	58849.	31953.	25996.	830.
1292.	1398.	83599.	47980.	33448.	2070.
1293.	1729.	112742.	66526.	41642.	4444.
1294.	2068.	143827.	85625.	50330.	7337.
1295.	2408.	176992.	105642.	59568.	10318.
1296.	2748.	214097.	128091.	69526.	14106.
1297.	3088.	255243.	153042.	80195.	18830.

CROSS SECTION 15.8

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION

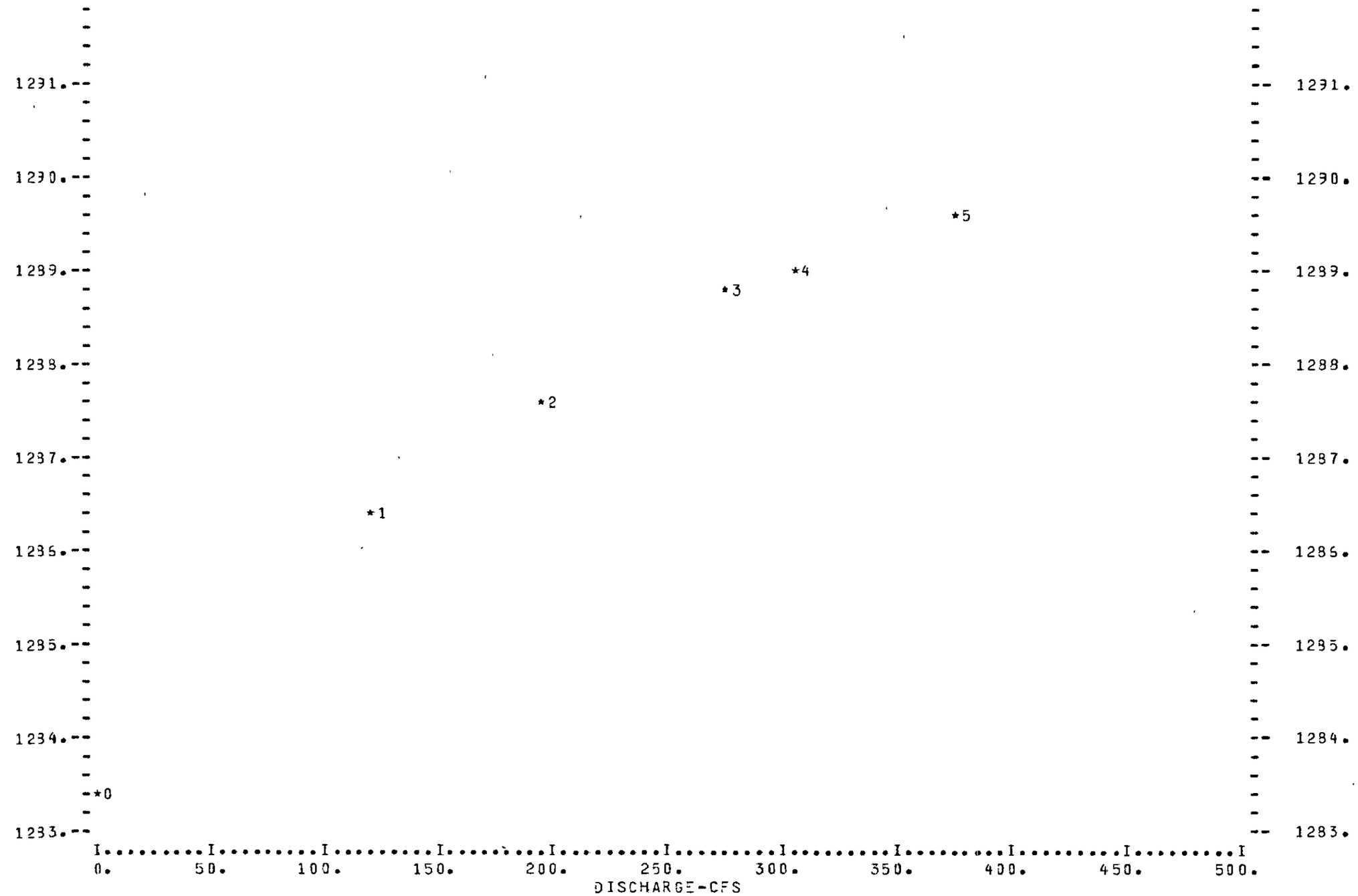


TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.1815	.2034	.0000	.0000	.0000	-.0219	.8669	1.0000	1.0000	57.1859	72.7836	72.1884
DCRIT	1284.63	KBCRIT=									
.4057	.4584	.0000	.0000	.0000	-.0517	.7552	1.0000	1.0000	80.9305	154.5855	159.7190
DCRIT	1284.93	KBCRIT=									
1.0629	1.2305	.0000	.0000	.0000	-.1676	.5181	1.0000	1.0000	105.2046	480.8744	449.4215
DCRIT	1285.29	KBCRIT=									
1.1799	1.3710	.0000	.0000	.0000	-.1910	.4827	1.0000	1.0000	111.7588	546.8541	519.4997
DCRIT	1285.20	KBCRIT=									
1.4023	1.6395	.0000	.0000	.0000	-.2373	.4188	1.0000	1.0000	91.1926	593.2105	576.7978
DCRIT	1284.75	KBCRIT=									

ROAD SECTION 16.

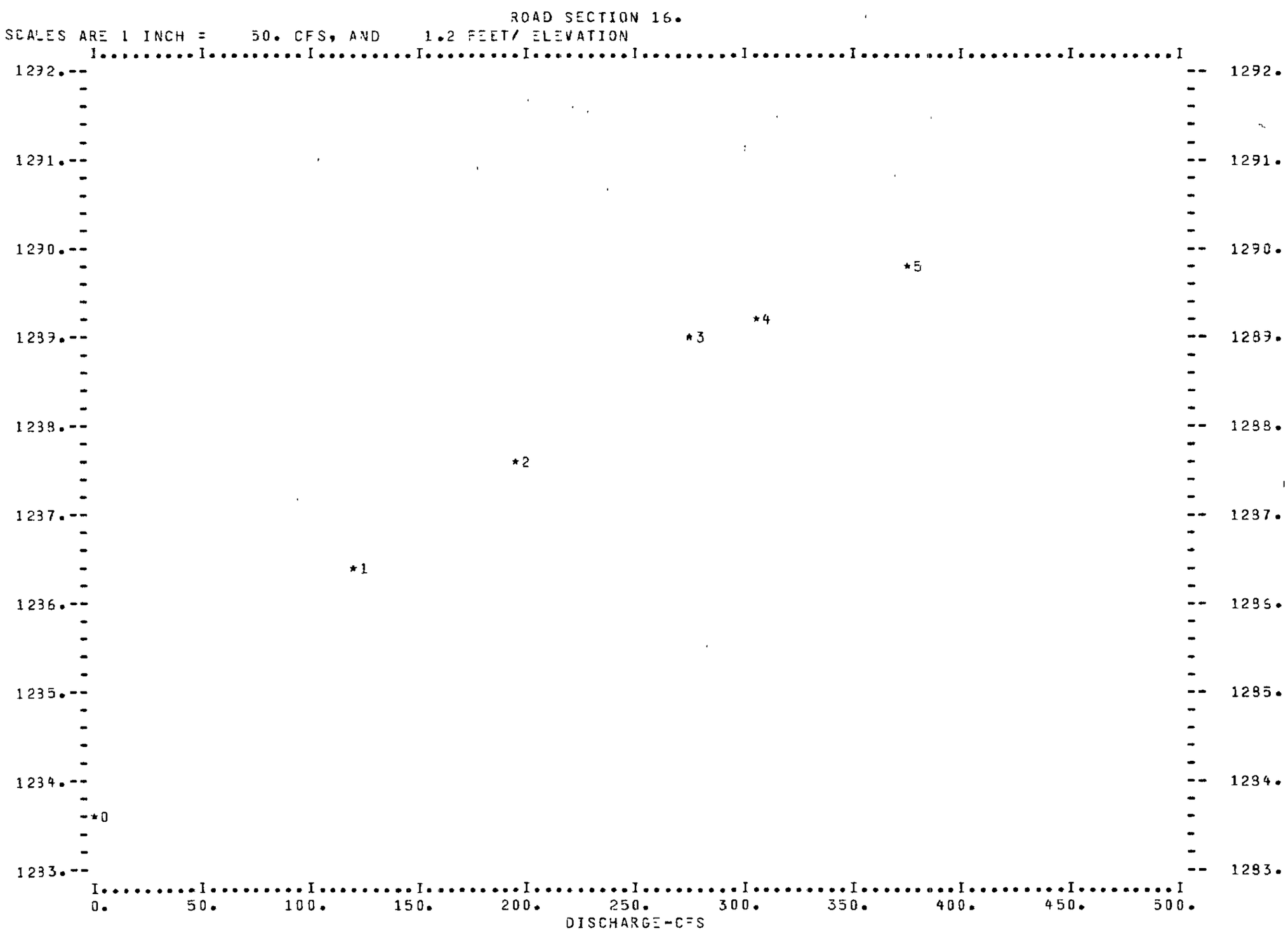
NO.	HW	CFS	HL	TW	CSM
0	1283.50	0.00	0.00	0.00	0.00
1	1286.48	120.00	.00	1286.48	120.00
2	1287.64	195.00	.02	1287.62	195.00
3	1288.93	275.00	.10	1288.83	275.00
4	1289.18	305.00	.08	1289.10	305.00
5	1289.72	375.00	.04	1289.68	375.00

MIN ROAD ELEVATION 1288.80

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 1289.40 OPENING NO.= 1

ROAD SECTION 16.

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 16.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	CHANNEL	NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1283.4	0.0	0.0						
1	1286.5	77.3	120.0	.00	.00	.00	120.00	1284.6	.00072
2	1287.7	186.0	195.0	.00	.00	.00	195.00	1285.0	.00050
BANK FULL	1288.0	262.8	215.7	.00	.00	.00			
3	1288.9	504.5	275.0	.00	.00	.00	275.00	1285.3	.00017
4	1289.2	571.2	305.0	.00	.00	.00	305.00	1285.4	.00015
5	1289.7	717.1	375.0	.00	.00	.00	375.00	1285.5	.00013

SEGMENT TABLE FOR SECTION 16.1

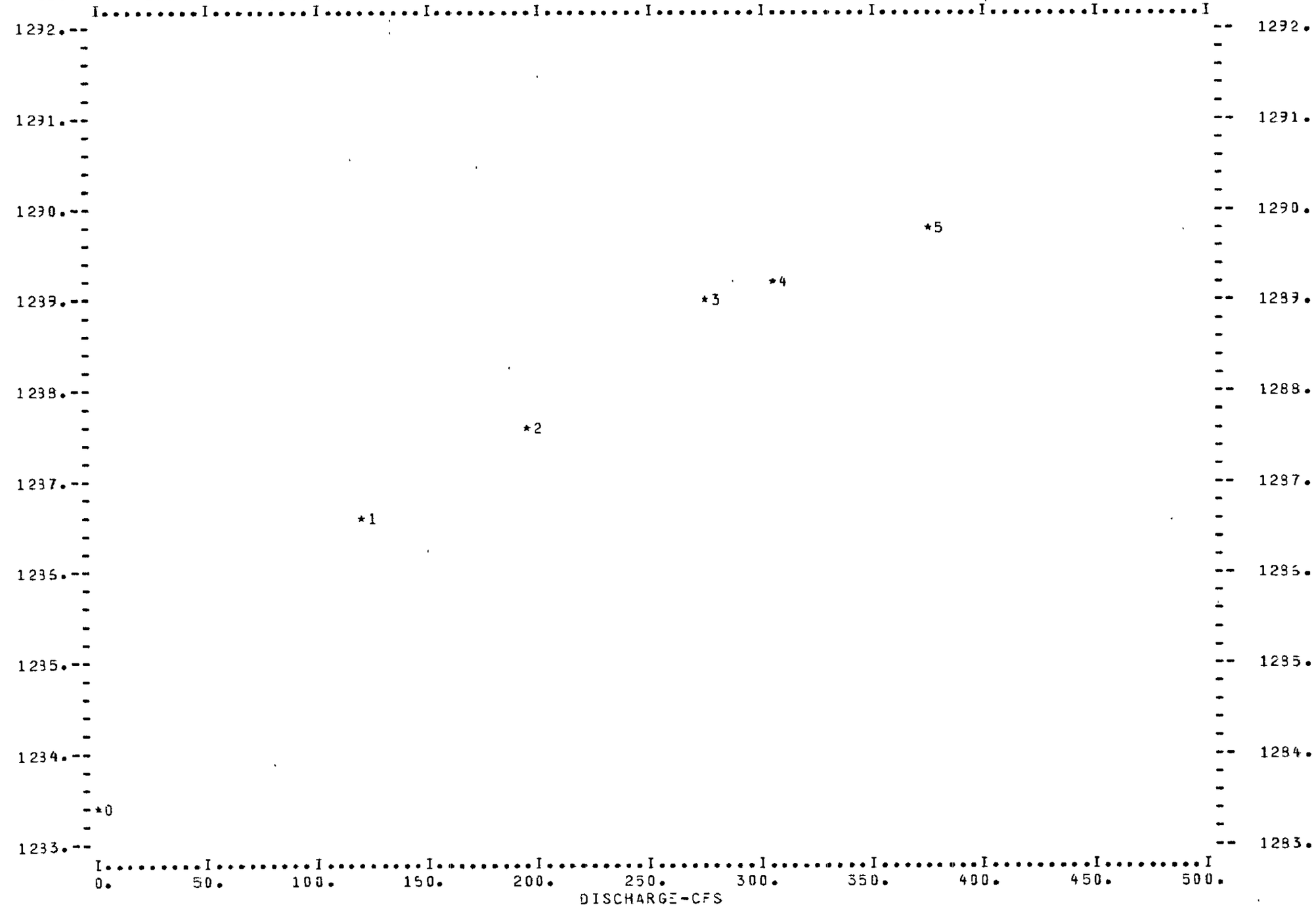
CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	120.	0.	120.	0.
120.	VELOCITY FPS	1.57	.13	1.57	.00
2	DISCHARGE CFS	195.	18.	177.	0.
195.	VELOCITY FPS	1.50	.25	1.56	.00
3	DISCHARGE CFS	275.	104.	171.	0.
275.	VELOCITY FPS	.86	.30	1.05	.08
4	DISCHARGE CFS	305.	126.	178.	1.
305.	VELOCITY FPS	.83	.32	1.03	.12
5	DISCHARGE CFS	375.	175.	198.	2.
375.	VELOCITY FPS	.78	.34	1.02	.13
1	ELEV 1286.5 KD	4482.	2.	4479.	1.
2	ELEV 1287.7 KD	8509.	572.	7937.	1.
3	ELEV 1288.9 KD	20953.	7769.	13174.	10.
4	ELEV 1289.2 KD	24425.	9905.	14498.	22.
5	ELEV 1289.7 KD	33180.	15444.	17616.	120.

KD TABLE FOR CROSS SECTION 16.1

ELEVATION	AREA	KD	KD BY SEGMENT		
1283.40	0.				
1284.	8.	158.	1.	156.	1.
1285.	33.	1212.	1.	1210.	1.
1286.	61.	3166.	1.	3164.	1.
1287.	95.	5888.	14.	5874.	1.
1288.	263.	10812.	1606.	8963.	1.
1289.	519.	21837.	8364.	13461.	12.
1290.	795.	38170.	18580.	19312.	210.
1291.	1086.	58849.	31953.	25996.	830.
1292.	1398.	83599.	47980.	33448.	2070.
1293.	1729.	112742.	66526.	41642.	4444.
1294.	2068.	143827.	85526.	50330.	7337.
1295.	2408.	176992.	105642.	59568.	10318.
1296.	2748.	214097.	128091.	69526.	14106.
1297.	3088.	255243.	153042.	80196.	18830.

CROSS SECTION 16.1

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION



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-----------------------------80/80 LIST OF INPUT DATA-----------------------------
TITLE     DISCHARGE BETWEEN POWER ST. AND GIANTWAY TUBES                    233B
CHANGE    DISCHARGE                                                        233C
DISCHARGE -1.       115.      170.      225.      245.      295.            233D
END                                                                        233E
REACH     17.5      1.        550.      550.                               234
SEGMENT   17.5      1         N         -20.      1288.                    235
NVALUE    .115                                                             236
SEGMENT   17.5      2         C         17.       1287.6                   237
NVALUE    .04                                                              238
SEGMENT   17.5      3         N         130.      1292.                    239
NVALUE    .085                                                             240
SECTION   17.5                                                             241
          -170.     1292.     -170.     1288.8    -30.      1288.          242
          -20.      1283.     -14.      1285.6    -12.      1284.6         243
          -5.       1284.2    0.        1284.8    5.        1283.9         244
          15.       1284.6    17.       1287.6    25.       1288.1         245
          30.       1283.5    85.       1290.     130.      1292.          246
ENDTABLE                                                                   247
COMPUTE   17.5      17.5      16.1                                         247A
-----------------------------END OF 80/80 LIST------------------------------
```

COMPUTE 17.5 17.5 15.1 247A

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 17.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1283.9	0.0	0.0						
1	1286.9	75.2	115.0	.00	.00	.00	115.00	1285.2	.00052
BANK FULL	1287.6	101.4	153.7	.00	.00	.00			
2	1287.9	114.6	170.0	.00	.00	.00	170.00	1285.4	.00041
3	1289.1	278.0	225.0	.00	.00	.00	225.00	1285.6	.00021
4	1289.3	330.1	245.0	.00	.00	.00	245.00	1285.7	.00019
5	1289.8	454.2	295.0	.00	.00	.00	295.00	1285.9	.00016

SEGMENT TABLE FOR SECTION 17.5

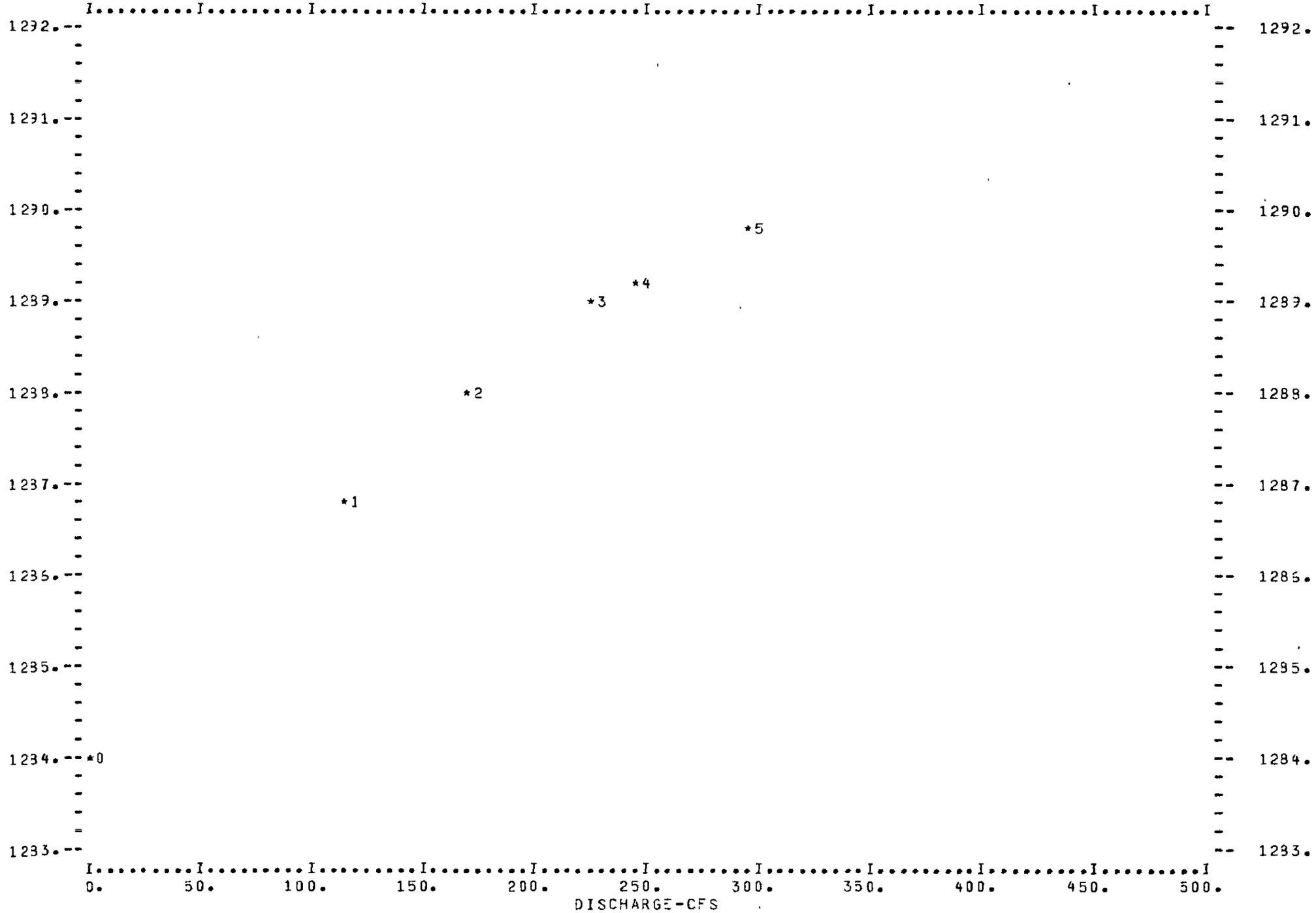
CSM		TOTAL	SEG NO 1 V	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	115.	0.	115.	0.
115.	VELOCITY FPS	1.53	.00	1.53	.00
2	DISCHARGE CFS	170.	0.	170.	0.
170.	VELOCITY FPS	1.52	.05	1.52	.14
3	DISCHARGE CFS	225.	17.	203.	4.
225.	VELOCITY FPS	1.28	.17	1.32	.19
4	DISCHARGE CFS	245.	25.	214.	6.
245.	VELOCITY FPS	1.25	.18	1.32	.19
5	DISCHARGE CFS	295.	46.	237.	13.
295.	VELOCITY FPS	1.18	.21	1.30	.22
1	ELEV 1286.9 KD	4606.	1.	4604.	1.
2	ELEV 1287.9 KD	8400.	3.	8391.	6.
3	ELEV 1289.1 KD	15222.	318.	14186.	217.
4	ELEV 1289.3 KD	17355.	1442.	15557.	355.
5	ELEV 1289.8 KD	22977.	3366.	18749.	863.

KD TABLE FOR CROSS SECTION 17.5

ELEVATION	AREA	KD	KD BY SEGMENT		
1283.90	0.				
1284.	0.	4.	1.	2.	1.
1285.	18.	463.	1.	465.	1.
1286.	47.	2256.	1.	2254.	1.
1287.	80.	5018.	1.	5016.	1.
1288.	119.	8799.	3.	8784.	9.
1289.	267.	15115.	723.	13902.	195.
1290.	503.	25524.	4171.	19991.	1140.
1291.	767.	40038.	9540.	25937.	3484.
1292.	1055.	58397.	16323.	34676.	7340.
1293.	1355.	80893.	24273.	43154.	13373.
1294.	1655.	103579.	31747.	52118.	18667.
1295.	1955.	129564.	40483.	61830.	25248.
1296.	2255.	158968.	50550.	72279.	33271.

CROSS SECTION 17.5

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION



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-----------------------------80/80 LIST OF INPUT DATA-----------------------------
TITLE     DISCHARGE BETWEEN GIANTWAY TUBES AND MITCHELL ST.                  247C
CHANGE    DISCHARGE                                                          247D
DISCHARGE -1.       105.      150.      190.      205.      245.             247E
END                                                                          247F
REACH     17.9      1.        40.       40.                                247G
REACH2    13.1      -.5                                                      247H
ROAD      13.       2.7       5.        5.                                  248
CULV 1    13.       3.        12133.                                        249
CULV2     6.7                 400.      1283.     1282.8    .032            250
SECTION   13.                                                                251
          -580.     1293.9    -480.     1292.     -405.     1290.           252
          -365.     1290.     -345.     1290.     -260.     1291.5          253
          -260.     1299.     -130.     1299.     -130.     1291.5          254
          -55.      1290.     -45.      1290.     0.0       1291.1          255
          20.       1291.5    20.       1299.     185.      1299.           256
          135.      1293.     280.      1294.                               257
ENDTABLE                                                                     258
REACH     13.1      1.        25.       25.                                259
SEGMENT   13.1      1         N         -13.      1290.5                    260
NVALUE    .035                                                               261
SEGMENT   13.1      2         C         11.       1290.3                    262
NVALUE    .04                                                                263
SEGMENT   13.1      3         N         35.       1295.                     264
NVALUE    .035                                                               265
SECTION   13.1                                                               266
          -120.     1295.     -120.     1290.     -13.      1290.5          267
          -13.      1285.     -11.      1284.8    -5.       1284.2          268
          0.        1284.1    5.        1284.2    6.        1284.8          269
          11.       1285.2    11.       1290.3    35.       1290.7          270
          35.       1295.                                                   271
ENDTABLE                                                                     272
COMPUTE   17.9      18.1      17.5                                          272A
-----------------------------END OF 80/80 LIST------------------------------
```

COMPUTE 17.9 19.1 17.5 272A

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 17.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1283.6	0.0	0.0						
1	1286.9	69.6	105.0	.00	.00	.00	105.00	1284.8	.00051
2	1287.9	94.3	150.0	.00	.00	.00	150.00	1285.0	.00041
3	1289.1	121.4	190.0	.00	.00	.00	190.00	1285.2	.00031
4	1289.3	129.9	205.0	.00	.00	.00	205.00	1285.3	.00032
5	1289.8	160.2	245.0	.00	.00	.00	245.00	1285.5	.00033

SEGMENT TABLE FOR SECTION 17.9

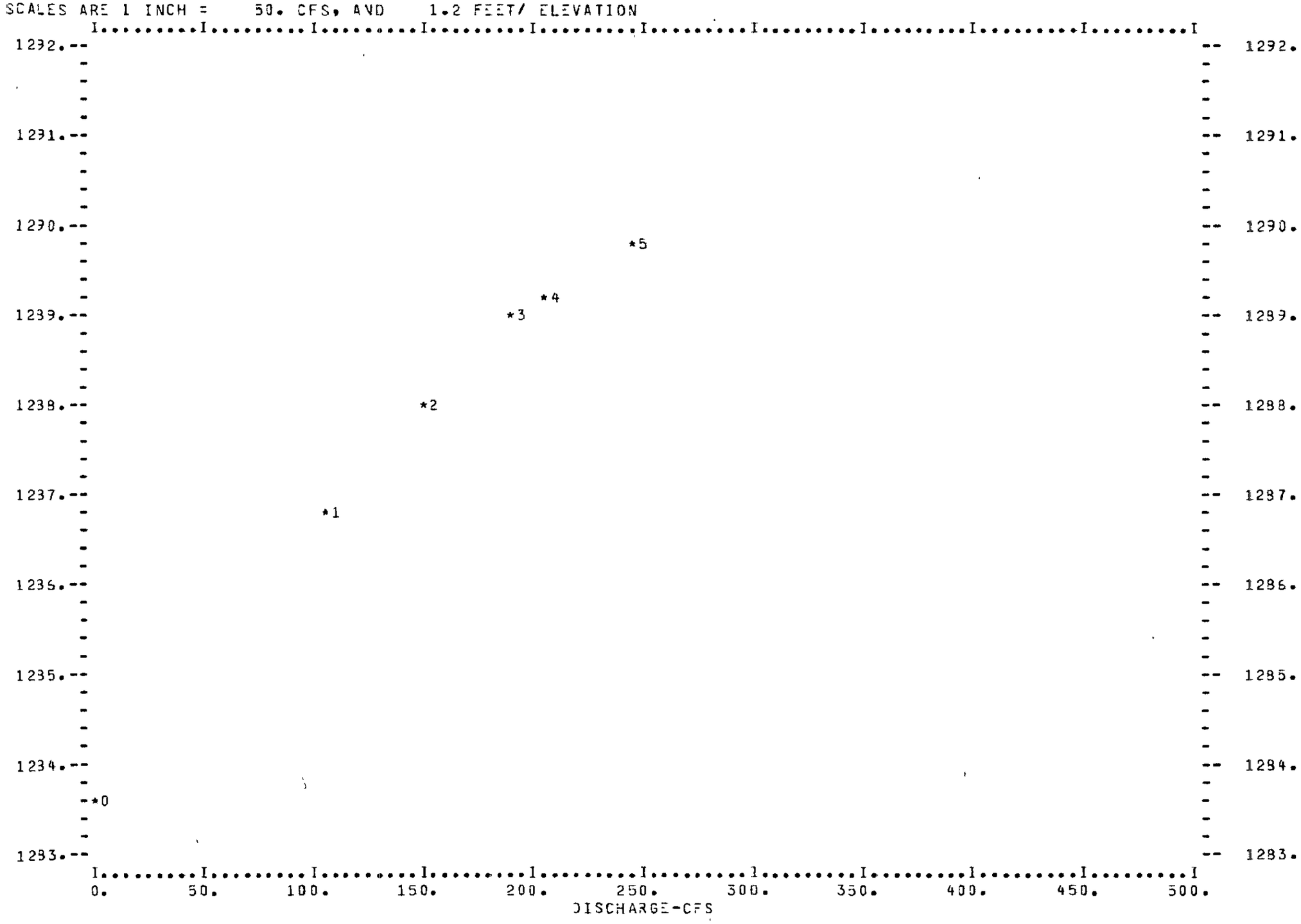
CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	105.	0.	105.	0.
105.	VELOCITY FPS	1.51	.00	1.51	.00
2	DISCHARGE CFS	150.	0.	150.	0.
150.	VELOCITY FPS	1.59	.00	1.59	.00
3	DISCHARGE CFS	190.	0.	190.	0.
190.	VELOCITY FPS	1.57	.00	1.57	.00
4	DISCHARGE CFS	205.	1.	204.	0.
205.	VELOCITY FPS	1.61	.30	1.61	.00
5	DISCHARGE CFS	245.	6.	239.	0.
245.	VELOCITY FPS	1.70	.30	1.71	.17
1	ELEV 1286.9 KD	4649.	1.	4647.	1.
2	ELEV 1287.9 KD	7380.	1.	7378.	1.
3	ELEV 1289.1 KD	10722.	1.	10720.	1.
4	ELEV 1289.3 KD	11460.	2.	11457.	1.
5	ELEV 1289.8 KD	13246.	103.	13136.	6.

KD TABLE FOR CROSS SECTION 17.9

ELEVATION	AREA	KD	KD BY SEGMENT		
1283.60	0.				
1284.	4.	68.	1.	65.	1.
1285.	24.	872.	1.	870.	1.
1286.	48.	2635.	1.	2634.	1.
1287.	72.	4921.	1.	4919.	1.
1288.	96.	7600.	1.	7598.	1.
1289.	120.	10565.	1.	10564.	1.
1290.	172.	14281.	449.	13820.	11.
1291.	326.	25350.	6241.	17862.	928.
1292.	481.	42435.	16810.	22309.	2971.
1293.	636.	64494.	31338.	27145.	5822.
1294.	791.	90704.	48992.	32352.	9244.
1295.	946.	118622.	67673.	37901.	12753.
1296.	1101.	146413.	85643.	43769.	15964.
1297.	1256.	177787.	106422.	49984.	19639.
1298.	1411.	212887.	130190.	56539.	23802.

CROSS SECTION 17.9

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION



ROAD SECTION 18.

NO.	HW	CFS	HL	TW	CSM
0	1283.00	0.00	0.00	0.00	0.00
1	1287.15	105.00	.24	1286.91	105.00
2	1288.18	150.00	.24	1287.94	150.00
3	1289.30	190.00	.24	1289.06	190.00
4	1289.62	205.00	.32	1289.30	205.00
5	1290.22	245.00	.40	1289.82	245.00

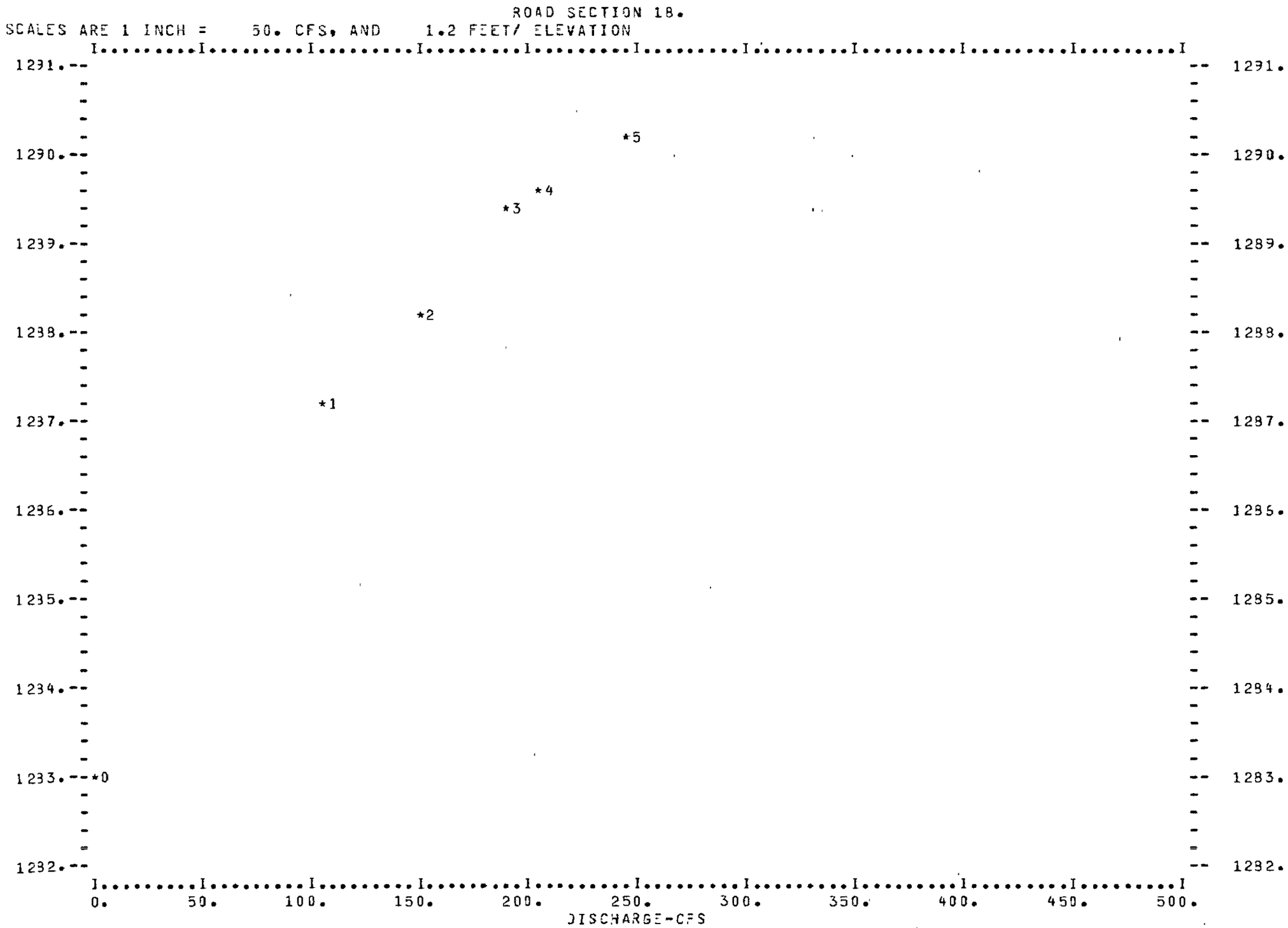
1289.76

MIN ROAD ELEVATION 1290.00

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	3	12133.	6.70		400.00	1283.00	1282.80	.032
						6.7	6.7	
						1289.7	1289.5	

ROAD SECTION 18.

