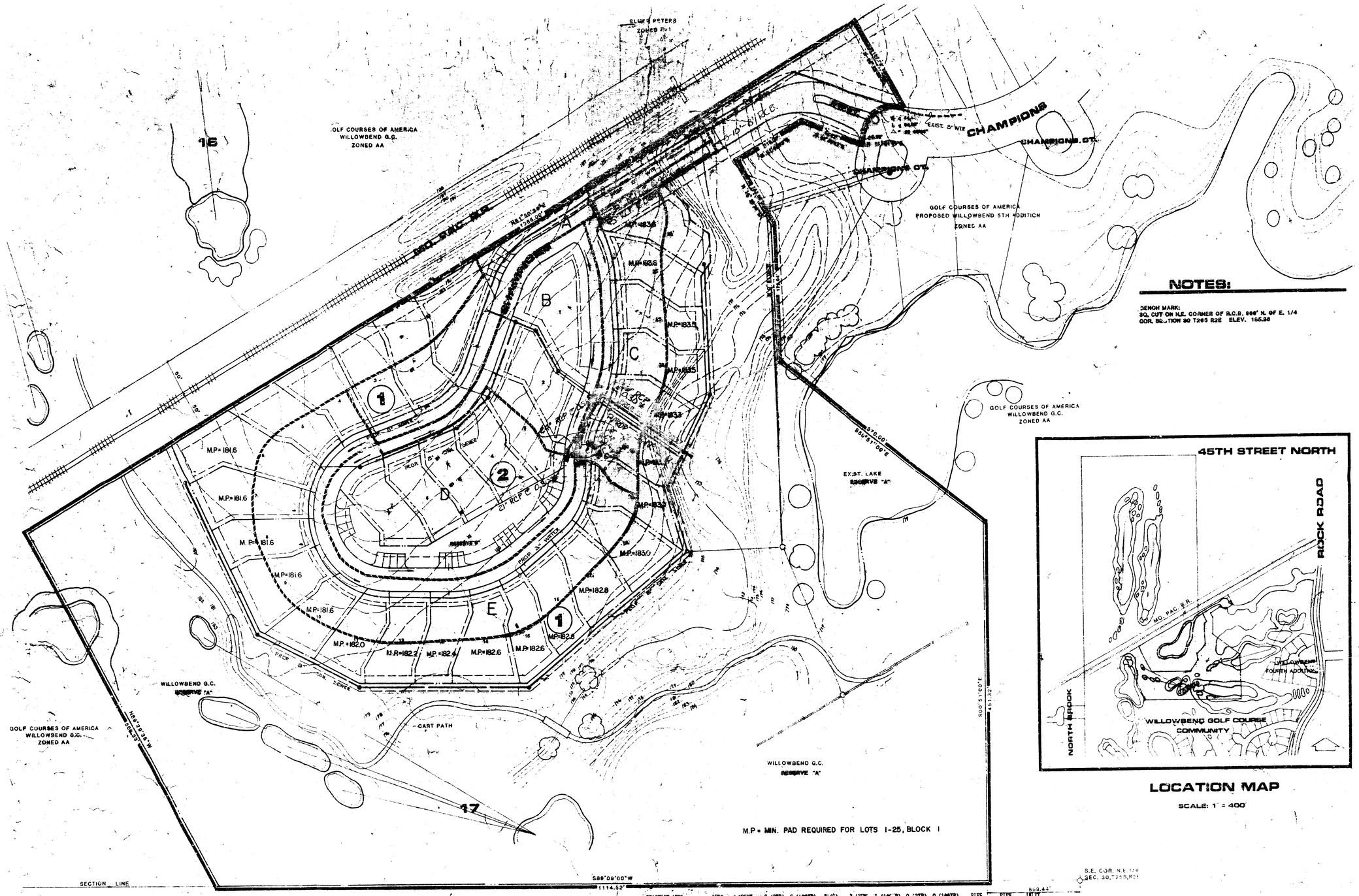


NOTES:

BENCH MARK:
SQ. CUT ON N.E. CORNER OF R.C.B. 996' N. OF E. 1/4
COR. SECTION 30 T26S R2E ELEV. 1165.38

LOCATION MAP

SCALE: 1" = 400'

S.E. COR. N.E. 1/4 SEC. 30, T26S, R2E

DRAINAGE AREA	AREA (ACRES)	ACCUM. AREA	C (2YR)	C (100YR)	T'C (MIN.)	I (2YR) (IN./HR.)	I (100YR) (IN./HR.)	Q (2YR) (CFS)	Q (100YR) (CFS)	PIPE SIZE	PIPE SLOPE	INLET TYPE
A	0.61		0.57	0.70	15.00	3.83	7.37	1.33	4.69	15" RCP	0.445	2L(I)=5
B	0.96		0.57	0.70	15.00	3.83	7.37	2.10	5.59			
C	0.67		0.57	0.70	15.00	3.83	7.37	1.90	5.37			1.(I)=5'
E & C		1.83	0.57	0.70	15.00	3.83	7.37	4.00	10.05	24" RCP	0.505	2L(I)=10
D	1.48		0.57	0.70	15.00	3.83	7.37	5.06	8.15			
B	1.79		0.57	0.70	15.00	3.83	7.37	3.71	9.90			
D & B		3.18	0.57	0.70	15.00	3.83	7.37	6.77	18.05			
A THRU E		5.77	0.57	0.70	15.00	3.83	7.37	12.60	33.59	30" RCP	0.395	2L(I)=14

N
W E
S

SCALE: 1" = 50'
CONTOUR INTERVAL = 1'

DRAINAGE & UTILITY PLAN

WILLOWBEND HEIGHTS

MID-KANSAS ENGINEERING CONSULTANTS PA
3500 NORTH ROCK ROAD
BUILDING #800
WICHITA, KANSAS 67226
682-6561

CONFIRMATION MEMO

MID-KANSAS ENGINEERING
CONSULTANTS, P.A.
1609 S.W. 37th STREET
TOPEKA, KANSAS 66611

PROJECT: East Fork of Chisholm Creek (Willowbend Heights)

PROJECT NO.: DATE: 9/29/87

TO: Chris Dreitenstein

FROM: John White

REF: Summary of Hydraulic Review

This memo is written to summarize the findings of our hydraulic review of the East Fork of Chisholm Creek in Wichita, Kansas. Our study began north of 37th Street and extended to the downstream end of the Missouri Pacific Railroad. Attached is a copy of the flood boundary map for the study area.

Hydraulic analysis was completed using the HEC2 computer program. Cross section data for input was taken from field surveys. Starting elevations and 100 year flows were taken from the FEMA report dated May 15, 1986.

Two water surface profiles were developed for review. The first profile considered existing conditions. For an existing condition, the "n" factor used was relatively low. With these "n" factors, the calculated profile was similar but higher than that presented in the FEMA report. These elevations are outlined in the attached table.

The discrepancies in the two profiles were considered acceptable because of potential variances that would be expected in the methods of gathering cross section data.

The profile for the improved conditions considered an improved channel for the first 800 feet downstream of the Missouri Pacific Railroad. The improved channel will have a 52 foot flat bottom with near vertical limestone rock walls up 5 feet to a flat bench on each side. The benchs will be 15 feet wide with 1:2 side slopes. The model assumed that low areas along the channel were filled to an elevation above the maximum high water.

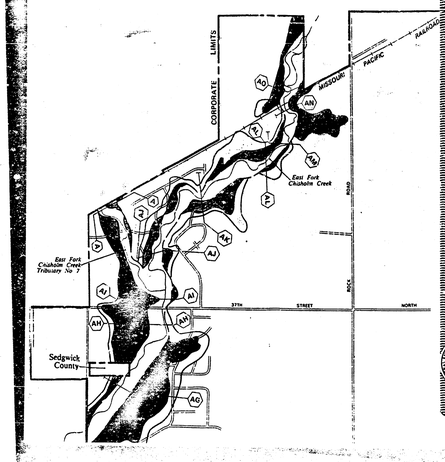
The improved channel profile indicates a reduction of about 0.5 feet in the water surface at the railroad as compared to the FEMA profile. The reduction is greater when compared to the existing conditions profile.

