CB42

DRAINAGE REPORT
FOR
48TH STREET-CHANDLER BOULEVARD
INFRASTRUCTURE

April 11, 1991

REGISTERED PROFESSIONAL ENGINEER (CIVIL)
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CLOUSE ENGINEERING, INC.
JOB NO. 910103

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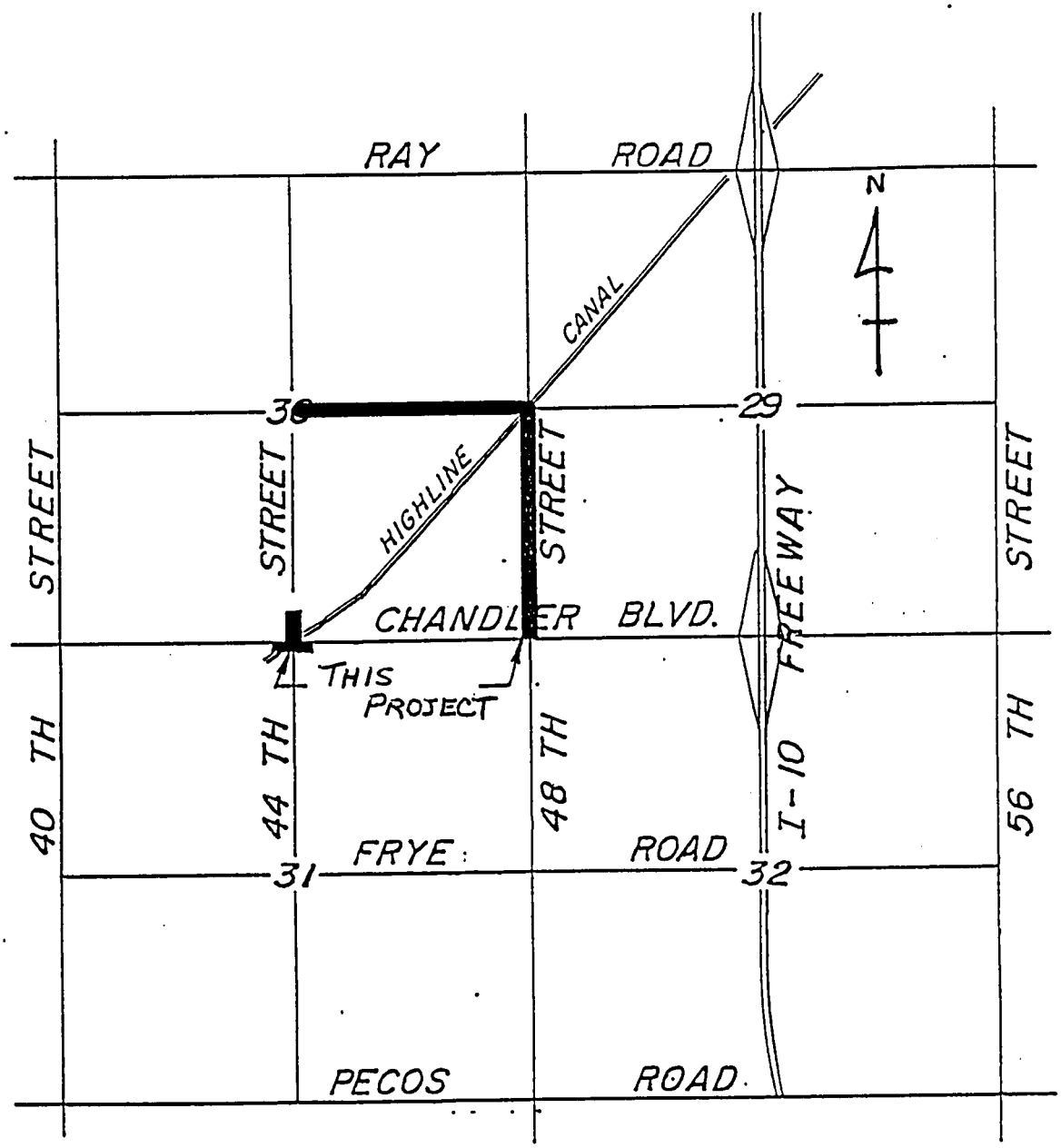
INTRODUCTION

Clouse Engineering, Inc. is preparing the infrastructure paving, drainage, sewer, and water plans for 48TH STREET-CHANDLER BOULEVARD INFRASTRUCTURE. The proposed infrastructure improvements will service the 48TH STREET AND CHANDLER BOULEVARD development, which is comprised of three (3) separate subdivisions. This report addresses the design of the proposed perimeter channels and drainage improvements pertinent to the project.

The project site lies within the City of Phoenix and is located in a portion of the S.E.¼ of Section 30, T. 1 S., R. 4 E., G. & S. R. B. & M., Maricopa County, Arizona. Areas of improvement include the west half of 48th Street, 44th Street, and drainage channel along the Galveston Road alignment and along the west side of 48th Street. The property is dissected from the northeast to southwest by the Salt River Valley Water Users Association's Highline Canal. The natural ground in the area generally slopes to the southeast at approximately 1.0 percent.

The drainage concepts proposed by this report conform to the drainage report prepared by Coe & Van Loo Consulting Engineers, Inc. (CVL), entitled; "48th Street & Chandler Blvd. Master Drainage Report," which was submitted to and subsequently approved by the City of Phoenix.



VICINITY MAP

HYDROLOGY

The proposed perimeter channels and road crossing structures are sized to convey the 100 year peak flows generated by offsite areas tributary to the project. These flows have been previously determined in the drainage report prepared by Coe & Van Loo Consulting Engineers, Inc. (CVL), entitled; "48th Street & Chandler Blvd. Master Drainage Report." The location of points of concentration and the corresponding peak 100 year, 24 hour flows obtained from the Master Drainage Report are indicated on the enclosed Drainage Map.

The points of concentration labelled 1 through 5 on the Drainage Map, are discussed below.

Point 1:

Approximately 32 acres of proposed single family development, situated south of the north channel and north of the Highline Canal, will drain to Point 1. According to the report prepared by Coe & Van Loo Consulting Engineers, Inc. entitled; "Monarch Drainage Report," the time of concentration to Point 1 (CP "K" in CVL report) is 33 minutes and the peak 10 and 100 year flows are 36 and 55 cfs. The CVL report and construction plans are currently in the review process at the City of Phoenix.

Point 2:

Runoff at Point 2 reflects the tributary area from Point 1 and the additional street area within the future subdivision south of the Highline Canal. The subdivision south of the canal is required to provide onlot retention for the 100 year, 2 hour event, therefore, only the streets will be considered as tributary. A runoff coefficient of 0.90 will be considered for the street right-of-way area.

Point 2 (Continued):

The time of concentration at Point 2 is obtained using the time at Point 1 (33 minutes) and the additional travel time within the street. Street travel time is based on an average velocity of flow within the street. Given these considerations, the following calculations summarize the peak runoff at Point 2.

A = Point 1 + Street ROW of southern subdivision

A = 38.2 + 6.6 = 44.8 acres

$$c = \frac{[0.45(38.2) + 0.90(6.6)]}{44.8} = 0.52$$

$$tc = \frac{1470 \text{ ft}}{3.0 \text{ fps } (60)} + 33 = 41 \text{ minutes}$$

i10 = 1.7 in/hr

i100 = 2.6 in/hr

Q10 = 39.6 cfs

Q100 = 60.6 cfs

Points 3 and 4:

Runoff for a 2 year event will be intercepted and conveyed to the channel along 48th Street at Points 3 and 4. Based on a runoff coefficient of 0.90 and the City of Phoenix intensity chart minimum time of concentration of 10 minutes, the following calculations summarize the peak 2 year flows at each Point.

		Point 3	Point 4
A	=	1.3 ac	1.2 ac
c	=	0.90	0.90
tc	=	10 min	10 min
i2	=	2.7 in/hr	2.7 in/hr
Q2	=	3.2 cfs	2.9 cfs

Point 5:

Approximately 16.0 acres of future single family development will drain to 44th Street. Peak flows from this area are calculated using on a runoff coefficient of 0.45 and an initial lot time of 15 minutes. A runoff coefficient of 0.90 is considered for 44th Street. Based on these considerations, the following calculations summarize the peak flow at Point 5.

A = Future subdivision + 44th Street ROW

A = 16.0 + 0.8 = 16.8 acres

$$c = \frac{[0.45(16.0) + 0.90(0.8)]}{16.8} = 0.47$$

$$tc = \frac{1700 \text{ ft}}{2.0 \text{ fps } (60)} + 15 = 29 \text{ minutes}$$

i10 = 2.3 in/hr

i100 = 3.4 in/hr

Q10 = 18.2 cfs

Q100 = 26.8 cfs

HYDRAULICS

STREETS:

The depth of flow within the street at Points 3, 4, and 5 are calculated using Manning's Equation with n = 0.015 and the pertinent street geometry and slope. Forty-eighth (48th) Street is 37 feet in width from the face of curb to the centerline, with a 0.69 foot crown and vertical (6 inch) curb. Forty-fourth (44th) Street is 48 feet in width to the face of curbs with a 0.48 foot crown and vertical (6 inch) curb.

The following table summarizes the depth of flow at Points 3, 4, and 5 as indicated on the enclosed Drainage Map. Depths are measured in feet from the gutter.

Point	S%	Q10	Q100	d10	d100
5	0.45	18.2	26.8	0.40	0.46
4	0.60	.....Q2 = 2.9 cfs		.....d2 = 0.25 ft...	
3	0.60	.....Q2 = 3.2 cfs		.....d2 = 0.26 ft...	

CATCH BASINS:

Catch basins will be constructed at Points 3 and 4 and are designed to intercept and remove the peak 2 year flows. The catch basins are also situated such that one dry lane will be maintained for the 2 year event. Catch basin selections are determined using the methods outlined in the Federal Highway Departments HEC-12 Circular referenced in the APPENDIX. The following example is the calculations at Point 4.

$$Q = 3.2 \text{ cfs}$$

$$d = 0.26 \text{ feet}$$

$$T = \frac{d}{Sx} = \frac{0.25}{0.02} = 13.0 \text{ ft.}$$

$$W/T = 1.5 / 13.0 = 0.115$$

$$\frac{Sw}{Sx} = \frac{0.02 + 0.17/1.5}{0.02} = 6.67$$

$$Eo = 0.42 \text{ (chart 4)}$$

$$Se = Sx + Sw'Eo = 0.02 + \frac{0.17(0.42)}{1.5}$$

$$Se = 0.068$$

Curb opening length required to intercept total flow:

$$L_T = 0.6\ (Q)^{0.42}\ (S)^{0.3}\ \left(\frac{1}{n\ (S_e)}\right)^{0.6}$$

$$L_T = 0.6\ (3.2)^{0.42}\ (0.006)^{0.3}\ \left(\frac{1}{0.015(0.068)}\right)^{0.6}$$

$$L_T = 13.1 \text{ ft.}$$

Using a COP 1569, 'M-1', L = 10 ft, the total length of opening available for interception is 13.0 feet, therefore, the entire 2 year flow of 3.2 cfs will be removed. An identical catch basin will be constructed at Point 4, which will also remove the entire 2 year peak flow of 2.9 cfs.

STORM DRAIN:

Storm drain lines A through E are indicated on the enclosed Drainage Map. Brief summaries outlining the purpose for each line are given on the following page.

Line A:

The master drainage report prepared by CVL indicates that an approximate 100 year flow of 60 cfs drains to the northwest corner of the Galveston Street/48th Street intersection. Accordingly, a 36 inch pipe will be extended north from the channel to intercept and convey the flow.

Line B:

A 24 inch pipe will be extended north from the channel to provide an outlet for the storm drain proposed by CVL at this location. Design calculations for this storm drain are presented in the drainage report prepared by CVL for MONARCH.

Lines C and D:

These storm drains will be installed to convey the 2 year runoff removed by the catch basins at Points 3 and 4, to the channel.

Line E:

A 36 inch pipe will be extended west from the box culvert to provide an outfall for future storm drain within the subdivision. The pipe is sized to convey the peak 10 year flow at Point 2 and maintain the hydraulic grade line within the pipe.

The following table summarizes the pipe size and design capacity of each storm drain indicated on the Drainage Map.

Line	Pipe size(in)	Pipe slope(%)	Capacity(cfs)	Design Q(cfs)
A	36	*0.70	60.0	60.0
B	24	0.62	19.0	17.0
C	18	0.20	5.0	3.2
D	18	0.20	5.0	2.9
E	36	0.30	40.0	39.6

*NOTE: Slope indicated is the hydraulic grade line slope. Outlet water surface elevation = 1213.60 feet; Inlet water surface elevation = 1214.44 feet; Natural ground elevation at inlet = ±1216.50 feet.

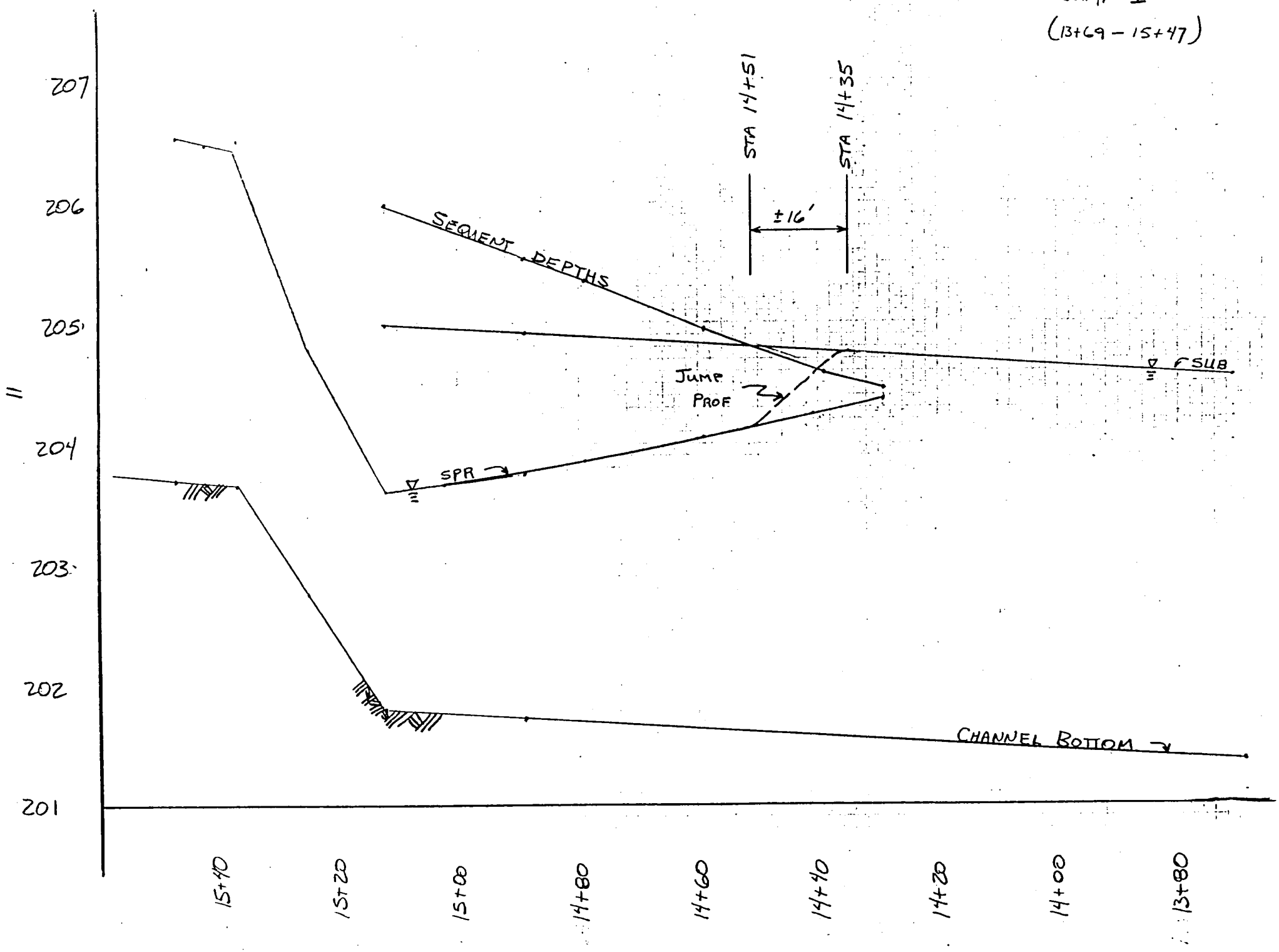
CHANNEL DESIGN:

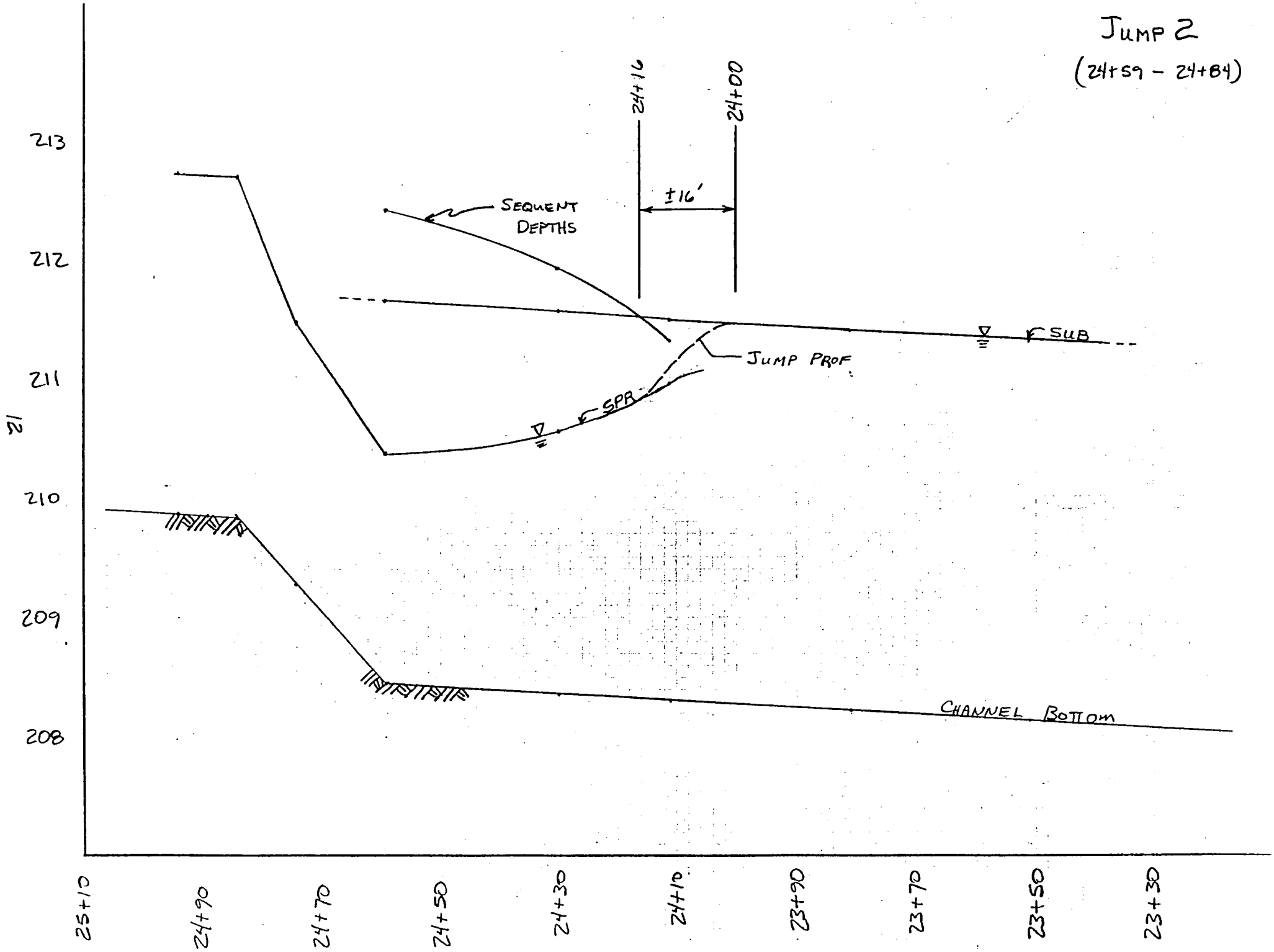
Concrete lined channels will be constructed to intercept and convey the 100 year offsite runoff approaching the northern boundary of the 48TH STREET AND CHANDLER BOULEVARD development. The proposed channel along the Galveston Street alignment varies from a trapezoidal section 2.5 feet deep with an 8 foot bottom and 1.5 to 1 side slopes, to a section 4 feet deep with a 10 foot bottom and 1.5 to 1 side slopes. The proposed channel paralleling 48th Street is a trapezoidal section 4 foot deep with a 10 foot bottom and 1.5 to 1 side slopes. A temporary "vee" channel will be extended south along 48th Street, from the termination of the concrete channel to Chandler Boulevard. The extension will operate as a spreader channel and runoff exceeding the capacity of the section will spill east to 48th Street. Runoff reaching Chandler Boulevard will be partially conveyed east by the road and the remaining portion will spill to the south. A double barrel 6 foot x 3 foot concrete box culvert will be constructed at the Galveston crossing and a double barrel 8 foot x 3 foot box culvert will be constructed at each of the future street crossings of the channel along 48th Street. Each culvert is designed to convey the 100 year runoff under the proposed road crossings.

The U.S. Army Corps of Engineer's HEC-2 Water Surface Profiles Program, Version 4.6.0, is utilized to model the perimeter channels and analyze backwater effects. Version 4.6.0 also incorporates culvert calculation routines that utilize the nomographs and equations published by the Federal Highway Administration. Water surface profiles were computed for the 100 year peak flows from the Master Drainage Report. A Manning's roughness coefficient of 0.019 for pneumatically applied concrete lining, is obtained from "Open-Channel Hydraulics" by Ven Te Chow and used in the model. The program output for this project is included in the APPENDIX and approximate channel station locations are identified on the Drainage Map.

The channel paralleling 48th Street has two (2) steep drop sections located at Stations 15+25 and 24+74. The two figures on pages 11 and 12 present a graphical analysis of the hydraulic jump location and size at each drop. Each figure is generated using the HEC-2 output (supercritical and subcritical) at the drop location and the methods outlined in the following sources: "Open Channel Hydraulics," by V. T. Chow, "Handbook of Hydraulics," by King and Brater, and "National Engineering Handbook; Section 5," published by the Soil Conservation Service. In summary, the supercritical flows entering the jumps have Froude numbers between 1.5 and 2.1, which according to Chow, classifies the jumps as "weak" and very stable. Given this condition, energy dissipation devices or structurally augmented channel lining are not considered necessary.

The runoff approaching the culvert crossing at Galveston Street is determined as flowing supercritical. The headwater of the culvert will force the supercritical flow to transition to subcritical flow in the area immediately upstream of the culvert inlet. The Froude number of the approaching supercritical flow is less than 1.4 and according to Chow, is classified as and undular jump. This type of jump is regarded as extremely weak and is considered inconsequential to this design. Accordingly, this transition will not be analyzed.


JUMP 1
(13+69 – 15+47)
STA 14+51
STA 14+35
±16'
SEQUENT DEPTHS
JUMP PROF
SPR
SUB
CHANNEL BOTTOM
207
206
205
204
203
202
201
15+40
15+20
15+00
14+80
14+60
14+40
14+20
14+00
13+80


JUMP 2
(24+59 - 24+84)
24+16
24+00
±16'
SEQUENT DEPTHS
SUB
JUMP PROF
SPR
CHANNEL BOTTOM
213
212
211
210
209
208
25+10
24+90
24+70
24+50
24+30
24+10
23+90
23+70
23+50
23+30

APPENDIX

```
*******************************************
  HEC-2 WATER SURFACE PROFILES            *
*                                         *
*  Version   4.6.0;  February 1991        *
                                          *
  RUN DATE    17APR91    TIME   14:35:14  *
*******************************************
```


```
****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*          (916) 756-1104              *
****************************************
```


```
X     X  XXXXXXX   XXXXX            XXXXX
X     X  X       X     X          X     X
X     X  X       X                      X
XXXXXXX  XXXX     X         XXXXX   XXXXX
X     X  X       X                X
X     X  X       X     X          X
X     X  XXXXXXX   XXXXX           XXXXXXX
```

I. 48TH STREET CHANNEL

(SUBCRITICAL)

THIS RUN EXECUTED 17APR91 14:35:14

```
************************************
HEC-2 WATER SURFACE PROFILES

Version   4.6.0;  February 1991
************************************
```

```
T1  48TH ST & CHANDLER BLVD INFRASTRUCTURE CHANNEL. JOB NO 910103
T2  SUBCRITICAL RUN #1. 100 YR FLOWS. SPECIAL CULVERT OPTION USED. n=0.019
T3      48TH&CHNDLR CHNL (SUBCR)

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

                                         -1                         340      199.5

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     -1                                                     -1


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38        1        2        8       13       14       15        3        5
     38       26       56       55        4       25       68       33
    101


IC     0.03     0.03     0.03      .1       .3
X1      000       10       70       90
GR    200.0       15    199.0       37    198.5       61    199.0       70    199.0       80
GR    199.0       90    200.0      108    200.0      118    199.7      156    200.0      192


X1      005       10       70       90        5        5        5
GR    200.0       21    199.0       37    198.5       61    198.5       70    198.4       80
GR    199.2       90    200.0      111    200.0      118    199.6      157    200.0      192


X1      155        7       68       93      150      150      150
GR    200.0       25    199.9       32    199.4       55    199.0       68    198.4       80
GR    199.0       93    200.0      169


X1      305        8       66      105      150      150      150
GR    201.5       20    200.8       27    200.3       50    199.0       66    198.4       80
GR    200.2      105    201.0      139    201.3      180
```

```
X1     455       8      63      97     150     150     150
GR   202.8      16   201.7      22   201.2      45   200.2      63   198.4      80
GR   201.3      97   202.0     131   202.4     164

NH       5    0.03      14   0.015      50    0.03      60   0.019      99    0.03
NH     180
X1     655       7      60      99     200     200     200
X3      10
GR   204.1       6   202.8      14   202.1      50   203.0      60   198.4      80
GR   203.0      99   203.8     180

NH       3    0.03      69   0.019      91    0.03      97
          END MAIN CHANNEL AND START TEMPORARY DAYLIGHT CHANNEL
X1     675       7      69      91      23      21      20
GR   202.8      54   202.4      69   198.4      75   198.7      80   198.4      85
GR   202.4      91   203.0      97

NC   0.019   0.019   0.019
X1     750       5      69      91      75      75      75           -1.17
GR   203.8      69   199.8      75   199.8      80   199.8      85   203.8      91

X1     773       7      72      88      23      23      23
X3      10                                                   202.9   202.9
GR  202.69      69  198.69      72  198.69      75  198.69      80  198.69      85
GR  198.69      88  202.69      91

SC   2.012     0.5     2.6      30       3       8      66     8.2  199.00  198.69

X1     839       7      72      88      66      66      66
X2                       2            203.8
X3      10                                                   203.80  203.80
GR   203.8      69   199.0      72   199.0      75   199.0      80   199.0      85
GR   199.0      88   203.8      91

          HEADWATER OF MOUNTAIN SKY AVE CULVERT
X1     846       5      69      91       7       7       7
GR   203.8      69   199.8      75   199.8      80   199.8      85   203.8      91

X1     969       5      69      91     123     123     123            0.37
GR   203.8      69   199.8      75   199.8      80   199.8      85   203.8      91
```

^1	1169	5	69	91	200	200	200		0.97	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	1369	5	69	91	200	200	200		1.57	
^R	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	1489	5	69	91	120	120	120		1.93	
R	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
	TOE OF DROP									
1	1512	5	69	91	23	23	23		2.0	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	1525	5	69	91	13	13	13		2.97	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
	HEAD OF DROP									
1	1537	5	69	91	12	12	12		3.87	
R	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
1	1542	5	69	91	5	5	5		3.88	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
.1	1547	5	69	91	5	5	5		3.90	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	1587	5	69	91	40	40	40		4.02	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	1637	5	69	91	50	50	50		4.17	
R	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
^1	1697	5	69	91	60	60	60		4.35	
R	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
1	1857	5	69	91	160	160	160		4.83	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91

X1	2009	5	69	91	152	152	152		5.28	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	2034	7	72	88	25	25	25			
X3	10							210.0	210.0	
GR	209.15	69	205.15	72	205.15	75	205.15	80	205.15	85
GR	205.15	88	209.15	91						
SC	2.012	0.5	2.6	30	3	8	66	8.2	206.95	205.15
X1	2100	7	72	88	66	66	66			
X2			2		211.4					
X3	10							211.4	211.4	
GR	210.95	69	206.95	72	206.95	75	206.95	80	206.95	85
GR	206.95	88	210.95	91						

HEADWATER OF GRANITE VIEW DR CULVERT

X1	2109	5	69	91	9	9	9		7.60	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	2229	5	69	91	120	120	120		7.96	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	2351	5	69	91	122	122	122		8.33	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	2381	5	69	91	30	30	30		8.42	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	2411	5	69	91	30	30	30		8.51	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	2430	5	69	91	19	19	19		8.56	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91

TOE OF DROP

X1	2459	5	69	91	29	29	29		8.66	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91

X1	2474	5	69	91	15	15	15		9.49	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91

HEAD OF DROP AND END OF CURVE

X1	2484	5	69	91	10	10	10		10.05	
R	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
1	2489	5	69	91	6	4	5		10.06	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
1	2494	5	69	91	6	4	5		10.08	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	2514	5	69	91	23	17	20		10.14	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	2545	5	69	91	37	27	31		10.23	
R	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91