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 18.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	CHANNEL	NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1284.1	0.0	0.0						
1	1287.1	63.6	105.0	.00	.00	.00	105.00	1285.3	.00057
2	1288.2	88.3	150.0	.00	.00	.00	150.00	1285.5	.00050
3	1289.3	115.3	190.0	.00	.00	.00	190.00	1285.7	.00037
4	1289.6	122.7	205.0	.00	.00	.00	205.00	1285.8	.00035
5	1290.2	154.5	245.0	.00	.00	.00	245.00	1286.0	.00035

SEGMENT TABLE FOR SECTION 18.1

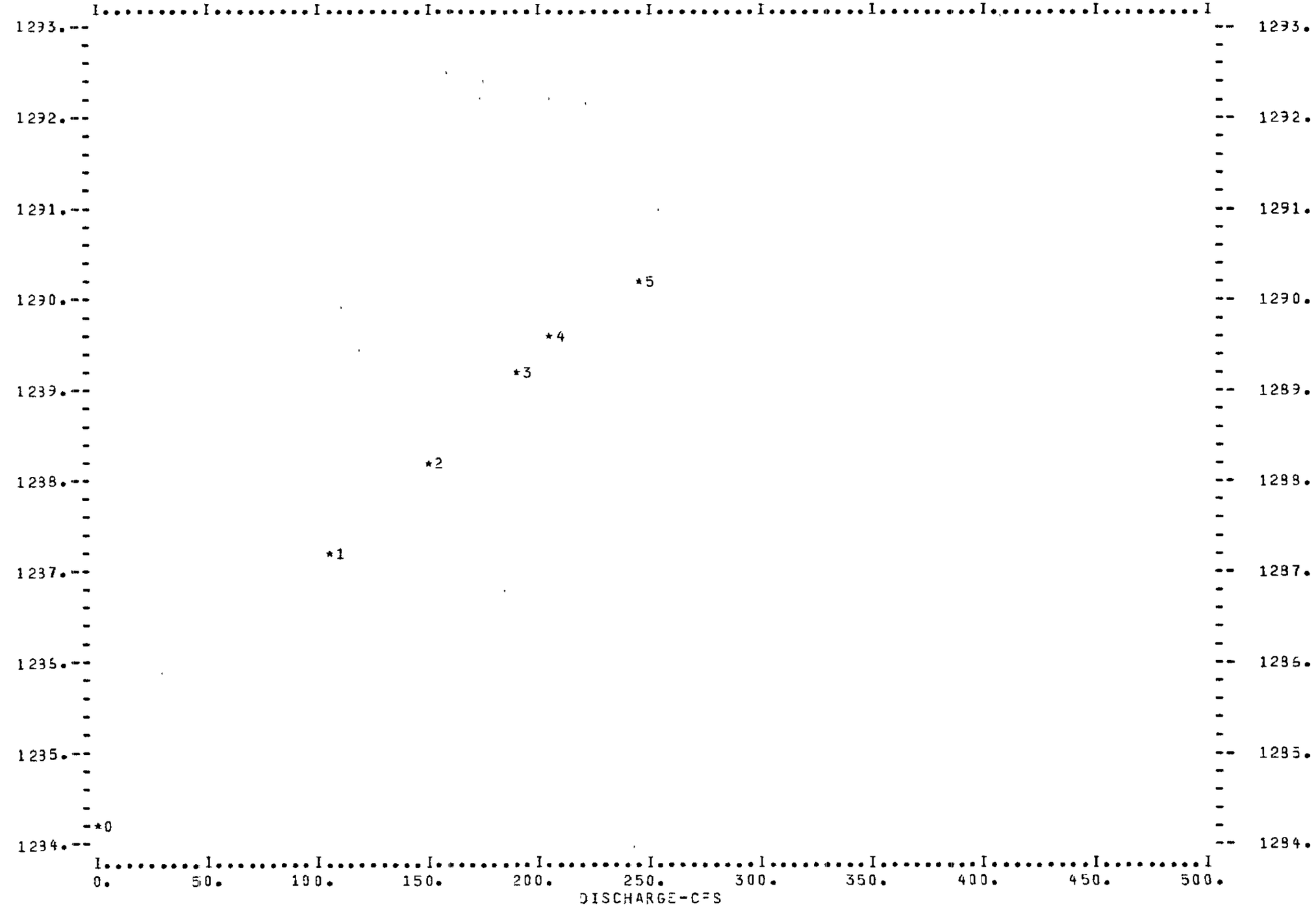
CSM		TOTAL	SEG NO 1 V	2 C	3 N
1	DISCHARGE CFS	105.	0.	105.	0.
105.	VELOCITY FPS	1.65	.00	1.65	.00
2	DISCHARGE CFS	150.	0.	150.	0.
150.	VELOCITY FPS	1.70	.00	1.70	.00
3	DISCHARGE CFS	190.	0.	190.	0.
190.	VELOCITY FPS	1.65	.00	1.65	.00
4	DISCHARGE CFS	205.	0.	205.	0.
205.	VELOCITY FPS	1.67	.00	1.67	.00
5	DISCHARGE CFS	245.	5.	240.	0.
245.	VELOCITY FPS	1.73	.31	1.75	.18
1	ELEV 1287.1 KD	4053.	1.	4051.	1.
2	ELEV 1288.2 KD	6579.	1.	6577.	1.
3	ELEV 1289.3 KD	9937.	1.	9935.	1.
4	ELEV 1289.6 KD	10897.	1.	10895.	1.
5	ELEV 1290.2 KD	12869.	50.	12814.	5.

KD TABLE FOR CROSS SECTION 18.1

ELEVATION	AREA	KD	KD BY SEGMENT		
1284.10	0.				
1285.	13.	331.	1.	329.	1.
1286.	36.	1673.	1.	1671.	1.
1287.	60.	3721.	1.	3719.	1.
1288.	84.	6219.	1.	6217.	1.
1289.	108.	9053.	1.	9051.	1.
1290.	143.	12313.	11.	12155.	3.
1291.	249.	19147.	2063.	15788.	155.
1292.	403.	33335.	11179.	20038.	1876.
1293.	558.	53070.	23871.	24681.	4365.
1294.	713.	77279.	39984.	29705.	7510.
1295.	868.	105362.	59048.	35093.	11173.
1296.	1023.	132079.	76318.	40791.	14302.
1297.	1178.	161643.	95670.	46834.	17742.
1298.	1333.	194863.	117922.	53220.	21658.
1299.	1488.	231878.	143251.	59941.	26074.