For review purposes the HEC2 output for each of the two runs has been attached.

EAST FORK CHISHOLM CREEK
Wichita, Kansas

MKEC Station	FEMA Section	FEMA 100 Year	MKEC 100 Year Existing	MKEC 100 Year Improved
50+00	AK	1364.1	1364.10	1361.10
55+50			1364.58	1361.58
60+00			1365.04	1365.04
64+00			1365.91	1365.91
68+00	AL	1366.2	1366.38	1366.38
70+00			1366.75	1366.75
72+00			1366.56	1366.86
75+00	AM	1367.3	1367.84	1367.04
80+00(1)	AN	1368.1	1368.91	1367.63

(1) Downstream of Missouri Pacific Railroad



NATIONAL FLOOD INSURANCE PROGRAM

FLOODWAY
FLOOD BOUNDARY AND FLOODWAY MAP

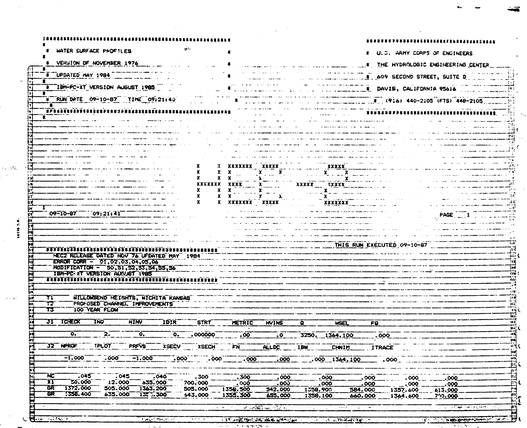
CITY OF
WICHITA,
KANSAS
SEDGWICK COUNTY

PANEL 15 OF 40
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
200328 0015

EFFECTIVE DATE:
MAY 15, 1986

Federal Emergency Management Agency


* WATER SURFACE PROFILES *
* VERSION OF NOVEMBER 1976 *
* UPDATED MAY 1984 *
* IBM-PC-XT VERSION AUGUST 1985 *
* RUN DATE 09-10-87 TIME 09:21:40 *
* U.S. ARMY CORPS OF ENGINEERS *
* THE HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET, SUITE D *
* DAVIS, CALIFORNIA 95616 *
* (916) 440-2105 (FTS) 448-2105 *
09-10-87 09:21:41
PAGE 1
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HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
ERROR CORR - 01,02,03,04,05,06
MODIFICATION - 50,51,52,53,54,55,56
IBM-PC-XT VERSION AUGUST 1985
Y1 WILLOWBEND HEIGHTS, WICHITA KANSAS
Y2 PROPOSED CHANNEL IMPROVEMENTS
Y3 100 YEAR FLOW
J1 ICHECK INQ NINV IOPT STRT METRIC HVINS Q WSEL FQ
0. 2. 0. 0. .000000 .00 0. 3250. 1364.100 .000
J2 NPROF IPLOT PRFVS XSECV XSECH FN ALLOC IBW CHNIM ITRACE
-1.000 .000 -1.000 .000 .000 .000 .000 .000 1364.100 .000
NC .045 .045 .040 .300 .500 .000 .000 .000 .000 .000
X1 50.000 12.000 635.000 700.000 .000 .000 .000 .000 .000 .000
GR 1372.000 505.000 1343.200 542.000 1298.900 584.000 1337.600 613.000
GR 1288.600 635.000 1355.300 643.000 1359.300 655.000 1358.100 660.000 1264.600 700.000
X1 55.500 .000 .000 .000 420.000 470.000 550.000 .000 .000 .000
X1 60.000 11.000 624.000 701.000 400.000 450.000 450.000 .000 .000 .000
GR 1349.000 .000 1364.400 741.000 1344.400 784.000 1364.800 466.000 1361.800 555.000
GR 1360.000 624.000 1358.700 643.000 1355.700 650.000 1358.500 653.000 1368.200 701.000
GR 1372.300 822.000 .000 .000 .000 .000 .000 .000 .000 .000
X1 64.000 .000 .000 .000 450.000 400.000 400.000 .000 .000 .000
X1 68.000 .000 .000 .000 300.000 400.000 400.000 .000 .000 .000
X1 70.000 .000 .000 .000 200.000 200.000 200.000 .000 .000 .000
NC .035 .035 .030 .030 .000 .000 .000 .000 .000 .000
