

PROFESSIONAL
ENGINEERING
CONSULTANTS
PROFESSIONAL ASSOCIATION

Regency Point

L. C. PARCEL
CENTRAL AND WEBB

STORM WATER DRAIN STUDY
APPENDIX #1

PEC JOB NO.
32-86325-2063

JULY 1986



MEMO

TO: File

PROJECT NO. 32-86325-2063

PROJECT: Central & Webb

Storm Sewer

DATE: 7-17-86

COPIES TO:

ATTN:

Richard W. Linn

FROM: Michael Berry, P. E.

M. E. Lindebak, Attn: Vicky Huang

REFERENCE: Design Research by M. S. Mitchell

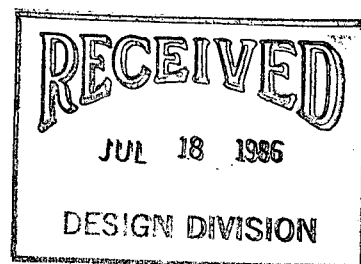
PLEASE ADVISE IMMEDIATELY OF ANY MISCONCEPTIONS OR OMISSIONS YOU BELIEVE TO BE CONTAINED HEREIN.

The writer spoke with M. S. Mitchell of Sedgwick County Bureau of Public Services on 7-16-86 concerning the above-referenced project.

The major topic of discussion was the apparent oversizing of the 3 - 10 x 5 RCBB structure beneath Webb Road (Bridge 833-0-262). Mr. Mitchell located design computations for the box indicating that it was sized for 790 cfs. He further stated that at that time, a county policy had been established which sized bridges on a basis of spanning "bank-to-bank", with little regard for hydrologic/hydraulic computations. It would appear from several photos of the upstream channel on Beech property taken prior to installation of the 2-54" RCP's that this policy was followed at this site.

Mr. Mitchell stated that the channel change constructed downstream from Webb Road across the Rounds property was constructed when Central Avenue was widened from two to four lanes. This flow previously had been carried in the north road ditch of Central.

The file information quoted above was found in the Flood Control Office (7th Floor-City Hall.) plat file for the "Art Association Addition".



MEMO



TO: FILE

PROJECT NO. 32-86325-2063

PROJECT: CENTRAL & WEBB

STORM SEWER

ATTN: _____

DATE: 7-23-86

COPIES TO:

M. E. LINDEBAK, P.E.

FROM: MICHAEL W. BERRY, P.E.

ATTN: C. L. GIPSON, P.E.

REFERENCE: HYDRAULIC COMPUTATIONS - NON-LINEAR

WOLFE CO.

RCB ALIGNMENT

PLEASE ADVISE IMMEDIATELY OF ANY MISCONCEPTIONS OR OMISSIONS YOU BELIEVE TO BE CONTAINED HEREIN.

Attached hereto are hydraulic computations for a non-linear reinforced concrete box alignment for the above-referenced project.

The hydrologic analysis was presented in a previous report entitled "LC Parcel, Central & Webb, Storm Water Drain Study," dated July 1986. Hydraulic analysis for a twin-8'X5' reinforced concrete box culvert on a straight alignment was presented therein.

The computations attached were made to analyze the effect of offsetting the alignment to avoid potential building sites, thus introducing four (4) 45 degree bends. The result in this non-tangent alignment is an increase in structure length and a decrease in invert slope. Also, each point of intersection (P.I.) produces a head loss.

The combination of these hydraulic factors results in an increase in the required culvert barrel size, from twin-8'X5' barrels to twin-9'X5' barrels.

For these computations, culvert barrel hydraulics were analyzed using Manning's Equation as presented in "Design Charts for Open Channel Flow," Hydraulic Design Series No. 3, USDOT, FHWA, Aug., 1961. The culvert is designed to operate in open channel flow. Head loss at each bend was analyzed by procedures given in the Los Angeles County Flood Control District (LAFCD) Manual. A check of these long-hand hydraulic computations was made using the U.S. Army Corps of Engineers Computer Program HEC-2. The computer model and the long-hand computations agree fairly well.