CROSS SECTION 18.1

SCALES ARE 1 INCH = 50. CFS, AND 1.2 FEET/ ELEVATION



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-------------------------------80/80 LIST OF INPUT DATA-------------------------------
TITLE      DISCHARGE FROM MITCHELL ST. TO ANN ARBOR R.R.                          272B
CHANGE     DISCHARGE                                                              272C
DISCHARGE  -1.       95.       130.      160.      170.      200.                 272D
END                                                                               272E
REACH      13.9      1.        30.       30.                                     272F
REACH2     13.9      0.                                                          272G
ROAD       13.       2.7       25.       25.                                      273
BPR        13.       A         1.                                                 274
GIRDER     1287.9    1287.4    0.        .8        2.7                            275
           -22.      1291.2    -22.      1287.4    22.       1287.4               276
           22.       1291.5                                                       277
ENDTABLE                                                                          278
SECTION    13.                                                                    279
           -485.     1294.     -435.     1292.     -350.     1291.4               280
           -235.     1292.     -175.     1292.5    -125.     1292.                281
           -22.      1291.2    -22.      1284.6    0.0       1285.1               282
           15.       1285.1    22.       1286.7    22.       1291.5               283
           195.0     1292.0    350.0     1294.0                                  283A
ENDTABLE                                                                          284
REACH      13.1      1.        20.       20.                                      285
REACH2     13.9      0.                                                           286
ROAD       13.5      2.7       50.       50.                                      287
CULV1      13.5      2.        12133.                                             288
CULV2      7.                  200.      1285.1    1284.     .032                 289
SECTION    13.5                                                                  290.
           -1235.    1292.2    -1175.    1291.7    -430.     1291.5               291
           -115.     1292.     -12.      1292.6    0.        1292.6               292
           12.       1292.1    70.       1294.                                    293
ENDTABLE                                                                          294
REACH      13.6      1.        20.       20.                                      295
REACH2     13.9      -.1                                                          296
ROAD       13.7      2.7       20.       20.                                      297
BPR        13.7      A         3.                                                 298
GIRDER     1291.7    1291.2    26.       .8        2.7                            299
           -11.5     1295.     -11.5     1291.2    11.5      1291.2               300
           11.5      1295.                                                        301
ENDTABLE                                                                          302
SECTION    13.7                                                                   303
           -535.     1294.     -450.     1292.     -300.     1291.8               304
           -115.     1292.     -115.     1295.     -11.5     1295.                305
           -11.5     1286.7    0.        1284.8    11.5      1286.3               306
           11.5      1295.     20.       1295.     20.       1292.                307
           30.       1292.     80.       1292.     80.       1300.                308
           200.      1300.     200.      1293.     345.      1294.                309
ENDTABLE                                                                          400
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-----------------------------80/80 LIST OF INPUT DATA-----------------------------
REACH     19.9      1.        30.       30.                                   401
SEGMENT   19.9      1         N         -17.      1291.                       402
NVALUE    .035                                                                403
SEGMENT   19.9      2         C         18.       1291.5                      404
NVALUE    .04                                                                 405
SEGMENT   19.9      3         N         50.       1295.                       406
NVALUE    .035                                                                407
SECTION   19.9                                                                408
          -110.     1295.     -110.     1291.4    -17.      1291.             409
          -11.      1283.     -7.       1285.5    -5.       1285.             410
          0.        1284.8    5.        1284.7    8.        1285.5            411
          13.       1287.8    18.       1291.5    50.       1292.3            412
          50.       1295.                                                     413
ENDTABLE                                                                      414
ROAD      20.       2.7       50.       50.                                   415
BPR       20.       A         3.        7.                                    416
PIER      1285.     2.                                                        417
GIRDER    1291.1    1290.6    40.       .8        2.7                         418
          -14.      1292.     -14.      1289.45   -12.75    1290.6            419
          -2.25     1290.6    -1.       1289.45   1.        1289.45           420
          2.25      1290.6    12.75     1290.6    14.       1289.45           421
          14.       1292.                                                     422
ENDTABLE                                                                      423
SECTION   20.                                                                 424
          -530.     1294.     -275.     1292.8    -14.      1292.             425
          -14.      1285.4    -7.5      1284.8    -1.       1284.9            426
          1.        1285.1    7.5       1285.     14.       1285.2            427
          14.       1292.     60.       1292.     190.      1294.             428
ENDTABLE                                                                      429
REACH     20.5      1.        105.      105.                                  430
SEGMENT   20.5      1         N         -17.      1291.                       431
NVALUE    .035                                                                432
SEGMENT   20.5      2         C         18.       1290.4                      433
NVALUE    .04                                                                 434
SEGMENT   20.5      3         N         195.      1300.                       435
NVALUE    .035                                                                436
SECTION   20.5                                                                437
          -90.      1300.     -90.      1292.     -17.      1291.             438
          -11.      1283.     -7.       1285.5    -5.       1285.             439
          0.        1284.8    5.        1284.7    8.        1285.5            440
          13.       1287.8    18.       1290.4    195.      1290.4            441
          195.      1300.                                                     442
ENDTABLE                                                                      443
ROAD      21.       2.7       160.      160.                                  444
BPR       21.       A         1.        7.                                    445
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
PIER      1284.8    1.5                                                        445
GIRDER    1291.1    1290.6    0.        .8        2.7                          447
          -10.25    1291.6    -10.25    1290.6    10.25     1290.6             448
          10.25     1291.6                                                       449
ENDTABLE                                                                         450
SECTION   21.                                                                    451
          -280.     1294.     -110.     1292.     -10.25    1291.6             452
          -10.25    1285.3    -.75      1284.8    10.25     1285.6             453
          10.25     1291.6    275.      1292.     430.      1293.              454
          430.      1294.                                                        455
ENDTABLE                                                                         456
REACH     21.1      1.        50.       50.                                      457
REACH2    21.6      .1                                                           458
REACH     21.6      1.        340.      310.                                     459
SEGMENT   21.6      1         N         -25.      1286.                          460
NVALUE    .095                                                                   461
SEGMENT   21.6      2         C         40.       1288.3                         462
NVALUE    .04                                                                    463
SEGMENT   21.6      3         N         320.      1294.                          464
NVALUE    .11                                                                    465
SECTION   21.6                                                                   466
          -225.     1294.     -165.     1292.     -40.      1290.4             467
          -25.      1290.3    -25.      1285.     -24.      1285.6             468
          -24.      1285.5    -15.      1285.4    -5.       1284.7             469
          0.        1285.     5.        1285.     15.       1285.              470
          24.       1285.6    30.       1287.3    40.       1288.3             471
          113.      1290.     320.      1292.     320.      1294.              472
ENDTABLE                                                                         473
ROAD      22.       2.7       105.      105.                                     474
BPR       22.       A         1.                                                 475
GIRDER    1294.1    1293.6    48.       .8        2.7                          476
          -10.      1296.     -10.      1293.6    10.       1293.6             477
          10.       1296.                                                        478
ENDTABLE                                                                         479
SECTION   22.                                                                    480
          -250.     1299.     -250.     1295.8    -10.      1296.              481
          -10.      1287.1    0.        1286.1    10.       1287.8             482
          10.       1296.     75.       1296.     190.      1295.              483
          190.      1299.                                                        484
ENDTABLE                                                                         485
REACH     22.1      1.        50.       50.                                      486
REACH2    22.6      .5                                                           487
REACH     22.6      1.        475.      455.                                     488
SEGMENT   22.6      1         N         -76.      1292.4                         489
NVALUE    .095                                                                   490
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
SEGMENT   22.6      2         C         13.       1291.6                          491
NVALUE    .04                                                                      492
SEGMENT   22.6      3         N         510.      1297.                           493
NVALUE    .11                                                                      494
SECTION   22.6                                                                     495
          -387.     1297.     -170.     1296.     -110.     1294.                 496
          -100.     1293.     -76.      1292.4    -70.      1288.1                497
          -40.      1287.8    -20.      1287.7    -10.      1288.                 498
          -5.1      1287.5    -5.       1285.5    0.        1285.5                499
          5.        1285.9    5.5       1287.5    13.       1291.6                500
          20.       1291.7    37.       1292.     144.      1294.                 501
          510.      1294.4    510.      1297.                                     502
ENDTABLE                                                                           503
COMPUTE   13.9      22.6      18.1                                                503A
-----------------------------END OF 80/80 LIST------------------------------
```

COMPUTE 18.9 22.6 18.1 503A

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 18.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1284.7	0.0	0.0						
1	1287.2	38.4	95.0	.00	.00	.00	95.00	1286.0	.00214
2	1288.2	62.2	130.0	.00	.00	.00	130.00	1286.3	.00102
3	1289.3	92.4	160.0	.00	.00	.00	160.00	1286.4	.00050
4	1289.6	101.5	170.0	.00	.00	.00	170.00	1286.5	.00044
5	1290.2	119.8	200.0	.00	.00	.00	200.00	1286.7	.00038

SEGMENT TABLE FOR SECTION 18.9

CSM		TOTAL	SEG NO 1 V	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	0.	95.	0.
95.	VELOCITY FPS	2.47	.00	2.47	.00
2	DISCHARGE CFS	130.	0.	130.	0.
130.	VELOCITY FPS	2.10	.00	2.09	.00
3	DISCHARGE CFS	160.	0.	160.	0.
160.	VELOCITY FPS	1.73	.00	1.73	.00
4	DISCHARGE CFS	170.	0.	170.	0.
170.	VELOCITY FPS	1.68	.00	1.67	.00
5	DISCHARGE CFS	200.	0.	200.	0.
200.	VELOCITY FPS	1.67	.00	1.67	.00
1	ELEV 1287.2 KD	2055.	1.	2053.	1.
2	ELEV 1288.2 KD	4076.	1.	4074.	1.
3	ELEV 1289.3 KD	7124.	1.	7122.	1.
4	ELEV 1289.6 KD	8122.	1.	8120.	1.
5	ELEV 1290.2 KD	10221.	1.	10219.	1.

KD TABLE FOR CROSS SECTION 18.9

ELEVATION	AREA	KD	KD BY SEGMENT		
1284.70	0.				
1285.	2.	25.	1.	23.	1.
1286.	16.	590.	1.	588.	1.
1287.	35.	1813.	1.	1811.	1.
1288.	58.	3676.	1.	3674.	1.
1289.	84.	6213.	1.	6211.	1.
1290.	113.	9435.	1.	9433.	1.
1291.	147.	13430.	5.	13423.	1.
1292.	261.	21682.	2562.	18832.	69.
1293.	418.	37114.	10013.	25293.	1408.
1294.	578.	58383.	21261.	32520.	4396.
1295.	738.	84341.	35383.	40453.	8384.
1296.	898.	112842.	50898.	48935.	12783.
1297.	1058.	140745.	65361.	57750.	16645.
1298.	1218.	172541.	82307.	67275.	21231.
1299.	1378.	208417.	101929.	77508.	26607.

CROSS SECTION 18.9

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION

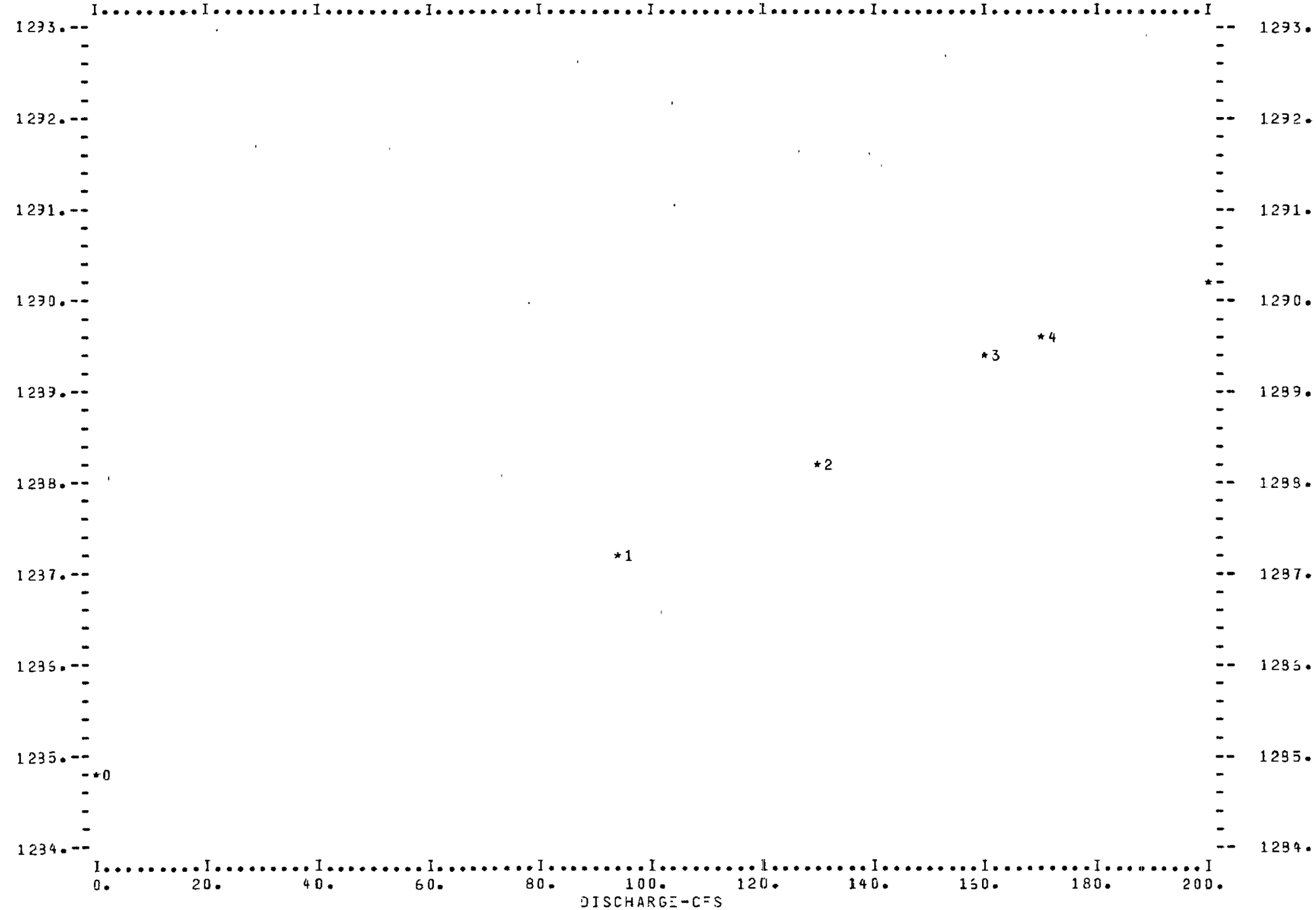


TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.0000	.0000	.0000	.0000	.0000	.0000	1.0000	1.0000	1.0000	92.6527	41.8926	41.8926
DCRIT	1285.52	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	1.0000	101.1001	41.8926	41.8926
DCRIT	-1.00	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	1.0000	101.1001	41.8926	41.8926
DCRIT	-1.00	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	1.0000	101.1001	41.8926	41.8926
DCRIT	-1.00	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	1.0000	101.1001	41.8926	41.8926
DCRIT	-1.00	KBCRIT=									

ROAD SECTION 19.

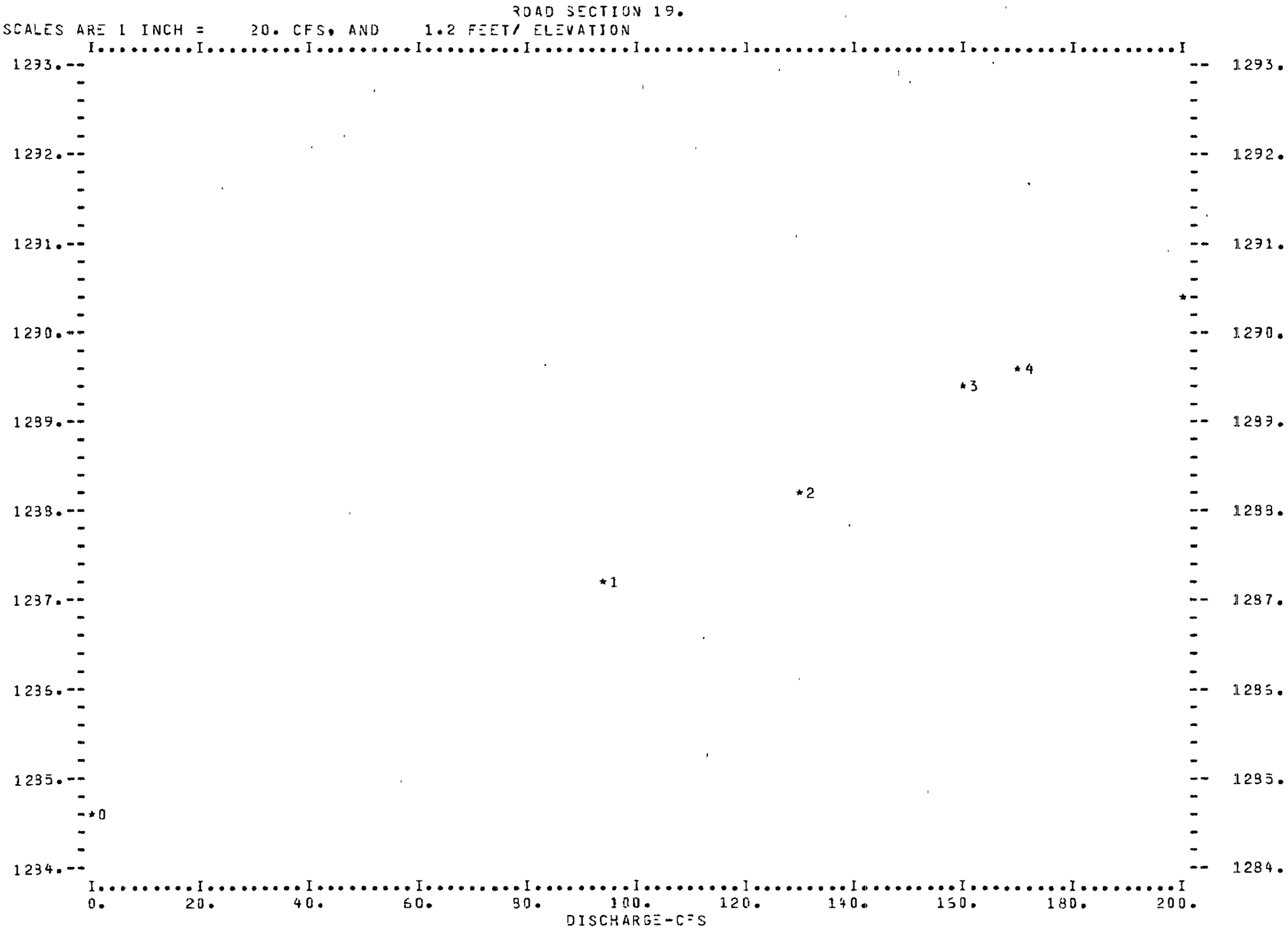
NO.	HW	CFS	HL	TW	CSM
0	1284.60	0.00	0.00	0.00	0.00
1	1287.21	95.00	.00	1287.21	95.00
2	1289.24	130.00	.04	1288.20	130.00
3	1289.38	160.00	.06	1289.32	160.00
4	1289.69	170.00	.06	1289.53	170.00
5	1290.31	200.00	.08	1290.23	200.00

MIN ROAD ELEVATION 1291.20

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 1287.40 OPENING NO.= 1

ROAD SECTION 19.

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 19.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1284.7	0.0	0.0						
1	1287.2	40.3	95.0	.00	.00	.00	95.00	1286.0	.00187
2	1288.3	64.1	130.0	.00	.00	.00	130.00	1286.3	.00093
3	1289.4	94.7	160.0	.00	.00	.00	160.00	1286.4	.00047
4	1289.7	103.9	170.0	.00	.00	.00	170.00	1286.5	.00041
5	1290.3	122.8	200.0	.00	.00	.00	200.00	1286.7	.00036

SEGMENT TABLE FOR SECTION 19.1

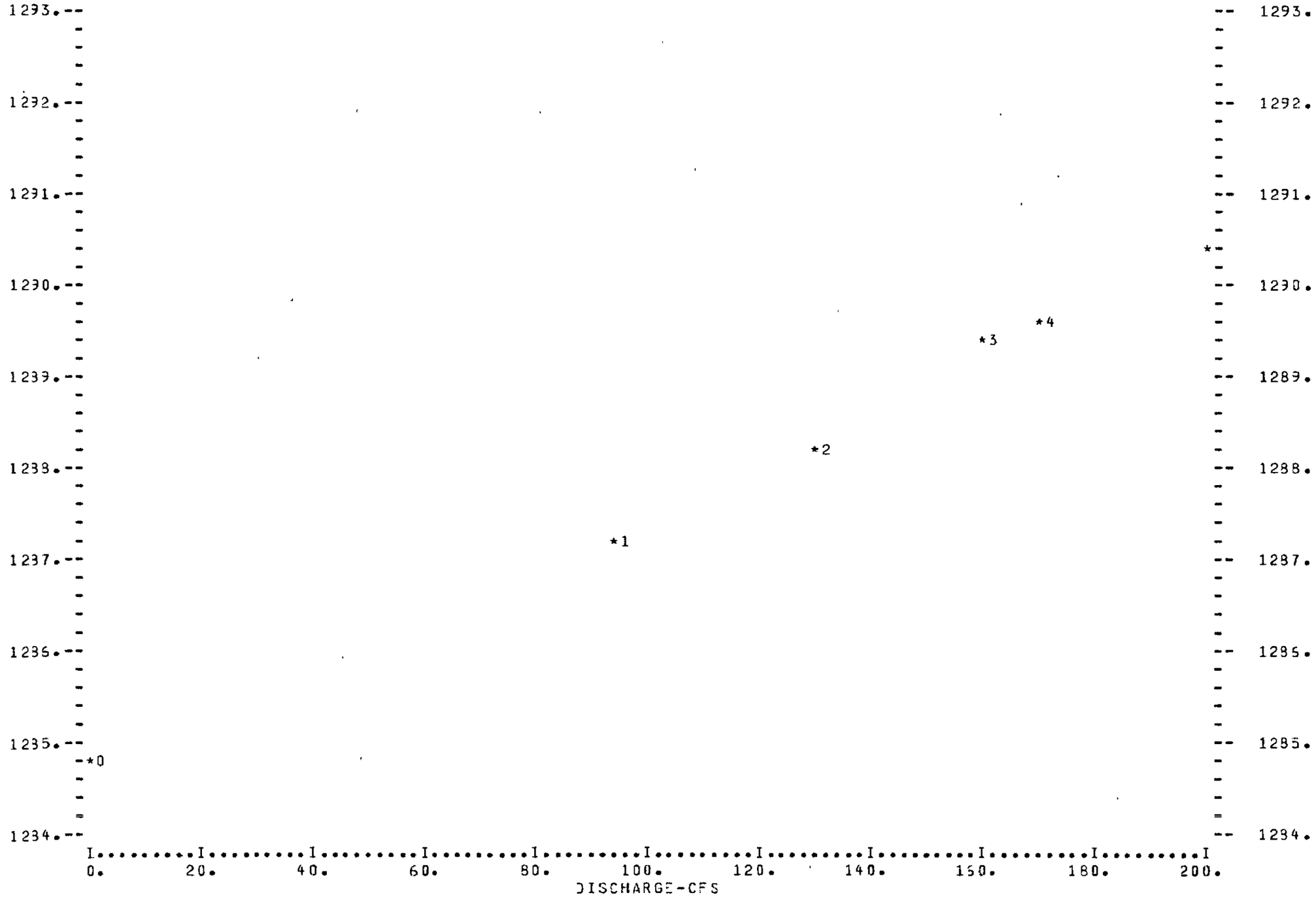
CSM		TOTAL	SEG NO 1 V	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	0.	95.	0.
95.	VELOCITY FPS	2.36	.00	2.35	.00
2	DISCHARGE CFS	130.	0.	130.	0.
130.	VELOCITY FPS	2.03	.00	2.03	.00
3	DISCHARGE CFS	160.	0.	160.	0.
160.	VELOCITY FPS	1.69	.00	1.69	.00
4	DISCHARGE CFS	170.	0.	170.	0.
170.	VELOCITY FPS	1.64	.00	1.64	.00
5	DISCHARGE CFS	200.	0.	200.	0.
200.	VELOCITY FPS	1.63	.00	1.63	.00
1	ELEV 1287.2 KD	2197.	1.	2195.	1.
2	ELEV 1288.3 KD	4269.	1.	4267.	1.
3	ELEV 1289.4 KD	7376.	1.	7374.	1.
4	ELEV 1289.7 KD	8384.	1.	8382.	1.
5	ELEV 1290.3 KD	10582.	1.	10580.	1.

KD TABLE FOR CROSS SECTION 19.1

ELEVATION	AREA	KD	KD BY SEGMENT		
1284.70	0.				
1285.	2.	25.	1.	23.	1.
1286.	16.	590.	1.	588.	1.
1287.	35.	1813.	1.	1811.	1.
1288.	58.	3676.	1.	3674.	1.
1289.	84.	6213.	1.	6211.	1.
1290.	113.	9435.	1.	9433.	1.
1291.	147.	13430.	5.	13423.	1.
1292.	261.	21682.	2562.	18832.	69.
1293.	418.	37114.	10013.	25293.	1408.
1294.	579.	58383.	21261.	32520.	4396.
1295.	738.	84341.	35383.	40453.	8384.
1296.	898.	112842.	50898.	48935.	12783.
1297.	1058.	140745.	65361.	57750.	16645.
1298.	1218.	172541.	82307.	67275.	21231.
1299.	1378.	208417.	101929.	77508.	26607.

CROSS SECTION 19.1

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION



ROAD SECTION 19.5

NO.	HW	CFS	HL	TW	CSM
0	1285.10	0.00	0.00	0.00	0.00
1	1288.04	95.00	.72	1287.32	95.00
2	1288.87	130.00	.56	1288.31	130.00
3	1289.82	160.00	.40	1289.42	160.00
4	1290.12	170.00	.40	1289.72	170.00
5	1290.81	200.00	.48	1290.33	200.00

MIN ROAD ELEVATION 1291.50

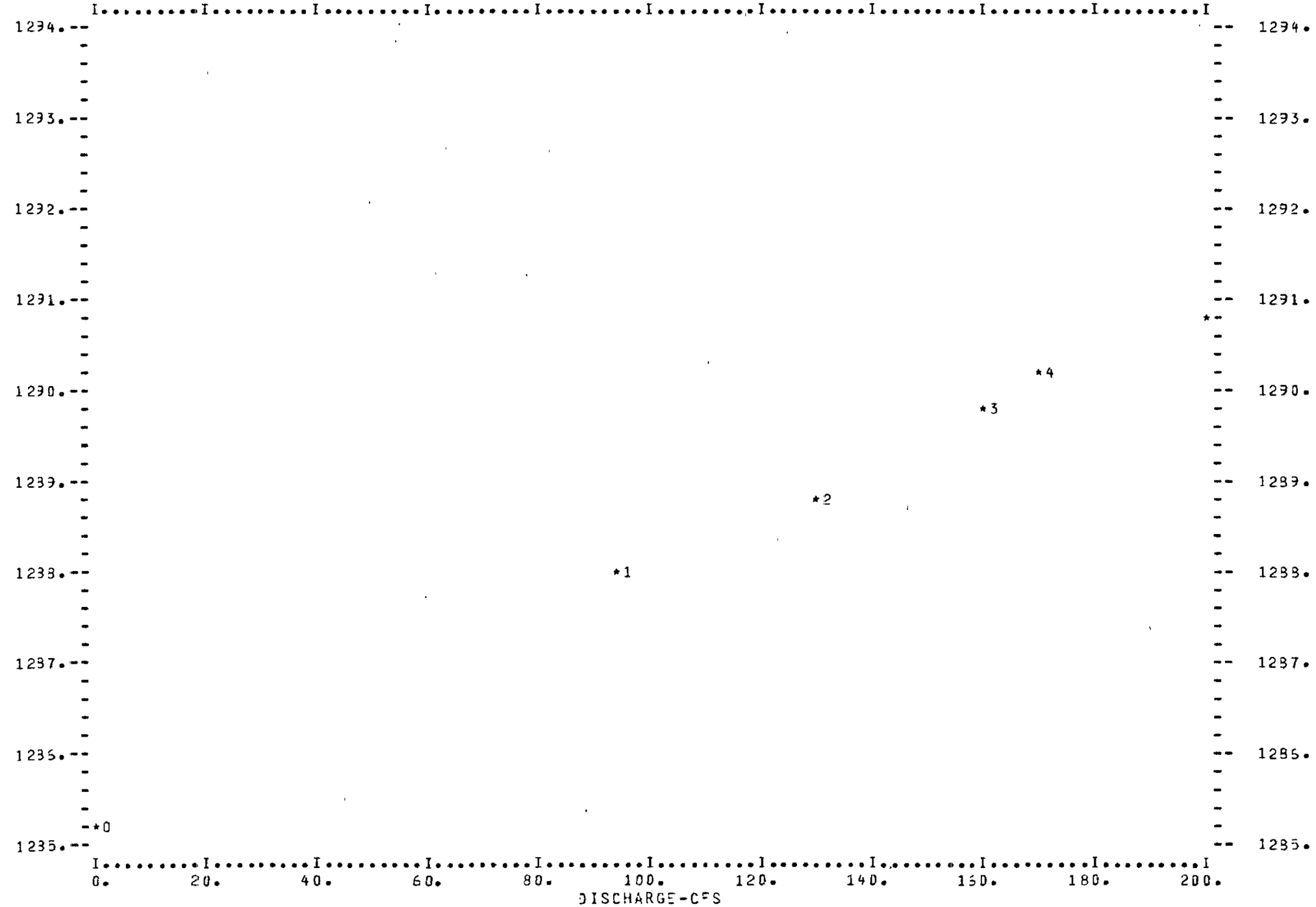
OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	2	12133.	7.00		200.00	1285.10	1284.00	.032

D_{flow} = 5.72ft

WSP2 XEQ 12/01/86 CLAM RIVER,PRESENT COND.,10-07-85, 2,10,50,100,500 YR.STORMS PAGE 54P
REV 09/01/82 DISCHARGE FROM MITCHELL ST. TO ANN ARBOR R.R.

ROAD SECTION 19.5

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 19.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1284.6	0.0	0.0						
1	1288.1	62.0	95.0	.00	.00	.00	95.00	1285.9	.00055
2	1288.9	83.5	130.0	.00	.00	.00	130.00	1286.2	.00044
3	1289.8	111.2	160.0	.00	.00	.00	160.00	1286.3	.00030
4	1290.1	120.5	170.0	.00	.00	.00	170.00	1286.4	.00027
5	1290.8	144.2	200.0	.00	.00	.00	200.00	1286.5	.00023

SEGMENT TABLE FOR SECTION 19.6

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	0.	95.	0.
95.	VELOCITY FPS	1.54	.00	1.53	.00
2	DISCHARGE CFS	130.	0.	130.	0.
130.	VELOCITY FPS	1.56	.00	1.56	.00
3	DISCHARGE CFS	160.	0.	160.	0.
160.	VELOCITY FPS	1.44	.00	1.44	.00
4	DISCHARGE CFS	170.	0.	170.	0.
170.	VELOCITY FPS	1.41	.00	1.41	.00
5	DISCHARGE CFS	200.	0.	200.	0.
200.	VELOCITY FPS	1.40	.09	1.39	.00
1	ELEV 1288.1 KD	4057.	1.	4055.	1.
2	ELEV 1288.9 KD	6189.	1.	6187.	1.
3	ELEV 1289.8 KD	9195.	1.	9193.	1.
4	ELEV 1290.1 KD	10303.	1.	10301.	1.
5	ELEV 1290.8 KD	13115.	5.	13109.	1.

KD TABLE FOR CROSS SECTION 19.6

ELEVATION	AREA	KD	KD BY SEGMENT		
1284.60	0.				
1285.	3.	48.	1.	46.	1.
1286.	18.	684.	1.	682.	1.
1287.	37.	1970.	1.	1968.	1.
1288.	60.	3900.	1.	3898.	1.
1289.	87.	6504.	1.	6502.	1.
1290.	116.	9796.	1.	9794.	1.
1291.	150.	13873.	7.	13865.	1.
1292.	276.	22964.	3016.	19437.	101.
1293.	434.	38980.	10911.	25978.	1612.
1294.	594.	60739.	22491.	33278.	4728.
1295.	754.	87125.	36892.	41280.	8811.
1296.	914.	115462.	52238.	49784.	13139.
1297.	1074.	143746.	65940.	58670.	17070.
1298.	1234.	175941.	84146.	68265.	21732.
1299.	1394.	212236.	104045.	78571.	27190.

CROSS SECTION 19.6

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION

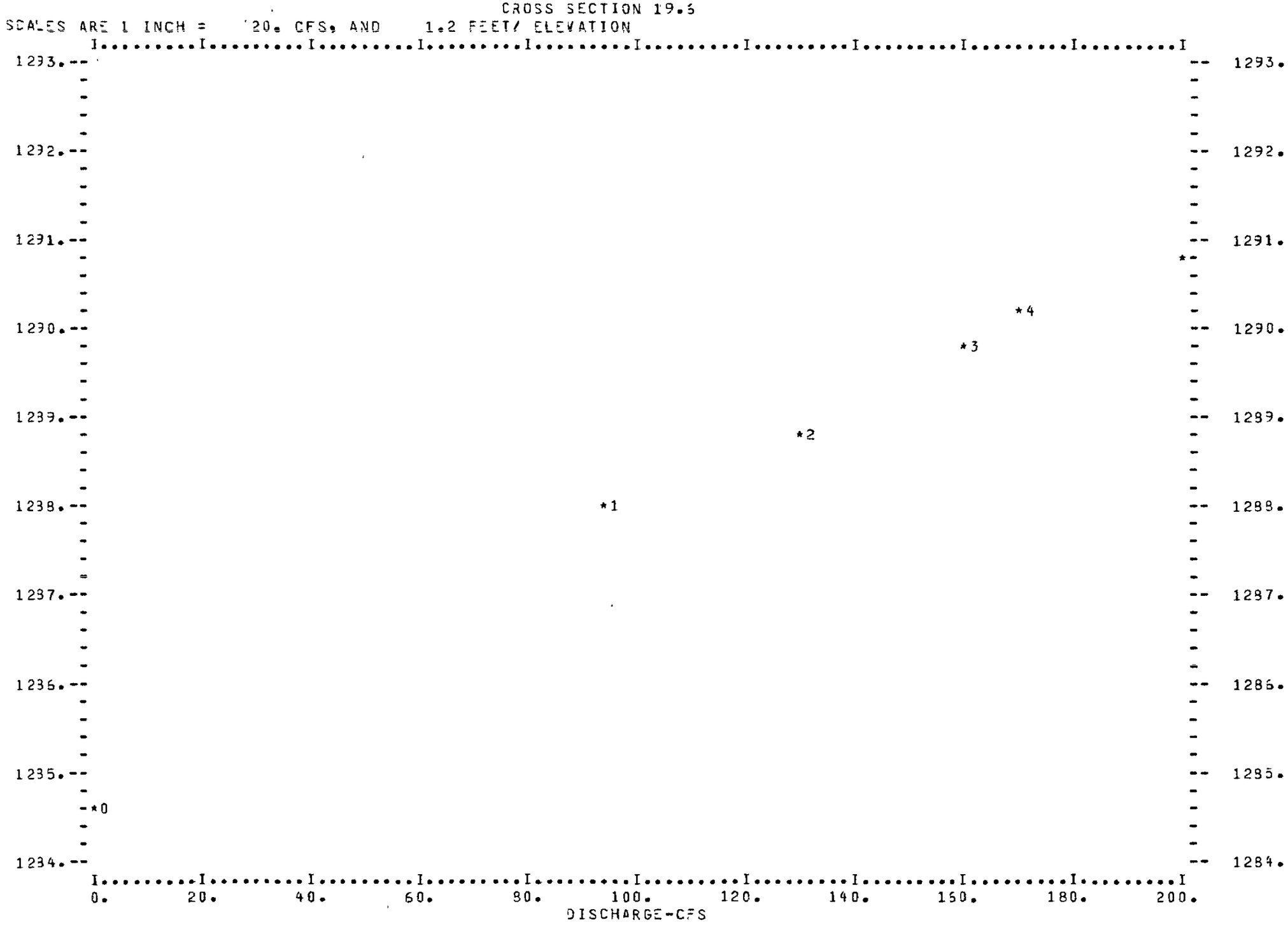


TABLE OF VALUES FOR BPR EQUATION

COEFK	AK3	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.0000	.0000	.0000	.0000	.0000	.0000	1.0167	1.0000	1.0000	50.1395	57.2747	57.2747
DCRIT	1286.41	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	1.0185	1.0000	1.0000	67.1184	78.2151	78.2151
DCRIT	1286.62	KBCRIT=									
.0433	.0506	.0000	.0000	.0000	-.0073	.9581	1.0000	1.0000	86.5270	105.7354	105.1230
DCRIT	1286.79	KBCRIT=									
.0768	.0857	.0000	.0000	.0000	-.0089	.9342	1.0000	1.0000	92.8287	115.0750	114.4526
DCRIT	1286.84	KBCRIT=									
.1177	.1292	.0000	.0000	.0000	-.0115	.9074	1.0000	1.0000	107.0857	138.0592	137.3644
DCRIT	1286.97	KBCRIT=									

ROAD SECTION 19.7

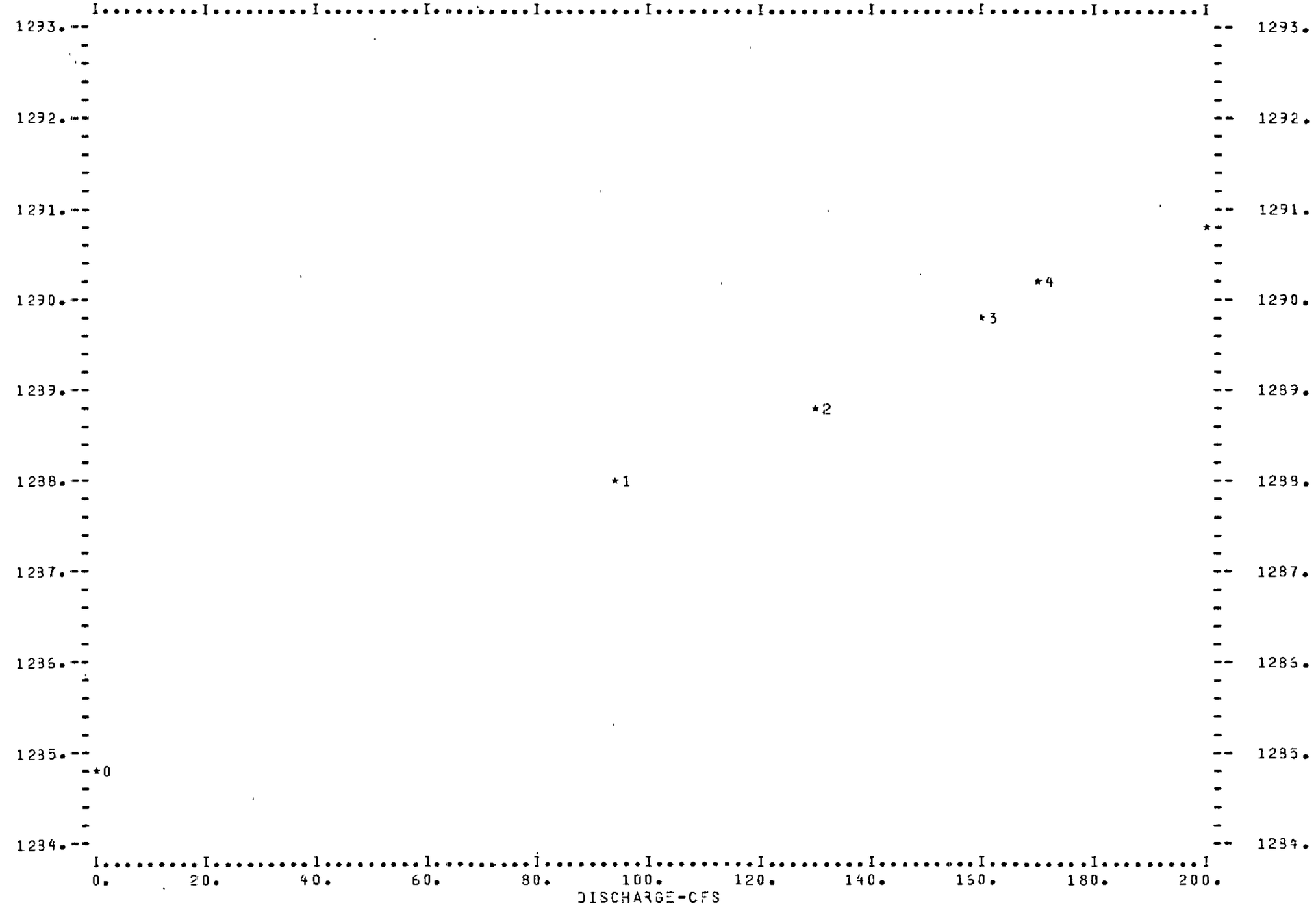
NO.	HW	CFS	HL	TW	CSM
0	1284.80	0.00	0.00	0.00	0.00
1	1288.08	95.00	.00	1288.08	95.00
2	1288.90	130.00	.00	1288.90	130.00
3	1289.84	160.00	.00	1289.84	160.00
4	1290.14	170.00	.00	1290.14	170.00
5	1290.83	200.00	.00	1290.83	200.00

MIN ROAD ELEVATION 1291.80

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 1291.20 OPENING NO.= 1

ROAD SECTION 19.7

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 19.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1284.7	0.0	0.0						
1	1288.1	60.2	95.0	.00	.00	.00	95.00	1286.0	.00060
2	1288.9	81.3	130.0	.00	.00	.00	130.00	1286.3	.00047
3	1289.8	108.5	160.0	.00	.00	.00	160.00	1286.4	.00032
4	1290.2	117.8	170.0	.00	.00	.00	170.00	1286.5	.00029
5	1290.8	141.2	200.0	.00	.00	.00	200.00	1286.7	.00025

SEGMENT TABLE FOR SECTION 19.9

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	0.	95.	0.
95.	VELOCITY FPS	1.58	.00	1.58	.00
2	DISCHARGE CFS	130.	0.	130.	0.
130.	VELOCITY FPS	1.60	.00	1.60	.00
3	DISCHARGE CFS	160.	0.	160.	0.
160.	VELOCITY FPS	1.48	.00	1.47	.00
4	DISCHARGE CFS	170.	0.	170.	0.
170.	VELOCITY FPS	1.44	.00	1.44	.00
5	DISCHARGE CFS	200.	0.	200.	0.
200.	VELOCITY FPS	1.43	.10	1.42	.00
1	ELEV 1288.1 KD	3894.	1.	3892.	1.
2	ELEV 1288.9 KD	5968.	1.	5966.	1.
3	ELEV 1289.8 KD	8898.	1.	8896.	1.
4	ELEV 1290.2 KD	9983.	1.	9981.	1.
5	ELEV 1290.8 KD	12733.	4.	12728.	1.

KD TABLE FOR CROSS SECTION 19.9

ELEVATION	AREA	KD	KD BY SEGMENT		
1284.70	0.				
1285.	2.	25.	1.	23.	1.
1286.	16.	590.	1.	588.	1.
1287.	35.	1813.	1.	1811.	1.
1288.	58.	3676.	1.	3674.	1.
1289.	84.	6213.	1.	6211.	1.
1290.	113.	9435.	1.	9433.	1.
1291.	147.	13430.	5.	13423.	1.
1292.	261.	21682.	2562.	18832.	69.
1293.	418.	37114.	10013.	25293.	1408.
1294.	578.	58383.	21261.	32520.	4395.
1295.	738.	84341.	35383.	40453.	8384.
1296.	898.	112842.	50898.	48935.	12783.
1297.	1058.	140745.	65361.	57750.	16645.
1298.	1218.	172541.	82307.	67273.	21231.
1299.	1378.	208417.	101929.	77508.	26607.

CROSS SECTION 19.9

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION

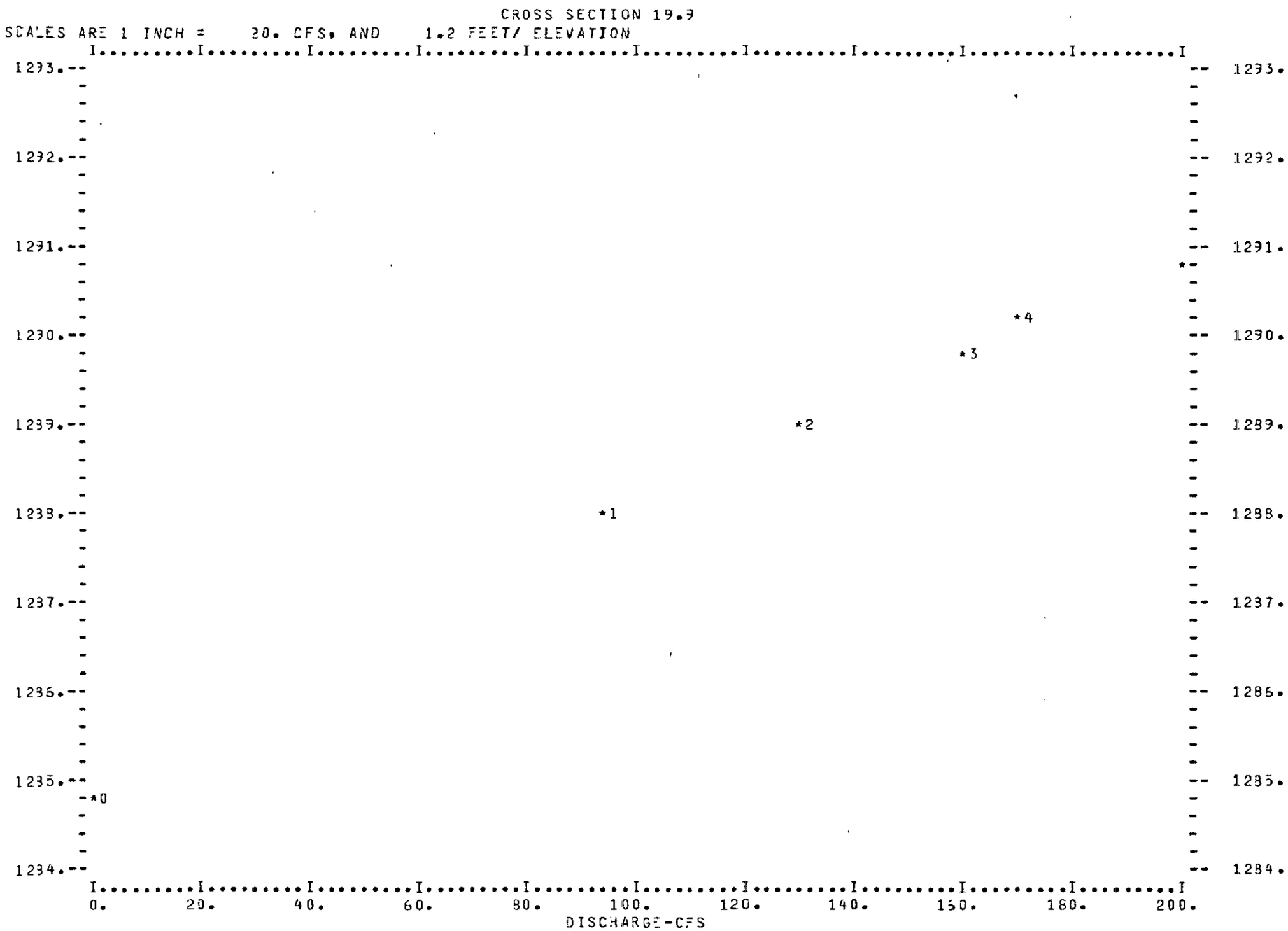


TABLE OF VALUES FOR BPR EQUATION

COEFK	AK3	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.1255	.0000	.1355	.9989	.0000	-.0100	.9999	1.0000	1.0000	61.7895	59.0620	58.5350
DCRIT	1285.75	KBCRIT=									
.1262	.0000	.1362	.9989	.0000	-.0100	.9999	1.0000	1.0000	77.9230	80.1331	79.2814
DCRIT	1285.93	KBCRIT=									
.1261	.0000	.1360	.9989	.0000	-.0100	.9999	1.0000	1.0000	95.3582	107.7376	105.9593
DCRIT	1286.07	KBCRIT=									
.1260	.0000	.1350	.9989	.0000	-.0100	.9999	1.0000	1.0000	102.3717	117.3504	115.2096
DCRIT	1286.11	KBCRIT=									
.2339	.1093	.1474	.9873	.0000	-.0228	.9193	1.0000	1.0000	106.6895	213.5150	138.0814
DCRIT	1286.24	KBCRIT=									

ROAD SECTION 20.

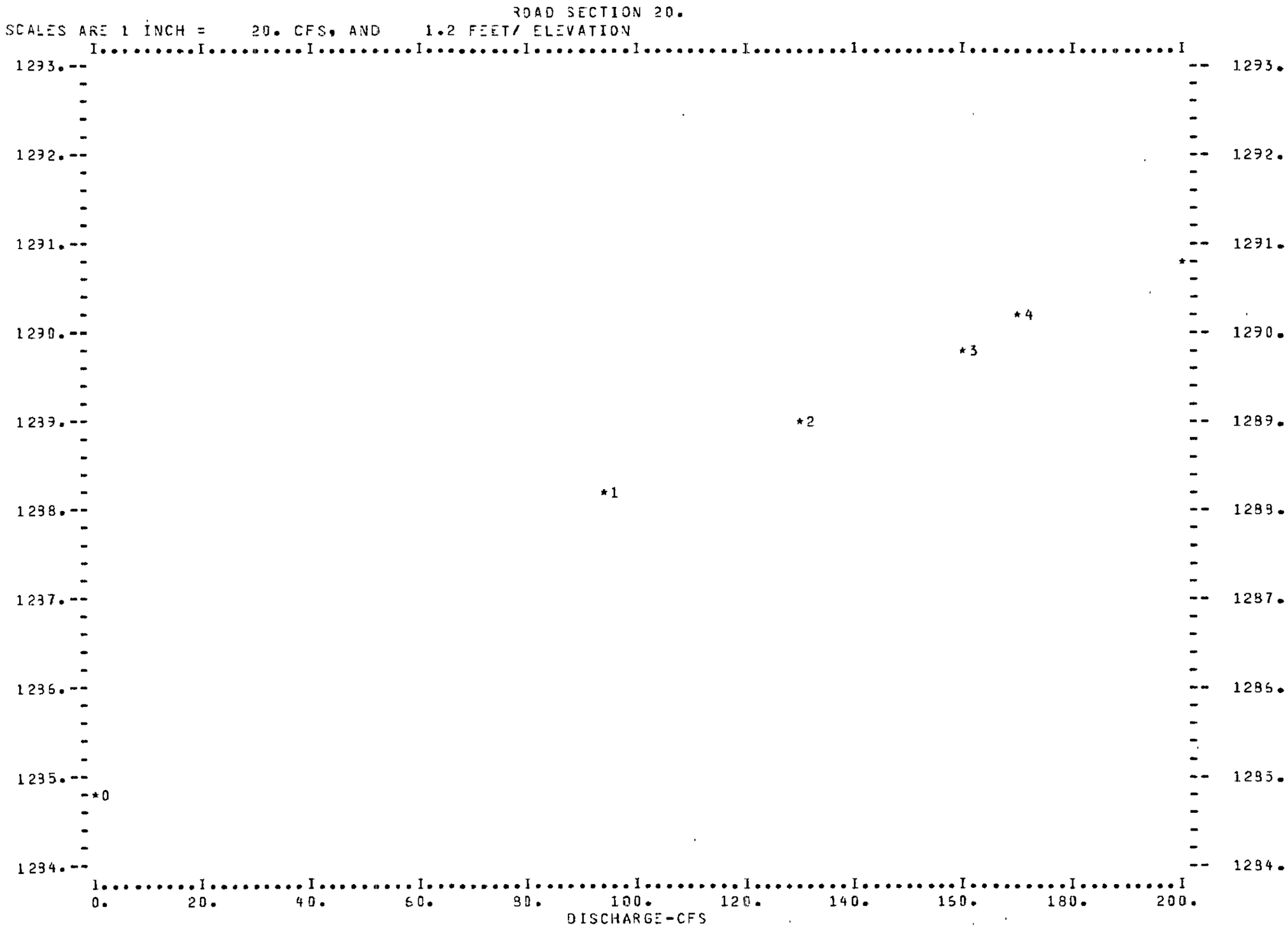
NO.	HW	CFS	HL	TW	CSM
0	1284.80	0.00	0.00	0.00	0.00
1	1288.13	95.00	.00	1288.13	95.00
2	1288.94	130.00	.00	1288.94	130.00
3	1289.86	160.00	.00	1289.86	160.00
4	1290.16	170.00	.00	1290.16	170.00
5	1290.85	200.00	.00	1290.85	200.00

MIN ROAD ELEVATION 1292.00

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 1290.60 OPENING NO.= 1

ROAD SECTION 20.

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 20.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	CHANNEL	NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1284.7	0.0	0.0						
1	1288.2	62.6	95.0	.00	.00	.00	95.00	1286.0	.00054
2	1289.0	83.9	130.0	.00	.00	.00	130.00	1286.3	.00045
3	1289.9	111.4	160.0	.00	.00	.00	160.00	1286.4	.00031
4	1290.2	120.9	170.0	.00	.00	.00	170.00	1286.5	.00028
BANK FULL	1290.4	143.2	179.0	.00	.00	.00			
5	1290.9	233.2	200.0	.00	.00	.00	200.00	1286.7	.00020

SEGMENT TABLE FOR SECTION 20.5

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	95.	0.	95.	0.
95.	VELOCITY FPS	1.52	.00	1.52	.00
2	DISCHARGE CFS	130.	0.	130.	0.
130.	VELOCITY FPS	1.55	.00	1.55	.00
3	DISCHARGE CFS	160.	0.	160.	0.
160.	VELOCITY FPS	1.44	.00	1.44	.00
4	DISCHARGE CFS	170.	0.	170.	0.
170.	VELOCITY FPS	1.41	.00	1.41	.00
5	DISCHARGE CFS	200.	0.	185.	15.
200.	VELOCITY FPS	1.25	.00	1.28	.17
1	ELEV 1288.2 KD	4097.	1.	4095.	1.
2	ELEV 1289.0 KD	6153.	1.	6151.	1.
3	ELEV 1289.9 KD	9068.	1.	9066.	1.
4	ELEV 1290.2 KD	10158.	1.	10156.	1.
5	ELEV 1290.9 KD	13361.	2.	13147.	213.

KD TABLE FOR CROSS SECTION 20.5

ELEVATION	AREA	KD	KD BY SEGMENT		
1284.70	0.				
1285.	2.	25.	1.	23.	1.
1286.	15.	590.	1.	588.	1.
1287.	35.	1813.	1.	1811.	1.
1288.	58.	3668.	1.	3665.	1.
1289.	84.	6184.	1.	6182.	1.
1290.	115.	9432.	1.	9430.	1.
1291.	257.	15049.	2.	13758.	642.
1292.	503.	25905.	341.	19513.	5939.
1293.	788.	41669.	2103.	26102.	13265.
1294.	1073.	61574.	5069.	33460.	22931.
1295.	1358.	84989.	8893.	41530.	34495.
1296.	1643.	111568.	13455.	50280.	47786.
1297.	1928.	141022.	18659.	59682.	62640.
1298.	2213.	173349.	24513.	69733.	79092.
1299.	2498.	208108.	30861.	80385.	96849.
1300.	2783.	245206.	37683.	91627.	115874.
1301.	3068.	282532.	44332.	103239.	134829.
1302.	3353.	321294.	51161.	115351.	154478.
1303.	3638.	362743.	58568.	128082.	175642.
1304.	3923.	406903.	66566.	141428.	198345.

CROSS SECTION 20.5

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION

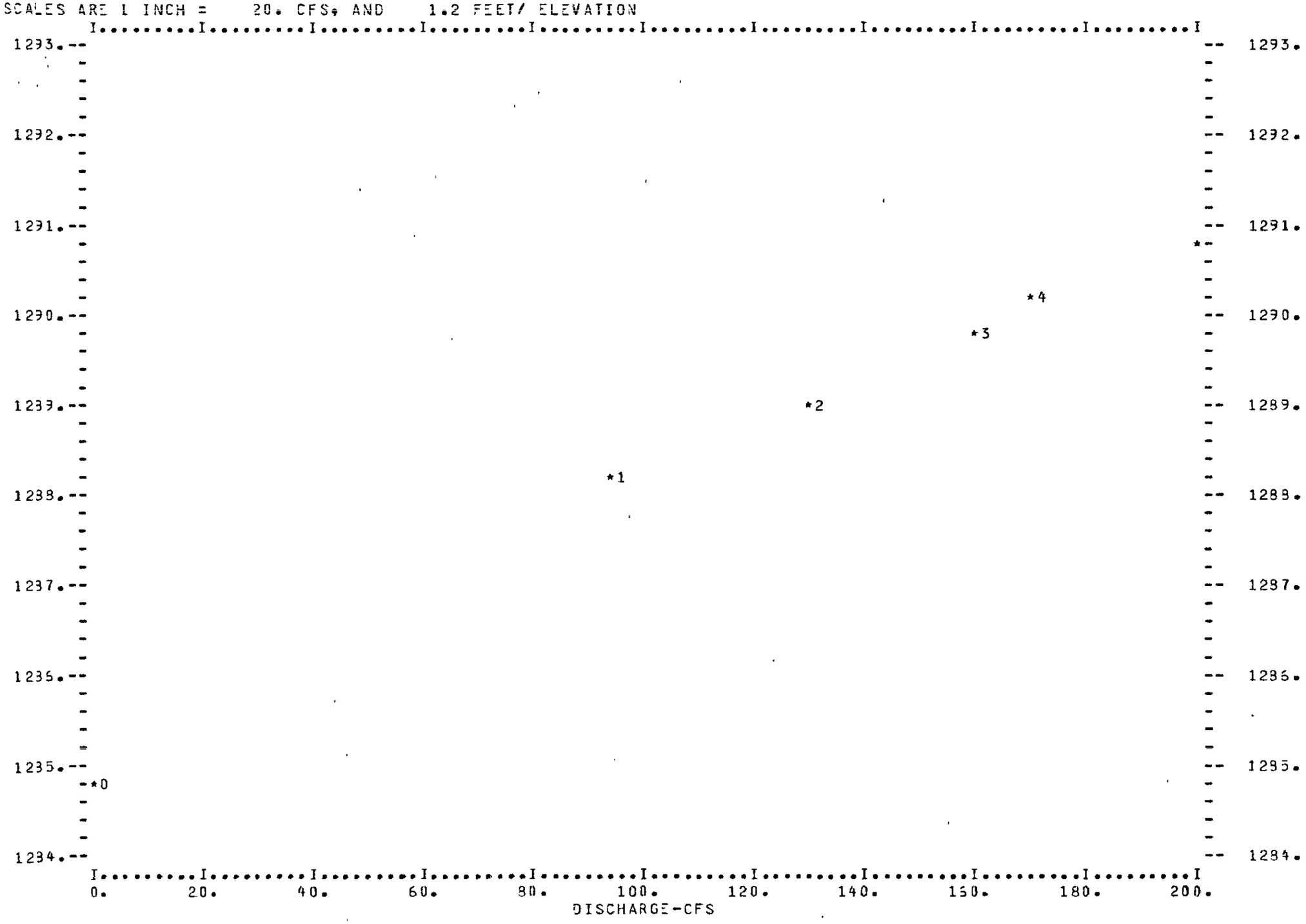


TABLE OF VALUES FOR BPR EQUATION

COEFK	AK3	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
1.3708	1.2565	.1143	.7282	.0000	.0000	.4658	1.0000	1.0000	59.4336	168.3065	62.4149
DCRIT	1286.06	KBCRIT=									
1.5213	1.4150	.1064	.6931	.0000	.0000	.4262	1.0000	1.0000	74.2629	234.3420	83.1691
DCRIT	1286.29	KBCRIT=									
1.6531	1.5531	.1000	.6626	.0000	.0000	.3931	1.0000	1.0000	91.0850	341.1825	109.8893
DCRIT	1286.45	KBCRIT=									
1.6810	1.5824	.0986	.6561	.0000	.0000	.3862	1.0000	1.0000	96.6479	381.3254	119.2110
DCRIT	1286.50	KBCRIT=									
1.7897	1.6892	.1006	.6326	.0000	.0000	.3616	1.0000	1.0000	102.9638	544.9894	220.4761
DCRIT	1286.66	KBCRIT=									

ROAD SECTION 21.

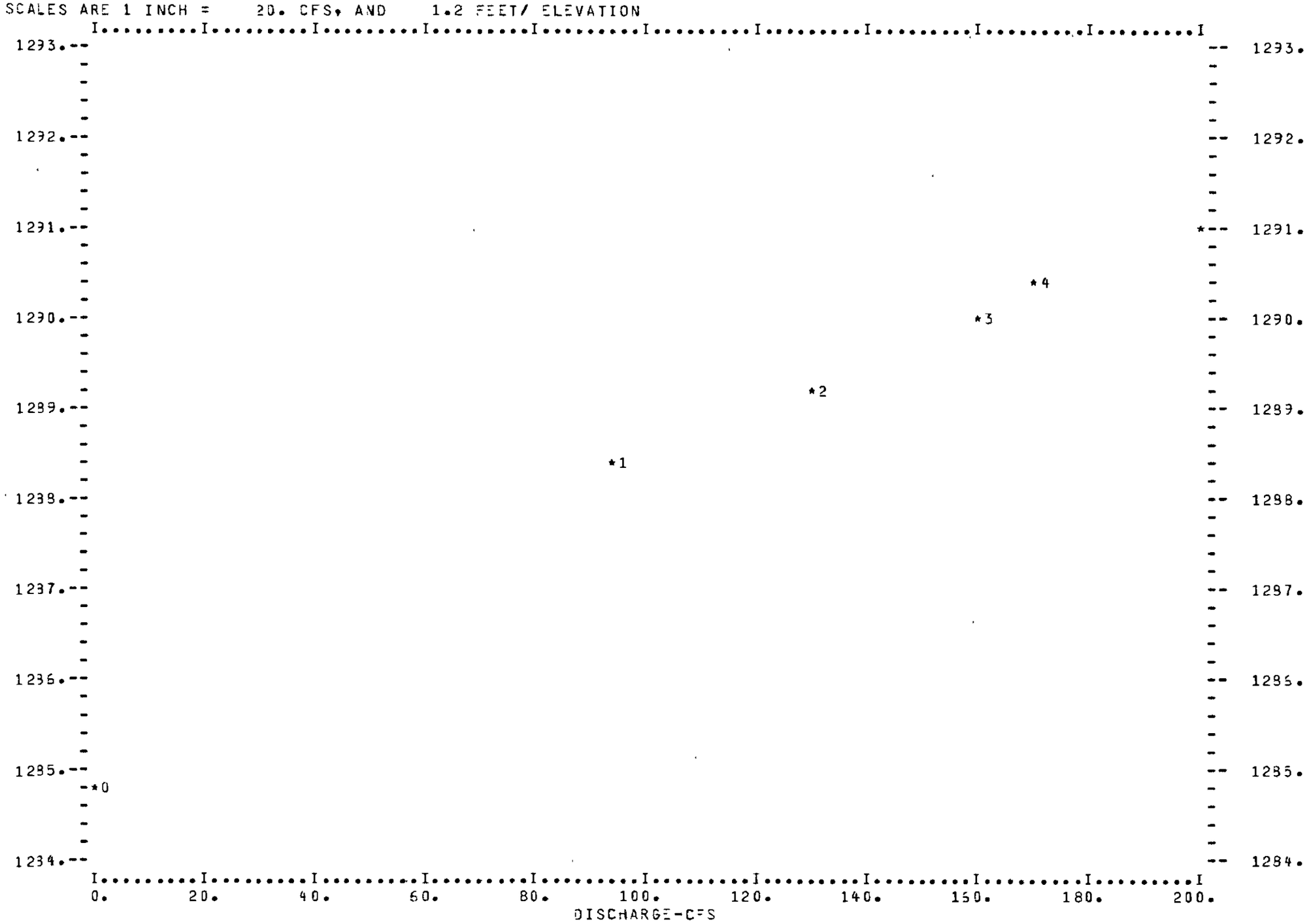
NO.	HW	CFS	HL	TW	CSM
0	1284.80	0.00	0.00	0.00	0.00
1	1288.34	95.00	.06	1288.28	95.00
2	1289.15	130.00	.08	1289.07	130.00
3	1290.03	160.00	.08	1289.95	160.00
4	1290.32	170.00	.08	1290.24	170.00
5	1291.01	200.00	.10	1290.91	200.00

MIN ROAD ELEVATION 1291.60

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 1290.60 OPENING NO.= 1

ROAD SECTION 21.

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 21.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	CHANNEL	NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1284.8	0.0	0.0						
BANK FULL	1286.1	42.0	34.8	.00	.00	.00			
*****WARNING-BANKFULL OR ZERO DAMAGE ELEV BELOW FIRST PROFILE. FLOW INTERPOLATED LINEARLY FROM CHANNEL BOTTOM*****									
1	1288.3	167.3	95.0	.00	.00	.00	95.00	1285.7	.00007
2	1289.1	232.5	130.0	.00	.00	.00	130.00	1285.8	.00005
3	1290.0	338.7	160.0	.00	.00	.00	160.00	1285.9	.00003
4	1290.3	378.8	170.0	.00	.00	.00	170.00	1286.0	.00003
5	1291.0	540.3	200.0	.00	.00	.00	200.00	1286.0	.00002

SEGMENT TABLE FOR SECTION 21.1

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	95.	0.	95.	0.
95.	VELOCITY FPS	.57	.00	.57	.00
2	DISCHARGE CFS	130.	0.	129.	1.
130.	VELOCITY FPS	.59	.00	.59	.06
3	DISCHARGE CFS	160.	0.	156.	4.
160.	VELOCITY FPS	.56	.00	.56	.07
4	DISCHARGE CFS	170.	0.	165.	5.
170.	VELOCITY FPS	.55	.00	.56	.07
5	DISCHARGE CFS	200.	1.	187.	12.
200.	VELOCITY FPS	.53	.04	.55	.07

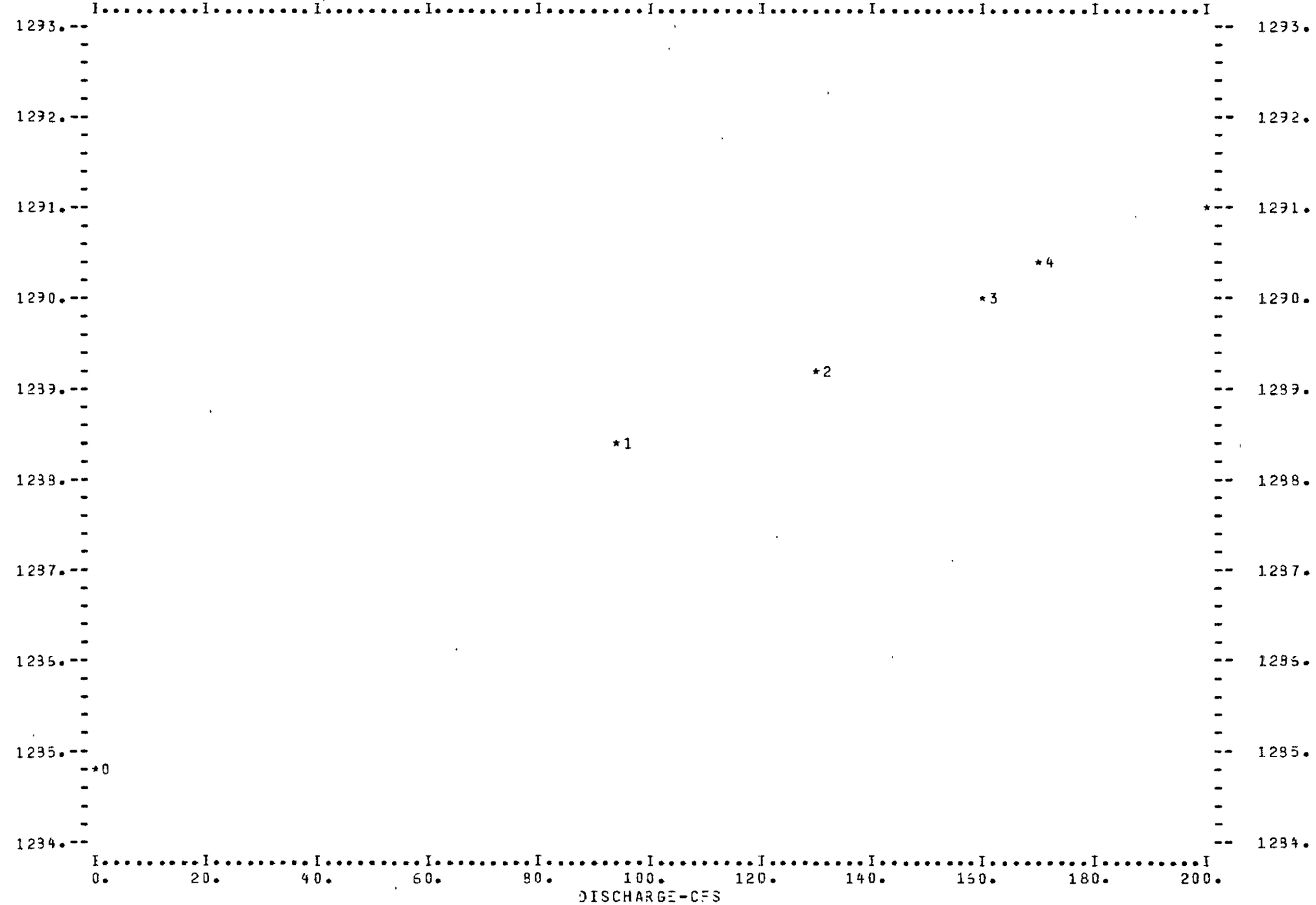
1	ELEV	1288.3	KD	11563.	1.	11661.	1.
2	ELEV	1289.1	KD	18267.	1.	18190.	75.
3	ELEV	1290.0	KD	27427.	1.	26816.	610.
4	ELEV	1290.3	KD	30949.	1.	29988.	960.
5	ELEV	1291.0	KD	40287.	74.	37871.	2342.

KD TABLE FOR CROSS SECTION 21.1

ELEVATION	AREA	KD	KD BY SEGMENT		
1284.80	0.				
1285.	1.	7.	1.	5.	1.
1286.	37.	1124.	1.	1122.	1.
1287.	89.	4588.	1.	4586.	1.
1288.	146.	9589.	1.	9587.	1.
1289.	217.	16947.	1.	16899.	47.
1290.	334.	27125.	1.	26478.	579.
1291.	538.	40367.	70.	37765.	2318.
1292.	903.	58789.	1516.	50604.	6569.
1293.	1402.	86323.	5347.	64855.	15814.
1294.	1927.	121079.	11807.	80511.	28519.
1295.	2471.	162028.	20865.	97409.	43262.
1296.	3016.	204175.	28992.	115225.	56927.
1297.	3561.	252245.	39166.	134354.	73167.
1298.	4106.	306481.	51672.	154773.	92199.

CROSS SECTION 21.1

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 21.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	CHANNEL	NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1284.7	0.0	0.0						
BANK FULL	1286.0	42.0	33.7	.00	.00	.00			
*****WARNING-BANKFULL OR ZERO DAMAGE ELEV BELOW FIRST PROFILE. FLOW INTERPOLATED LINEARLY FROM CHANNEL BOTTOM*****									
1	1288.4	175.8	95.0	.00	.00	.00	95.00	1285.6	.00006
2	1289.2	244.5	130.0	.00	.00	.00	130.00	1285.7	.00004
3	1290.0	353.9	160.0	.00	.00	.00	160.00	1285.8	.00003
4	1290.3	397.7	170.0	.00	.00	.00	170.00	1285.9	.00003
5	1291.0	567.1	200.0	.00	.00	.00	200.00	1285.9	.00002

SEGMENT TABLE FOR SECTION 21.6

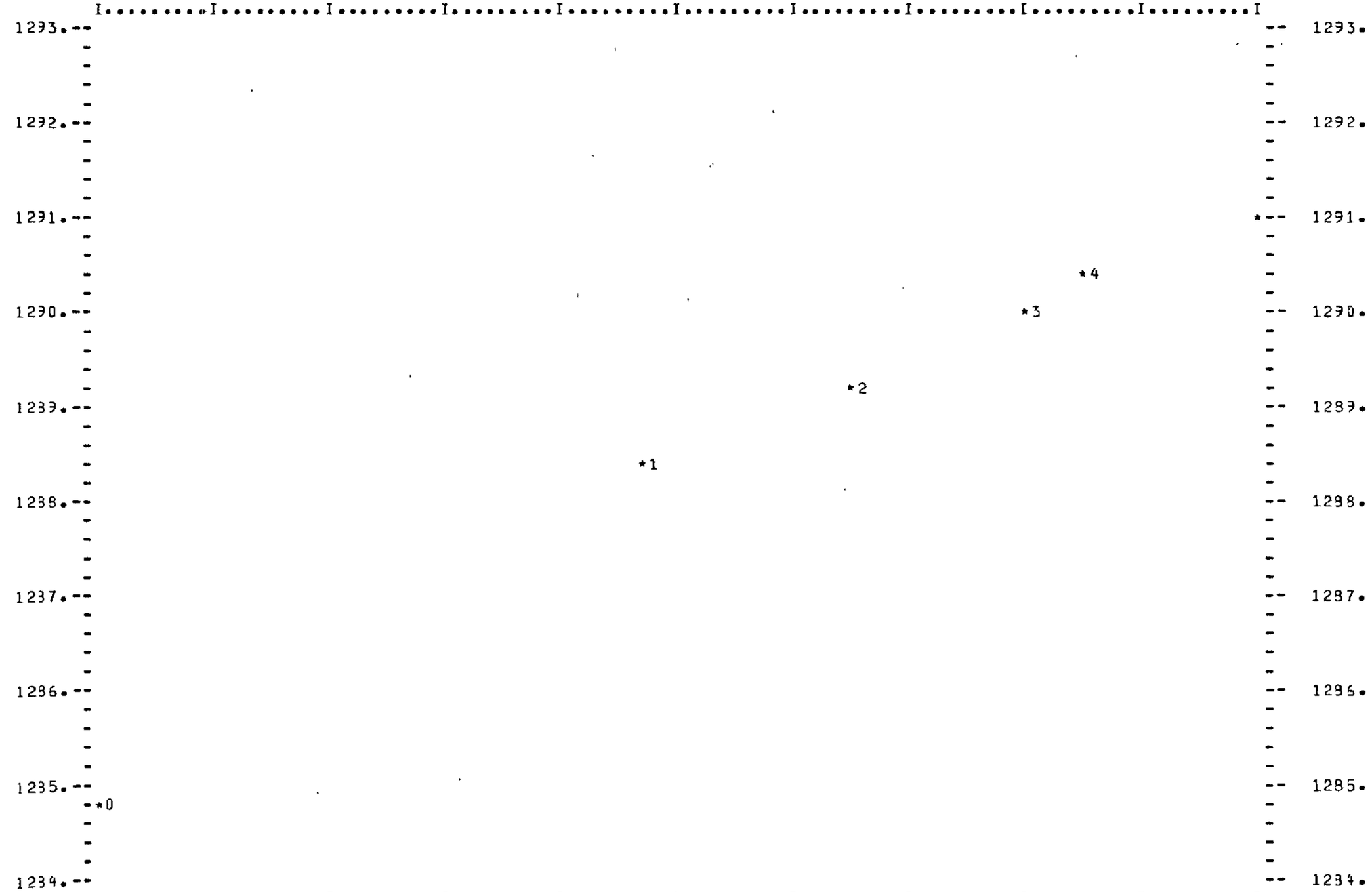
CSM		TOTAL	SEG NO 1 V	2 C	3 N
1	DISCHARGE CFS	95.	0.	95.	0.
95.	VELOCITY FPS	.54	.00	.54	.06
2	DISCHARGE CFS	130.	0.	129.	1.
130.	VELOCITY FPS	.57	.00	.57	.06
3	DISCHARGE CFS	160.	0.	155.	5.
160.	VELOCITY FPS	.54	.00	.55	.07
4	DISCHARGE CFS	170.	0.	164.	6.
170.	VELOCITY FPS	.53	.05	.54	.07
5	DISCHARGE CFS	200.	1.	185.	14.
200.	VELOCITY FPS	.52	.04	.53	.07
1	ELEV 1288.4 KD	12504.	1.	12501.	2.
2	ELEV 1289.2 KD	19353.	1.	19239.	114.
3	ELEV 1290.0 KD	28758.	1.	27996.	761.
4	ELEV 1290.3 KD	32393.	1.	31212.	1179.
5	ELEV 1291.0 KD	42146.	159.	39193.	2793.

KD TABLE FOR CROSS SECTION 21.6

ELEVATION	AREA	KD	KD BY SEGMENT		
1284.70	0.				
1285.	2.	20.	1.	17.	1.
1286.	42.	1368.	1.	1365.	1.
1287.	94.	5041.	1.	5038.	1.
1288.	152.	10166.	1.	10163.	1.
1289.	228.	17855.	1.	17768.	68.
1290.	348.	28317.	1.	27535.	711.
1291.	563.	42024.	143.	38989.	2739.
1292.	953.	51671.	1830.	51957.	7585.
1293.	1454.	90551.	6102.	65353.	17664.
1294.	1982.	126962.	13193.	82145.	31288.
1295.	2525.	169125.	22614.	99131.	46523.
1296.	3071.	212965.	31327.	117079.	61193.
1297.	3615.	252975.	42212.	136338.	78484.
1298.	4151.	319415.	55570.	156885.	98720.

CROSS SECTION 21.5

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION



*****SECT.22.1 KD VALUES REVERSED ON SEGMENT 2 AT ELEVATION 1288.40 VALUE CHANGED TO EQUAL PREVIOUS VALUE*****

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.0000	.0000	.0000	.0000	.0000	.0000	1.0000	1.0000	1.0000	21.6941	22.7877	94.0010
DCRIT	1287.64	KBCRIT=									
.6644	.9318	.0000	.0000	.0000	-.2674	.5538	1.0000	1.0000	32.1487	86.3811	138.0910
DCRIT	1287.84	KBCRIT=									
1.1306	1.6029	.0000	.0000	.0000	-.4723	.3814	1.0000	1.0000	43.8180	154.1655	197.7005
DCRIT	1288.02	KBCRIT=									
1.2207	1.7351	.0000	.0000	.0000	-.5144	.3512	1.0000	1.0000	47.6966	188.1203	221.2805
DCRIT	1288.08	KBCRIT=									
1.2996	1.8515	.0000	.0000	.0000	-.5519	.3253	1.0000	1.0000	56.7953	246.8723	295.7299
DCRIT	1288.23	KBCRIT=									

ROAD SECTION 22.

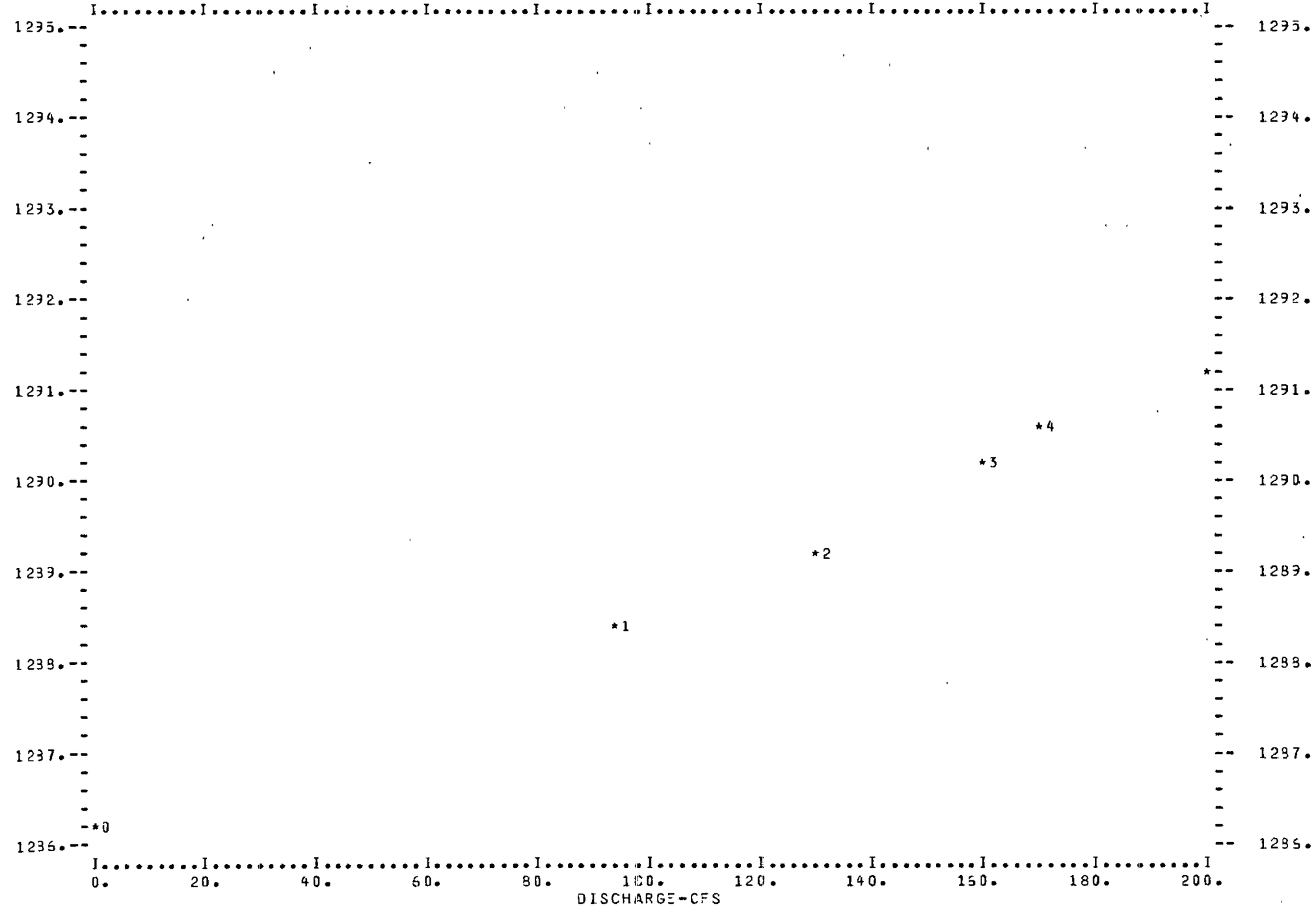
NO.	HW	CFS	HL	TW	CSM
0	1286.10	0.00	0.00	0.00	0.00
1	1288.40	95.00	.00	1288.40	95.00
2	1289.30	130.00	.12	1289.18	130.00
3	1290.27	160.00	.22	1290.05	160.00
4	1290.55	170.00	.22	1290.34	170.00
5	1291.25	200.00	.24	1291.02	200.00

MIN ROAD ELEVATION 1295.00

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 1293.60 OPENING NO.= 1

ROAD SECTION 22.

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 22.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1286.0	0.0	0.0						
1	1288.8	54.2	95.0	.00	.00	.00	95.00	1287.9	.00367
2	1289.4	98.2	130.0	.00	.00	.00	130.00	1288.5	.00105
3	1290.3	171.9	160.0	.00	.00	.00	160.00	1288.5	.00025
4	1290.6	195.6	170.0	.00	.00	.00	170.00	1288.6	.00018
5	1291.3	254.2	200.0	.00	.00	.00	200.00	1288.6	.00011

SEGMENT TABLE FOR SECTION 22.1

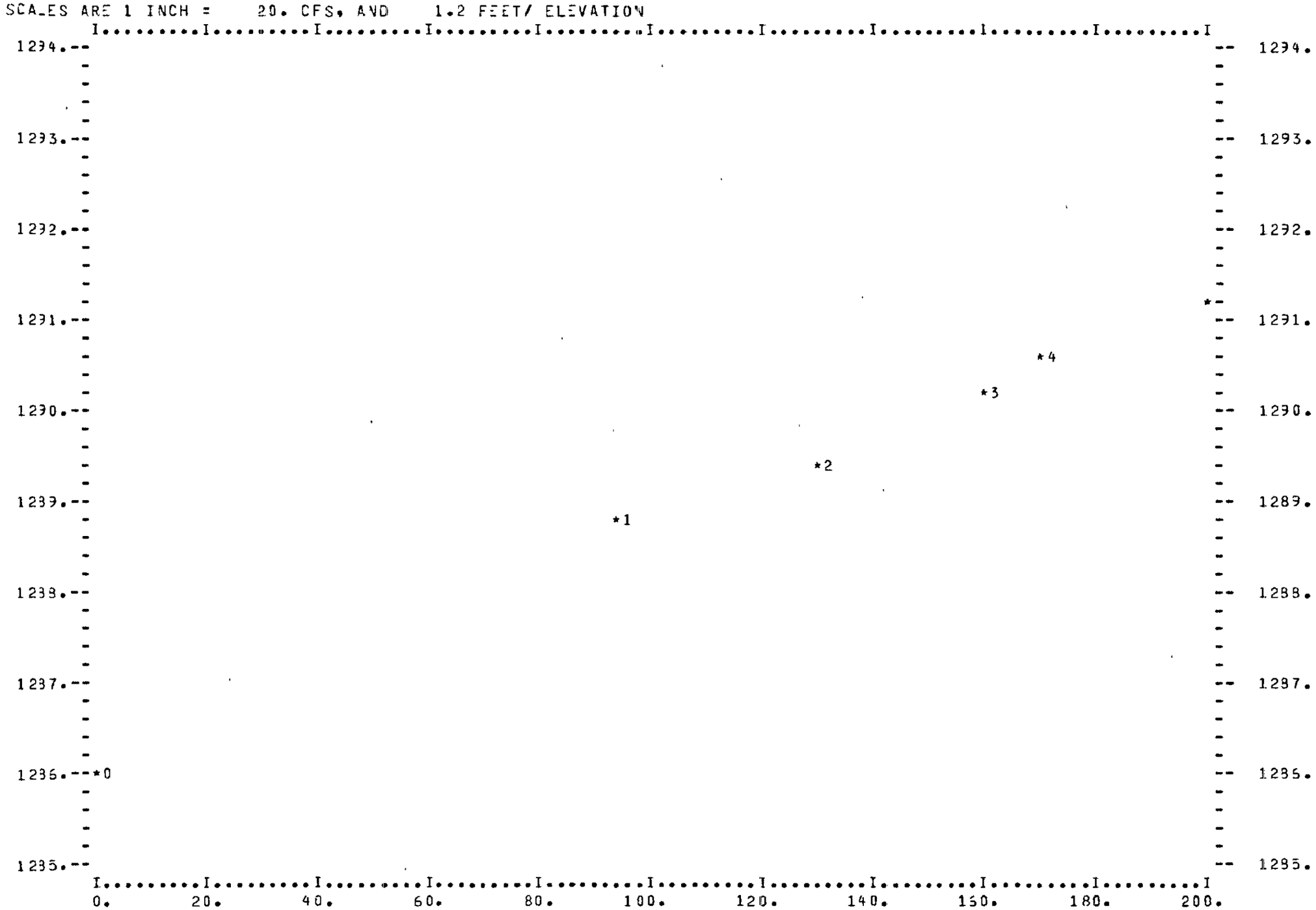
CSM		TOTAL	SEG NO 1 V	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	0.	95.	0.
95.	VELOCITY FPS	1.90	.00	1.75	.00
2	DISCHARGE CFS	130.	0.	130.	0.
130.	VELOCITY FPS	1.37	.00	1.32	.00
3	DISCHARGE CFS	160.	0.	160.	0.
160.	VELOCITY FPS	.93	.00	.93	.00
4	DISCHARGE CFS	170.	0.	170.	0.
170.	VELOCITY FPS	.88	.00	.87	.00
5	DISCHARGE CFS	200.	0.	200.	0.
200.	VELOCITY FPS	.79	.00	.79	.00
1	ELEV 1288.8 KD	1569.	1.	1567.	1.
2	ELEV 1289.4 KD	4012.	1.	4010.	1.
3	ELEV 1290.3 KD	10208.	1.	10206.	1.
4	ELEV 1290.6 KD	12515.	1.	12513.	1.
5	ELEV 1291.3 KD	18977.	1.	18975.	1.

KO TABLE FOR CROSS SECTION 22.1

ELEVATION	AREA	KO	KO BY SEGMENT		
1286.00	0.				
1286.	0.	0.	1.	0.	1.
1287.	5.	113.	1.	112.	1.
1288.	15.	661.	1.	659.	1.
1289.	69.	2343.	1.	2341.	1.
1290.	149.	8035.	1.	8033.	1.
1291.	232.	16399.	1.	16397.	1.
1292.	319.	27084.	1.	27077.	4.
1293.	434.	40537.	5.	40299.	145.
1294.	617.	57684.	253.	56091.	1340.
1295.	975.	78365.	984.	73898.	3483.
1296.	1626.	111962.	2512.	93615.	15834.
1297.	2330.	153825.	4155.	115155.	34514.
1298.	3199.	208499.	11525.	138442.	58529.
1299.	4095.	264789.	17736.	162120.	78254.
1300.	4993.	330371.	26435.	187637.	102398.
1301.	5890.	405947.	39330.	214991.	131527.

CROSS SECTION 22.1

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION



*****SECT.22.6 KQ VALUES REVERSED ON SEGMENT 2 AT ELEVATION 1287.90 VALUE CHANGED TO EQUAL PREVIOUS VALUE*****

RATING TABLE FOR SECTION 22.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1285.5	0.0	0.0						
1	1289.0	110.1	95.0	.00	.00	.00	95.00	1287.4	.00037
2	1289.5	150.1	130.0	.00	.00	.00	130.00	1288.0	.00025
3	1290.3	218.6	160.0	.00	.00	.00	160.00	1288.0	.00011
4	1290.6	241.9	170.0	.00	.00	.00	170.00	1288.1	.00009
5	1291.3	300.9	200.0	.00	.00	.00	200.00	1288.1	.00007

SEGMENT TABLE FOR SECTION 22.6

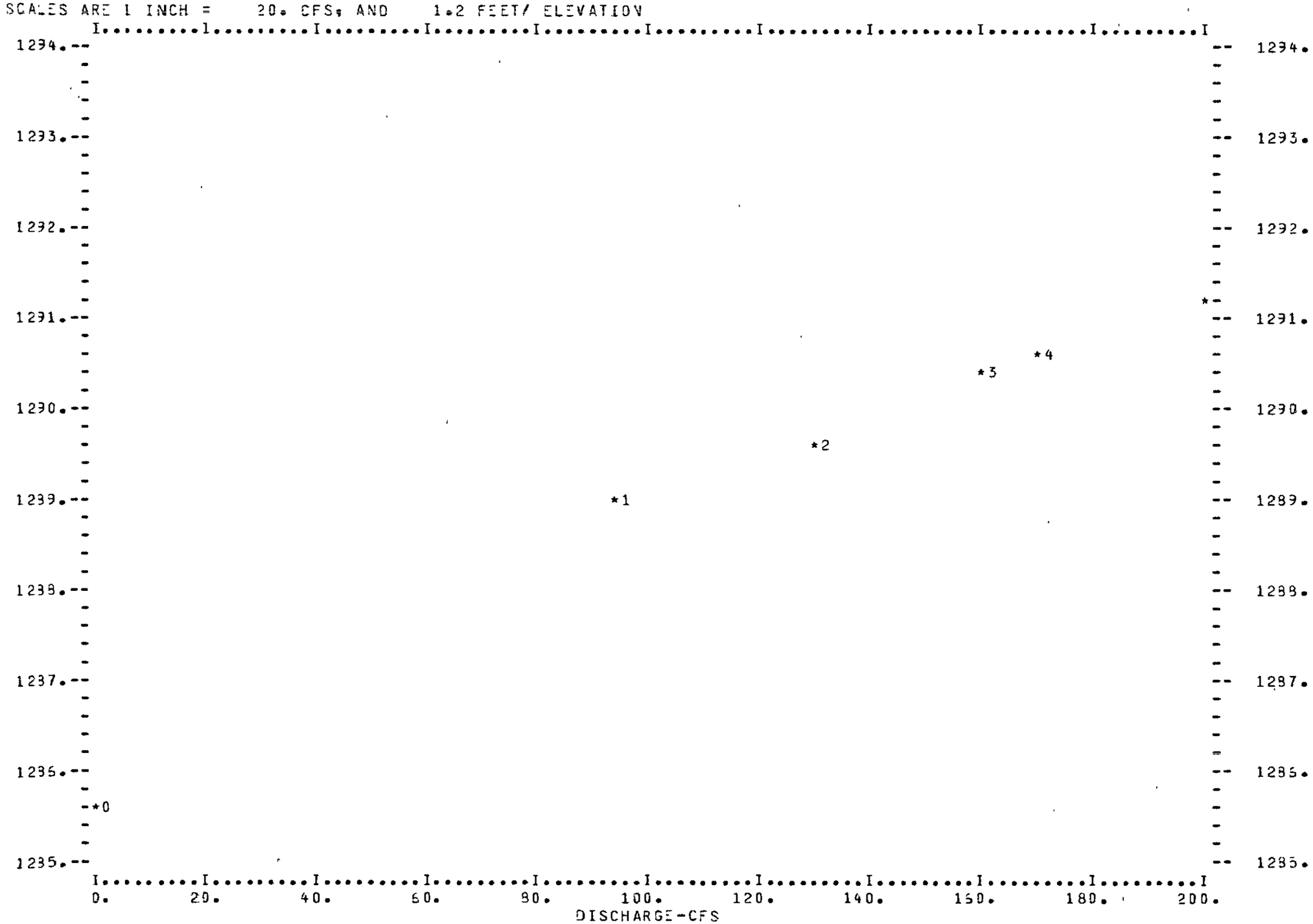
CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	0.	95.	0.
95.	VELOCITY FPS	.88	.00	.86	.00
2	DISCHARGE CFS	130.	0.	130.	0.
130.	VELOCITY FPS	.88	.00	.87	.00
3	DISCHARGE CFS	160.	0.	160.	0.
160.	VELOCITY FPS	.73	.00	.73	.00
4	DISCHARGE CFS	170.	0.	170.	0.
170.	VELOCITY FPS	.71	.00	.70	.00
5	DISCHARGE CFS	200.	0.	200.	0.
200.	VELOCITY FPS	.67	.00	.67	.04
1	ELEV 1289.0 KD	4920.	1.	4918.	1.
2	ELEV 1289.5 KD	8145.	1.	8143.	1.
3	ELEV 1290.3 KD	15013.	1.	15011.	1.
4	ELEV 1290.6 KD	17541.	1.	17539.	1.
5	ELEV 1291.3 KD	24770.	1.	24767.	2.

KD TABLE FOR CROSS SECTION 22.6

ELEVATION	AREA	KD	KD BY SEGMENT		
1285.50	0.				
1286.	1.	20.	1.	17.	1.
1287.	10.	332.	1.	330.	1.
1288.	33.	835.	1.	833.	1.
1289.	109.	4802.	1.	4800.	1.
1290.	190.	11925.	1.	11923.	1.
1291.	274.	21467.	1.	21465.	1.
1292.	369.	33419.	1.	33373.	18.
1293.	519.	48628.	31.	47863.	573.
1294.	796.	67600.	520.	64643.	2238.
1295.	1301.	94338.	1525.	83433.	7741.
1296.	1978.	132328.	3320.	104084.	24109.
1297.	2764.	180831.	7150.	126515.	46188.
1298.	3648.	237352.	14671.	150050.	69349.
1299.	4545.	298923.	22206.	174648.	91690.
1300.	5442.	370310.	32528.	201084.	118831.
1301.	6339.	452236.	46727.	229354.	151365.

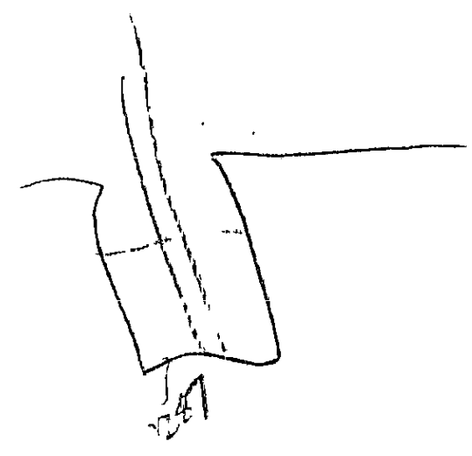
CROSS SECTION 22.5

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION



```
-------------------------------80/80 LIST OF INPUT DATA-------------------------------
TITLE      DISCHARGE FROM ANN ARBOR R.R. TO LAKE CADILLAC                    503B
CHANGE     DISCHARGE                                                         503C
DISCHARGE  -1.       90.       115.      130.      140.      155.            503D
END                                                                          503E
REACH      22.9      1.        375.      375.                                504
REACH2     23.6      -.4                                                     505
ROAD       23.0      2.7       50.       50.                                 506
BPR        23.0      A         3.                                            507
GIRDER     1291.6    1291.0    16.       .8        2.7                       508
           -10.5     1293.     -10.5     1291.0    10.5      1291.0          509
           10.5      1293.                                                   510
ENDTABLE                                                                     511
SECTION    23.0                                                              512
           -380.     1299.     -380.     1294.     -195.     1293.           513
           -10.5     1293.     -10.5     1287.1    0.        1287.5          514
           10.5      1287.8    10.5      1293.     350.      1294.           515
ENDTABLE                                                                     516
REACH      23.1      1.        50.       50.                                 517
REACH2     23.6      .9                                                      518
REACH      23.6      1.        415.      415.                                519
SEGMENT    23.6      1         N         -40.                                520
NVALUE     .035                                                              521
SEGMENT    23.6      2         C         43.                                 522
NVALUE     .04                                                               523
SEGMENT    23.6      3         N         180.                                524
NVALUE     .07                                                               525
SECTION    23.6                                                              526
           -470.     1294.     -105.     1293.     -40.      1292.4          527
           -35.      1291.8    -30.      1290.6    -21.      1287.8          528
           -15.      1286.7    -10.      1285.2    -5.       1285.9          529
           0.        1286.3    5.        1286.4    10.       1287.1          530
           14.       1287.8    20.       1290.4    25.       1291.4          531
           43.       1292.1    112.0     1292.5    180.      1294.0          532
ENDTABLE                                                                     533
REACH      23.65     1.        5.0       5.0                                 534
SEGMENT    23.65     1         N         -10.0     1292.0                    535
NVALUE     .07                                                               536
SEGMENT    23.65     2         C         10.0      1292.0                    537
NVALUE     .04                                                               538
SEGMENT    23.65     3         N         170.0     1294.0                    539
NVALUE     .07                                                               540
SECTION    23.65                                                             541
           -470.0    1294.0    -35.0     1292.0    -10.0     1292.0          542
           -10.0     1287.0    10.0      1287.0    10.0      1292.0          543
           50.0      1292.0    170.0     1294.0                              544
```

control