X1 72.000 8.000 33.000 60.000 200.000 200.000 200.000 .000 .000 .000
GR 1366.100 .000 1363.600 33.000 1354.400 42.000 1353.400 54.000 1361.200 60.000
GR 1367.500 84.000 .000 .000 .000 .000 .000 .000 .000 .000
X1 75.000 10.000 63.000 119.000 300.000 300.000 300.000 .000 1.500 .000
GR 1366.600 .000 1364.600 63.000 1368.100 104.000 1359.900 104.000 1364.800 115.000
GR 1361.700 119.000 1362.000 161.000 1360.300 190.000 1359.900 189.000 1368.200 208.000
X1 80.000 9.000 137.000 197.000 500.000 500.000 500.000 .000 1.400 .000
GR 1368.000 .000 1364.100 84.000 1364.200 137.000 1360.900 149.000 1360.100 154.000
GR 1362.600 165.000 1362.400 180.000 1364.200 197.000 1369.200 214.000 .000 .000
ED .000 .000 .000 .000 .000 .000 .000 .000 .000 .000
09-29-87 08:25:32
PAGE 2
SECOND DEPTH CWSEL CRIWS WSELK ES HV HL OLOSS BANK ELEV
TIME VLOB VCH VROB XNL XNCH XNR VOL TWA LEFT/RIGHT
SLOPE KLOB KCH KROB TRIAL IBC ICONT CORAR TOPWID ENDST
#SECHO 50.000 1364.10 1364.28 .18 .00 .00 1790.60
50.00 8.80 1364.10 .00 1364.10 1364.28 .18 .00 .00 1790.60
3250. 2144. 1104. 0. 0. 0. 0. 0. 0. 1364.60
.00 3.27 5.00 .00 .045 .040 .045 .000 1335.30 505.00
.001103 0. 0. 0. 1 0 0 .00 191.92 494.92
#SECHO 55.500 1364.58 .00 .00 1364.72 .15 .44 .01 1358.43
55.50 9.28 1364.58 .00 .00 1364.72 .15 .44 .01 1358.43
3250. 2195. 1091. 0. 764. 942. 0. 11. 1360.20
.00 3.03 5.19 .00 .045 .040 .045 .000 1335.30 505.00
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60.00 9.34 1365.04 .00 .00 1365.33 .29 .56 .04 1360.20
3250. 1772. 1478. 0. 492. 293. 0. 20. 4. 1368.34
.00 3.60 5.00 .00 .045 .040 .045 .000 1335.30 505.00
.002838 400. 450. 400. 2 0 0 .00 251.30 685.30
#SECHO 64.000 1365.91 .00 .00 1366.08 .17 .72 .04 1360.20
64.00 10.21 1365.91 .00 .00 1366.08 .17 .72 .04 1360.20
3250. 1910. 1340. 0. 677. 348. 0. 26. 7. 1368.20
.00 2.82 5.85 .00 .045 .040 .045 .000 1335.30 505.00
.001220 400. 450. 400. 2 0 0 .00 299.38 689.69
#SECHO 68.000 1366.38 .00 .00 1366.61 .23 .91 .02 1361.00
68.00 10.92 1421. 0. 359. 314. 0. 36. 9. 1369.20
3250. 1897. 1441. 0. 533. 304. 0. 40. 10. 1369.36
.00 2.39 6.72 .00 .045 .040 .045 .000 1337.20 423.50
.002039 200. 200. 200. 2 0 0 .00 262.90 686.40
09-29-87 08:25:32
PAGE 3
SECOND DEPTH CWSEL CRIWS WSELK ES HV HL OLOSS BANK ELEV
TIME VLOB VCH VROB XNL XNCH XNR VOL TWA LEFT/RIGHT
SLOPE KLOB KCH KROB TRIAL IBC ICONT CORAR TOPWID ENDST
#SECHO 72.000 1366.86 .00 .00 1367.29 .42 .24 .05 1362.20
72.00 9.46 1366.86 .00 .00 1367.29 .42 .24 .05 1362.20
3250. 1281. 1796. 224. 73. 502. 72. 45. 11. 1362.20
.16 3.11 5.56 3.10 .035 .030 .035 .000 1357.20 .00