The transition structure was analyzed using the pressure-momentum equation as presented in the Los Angeles County Flood Control District Manual, pp DB-1 thru DB-14. (Copy included in prior report referenced above.)

MWB/mkm



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1440 EAST ENGLISH
WICHITA, KANSAS
ZIP CODE / 67211

Date 7-15-86 MNB Page 1 of 21
Project NW COR WEBB & CENTRAL - RCB HYDRAULICS
Item HEAD LOSSES @ P.I.'s

THE Head Loss due to a deflection at a point can be computed by the equation

$$H_L = K \frac{V^2}{2g}$$

where K can be determined from the plot attached, reproduced from the L.A.Co. Flood Control District Manual (See Sh 3 of 21)

Design parameters are as follows; for initial assumption (straight line)

$$Q = 850 \text{ cfs (100-yr Design)}$$

$$S_{box} = 0.50\%$$

$$2-8' \times 5' \text{ bbls}$$

$$L = 930'$$

$$d = 4.7'$$

$$V = 11.34 \text{ /s}$$

$$TW \text{ Elev} = 5.3' + 157 = 162.3 \text{ c.o.w.}$$

$$HW \text{ Elev} = 173$$

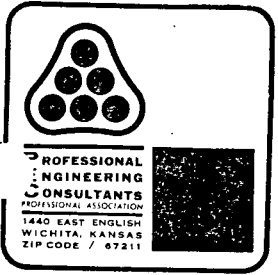
$$\text{Avail. fall} = 8.5'$$

$$\text{Fall thru trans} = 4'$$

$$\text{Net drop} = 4.5'$$

Find the following for the alignment

- New hydraulic factors based on increased L .
- Increase in box barrel size, if req'd.
- Head loss @ each P.I.
- Increase in box barrel size req'd due to P.I.'s



A) $L = 1060'$
 $S = \frac{4.5}{1060} = 0.0042 \text{ FT/FT}$

Compute head loss @ each 45° deflection point.

USE 0.4%
 From HDS # 3
 $n = 0.015$
 $S = 0.004$
 $Q = 425 \text{ cfs / bbl}$

Angle point loss = $K \frac{V^2}{2g}$
 For 45°, $K = 0.24$

$H_L = \frac{0.24 (10.5)^2}{64.4} = 0.4'$

B ft	d, ft	V ft/sec	
8'	4.9	10.8	subcritical
9'	4.5	10.5	subcritical
10'	4.0	10.6	subcritical

TOTAL LOSSES:
 $\left\{ \begin{array}{l} \text{Friction} \\ \text{thru} \\ \text{Barrel} \end{array} \right\} + 4 \left\{ \begin{array}{l} 45^\circ \\ \text{bend} \\ \text{loss} \end{array} \right\} + \left\{ \begin{array}{l} \text{Transition} \\ \text{Junction} \\ \text{Loss @ Inlet} \end{array} \right\}$ See Sh 4

2- 8x5 structure provides only 0.1' freeboard for head loss @ bends. If bend loss exceeds 0.1', pressure flow would result.

$= 1060(0.004) + 4(0.4') + 2.6' = 8.4$

If flow regime changes from open channel to pressure thru transition/jet box, then analysis is difficult if not impossible.

$\{HW\} = \{TW\} + \{TOTAL HEAD LOSS\}$
 $= 162.3 + 8.4 = 170.7 \text{ c/w}$

$= 1358.1 \text{ MSL}$
 Max allow HW = 1360.6' OK

To accommodate bend losses, decrease transition drop to 2.5' & put in 0.4' drop @ each bend