BEGIN CURVE OF CHANNEL

1	2571	5	69	91	31	23	26		10.31	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
1	2685	5	69	91	114	114	114		10.65	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	2695	5	74	86	12	12	12			
X2	280									
3	10							214.5	214.5	
GR	214.48	69	210.48	74	210.48	80	210.48	86	214.48	91
C	2.012	0.5	2.6	30	3	6	174	8.2	211.0	210.48
X1	2869	5	74	86	174	174	174			
2			2		216.4					
X3	10							216.4	216.4	
GR	215.0	69	211.0	74	211.0	80	211.0	86	215.0	91

```
        HEADWATER OF GALVESTON CULVERT AND START OF NORTH TEMP CHANNEL
        THIS SECTION INDENTICAL TO SPRPROF1 SECTION 2158
 1    2875        5       69       91        6        6        6              12.77
 R   203.8       69    199.8       75    199.8       80    199.8       85    203.8       91

        THIS SECTION INDENTICAL TO SPRPROF1 SECTION 2108
X1    2925        5       69       91       50       50       50              13.06
GR   203.8       69    199.8       75    199.8       80    199.8       85    203.8       91

        THIS SECTION INDENTICAL TO SPRPROF1 SECTION 2058
 1    2975        5       69       91       50       50       50              13.36
 R   203.8       69    199.8       75    199.8       80    199.8       85    203.8       91

        THIS SECTION INDENTICAL TO SPRPROF1 SECTION 2008
X1    3025        5       69       91       50       50       50              13.66
GR   203.8       69    199.8       75    199.8       80    199.8       85    203.8       91

        THIS SECTION INDENTICAL TO SPRPROF1 SECTION 1958
 1    3075        5       69       91       50       50       50              13.95
 R   203.8       69    199.8       75    199.8       80    199.8       85    203.8       91

        THIS SECTION INDENTICAL TO SPRPROF1 SECTION 1908
X1    3125        5       69       91       50       50       50              14.24
GR   203.8       69    199.8       75    199.8       80    199.8       85    203.8       91
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SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS


CCHV=     .100 CEHV=     .300
*SECNO  .000

3265 DIVIDED FLOW

3720 CRITICAL DEPTH ASSUMED
      .000      1.41    199.91    199.91    199.50    200.24       .33       .00       .00    199.00
     340.0     230.2      82.6      27.2      47.4      18.2      12.9        .0        .0    199.00
       .00      4.86      4.54      2.10      .030      .030      .030      .000    198.50     16.97
   .009510        0.        0.        0.         0        10         0       .00    141.31    181.24


*SECNO 5.000
3280 CROSS SECTION      5.00 EXTENDED       .13 FEET


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.81

     5.000      1.74    200.14    199.79       .00    200.28       .15       .02       .02    198.50
     340.0     183.4     105.4      51.2      57.9      30.1      36.5        .0        .0    199.20
       .00      3.17      3.50      1.40      .030      .030      .030      .000    198.40     21.00
   .002902        5.        5.        5.         3         5         0       .00    171.00    192.00


*SECNO 155.000
3280 CROSS SECTION    155.00 EXTENDED       .51 FEET


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.45

   155.000      2.11    200.51    200.01       .00    200.58       .08       .29       .01    199.00
     340.0      75.0     123.7     141.4      40.6      45.2      76.5        .5        .6    199.00
       .02      1.85      2.74      1.85      .030      .030      .030      .000    198.40     25.00
   .001389      150.      150.      150.         3        12         0       .00    144.00    169.00


*SECNO 305.000
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 SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
 Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
 TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
 SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .59

 305.000     2.31    200.71    200.35      .00    200.97      .25       .33       .05    199.00
   340.0     59.3     273.7       7.0     20.9      63.5      5.6        .9       1.0    200.20
     .03     2.84      4.31      1.26     .030      .030     .030      .000    198.40     31.06
 .003972     150.      150.      150.        2        11        0       .00     95.69    126.75


*SECNO 455.000
 455.000     2.90    201.30    201.03      .00    201.71      .40       .70       .04    200.20
   340.0     29.0     311.0        .0     11.2      58.9       .0       1.2       1.2    201.30
     .04     2.59      5.28       .04     .030      .030     .000      .000    198.40     40.03
 .005526     150.      150.      150.        2         8        0       .00     57.36     97.39


1490 NH CARD USED
 SECNO 655.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      203.00 ELREA=      203.00

 655.000     3.57    201.97    201.71      .00    202.58      .62       .81       .06    203.00
   340.0       .0     340.0        .0       .0      54.0       .0       1.5       1.4    203.00
     .05      .00      6.30       .00     .000      .019     .000      .000    198.40     64.49
 .003110     200.      200.      200.        2         8        0       .00     30.25     94.74


 490 NH CARD USED
 SECNO 675.000
          END MAIN CHANNEL AND START TEMPORARY DAYLIGHT CHANNEL
 675.000     3.63    202.03    201.32      .00    202.63      .60       .05       .00    202.40
   340.0       .0     340.0        .0       .0      54.6       .0       1.5       1.4    202.40
     .05      .00      6.22       .00     .000      .019     .000      .000    198.40     69.55
 .002010      23.       20.       21.        2        15        0       .00     20.90     90.45


*SECNO 750.000
 750.000     3.55    202.18    201.46      .00    202.79      .61       .15       .00    202.63
   340.0       .0     340.0        .0       .0      54.4       .0       1.6       1.5    202.63
     .05      .00      6.26       .00     .000      .019     .000      .000    198.63     69.68
 .002008      75.       75.       75.        2        15        0       .00     20.64     90.32
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 773.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 202.90 ELREA= 202.90

773.000	3.59	202.28	201.09	.00	202.83	.54	.03	.01	198.69
340.0	.0	340.0	.0	.0	57.5	.0	1.6	1.5	198.69
.05	.00	5.91	.00	.000	.019	.000	.000	198.69	72.00
.001039	23.	23.	23.	2	14	0	.00	16.00	88.00

PECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	2	.012	.50	2.60	30.00	3.00	8.00	66.00	8	2	199.00	198.69

CHART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
CALE 2 - WINGWALLS FLARED 90 OR 15 DEGREES

*SECNO 839.000

PECIAL CULVERT OUTLET CONTROL
EGIC = 203.400 EGOC = 203.644 PCWSE= 202.283 ELTRD= 203.800

PECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
203.40	203.64	.82	0.	340.	4.985	48.0	203.80	0.

495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 203.80 ELREA= 203.80

839.000	4.26	203.26	.00	.00	203.64	.39	.82	.00	199.00
340.0	.0	340.0	.0	.0	68.2	.0	1.7	1.5	199.00
.06	.00	4.99	.00	.000	.019	.000	.000	199.00	72.00
.000588	66.	66.	66.	2	0	0	.00	16.00	88.00

*SECNO 846.000

302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .44

HEADWATER OF MOUNTAIN SKY AVE CULVERT

846.000	3.16	202.96	202.63	.00	203.79	.83	.01	.13	203.80
340.0	.0	340.0	.0	.0	46.5	.0	1.8	1.5	203.80
.06	.00	7.31	.00	.000	.019	.000	.000	199.80	70.27
.003099	7.	7.	7.	3	14	0	.00	19.47	89.73

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  SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
  Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
  TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*SECNO 969.000
  969.000     3.18    203.35    203.00       .00    204.16       .82       .38       .00    204.17
    340.0       .0     340.0       .0        .0      46.9        .0       1.9       1.6    204.17
      .06      .00      7.25       .00      .000      .019      .000      .000    200.17     70.24
 .003031      123.      123.      123.         2        11         0       .00     19.53     89.76

*SECNO 1169.000
 1169.000     3.19    203.96    203.60       .00    204.77       .81       .60       .00    204.77
    340.0       .0     340.0       .0        .0      47.2        .0       2.1       1.7    204.77
      .07      .00      7.21       .00      .000      .019      .000      .000    200.77     70.22
 .002981      200.      200.      200.         0        11         0       .00     19.57     89.78

*SECNO 1369.000
 1369.000     3.18    204.55    204.20       .00    205.36       .81       .60       .00    205.37
    340.0       .0     340.0       .0        .0      47.2        .0       2.3       1.8    205.37
      .08      .00      7.21       .00      .000      .019      .000      .000    201.37     70.22
 .002982      200.      200.      200.         0        11         0       .00     19.57     89.78

*SECNO 1489.000
 1489.000     3.18    204.91    204.56       .00    205.72       .81       .36       .00    205.73
    340.0       .0     340.0       .0        .0      47.0        .0       2.4       1.8    205.73
      .08      .00      7.23       .00      .000      .019      .000      .000    201.73     70.23
 .003007      120.      120.      120.         0        11         0       .00     19.55     89.77

*SECNO 1512.000
          TOE OF DROP
 1512.000     3.18    204.98    204.63       .00    205.79       .81       .07       .00    205.80
    340.0       .0     340.0       .0        .0      47.0        .0       2.5       1.8    205.80
      .08      .00      7.24       .00      .000      .019      .000      .000    201.80     70.23
 .003017       23.       23.       23.         0        11         0       .00     19.54     89.77

*SECNO 1525.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 1525.000     2.83    205.60    205.60       .00    206.70      1.10       .05       .09    206.77
    340.0       .0     340.0       .0        .0      40.3        .0       2.5       1.8    206.77
      .08      .00      8.43       .00      .000      .019      .000      .000    202.77     70.75
 .004626       13.       13.       13.         0        11         0       .00     18.49     89.25
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 1537.000
185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
HEAD OF DROP

1537.000	2.83	206.50	206.50	.00	207.60	1.10	.06	.00	207.67
340.0	.0	340.0	.0	.0	40.4	.0	2.5	1.8	207.67
.08	.00	8.42	.00	.000	.019	.000	.000	203.67	70.75
.004613	12.	12.	12.	0	5	0	.00	18.50	89.25

*SECNO 1542.000

1542.000	3.04	206.72	206.51	.00	207.64	.92	.02	.02	207.68
340.0	.0	340.0	.0	.0	44.2	.0	2.5	1.8	207.68
.08	.00	7.70	.00	.000	.019	.000	.000	203.68	70.45
.003581	5.	5.	5.	8	5	0	.00	19.11	89.55

*SECNO 1547.000

1547.000	3.05	206.75	206.53	.00	207.66	.91	.02	.00	207.70
340.0	.0	340.0	.0	.0	44.3	.0	2.5	1.8	207.70
.08	.00	7.67	.00	.000	.019	.000	.000	203.70	70.44
.003546	5.	5.	5.	0	11	0	.00	19.13	89.56

*SECNO 1587.000

1587.000	3.15	206.97	206.65	.00	207.80	.83	.13	.01	207.82
340.0	.0	340.0	.0	.0	46.4	.0	2.5	1.9	207.82
.08	.00	7.33	.00	.000	.019	.000	.000	203.82	70.27
.003117	40.	40.	40.	2	11	0	.00	19.45	89.73

*SECNO 1637.000

1637.000	3.16	207.13	206.80	.00	207.96	.82	.15	.00	207.97
340.0	.0	340.0	.0	.0	46.7	.0	2.6	1.9	207.97
.09	.00	7.28	.00	.000	.019	.000	.000	203.97	70.25
.003067	50.	50.	50.	0	11	0	.00	19.50	89.75

*SECNO 1697.000

1697.000	3.17	207.32	206.98	.00	208.14	.82	.18	.00	208.15
340.0	.0	340.0	.0	.0	46.8	.0	2.7	1.9	208.15
.09	.00	7.27	.00	.000	.019	.000	.000	204.15	70.25
.003052	60.	60.	60.	0	11	0	.00	19.51	89.75

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  SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
  Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
  TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*SECNO 1857.000
 1857.000     3.18    207.81    207.46       .00    208.63       .81       .49       .00    208.63
    340.0       .0     340.0       .0        .0      47.0        .0       2.8       2.0    208.63
      .10      .00      7.24       .00      .000      .019      .000      .000    204.63     70.23
  .003014     160.      160.      160.         0        11         0       .00     19.54     89.77

*SECNO 2009.000
 2009.000     3.20    208.28    207.91       .00    209.08       .80       .45       .00    209.08
    340.0       .0     340.0       .0        .0      47.3        .0       3.0       2.0    209.08
      .10      .00      7.19       .00      .000      .019      .000      .000    205.08     70.21
  .002963     152.      152.      152.         0        11         0       .00     19.59     89.79

*SECNO 2034.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.54

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      210.00 ELREA=      210.00

 2034.000     3.39    208.54    207.55       .00    209.15       .61       .05       .02    205.15
    340.0       .0     340.0       .0        .0      54.3        .0       3.0       2.1    205.15
      .10      .00      6.26       .00      .000      .019      .000      .000    205.15     72.00
  .001255      25.       25.       25.         2        15         0       .00     16.00     88.00


SPECIAL CULVERT

SC  CUNO      CUNV      ENTLC     COFQ      RDLEN     RISE      SPAN      CULVLN    CHRT      SCL       ELCHU     ELCHD
    2          .012      .50      2.60      30.00     3.00      8.00      66.00     8         2        206.95    205.15

CHART  8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE  2 - WINGWALLS FLARED 90 OR 15 DEGREES

*SECNO 2100.000

SPECIAL CULVERT INLET CONTROL
EGIC =    211.316  EGOC =    209.901  PCWSE=    208.540  ELTRD=    211.400

SPECIAL CULVERT

    EGIC      EGOC       H4     QWEIR     QCULV      VCH     ACULV     ELTRD    WEIRLN
   211.32    209.90     2.17       0.      340.     5.424      48.0    211.40       0.
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  SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
  Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
  TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      211.40 ELREA=      211.40

 2100.000     3.91    210.86       .00       .00    211.32       .46      2.17       .00    206.95
    340.0       .0     340.0       .0       .0      62.7       .0       3.1       2.1    206.95
      .11      .00      5.42      .00      .000      .019      .000      .000    206.95     72.00
  .000779      66.       66.       66.        2         0         0       .00     16.00     88.00


*SECNO 2109.000

302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .53

         HEADWATER OF GRANITE VIEW DR CULVERT
 2109.000     3.26    210.66    210.24       .00    211.42       .76       .01       .09    211.40
    340.0       .0     340.0       .0       .0      48.7       .0       3.1       2.1    211.40
      .11      .00      6.99      .00      .000      .019      .000      .000    207.40     70.10
  .002733       9.        9.        9.        2        15         0       .00     19.80     89.90


*SECNO 2229.000
 2229.000     3.22    210.98    210.59       .00    211.76       .79       .34       .01    211.76
    340.0       .0     340.0       .0       .0      47.7       .0       3.3       2.1    211.76
      .11      .00      7.13      .00      .000      .019      .000      .000    207.76     70.17
  .002888      120.      120.      120.        2        11         0       .00     19.65     89.83


SECNO 2351.000
 2351.000     3.19    211.32    210.96       .00    212.13       .81       .36       .01    212.13
    340.0       .0     340.0       .0       .0      47.1       .0       3.4       2.2    212.13
      .12      .00      7.21      .00      .000      .019      .000      .000    208.13     70.22
  .002986      122.      122.      122.        0        11         0       .00     19.57     89.78


SECNO 2381.000
 2381.000     3.19    211.41    211.05       .00    212.22       .81       .09       .00    212.22
    340.0       .0     340.0       .0       .0      47.1       .0       3.4       2.2    212.22
      .12      .00      7.21      .00      .000      .019      .000      .000    208.22     70.22
  .002985       30.       30.       30.        0        11         0       .00     19.57     89.78


SECNO 2411.000
 2411.000     3.19    211.50    211.14       .00    212.31       .81       .09       .00    212.31
    340.0       .0     340.0       .0       .0      47.2       .0       3.5       2.2    212.31
      .12      .00      7.21      .00      .000      .019      .000      .000    208.31     70.22
  .002981       30.       30.       30.        0        11         0       .00     19.57     89.78
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2430.000

2430.000	3.20	211.56	211.19	.00	212.36	.80	.06	.00	212.36
340.0	.0	340.0	.0	.0	47.3	.0	3.5	2.2	212.36
.12	.00	7.19	.00	.000	.019	.000	.000	208.36	70.20
.002955	19.	19.	19.	0	11	0	.00	19.59	89.80

'SECNO 2459.000

TOE OF DROP

2459.000	3.18	211.64	211.29	.00	212.45	.81	.09	.00	212.46
340.0	.0	340.0	.0	.0	47.1	.0	3.5	2.2	212.46
.12	.00	7.21	.00	.000	.019	.000	.000	208.46	70.22
.002985	29.	29.	29.	0	11	0	.00	19.57	89.78

'SECNO 2474.000

7185 MINIMUM SPECIFIC ENERGY

)720 CRITICAL DEPTH ASSUMED

2474.000	2.83	212.12	212.12	.00	213.22	1.10	.06	.09	213.29
340.0	.0	340.0	.0	.0	40.3	.0	3.5	2.2	213.29
.12	.00	8.43	.00	.000	.019	.000	.000	209.29	70.75
.004626	15.	15.	15.	0	11	0	.00	18.49	89.25

'SECNO 2484.000

'185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

HEAD OF DROP AND END OF CURVE

2484.000	2.83	212.68	212.68	.00	213.78	1.10	.05	.00	213.85
340.0	.0	340.0	.0	.0	40.4	.0	3.5	2.2	213.85
.12	.00	8.42	.00	.000	.019	.000	.000	209.85	70.75
.004613	10.	10.	10.	0	5	0	.00	18.50	89.25

'SECNO 2489.000

2489.000	3.04	212.90	212.69	.00	213.82	.92	.02	.02	213.86
340.0	.0	340.0	.0	.0	44.2	.0	3.5	2.3	213.86
.12	.00	7.69	.00	.000	.019	.000	.000	209.86	70.45
.003577	6.	5.	4.	8	5	0	.00	19.11	89.55

'SECNO 2494.000

2494.000	3.05	212.93	212.71	.00	213.84	.91	.02	.00	213.88
340.0	.0	340.0	.0	.0	44.3	.0	3.5	2.3	213.88
.12	.00	7.67	.00	.000	.019	.000	.000	209.88	70.43
.003542	6.	5.	4.	0	11	0	.00	19.13	89.57

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 SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
 Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
 TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
 SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*SECNO 2514.000
 2514.000     3.12    213.06    212.77       .00    213.91       .85       .07       .01    213.94
    340.0       .0     340.0       .0       .0      45.9       .0       3.6       2.3    213.94
      .12      .00      7.41      .00      .000      .019      .000      .000    209.94     70.32
 .003223      23.       20.       17.        2        11         0       .00     19.37     89.68

*SECNO 2545.000
 2545.000     3.14    213.17    212.86       .00    214.02       .84       .10       .00    214.03
    340.0       .0     340.0       .0       .0      46.2       .0       3.6       2.3    214.03
      .12      .00      7.37      .00      .000      .019      .000      .000    210.03     70.29
 .003165      37.       31.       27.        0        11         0       .00     19.42     89.71

*SECNO 2571.000
          BEGIN CURVE OF CHANNEL
 2571.000     3.15    213.26    212.94       .00    214.10       .84       .08       .00    214.11
    340.0       .0     340.0       .0       .0      46.3       .0       3.6       2.3    214.11
      .12      .00      7.34      .00      .000      .019      .000      .000    210.11     70.28
 .003131      31.       26.       23.        0        11         0       .00     19.44     89.72

*SECNO 2685.000
 2685.000     3.18    213.63    213.28       .00    214.45       .82       .35       .00    214.45
    340.0       .0     340.0       .0       .0      46.9       .0       3.8       2.3    214.45
      .13      .00      7.25      .00      .000      .019      .000      .000    210.45     70.24
 .003030     114.      114.      114.        1        11         0       .00     19.53     89.76

*SECNO 2695.000

*495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      214.50 ELREA=      214.50

 2695.000     3.16    213.64    213.04       .00    214.49       .84       .03       .01    210.48
    280.0       .0     280.0       .0       .0      38.0       .0       3.8       2.3    210.48
      .13      .00      7.38      .00      .000      .019      .000      .000    210.48     74.00
 .001915      12.       12.       12.        2        15         0       .00     12.00     86.00
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	2	.012	.50	2.60	30.00	3.00	6.00	174.00	8	2	211.00	210.48

CHART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE 2 - WINGWALLS FLARED 90 OR 15 DEGREES

*SECNO 2869.000

SPECIAL CULVERT INLET CONTROL
EGIC = 215.815 EGOC = 215.739 PCWSE= 213.643 ELTRD= 216.400

3280 CROSS SECTION 2869.00 EXTENDED .38 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.72

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
215.82	215.74	1.33	0.	280.	5.326	36.0	216.40	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 216.40 ELREA= 216.40

2869.000	4.37	215.37	.00	.00	215.82	.44	1.33	.00	211.00
280.0	.0	280.0	.0	.0	52.6	.0	3.9	2.4	211.00
.14	.00	5.33	.00	.000	.019	.000	.000	211.00	74.00
.000647	174.	174.	174.	2	0	0	.00	12.00	86.00

*SECNO 2875.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
HEADWATER OF GALVESTON CULVERT AND START OF NORTH TEMP CHANNEL
THIS SECTION INDENTICAL TO SPRPROF1 SECTION 2158

2875.000	2.53	215.10	215.10	.00	216.10	1.00	.01	.17	216.57
280.0	.0	280.0	.0	.0	35.0	.0	3.9	2.4	216.57
.14	.00	8.01	.00	.000	.019	.000	.000	212.57	71.20
.004690	6.	6.	6.	0	11	0	.00	17.60	88.80

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  SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
  Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
  TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*SECNO 2925.000
 185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
        THIS SECTION INDENTICAL TO SPRPROF1 SECTION 2108
 2925.000     2.53    215.39    215.39       .00    216.39      1.00       .24       .00    216.86
    280.0       .0     280.0       .0        .0      34.8        .0       4.0       2.4    216.86
      .14      .00      8.04       .00      .000      .019      .000      .000    212.86     71.21
 .004741      50.       50.       50.         0         5         0       .00     17.58     88.79

*SECNO 2975.000
 185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
        THIS SECTION INDENTICAL TO SPRPROF1 SECTION 2058
 2975.000     2.53    215.69    215.69       .00    216.69      1.00       .24       .00    217.16
    280.0       .0     280.0       .0        .0      34.9        .0       4.0       2.4    217.16
      .14      .00      8.03       .00      .000      .019      .000      .000    213.16     71.21
 .004729      50.       50.       50.         0         5         0       .00     17.58     88.79

*SECNO 3025.000
 185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
        THIS SECTION INDENTICAL TO SPRPROF1 SECTION 2008
 3025.000     2.53    215.99    215.99       .00    216.99      1.00       .24       .00    217.46
    280.0       .0     280.0       .0        .0      34.9        .0       4.1       2.5    217.46
      .14      .00      8.03       .00      .000      .019      .000      .000    213.46     71.21
 .004731      50.       50.       50.         0         5         0       .00     17.58     88.79

*SECNO 3075.000
 185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
        THIS SECTION INDENTICAL TO SPRPROF1 SECTION 1958
 3075.000     2.53    216.28    216.28       .00    217.28      1.00       .24       .00    217.75
    280.0       .0     280.0       .0        .0      34.9        .0       4.1       2.5    217.75
      .14      .00      8.03       .00      .000      .019      .000      .000    213.75     71.21
 .004731      50.       50.       50.         0         5         0       .00     17.58     88.79

*SECNO 3125.000
 185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
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THIS SECTION INDENTICAL TO SPRPROF1 SECTION 1908

3125.000	2.53	216.57	216.57	.00	217.57	1.00	.24	.00	218.04
280.0	.0	280.0	.0	.0	34.9	.0	4.1	2.5	218.04
.15	.00	8.03	.00	.000	.019	.000	.000	214.04	71.21
.004731	50.	50.	50.	0	5	0	.00	17.58	88.79

ROFILE FOR STREAM 48TH&CHNDLR CHNL (SUBCR)

PLOTTED POINTS (BY PRIORITY) E-ENERGY,W-WATER SURFACE,I-INVERT,C-CRITICAL W.S.,L-LEFT BANK,R-RIGHT BANK,M-LOWER END STA

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ELEVATION   198.     200.     202.     204.     206.     208.     210.     212.     214.     216.
   SECNO   CUMDIS

     .00     0.  .I L    WE.        .        .        .        .        .        .        .        .
    5.00    10.  IL  R  CME.        .        .        .        .        .        .        .        .
            20.  IL  R  CMWE        .        .        .        .        .        .        .        .
            30.  IL  R  CMWE        .        .        .        .        .        .        .        .
            40.  IL  R  CMWE        .        .        .        .        .        .        .        .
            50.  IL  R  CMWE        .        .        .        .        .        .        .        .
            60.  IL  R  CMWE        .        .        .        .        .        .        .        .
            70.  I L R  CMWE        .        .        .        .        .        .        .        .
            80.  I L R  CM E        .        .        .        .        .        .        .        .
            90.  I LR    C E        .        .        .        .        .        .        .        .
           100.  I LR    C E        .        .        .        .        .        .        .        .
           110.  I LR    C E        .        .        .        .        .        .        .        .
           120.  I LR    C WE       .        .        .        .        .        .        .        .
           130.  I  L    C WE       .        .        .        .        .        .        .        .
           140.  I  L    C WE       .        .        .        .        .        .        .        .
           150.  I  L    C WE       .        .        .        .        .        .        .        .
   155.00  160.  I  L    C .E       .        .        .        .        .        .        .        .
           170.  I  L    C .E       .        .        .        .        .        .        .        .
           180.  I  LR   CM.E       .        .        .        .        .        .        .        .
           190.  I  LR   CM.E       .        .        .        .        .        .        .        .
           200.  I  L R   CME       .        .        .        .        .        .        .        .
           210.  I  L R   CMWE      .        .        .        .        .        .        .        .
           220.  I  L R   C.WE      .        .        .        .        .        .        .        .
           230.  I  L  R  C.WE      .        .        .        .        .        .        .        .
           240.  I  L  R  C.WE      .        .        .        .        .        .        .        .
           250.  I  L   R C.WE      .        .        .        .        .        .        .        .
           260.  I  L   R C.WE      .        .        .        .        .        .        .        .
           270.  I  L   R C.WEM     .        .        .        .        .        .        .        .
           280.  I  L    RC.WEM     .        .        .        .        .        .        .        .
           290.  I  L    R CW EM    .        .        .        .        .        .        .        .
           300.  I  L     RCW EM    .        .        .        .        .        .        .        .
   305.00  310.  I  L     RC WE M   .        .        .        .        .        .        .        .
           320.  I  L     RC WE M   .        .        .        .        .        .        .        .
           330.  I   L     C WE M   .        .        .        .        .        .        .        .
           340.  I   L     C W E M  .        .        .        .        .        .        .        .
           350.  I    L    RCW E M  .        .        .        .        .        .        .        .
           360.  I    L    .C WE M  .        .        .        .        .        .        .        .
           370.  I    L    .C WE  M .        .        .        .        .        .        .        .
           380.  I     L   .CRW E M .        .        .        .        .        .        .        .
           390.  I     L   . CW E M .        .        .        .        .        .        .        .
           400.  I      L  . CW E  M.        .        .        .        .        .        .        .
           410.  I      L  . CRWE  M.        .        .        .        .        .        .        .
           420.  I      L  . CRW E  M.       .        .        .        .        .        .        .
           430.  I       L . CRW E  M.       .        .        .        .        .        .        .
           440.  I       L .  CW E  M.       .        .        .        .        .        .        .
           450.  I        L.  CW E   M       .        .        .        .        .        .        .
   455.00  460.  I        L.  C W E  M       .        .        .        .        .        .        .
           470.  I         L  C W E  M       .        .        .        .        .        .        .
           480.  I         L  C W E  M
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        490.  I        .L  CWRE  .M       .         .         .         .         .         .         .         .
        500.  I        . L CWRE  .M       .         .         .         .         .         .         .         .
        510.  I        .  LCW RE . M      .         .         .         .         .         .         .         .
        520.  I        .  LC WRE . M      .         .         .         .         .         .         .         .
        530.  I        .   C WRE . M      .         .         .         .         .         .         .         .
        540.  I        .    CW E .  M     .         .         .         .         .         .         .         .
        550.  I        .    CW RE.  M     .         .         .         .         .         .         .         .
        560.  I        .    CW  E.   M    .         .         .         .         .         .         .         .
        570.  I        .    CWL E.   M    .         .         .         .         .         .         .         .
        580.  I        .    C W ER   M    .         .         .         .         .         .         .         .
        590.  I        .    C WLER    M   .         .         .         .         .         .         .         .
        600.  I        .     CW LE    M   .         .         .         .         .         .         .         .
        610.  I        .     CW  ER   M   .         .         .         .         .         .         .         .
        620.  I        .     CW  ER    M  .         .         .         .         .         .         .         .
        630.  I        .     CW  ELR   M  .         .         .         .         .         .         .         .
        640.  I        .     C W E L   M  .         .         .         .         .         .         .         .
        650.  I        .     C W .ELR   M .         .         .         .         .         .         .         .
655.00  660.  I        .      CW .E L   M .         .         .         .         .         .         .         .
        670.  I        .     C W .EL  M   .         .         .         .         .         .         .         .
675.00  680.  I        .    C  W LEM      .         .         .         .         .         .         .         .
        690.  I        .    C  W LEM      .         .         .         .         .         .         .         .
        700.  I        .    C  W LEM      .         .         .         .         .         .         .         .
        710.  I        .    C  W LEM      .         .         .         .         .         .         .         .
        720.  .I       .    C   W.LE      .         .         .         .         .         .         .         .
        730.  .I       .    C   W.LE      .         .         .         .         .         .         .         .
        740.  .I       .    C   W.LE      .         .         .         .         .         .         .         .
750.00  750.  .I       .    C   W.LE      .         .         .         .         .         .         .         .
        760.  .I       .  LC    W.ME      .         .         .         .         .         .         .         .
        770.  .I  L    .   C    W.ME      .         .         .         .         .         .         .         .
773.00  780.  .I       .  C     W.ME      .         .         .         .         .         .         .         .
        790.  C I      .         W ME     .         .         .         .         .         .         .         .
        800.  C I      .         .W E     .         .         .         .         .         .         .         .
        810.  C I      .         . W E    .         .         .         .         .         .         .         .
        820.  C I      .         . W  E   .         .         .         .         .         .         .         .
        830.  C  I     .         .  W EM  .         .         .         .         .         .         .         .
839.00  840.  C  I     .         .   W EM .         .         .         .         .         .         .         .
846.00  850.  .     I  .         .C W   E .         .         .         .         .         .         .         .
        860.  .     I  .         .C W   E .         .         .         .         .         .         .         .
        870.  .     I  .         .C W   E .         .         .         .         .         .         .         .
        880.  .     I  .         . CW   E .         .         .         .         .         .         .         .