```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
ENDTABLE                                                                        545
REACH     23.7      1.        25.       25.                                     546
SEGMENT   23.7      1         N         -35.                                    547
NVALUE    .07                                                                   548
SEGMENT   23.7      2         C         65.                                     549
NVALUE    .04                                                                   550
SEGMENT   23.7      3         N         155.                                    551
NVALUE    .07                                                                   552
SECTION   23.7                                                                  553
          -480.     1299.     -480.     1294.     -45.      1293.               554
          -35.      1293.     -25.      1292.     -19.      1289.7              555
          -18.      1288.9    -10.      1288.3    -5.       1286.8              556
          0.        1285.2    5.        1285.8    10.       1285.2              557
          15.       1286.8    20.       1287.5    28.       1288.9              558
          29.       1289.7    35.       1291.2    50.       1291.8              559
          65.       1292.5    155.      1294.     155.      1299.               560
ENDTABLE                                                                        561
REACH     23.9      1.        210.      210.                                    562
REACH2    23.7      1.5                                                         563
ROAD      24.       2.7       50.       50.                                     564
CULV1     24.       1.        33122                                             565
CULV2     4.4       10.       74.       1288.2    1286.9    .032                566
CULV1     24.       1.        33122                                             567
CULV2     4.9       10.       74.       1287.5    1286.8    .032                568
SECTION   24.                                                                   569
          -400.     1295.     -400.     1292.     -320.     1291.8              570
          -230.     1292.     -110.     1293.     0.        1293.7              571
          350.      1292.5    350.      1295.                                   572
ENDTABLE                                                                        573
REACH     24.1      1.        50.       50.                                     574
REACH2    23.7      1.6                                                         575
COMPUTE   22.9      24.1      22.6                                              576
-----------------------------END OF 80/80 LIST------------------------------
```

COMPUTE 22.9 24.1 22.6 575

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 22.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1285.5	0.0	0.0						
1	1289.1	107.9	90.0	.00	.00	.00	90.00	1286.7	.00016
2	1289.6	130.5	115.0	.00	.00	.00	115.00	1286.8	.00015
3	1290.4	170.6	130.0	.00	.00	.00	130.00	1286.9	.00009
4	1290.7	185.8	140.0	.00	.00	.00	140.00	1286.9	.00009
5	1291.3	228.6	155.0	.00	.00	.00	155.00	1287.0	.00007

SEGMENT TABLE FOR SECTION 22.9

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	0.	90.	0.
90.	VELOCITY FPS	.83	.00	.83	.00
2	DISCHARGE CFS	115.	0.	115.	0.
115.	VELOCITY FPS	.88	.00	.88	.00
3	DISCHARGE CFS	130.	0.	130.	0.
130.	VELOCITY FPS	.76	.00	.76	.00
4	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	.76	.00	.75	.00
5	DISCHARGE CFS	155.	0.	155.	0.
155.	VELOCITY FPS	.68	.00	.68	.04
1	ELEV 1289.1 KD	7169.	1.	7167.	1.
2	ELEV 1289.6 KD	9420.	1.	9418.	1.
3	ELEV 1290.4 KD	13578.	1.	13576.	1.
4	ELEV 1290.7 KD	14995.	1.	14993.	1.
5	ELEV 1291.3 KD	18673.	1.	18669.	2.

KD TABLE FOR CROSS SECTION 22.9

ELEVATION	AREA	KD	KD BY SEGMENT		
1285.50	0.				
1286.	4.	57.	1.	55.	1.
1287.	28.	982.	1.	980.	1.
1288.	63.	3247.	1.	3245.	1.
1289.	104.	6815.	1.	6814.	1.
1290.	151.	11557.	1.	11555.	1.
1291.	205.	16894.	1.	16892.	1.
1292.	293.	23098.	2.	22969.	27.
1293.	561.	38044.	500.	35297.	1669.
1294.	1108.	63432.	5887.	49820.	6192.
1295.	1756.	97202.	17342.	65427.	12598.
1296.	2405.	134127.	27530.	81849.	18627.
1297.	3055.	179732.	41900.	100325.	26576.
1298.	3706.	235033.	61577.	120905.	36810.

CROSS SECTION 22.9

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION

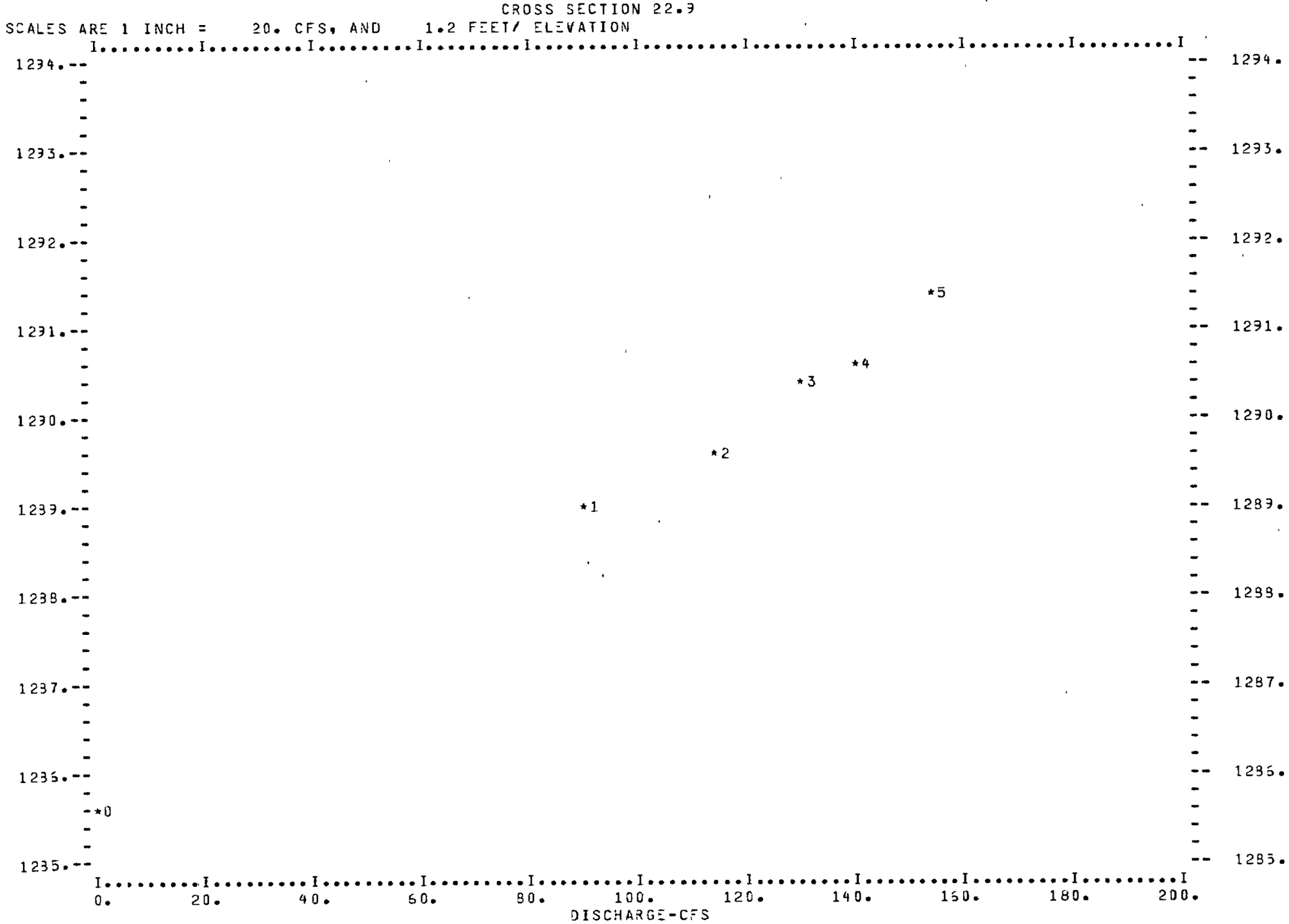


TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.1207	.1254	.0000	.0000	.0000	-.0047	.9096	1.0000	1.0000	33.6576	47.0120	46.2793
DCRIT	1288.29	KBCRIT=									
.2415	.2505	.0000	.0000	.0000	-.0089	.8436	1.0000	1.0000	42.8634	64.0557	63.2677
DCRIT	1288.44	KBCRIT=									
.3865	.4025	.0000	.0000	.0000	-.0160	.7772	1.0000	1.0000	58.7293	96.0448	95.1906
DCRIT	1288.53	KBCRIT=									
.4140	.4316	.0000	.0000	.0000	-.0175	.7656	1.0000	1.0000	64.1837	107.5906	106.7365
DCRIT	1288.59	KBCRIT=									
.5087	.5318	.0000	.0000	.0000	-.0232	.7279	1.0000	1.0000	71.1577	139.5137	137.5319
DCRIT	1288.66	KBCRIT=									

ROAD SECTION 23.0

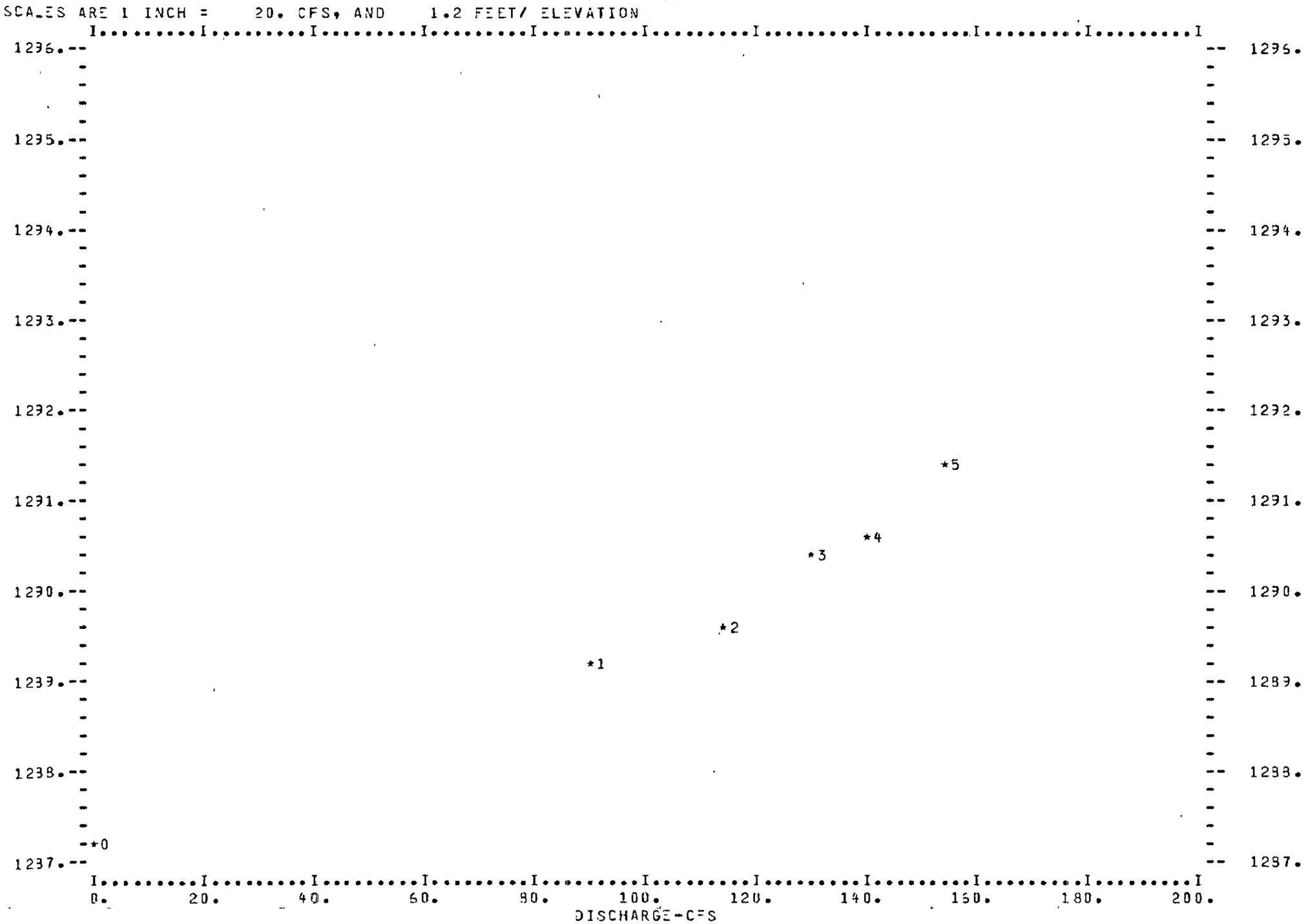
NO.	HW	CFS	HL	TW	CSM
0	1287.10	0.00	0.00	0.00	0.00
1	1289.14	90.00	.00	1289.14	90.00
2	1289.50	115.00	.00	1289.50	115.00
3	1290.38	130.00	.00	1290.38	130.00
4	1290.65	140.00	.00	1290.65	140.00
5	1291.34	155.00	.02	1291.32	155.00

MIN ROAD ELEVATION 1293.00

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 1291.00 OPENING NO.= 1

ROAD SECTION 23.0

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 23.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1286.8	0.0	0.0						
1	1289.2	60.0	90.0	.00	.00	.00	90.00	1288.0	.00090
2	1289.7	77.2	115.0	.00	.00	.00	115.00	1288.1	.00070
3	1290.4	109.0	130.0	.00	.00	.00	130.00	1288.2	.00032
4	1290.7	121.3	140.0	.00	.00	.00	140.00	1288.2	.00027
5	1291.4	154.0	155.0	.00	.00	.00	155.00	1288.3	.00017

SEGMENT TABLE FOR SECTION 23.1

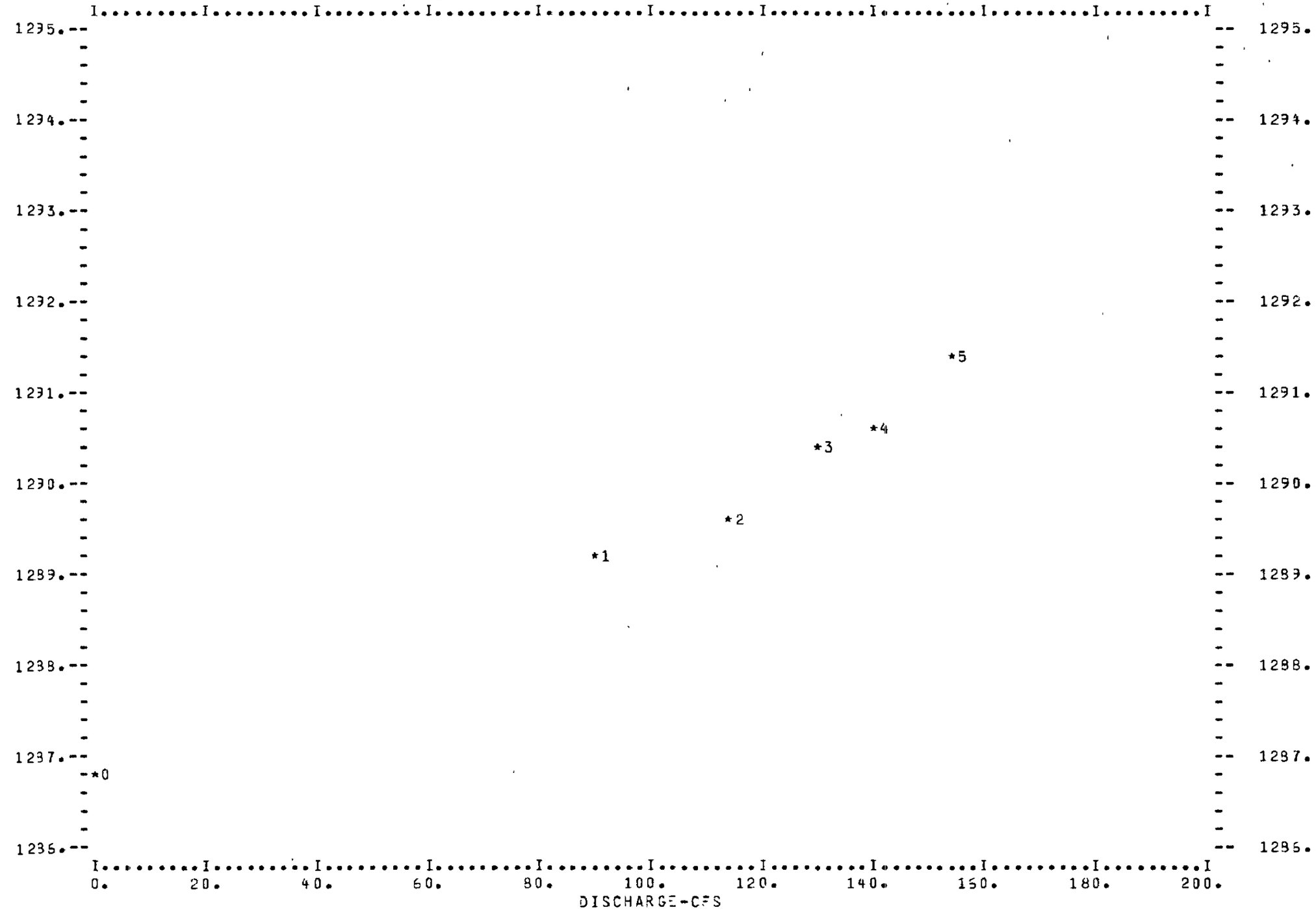
CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	0.	90.	0.
90.	VELOCITY FPS	1.50	.00	1.50	.00
2	DISCHARGE CFS	115.	0.	115.	0.
115.	VELOCITY FPS	1.50	.00	1.49	.00
3	DISCHARGE CFS	130.	0.	130.	0.
130.	VELOCITY FPS	1.19	.00	1.19	.00
4	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	1.16	.00	1.15	.00
5	DISCHARGE CFS	155.	0.	155.	0.
155.	VELOCITY FPS	1.01	.00	1.01	.00
1	ELEV 1289.2 KD	3004.	1.	3002.	1.
2	ELEV 1289.7 KD	4358.	1.	4356.	1.
3	ELEV 1290.4 KD	7276.	1.	7274.	1.
4	ELEV 1290.7 KD	8466.	1.	8464.	1.
5	ELEV 1291.4 KD	11855.	1.	11853.	1.

KD TABLE FOR CROSS SECTION 23.1

ELEVATION	AREA	KD	KD BY SEGMENT		
1286.80	0.				
1287.	1.	7.	1.	5.	1.
1288.	19.	577.	1.	575.	1.
1289.	52.	2414.	1.	2412.	1.
1290.	92.	5615.	1.	5613.	1.
1291.	136.	10050.	1.	10048.	1.
1292.	189.	15247.	1.	15245.	1.
1293.	258.	20765.	1.	20753.	8.
1294.	428.	32623.	184.	31421.	1018.
1295.	913.	54110.	3492.	45294.	4524.
1296.	1562.	87668.	14954.	60894.	11114.
1297.	2212.	122184.	24081.	75709.	16632.
1298.	2862.	155079.	37086.	94565.	23969.
1299.	3512.	217364.	53043.	114508.	33477.

CROSS SECTION 23.1

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 23.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	CHANNEL	NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1285.9	0.0	0.0						
1	1289.3	101.0	90.0	.00	.00	.00	90.00	1287.1	.00019
2	1289.8	120.3	115.0	.00	.00	.00	115.00	1287.2	.00019
3	1290.5	154.7	130.0	.00	.00	.00	130.00	1287.3	.00012
4	1290.7	167.8	140.0	.00	.00	.00	140.00	1287.3	.00011
5	1291.4	205.3	155.0	.00	.00	.00	155.00	1287.4	.00008

SEGMENT TABLE FOR SECTION 23.6

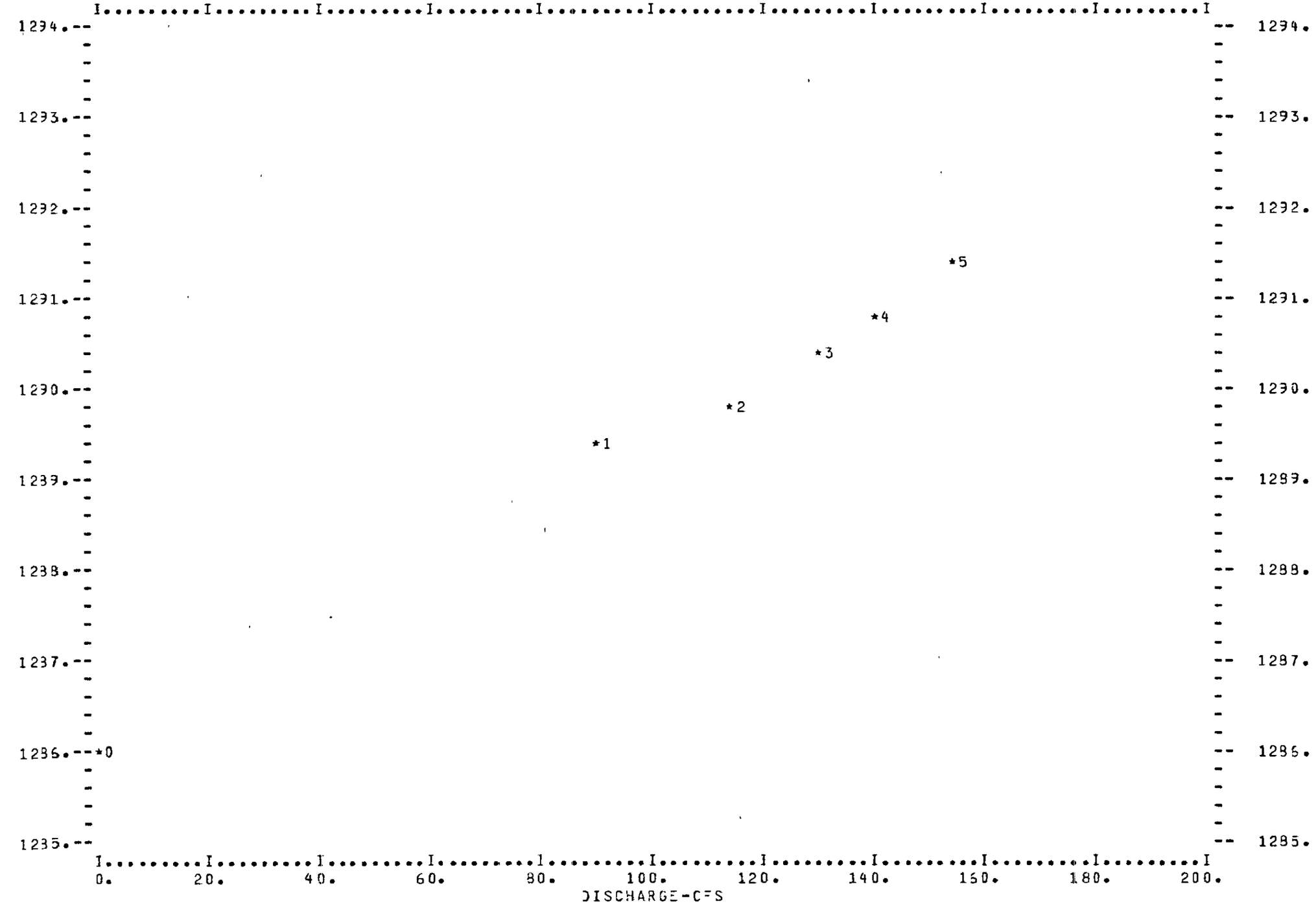
CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	90.	0.	90.	0.
90.	VELOCITY FPS	.89	.00	.89	.00
2	DISCHARGE CFS	115.	0.	115.	0.
115.	VELOCITY FPS	.96	.00	.96	.00
3	DISCHARGE CFS	130.	0.	130.	0.
130.	VELOCITY FPS	.84	.00	.84	.00
4	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	.83	.00	.83	.00
5	DISCHARGE CFS	155.	0.	155.	0.
155.	VELOCITY FPS	.76	.00	.75	.00
1	ELEV 1289.3 KD	6486.	1.	6484.	1.
2	ELEV 1289.8 KD	8368.	1.	8366.	1.
3	ELEV 1290.5 KD	11925.	1.	11923.	1.
4	ELEV 1290.7 KD	13331.	1.	13329.	1.
5	ELEV 1291.4 KD	16892.	1.	16890.	1.

KD TABLE FOR CROSS SECTION 23.6

ELEVATION	AREA	KD	KD BY SEGMENT		
1285.90	0.				
1286.	0.	4.	1.	3.	1.
1287.	17.	462.	1.	460.	1.
1288.	48.	2163.	1.	2161.	1.
1289.	87.	5243.	1.	5241.	1.
1290.	132.	9549.	1.	9547.	1.
1291.	183.	14715.	1.	14713.	1.
1292.	250.	20198.	1.	20187.	5.
1293.	408.	31118.	99.	30104.	621.
1294.	848.	51250.	2921.	43844.	4065.
1295.	1497.	84639.	14218.	59423.	10649.
1296.	2147.	118371.	23010.	75036.	16004.
1297.	2797.	150384.	35582.	92685.	23143.
1298.	3447.	211684.	52991.	112419.	32418.

CROSS SECTION 23.6

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 23.65 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1287.0	0.0	0.0						
1	1289.3	45.6	90.0	.00	.00	.00	90.00	1287.9	.00123
2	1289.7	54.1	115.0	.00	.00	.00	115.00	1288.0	.00119
3	1290.4	68.6	130.0	.00	.00	.00	130.00	1288.1	.00074
4	1290.7	73.8	140.0	.00	.00	.00	140.00	1288.1	.00069
5	1291.4	87.3	155.0	.00	.00	.00	155.00	1288.2	.00052

SEGMENT TABLE FOR SECTION 23.65

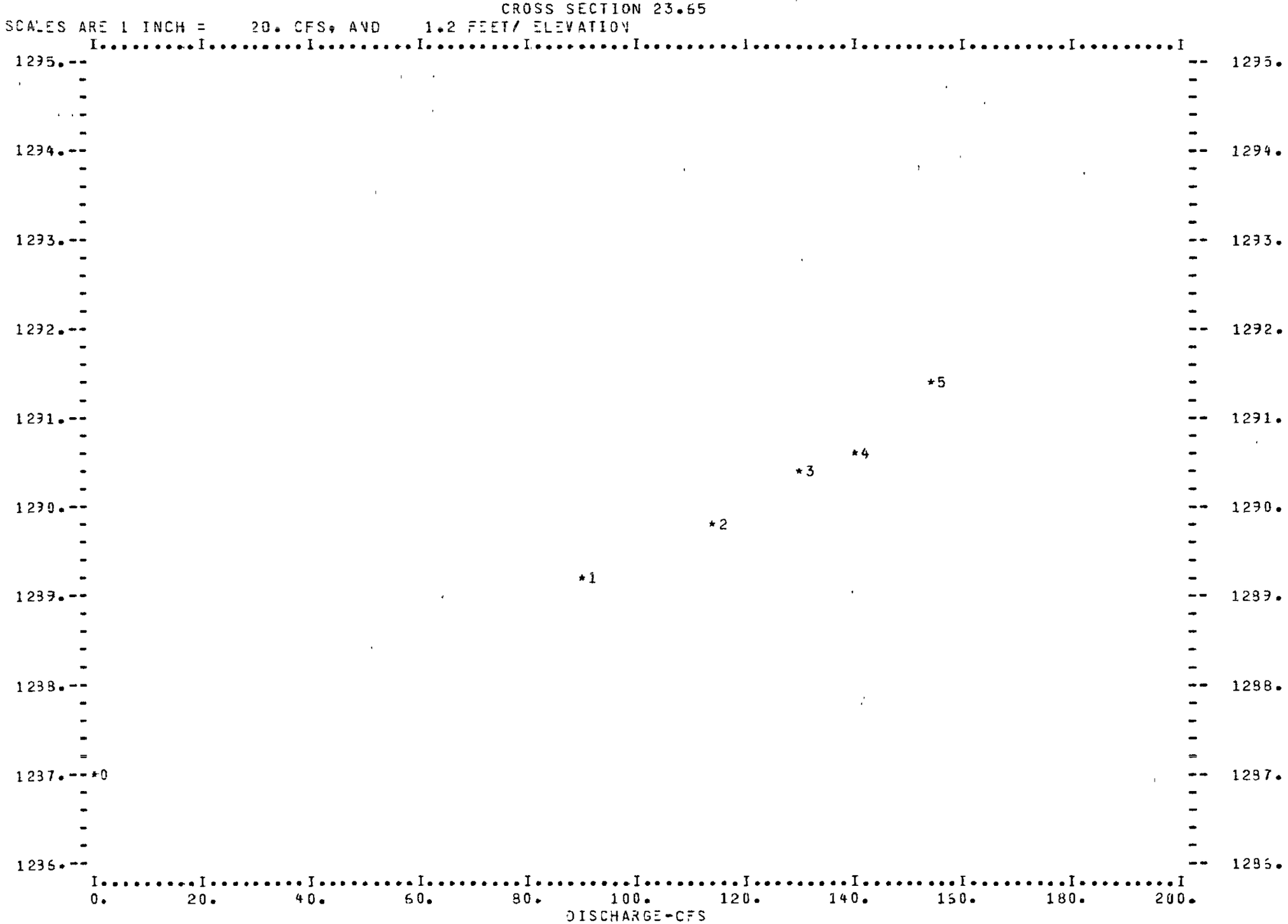
CSM		TOTAL	SEG NO 1 V	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	0.	90.	0.
90.	VELOCITY FPS	1.97	.00	1.97	.00
2	DISCHARGE CFS	115.	0.	115.	0.
115.	VELOCITY FPS	2.13	.00	2.13	.00
3	DISCHARGE CFS	130.	0.	130.	0.
130.	VELOCITY FPS	1.90	.00	1.89	.00
4	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	1.90	.00	1.90	.00
5	DISCHARGE CFS	155.	0.	155.	0.
155.	VELOCITY FPS	1.78	.00	1.78	.00
1	ELEV 1289.3 KD	2561.	1.	2559.	1.
2	ELEV 1289.7 KD	3327.	1.	3325.	1.
3	ELEV 1290.4 KD	4764.	1.	4762.	1.
4	ELEV 1290.7 KD	5315.	1.	5313.	1.
5	ELEV 1291.4 KD	6802.	1.	6800.	1.

KD TABLE FOR CROSS SECTION 23.65

ELEVATION	AREA	KD	KD BY SEGMENT		
1287.00	0.				
1288.	20.	699.	1.	695.	1.
1289.	40.	2091.	1.	2089.	1.
1290.	60.	3896.	1.	3894.	1.
1291.	80.	5986.	1.	5984.	1.
1292.	122.	8564.	5.	8348.	5.
1293.	346.	14681.	1629.	11239.	1036.
1294.	837.	30825.	10731.	14532.	4961.
1295.	1465.	52182.	22184.	18155.	9537.
1296.	2105.	79572.	36409.	22093.	15150.
1297.	2745.	116059.	56713.	26335.	22920.
1298.	3385.	163290.	84582.	30870.	33332.

CROSS SECTION 23.65

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 23.7 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1285.8	0.0	0.0						
1	1289.3	96.7	90.0	.00	.00	.00	90.00	1287.1	.00025
2	1289.8	117.5	115.0	.00	.00	.00	115.00	1287.3	.00022
3	1290.5	153.9	130.0	.00	.00	.00	130.00	1287.4	.00013
4	1290.7	168.3	140.0	.00	.00	.00	140.00	1287.4	.00012
5	1291.4	207.0	155.0	.00	.00	.00	155.00	1287.5	.00009

SEGMENT TABLE FOR SECTION 23.7

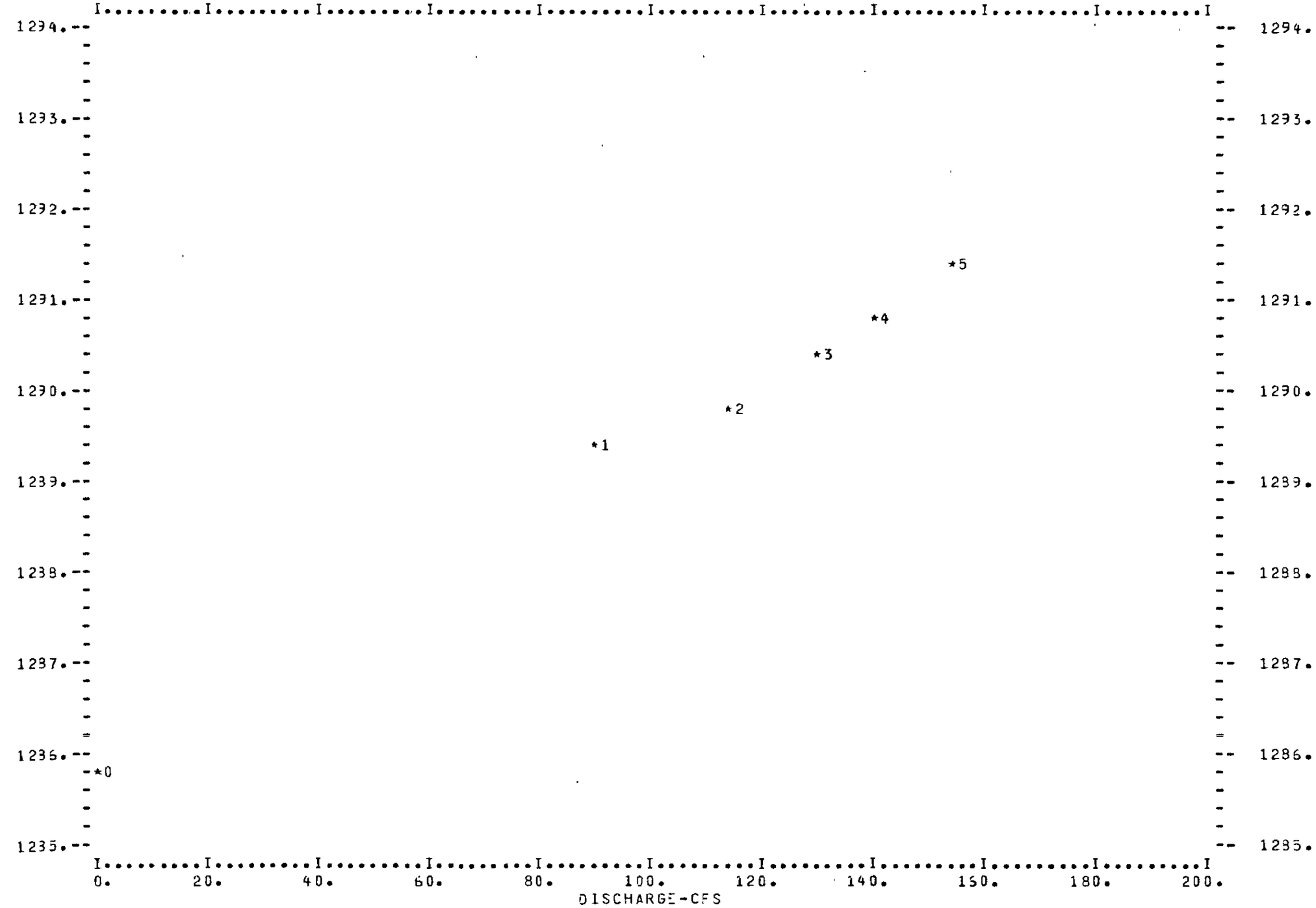
CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	0.	90.	0.
90.	VELOCITY FPS	.93	.00	.93	.00
2	DISCHARGE CFS	115.	0.	115.	0.
115.	VELOCITY FPS	.98	.00	.98	.00
3	DISCHARGE CFS	130.	0.	130.	0.
130.	VELOCITY FPS	.85	.00	.84	.00
4	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	.83	.00	.83	.00
5	DISCHARGE CFS	155.	0.	155.	0.
155.	VELOCITY FPS	.75	.00	.75	.00
1	ELEV 1289.3 KD	5736.	1.	5734.	1.
2	ELEV 1289.8 KD	7669.	1.	7667.	1.
3	ELEV 1290.5 KD	11330.	1.	11328.	1.
4	ELEV 1290.7 KD	12746.	1.	12744.	1.
5	ELEV 1291.4 KD	16514.	1.	16512.	1.

KD TABLE FOR CROSS SECTION 23.7

ELEVATION	AREA	KD	KD BY SEGMENT		
1285.80	0.				
1286.	1.	6.	1.	4.	1.
1287.	15.	441.	1.	439.	1.
1288.	43.	1889.	1.	1887.	1.
1289.	81.	4387.	1.	4385.	1.
1290.	129.	8841.	1.	8839.	1.
1291.	183.	14164.	1.	14162.	1.
1292.	251.	19686.	1.	19684.	1.
1293.	350.	28587.	1.	28522.	63.
1294.	745.	48541.	2711.	43614.	1126.
1295.	1372.	84646.	18046.	61346.	4681.
1296.	2007.	134873.	43110.	81401.	10051.
1297.	2642.	196480.	75303.	103654.	16828.
1298.	3277.	258138.	115186.	127985.	24820.
1299.	3912.	349772.	161326.	154419.	34027.
1300.	4547.	438987.	212203.	182622.	44050.
1301.	5182.	527497.	261522.	211370.	53664.
1302.	5817.	622241.	314744.	241780.	63989.
1303.	6452.	726773.	374482.	274347.	75271.
1304.	7087.	841446.	441202.	309084.	87362.

CROSS SECTION 23.7

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 23.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1287.3	0.0	0.0						
1	1289.6	46.1	90.0	.00	.00	.00	90.00	1288.6	.00180
2	1290.0	61.9	115.0	.00	.00	.00	115.00	1288.8	.00142
3	1290.6	86.6	130.0	.00	.00	.00	130.00	1289.9	.00073
4	1290.8	97.3	140.0	.00	.00	.00	140.00	1288.9	.00058
5	1291.5	127.0	155.0	.00	.00	.00	155.00	1289.0	.00032

SEGMENT TABLE FOR SECTION 23.9

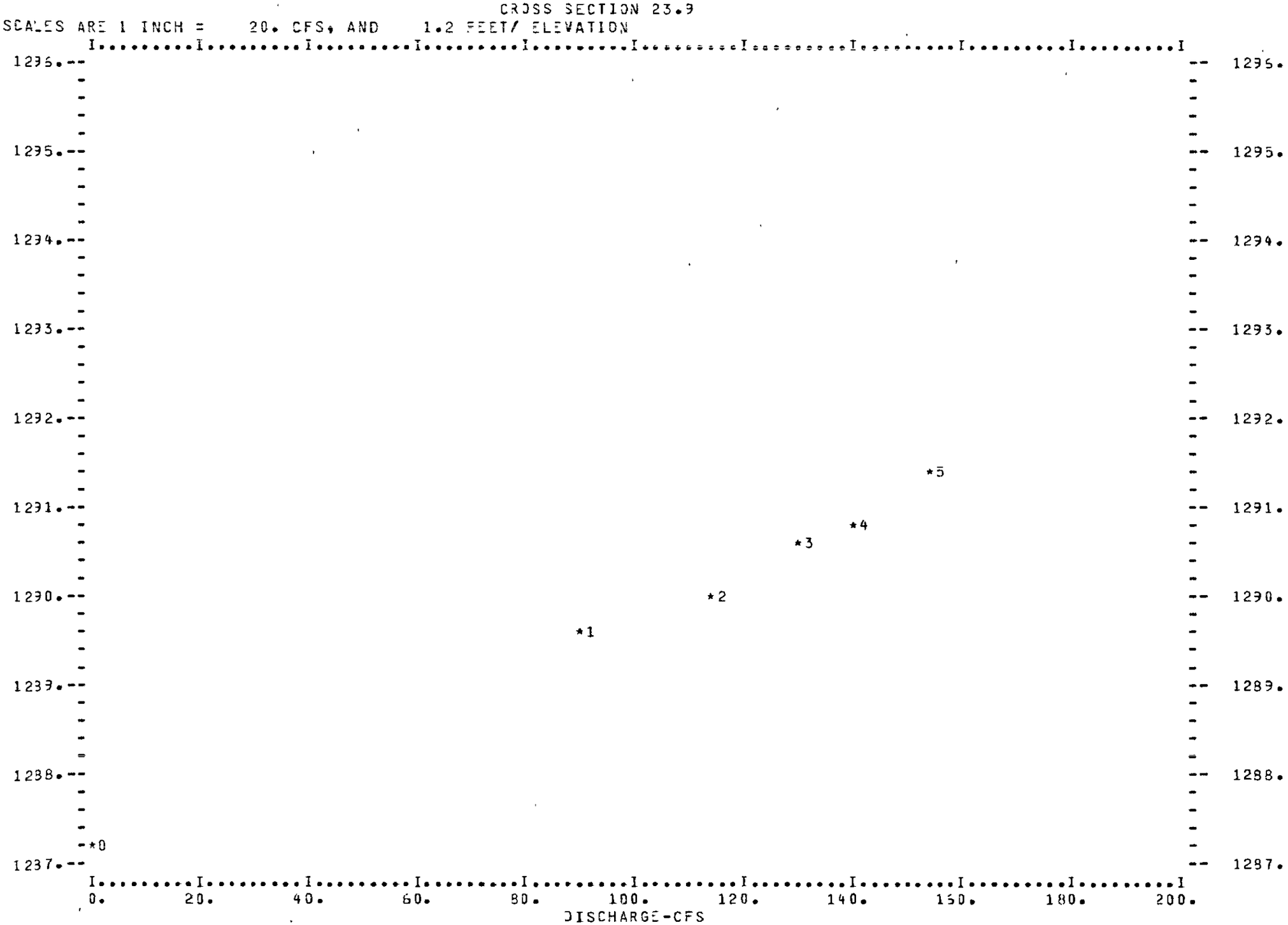
CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	0.	90.	0.
90.	VELOCITY FPS	1.96	.00	1.95	.00
2	DISCHARGE CFS	115.	0.	115.	0.
115.	VELOCITY FPS	1.87	.00	1.86	.00
3	DISCHARGE CFS	130.	0.	130.	0.
130.	VELOCITY FPS	1.52	.00	1.50	.00
4	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	1.44	.00	1.44	.00
5	DISCHARGE CFS	155.	0.	155.	0.
155.	VELOCITY FPS	1.22	.00	1.22	.00
1	ELEV 1289.6 KD	2121.	1.	2119.	1.
2	ELEV 1290.0 KD	3046.	1.	3044.	1.
3	ELEV 1290.6 KD	4825.	1.	4823.	1.
4	ELEV 1290.8 KD	5792.	1.	5790.	1.
5	ELEV 1291.5 KD	8644.	1.	8642.	1.

KD TABLE FOR CROSS SECTION 23.9

ELEVATION	AREA	KD	KD BY SEGMENT		
1287.30	0.				
1288.	6.	114.	1.	112.	1.
1289.	28.	1026.	1.	1024.	1.
1290.	60.	2958.	1.	2956.	1.
1291.	105.	6459.	1.	6457.	1.
1292.	155.	11453.	1.	11451.	1.
1293.	214.	17004.	1.	17002.	1.
1294.	297.	23542.	1.	23520.	5.
1295.	518.	37095.	116.	35658.	320.
1296.	1057.	54813.	7985.	52120.	2498.
1297.	1690.	108055.	28987.	71044.	7077.
1298.	2325.	164113.	58205.	92221.	13210.
1299.	2960.	230928.	94471.	115538.	20639.
1300.	3595.	307051.	136771.	140842.	29152.
1301.	4230.	392663.	185488.	168187.	38807.
1302.	4865.	483684.	237427.	196970.	48969.
1303.	5500.	573669.	287380.	226307.	58635.
1304.	6135.	673263.	343764.	257793.	59432.
1305.	6770.	782822.	406947.	291444.	81412.

CROSS SECTION 23.9

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION



ROAD SECTION 24.

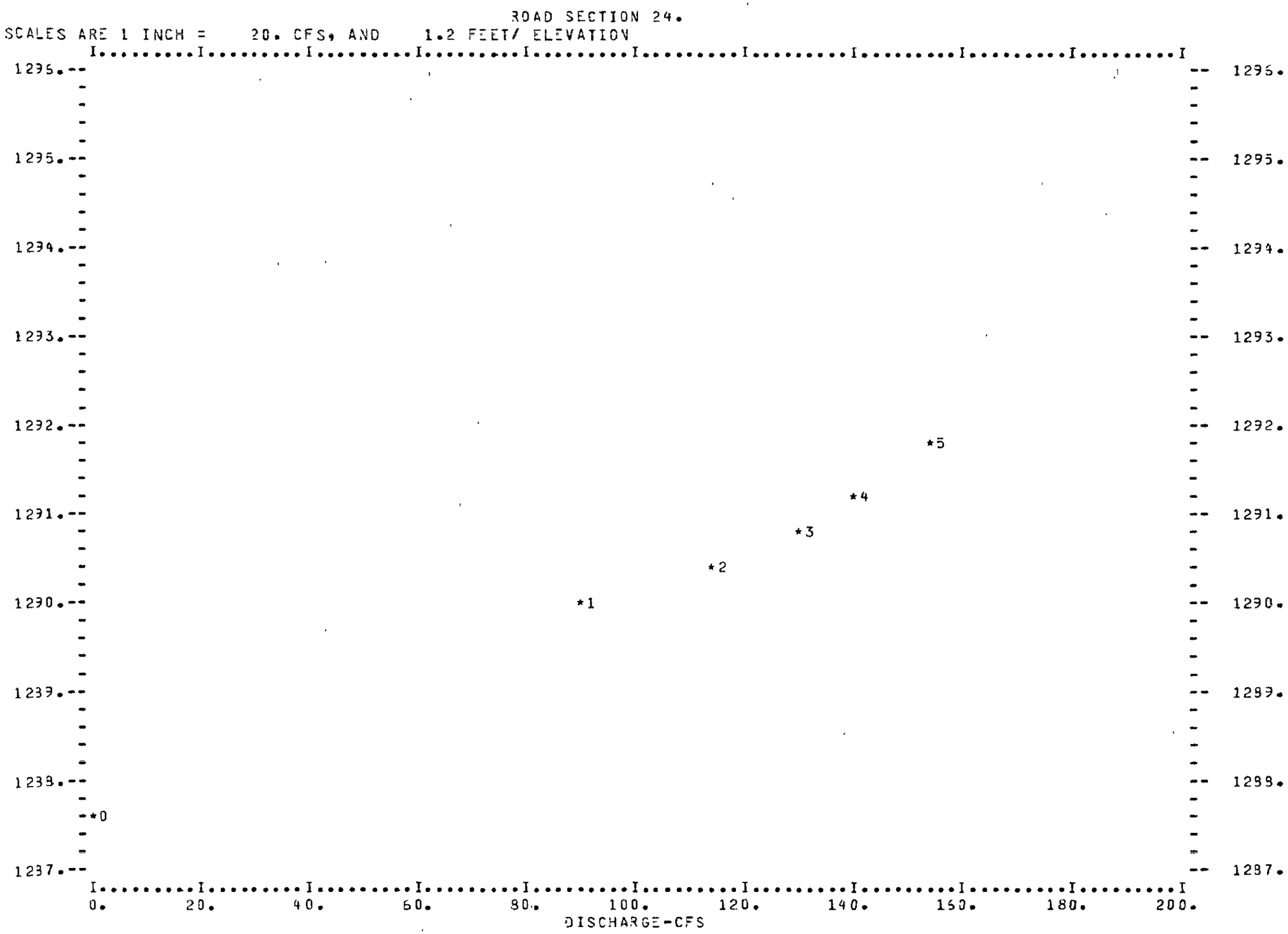
NO.	HW	CFS	HL	TW	CSM
0	1287.50	0.00	0.00	0.00	0.00
1	1290.08	90.00	.40	1289.68	90.00
2	1290.41	115.00	.32	1290.09	115.00
3	1290.89	130.00	.24	1290.65	130.00
4	1291.11	140.00	.24	1290.87	140.00
5	1291.72	155.00	.24	1291.48	155.00

MIN ROAD ELEVATION 1291.80

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	33122.	5.50	7.93	74.00	1288.20	1286.90	.032
2	1	33122.	5.78	8.15	74.00	1287.50	1286.80	.032

ROAD SECTION 24.

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 24.1 DAF 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	CHANNEL	NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1287.4	0.0	0.0						
1	1290.1	61.7	90.0	.00	.00	.00	90.00	1288.7	.00088
2	1290.5	75.1	115.0	.00	.00	.00	115.00	1288.9	.00086
3	1290.9	96.0	130.0	.00	.00	.00	130.00	1289.0	.00053
4	1291.1	106.5	140.0	.00	.00	.00	140.00	1289.0	.00045
5	1291.7	135.8	155.0	.00	.00	.00	155.00	1289.1	.00027

SEGMENT TABLE FOR SECTION 24.1

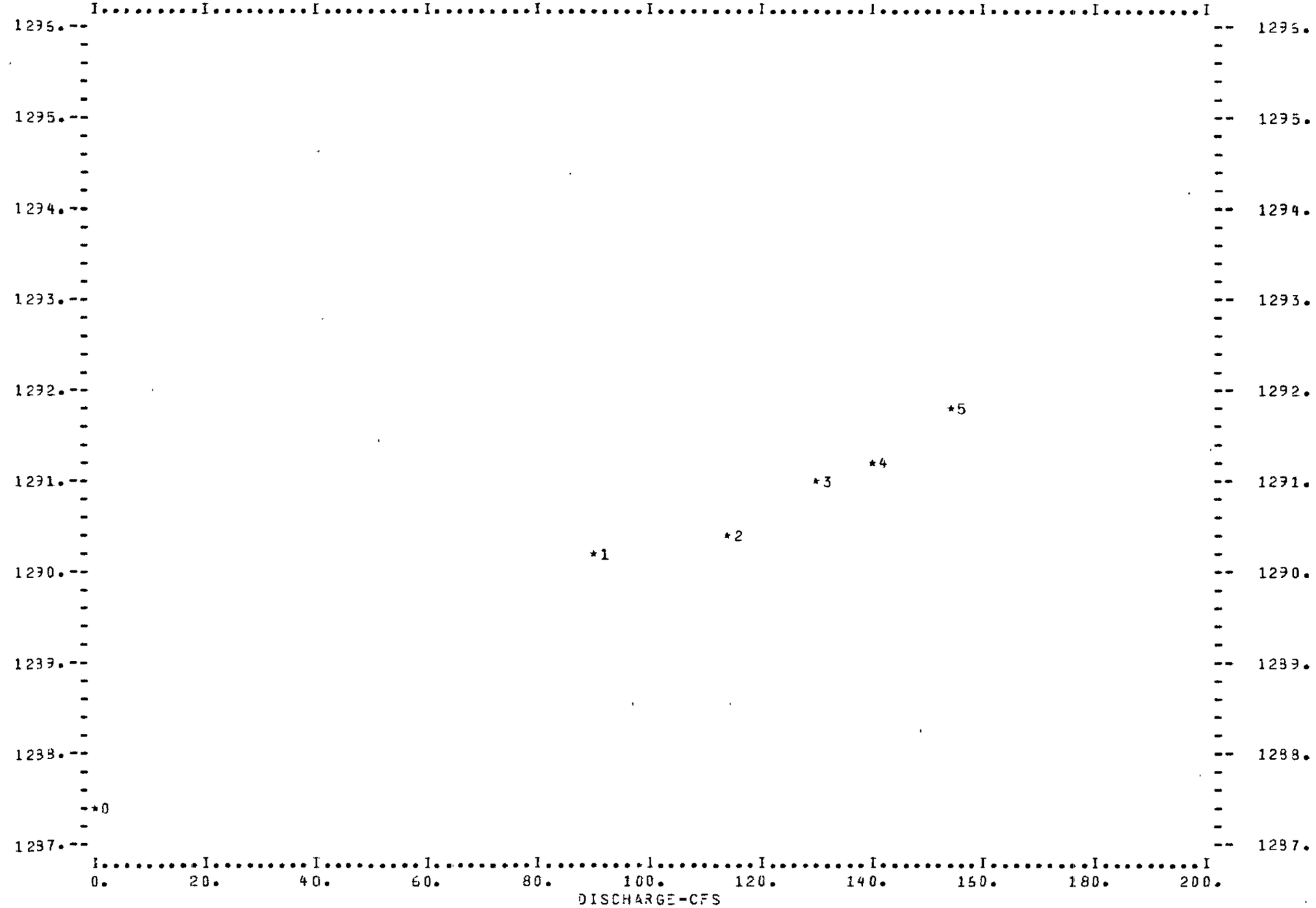
CSM		TOTAL	SEG NO 1 V	2 C	3 N
1	DISCHARGE CFS	90.	0.	90.	0.
90.	VELOCITY FPS	1.47	.00	1.46	.00
2	DISCHARGE CFS	115.	0.	115.	0.
115.	VELOCITY FPS	1.54	.00	1.53	.00
3	DISCHARGE CFS	130.	0.	130.	0.
130.	VELOCITY FPS	1.36	.00	1.35	.00
4	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	1.32	.00	1.31	.00
5	DISCHARGE CFS	155.	0.	155.	0.
155.	VELOCITY FPS	1.14	.00	1.14	.00
1	ELEV 1290.1 KD	3033.	1.	3031.	1.
2	ELEV 1290.5 KD	3910.	1.	3908.	1.
3	ELEV 1290.9 KD	5564.	1.	5662.	1.
4	ELEV 1291.1 KD	6524.	1.	6622.	1.
5	ELEV 1291.7 KD	9502.	1.	9500.	1.

KD TABLE FOR CROSS SECTION 24.1

ELEVATION	AREA	KD	KD BY SEGMENT		
1287.40	0.				
1288.	4.	78.	1.	76.	1.
1289.	25.	888.	1.	886.	1.
1290.	57.	2734.	1.	2732.	1.
1291.	100.	6035.	1.	6035.	1.
1292.	150.	10900.	1.	10898.	1.
1293.	207.	16488.	1.	16486.	1.
1294.	287.	22607.	1.	22592.	3.
1295.	485.	35260.	46.	34141.	234.
1296.	995.	61255.	6466.	50337.	2138.
1297.	1626.	103010.	26418.	69031.	6527.
1298.	2261.	157916.	54876.	89990.	12520.
1299.	2896.	223711.	90471.	113100.	19827.
1300.	3531.	298970.	132224.	139214.	28243.
1301.	4166.	383814.	180456.	165380.	37815.
1302.	4801.	475199.	232771.	194153.	48063.
1303.	5436.	564244.	282101.	223276.	57619.
1304.	6071.	652860.	337925.	254547.	68300.
1305.	6706.	771407.	400312.	287981.	80160.

CROSS SECTION 24.1

SCALES ARE 1 INCH = 20. CFS, AND 1.2 FEET/ ELEVATION



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00BREAK00

1) COUNTY: WEXFORD

2) STUDY NAME: WEXFORD, COUNTY

3) WATERCOURSE: CLAM RIVER

4) DOCUMENT TYPE: TECHNICAL REPORT

00BREAK00

FLOOD PLAIN MANAGEMENT STUDY

TECHNICAL REPORT

CLAM RIVER

Wexford County, Michigan
November 1986

CONTENTS

1. Investigations and Analyses
2. Table 1 - Flood Discharges
3. Table 2 - Flood Elevations
4. Bench Mark Descriptions
5. Glossary
6. High Water Profiles - Attachment
7. Flood Hazard Area Photo Maps - Attachment
8. Bench Mark Map - Attachment

PREPARED BY

U.S. Department of Agriculture
Soil Conservation Service
East Lansing, Michigan

1

INVESTIGATIONS AND ANALYSES

SURVEY PROCEDURES

Field surveys were made of bridges, roads, structures, channel and flood plains, around Lakes Cadillac and Mitchell by the Soil Conservation Service in 1985 and around Pleasant Lake in 1986. Temporary bench marks based on USC & GS mean sea level elevations datum of 1929 were also set at this time and used for this study. In addition, several temporary bench marks, previously set by the City of Cadillac were used. Surveys were made using second order accuracy. Temporary bench marks are described in Part 4.

For the Clam River, 18 valley and channel cross-sections plus 22 roads, bridges and structures were surveyed. Eight shoreline cross-sections were surveyed around Lake Cadillac and Lake Mitchell. Eight shoreline cross-sections were surveyed around Pleasant Lake. Six valley and channel cross-sections plus two roads and bridges were surveyed for Pleasant Lake. Aerial photography flown on April 28, 1985 was used as a base for the photo mosaic sheets used to delineate the flood plains. U.S. Geologic Survey topographic maps and two foot contour maps provided by the City of Cadillac were used to extend valley cross-sections.

HYDROLOGY AND HYDRAULICS

Physical data were obtained from U.S.G.S. topographic maps, soil survey maps, local topographic maps and aerial photographs, as well as on-site field inspections. The watershed boundary was determined from map studies and field checks. The watershed was divided into 13 sub-watershed areas for use in evaluating the runoff volumes. Drainage areas for the sub-watersheds were measured from U.S.G.S. topographic maps. Times of concentration were calculated for the sub-watersheds using the upland flow method. Each sub-watershed was evaluated for land use, cover and soils. Runoff curve numbers were calculated.

Due to considerable differences in sub-watersheds, travel times, time of concentrations, soil conditions and topography, the analysis consists of three parts. Lakes Mitchell and Cadillac, the Clam River and Pleasant Lake were analyzed separately.

Lakes Mitchell and Cadillac

The lakes were treated as one body of water. The drainage area above the lakes is approximately 75 sq. mi.; however, the area that contributes surface runoff is only about 46 sq. mi. The soils are very sandy and pervious with considerable vegetative cover. Many of the roads prevent surface runoff from directly entering the lakes. In addition, several of the smaller lakes and swamps above Lakes Mitchell and Cadillac are land locked. Therefore, a surface water analysis alone would not be adequate. Snow melt and groundwater needed to be included.

Information from U.S.G.S. stream gage No. 04121300 located at Vogel Center was utilized to develop information for the TR-20 flood routing program used to determine elevations and peak discharges out of the lakes. Inflow hydrographs into the lakes were developed based on a volume-duration-probability analyses of the gage and the area above the lakes. Outflow hydrographs were based on elevation-discharge relationships developed by the WSP-2 water surface profile program and storage calculations. A starting lake elevation of 1290.50 feet was used to model existing conditions. The TR-20 computer program used the Storage Indication method of evaluating the effect of the lakes in reducing peak flood discharges into the Clam River. Table 1 lists discharges obtained from the flood routings and Table 2 lists lake elevations.

Information from the U.S.G.S. staff gage located at Lake Cadillac was used to verify the peak lake elevations. A frequency analysis using the Log Pearson III distribution and a skew factor of -0.40 very closely approximates peak elevations as determined by the TR-20 model.

Clam River

Channel flood routings to establish peak discharge-frequency relationships were made using the SCS TR-20 Hydrology Computer Program and U.S. Department of Agriculture computer facilities. The Modified Attenuation-Kinematic (Att-Kin) method of routing through stream channels is used by this program. This method is derived from inflow-outflow hydrograph relationships.

Base flood flows from Lakes Cadillac and Mitchell, local runoff and valley sections were used to flood route and model study area conditions. Table 1 lists discharges obtained from the flood routings and Table 2 lists flood elevations at sections.

Information from the U.S.G.S. stream gage at Vogel Center and U.S.G.S. Water Supply Paper 1677 were used to verify peak discharges at the county line as determined by the TR-20 model. Peak discharges for the 100 year storm compared within 4 percent.

Pleasant Lake

The Pleasant Lake drainage area is approximately 4.25 square miles. Flood waters from the Pleasant Lake flow to the south under Rd. No. 32 and eventually enter Lakes Cadillac and Mitchell. The hydrology and hydraulics analysis was similar to Lakes Cadillac and Mitchell.

Inflow hydrographs into the Lake were developed based on a volume-duration-probability analysis of the U.S.G.S. stream gage at Vogel Center. Outflow hydrographs for discharge out of the lake were based on elevation-discharge relationships developed by the WSP-2 water surface profile program and TR-20 flood routing program. A starting lake elevation of 1326.80 feet was used to model existing conditions. Table 1 lists discharges obtained from the flood routings and Table 2 lists lake elevations.

Water surface profiles for the Clam River and Pleasant Lake outlet channel were developed using the Soil Conservation Service WSP-2 computer program. This program uses the step method of computation to solve the Bernoulli equation, and the Bureau of Public Roads bridge loss analysis. Flood discharges determined from flood routings were used in the water surface profile program to develop high water profiles along the Clam River and Pleasant Lake outlet channel. Mannings "n" values were determined from field investigations of the channels and flood plains.

Normal bridge and channel flow conditions were assumed in the hydraulic computations. No consideration was made for openings blocked by ice or other debris. Channel and flood plain flow characteristics may change due to vegetative growth, sedimentation, scour, debris accumulation, filling and encroachment. Computations for this study considered only those features in the flood plain at the time of field surveys. Future flood plain developments and modifications, as well as changes in the upstream drainage area and land use and cover will require recomputation of water surface profiles.

Flood plain delineations were made on the contour maps and photo map sheets. Computed water surface elevations at surveyed sections and bridges were used to identify flood plain limits. Between sections, topographic map interpretations and field inspections were used to delineate the flood boundary lines. Limits of flooding shown on the photo maps may vary from actual location on the ground and the photographic image may vary from true ground location due to inherent aerial photographic displacement. Flood plain delineations around Lakes Cadillac and Mitchell were based on the computed lake level only. Wave action may cause flooding of additional areas. In addition, road fills with inadequate or no crossings are causing some flooding above the roads. These areas were not delineated in this study. High water profile elevations and detailed field surveys should be used to determine the extent or depth of flooding at any specific site.

Where the limits of the 500-year and 100-year floods were too close to delineate, the limits of the two flood plains are shown as the same line on the photo map sheets.

2

TABLE I CLAM RIVER FLOOD DISCHARGES

Location	TR-20 Sec.	From Sec.	To Sec.	Drainage Area	Estimated Peak Discharges 10-Yr.	50-Yr.	100-Yr.	500-Yr.
				Sq. Miles	-Cubic Feet Per Second-			
Lake Cadillac (Base Flow)	01			74.39	105	120	125	135
To Ann Arbor R.R.	004	24.1	22.9	74.43	115	130	140	155
To Mitchell St.	006	22.6	18.9	74.50	130	160	170	200
To Below Giant-way Tubes	009	18.1	17.9	74.58	150	190	205	245
To Power St.	012	17.5	17.5	74.66	170	225	245	295
To Smith St.	015	16.1	14.8	74.81	195	275	305	375
To the Ball Drain	022	14.1	11.3	93.97	230	335	360	445
To 49 Rd.	030	11.2	10.0	99.87	230	390	460	655
Pleasant Lake	01			4.25	1	2	4	6

3

TABLE 2 - FLOOD ELEVATIONS AT SECTIONS

Location	Section	Station	10-Year	50-Year	100-Year	500-Year
Clam River						
49 Road	10.0 D	0+00	1261.3	1261.8	1261.9	1262.4
	10.0 U	0+46	1263.1	1264.4	1264.5	1264.7
	10.2	25+00	1264.2	1265.3	1265.6	1266.2
	10.3	50+00	1265.8	1266.8	1267.0	1267.7
	10.5	75+00	1267.3	1268.3	1268.7	1269.5
	10.6	100+00	1269.8	1270.7	1271.0	1271.7
	10.7	125+00	1272.5	1273.3	1273.6	1274.4
	10.8	150+00	1275.5	1276.2	1276.3	1277.0
	10.85	175+00	1278.2	1279.0	1279.2	1279.8
34 Road	10.9	184+50	1279.3	1280.0	1280.2	1280.9
	11.0 D	184+77	1279.4	1280.1	1280.3	1281.0
	11.0 U	185+23	1279.9	1281.3	1281.4	1281.7
	11.2	212+00	1281.7	1282.6	1282.9	1283.4
	11.3	240+00	1282.9	1283.6	1283.8	1284.2
Plett Road	12.0 D	271+84	1284.5	1285.0	1285.2	1285.6
	12.0 U	272+16	1284.9	1285.9	1286.3	1286.9
	12.5	273+00	1285.1	1286.1	1286.4	1287.0
13th Street	13.0 D	273+69	1285.3	1286.2	1286.5	1287.1
	13.0 U	274+31	1286.0	1287.3	1287.7	1287.9
	13.2	280+00	1286.2	1287.5	1287.9	1288.2
	13.8	288+00	1286.6	1287.8	1288.2	1288.5
Smith Street	14.0 D	291+32	1286.7	1288.0	1288.3	1288.7
	14.0 U	291+68	1286.8	1288.2	1288.4	1288.8
	14.8	299+00	1287.0	1288.4	1288.6	1288.9
Ayer Street	15.0 D	300+73	1287.1	1288.4	1288.6	1289.0
	15.0 U	301+27	1287.4	1288.7	1289.0	1289.6
	15.7	305+20	1287.5	1288.8	1289.1	1289.6
Power Street	16.0 D	307+82	1287.6	1288.8	1289.1	1289.7
	16.0 U	308+18	1287.6	1288.9	1289.2	1289.7
	17.5	314+00	1287.9	1289.1	1289.3	1289.8
Giantway Tubes	18.0 D	314+45	1287.9	1289.1	1289.3	1289.8
	18.0 U	318+45	1288.2	1289.3	1289.6	1290.2
	18.1	318+70	1288.2	1289.3	1289.6	1290.2
Mitchell St.	19.0 D	319+00	1288.2	1289.3	1289.6	1290.2
	19.0 U	319+80	1288.2	1289.4	1289.7	1290.3
NBD Parking Lot & R.R.	19.5 D	320+15	1288.3	1289.4	1289.7	1290.3
	19.5 U	322+15	1288.9	1289.8	1290.1	1290.8
Alpena Store	19.7 D	322+45	1288.9	1289.8	1290.1	1290.8
	19.7 U	323+15	1288.9	1289.8	1290.1	1290.8
	19.9	323+45	1288.9	1289.8	1290.2	1290.8

TABLE 2 - FLOOD ELEVATIONS AT SECTIONS - CONTINUED

Location	Section	Station	10-Year	50-Year	100-Year	500-Year
W. River St.	20.0 D	323+65	1288.9	1289.9	1290.2	1290.9
	20.0 U	324+25	1288.9	1289.9	1290.2	1290.9
Lake Street	21.0 D	326+41	1289.1	1290.0	1290.2	1290.9
	21.0 U	326+79	1289.2	1290.0	1290.3	1291.0
	21.6	330+50	1289.2	1290.0	1290.3	1291.0
Ann Arbor R.R.	22.0 D	331+46	1289.2	1290.1	1290.3	1291.0
	22.0 U	331+64	1289.3	1290.3	1290.6	1291.3
	22.6	336+80	1289.5	1290.3	1290.6	1291.3
Haynes Street	23.0 D	340+73	1289.6	1290.4	1290.7	1291.3
	23.0 U	341+37	1289.6	1290.4	1290.7	1291.3
	23.6	345+70	1289.8	1290.5	1290.7	1291.4
Dam	23.65	345+85	1289.8	1290.5	1290.7	1291.4
	23.7	346+10	1289.8	1290.5	1290.7	1291.4
Chestnut St.	24.0 D	348+33	1290.1	1290.7	1290.9	1291.5
	24.0 U	349+07	1290.4	1290.9	1291.1	1291.7
Lakes Cadillac & Mitchell			1290.8 1290.5	1291.2 1290.9	1291.4 ~~1291.1~~	1291.7 ~~1291.7~~
Pleasant Lake			1329.0	1329.4	1329.5	1329.6

1329.2 ~ now

4

BENCH MARK DESCRIPTIONS *

CLAM RIVER

WEXFORD COUNTY, MICHIGAN

BM 70B

Section 24, T22N, R9W - Railroad spike in south side of power pole located 75 feet west of Missaukee County Line Road also known as 49 Road and 80 feet south of the Clam River.

Elev. 1269.27

BM 65B

Section 24, T22N, R9W - Top of iron in concrete marker located 50 feet northwest of the intersection of Boon Road and Sarah Street.

Elev. 1286.06

BM 62B

Section 23, T22N, R9W - Railroad spike in south side of power pole located near section line common to sections 23 and 24. The power pole is the first power pole south of the Clam River.

Elev. 1273.38

BM 60B

Section 23, T22N, R9W - Railroad spike in the north side of power pole located 65 feet northwest of the south 1/16 corner of southeast 1/4 of section 23.

Elev. 1287.14

BM 55B

Section 22, T22N, R9W - Railroad spike in the south side of power pole, located on the north side of Boon Road and being the first power pole west of the Clam River and Boon Road intersection.

Elev. 1283.24

BM 50

Section 27, T22N, R9W - Railroad spike in west side of power pole, southeast of the junction of Boon Road and Plett Road.

Elev. 1285.59

* Elevations based on USC & GS mean sea level datum of 1929.

BM 42

Section 34, T22N, R9W - Railroad spike in north side of power pole located at the southeast corner of the intersection of Platt Road and 13th Street.

Elev. 1288.63

BM 144

Section 33, T22N, R9W - Railroad spike in power pole at the southside of Ford Street at the intersection of Ford, Dandy and Riverside Street.

Elev. 1289.34

BM 146

Section 33, T22N, R9W - Railroad spike in guy pole at the southwest corner of Ayer and Wheeler Streets.

Elev. 1293.34

BM 73

Section 33, T22N, R9W - Top of steamer valve on fire hydrant located at the northwest corner of Powers and Baker Streets.

Elev. 1291.10

BM 78

Section 33, T22N, R9W - Top of steamer valve on fire hydrant located in the southerly corner of Wheeler Street and North Simmons Street.

Elev. 1294.26

TBM 780B

Section 33, T22N, R9W - Top of the northeast corner of the fourth concrete guardrail piller to the north located on the east side of U.S. 131 at Giantway.

Elev. 1294.71

BM 140

Section 33, T22N, R9W - Chisled mark on top of safety rail at the northwest corner of the Clam River Bridge near Novak Building.

Elev. 1295.12

BM 145B

Section 33, T22N, R9W - Top of steamer valve on fire hydrant located southeast of the corner of West River Street (Wright) and Second Ave.

Elev. 1295.45

TBM 140B

Section 33, T22N, R9W - "X" chisled in top of square steel rod at the northeast corner of Wood Railroad Tressel located in the northwest corner of the Ann Arbor railroad and Clam River intersection. 550 feet southwest of the intersection of Lake Street and West River Street (Wright).

Elev. 1290.75

BM 39

Section 33, T22N, R9W - South bolt on fire hydrant located east of the intersection of Bond and Haynes Street.

Elev. 1294.02

BM DAM

Section 33, T22N, R9W - "X" chiseled on top of southwest corner of concrete abutement of Clam River Dam at Consumers Power.

Elev. 1292.07

TBM 1-36

Section 1, T21N, R10W - Spike in power pole located in front of House No. 917 North Lake Mitchell Drive.

Elev. 1293.43

TBM 1-39

Section 1, T21N, R10W - Spike in power pole opposite 477 North Lake Mitchell Drive.

Elev. 1294.72

BM 61

Section 6, T21N, R9W - Spike in the west side of power pole located northeast of the intersection of M-115 and North Blvd.

Elev. 1302.34

BM 61B

Section 6, T21N, R9W - Railroad spike in southside of power pole #505 located on the north side of North Boulevard 720 feet east of M-115.

Elev. 1293.27

BM 169

Section 7, T21N, R9W - Railroad spike in power pole at the westernly corner of the intersection of M-55 and S. Lake Mitchell Drive of Cadillac West Motel.

Elev. 1296.44

TBM 2-26

Section 12, T21N, R10W - Spike in north root of 20 inch diameter red oak south side of M-55 at Caberfac Motor Inn.

Elev. 1299.96

BM B1

Section 12, T21N, R10W - Split "1" on top of northeast edge of Bell Systems manhole cover rim located in northerly corner of M-55 and Pole Road Junction.

Elev. 1295.91

TBM 2-15

Section 10, T21N, R10W - Chiseled "X" in top square of triangular concrete post, 15 feet west and 25 feet south of Sunset Pt. Road (33 Mile Road) at the intersection of South Lake Mitchell and 33 Mile Road.

Elev. 1299.40

TBM 2-2

Section 10, T21N, R10W - Spike in east side of 20 inch poplar tree 50 feet south and 25 feet west of the intersection of Sunset Point Road and Woodland Drive.

Elev. 1297.66

BM 220B

Section 10, T21N, R10W - Railroad spike in north side of power pole at the south side and end of 33 Road at Sunset Point Cabins.

Elev. 1293.07

TBM 230B

Section 10, T21N, R10W - Railroad spike in north side of power pole located in the southeast corner of the intersection of South Lake Mitchell (Pole Road) and South 31 Road.

Elev. 1301.25

TBM 231B

Section 9, T21N, R10W - Railroad spike in east side of 12 inch diameter Maple tree located on the west side of 31 Road, 0.25 miles north of Pole Road.

Elev. 1297.16

TBM 1-1

Section 3, T21N, R10W - Spike in power pole south of House #519 Lake Drive.

Elev. 1295.33

TBM 1-8

Section 34, T22N, R10W - Spike in power pole on south side of North Lake Mitchell Drive at House #4301.

Elev. 1294.34

TBM 1-15

Section 35, T22N, R10W - Spike in power pole at west side of House #3367, North Lake Mitchell Drive.

Elev. 1292.30

BM B7

Section 26, T22N, R10W - Top of cap on cement marker reading "Wexford County Board of Public Works" located 75 feet east and 50 feet north of the intersection of North Lake Mitchell Drive and Ann Arbor railroad tracks.

Elev. 1296.87

BM B8

Section 25, T22N, R10W - Top northeast corner concrete marker, "Wexford County Board of Public Works" located 45 feet north and 35 feet east of the intersection of East Lake Mitchell Drive and Ann Arbor railroad tracks.

Elev. 1305.93

BM B9

Section 25, T22N, R10W - Top of the northwest bolt of the railroad warning light base, located in the southeast corner of the intersection of M-115 and Ann Arbor railroad tracks.

Elev. 1307.25

BM 13

Section 22, T22N, R10W - 2.0 miles north and 6.0 miles west of Cadillac, 27 feet north and 35 feet east of crossroads, 12 feet east of corner post, in concrete post, standard tablet stamped "TT 112 TEX 1930 1353".

Elev. 1353.06

BM LJ 105

Section 14, T22N, R10W - Top of nail set 0.5 feet above ground, south side of power pole, 39 feet north of Rd. No. 32, 419 feet east of the intersection of 35 Rd. and Rd. No. 32 at #5095.

Elev. 1335.17

BM LJ 107

Section 13, T22N, R10W - Top of nail set 6 inches up from ground on west side of power pole, east side of Lake Shore Drive and southside of drive to Richardsons at #2753 Lake Shore Drive.

Elev. 1331.42

BM LJ 109

Section 13, T22N, R10W - Top of nail set 6 inches up from ground on west side of power pole, 39 feet east of 35 1/2 Road, and 178 feet north of intersection of Lake Shore Drive and 35 1/2 Road.

Elev. 1338.61

5

GLOSSARY

BACKWATER--The resulting highwater surface upstream from a dam, bridge or other obstruction in a river channel or high stages in a receiving stream.

BRIDGE DECK--Elevation of road surface at the bridge.

BRIDGE LOW CLEARANCE--The lowest point of a bridge or other structure over or across a river, stream or water course that limits the opening through which water flows. This is referred to as "low steel" or "low chord". It often is higher than the low point of the roadway.

CHANNEL OR WATER COURSE--An elongated depression either natural or man-made having a bed and well-defined banks varying in depth, width and length which gives direction to a current of water and is normally described as a creek, stream or riverbed.

CHANNEL BOTTOM--The lowest part of the stream channel (either in a constructed cross-section or a natural channel). Bottom elevations at a series of points along the length of a stream may be plotted and connected to provide a stream bottom profile.

CONFLUENCE--A flowing together or place of junction of two or more streams.

CROSS-SECTION OR VALLEY SECTION--A graph showing the shape of the stream bed, banks and adjacent land on either side made by plotting elevations at measured distances along a line perpendicular to the flow of the stream.

DATUM--An assumed reference plane from which elevations and depths are measured such as from sea level.

HIGH WATER OR FLOOD PROFILE--A graph showing the relationship of water surface elevation location along the stream. While it is drawn to show surface elevations for the crest of a specific flood, it may be prepared for conditions at any other given time or stage.

ELEVATION-DISCHARGE RELATIONSHIP--The relationship between water surface elevation and rate of flow at a specified location for a range of flow rates.

FLOOD--A temporary overflow by a river, stream, ocean, lake or other body of lands not normally covered by water. It does not include the ponding of surface water due to inadequate drainage such as within a development. It is characterized by damaging inundation, backwater effects of surcharging sewers and local drainage channels, and by unsanitary conditions within adjoining flooded habitated area attributable to pollutants, debris and water table.

FLOOD CREST--The maximum stage or elevation reached by flood waters at a given location.

FLOOD FREQUENCY--A means of expressing the probability of flood occurrences as determined from a statistical analysis of representative stream flow or rainfall and runoff records. It is customary to estimate the frequency with which specific flood stages or discharges may be equalled or exceeded, rather than the frequency of an exact stage or discharge. Such estimates by strict definition are designated "exceedence frequence", but in practice the term "frequency" is used. The frequency of a particular stage or discharge is usually expressed as occurring once in a specified number of years.

10-YEAR FLOOD--A flood having a long-term average frequency of occurrence in the order of once in 10 years. It has a 10 percent chance of being equalled or exceeded in any given year.

100-YEAR FLOOD--A flood having a long-term average frequency of occurrence in the order of once in 100 years. It has a one percent chance of being equalled or exceeded in any given year. This flood is comparable to the "Intermediate Regional Flood" used by the U.S. Army Corps of Engineers.

FLOOD PEAK--The maximum instantaneous discharge or volume of flow in cubic feet per second passing a given location. It usually occurs at or near the time of the flood crest.

FLOOD PLAIN--The relatively flat area or low lands covered by flood waters originating with either the adjoining channel of a water course such as a river or stream, or a body of standing water such as an ocean or lake.

FLOOD ROUTING--The process of determining progressively the timing and shape of a flood wave at successive points along a stream. This procedure is used to derive a downstream hydrograph from an upstream hydrograph. Local inflow and tributary hydrographs are considered.

FLOOD STAGE--The elevation at which overflow of the natural stream banks or body of water occurs.

FLOODWAY--The portion of the flood plain including the channel of the stream that is required for the conveyance of flood flow.

FLOODWAY FRINGE--The area of the flood plain lying outside the floodway which may be covered by flood waters originating from an adjoining river or stream.

HEAD LOSS--The effect of obstructions, such as narrow bridge openings, dams or buildings, that limit the area through which water must flow, raising the surface water upstream from the obstruction.

HEADWATER--The tributaries and upper reaches which are the sources of the stream.

HYDRAULICS--The science of the laws governing the motion of water and their practical applications.

HYDROGRAPH--A graph denoting the discharge or stage of flow over a period of time.

HYDROLOGY--The science dealing with the occurrence and movement of water upon and beneath the land areas of the earth.

INUNDATION--The flooding or overflow of an area with water.

LEFT BANK--The bank of the left side of a river, stream or water course, looking downstream.

LOW GROUND--The highest elevation at a specific stream channel cross-section at which the flow in the stream can be contained in the channel without overflowing into adjacent overbank areas.

MANNING'S "n"--A coefficient of channel and overbank roughness used in Manning's open channel flow formula, commonly called a retardance factor.

REACH LENGTH--A longitudinal length of stream channel selected for use in hydraulic or other computations.

RIGHT BANK--The bank on the right side of the river, stream or water course, looking downstream.

ROAD OVERFLOW--The lowest elevation on a road profile in the vicinity of where the road and stream cross. It is the first point on the roadway inundated if overtopping of the road occurs during a storm.

RUNOFF--That part of precipitation, as well as any other flow contributions, which appears in surface streams of either perennial or intermittent form.

TIME OF CONCENTRATION--Time required for water to flow from the most remote point of a watershed to the outlet or other point of reference.

WATERSHED--A drainage basin or area which collects runoff and transmits it, usually by means of streams and tributaries, to the outlet of the basin.

WATERSHED BOUNDARY--The divide separating one drainage basin from another.

1868C

00BREAK00

1) COUNTY: WEXFORD

2) STUDY NAME: WEXFORD, COUNTY

3) WATERCOURSE: Pleasant Lake outlet ~~CLAM RIVER~~

4) DOCUMENT TYPE: Present Conditions ~~PLEASANT LAKE OUTLET~~

00BREAK00

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
WSP2       10.                                                                   1
TITLE      CLAM RIVER - FPMS -WEXFORD CO.,MI. OCT. 23,1986                       2
TITLE      PLEASANT LAKE OUTLET - PRESENT CONDITIONS                             3
DISCHARGE  -1.       0.1       0.5       1.0       1.5       2.0                 4
DISCHARGE  -1.       2.5       3.0       3.5       4.0       4.5                 5
DISCHARGE  -1.       5.0       7.0       10.0      15.0      25.0                6
STARTS     50.31     .0002     .0002     .0002     .0002     .0002               7
STARTS     50.31     .0002     .0002     .0002     .0002     .0002               8
STARTS     50.31     .0002     .0002     .0002     .0002     .0002               9
OUTPUT     PSK                                                                  10
REACH      50.31     1.        0.        0.                                     11
SEGMENT    50.31     1         C         100.      1332.0                       12
NVALUE     .04                                                                  13
SECTION    50.31                                                                14
           -100.     1332.     -100.     1328.7    0.        1326.5             15
           100.      1328.7    100.      1332.                                  16
ENDTABLE                                                                        17
ROAD       50.32     2.8       90.       90.                                    18
CULV1      50.32     1.        32233                                            19
CULV2      1.9       2.4       28.       1327.4    1327.2    .026               20
SECTION    50.32                                                                21
           -100.     1332.     -100.     1330.6    0.        1330.6             22
           80.       1330.9    80.       1332.                                  23
ENDTABLE                                                                        24
REACH      50.33     1.        10.       10.                                    25
SEGMENT    50.33     1.        C         42.       1332.                        26
NVALUE     .04                                                                  27
SECTION    50.33                                                                28
           -20.      1332.     0.        1327.4    12.       1328.6             29
           42.       1329.9    42.       1332.                                  30
ENDTABLE                                                                        31
REACH      50.34     1.        65.       65.                                    32
SEGMENT    50.34     1.        C         85.       1332.                        33
NVALUE     .04                                                                  34
SECTION    50.34                                                                35
           -20.      1332.     -10.      1329.65   0.        1328.4             36
           85.       1329.9    85.       1332.                                  37
ENDTABLE                                                                        38
REACH      50.35     1.        50.       50.                                    39
SEGMENT    50.35     1.        C         185.      1332.0                       40
NVALUE     .04                                                                  41
SECTION    50.35                                                                42
           -145.     1332.     -50.      1328.7    -18.      1327.6             43
           0.        1327.4    30.       1328.1    185.      1332.              44
ENDTABLE                                                                        45
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
REACH     50.36     1.        530.      530.                                    46
REACH2    50.35     -.2                                                         47
ROAD      50.4      2.8       10.       10.                                     48
CULV1     50.4      1.        12311                                             49
CULV2     1.                  40.       1328.24   1327.99   .024                50
SECTION   50.4                                                                  51
          -1000.    1333.1    -400.     1328.7    0.        1329.8              52
          500.      1330.9    500.      1332.                                   53
ENDTABLE                                                                        54
REACH     50.41     1.        5.        5.                                      55
REACH2    50.35     .9                                                          56
ROAD      50.42     2.8       5.        5.                                      57
CULV1     50.42     1.        22533                                             58
CULV2     .33                 170.      1327.87   1327.91   .012                59
SECTION   50.42                                                                 60
          -100.     1332.     -100.     1329.4    0.        1329.4              61
          100.      1329.4    100.      1332.                                   62
ENDTABLE                                                                        63
REACH     50.43     1.        10.       10.                                     64
SEGMENT   50.43     1.        C         100.      1332.                         65
NVALUE    .04                                                                   66
SECTION   50.43                                                                 67
          -100.     1332.     -100.     1326.8    0.        1326.8              68
          100.      1326.8    100.      1332.                                   69
ENDTABLE                                                                        70
COMPUTE   50.31     50.43     50.31                                             71
-----------------------------END OF 80/80 LIST-----------------------------
```