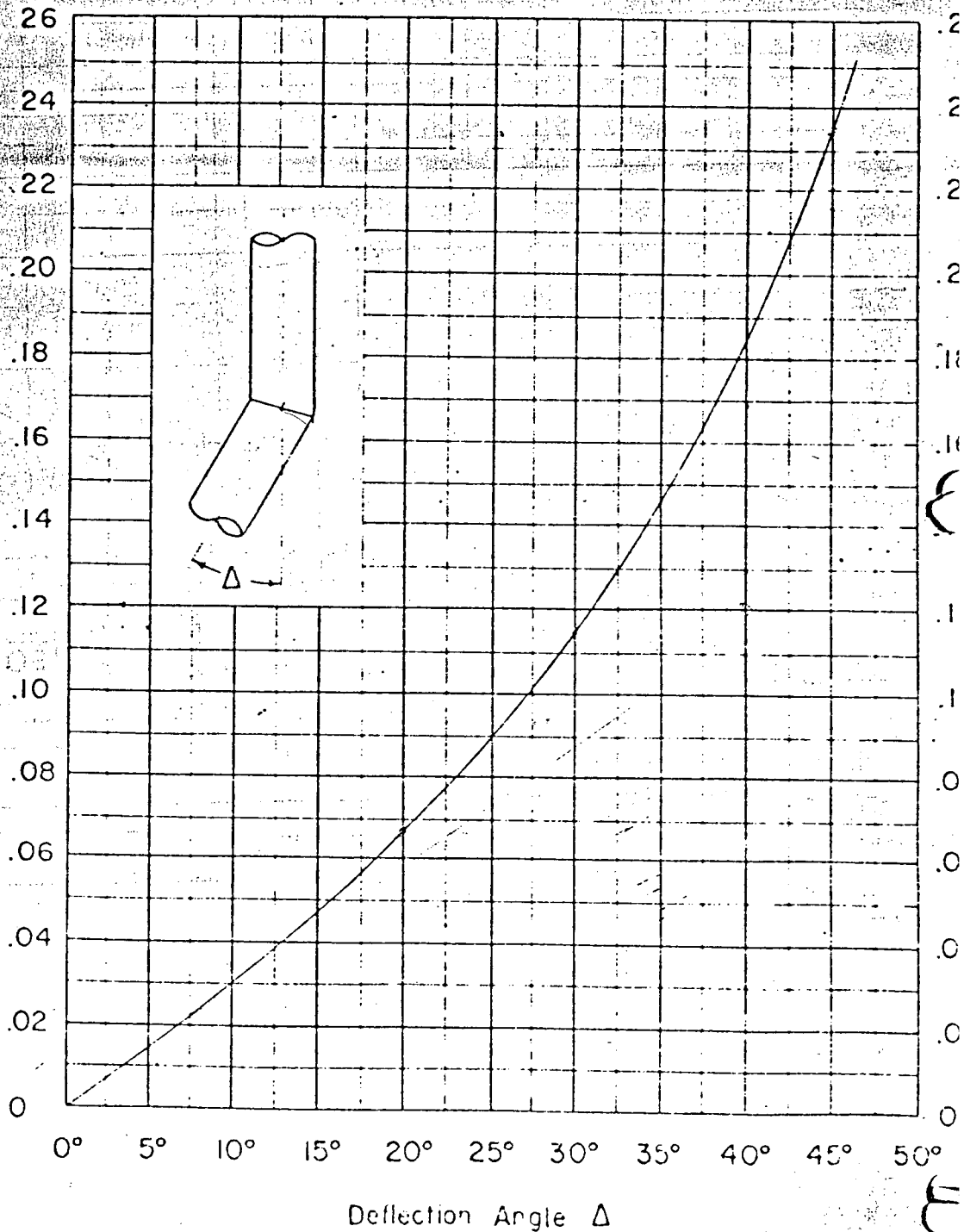
B) Therefore recommend 2- 9x5 RCB for longer alignment.

3/21

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

ANGLE POINT LOSS

$$\text{Angle Point Loss} = K \frac{V^2}{2g}$$



$$K = 0.5 \left(\frac{\Delta \text{ng}}{90} \right)^{1.2}$$



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Date 7-15-66 MAB Page 4 of 21

Project NW COR CENTRAL & WEBB - RCB HYD.