        890.  .      I .         . CW    E.         .         .         .         .         .         .         .
        900.  .      I .         . C W   E.         .         .         .         .         .         .         .
        910.  .      I .         . C W   E.         .         .         .         .         .         .         .
        920.  .      I .         . C W   E.         .         .         .         .         .         .         .
        930.  .      I .         . C W   E.         .         .         .         .         .         .         .
        940.  .      I .         .  CW   E.         .         .         .         .         .         .         .
        950.  .       I.         .  CW   EL.        .         .         .         .         .         .         .
        960.  .       I.         .  C W   E.        .         .         .         .         .         .         .
969.00  970.  .       I.         .  C W   E.        .         .         .         .         .         .         .
        980.  .       I.         .  C W   E.        .         .         .         .         .         .         .
        990.  .       I.         .  C W   E.        .         .         .         .         .         .         .
       1000.  .       I.         .  C W   E.        .         .         .         .         .         .         .
       1010.  .       I.         .   CW   E.        .         .         .         .         .         .         .
       1020.  .        I         .   C W   E        .         .         .         .         .         .         .
       1030.  .        I         .   C W   E        .         .         .         .         .         .         .
       1040.  .        I         .   C W   E        .         .         .         .         .         .         .
       1050.  .        I         .   C W   E        .         .         .         .         .         .         .
       1060.  .        I         .   C W   E        .         .         .         .         .         .         .
       1070.  .        I         .    CW   E        .         .         .         .         .         .         .
       1080.  .        .I        .    CW   EL       .         .         .         .         .         .         .
       1090.  .        .I        .    C W  .E       .         .         .         .         .         .         .
       1100.  .        .I        .    C W  .E       .         .         .         .         .         .         .
       1110.  .        .I        .    C W  .E       .         .         .         .         .         .         .
       1120.  .        .I        .    C W  .E       .         .         .         .         .         .         .
       1130.  .        .I        .    C W  .E       .         .         .         .         .         .         .
       1140            .I             CW   E
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         1150. .       . I       .    CW . E       .         .         .         .         .         .         .
         1160. .       . I       .    C W . E      .         .         .         .         .         .         .
1169.00  1170. .       . I       .    C W . E      .         .         .         .         .         .         .
         1180. .       . I       .    C W . E      .         .         .         .         .         .         .
         1190. .       . I       .    C W . E      .         .         .         .         .         .         .
         1200. .       . I       .    C W . E      .         .         .         .         .         .         .
         1210. .       . I       .     CW . E      .         .         .         .         .         .         .
         1220. .       .  I      .     C W.  E     .         .         .         .         .         .         .
         1230. .       .  I      .     C W.  E     .         .         .         .         .         .         .
         1240. .       .  I      .     C W.  E     .         .         .         .         .         .         .
         1250. .       .  I      .     C W.  E     .         .         .         .         .         .         .
         1260. .       .  I      .     C W.  E     .         .         .         .         .         .         .
         1270. .       .  I      .      CW.  E     .         .         .         .         .         .         .
         1280. .       .   I     .      CW.  EL    .         .         .         .         .         .         .
         1290. .       .   I     .      C W   E    .         .         .         .         .         .         .
         1300. .       .   I     .      C W   E    .         .         .         .         .         .         .
         1310. .       .   I     .      C W   E    .         .         .         .         .         .         .
         1320. .       .   I     .      C W   E    .         .         .         .         .         .         .
         1330. .       .   I     .      C W   E    .         .         .         .         .         .         .
         1340. .       .   I     .       CW   E    .         .         .         .         .         .         .
         1350. .       .    I    .       C.W   E   .         .         .         .         .         .         .
         1360. .       .    I    .       C.W   E   .         .         .         .         .         .         .
1369.00  1370. .       .    I    .       C.W   E   .         .         .         .         .         .         .
         1380. .       .    I    .       C.W   E   .         .         .         .         .         .         .
         1390. .       .    I    .       C.W   E   .         .         .         .         .         .         .
         1400. .       .    I    .       C.W   E   .         .         .         .         .         .         .
         1410. .       .    I    .        CW   E   .         .         .         .         .         .         .
         1420. .       .     I   .        C W   E  .         .         .         .         .         .         .
         1430. .       .     I   .        C W   E  .         .         .         .         .         .         .
         1440. .       .     I   .        C W   E  .         .         .         .         .         .         .
         1450. .       .     I   .        C W   E  .         .         .         .         .         .         .
         1460. .       .     I   .        C W   E  .         .         .         .         .         .         .
         1470. .       .     I   .        .CW   E  .         .         .         .         .         .         .
         1480. .       .      I  .        .CW   EL .         .         .         .         .         .         .
1489.00  1490. .       .      I  .        .C W   E .         .         .         .         .         .         .
         1500. .       .      I  .        .C W   E .         .         .         .         .         .         .
         1510. .       .      I  .        .C W   E .         .         .         .         .         .         .
1512.00  1520. .       .      I  .        .C W   E .         .         .         .         .         .         .
1525.00  1530. .       .        . I       .    W  . E       .         .         .         .         .         .
1537.00  1540. .       .        .    I    .        .W    E  .         .         .         .         .         .
1542.00  1550. .       .        .    I    .        .CW   E  .         .         .         .         .         .
1547.00  1560. .       .        .     I   .        .CW   EL .         .         .         .         .         .
         1570. .       .        .     I   .        .CW   EL .         .         .         .         .         .
         1580. .       .        .     I   .        .CW    E .         .         .         .         .         .
1587.00  1590. .       .        .     I   .        .C W   E .         .         .         .         .         .
         1600. .       .        .     I   .        .C W   E .         .         .         .         .         .
         1610. .       .        .     I   .        . CW   E .         .         .         .         .         .
         1620. .       .        .      I  .        . CW   EL.         .         .         .         .         .
         1630. .       .        .      I  .        . C W  E .         .         .         .         .         .
1637.00  1640. .       .        .      I  .        . C W  E .         .         .         .         .         .
         1650. .       .        .      I  .        . C W  E .         .         .         .         .         .
         1660. .       .        .      I  .        . C W  E .         .         .         .         .         .
         1670. .       .        .      I  .        . C W  E .         .         .         .         .         .
         1680. .       .        .      I  .        .  CW  E .         .         .         .         .         .
         1690. .       .        .       I.         .  CW   E.         .         .         .         .         .
1697.00  1700. .       .        .       I.         .  C W  E.         .         .         .         .         .
         1710. .       .        .       I.         .  C W  E.         .         .         .         .         .
         1720. .       .        .       I.         .  C W  E.         .         .         .         .         .
         1730. .       .        .       I.         .  C W  E.         .         .         .         .         .
         1740. .       .        .       I.         .   CW  E.         .         .         .         .         .
         1750. .       .        .        I         .   CW  EL         .         .         .         .         .
         1760. .       .        .        I         .   C W  E         .         .         .         .         .
         1770. .       .        .        I         .   C W  E         .         .         .         .         .
         1780. .       .        .        I         .   C W  E         .         .         .         .         .
         1790. .       .        .        I         .   C W  E         .         .         .         .         .
         1800.                        I            .   C W  E
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          1810.  .         .         .         I         .  CW   E         .         .         .         .         .
          1820.  .         .         .         .I        .  CW   .E        .         .         .         .         .
          1830.  .         .         .         .I        .  C W  .E        .         .         .         .         .
          1840.  .         .         .         .I        .  C W  .E        .         .         .         .         .
          1850.  .         .         .         .I        .  C W  .E        .         .         .         .         .
1857.00   1860.  .         .         .         .I        .  C W  .E        .         .         .         .         .
          1870.  .         .         .         .I        .  C W  .E        .         .         .         .         .
          1880.  .         .         .         .I        .   CW  .E        .         .         .         .         .
          1890.  .         .         .         . I       .   C W . E       .         .         .         .         .
          1900.  .         .         .         . I       .   C W . E       .         .         .         .         .
          1910.  .         .         .         . I       .   C W . E       .         .         .         .         .
          1920.  .         .         .         . I       .   C W . E       .         .         .         .         .
          1930.  .         .         .         . I       .   C W . E       .         .         .         .         .
          1940.  .         .         .         . I       .   C W . E       .         .         .         .         .
          1950.  .         .         .         . I       .    CW . E       .         .         .         .         .
          1960.  .         .         .         .  I      .    C W.  E      .         .         .         .         .
          1970.  .         .         .         .  I      .    C W.  E      .         .         .         .         .
          1980.  .         .         .         .  I      .    C W.  E      .         .         .         .         .
          1990.  .         .         .         .  I      .    C W.  E      .         .         .         .         .
          2000.  .         .         .         .  I      .    C W.  E      .         .         .         .         .
2009.00   2010.  .         .         .         .  I      .     CW.  E      .         .         .         .         .
          2020.  .         .         .         .   I     .   LC  W   E     .         .         .         .         .
          2030.  .         .         .         .   I  L .   C   W   E     .         .         .         .         .
2034.00   2040.  .         .         .         .   I     .   C   .W  E     .         .         .         .         .
          2050.  C         .         .         .    I    .        . W  E   .         .         .         .         .
          2060.  C         .         .         .     I   .         .   W ME .         .         .         .         .
          2070.  C         .         .         .      I .         .    W ME.         .         .         .         .
          2080.  C         .         .         .       I.         .      WME         .         .         .         .
          2090.  C         .         .         .        .I        .        WME       .         .         .         .
2100.00   2100.  C         .         .         .         . I      .         . WM E   .         .         .         .
2109.00   2110.  .         .         .         .         .  I     .       C.W   E   .         .         .         .
          2120.  .         .         .         .         .  I     .       C.W   E   .         .         .         .
          2130.  .         .         .         .         .  I     .       C. W  E   .         .         .         .
          2140.  .         .         .         .         .  I     .        C W  LE  .         .         .         .
          2150.  .         .         .         .         .   I    .        C W   E  .         .         .         .
          2160.  .         .         .         .         .   I    .        C W   E  .         .         .         .
          2170.  .         .         .         .         .   I    .        C W   E  .         .         .         .
          2180.  .         .         .         .         .   I    .        C W   E  .         .         .         .
          2190.  .         .         .         .         .   I    .        C W   E  .         .         .         .
          2200.  .         .         .         .         .   I    .        .C W  E  .         .         .         .
          2210.  .         .         .         .         .    I   .        .C W   E .         .         .         .
          2220.  .         .         .         .         .    I   .        .C W   E .         .         .         .
2229.00   2230.  .         .         .         .         .    I   .        .C W   E .         .         .         .
          2240.  .         .         .         .         .    I   .        .C W   E .         .         .         .
          2250.  .         .         .         .         .    I   .        .C W   E .         .         .         .
          2260.  .         .         .         .         .    I   .        .C W   E .         .         .         .
          2270.  .         .         .         .         .    I   .        . CW   E .         .         .         .
          2280.  .         .         .         .         .     I .        . C W   E .         .         .         .
          2290.  .         .         .         .         .     I .        . C W   E .         .         .         .
          2300.  .         .         .         .         .     I .        . C W   E .         .         .         .
          2310.  .         .         .         .         .     I .        . C W   E .         .         .         .
          2320.  .         .         .         .         .     I .        . C W   E .         .         .         .
          2330.  .         .         .         .         .     I .        . C W   E .         .         .         .
          2340.  .         .         .         .         .     I .        .  CW   E .         .         .         .
          2350.  .         .         .         .         .      I.        .  C W   E.         .         .         .
2351.00   2360.  .         .         .         .         .      I.        .  C W   E.         .         .         .
          2370.  .         .         .         .         .      I.        .  C W   E.         .         .         .
          2380.  .         .         .         .         .      I.        .  C W   E.         .         .         .
2381.00   2390.  .         .         .         .         .      I.        .  C W   E.         .         .         .
          2400.  .         .         .         .         .      I.        .  C W   E.         .         .         .
          2410.  .         .         .         .         .      I.        .   CW   E.         .         .         .
2411.00   2420.  .         .         .         .         .       I        .   C W   E         .         .         .
2430.00   2430.  .         .         .         .         .       I        .   C W   E         .         .         .
          2440.  .         .         .         .         .       I        .   C W   E         .         .         .
          2450.  .         .         .         .         .       I        .   C W   E         .         .         .
2459.00   2460                                                  I            C W   E
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         2470. .         .         .         .         .         . A       .     CW . E       .         .         .
2474.00  2480. .         .         .         .         .         . I       .       W.   E     .         .         .
2484.00  2490. .         .         .         .         .         .     I   .        .W     E   .         .         .
2489.00  2500. .         .         .         .         .         .     I   .        .C W   E   .         .         .
2494.00  2510. .         .         .         .         .         .     I   .        . CW   E   .         .         .
2514.00  2520. .         .         .         .         .         .      I  .        . CW    E  .         .         .
         2530. .         .         .         .         .         .      I  .        . CW    E  .         .         .
         2540. .         .         .         .         .         .      I  .        . C W   E  .         .         .
2545.00  2550. .         .         .         .         .         .      I  .        . C W   E  .         .         .
         2560. .         .         .         .         .         .      I  .        . C W   E  .         .         .
         2570. .         .         .         .         .         .      I  .        .  CW   E  .         .         .
2571.00  2580. .         .         .         .         .         .       I.         .  CW    E.         .         .
         2590. .         .         .         .         .         .       I.         .  CW    E.         .         .
         2600. .         .         .         .         .         .       I.         .  C W   E.         .         .
         2610. .         .         .         .         .         .       I.         .  C W   E.         .         .
         2620. .         .         .         .         .         .       I.         .  C W   E.         .         .
         2630. .         .         .         .         .         .       I.         .  C W   E.         .         .
         2640. .         .         .         .         .         .       I.         .   CW   E.         .         .
         2650. .         .         .         .         .         .        I         .   CW    E         .         .
         2660. .         .         .         .         .         .        I         .   C W   E         .         .
         2670. .         .         .         .         .         .        I         .   C W   E         .         .
         2680. .         .         .         .         .         .        I         .   C W   E         .         .
2685.00  2690. .         .         .         .         .         .        I         .   C W   E         .         .
2695.00  2700. .         .         .         .         .         .        I         .  C  W   E         .         .
         2710. .         . C       .         .         .         .        .I        .     W  .E         .         .
         2720. C         .         .         .         .         .        .I        .     W  .E         .         .
         2730. C         .         .         .         .         .        .I        .      W .ME        .         .
         2740. C         .         .         .         .         .        .I        .      W .ME        .         .
         2750. C         .         .         .         .         .        .I        .       W.ME        .         .
         2760. C         .         .         .         .         .        .I        .       W.M E       .         .
         2770. C         .         .         .         .         .        .I        .        WM E       .         .
         2780. C         .         .         .         .         .        . I       .        W M E      .         .
         2790. C         .         .         .         .         .        . I       .        .WM E      .         .
         2800. C         .         .         .         .         .        . I       .        .WM E      .         .
         2810. C         .         .         .         .         .        . I       .        . W  E     .         .
         2820. C         .         .         .         .         .        . I       .        . W  E     .         .
         2830. C         .         .         .         .         .        . I       .        . MW E     .         .
         2840. C         .         .         .         .         .        . I       .        . MW  E    .         .
         2850. C         .         .         .         .         .        .  I      .        .  MW E    .         .
         2860. C         .         .         .         .         .        .  I      .        .  MW  E   .         .
         2870. C         .         .         .         .         .        .  I      .        .  M W E   .         .
2869.00  2880. C         .         .         .         .         .        .  I      .        .  M W E   .         .
2875.00  2890. .         .         .         .         .         .        .       .I        .   W   E.L         .
         2900. .         .         .         .         .         .        .       .I        .   W   E.L         .
         2910. .         .         .         .         .         .        .       .I        .   W   E.L         .
         2920. .         .         .         .         .         .        .       . I       .   W   E. L        .
2925.00  2930. .         .         .         .         .         .        .       . I       .    W   E L        .
         2940. .         .         .         .         .         .        .       .  I      .    W   E  L       .
         2950. .         .         .         .         .         .        .       .  I      .     W  .E L       .
         2960. .         .         .         .         .         .        .       .  I      .     W  .E L       .
         2970. .         .         .         .         .         .        .       .   I     .     W  .E  L      .
2975.00  2980. .         .         .         .         .         .        .       .   I     .     W  .E  L      .
         2990. .         .         .         .         .         .        .       .   I     .      W . E L      .
         3000. .         .         .         .         .         .        .       .   I     .      W . E L      .
         3010. .         .         .         .         .         .        .       .    I    .      W . E  L     .
         3020. .         .         .         .         .         .        .       .    I    .       W .  E L     .
3025.00  3030. .         .         .         .         .         .        .       .    I    .       W .  E L     .
         3040. .         .         .         .         .         .        .       .     I   .       W .  E  L    .
         3050. .         .         .         .         .         .        .       .     I   .        W.   E L    .
         3060. .         .         .         .         .         .        .       .     I   .        W.   E L    .
         3070. .         .         .         .         .         .        .       .     I   .        W.   E L    .
3075.00  3080. .         .         .         .         .         .        .       .      I  .        W.   E  L   .
         3090. .         .         .         .         .         .        .       .      I  .         W   E L   .
         3100. .         .         .         .         .         .        .       .      I  .         W   E L   .
         3110. .         .         .         .         .         .        .       .       I .         W   E  L  .
         3120
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THIS RUN EXECUTED 17APR91 14:35:57

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HEC-2 WATER SURFACE PROFILES

Version 4.6.0; February 1991
****

OTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

8TH&CHNDLR CHNL (SUBCR)

SUMMARY PRINTOUT

	SECNO	CWSEL	CRIWS	DEPTH	QLOB	QCH	QROB	EG	10*KS
	.000	199.91	199.91	1.41	230.21	82.61	27.17	200.24	95.10
*	5.000	200.14	199.79	1.74	183.43	105.39	51.18	200.28	29.02
	155.000	200.51	200.01	2.11	74.99	123.66	141.35	200.58	13.89
*	305.000	200.71	200.35	2.31	59.31	273.69	7.00	200.97	39.72
	455.000	201.30	201.03	2.90	29.03	310.97	.00	201.71	55.26
	655.000	201.97	201.71	3.57	.00	340.00	.00	202.58	31.10
	675.000	202.03	201.32	3.63	.00	340.00	.00	202.63	20.10
	750.000	202.18	201.46	3.55	.00	340.00	.00	202.79	20.08
	773.000	202.28	201.09	3.59	.00	340.00	.00	202.83	10.39
	839.000	203.26	.00	4.26	.00	340.00	.00	203.64	5.88
	846.000	202.96	202.63	3.16	.00	340.00	.00	203.79	30.99
	969.000	203.35	203.00	3.18	.00	340.00	.00	204.16	30.31
	1169.000	203.96	203.60	3.19	.00	340.00	.00	204.77	29.81
	1369.000	204.55	204.20	3.18	.00	340.00	.00	205.36	29.82
	1489.000	204.91	204.56	3.18	.00	340.00	.00	205.72	30.07
	1512.000	204.98	204.63	3.18	.00	340.00	.00	205.79	30.17
*	1525.000	205.60	205.60	2.83	.00	340.00	.00	206.70	46.26

	SECNO	CWSEL	CRIWS	DEPTH	QLOB	QCH	QROB	EG	10*KS
*	1537.000	206.50	206.50	2.83	.00	340.00	.00	207.60	46.13
	1542.000	206.72	206.51	3.04	.00	340.00	.00	207.64	35.81
	1547.000	206.75	206.53	3.05	.00	340.00	.00	207.66	35.46
	1587.000	206.97	206.65	3.15	.00	340.00	.00	207.80	31.17
	1637.000	207.13	206.80	3.16	.00	340.00	.00	207.96	30.67
	1697.000	207.32	206.98	3.17	.00	340.00	.00	208.14	30.52
	1857.000	207.81	207.46	3.18	.00	340.00	.00	208.63	30.14
	2009.000	208.28	207.91	3.20	.00	340.00	.00	209.08	29.63
*	2034.000	208.54	207.55	3.39	.00	340.00	.00	209.15	12.55
	2100.000	210.86	.00	3.91	.00	340.00	.00	211.32	7.79
*	2109.000	210.66	210.24	3.26	.00	340.00	.00	211.42	27.33
	2229.000	210.98	210.59	3.22	.00	340.00	.00	211.76	28.88
	2351.000	211.32	210.96	3.19	.00	340.00	.00	212.13	29.86
	2381.000	211.41	211.05	3.19	.00	340.00	.00	212.22	29.85
	2411.000	211.50	211.14	3.19	.00	340.00	.00	212.31	29.81
	2430.000	211.56	211.19	3.20	.00	340.00	.00	212.36	29.55
	2459.000	211.64	211.29	3.18	.00	340.00	.00	212.45	29.85
*	2474.000	212.12	212.12	2.83	.00	340.00	.00	213.22	46.26
*	2484.000	212.68	212.68	2.83	.00	340.00	.00	213.78	46.13
	2489.000	212.90	212.69	3.04	.00	340.00	.00	213.82	35.77
	2494.000	212.93	212.71	3.05	.00	340.00	.00	213.84	35.42
	2514.000	213.06	212.77	3.12	.00	340.00	.00	213.91	32.23
	2545.000	213.17	212.86	3.14	.00	340.00	.00	214.02	31.65
	2571.000	213.26	212.94	3.15	.00	340.00	.00	214.10	31.31
	2685.000	213.63	213.28	3.18	.00	340.00	.00	214.45	30.30
	2695.000	213.64	213.04	3.16	.00	280.00	.00	214.49	19.15

	SECNO	CWSEL	CRIWS	DEPTH	QLOB	QCH	QROB	EG	10*KS
*	2869.000	215.37	.00	4.37	.00	280.00	.00	215.82	6.47
	2875.000	215.10	215.10	2.53	.00	280.00	.00	216.10	46.90
	2925.000	215.39	215.39	2.53	.00	280.00	.00	216.39	47.41
*	2975.000	215.69	215.69	2.53	.00	280.00	.00	216.69	47.29
	3025.000	215.99	215.99	2.53	.00	280.00	.00	216.99	47.31
*	3075.000	216.28	216.28	2.53	.00	280.00	.00	217.28	47.31
	3125.000	216.57	216.57	2.53	.00	280.00	.00	217.57	47.31

8TH&CHNDLR CHNL (SUBCR)

SUMMARY PRINTOUT

	SECNO	VCH	VROB	VLOB	TOPWID	AREA	FRCH	K*CHSL
	.000	4.54	2.10	4.86	141.31	78.53	.84	.00
*	5.000	3.50	1.40	3.17	171.00	124.46	.50	-20.00
	155.000	2.74	1.85	1.85	144.00	162.32	.36	.00
	305.000	4.31	1.26	2.84	95.69	89.91	.60	.00
	455.000	5.28	.04	2.59	57.36	70.14	.71	.00
	655.000	6.30	.00	.00	30.25	53.96	.83	.00
	675.000	6.22	.00	.00	20.90	54.65	.68	.00
	750.000	6.26	.00	.00	20.64	54.35	.68	3.07
	773.000	5.91	.00	.00	16.00	57.50	.55	2.61
	839.000	4.99	.00	.00	16.00	68.20	.43	4.70
	846.000	7.31	.00	.00	19.47	46.51	.83	114.29
	969.000	7.25	.00	.00	19.53	46.89	.82	3.01
	1169.000	7.21	.00	.00	19.57	47.16	.82	3.00
	1369.000	7.21	.00	.00	19.57	47.16	.82	3.00
	1489.000	7.23	.00	.00	19.55	47.02	.82	3.00
	1512.000	7.24	.00	.00	19.54	46.96	.82	3.04
*	1525.000	8.43	.00	.00	18.49	40.32	1.01	74.62
	1537.000	8.42	.00	.00	18.50	40.36	1.00	75.00
	1542.000	7.70	.00	.00	19.11	44.17	.89	2.00
	1547.000	7.67	.00	.00	19.13	44.33	.89	4.00
	1587.000	7.33	.00	.00	19.45	46.41	.84	3.00
	1637.000	7.28	.00	.00	19.50	46.69	.83	3.00
	1697.000	7.27	.00	.00	19.51	46.77	.83	3.00
	1857.000	7.24	.00	.00	19.54	46.98	.82	3.00

	SECNO	VCH	VROB	VLOB	TOPWID	AREA	FRCH	K*CHSL
	2009.000	7.19	.00	.00	19.59	47.27	.82	2.96
:	2034.000	6.26	.00	.00	16.00	54.32	.60	2.80
	2100.000	5.42	.00	.00	16.00	62.68	.48	27.27
*	2109.000	6.99	.00	.00	19.80	48.65	.79	50.00
	2229.000	7.13	.00	.00	19.65	47.70	.81	3.00
	2351.000	7.21	.00	.00	19.57	47.14	.82	3.03
	2381.000	7.21	.00	.00	19.57	47.14	.82	3.00
	2411.000	7.21	.00	.00	19.57	47.16	.82	3.00
	2430.000	7.19	.00	.00	19.59	47.31	.82	2.63
	2459.000	7.21	.00	.00	19.57	47.14	.82	3.45
*	2474.000	8.43	.00	.00	18.49	40.32	1.01	55.33
:	2484.000	8.42	.00	.00	18.50	40.36	1.00	56.00
	2489.000	7.69	.00	.00	19.11	44.19	.89	2.00
	2494.000	7.67	.00	.00	19.13	44.34	.89	4.00
	2514.000	7.41	.00	.00	19.37	45.86	.85	3.00
	2545.000	7.37	.00	.00	19.42	46.16	.84	2.90
	2571.000	7.34	.00	.00	19.44	46.34	.84	3.08
	2685.000	7.25	.00	.00	19.53	46.89	.82	2.98
	2695.000	7.38	.00	.00	12.00	37.96	.73	2.50
:	2869.000	5.33	.00	.00	12.00	52.57	.45	2.99
*	2875.000	8.01	.00	.00	17.60	34.97	1.00	261.67
:	2925.000	8.04	.00	.00	17.58	34.84	1.01	5.80
*	2975.000	8.03	.00	.00	17.58	34.87	1.00	6.00
:	3025.000	8.03	.00	.00	17.58	34.86	1.01	6.00
:	3075.000	8.03	.00	.00	17.58	34.86	1.01	5.80
*	3125.000	8.03	.00	.00	17.58	34.86	1.01	5.80

8TH&CHNDLR CHNL (SUBCR)

SUMMARY PRINTOUT TABLE 101

SECNO	EGOC	ELLC	EGIC	ELTRD	QCULV	QWEIR	CLASS	H4	DEPTH	CWSEL	VCH	EG
839.000	203.64	.00	203.40	203.80	340.00	.00	7.00	.82	4.26	203.26	4.99	203.64
2100.000	209.90	.00	211.32	211.40	340.00	.00	6.00	2.17	3.91	210.86	5.42	211.32
2869.000	215.74	.00	215.82	216.40	280.00	.00	6.00	1.33	4.37	215.37	5.33	215.82

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION SECNO=      .000  PROFILE=  1  CRITICAL DEPTH ASSUMED

 ARNING SECNO=     5.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   155.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   305.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 ARNING SECNO=   846.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=  1525.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  1525.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  1537.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  1537.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=  2034.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 ARNING SECNO=  2109.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=  2474.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  2474.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  2484.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  2484.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 ARNING SECNO=  2869.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 AUTION SECNO=  2875.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 AUTION SECNO=  2875.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  2925.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 AUTION SECNO=  2925.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  2975.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 AUTION SECNO=  2975.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  3025.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  3025.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  3075.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  3075.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 AUTION SECNO=  3125.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  3125.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
```

```
*********************************************
*  HEC-2 WATER SURFACE PROFILES             *
*                                           *
*  Version   4.6.0;  February 1991          *
*                                           *
*  RUN DATE    17APR91    TIME   14:30:52   *
*********************************************
```

```
****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*          (916) 756-1104              *
****************************************
```

```
X     X  XXXXXXX   XXXXX             XXXXX
X     X  X       X    X           X    X
X     X  X       X                     X
XXXXXXX  XXXX    X         XXXXX   XXXXX
X     X  X       X                X
X     X  X       X    X           X
X     X  XXXXXXX   XXXXX           XXXXXXX
```