COMPUTE 50.31 50.43 50.31 71

----------STARTING DATA FROM GIVEN SLOPES----------

RATING TABLE FOR SECTION 50.31 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1326.5	0.0	0.0						
1	1326.7	1.6	.1	.00	.00	.00	.10	1326.5	.00006
2	1326.8	4.5	.5	.00	.00	.00	.50	1326.5	.00014
3	1326.9	6.5	1.0	.00	.00	.00	1.00	1326.5	.00017
4	1326.9	8.4	1.5	.00	.00	.00	1.50	1326.5	.00019
5	1327.0	10.9	2.0	.00	.00	.00	2.00	1326.6	.00018
6	1327.0	12.7	2.5	.00	.00	.00	2.50	1326.7	.00018
7	1327.1	14.3	3.0	.00	.00	.00	3.00	1326.7	.00019
8	1327.1	15.6	3.5	.00	.00	.00	3.50	1326.7	.00019
9	1327.1	17.0	4.0	.00	.00	.00	4.00	1326.7	.00020
10	1327.1	19.0	4.5	.00	.00	.00	4.50	1326.7	.00019
11	1327.2	20.7	5.0	.00	.00	.00	5.00	1326.7	.00019
12	1327.3	26.3	7.0	.00	.00	.00	7.00	1326.7	.00019
13	1327.4	35.4	10.0	.00	.00	.00	10.00	1326.8	.00019
14	1327.5	49.0	15.0	.00	.00	.00	15.00	1326.9	.00018
15	1327.7	66.9	25.0	.00	.00	.00	25.00	1326.9	.00020