Item TRANSITION STRUCTURE

SEE FIG. A, SH 5, & LACFCO Manual pp DB-1 thru DB-14

From previous computation

$$M_1 = 144 \quad P_1 = 154 \quad M_3 \cos \theta = 14$$

$$M_2 = Q_2^2 = \frac{(850)^2}{b_2 d_2 g} = \frac{(850)^2}{(18)(4.5)(32.2)} = 277$$

$$P_2 = \frac{b_2 D_2^3}{2} = \frac{(18)(4.5)^3}{2} = 182$$

$$P_c = \left(\frac{b_1 + b_2}{2} \right) \left[D_1 + \frac{(D_2 - D_1)(b_1 + 2b_2)}{3(b_1 + b_2)} \right] h$$
$$= \left(\frac{30 + 18}{2} \right) \left[3.2 + \frac{(4.5 - 3.2)(30 + 2(18))}{3(30 + 18)} \right] h$$
$$= 24 \left[3.2 + \frac{(1.3)(66)}{3(48)} \right] h = 91h$$

$$P_w = \frac{(D_1 + D_2)(b_2 - b_1)}{4} \left[D_1 + \frac{(D_2 - D_1)(D_1 + 2D_2)}{3(D_1 + D_2)} \right]$$
$$= \frac{(3.2 + 4.5)(18 - 30)}{4} \left[3.2 + \frac{(4.5 - 3.2)(3.2 + 2(4.5))}{3(3.2 + 4.5)} \right]$$
$$= 1.93(-12) \left[3.2 + \frac{1.3(12.2)}{3(7.7)} \right] = -90$$

P_f is neglected

$$P_2 + M_2 = P_1 + M_1 + M_3 \cos \theta + P_c + P_w - P_f$$

$$182 + 277 = 144 + 154 + 14 + 91h - 90$$

$$h = (182 + 277 - 144 - 154 - 14 + 90) / 91 = 2.60'$$

h provided $>$ h computed OK



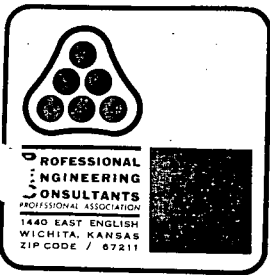
Date 7-17-86 MB Page 5 of 21
Project NW COR CENTRAL & WEBB RD
Item HYDRAULICS

To verify the long hand computation, a HEC-2 run was made to check the hydraulic grade line. Four (4) 45° deflections were assumed, each having a invert drop of 0.4'. The invert slope on tangent was taken to be 0.004 ft/ft.

The profile was run from the east line of the Art Association Addition thru the transition/junction box to the upstream end of the 3-10x5 RCB beneath Webb Rd.

The profile thru the junction box ^{& upstream} should be considered only as approximate, since HEC-2 has no capability to analyze the pressure/momentum equations to compute the junction losses.

The computer coincided with the hand computation fairly well.



Date 7-17-86 MMB Page 6 of 21

Project NW COR CENTRAL & WEBB RD

Item RIPRAP DESIGN

REFERENCE: "Field & Laboratory Evaluation of Energy Dissipators for Culvert & Storm Drain Outlets," Vol. I, by S. Sarikelle & A.L. Simon, University of Akron, Akron Ohio 44325

DESIGN PARAMETERS

* Based on hydraulic analysis for Art. Assoc. bridge

Q, cfs	Box Bbl Parameters			* CHANNEL PARAMETERS		
	Vel, ft/s	Depth, ft	Np	V, ft/s	Depth, ft	
100-yr	850	9.8	4.11	0.85	7.5	5.2
10-yr	500	8.4	2.89	0.87	6.5	4.3
5-yr	420	8.1	2.56	0.89	6.1	4.0

METHOD 1 Ohio D.O.T. p. 109

For largest pipe size (120" = 78 ft²) @ 10 ft/s, use 27 lin ft protection consisting of 30" thickness of 9" rock