2. NORTH CHANNEL

(SUPERCRITICAL)

THIS RUN EXECUTED 17APR91 14:30:52

```
************************************
HEC-2 WATER SURFACE PROFILES

Version   4.6.0;  February 1991
************************************

 1  48TH ST & CHANDLER BLVD INFRASTRUCTURE CHANNEL. JOB NO 910103
 2  SUPERCRITICAL RUN #1. 100 YR FLOWS. TEMPORARY CHANNEL ALONG N. PL. n=0.019
T3      48TH&CHNDLR CHNL (SPRCR)

 1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                                    1        -1                            60      227.9

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     -1                                                            -1

 3  VARIABLE CODES FOR SUMMARY PRINTOUT

      38        1         2         8        13        14        15         3         5
      38       26        56        55         4        25        68        33

NC    0.015     0.015     0.015       .1        .3
X1     000        5      72.2      87.8       350       350       350
GR   229.37     72.2    226.87        76    226.87        80    226.87        84    229.37      87.8

X1     350        5      72.2      87.8        82        82        82
GR   226.6     72.2     224.1        76     224.1        80     224.1        84     226.6      87.8

X1     432        5      71.5      88.5        11         7         9
GR   226.45     71.5    223.45        76    223.45        80    223.45        84    226.45      88.5

X1     441        5         71        89         8        13        10
GR   226.38     71.0    223.38      75.5    223.38        80    223.38      84.5    226.38        89

X1     451        5      70.5      89.5       190       190       190                 6.89
GR   219.4     70.5     216.4        75     216.4        80     216.4        85     219.4      89.5
```

```
 X1    641      5     70.5    89.5     310     310     310              5.4
 X2    200
  R  219.4    70.5    216.4     75    216.4      80    216.4     85    219.4    89.5

  1    951      5     70.5    89.5     310     310     310              3.57
  R  219.4    70.5    216.4     75    216.4      80    216.4     85    219.4    89.5

  1   1261      5     70.5    89.5     303     303     303              1.74
 GR  219.4    70.5    216.4     75    216.4      80    216.4     85    219.4    89.5

  1   1564      5     70.5    89.5      20      20      20
 X2    280
 GR  219.35   70.5   216.35     75   216.35      80   216.35     85   219.35    89.5

 X1   1584      5       69     91     324     324     324
  R  220.23     69   216.23     75   216.23      80   216.23     85   220.23     91

          THIS SECTION IDENTICAL TO SUBPROF1 SECTION 3125
  1   1908      5       69     91      50      50      50
 GR  218.34     69   214.34     75   214.34      80   214.34     85   218.34     91

          THIS SECTION IDENTICAL TO SUBPROF1 SECTION 3075
 X1   1958      5       69     91      50      50      50              14.24
  R   203.8     69    199.8     75    199.8      80    199.8     85    203.8     91

          THIS SECTION IDENTICAL TO SUBPROF1 SECTION 3025
  1   2008      5       69     91      50      50      50              13.95
 GR   203.8     69    199.8     75    199.8      80    199.8     85    203.8     91

          THIS SECTION IDENTICAL TO SUBPROF1 SECTION 2975
 X1   2058      5       69     91      50      50      50              13.66
  R   203.8     69    199.8     75    199.8      80    199.8     85    203.8     91

          THIS SECTION IDENTICAL TO SUBPROF1 SECTION 2925
  1   2108      5       69     91      50      50      50              13.36
 GR   203.8     69    199.8     75    199.8      80    199.8     85    203.8     91

          THIS SECTION IDENTICAL TO SUBPROF1 SECTION 2875
 X1   2158      5       69     91      50      50      50              13.06
  R   203.8     69    199.8     75    199.8      80    199.8     85    203.8     91
```

A1	2208	5	69	91					12.77	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV= .100 CEHV= .300
SECNO .000
.720 CRITICAL DEPTH ASSUMED