SEGMENT TABLE FOR SECTION 50.31

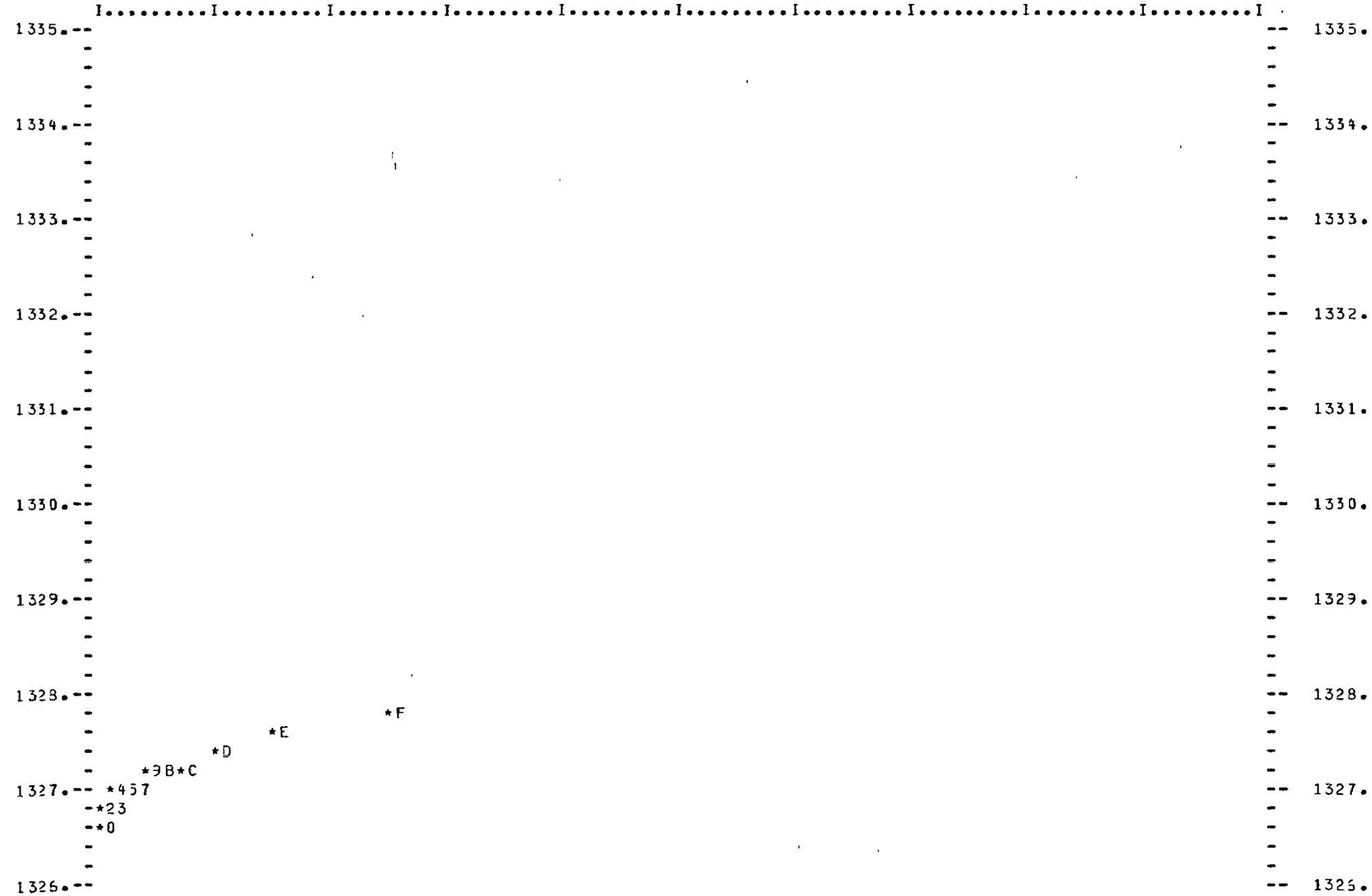
CSM		TOTAL	SEG NO 1 C
1	DISCHARGE CFS	0.	0.
0.	VELOCITY FPS	.06	.06
2	DISCHARGE CFS	0.	0.
0.	VELOCITY FPS	.13	.11
3	DISCHARGE CFS	1.	1.
1.	VELOCITY FPS	.16	.15
4	DISCHARGE CFS	1.	1.
1.	VELOCITY FPS	.18	.18
5	DISCHARGE CFS	2.	2.
2.	VELOCITY FPS	.19	.18
6	DISCHARGE CFS	2.	2.
2.	VELOCITY FPS	.20	.20
7	DISCHARGE CFS	3.	3.
3.	VELOCITY FPS	.22	.21
8	DISCHARGE CFS	3.	3.
3.	VELOCITY FPS	.23	.22
9	DISCHARGE CFS	4.	4.
4.	VELOCITY FPS	.24	.24
10	DISCHARGE CFS	4.	4.
4.	VELOCITY FPS	.24	.24
11	DISCHARGE CFS	5.	5.
5.	VELOCITY FPS	.25	.24
12	DISCHARGE CFS	7.	7.
7.	VELOCITY FPS	.27	.27
13	DISCHARGE CFS	10.	10.
10.	VELOCITY FPS	.29	.28
14	DISCHARGE CFS	15.	15.
15.	VELOCITY FPS	.32	.31
15	DISCHARGE CFS	25.	25.
25.	VELOCITY FPS	.38	.37
1	ELEV 1326.7 KD	13.	13.
2	ELEV 1326.8 KD	42.	42.
3	ELEV 1326.9 KD	76.	76.
4	ELEV 1326.9 KD	109.	109.
5	ELEV 1327.0 KD	149.	149.
6	ELEV 1327.0 KD	186.	186.
7	ELEV 1327.1 KD	220.	220.
8	ELEV 1327.1 KD	251.	251.
9	ELEV 1327.1 KD	284.	284.
10	ELEV 1327.1 KD	324.	324.
11	ELEV 1327.2 KD	363.	363.
12	ELEV 1327.3 KD	504.	504.
13	ELEV 1327.4 KD	732.	732.
14	ELEV 1327.5 KD	1118.	1118.

KD TABLE FOR CROSS SECTION 50.31

ELEVATION	AREA	KD	KD BY SEGMENT
1326.50	0.		
1327.	12.	167.	167.
1328.	104.	3136.	3136.
1329.	280.	12889.	12889.
1330.	480.	31610.	31610.
1331.	680.	56181.	56181.
1332.	880.	85870.	85870.
1333.	1080.	117365.	117365.
1334.	1280.	152820.	152820.
1335.	1480.	192509.	192509.
1336.	1680.	236350.	236350.

CROSS SECTION 50.31

SCALES ARE 1 INCH = 10. CFS, AND 1.2 FEET/ ELEVATION



WARNING HEADLATES FLOW CRITICAL DEPTH ON APPROACH SECTION, HW PRESUMED AT CRITICAL FOR PROFILE 1

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BRIDGE HEADWATER BELOW CRITICAL DEPTH ON APPROACH SECTION. HW PRESUMED AT CRITICAL FOR PROFILE  2********************
BRIDGE HEADWATER BELOW CRITICAL DEPTH ON APPROACH SECTION. HW PRESUMED AT CRITICAL FOR PROFILE  3********************
BRIDGE HEADWATER BELOW CRITICAL DEPTH ON APPROACH SECTION. HW PRESUMED AT CRITICAL FOR PROFILE  4********************
BRIDGE HEADWATER BELOW CRITICAL DEPTH ON APPROACH SECTION. HW PRESUMED AT CRITICAL FOR PROFILE  5********************
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CLAM RIVER - FPMS -WEXFORD CO.,MI. OCT. 23,1986
PLEASANT LAKE OUTLET - PRESENT CONDITIONS

ROAD SECTION 50.32

NO.	HW	CFS	HL	TW	CSM
0	1327.40	0.00	0.00	0.00	0.00
1	1327.44	.10	.13	1327.31	.10
2	1327.59	.50	.26	1327.33	.50
3	1327.64	1.00	.18	1327.46	1.00
4	1327.68	1.50	.17	1327.52	1.50
5	1327.72	2.00	.23	1327.49	2.00
6	1327.87	2.50	.32	1327.55	2.50
7	1328.05	3.00	.56	1327.49	3.00
8	1328.10	3.50	.64	1327.46	3.50
9	1328.17	4.00	.64	1327.53	4.00
10	1328.26	4.50	.64	1327.62	4.50
11	1328.27	5.00	.64	1327.63	5.00
12	1328.59	7.00	.96	1327.63	7.00
13	1329.02	10.00	1.36	1327.66	10.00
14	1329.66	15.00	1.92	1327.74	15.00
15	1330.62	25.00	2.64	1327.98	25.00

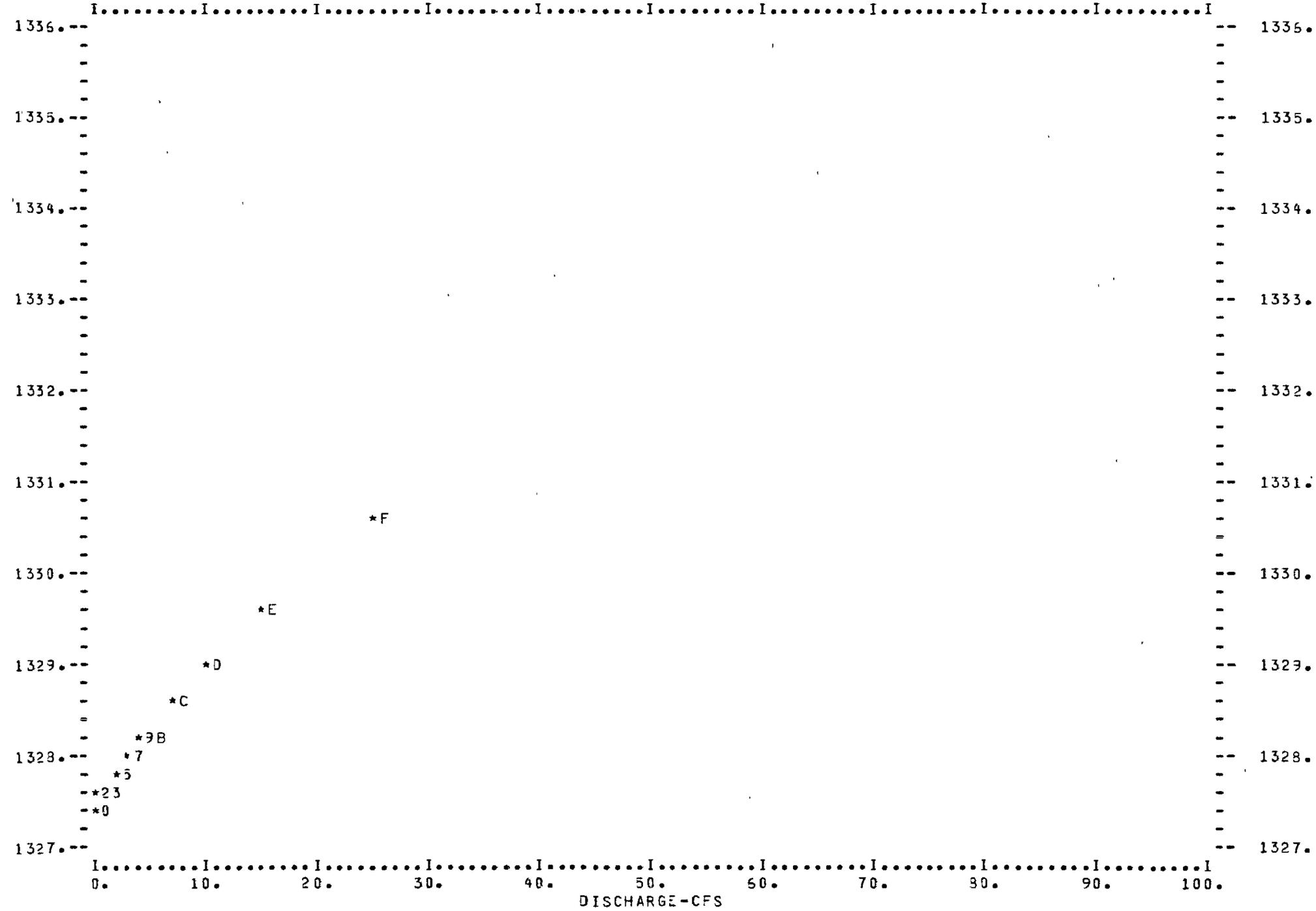
MIN ROAD ELEVATION 1330.60

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32233.	1.48	2.41	28.00	1327.40	1327.20	.026

2.85 ft²

ROAD SECTION 50.32

SCALES ARE 1 INCH = 10. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 50.33 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1327.4	0.0	0.0						
1	1327.5	.1	.1	.00	.00	.00	.10	1327.4	.00306
2	1327.7	.6	.5	.00	.00	.00	.50	1327.5	.01119
3	1327.8	1.0	1.0	.00	.00	.00	1.00	1327.6	.00715
4	1327.8	1.4	1.5	.00	.00	.00	1.50	1327.7	.00717
5	1327.9	1.6	2.0	.00	.00	.00	2.00	1327.7	.00893
6	1327.9	2.2	2.5	.00	.00	.00	2.50	1327.8	.00575
7	1328.1	3.4	3.0	.00	.00	.00	3.00	1327.8	.00245
8	1328.1	3.9	3.5	.00	.00	.00	3.50	1327.8	.00237
9	1328.2	4.5	4.0	.00	.00	.00	4.00	1327.8	.00196
10	1328.3	5.6	4.5	.00	.00	.00	4.50	1327.9	.00151
11	1328.3	5.9	5.0	.00	.00	.00	5.00	1327.9	.00170
12	1328.5	10.3	7.0	.00	.00	.00	7.00	1328.0	.00068
13	1329.0	20.1	10.0	.00	.00	.00	10.00	1328.0	.00030
14	1329.7	44.6	15.0	.00	.00	.00	15.00	1328.2	.00009
15	1330.6	95.5	25.0	.00	.00	.00	25.00	1328.3	.00003

SEGMENT TABLE FOR SECTION 50.33

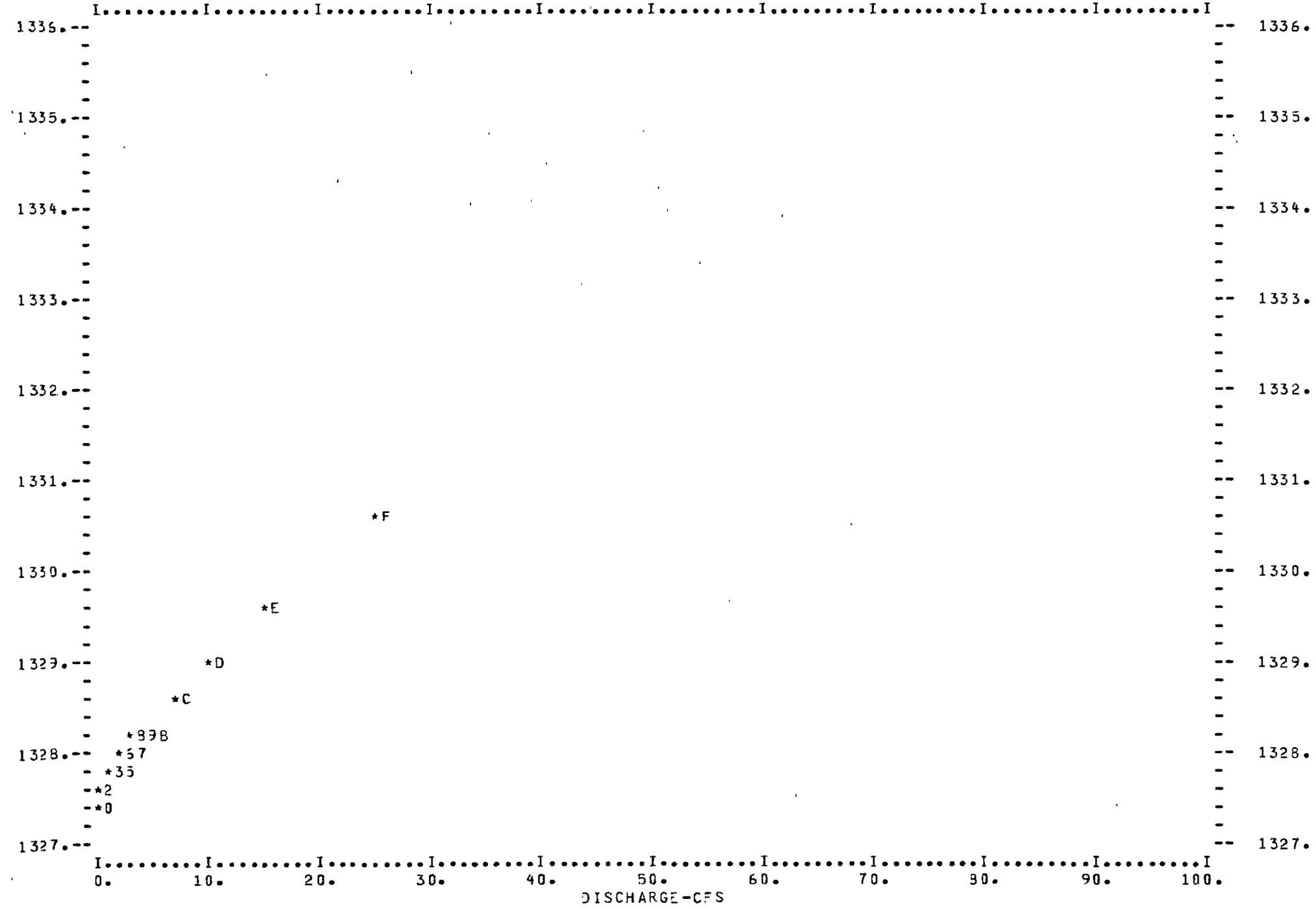
CSM		TOTAL	SEG NO 1 C
1	DISCHARGE CFS	0.	0.
0.	VELOCITY FPS	.29	.00
2	DISCHARGE CFS	0.	0.
0.	VELOCITY FPS	1.02	.90
3	DISCHARGE CFS	1.	1.
1.	VELOCITY FPS	1.02	.98
4	DISCHARGE CFS	1.	1.
1.	VELOCITY FPS	1.13	1.09
5	DISCHARGE CFS	2.	2.
2.	VELOCITY FPS	1.32	1.26
6	DISCHARGE CFS	2.	2.
2.	VELOCITY FPS	1.18	1.14
7	DISCHARGE CFS	3.	3.
3.	VELOCITY FPS	.90	.87
8	DISCHARGE CFS	3.	3.
3.	VELOCITY FPS	.92	.90
9	DISCHARGE CFS	4.	4.
4.	VELOCITY FPS	.88	.88
10	DISCHARGE CFS	4.	4.
4.	VELOCITY FPS	.83	.80
11	DISCHARGE CFS	5.	5.
5.	VELOCITY FPS	.89	.85
12	DISCHARGE CFS	7.	7.
7.	VELOCITY FPS	.68	.68
13	DISCHARGE CFS	10.	10.
10.	VELOCITY FPS	.50	.50
14	DISCHARGE CFS	15.	15.
15.	VELOCITY FPS	.34	.34
15	DISCHARGE CFS	25.	25.
25.	VELOCITY FPS	.26	.26
1	ELEV 1327.5 KD	2.	2.
2	ELEV 1327.7 KD	5.	5.
3	ELEV 1327.8 KD	12.	12.
4	ELEV 1327.8 KD	18.	18.
5	ELEV 1327.9 KD	21.	21.
6	ELEV 1327.9 KD	33.	33.
7	ELEV 1328.1 KD	61.	61.
8	ELEV 1328.1 KD	72.	72.
9	ELEV 1328.2 KD	90.	90.
10	ELEV 1328.3 KD	115.	116.
11	ELEV 1328.3 KD	121.	121.
12	ELEV 1328.6 KD	268.	268.
13	ELEV 1329.0 KD	581.	581.
14	ELEV 1329.7 KD	1580.	1580.

KD TABLE FOR CROSS SECTION 50.33

ELEVATION	AREA	KD	KD BY SEGMENT
1327.40	0.		
1328.	3.	43.	43.
1329.	19.	559.	559.
1330.	61.	2474.	2474.
1331.	117.	6811.	6811.
1332.	177.	12835.	12835.
1333.	239.	19433.	19433.
1334.	301.	26987.	26987.
1335.	363.	35777.	35777.
1336.	425.	45804.	45804.

CROSS SECTION 50.33

SCALES ARE 1 INCH = 10. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 50.34 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM		CRIT ELEV	FRICTION SLOPE
0	1328.4	0.0	0.0							
1	1328.4	.1	.1	.00	.00	.00	.10	C	1328.4	.01264
2	1328.5	.9	.5	.00	.00	.00	.50		1328.4	.00395
3	1328.5	.7	1.0	.00	.00	.00	1.00		1328.5	.02407
4	1328.7	3.3	1.5	.00	.00	.00	1.50		1328.5	.00232
5	1328.7	2.7	2.0	.00	.00	.00	2.00		1328.6	.00721
6	1328.7	3.3	2.5	.00	.00	.00	2.50		1328.6	.00635
7	1328.6	2.0	3.0	.00	.00	.00	3.00		1328.6	.03318
8	1328.7	3.5	3.5	.00	.00	.00	3.50		1328.6	.01020
9	1328.7	2.7	4.0	.00	.00	.00	4.00		1328.6	.02814
10	1328.8	6.5	4.5	.00	.00	.00	4.50		1328.6	.00274
11	1328.9	7.2	5.0	.00	.00	.00	5.00		1328.6	.00268
12	1328.8	6.3	7.0	.00	.00	.00	7.00		1328.7	.00734
13	1329.1	15.9	10.0	.00	.00	.00	10.00		1328.7	.00124
14	1329.7	52.9	15.0	.00	.00	.00	15.00		1328.8	.00011
15	1330.6	143.5	25.0	.00	.00	.00	25.00		1328.9	.00001

SEGMENT TABLE FOR SECTION 50.34

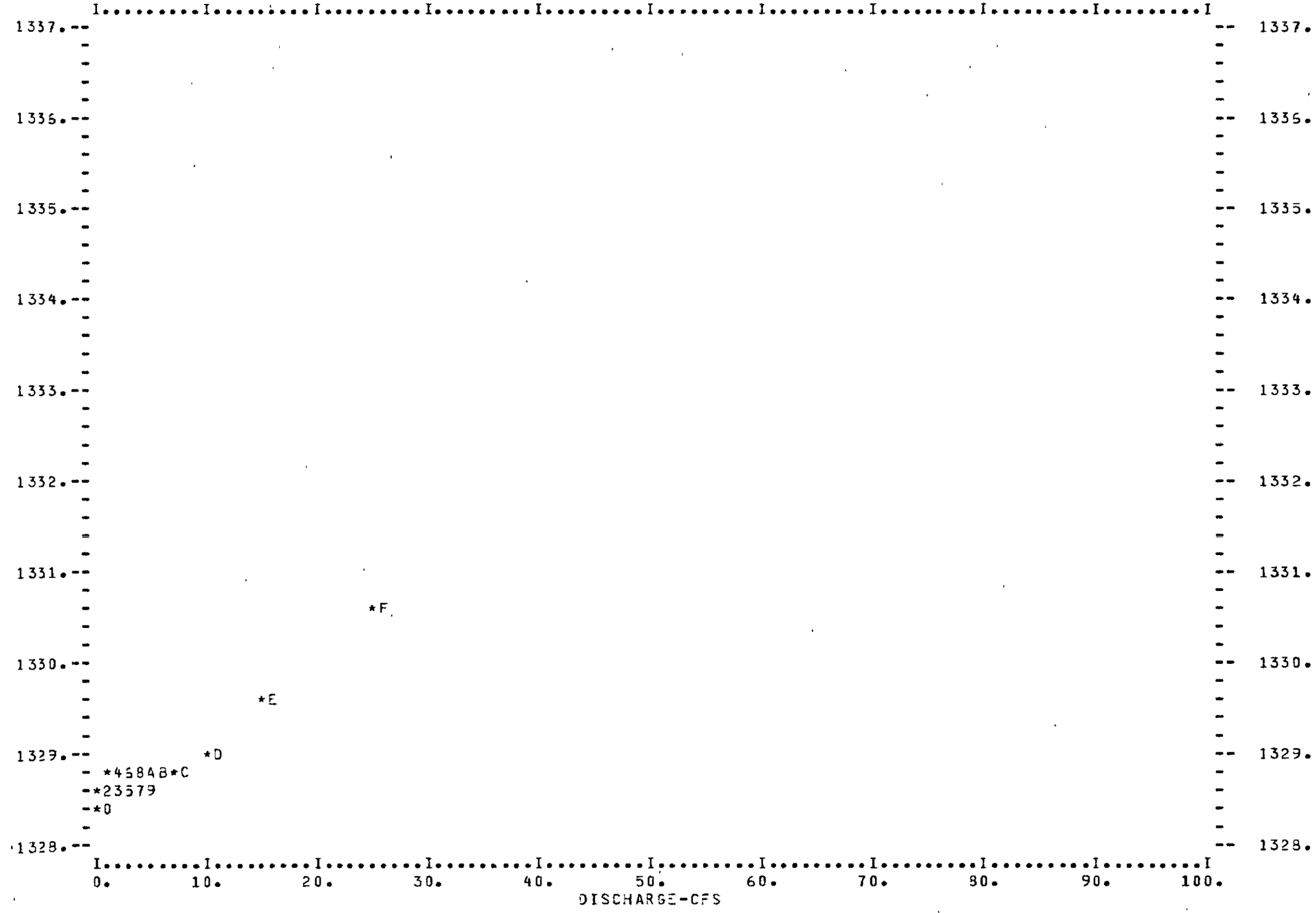
CSM		TOTAL	SEG NO 1 C
1	DISCHARGE CFS	0.	0.
0.	VELOCITY FPS	.19	.00
2	DISCHARGE CFS	0.	0.
0.	VELOCITY FPS	.42	.54
3	DISCHARGE CFS	1.	1.
1.	VELOCITY FPS	.92	1.42
4	DISCHARGE CFS	1.	1.
1.	VELOCITY FPS	.51	.46
5	DISCHARGE CFS	2.	2.
2.	VELOCITY FPS	.85	.74
6	DISCHARGE CFS	2.	2.
2.	VELOCITY FPS	.85	.76
7	DISCHARGE CFS	3.	3.
3.	VELOCITY FPS	1.65	1.47
8	DISCHARGE CFS	3.	3.
3.	VELOCITY FPS	1.11	.99
9	DISCHARGE CFS	4.	4.
4.	VELOCITY FPS	1.68	1.47
10	DISCHARGE CFS	4.	4.
4.	VELOCITY FPS	.71	.69
11	DISCHARGE CFS	5.	5.
5.	VELOCITY FPS	.73	.70
12	DISCHARGE CFS	7.	7.
7.	VELOCITY FPS	1.15	1.12
13	DISCHARGE CFS	10.	10.
10.	VELOCITY FPS	.55	.63
14	DISCHARGE CFS	15.	15.
15.	VELOCITY FPS	.29	.28
15	DISCHARGE CFS	25.	25.
25.	VELOCITY FPS	.18	.17
1	ELEV 1328.4 KD	1.	1.
2	ELEV 1328.5 KD	8.	8.
3	ELEV 1328.5 KD	6.	6.
4	ELEV 1328.7 KD	31.	31.
5	ELEV 1328.7 KD	24.	24.
6	ELEV 1328.7 KD	31.	31.
7	ELEV 1328.6 KD	16.	16.
8	ELEV 1328.7 KD	35.	35.
9	ELEV 1328.7 KD	24.	24.
10	ELEV 1328.8 KD	86.	86.
11	ELEV 1328.9 KD	97.	97.
12	ELEV 1328.8 KD	82.	82.
13	ELEV 1329.1 KD	284.	284.
14	ELEV 1329.7 KD	1443.	1443.

KD TABLE FOR CROSS SECTION 50.34

ELEVATION	AREA	KD	KD BY SEGMENT
1328.40	0.		
1329.	12.	194.	194.
1330.	82.	2743.	2743.
1331.	181.	9792.	9792.
1332.	284.	20144.	20144.
1333.	389.	32963.	32963.
1334.	494.	47160.	47160.
1335.	599.	63604.	63604.
1336.	704.	82231.	82231.

CROSS SECTION 50.34

SCALES ARE 1 INCH = 10. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 50.35 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1327.4	0.0	0.0						
1	1328.4	48.9	.1	.00	.00	.00	.10	1327.4	.00000
2	1328.5	60.3	.5	.00	.00	.00	.50	1327.4	.00000
3	1328.5	58.3	1.0	.00	.00	.00	1.00	1327.4	.00000
4	1328.7	76.6	1.5	.00	.00	.00	1.50	1327.5	.00000
5	1328.7	74.1	2.0	.00	.00	.00	2.00	1327.5	.00000
6	1328.7	77.5	2.5	.00	.00	.00	2.50	1327.5	.00000
7	1328.7	73.8	3.0	.00	.00	.00	3.00	1327.5	.00000
8	1328.7	79.6	3.5	.00	.00	.00	3.50	1327.5	.00000
9	1328.7	77.8	4.0	.00	.00	.00	4.00	1327.6	.00000
10	1328.9	92.5	4.5	.00	.00	.00	4.50	1327.6	.00000
11	1328.9	94.8	5.0	.00	.00	.00	5.00	1327.6	.00000
12	1328.9	93.0	7.0	.00	.00	.00	7.00	1327.6	.00001
13	1329.1	122.9	10.0	.00	.00	.00	10.00	1327.7	.00001
14	1329.7	209.4	15.0	.00	.00	.00	15.00	1327.7	.00000
15	1330.6	404.8	25.0	.00	.00	.00	25.00	1327.8	.00000

SEGMENT TABLE FOR SECTION 50.35

CSM		TOTAL	SEG NO 1 C
1	DISCHARGE CFS	0.	0.
0.	VELOCITY FPS	.00	.00
2	DISCHARGE CFS	0.	0.
0.	VELOCITY FPS	.01	.01
3	DISCHARGE CFS	1.	1.
1.	VELOCITY FPS	.02	.02
4	DISCHARGE CFS	1.	1.
1.	VELOCITY FPS	.02	.02
5	DISCHARGE CFS	2.	2.
2.	VELOCITY FPS	.03	.03
6	DISCHARGE CFS	2.	2.
2.	VELOCITY FPS	.03	.03
7	DISCHARGE CFS	3.	3.
3.	VELOCITY FPS	.04	.04
8	DISCHARGE CFS	3.	3.
3.	VELOCITY FPS	.04	.04
9	DISCHARGE CFS	4.	4.
4.	VELOCITY FPS	.05	.05
10	DISCHARGE CFS	4.	4.
4.	VELOCITY FPS	.05	.05
11	DISCHARGE CFS	5.	5.
5.	VELOCITY FPS	.05	.05
12	DISCHARGE CFS	7.	7.
7.	VELOCITY FPS	.08	.08
13	DISCHARGE CFS	10.	10.
10.	VELOCITY FPS	.08	.08
14	DISCHARGE CFS	15.	15.
15.	VELOCITY FPS	.07	.07
15	DISCHARGE CFS	25.	25.
25.	VELOCITY FPS	.06	.06

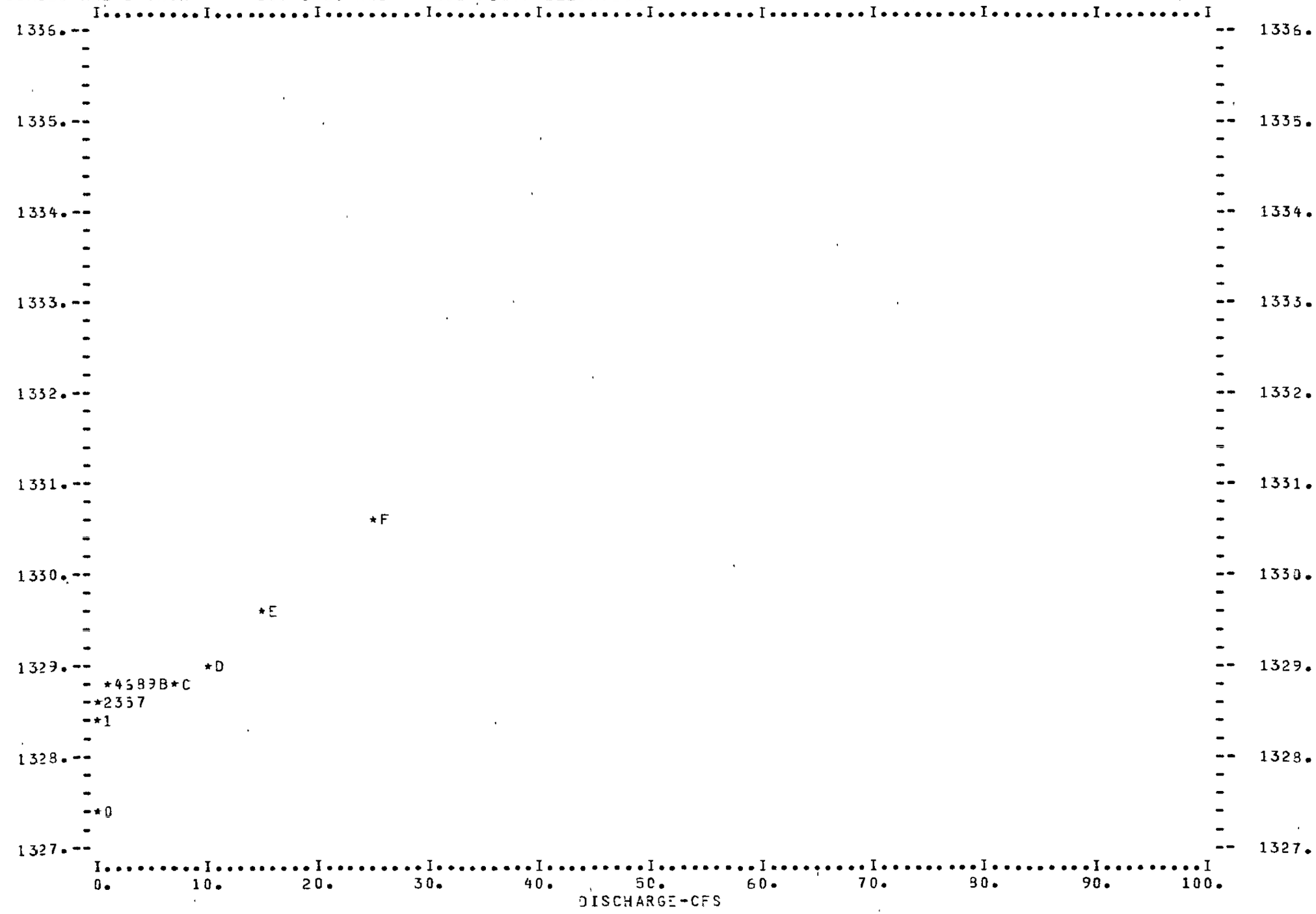
1	ELEV	1328.4	KD	1212.	1212.
2	ELEV	1328.5	KD	1646.	1646.
3	ELEV	1328.5	KD	1565.	1565.
4	ELEV	1328.7	KD	2264.	2264.
5	ELEV	1328.7	KD	2168.	2168.
6	ELEV	1328.7	KD	2299.	2299.
7	ELEV	1328.7	KD	2157.	2157.
8	ELEV	1328.7	KD	2382.	2382.
9	ELEV	1328.7	KD	2310.	2310.
10	ELEV	1328.9	KD	2922.	2922.
11	ELEV	1328.9	KD	3022.	3022.
12	ELEV	1328.9	KD	2944.	2944.
13	ELEV	1329.1	KD	4308.	4308.
14	ELEV	1329.7	KD	8840.	8840.
15	ELEV	1330.6	KD	21311.	21311.