.003772 200. 200. 200. 2 2 0 .00 84.00 84.00
#SECHO 75.000 1367.04 .00 .00 1367.62 .39 .28 .05 1362.40
75.00 8.64 1367.04 .00 .00 1367.62 .39 .28 .05 1362.40
3250. 2195. 1091. 0. 764. 942. 0. 11. 1360.20
.14 3.29 6.41 3.10 .035 .030 .035 .000 1357.20 505.00
.001191 420. 980. 470. 2 2 0 .00 85.44 85.72
#SECHO 80.000 1367.63 .00 .00 1368.39 .76 .72 .05 1364.80
80.00 7.85 1367.63 .00 .00 1368.39 .76 .72 .05 1364.80
3250. 1441. 2963. 143. 43. 407. 42. 53. 13. 1364.80
.19 3.38 7.27 3.58 .035 .030 .035 .000 1374.80 .69
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09-10-87 09:21:41
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ERROR CORR - 01,02,03,04,05,06
MODIFICATION - 50,51,52,53,54,55,56
IBM-PC-XT VERSION AUGUST 1985
NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST
100 YEAR FLOW
SUMMRY PRINTOUT TABLE 150
SECNO XLCH ELTRD ELLC ELMIN Q CWSEL CRIWS ES 10K*S VCH AREA .01K
50.000 .00 .00 .00 1355.30 3250.00 1364.10 .00 1364.28 11.03 3.55 962.24 978.61
55.500 550.00 .00 .00 1355.30 3250.00 1364.58 .00 1364.72 8.34 3.19 1055.99 1125.40
60.000 450.00 .00 .00 1355.70 3250.00 1365.04 .00 1365.33 24.24 5.05 784.60 659.88
64.000 400.00 .00 .00 1355.70 3250.00 1365.91 .00 1366.08 12.20 2.85 1025.56 930.40
68.000 400.00 .00 .00 1354.70 3250.00 1366.38 .00 1366.61 18.42 4.53 872.55 757.29
70.000 200.00 .00 .00 1357.20 3250.00 1366.75 .00 1367.00 20.39 4.72 838.89 719.77
72.000 200.00 .00 .00 1357.20 3250.00 1366.86 .00 1367.29 11.91 6.41 561.29 941.62
75.000 300.00 .00 .00 1358.40 3250.00 1367.04 .00 1367.62 11.91 6.41 561.29 941.62
80.000 500.00 .00 .00 1359.80 3250.00 1367.63 .00 1368.39 17.49 7.27 492.36 777.21
09-10-87 09:21:41
PAGE 5
100 YEAR FLOW
SUMMRY PRINTOUT TABLE 150
SECNO Q CWSEL DIFWSP DIFWSR DIFKWS TOPWID XLCH
50.000 3250.00 1364.10 .00 .00 .00 191.92 .00
55.500 3250.00 1364.58 .00 .48 .00 194.89 550.00
60.000 3250.00 1365.04 .00 .46 .00 251.30 450.00
64.000 3250.00 1365.91 .00 .88 .00 299.38 400.00
68.000 3250.00 1366.38 .00 .46 .00 249.84 400.00
70.000 3250.00 1366.75 .00 .37 .00 262.90 200.00
72.000 3250.00 1366.86 .00 .11 .00 84.00 200.00
75.000 3250.00 1367.04 .00 .18 .00 85.44 300.00
80.000 3250.00 1367.63 .00 .59 .00 84.63 500.00
09-10-87 09:21:41
PAGE 6
SUMMARY OF ERRORS AND SPECIAL NOTES
09-10-87 09:21:53
PAGE 1
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HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
ERROR CORR - 01,02,03,04,05,06
MODIFICATION - 50,51,52,53,54,55,56
IBM-PC-XT VERSION AUGUST 1985
UNEXPECTED END OF FILE ABORT IN SUBROUTINE HCHAIN