.000	1.11	227.98	227.98	227.90	228.46	.48	.00	.00	229.37
60.0	.0	60.0	.0	.0	10.8	.0	.0	.0	229.37
.00	.00	5.56	.00	.000	.015	.000	.000	226.87	74.31
.003642	0.	0.	0.	0	7	0	.00	11.39	85.69

SECNO 350.000

301 HV CHANGED MORE THAN HVINS

302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.05

350.000	.73	224.83	225.21	.00	226.08	1.25	2.30	.08	226.60
60.0	.0	60.0	.0	.0	6.7	.0	.1	.1	226.60
.01	.00	8.97	.00	.000	.015	.000	.000	224.10	74.88
.015278	350.	350.	350.	6	5	0	.00	10.23	85.12

SECNO 432.000

301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .68

432.000	.92	224.37	224.56	.00	225.12	.75	.82	.15	226.45
60.0	.0	60.0	.0	.0	8.7	.0	.1	.1	226.45
.01	.00	6.93	.00	.000	.015	.000	.000	223.45	74.62
.006996	82.	82.	82.	5	14	0	.00	10.77	85.38

SECNO 441.000

441.000	.79	224.17	224.43	.00	225.03	.86	.07	.01	226.38
60.0	.0	60.0	.0	.0	8.0	.0	.1	.1	226.38
.01	.00	7.46	.00	.000	.015	.000	.000	223.38	74.32
.009500	11.	9.	7.	12	8	0	.00	11.37	85.68

```
 SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
 Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
 TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
 SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


*SECNO 451.000
 451.000      .70    223.99    224.27       .00    224.92       .93       .10       .01    226.29
    60.0       .0      60.0       .0       .0       7.8       .0       .1       .1    226.29
     .01      .00      7.74       .00     .000      .015      .000      .000    223.29     73.95
 .011583       8.       10.       13.       11        11         0       .00     12.10     86.05


*SECNO 641.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 641.000     2.07    223.87    223.87       .00    224.71       .85       .74       .75    224.80
   200.0       .0     200.0       .0       .0      27.1       .0       .2       .2    224.80
     .02      .00      7.39       .00     .000      .015      .000      .000    221.80     71.90
 .003094     190.      190.      190.       20        20         0       .00     16.20     88.10


*SECNO 951.000

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.60

 951.000     1.58    221.55    222.04       .00    223.18      1.63      1.46       .08    222.97
   200.0       .0     200.0       .0       .0      19.5       .0       .3       .3    222.97
     .03      .00     10.23       .00     .000      .015      .000      .000    219.97     72.63
 .007969     310.      310.      310.        6         5         0       .00     14.74     87.37


*SECNO 1261.000
1261.000     1.81    219.95    220.21       .00    221.12      1.17      1.92       .14    221.14
   200.0       .0     200.0       .0       .0      23.0       .0       .5       .4    221.14
     .04      .00      8.69       .00     .000      .015      .000      .000    218.14     72.28
 .004946     310.      310.      310.        4        11         0       .00     15.43     87.72


*SECNO      000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .60

1564.000     2.41    218.76    218.88       .00    219.89      1.14      1.22       .01    219.35
   280.0       .0     280.0       .0       .0      32.7       .0       .7       .5    219.35
     .05      .00      8.55       .00     .000      .015      .000      .000    216.35     71.39
 .003524     303.      303.      303.        3        11         0       .00     17.22     88.61
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SECNO 1584.000

1584.000	2.29	218.52	218.76	.00	219.80	1.28	.08	.01	220.23
280.0	.0	280.0	.0	.0	30.9	.0	.7	.5	220.23
.05	.00	9.07	.00	.000	.015	.000	.000	216.23	71.56
.004166	20.	20.	20.	12	8	0	.00	16.89	88.44

SECNO 1908.000

THIS SECTION IDENTICAL TO SUBPROF1 SECTION 3125

1908.000	2.03	216.37	216.87	.00	218.10	1.73	1.66	.05	218.34
280.0	.0	280.0	.0	.0	26.5	.0	.9	.6	218.34
.06	.00	10.56	.00	.000	.015	.000	.000	214.34	71.95
.006446	324.	324.	324.	5	8	0	.00	16.10	88.05

-SECNO 1958.000

THIS SECTION IDENTICAL TO SUBPROF1 SECTION 3075

1958.000	2.07	216.11	216.57	.00	217.76	1.65	.31	.02	218.04
280.0	.0	280.0	.0	.0	27.2	.0	.9	.7	218.04
.06	.00	10.31	.00	.000	.015	.000	.000	214.04	71.89
.006009	50.	50.	50.	11	11	0	.00	16.22	88.11

*SECNO 2008.000

THIS SECTION IDENTICAL TO SUBPROF1 SECTION 3025

2008.000	2.07	215.82	216.28	.00	217.46	1.64	.30	.00	217.75
280.0	.0	280.0	.0	.0	27.3	.0	1.0	.7	217.75
.06	.00	10.26	.00	.000	.015	.000	.000	213.75	71.88
.005937	50.	50.	50.	10	11	0	.00	16.24	88.12

SECNO 2058.000

THIS SECTION IDENTICAL TO SUBPROF1 SECTION 2975

2058.000	2.08	215.54	215.99	.00	217.16	1.62	.29	.01	217.46
280.0	.0	280.0	.0	.0	27.4	.0	1.0	.7	217.46
.06	.00	10.21	.00	.000	.015	.000	.000	213.46	71.87
.005848	50.	50.	50.	10	11	0	.00	16.26	88.13

*SECNO 2108.000

THIS SECTION IDENTICAL TO SUBPROF1 SECTION 2925

2108.000	2.09	215.25	215.69	.00	216.87	1.62	.29	.00	217.16
280.0	.0	280.0	.0	.0	27.4	.0	1.0	.7	217.16
.06	.00	10.21	.00	.000	.015	.000	.000	213.16	71.87
.005854	50.	50.	50.	10	11	0	.00	16.26	88.13

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SECNO 2158.000

THIS SECTION IDENTICAL TO SUBPROF1 SECTION 2875

2158.000	2.08	214.94	215.39	.00	216.57	1.63	.29	.00	216.86
280.0	.0	280.0	.0	.0	27.3	.0	1.1	.7	216.86
.07	.00	10.25	.00	.000	.015	.000	.000	212.86	71.88
.005906	50.	50.	50.	10	11	0	.00	16.25	88.12

SECNO 2208.000

2208.000	2.08	214.65	215.10	.00	216.27	1.62	.29	.00	216.57
280.0	.0	280.0	.0	.0	27.4	.0	1.1	.7	216.57
.07	.00	10.22	.00	.000	.015	.000	.000	212.57	71.87
.005868	50.	50.	50.	10	11	0	.00	16.26	88.13

ROFILE FOR STREAM 48TH&CHNDLR CHNL (SPRCR)

PLOTTED POINTS (BY PRIORITY) E-ENERGY,W-WATER SURFACE,I-INVERT,C-CRITICAL W.S.,L-LEFT BANK,R-RIGHT BANK,M-LOWER END STA

```
ELEVATION   213.     215.     217.     219.     221.     223.     225.     227.     229.     231.
   SECNO   CUMDIS

     .00     0.  .        .        .        .        .        .        .        .I    W E.  L    .        .
            20.  .        .        .        .        .        .        .        .I   W  E.  L    .        .
            40.  .        .        .        .        .        .        .        I   W  E . L     .        .
            60.  .        .        .        .        .        .        .       I.   WC E  . L    .        .
            80.  .        .        .        .        .        .        .      I .  WC  E  .L     .        .
           100.  .        .        .        .        .        .        .      I .  W  E   L      .        .
           120.  .        .        .        .        .        .        .     I  . W  E   L.      .        .
           140.  .        .        .        .        .        .        .    I   .WC  E  L .      .        .
           160.  .        .        .        .        .        .        .   I    WC  E   L .      .        .
           180.  .        .        .        .        .        .        .  I    WC  E   L  .      .        .
           200.  .        .        .        .        .        .        .  I   WC.  E  L   .      .        .
           220.  .        .        .        .        .        .        . I   WC . E  L    .      .        .
           240.  .        .        .        .        .        .        . I   W C .E   L    .      .        .
           260.  .        .        .        .        .        .        .I   W C  .E  L     .      .        .
           280.  .        .        .        .        .        .        I   W C   E  L      .      .        .
           300.  .        .        .        .        .        .        I   WC   E. L       .      .        .
           320.  .        .        .        .        .        .       I.  WC    E.L        .      .        .
           340.  .        .        .        .        .        .      I . W C   E .L        .      .        .
   350.00  360.  .        .        .        .        .        .      I .W C    E L         .      .        .
           380.  .        .        .        .        .        .     I  .WC   E   L         .      .        .
           400.  .        .        .        .        .        .    I   W C  E    L         .      .        .
           420.  .        .        .        .        .        .   I    WC  E     L         .      .        .
   432.00  440.  .        .        .        .        .        .  I    WC  E     L.        .      .        .
   441.00  460.  .        .        .        .        .        .  I   WC. E      L.        .      .        .
   451.00  480.  .        .        .        .        .        .  I  WC . E      L.        .      .        .
           500.  .        .        .        .        .        . I   WC . E     L .        .      .        .
           520.  .        .        .        .        .        . I    WC . E    L  .        .      .        .
           540.  .        .        .        .        .        .I     WC .E    L   .        .      .        .
           560.  .        .        .        .        .        I      WC .E   L    .        .      .        .
           580.  .        .        .        .        .        I      W  .E   L    .        .      .        .
           600.  .        .        .        .        .       I.      W  .E  L     .        .      .        .
           620.  .        .        .        .        .      I .      W  .E L      .        .      .        .
           640.  .        .        .        .        .     I  .      W  .EL       .        .      .        .
   641.00  660.  .        .        .        .        .    I   .     W   .E        .        .      .        .
           680.  .        .        .        .        .    I   .     W   EL        .        .      .        .
           700.  .        .        .        .        .   I    .    W    E         .        .      .        .
           720.  .        .        .        .        .  I     .   WC   E.         .        .      .        .
           740.  .        .        .        .        .  I     .   W    E.         .        .      .        .
           760.  .        .        .        .        . I      .  WC   E .         .        .      .        .
           780.  .        .        .        .        . I      . WC    E .         .        .      .        .
           800.  .        .        .        .        . I      .WC    E  .         .        .      .        .
           820.  .        .        .        .        .I       .WC   LE  .         .        .      .        .
           840.  .        .        .        .        .I       WC    E   .         .        .      .        .
           860.  .        .        .        .        I       W.C   LE   .         .        .      .        .
           880.  .        .        .        .        I      W C    E   .         .        .      .        .
           900.  .        .        .        .       I.      WC.   LE   .         .        .      .        .
           920.  .        .        .        .      I .     W C.  LE    .         .        .      .        .
           940.  .        .        .        .      I .    W C .  LE    .         .        .      .        .
   951.00  960                                     I      W C    LE
```

```
         980.  .        .        .        .    I   .  W C  .LE    .        .        .        .        .
        1000.  .        .        .        .    I   .  W C  .LE    .        .        .        .        .
        1020.  .        .        .        .   I    .  W  C  LE    .        .        .        .        .
        1040.  .        .        .        .   I    .  W C   E     .        .        .        .        .
        1060.  .        .        .        .  I     . W C   LE     .        .        .        .        .
        1080.  .        .        .        . I      . W C  LE.     .        .        .        .        .
        1100.  .        .        .        . I      .W C   E .     .        .        .        .        .
        1120.  .        .        .        .I       .W C  LE .     .        .        .        .        .
        1140.  .        .        .        .I       W C   E  .     .        .        .        .        .
        1160.  .        .        .        .I       WC    E  .     .        .        .        .        .
        1180.  .        .        .        .I      W.C    E  .     .        .        .        .        .
        1200.  .        .        .        I       WC    E   .     .        .        .        .        .
        1220.  .        .        .       I.      W C   E    .     .        .        .        .        .
        1240.  .        .        .       I.      WC.   E    .     .        .        .        .        .
        1260.  .        .        .      I .     WC .  E     .     .        .        .        .        .
1261.00 1280.  .        .        .      I .     WC .  E     .     .        .        .        .        .
        1300.  .        .        .     I  .     WC . E      .     .        .        .        .        .
        1320.  .        .        .     I  .    WC  . E      .     .        .        .        .        .
        1340.  .        .        .    I   .    WC  .LE      .     .        .        .        .        .
        1360.  .        .        .   I    .   WC  LE        .     .        .        .        .        .
        1380.  .        .        .   I    .   WC  LE        .     .        .        .        .        .
        1400.  .        .        .  I     .   WC  LE        .     .        .        .        .        .
        1420.  .        .        .  I     .  WC  LE         .     .        .        .        .        .
        1440.  .        .        . I      .  WC  L E        .     .        .        .        .        .
        1460.  .        .        . I      . WC  LE.         .     .        .        .        .        .
        1480.  .        .        .I       . WC  L E.        .     .        .        .        .        .
        1500.  .        .        .I       . W  L E .        .     .        .        .        .        .
        1520.  .        .        .I       . WC  L E .       .     .        .        .        .        .
        1540.  .        .        I        . W  L E  .       .     .        .        .        .        .
        1560.  .        .        I        .WC  L E  .       .     .        .        .        .        .
1564.00 1580.  .        .       I.        .WC L  E  .       .     .        .        .        .        .
1584.00 1600.  .        .      I .        WC    E L .       .     .        .        .        .        .
        1620.  .        .      I .       WC     E L .       .     .        .        .        .        .
        1640.  .        .     I  .      W C    E L  .       .     .        .        .        .        .
        1660.  .        .     I  .      WC.    E L  .       .     .        .        .        .        .
        1680.  .        .    I   .     W C.   E L   .       .     .        .        .        .        .
        1700.  .        .   I    .    W C .   EL    .       .     .        .        .        .        .
        1720.  .        .   I    .    WC  .  E L    .       .     .        .        .        .        .
        1740.  .        .  I     .   W C  . E L     .       .     .        .        .        .        .
        1760.  .        .  I     .  W C   . E L     .       .     .        .        .        .        .
        1780.  .        . I      .  W C   .E L      .       .     .        .        .        .        .
        1800.  .        . I      . W C    .EL       .       .     .        .        .        .        .
        1820.  .        . I      . W  C   E L       .       .     .        .        .        .        .
        1840.  .        .I       . W C    EL        .       .     .        .        .        .        .
        1860.  .        .I       .W C    E.L        .       .     .        .        .        .        .
        1880.  .        I        W  C    EL         .       .     .        .        .        .        .
        1900.  .        I        W C    E L         .       .     .        .        .        .        .
1908.00 1920.  .       I.        W.C    EL.         .       .     .        .        .        .        .
        1940.  .      I .        W .C   EL .        .       .     .        .        .        .        .
1958.00 1960.  .     I  .        W C    EL  .       .       .     .        .        .        .        .
        1980.  .     I  .       W C.   E L  .        .       .     .        .        .        .        .
        2000.  .    I   .       W C.   EL   .        .       .     .        .        .        .        .
2008.00 2020.  .    I   .      W  C.  E L   .        .       .     .        .        .        .        .
        2040.  .   I    .      W C .  EL    .        .       .     .        .        .        .        .
2058.00 2060.  .  I     .     W C  .  EL     .        .       .     .        .        .        .        .
        2080.  .  I     .    W C   . E L     .        .       .     .        .        .        .        .
        2100.  . I      .    W C   . EL      .        .       .     .        .        .        .        .
2108.00 2120.  . I      .   W  C   .E L      .        .       .     .        .        .        .        .
        2140.  .I       .   W C    .EL       .        .       .     .        .        .        .        .
2158.00 2160. .I        . W C     EL         .        .       .     .        .        .        .        .
        2180. .I        .W  C    E.L         .        .       .     .        .        .        .        .
        2200. I         .W C     EL          .        .       .     .        .        .        .        .
2208.00 2220. I         W  C    E L          .        .       .     .        .        .        .        .
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THIS RUN EXECUTED 17APR91 14:31:09

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HEC-2 WATER SURFACE PROFILES

Version 4.6.0; February 1991
****

OTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

8TH&CHNDLR CHNL (SPRCR)

SUMMARY PRINTOUT

	SECNO	CWSEL	CRIWS	DEPTH	QLOB	QCH	QROB	EG	10*KS
	.000	227.98	227.98	1.11	.00	60.00	.00	228.46	36.42
*	350.000	224.83	225.21	.73	.00	60.00	.00	226.08	152.78
	432.000	224.37	224.56	.92	.00	60.00	.00	225.12	69.96
	441.000	224.17	224.43	.79	.00	60.00	.00	225.03	95.00
	451.000	223.99	224.27	.70	.00	60.00	.00	224.92	115.83
	641.000	223.87	223.87	2.07	.00	200.00	.00	224.71	30.94
*	951.000	221.55	222.04	1.58	.00	200.00	.00	223.18	79.69
	1261.000	219.95	220.21	1.81	.00	200.00	.00	221.12	49.46
*	1564.000	218.76	218.88	2.41	.00	280.00	.00	219.89	35.24
	1584.000	218.52	218.76	2.29	.00	280.00	.00	219.80	41.66
	1908.000	216.37	216.87	2.03	.00	280.00	.00	218.10	64.46
	1958.000	216.11	216.57	2.07	.00	280.00	.00	217.76	60.09
	2008.000	215.82	216.28	2.07	.00	280.00	.00	217.46	59.37
	2058.000	215.54	215.99	2.08	.00	280.00	.00	217.16	58.48
	2108.000	215.25	215.69	2.09	.00	280.00	.00	216.87	58.54
	2158.000	214.94	215.39	2.08	.00	280.00	.00	216.57	59.06
	2208.000	214.65	215.10	2.08	.00	280.00	.00	216.27	58.68

.8TH&CHNDLR CHNL (SPRCR)

SUMMARY PRINTOUT

	SECNO	VCH	VROB	VLOB	TOPWID	AREA	FRCH	K*CHSL
*	.000	5.56	.00	.00	11.39	10.80	1.01	.00
*	350.000	8.97	.00	.00	10.23	6.69	1.95	-7.91
*	432.000	6.93	.00	.00	10.77	8.66	1.36	-7.93
	441.000	7.46	.00	.00	11.37	8.04	1.56	-7.78
	451.000	7.74	.00	.00	12.10	7.75	1.70	-9.00
*	641.000	7.39	.00	.00	16.20	27.08	1.01	-7.84
*	951.000	10.23	.00	.00	14.74	19.54	1.57	-5.90
	1261.000	8.69	.00	.00	15.43	23.02	1.25	-5.90
*	1564.000	8.55	.00	.00	17.22	32.74	1.09	-5.91
	1584.000	9.07	.00	.00	16.89	30.88	1.18	-6.00
	1908.000	10.56	.00	.00	16.10	26.51	1.45	-5.83
	1958.000	10.31	.00	.00	16.22	27.17	1.40	-6.00
	2008.000	10.26	.00	.00	16.24	27.28	1.40	-5.80
	2058.000	10.21	.00	.00	16.26	27.42	1.39	-5.80
	2108.000	10.21	.00	.00	16.26	27.42	1.39	-6.00
	2158.000	10.25	.00	.00	16.25	27.33	1.39	-6.00
	2208.000	10.22	.00	.00	16.26	27.39	1.39	-5.80