METHOD 2 Thorson Method p. 14

$$L_{sp} = \frac{1}{2} \tan \theta \left[\frac{Q}{TW(V)} - W_0 \right] \quad \text{Eq. 20}$$

- L_{sp} = length of stone protection (ft)
- θ = angle of lateral expansion (Min value $\tan \theta = 0.05$)
- Q = discharge (ft³/s)
- TW = tailwater depth (ft)
- V = allowable downstream velocity (ft/s)
- W_0 = basin width @ inlet (ft)

$$L_{sp} = \frac{1}{2} \tan 45^\circ \left[\frac{850}{(5.2)(6.1)} - 40 \right] < 0' \Rightarrow \text{does not apply}$$

45° wing walls

velocity in existing channel



Date 4-18-86 MIB Page 7 of 21
 Project NW COR CENTRAL & WEBB RD
 Item RIPPRAP DESIGN

METHOD 3 Corps of Engineers, Fletcher & Grace

$$\frac{L}{D} = 1.7 \frac{Q}{D^{2.5}} + 8.0$$

L = length of bed, ft
 D = diameter of culvert, ft
 Q = design discharge, cfs

Solve for equiv. round pipe

$$2 \times 9 \times 5 = 90 \text{ ft}^2$$

$$A = \frac{\pi D^2}{4}$$

$$D = \sqrt{\frac{4A}{\pi}} = 10.7'$$

$$\therefore \frac{L}{D} = 1.7 \frac{850}{(10.7)^{2.5}} + 8$$

$$= 11.9$$

$$L = 11.9(10.7) = 127 \text{ ft.}$$

METHOD 4 HEC-14

$$L = 4D = 4(10.7) = 42.8'$$

CHECK NORMAL FLOW IN 40' TRAPEZOIDAL RIPRAPPED CHANNEL WITH 3:1 SLOPES. USE $S = 0.009$ ft/ft, $n = 0.045$

Reference Chow Fig 6-1

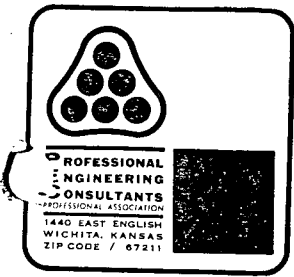
$$Q = (1.49 A R^{2/3} S^{1/2}) / n$$

$$\frac{Qn}{1.49 S^{1/2}} = AR^{2/3} = \frac{(850)(0.045)}{1.49 (0.009)^{1/2}} = 271$$