KD TABLE FOR CROSS SECTION 50.35

ELEVATION	AREA	KD	KD BY SEGMENT
1327.40	0.		
1328.	19.	347.	347.
1329.	109.	3712.	3712.
1330.	271.	12382.	12382.
1331.	495.	28137.	28137.
1332.	793.	53463.	53463.
1333.	1121.	85742.	85742.
1334.	1451.	125286.	125286.
1335.	1781.	173513.	173513.
1336.	2111.	230808.	230808.

CROSS SECTION 50.35

SCALES ARE 1 INCH = 10. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 50.36 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1327.2	0.0	0.0						
1	1328.4	65.8	.1	.00	.00	.00	.10	1327.2	.00000
2	1328.5	81.0	.5	.00	.00	.00	.50	1327.2	.00000
3	1328.5	78.3	1.0	.00	.00	.00	1.00	1327.2	.00000
4	1328.7	98.7	1.5	.00	.00	.00	1.50	1327.3	.00000
5	1328.7	96.2	2.0	.00	.00	.00	2.00	1327.3	.00000
6	1328.7	99.7	2.5	.00	.00	.00	2.50	1327.3	.00000
7	1328.7	95.9	3.0	.00	.00	.00	3.00	1327.3	.00000
8	1328.7	101.8	3.5	.00	.00	.00	3.50	1327.3	.00000
9	1328.7	100.0	4.0	.00	.00	.00	4.00	1327.4	.00000
10	1328.9	116.2	4.5	.00	.00	.00	4.50	1327.4	.00000
11	1328.9	119.0	5.0	.00	.00	.00	5.00	1327.4	.00000
12	1328.9	116.9	7.0	.00	.00	.00	7.00	1327.4	.00000
13	1329.1	150.7	10.0	.00	.00	.00	10.00	1327.5	.00000
14	1329.7	245.2	15.0	.00	.00	.00	15.00	1327.5	.00000
15	1330.6	453.1	25.0	.00	.00	.00	25.00	1327.6	.00000

SEGMENT TABLE FOR SECTION 50.36

CSM		TOTAL	SEG NO 1
1	DISCHARGE CFS	0.	0.
0.	VELOCITY FPS	.00	.00
2	DISCHARGE CFS	0.	0.
0.	VELOCITY FPS	.01	.01
3	DISCHARGE CFS	1.	1.
1.	VELOCITY FPS	.01	.01
4	DISCHARGE CFS	1.	1.
1.	VELOCITY FPS	.02	.02
5	DISCHARGE CFS	2.	2.
2.	VELOCITY FPS	.02	.02
6	DISCHARGE CFS	2.	2.
2.	VELOCITY FPS	.03	.03
7	DISCHARGE CFS	3.	3.
3.	VELOCITY FPS	.03	.03
8	DISCHARGE CFS	3.	3.
3.	VELOCITY FPS	.03	.03
9	DISCHARGE CFS	4.	4.
4.	VELOCITY FPS	.04	.04
10	DISCHARGE CFS	4.	4.
4.	VELOCITY FPS	.04	.04
11	DISCHARGE CFS	5.	5.
5.	VELOCITY FPS	.04	.04
12	DISCHARGE CFS	7.	7.
7.	VELOCITY FPS	.06	.06
13	DISCHARGE CFS	10.	10.
10.	VELOCITY FPS	.07	.07
14	DISCHARGE CFS	15.	15.
15.	VELOCITY FPS	.06	.06
15	DISCHARGE CFS	25.	25.
25.	VELOCITY FPS	.06	.06

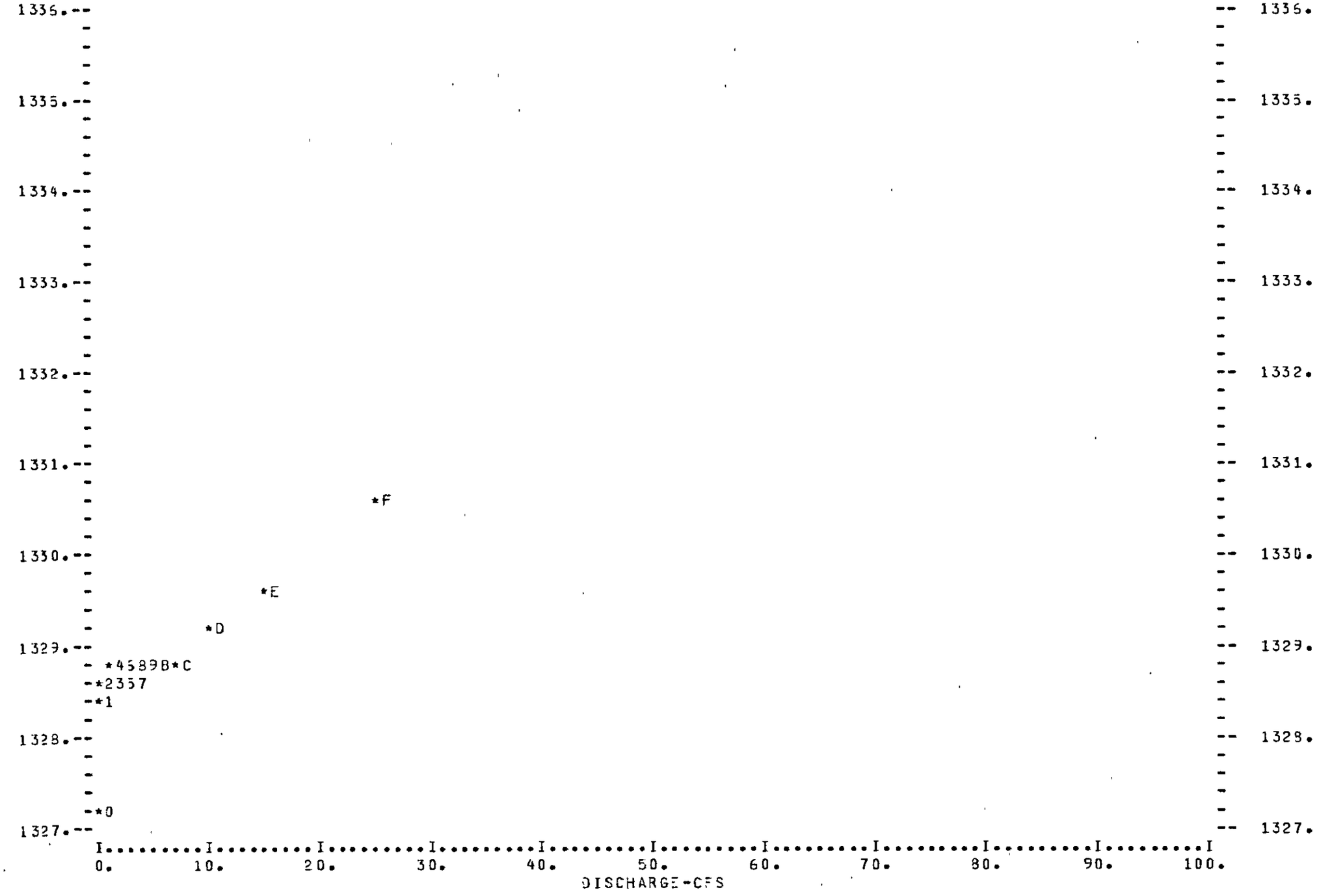
1	ELEV	1328.4	KD	1874.	1874.
2	ELEV	1328.5	KD	2434.	2434.
3	ELEV	1328.5	KD	2332.	2332.
4	ELEV	1328.7	KD	3205.	3205.
5	ELEV	1328.7	KD	3088.	3088.
6	ELEV	1328.7	KD	3249.	3249.
7	ELEV	1328.7	KD	3076.	3076.
8	ELEV	1328.7	KD	3352.	3352.
9	ELEV	1328.7	KD	3266.	3266.
10	ELEV	1328.9	KD	4011.	4011.
11	ELEV	1328.9	KD	4134.	4134.
12	ELEV	1328.9	KD	4044.	4044.
13	ELEV	1329.1	KD	5580.	5580.
14	ELEV	1329.7	KD	10922.	10922.
15	ELEV	1330.6	KD	24827.	24827.

KD TABLE FOR CROSS SECTION 50.36

ELEVATION	AREA	KD	KD BY SEGMENT
1327.20	0.		
1328.	32.	692.	692.
1329.	137.	4963.	4963.
1330.	310.	14914.	14914.
1331.	551.	32293.	32293.
1332.	857.	60071.	60071.
1333.	1187.	92976.	92976.
1334.	1517.	134224.	134224.
1335.	1847.	184235.	184235.

CROSS SECTION 50.36

SCALES ARE 1 INCH = 10. CFS, AND 1.2 FEET/ ELEVATION



ROAD SECTION 50.4

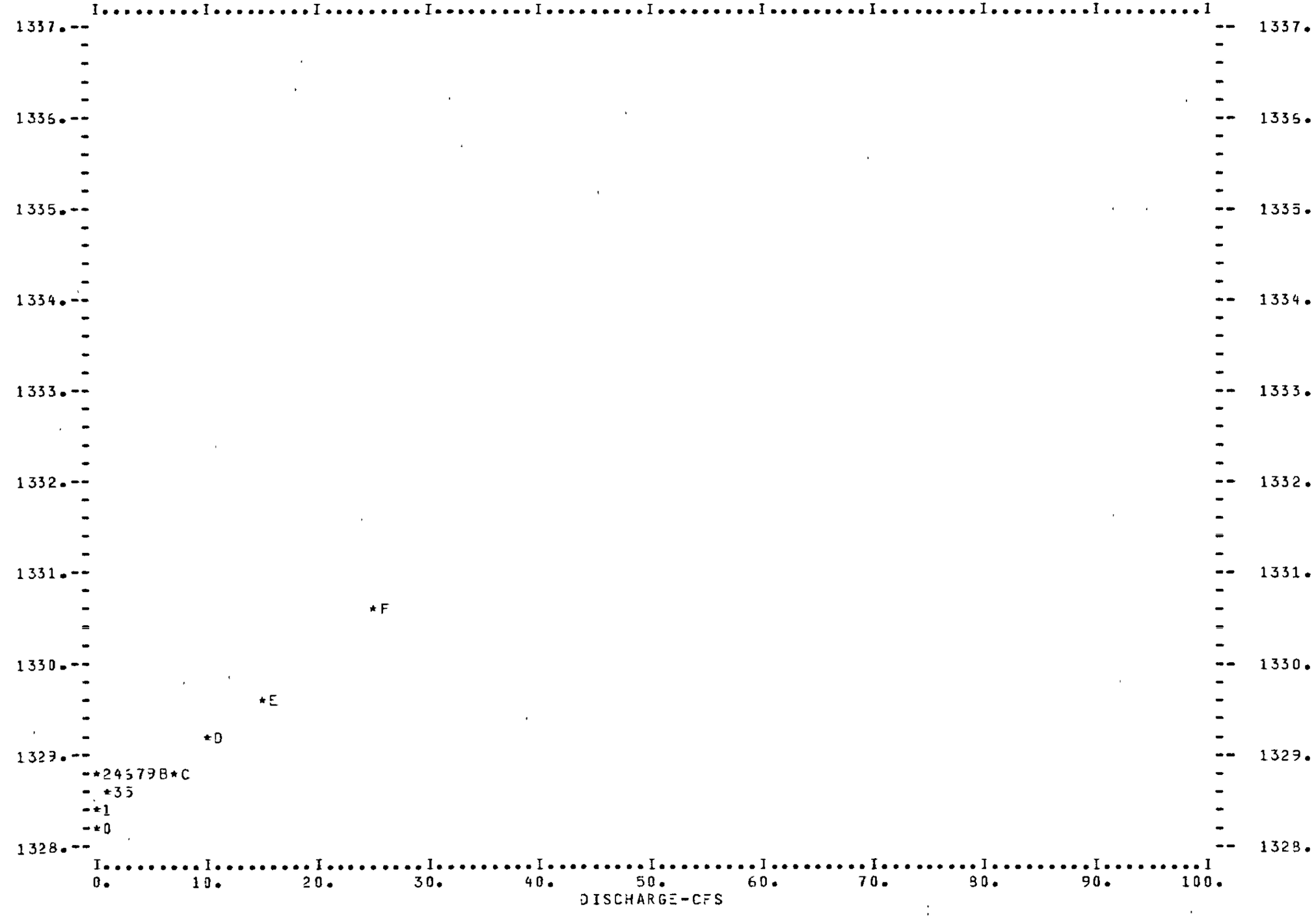
NO.	HW	CFS	HL	TW	CSM
0	1328.24	0.00	0.00	0.00	0.00
1	1328.41	.10	.00	1328.41	.10
2	1328.71	.50	.16	1328.55	.50
3	1328.68	1.00	.16	1328.52	1.00
4	1328.71	1.50	.00	1328.71	1.50
5	1328.68	2.00	.00	1328.68	2.00
6	1328.71	2.50	.00	1328.71	2.50
7	1328.76	3.00	.08	1328.68	3.00
8	1328.73	3.50	.00	1328.73	3.50
9	1328.72	4.00	.00	1328.72	4.00
10	1328.85	4.50	.00	1328.85	4.50
11	1328.87	5.00	.00	1328.87	5.00
12	1328.86	7.00	.00	1328.86	7.00
13	1329.10	10.00	.00	1329.10	10.00
14	1329.67	15.00	.00	1329.67	15.00
15	1330.63	25.00	.00	1330.63	25.00

MIN ROAD ELEVATION 1328.70

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	12311.	1.00		40.00	1328.24	1327.99	.024

ROAD SECTION 50.4

SCALES ARE 1 INCH = 10. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 50.41 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1328.3	0.0	0.0						
1	1328.4	1.5	.1	.00	.00	.00	.10	1328.3	.00008
2	1328.7	9.7	.5	.00	.00	.00	.50	1328.3	.00001
3	1328.7	8.8	1.0	.00	.00	.00	1.00	1328.3	.00007
4	1328.7	9.8	1.5	.00	.00	.00	1.50	1328.4	.00012
5	1328.7	8.9	2.0	.00	.00	.00	2.00	1328.4	.00029
6	1328.7	10.2	2.5	.00	.00	.00	2.50	1328.4	.00030
7	1328.8	12.4	3.0	.00	.00	.00	3.00	1328.4	.00026
8	1328.7	11.2	3.5	.00	.00	.00	3.50	1328.4	.00047
9	1328.7	10.4	4.0	.00	.00	.00	4.00	1328.5	.00073
10	1328.9	16.7	4.5	.00	.00	.00	4.50	1328.5	.00025
11	1328.9	17.7	5.0	.00	.00	.00	5.00	1328.5	.00026
12	1328.9	17.1	7.0	.00	.00	.00	7.00	1328.5	.00057
13	1329.1	31.7	10.0	.00	.00	.00	10.00	1328.6	.00021
14	1329.7	84.0	15.0	.00	.00	.00	15.00	1328.6	.00003
15	1330.6	218.4	25.0	.00	.00	.00	25.00	1328.7	.00001

SEGMENT TABLE FOR SECTION 50.41

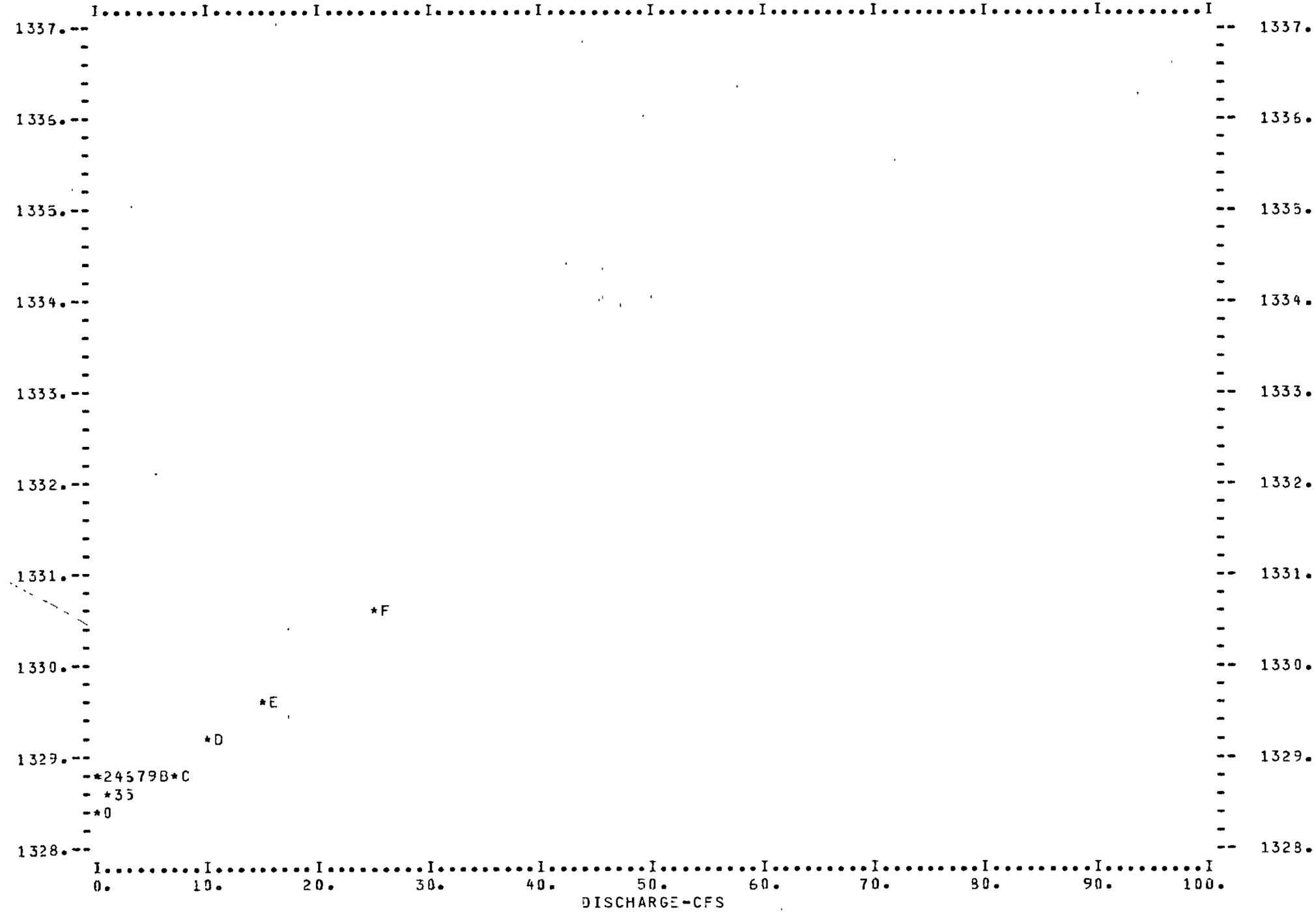
CSM		TOTAL	SEG NO 1 C
1	DISCHARGE CFS	0.	0.
0.	VELOCITY FPS	.05	.07
2	DISCHARGE CFS	0.	0.
0.	VELOCITY FPS	.05	.05
3	DISCHARGE CFS	1.	1.
1.	VELOCITY FPS	.12	.11
4	DISCHARGE CFS	1.	1.
1.	VELOCITY FPS	.15	.15
5	DISCHARGE CFS	2.	2.
2.	VELOCITY FPS	.23	.22
6	DISCHARGE CFS	2.	2.
2.	VELOCITY FPS	.25	.25
7	DISCHARGE CFS	3.	3.
3.	VELOCITY FPS	.25	.24
8	DISCHARGE CFS	3.	3.
3.	VELOCITY FPS	.32	.31
9	DISCHARGE CFS	4.	4.
4.	VELOCITY FPS	.39	.38
10	DISCHARGE CFS	4.	4.
4.	VELOCITY FPS	.27	.27
11	DISCHARGE CFS	5.	5.
5.	VELOCITY FPS	.29	.28
12	DISCHARGE CFS	7.	7.
7.	VELOCITY FPS	.42	.41
13	DISCHARGE CFS	10.	10.
10.	VELOCITY FPS	.32	.32
14	DISCHARGE CFS	15.	15.
15.	VELOCITY FPS	.18	.18
15	DISCHARGE CFS	25.	25.
25.	VELOCITY FPS	.12	.11
1	ELEV 1328.4 KD	11.	11.
2	ELEV 1328.7 KD	136.	136.
3	ELEV 1328.7 KD	117.	117.
4	ELEV 1328.7 KD	137.	137.
5	ELEV 1328.7 KD	118.	118.
6	ELEV 1328.7 KD	144.	144.
7	ELEV 1328.8 KD	186.	186.
8	ELEV 1328.7 KD	162.	162.
9	ELEV 1328.7 KD	148.	148.
10	ELEV 1328.9 KD	284.	284.
11	ELEV 1328.9 KD	310.	310.
12	ELEV 1328.9 KD	293.	293.
13	ELEV 1329.1 KD	696.	696.
14	ELEV 1329.7 KD	2557.	2557.

KD TABLE FOR CROSS SECTION 50.41

ELEVATION	AREA	KD	KD BY SEGMENT
1328.30	0.		
1329.	25.	502.	502.
1330.	123.	4310.	4310.
1331.	290.	13613.	13613.
1332.	523.	30172.	30172.
1333.	825.	56706.	56706.
1334.	1154.	89318.	89318.
1335.	1484.	129712.	129712.
1336.	1814.	178829.	178829.
1337.	2144.	237051.	237051.

CROSS SECTION 50.41

SCALES ARE 1 INCH = 10. CFS, AND 1.2 FEET/ ELEVATION



CLAM RIVER - FPMS -WEXFORD CO.,MI. OCT. 23,1986
PLEASANT LAKE OUTLET - PRESENT CONDITIONS

ROAD SECTION 50.42

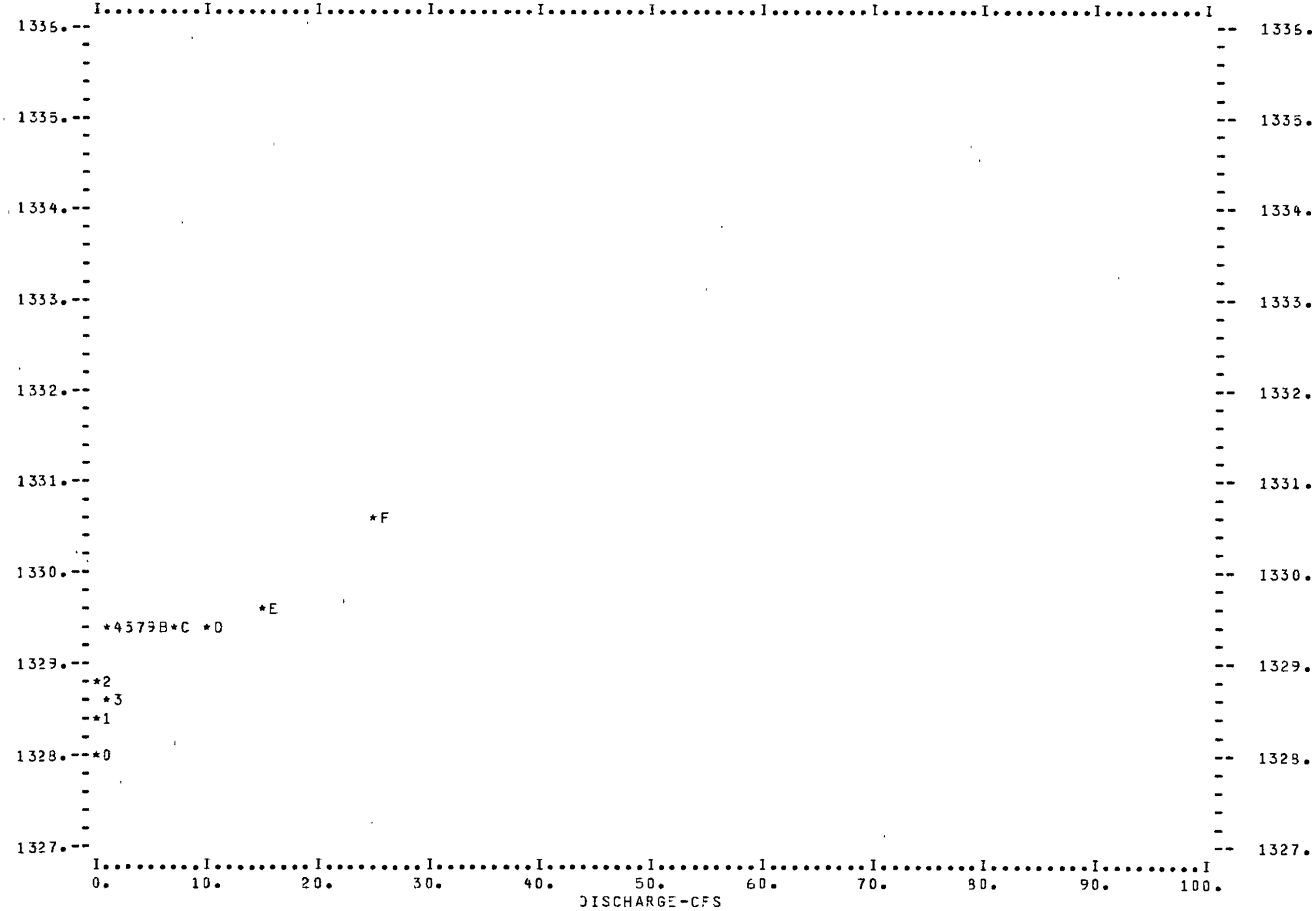
NO.	HW	CFS	HL	TW	CSM
0	1327.91	0.00	0.00	0.00	0.00
1	1328.41	.10	.00	1328.41	.10
2	1328.71	.50	.00	1328.71	.50
3	1328.68	1.00	.00	1328.68	1.00
4	1329.35	1.50	.64	1328.71	1.50
5	1329.41	2.00	.72	1328.69	2.00
6	1329.36	2.50	.64	1328.72	2.50
7	1329.40	3.00	.64	1328.76	3.00
8	1329.38	3.50	.64	1328.74	3.50
9	1329.36	4.00	.64	1328.72	4.00
10	1329.41	4.50	.56	1328.85	4.50
11	1329.43	5.00	.56	1328.87	5.00
12	1329.42	7.00	.56	1328.86	7.00
13	1329.42	10.00	.32	1329.10	10.00
14	1329.67	15.00	.00	1329.67	15.00
15	1330.63	25.00	.00	1330.63	25.00

MIN ROAD ELEVATION 1329.40

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	22533.	.83		170.00	1327.87	1327.91	.012

ROAD SECTION 50.42

SCALES ARE 1 INCH = 10. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 50.43 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1326.8	0.0	0.0						
1	1328.4	321.9	.1	.00	.00	.00	.10	1326.8	.00000
2	1328.7	381.2	.5	.00	.00	.00	.50	1326.8	.00000
3	1328.7	376.6	1.0	.00	.00	.00	1.00	1326.8	.00000
4	1329.3	509.5	1.5	.00	.00	.00	1.50	1326.8	.00000
5	1329.4	521.1	2.0	.00	.00	.00	2.00	1326.8	.00000
6	1329.4	511.4	2.5	.00	.00	.00	2.50	1326.8	.00000
7	1329.4	520.7	3.0	.00	.00	.00	3.00	1326.8	.00000
8	1329.4	515.6	3.5	.00	.00	.00	3.50	1326.8	.00000
9	1329.4	512.7	4.0	.00	.00	.00	4.00	1326.8	.00000
10	1329.4	522.6	4.5	.00	.00	.00	4.50	1326.8	.00000
11	1329.4	526.7	5.0	.00	.00	.00	5.00	1326.8	.00000
12	1329.4	524.3	7.0	.00	.00	.00	7.00	1326.8	.00000
13	1329.4	524.7	10.0	.00	.00	.00	10.00	1326.8	.00000
14	1329.7	574.7	15.0	.00	.00	.00	15.00	1326.8	.00000
15	1330.6	765.3	25.0	.00	.00	.00	25.00	1326.8	.00000

SEGMENT TABLE FOR SECTION 50.43

CSM		TOTAL	SEG NO 1
1	DISCHARGE CFS	0.	0.
0.	VELOCITY FPS	.00	.00
2	DISCHARGE CFS	0.	0.
0.	VELOCITY FPS	.00	.00
3	DISCHARGE CFS	1.	1.
1.	VELOCITY FPS	.00	.00
4	DISCHARGE CFS	1.	1.
1.	VELOCITY FPS	.00	.00
5	DISCHARGE CFS	2.	2.
2.	VELOCITY FPS	.00	.00
6	DISCHARGE CFS	2.	2.
2.	VELOCITY FPS	.00	.00
7	DISCHARGE CFS	3.	3.
3.	VELOCITY FPS	.01	.01
8	DISCHARGE CFS	3.	3.
3.	VELOCITY FPS	.01	.01
9	DISCHARGE CFS	4.	4.
4.	VELOCITY FPS	.01	.01
10	DISCHARGE CFS	4.	4.
4.	VELOCITY FPS	.01	.01
11	DISCHARGE CFS	5.	5.
5.	VELOCITY FPS	.01	.01
12	DISCHARGE CFS	7.	7.
7.	VELOCITY FPS	.01	.01
13	DISCHARGE CFS	10.	10.
10.	VELOCITY FPS	.02	.02
14	DISCHARGE CFS	15.	15.
15.	VELOCITY FPS	.03	.03
15	DISCHARGE CFS	25.	25.
25.	VELOCITY FPS	.03	.03

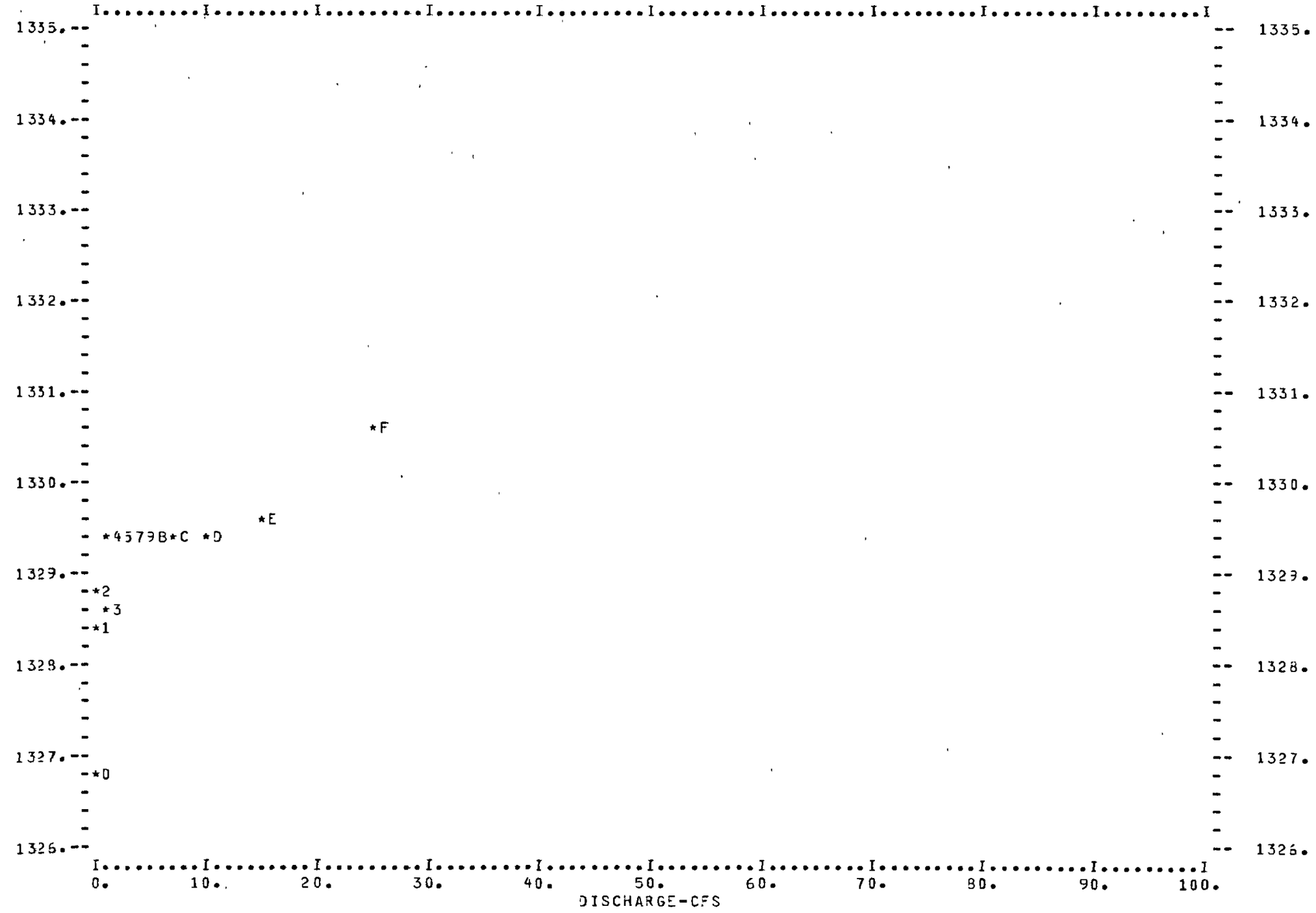
1	ELEV	1328.4	KD	16253.	16253.
2	ELEV	1328.7	KD	21500.	21500.
3	ELEV	1328.7	KD	21070.	21070.
4	ELEV	1329.3	KD	34724.	34724.
5	ELEV	1329.4	KD	36042.	36042.
6	ELEV	1329.4	KD	34940.	34940.
7	ELEV	1329.4	KD	35989.	35989.
8	ELEV	1329.4	KD	35411.	35411.
9	ELEV	1329.4	KD	35085.	35085.
10	ELEV	1329.4	KD	36216.	36216.
11	ELEV	1329.4	KD	36582.	36582.
12	ELEV	1329.4	KD	36402.	36402.
13	ELEV	1329.4	KD	36448.	36448.
14	ELEV	1329.7	KD	42360.	42360.
15	ELEV	1330.[illegible]	KD	67858.	67858.

KD TABLE FOR CROSS SECTION 50.43

ELEVATION	AREA	KD	KD BY SEGMENT
1326.80	0.		
1327.	40.	507.	507.
1328.	240.	9989.	9989.
1329.	440.	27257.	27257.
1330.	640.	50573.	50573.
1331.	840.	79073.	79073.
1332.	1040.	112161.	112161.
1333.	1240.	149126.	149126.
1334.	1440.	189686.	189686.
1335.	1640.	233834.	233834.
1336.	1840.	281390.	281390.

CROSS SECTION 50.43

SCALES ARE 1 INCH = 10. CFS, AND 1.2 FEET/ ELEVATION



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-----------------------------80/80 LIST OF INPUT DATA-----------------------------
ENDJOB                                                                      72


*****************************NORMAL END OF JOB-----------------------------
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-----------------------------80/80 LIST OF INPUT DATA-----------------------------
ENDRUN                                                                        73

@FIN
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