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION SECNO=      .000  PROFILE=  1  CRITICAL DEPTH ASSUMED

 ARNING SECNO=    350.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    432.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=    641.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    641.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 AUTION SECNO=    641.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=    951.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 ARNING SECNO=   1564.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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*******************************************
  HEC-2 WATER SURFACE PROFILES            *
*                                         *
  Version   4.6.0;  February 1991         *
                                          *
*  RUN DATE    01APR91    TIME   16:53:29 *
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****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*          (916) 756-1104              *
****************************************
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X     X  XXXXXXX   XXXXX            XXXXX
X     X  X       X    X           X    X
X     X  X       X                     X
XXXXXXX  XXXX     X        XXXXX   XXXXX
X     X  X       X               X
X     X  X       X    X          X
X     X  XXXXXXX   XXXXX           XXXXXXX
```

3. JUMP 1: STATION 15 + 25

(SUPERCRITICAL)

THIS RUN EXECUTED 01APR91 16:53:30

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************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.0;  February 1991
************************************


T1  48TH ST & CHANDLER BLVD INFRASTRUCTURE CHANNEL. JOB NO 910103
T2  SPRCRITICAL HYDRAULIC JUMP CK CALCS 1(1547 TO 1489).100 YR FLOWS. n=0.019
T3      48TH&CHNDLR CHNL(JMPCK1)

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                                  1        -1                            340     206.0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     -1                                                            -1


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38        1         2         8        13        14        15        3         5
     38       26        56        55         4        25        68       33
    101


NC   0.019     0.019     0.019       .1        .3

X1    1547        5        69        91         5         5         5                 3.90
GR   203.8       69     199.8        75     199.8        80     199.8        85     203.8        91


X1    1542        5        69        91         5         5         5                 3.88
GR   203.8       69     199.8        75     199.8        80     199.8        85     203.8        91


          HEAD OF DROP
X1    1537        5        69        91        12        12        12                 3.87
GR   203.8       69     199.8        75     199.8        80     199.8        85     203.8        91


X1    1525        5        69        91        13        13        13                 2.97
GR   203.8       69     199.8        75     199.8        80     199.8        85     203.8        91
```

TOE OF DROP

X1	1512	5	69	91	10	10	10		2.0	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	1502	5	69	91	13	13	13		1.97	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	1489	5	69	91	10	10	10		1.93	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	1479	5	69	91	20	20	20		1.90	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	1459	5	69	91	20	20	20		1.84	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	1439	5	69	91	10	10	10		1.78	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	1429	5	69	91	60	60	60		1.75	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	1369	5	69	91					1.57	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV= .100 CEHV= .300
SECNO 1547.000
720 CRITICAL DEPTH ASSUMED

1547.000	2.83	206.53	206.53	206.00	207.63	1.11	.00	.00	207.70
340.0	.0	340.0	.0	.0	40.3	.0	.0	.0	207.70
.00	.00	8.44	.00	.000	.019	.000	.000	203.70	70.76
.004633	0.	0.	0.	0	10	0	.00	18.49	89.24

SECNO 1542.000
7185 MINIMUM SPECIFIC ENERGY

1542.000	2.80	206.48	206.51	.00	207.61	1.13	.02	.00	207.68
340.0	.0	340.0	.0	.0	39.8	.0	.0	.0	207.68
.00	.00	8.53	.00	.000	.019	.000	.000	203.68	70.79
.004784	5.	5.	5.	0	5	0	.00	18.41	89.21

*SECNO 1537.000
685 20 TRIALS ATTEMPTED WSEL,CWSEL
693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
HEAD OF DROP

1537.000	2.84	206.51	206.51	.00	207.60	1.10	.02	.00	207.67
340.0	.0	340.0	.0	.0	40.5	.0	.0	.0	207.67
.00	.00	8.40	.00	.000	.019	.000	.000	203.67	70.74
.004578	5.	5.	5.	20	5	0	.00	18.52	89.26

SECNO 1525.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.84

1525.000	2.02	204.79	205.60	.00	207.36	2.57	.09	.15	206.77
340.0	.0	340.0	.0	.0	26.4	.0	.0	.0	206.77
.00	.00	12.87	.00	.000	.019	.000	.000	202.77	71.96
.015421	12.	12.	12.	5	5	0	.00	16.08	88.04

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 1512.000

3301 HV CHANGED MORE THAN HVINS

TOE OF DROP

1512.000	1.81	203.61	204.64	.00	207.04	3.43	.24	.09	205.80
340.0	.0	340.0	.0	.0	22.9	.0	.0	.0	205.80
.00	.00	14.86	.00	.000	.019	.000	.000	201.80	72.30
.023334	13.	13.	13.	12	11	0	.00	15.40	87.70

*SECNO 1502.000

1502.000	1.90	203.67	204.60	.00	206.70	3.04	.21	.12	205.77
340.0	.0	340.0	.0	.0	24.3	.0	.0	.0	205.77
.00	.00	13.99	.00	.000	.019	.000	.000	201.77	72.16
.019593	10.	10.	10.	4	14	0	.00	15.68	87.84

*SECNO 1489.000

1489.000	2.02	203.75	204.57	.00	206.35	2.60	.23	.13	205.73
340.0	.0	340.0	.0	.0	26.3	.0	.0	.0	205.73
.00	.00	12.94	.00	.000	.019	.000	.000	201.73	71.97
.015651	13.	13.	13.	5	11	0	.00	16.05	88.03

*SECNO 1479.000

1479.000	2.14	203.84	204.54	.00	206.10	2.27	.14	.10	205.70
340.0	.0	340.0	.0	.0	28.1	.0	.0	.0	205.70
.00	.00	12.08	.00	.000	.019	.000	.000	201.70	71.80
.012850	10.	10.	10.	3	11	0	.00	16.40	88.20

*SECNO 1459.000

3301 HV CHANGED MORE THAN HVINS

1459.000	2.41	204.05	204.47	.00	205.72	1.67	.20	.18	205.64
340.0	.0	340.0	.0	.0	32.8	.0	.1	.0	205.64
.00	.00	10.38	.00	.000	.019	.000	.000	201.64	71.39
.008318	20.	20.	20.	3	11	0	.00	17.22	88.61

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 1439.000
685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF

1439.000	2.65	204.23	204.42	.00	205.54	1.31	.14	.15	205.58
340.0	.0	340.0	.0	.0	37.0	.0	.1	.0	205.58
.00	.00	9.18	.00	.000	.019	.000	.000	201.58	71.03
.005887	20.	20.	20.	20	8	0	.00	17.95	88.97

*SECNO 1429.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1429.000	2.83	204.38	204.38	.00	205.48	1.10	.05	.01	205.55
340.0	.0	340.0	.0	.0	40.3	.0	.1	.0	205.55
.00	.00	8.43	.00	.000	.019	.000	.000	201.55	70.76
.004629	10.	10.	10.	20	8	0	.00	18.49	89.24

*SECNO 1369.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1369.000	2.83	204.20	204.20	.00	205.30	1.10	.28	.17	205.37
340.0	.0	340.0	.0	.0	40.4	.0	.1	.1	205.37
.00	.00	8.42	.00	.000	.019	.000	.000	201.37	70.75
.004613	60.	60.	60.	20	5	0	.00	18.50	89.25

ROFILE FOR STREAM 48TH&CHNDLR CHNL(JMPCK1)

LOTTED POINTS (BY PRIORITY) E-ENERGY,W-WATER SURFACE,I-INVERT,C-CRITICAL W.S.,L-LEFT BANK,R-RIGHT BANK,M-LOWER END STA

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ELEVATION  201.     202.     203.     204.     205.     206.     207.     208.     209.     210.
  SECNO    CUMDIS

 1547.00    0.  .        .        . I      .        .        . W      . E      .        .        .        .
            2.  .        .        . I      .        .        .WC      . E      .        .        .        .
            4.  .        .        . I      .        .        .W       . EL     .        .        .        .
 1542.00    6.  .        .        . I      .        .        .W       . EL     .        .        .        .
            8.  .        .        . I      .        .        .W       . EL     .        .        .        .
 1537.00   10.  .        .        . I      .        .        .W       . EL     .        .        .        .
           12.  .        .        .I       .        .       WC        .LE      .        .        .        .
           14.  .        .        I        .        .     W C .       LE       .        .        .        .
           16.  .        .      I .        .        .  W   C  .      L .E      .        .        .        .
           18.  .        .     I  .        .        W   C    .     L  .E      .        .        .        .
           20.  .        .   I    .        .     W  .   C     .   L   E       .        .        .        .
 1525.00   22.  .        .  I     .        .   W    . C       .  L    E       .        .        .        .
           24.  .        . I      .        . W      .C        . L    E.       .        .        .        .
           26.  .        .I       .        .W      C.         .L      E.       .        .        .        .
           28.  .        I        .       W.      C .         L      E .       .        .        .        .
           30.  .      I .        .     W  .    C  .       L .      E .       .        .        .        .
           32.  .     I  .        .    W   .   C   .      L  .     E  .       .        .        .        .
           34.  .   I    .        . W      . C      .   L    .     E  .       .        .        .        .
 1512.00   36.  . I      .        .W       . C      . L      .     E  .       .        .        .        .
           38.  . I      .        .W       . C      . L      .    E   .       .        .        .        .
           40.  . I      .        . W      . C      . L      .   E    .       .        .        .        .
           42.  . I      .        . W      .C       . L      .   E    .       .        .        .        .
           44.  . I      .        . W      .C       . L      .  E     .       .        .        .        .
 1502.00   46.  . I      .        . W      .C       . L      . E      .       .        .        .        .
           48.  . I      .        . W      .C       . L      . E      .       .        .        .        .
           50.  . I      .        . W      .C       . L      .E       .       .        .        .        .
           52.  . I      .        . W      .C       . L      .E       .       .        .        .        .
           54.  . I      .        . W      .C       . L      .E       .       .        .        .        .
           56.  . I      .        .  W     .C       . L      .E       .       .        .        .        .
 1489.00   58.  . I      .        .  W     .C       . L      E        .       .        .        .        .
           60.  . I      .        .  W     .C       . L     E.        .       .        .        .        .
           62.  . I      .        .  W     .C       . L     E.        .       .        .        .        .
           64.  . I      .        .  W     .C       . L    E .        .       .        .        .        .
           66.  . I      .        .  W     .C       . L    E .        .       .        .        .        .
 1479.00   68.  . I      .        .   W    .C       . L   E  .        .       .        .        .        .
           70.  . I      .        .   W    .C       . L   E  .        .       .        .        .        .
           72.  . I      .        .   W    .C       . L   E  .        .       .        .        .        .
           74.  . I      .        .   W   .C        . L  E   .        .       .        .        .        .
           76.  . I      .        .   W   .C        . L  E   .        .       .        .        .        .
           78.  . I      .        .    W  .C        . L E    .        .       .        .        .        .
           80.  . I      .        .    W  .C        . L E    .        .       .        .        .        .
           82.  . I      .        .    W  .C        . L E    .        .       .        .        .        .
           84.  . I      .        .    W  .C        . LE     .        .       .        .        .        .
           86.  . I      .        .     W .C        . LE     .        .       .        .        .        .
 1459.00   88.  . I      .        .     W .C        . E      .        .       .        .        .        .
           90.  . I      .        .     W .C        . E      .        .       .        .        .        .
           92.  . I      .        .     W .C        . E      .        .       .        .        .        .
           94.  . I      .        .     W .C        . E      .        .       .        .        .        .
           96.  . I      .        .      W.C        . LE     .        .       .        .        .        .
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	100.	. I	.	.	W .C	. E	.	.	.	.	.	.
	102.	. I	.	.	W .C	. E	.	.	.	.	.	.
	104.	. I	.	.	W .C	. E	.	.	.	.	.	.
	106.	. I	.	.	W .C	. E	.	.	.	.	.	.
1439.00	108.	. I	.	.	WC	. E	.	.	.	.	.	.
	110.	. I	.	.	WC	. E	.	.	.	.	.	.
	112.	. I	.	.	WC	.EL	.	.	.	.	.	.
	114.	. I	.	.	WC	.EL	.	.	.	.	.	.
	116.	. I	.	.	W	.EL	.	.	.	.	.	.
1429.00	118.	. I	.	.	W	.EL	.	.	.	.	.	.

PROFILE FOR STREAM 48TH&CHNDLR CHNL(JMPCK1)

PLOTTED POINTS (BY PRIORITY) E-ENERGY,W-WATER SURFACE,I-INVERT,C-CRITICAL W.S.,L-LEFT BANK,R-RIGHT BANK,M-LOWER END STA

ELEVATION SECNO	195. CUMDIS	196.	197.	198.	199.	200.	201.	202.	203.	204.		
	120.	.	.	.	.	.	.	. I	.	.	. W	E
	122.	.	.	.	.	.	.	. I	.	.	. W	E
	124.	.	.	.	.	.	.	. I	.	.	. W	E
	126.	.	.	.	.	.	.	. I	.	.	. W	E
	128.	.	.	.	.	.	.	. I	.	.	. W	E
	130.	.	.	.	.	.	.	. I	.	.	. W	E
	132.	.	.	.	.	.	.	. I	.	.	. W	E
	134.	.	.	.	.	.	.	. I	.	.	. W	E
	136.	.	.	.	.	.	.	. I	.	.	. W	E
	138.	.	.	.	.	.	.	. I	.	.	. W	E
	140.	.	.	.	.	.	.	. I	.	.	. W	E
	142.	.	.	.	.	.	.	. I	.	.	. W	E
	144.	.	.	.	.	.	.	. I	.	.	. W	E
	146.	.	.	.	.	.	.	. I	.	.	. W	E
	148.	.	.	.	.	.	.	. I	.	.	. W	E
	150.	.	.	.	.	.	.	. I	.	.	. W	E
	152.	.	.	.	.	.	.	. I	.	.	. W	E
	154.	.	.	.	.	.	.	. I	.	.	. W	E
	156.	.	.	.	.	.	.	. I	.	.	. W	E
	158.	.	.	.	.	.	.	. I	.	.	. W	E
	160.	.	.	.	.	.	.	. I	.	.	. W	E
	162.	.	.	.	.	.	.	. I	.	.	. W	E
	164.	.	.	.	.	.	.	. I	.	.	. W	E
	166.	.	.	.	.	.	.	. I	.	.	. W	E
	168.	.	.	.	.	.	.	. I	.	.	. W	E
	170.	.	.	.	.	.	.	. I	.	.	. W	E
	172.	.	.	.	.	.	.	. I	.	.	. W	E
	174.	.	.	.	.	.	.	. I	.	.	. W	E
	176.	.	.	.	.	.	.	. I	.	.	. W	E
1369.00	178.	.	.	.	.	.	.	. I	.	.	. W	E

THIS RUN EXECUTED 01APR91 16:53:43

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.0; February 1991
****

OTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

8TH&CHNDLR CHNL(JMPCK1)

SUMMARY PRINTOUT

	SECNO	CWSEL	CRIWS	DEPTH	QLOB	QCH	QROB	EG	10*KS
	1547.000	206.53	206.53	2.83	.00	340.00	.00	207.63	46.33
*	1542.000	206.48	206.51	2.80	.00	340.00	.00	207.61	47.84
	1537.000	206.51	206.51	2.84	.00	340.00	.00	207.60	45.78
*	1525.000	204.79	205.60	2.02	.00	340.00	.00	207.36	154.21
	1512.000	203.61	204.64	1.81	.00	340.00	.00	207.04	233.34
	1502.000	203.67	204.60	1.90	.00	340.00	.00	206.70	195.93
	1489.000	203.75	204.57	2.02	.00	340.00	.00	206.35	156.51
	1479.000	203.84	204.54	2.14	.00	340.00	.00	206.10	128.50
	1459.000	204.05	204.47	2.41	.00	340.00	.00	205.72	83.18
	1439.000	204.23	204.42	2.65	.00	340.00	.00	205.54	58.87
	1429.000	204.38	204.38	2.83	.00	340.00	.00	205.48	46.29
*	1369.000	204.20	204.20	2.83	.00	340.00	.00	205.30	46.13

8TH&CHNDLR CHNL(JMPCK1)

SUMMARY PRINTOUT

	SECNO	VCH	VROB	VLOB	TOPWID	AREA	FRCH	K*CHSL
*	1547.000	8.44	.00	.00	18.49	40.30	1.01	.00
*	1542.000	8.53	.00	.00	18.41	39.85	1.02	-4.00
*	1537.000	8.40	.00	.00	18.52	40.47	1.00	-2.00
*	1525.000	12.87	.00	.00	16.08	26.41	1.77	-75.00
	1512.000	14.86	.00	.00	15.40	22.88	2.15	-74.62
	1502.000	13.99	.00	.00	15.68	24.30	1.98	-3.00
	1489.000	12.94	.00	.00	16.05	26.27	1.78	-3.08
	1479.000	12.08	.00	.00	16.40	28.14	1.63	-3.00
	1459.000	10.38	.00	.00	17.22	32.77	1.33	-3.00
*	1439.000	9.18	.00	.00	17.95	37.02	1.13	-3.00
*	1429.000	8.43	.00	.00	18.49	40.31	1.01	-3.00
*	1369.000	8.42	.00	.00	18.50	40.36	1.00	-3.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION SECNO=   1547.000  PROFILE=  1  CRITICAL DEPTH ASSUMED

 AUTION SECNO=   1542.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=   1537.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 AUTION SECNO=   1537.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1537.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