$$AR^{2/3} / b^{2/3} = 271 / 40^{2/3} = 0.0145$$

$$y = 0.078 \quad y = 0.078(40) = 3.12'$$

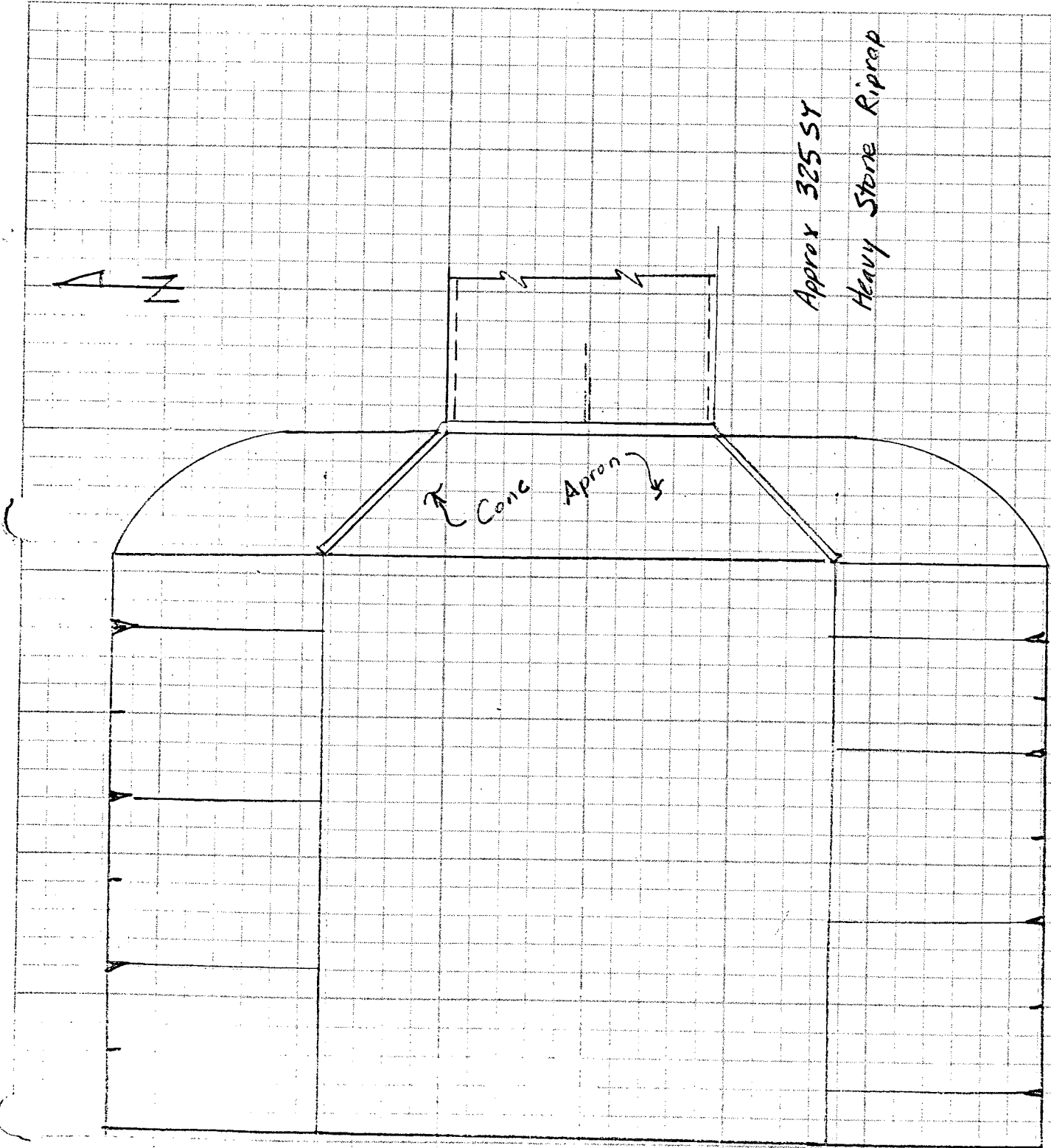
$$V = 5.76 \text{ ft/s} < \text{Natural channel velocity. OK}$$