09-29-87 08:25:32
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THIS RUN EXECUTED 09-29-87
HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
ERROR CORR - 01,02,03,04,05,06
MODIFICATION - 50,51,52,53,54,55,56
IBM-PC-XT VERSION AUGUST 1985
NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST
100 YEAR FLOW
SUMMRY PRINTOUT TABLE 150
SECNO XLCH ELTRD ELLC ELMIN Q CWSEL CRIWS ES 10K*S VCH AREA .01K
50.000 .00 .00 .00 1355.30 3250.00 1364.10 .00 1364.28 11.03 3.55 962.24 978.61
55.500 550.00 .00 .00 1355.30 3250.00 1364.58 .00 1364.72 8.34 3.19 1055.99 1125.40
60.000 450.00 .00 .00 1355.70 3250.00 1365.04 .00 1365.33 24.24 5.05 784.60 659.88
64.000 400.00 .00 .00 1355.70 3250.00 1365.91 .00 1366.08 12.20 2.85 1025.56 930.40
68.000 400.00 .00 .00 1354.70 3250.00 1366.38 .00 1366.61 18.42 4.53 872.55 757.29
70.000 200.00 .00 .00 1357.20 3250.00 1366.75 .00 1367.00 20.39 4.72 838.89 719.77
72.000 200.00 .00 .00 1357.20 3250.00 1366.86 .00 1367.29 11.91 6.41 561.29 941.62
75.000 300.00 .00 .00 1358.40 3250.00 1367.04 .00 1367.62 11.91 6.41 561.29 941.62
80.000 500.00 .00 .00 1359.80 3250.00 1367.63 .00 1368.39 17.49 7.27 492.36 777.21
09-29-87 08:25:32
PAGE 3
SECOND DEPTH CWSEL CRIWS WSELK ES HV HL OLOSS BANK ELEV
TIME VLOB VCH VROB XNL XNCH XNR VOL TWA LEFT/RIGHT
SLOPE KLOB KCH KROB TRIAL IBC ICONT CORAR TOPWID ENDST
CDAH= .030 CDAH= .300
#SECNO 72.000 EXTENDED .46 FEET
3280 CROSS SECTION 72.00 EXTENDED 1.06 FEET
3301 HV CHANGED MORE THAN HVINS
72.00 13.18 1366.54 .00 .00 1367.70 1.15 .43 .27 1362.60
3280. 1281. 1796. 224. 73. 502. 72. 45. 11. 1362.20
.16 2.86 5.56 3.10 .035 .030 .035 .000 1357.20 .00
.002284 200. 200. 200. 2 2 0 .00 96.00 96.00
#SECNO 75.000
3265 DIVISED FLOW
3280 CROSS SECTION 75.00 EXTENDED .24 FEET
3301 HV CHANGED MORE THAN HVINS
75.00 11.84 1367.84 .00 .00 1368.36 .52 .43 .02 1367.90
3280. 1441. 2963. 143. 43. 407. 42. 53. 13. 1364.80
.17 3.29 6.41 3.58 .035 .030 .035 .000 1374.80 .28
.001749 500. 500. 500. 2 2 0 .00 164.25 204.43
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09-29-87 08:25:32
PAGE 4
.07 2.60 5.05 .00 .045 .040 .045 .000 1335.70 434.04
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.11 2.82 5.85 .00 .045 .040 .045 .000 1335.70 505.00
.001220 400. 450. 400. 2 0 0 .00 299.38 689.69
#SECNO 68.000
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.14 2.39 6.72 .00 .045 .040 .045 .000 1337.20 423.50
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3250. 1897. 1441. 0. 533. 304. 0. 40. 10. 1369.70
.14 2.39 6.72 .00 .045 .040 .045 .000 1337.20 423.50