ARNING SECNO=   1525.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=   1439.000  PROFILE=  1  WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO=   1439.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   1429.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1429.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1429.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   1369.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1369.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1369.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
```

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*******************************************
 HEC-2 WATER SURFACE PROFILES            *
*                                        *
* Version   4.6.0;  February 1991        *
                                         *
 RUN DATE    01APR91    TIME   15:50:38  *
*******************************************
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****************************************
* U.S. ARMY CORPS OF ENGINEERS         *
* HYDROLOGIC ENGINEERING CENTER        *
* 609 SECOND STREET, SUITE D           *
* DAVIS, CALIFORNIA 95616-4687         *
*          (916) 756-1104              *
****************************************
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X     X  XXXXXXX   XXXXX            XXXXX
X     X  X       X     X          X     X
X     X  X       X                      X
XXXXXXX  XXXX     X         XXXXX   XXXXX
X     X  X       X                X
X     X  X       X     X          X
X     X  XXXXXXX   XXXXX           XXXXXXX
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4. JUMP 2: STATION 24 + 74

(SUPERCRITICAL)

THIS RUN EXECUTED 01APR91 15:50:38

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************************************
HEC-2 WATER SURFACE PROFILES

Version   4.6.0;  February 1991
************************************


 1  48TH ST & CHANDLER BLVD INFRASTRUCTURE CHANNEL. JOB NO 910103
 2  SPRCRITICAL HYDRAULIC JUMP CK #2(2459 TO 2484). 100 YR FLOWS. n=0.019
T3      48TH&CHNDLR CHNL(JMPCK2)

 1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                                    1        -1                          340     212.18

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    -1                                                            -1


 3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38        1         2         8        13        14        15         3         5
     38       26        56        55         4        25        68        33
    101


 C   0.019     0.019     0.019       .1        .3

X1    2494        5        69        91         6         4         5                10.08
^R   203.8       69     199.8        75     199.8        80     199.8        85     203.8        91


X1    2489        5        69        91         6         4         5                10.06
 R   203.8       69     199.8        75     199.8        80     199.8        85     203.8        91


         HEAD OF DROP
 1    2484        5        69        91        10        10        10                10.05
GR   203.8       69     199.8        75     199.8        80     199.8        85     203.8        91


X1    2474        5        69        91        15        15        15                 9.49
GR   203.8       69     199.8        75     199.8        80     199.8        85     203.8        91
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TOE OF DROP

X1	2459	5	69	91	29	29	29		8.66	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	2430	5	69	91	19	19	19		8.56	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	2411	5	69	91	30	30	30		8.51	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	2381	5	69	91	30	30	30		8.42	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91
X1	2351	5	69	91					8.33	
GR	203.8	69	199.8	75	199.8	80	199.8	85	203.8	91

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV= .100 CEHV= .300
SECNO 2494.000
720 CRITICAL DEPTH ASSUMED

2494.000	2.83	212.71	212.71	212.18	213.81	1.11	.00	.00	213.88
340.0	.0	340.0	.0	.0	40.3	.0	.0	.0	213.88
.00	.00	8.44	.00	.000	.019	.000	.000	209.88	70.76
.004633	0.	0.	0.	0	10	0	.00	18.49	89.24

SECNO 2489.000
7185 MINIMUM SPECIFIC ENERGY

2489.000	2.80	212.66	212.69	.00	213.79	1.13	.02	.00	213.86
340.0	.0	340.0	.0	.0	39.8	.0	.0	.0	213.86
.00	.00	8.53	.00	.000	.019	.000	.000	209.86	70.79
.004784	6.	5.	4.	0	5	0	.00	18.41	89.21

*SECNO 2484.000
685 20 TRIALS ATTEMPTED WSEL,CWSEL
693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
HEAD OF DROP

2484.000	2.84	212.69	212.69	.00	213.78	1.10	.02	.00	213.85
340.0	.0	340.0	.0	.0	40.5	.0	.0	.0	213.85
.00	.00	8.40	.00	.000	.019	.000	.000	209.85	70.74
.004577	6.	5.	4.	20	5	0	.00	18.52	89.26

SECNO 2474.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.61

2474.000	2.18	211.47	212.12	.00	213.61	2.14	.07	.10	213.29
340.0	.0	340.0	.0	.0	29.0	.0	.0	.0	213.29
.00	.00	11.74	.00	.000	.019	.000	.000	209.29	71.73
.011825	10.	10.	10.	6	5	0	.00	16.55	88.27

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2459.000

3301 HV CHANGED MORE THAN HVINS

TOE OF DROP

2459.000	1.92	210.38	211.29	.00	213.31	2.93	.22	.08	212.46
340.0	.0	340.0	.0	.0	24.7	.0	.0	.0	212.46
.00	.00	13.74	.00	.000	.019	.000	.000	208.46	72.12
.018613	15.	15.	15.	11	11	0	.00	15.76	87.88

*SECNO 2430.000

3301 HV CHANGED MORE THAN HVINS

2430.000	2.20	210.56	211.20	.00	212.64	2.08	.42	.26	212.36
340.0	.0	340.0	.0	.0	29.4	.0	.0	.0	212.36
.00	.00	11.57	.00	.000	.019	.000	.000	208.36	71.69
.011350	29.	29.	29.	5	11	0	.00	16.62	88.31

*SECNO 2411.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF

2411.000	2.65	210.96	211.14	.00	212.27	1.30	.15	.26	212.31
340.0	.0	340.0	.0	.0	37.1	.0	.1	.0	212.31
.00	.00	9.17	.00	.000	.019	.000	.000	208.31	71.02
.005853	19.	19.	19.	20	11	0	.00	17.96	88.98

*SECNO 2381.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2381.000	2.83	211.05	211.05	.00	212.15	1.10	.16	.05	212.22
340.0	.0	340.0	.0	.0	40.3	.0	.1	.0	212.22
.00	.00	8.43	.00	.000	.019	.000	.000	208.22	70.75
.004629	30.	30.	30.	20	8	0	.00	18.49	89.25

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2351.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2351.000	2.83	210.96	210.96	.00	212.06	1.10	.14	.00	212.13
340.0	.0	340.0	.0	.0	40.4	.0	.1	.1	212.13
.00	.00	8.42	.00	.000	.019	.000	.000	208.13	70.75
.004612	30.	30.	30.	20	5	0	.00	18.50	89.25

PROFILE FOR STREAM 48TH&CHNDLR CHNL(JMPCK2)

PLOTTED POINTS (BY PRIORITY) E-ENERGY,W-WATER SURFACE,I-INVERT,C-CRITICAL W.S.,L-LEFT BANK,R-RIGHT BANK,M-LOWER END STA

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ELEVATION   208.     209.     210.     211.     212.     213.     214.     215.     216.     217.
   SECNO    CUMDIS

 2494.00     0.  .        .     I  .        .        .    W   .     E  .        .        .        .        .
             2.  .        .     I  .        .        .    W   .     E  .        .        .        .        .
             4.  .        .     I  .        .        .   WC   .     E  .        .        .        .        .
 2489.00     6.  .        .     I  .        .        .   WC   .     E  .        .        .        .        .
             8.  .        .     I  .        .        .   WC   .     E  .        .        .        .        .
 2484.00    10.  .        .     I  .        .        .    W   .    EL  .        .        .        .        .
            12.  .        .    I   .        .        .  WC    .     E  .        .        .        .        .
            14.  .        .   I    .        .        .W C     .    LE  .        .        .        .        .
            16.  .        .  I     .        .      W . C      .   LE  .        .        .        .        .
            18.  .        . I      .        .    W   .C       . L E  .        .        .        .        .
 2474.00    20.  .        .I       .        . W     C        . L  E  .        .        .        .        .
            22.  .       I         .        . W     C.       L   E  .        .        .        .        .
            24.  .      I.         .       W      C .      L.   E  .        .        .        .        .
            26.  .     I .         .      W.     C  .     L .   E  .        .        .        .        .
            28.  .    I  .         .     W .   C    .    L  .  E  .        .        .        .        .
            30.  .   I   .         .   W   .  C     .   L   .  E  .        .        .        .        .
            32.  .  I    .         .  W    . C      .  L    . E  .        .        .        .        .
            34.  . I     .         . W     . C      . L     . E  .        .        .        .        .
 2459.00    36.  . I     .         .W      . C      . L     . E  .        .        .        .        .
            38.  . I     .         . W     . C      . L     .E   .        .        .        .        .
            40.  . I     .         . W     .C       . L     .E   .        .        .        .        .
            42.  . I     .         . W     .C       . L     E    .        .        .        .        .
            44.  . I     .         . W     .C       . L     E    .        .        .        .        .
            46.  . I     .         . W     .C       . L    E.    .        .        .        .        .
            48.  . I     .         . W     .C       . L    E.    .        .        .        .        .
            50.  . I     .         . W     .C       . L    E.    .        .        .        .        .
            52.  . I     .         .  W    .C       . L   E .    .        .        .        .        .
            54.  . I     .         .  W    .C       . L   E .    .        .        .        .        .
            56.  . I     .         .  W    .C       . L  E  .    .        .        .        .        .
            58.  . I     .         .  W    .C       . L  E  .    .        .        .        .        .
            60.  .I      .         .  W    .C       .L   E  .    .        .        .        .        .
            62.  .I      .         .  W    .C       .L   E  .    .        .        .        .        .
 2430.00    64.  .I      .         .  W    .C       .L  E   .    .        .        .        .        .
            66.  .I      .         .   W   .C       .L  E   .    .        .        .        .        .
            68.  .I      .         .   W   .C       .L E    .    .        .        .        .        .
            70.  .I      .         .    W  .C       .L E    .    .        .        .        .        .
            72.  .I      .         .    W  C        .L E    .    .        .        .        .        .
            74.  .I      .         .    W  C        .LE     .    .        .        .        .        .
            76.  .I      .         .     W C        .LE     .    .        .        .        .        .
            78.  .I      .         .     W C        .E      .    .        .        .        .        .
            80.  .I      .         .      W C       .E      .    .        .        .        .        .
            82.  .I      .         .      W C       .E      .    .        .        .        .        .
 2411.00    84.  .I      .         .      W C       .EL     .    .        .        .        .        .
            86.  .I      .         .      W C       .EL     .    .        .        .        .        .
            88.  .I      .         .      W C       .EL     .    .        .        .        .        .
            90.  .I      .         .      W C       .EL     .    .        .        .        .        .
            92.  .I      .         .       WC       .EL     .    .        .        .        .        .
            94.  .I      .         .       WC       .E      .    .        .        .        .        .
            96.  .I      .         .       WC        E
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	100.	.I	.	.	WC	.E	.	.	.	.	.	.
	102.	.I	.	.	WC	.E	.	.	.	.	.	.
	104.	.I	.	.	W.	.E	.	.	.	.	.	.
	106.	.I	.	.	W.	.E	.	.	.	.	.	.
	108.	.I	.	.	W.	EL	.	.	.	.	.	.
	110.	.I	.	.	W.	EL	.	.	.	.	.	.
	112.	.I	.	.	W.	EL	.	.	.	.	.	.
2381.00	114.	.I	.	.	W.	EL	.	.	.	.	.	.

PROFILE FOR STREAM 48TH&CHNDLR CHNL(JMPCK2)

PLOTTED POINTS (BY PRIORITY) E-ENERGY,W-WATER SURFACE,I-INVERT,C-CRITICAL W.S.,L-LEFT BANK,R-RIGHT BANK,M-LOWER END STA

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ELEVATION   202.     203.     204.     205.     206.     207.     208.     209.     210.     211.
   SECNO    CUMDIS

            116.  .        .        .        .        .        .        . I      .        .        W        E
            118.  .        .        .        .        .        .        . I      .        .        W        E
            120.  .        .        .        .        .        .        . I      .        .        W        E
            122.  .        .        .        .        .        .        . I      .        .        W        E
            124.  .        .        .        .        .        .        . I      .        .        W        E
            126.  .        .        .        .        .        .        . I      .        .        W        E
            128.  .        .        .        .        .        .        . I      .        .        W        E
            130.  .        .        .        .        .        .        . I      .        .        W        E
            132.  .        .        .        .        .        .        . I      .        .        W        E
            134.  .        .        .        .        .        .        . I      .        .        W        E
            136.  .        .        .        .        .        .        . I      .        .        W        E
            138.  .        .        .        .        .        .        .I       .        .        W        E
            140.  .        .        .        .        .        .        .I       .        .        W        E
            142.  .        .        .        .        .        .        .I       .        .        W        E
  2351.00   144.  .        .        .        .        .        .        .I       .        .        W        E
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THIS RUN EXECUTED 01APR91 15:50:49

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HEC-2 WATER SURFACE PROFILES

Version 4.6.0; February 1991
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OTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

8TH&CHNDLR CHNL(JMPCK2)

SUMMARY PRINTOUT

	SECNO	CWSEL	CRIWS	DEPTH	QLOB	QCH	QROB	EG	10*KS
	2494.000	212.71	212.71	2.83	.00	340.00	.00	213.81	46.33
*	2489.000	212.66	212.69	2.80	.00	340.00	.00	213.79	47.84
	2484.000	212.69	212.69	2.84	.00	340.00	.00	213.78	45.77
*	2474.000	211.47	212.12	2.18	.00	340.00	.00	213.61	118.25
	2459.000	210.38	211.29	1.92	.00	340.00	.00	213.31	186.13
	2430.000	210.56	211.20	2.20	.00	340.00	.00	212.64	113.50
*	2411.000	210.96	211.14	2.65	.00	340.00	.00	212.27	58.53
	2381.000	211.05	211.05	2.83	.00	340.00	.00	212.15	46.29
*	2351.000	210.96	210.96	2.83	.00	340.00	.00	212.06	46.12

18TH&CHNDLR CHNL(JMPCK2)

SUMMARY PRINTOUT

	SECNO	VCH	VROB	VLOB	TOPWID	AREA	FRCH	K*CHSL
*	2494.000	8.44	.00	.00	18.49	40.30	1.01	.00
*	2489.000	8.53	.00	.00	18.41	39.85	1.02	-4.00
*	2484.000	8.40	.00	.00	18.52	40.47	1.00	-2.00
*	2474.000	11.74	.00	.00	16.55	28.97	1.56	-56.00
	2459.000	13.74	.00	.00	15.76	24.74	1.93	-55.33
	2430.000	11.57	.00	.00	16.62	29.39	1.53	-3.45
*	2411.000	9.17	.00	.00	17.96	37.10	1.12	-2.63
*	2381.000	8.43	.00	.00	18.49	40.31	1.01	-3.00
*	2351.000	8.42	.00	.00	18.50	40.37	1.00	-3.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION SECNO=   2494.000  PROFILE=  1  CRITICAL DEPTH ASSUMED

 AUTION SECNO=   2489.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=   2484.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 AUTION SECNO=   2484.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 AUTION SECNO=   2484.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

 ARNING SECNO=   2474.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=   2411.000  PROFILE=  1  WSEL ASSUMED BASED ON MIN DIFF
 AUTION SECNO=   2411.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   2381.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   2381.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 AUTION SECNO=   2381.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   2351.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 AUTION SECNO=   2351.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 AUTION SECNO=   2351.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
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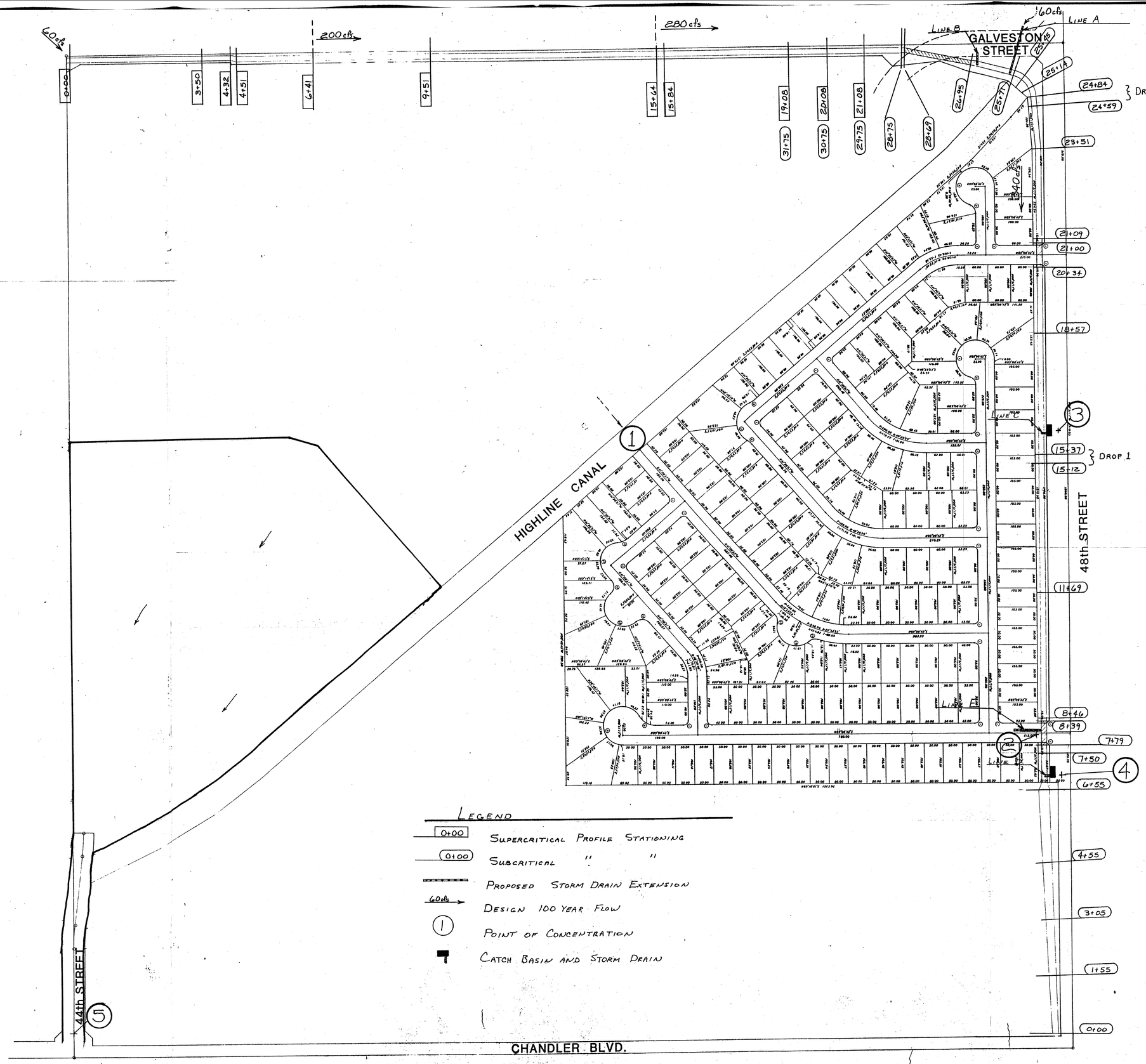

JOB NO. 910103

SCALE: 1" = 120'