.002039 200. 200. 200. 2 0 0 .00 262.90 686.40
09-29-87 08:25:32
PAGE 4
SECNO DEPTH CWSEL CRIWS WSELK ES HV HL OLOSS BANK ELEV
TIME VLOB VCH VROB XNL XNCH XNR VOL TWA LEFT/RIGHT
SLOPE KLOB KCH KROB TRIAL IBC ICONT CORAR TOPWID ENDST
CDAH= .030 CDAH= .300
#SECNO 72.000 EXTENDED 1.06 FEET
3280 CROSS SECTION 72.00 EXTENDED .46 FEET
3301 HV CHANGED MORE THAN HVINS
72.00 13.18 1366.54 .00 .00 1367.70 1.15 .43 .27 1362.60
3280. 1281. 1796. 224. 73. 502. 72. 45. 11. 1362.20
.16 2.86 5.56 3.10 .035 .030 .035 .000 1357.20 .00
.002284 200. 200. 200. 2 2 0 .00 96.00 96.00
#SECNO 75.000
3265 DIVISED FLOW
3280 CROSS SECTION 75.00 EXTENDED .24 FEET
3301 HV CHANGED MORE THAN HVINS
75.00 11.84 1367.84 .00 .00 1368.36 .52 .43 .02 1367.90
3280. 1441. 2963. 143. 43. 407. 42. 53. 13. 1364.80
.17 3.29 6.41 3.58 .035 .030 .035 .000 1374.80 .28
.001749 500. 500. 500. 2 2 0 .00 164.25 204.43
#SECNO 80.000
80.00 7.41 1368.91 .00 .00 1369.46 .55 1.10 .01 1365.60
3250. 1215. 2002. 33. 303. 269. 13. 52. 14. 1364.30
09-29-87 08:25:32
PAGE 5
.19 4.01 6.93 2.46 .025 .030 .035 .000 1361.50 10.86
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09-29-87 08:25:32
PAGE 5
THIS RUN EXECUTED 09-29-87
HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
ERROR CORR - 01,02,03,04,05,06
MODIFICATION - 50,51,52,53,54,55,56
IBM-PC-XT VERSION AUGUST 1985
NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST
100 YEAR FLOW
SUMMRY PRINTOUT TABLE 150
SECNO XLCH ELTRD ELLC ELMIN Q CWSEL CRIWS ES 10K*S VCH AREA .01K
50.000 .00 .00 .00 1355.30 3250.00 1364.10 .00 1364.28 11.03 3.55 962.24 978.61
55.500 550.00 .00 .00 1355.30 3250.00 1364.58 .00 1364.72 8.34 3.19 1055.99 1125.40
60.000 450.00 .00 .00 1355.70 3250.00 1365.04 .00 1365.33 24.24 5.05 784.60 659.88
64.000 400.00 .00 .00 1355.70 3250.00 1365.91 .00 1366.08 12.20 2.85 1025.56 930.40
68.000 400.00 .00 .00 1354.70 3250.00 1366.38 .00 1366.61 18.42 4.53 872.55 757.29
70.000 200.00 .00 .00 1357.20 3250.00 1366.75 .00 1367.00 20.39 4.72 838.89 719.77
72.000 200.00 .00 .00 1357.20 3250.00 1366.86 .00 1367.29 11.91 6.41 561.29 941.62
75.000 300.00 .00 .00 1358.40 3250.00 1367.04 .00 1367.62 11.91 6.41 561.29 941.62
80.000 500.00 .00 .00 1359.80 3250.00 1367.63 .00 1368.39 17.49 7.27 492.36 777.21
09-29-87 08:25:32
PAGE 6
SUMMRY OF ERRORS AND SPECIAL NOTES
09-29-87 08:26:00
PAGE 1
THIS RUN EXECUTED 09-29-87
HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
ERROR CORR - 01,02,03,04,05,06
MODIFICATION - 50,51,52,53,54,55,56
IBM-PC-XT VERSION AUGUST 1985
UNEXPECTED END OF FILE ABORT IN SUBROUTINE HCHAIN