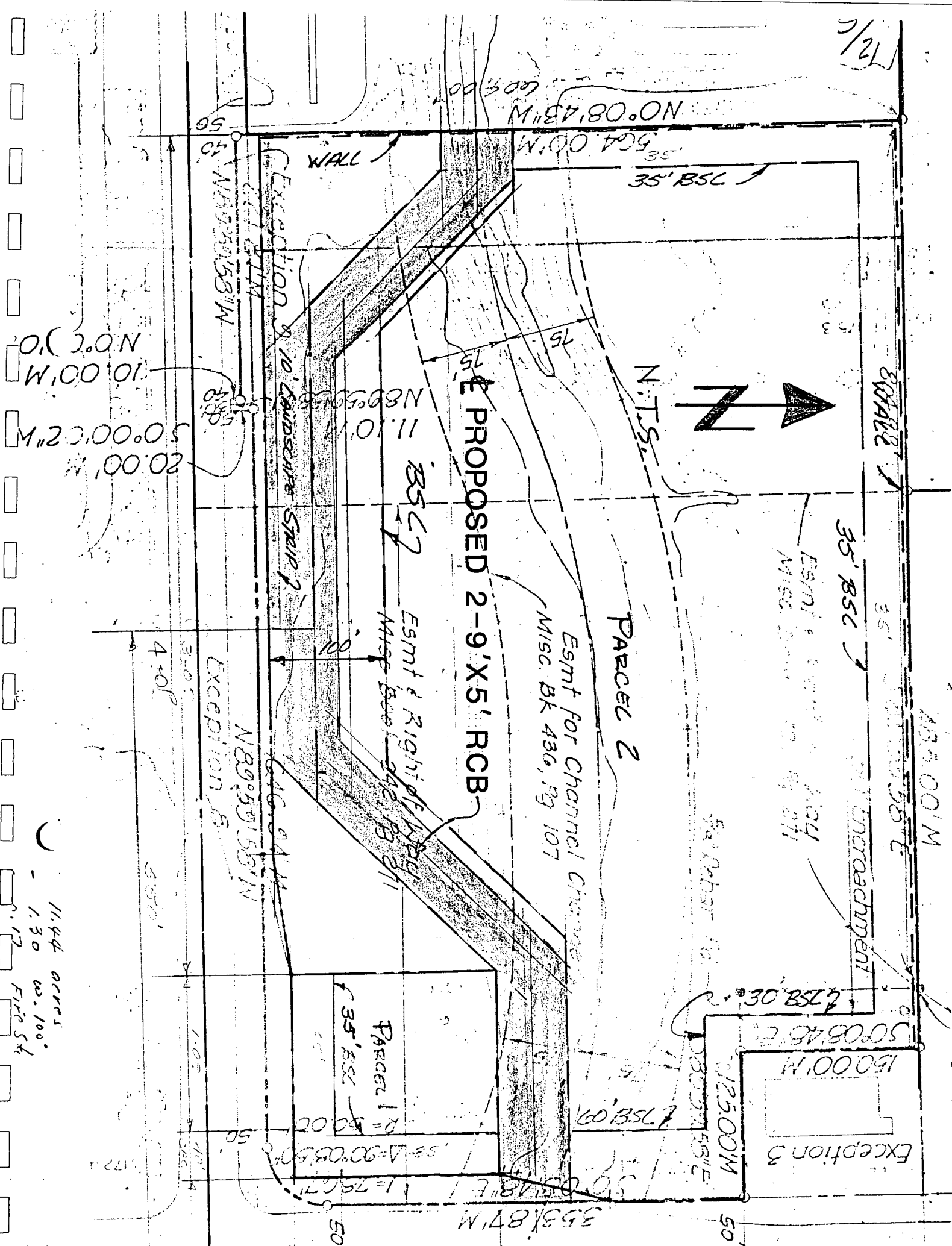
Date 7-18-86 Page B of 21

Project NW COR CENTRAL & WEBB RD

Item RIPRAP DESIGN - CONCEPT



12/16



10.00' N 0° 0' 0" W
 20.00' N 5° 0' 0" W
 5.00' N 0° 0' 0" W

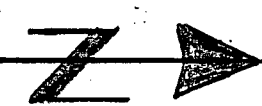
11.44 acres
 1.30 w. 100°
 1.17 FIRE 54

PROPOSED 2-9' X 5' RCB

PARCEL 2

PARCEL 1

Exception 3



WALL

Exception & 10' Landscape Strip

Exception 5

Esmt for Channel Change
 Misc. BK 436, Pg 107

Esmt & Right of Way
 Misc. BK 442, Pg 21

Esmt & Right of Way
 Misc. BK 442, Pg 21

35' BSC

35'

435.00' M

80' ABLE

Esmt for

Encroachment

150.00' M

125.00' M

50'

353.87' M

N 0° 08' 43" W

564.00' M

35' BSC

N.T.S.

N 89° 50' 55" W

N 89° 50' 55" W

N 89° 50' 55" W

50.00'

50.00'

50.00'

50.00'

50.00'

4.00'

0.550'

1.00'

40'

50'

50'

50'

172'

172'

172'

172'

```

*****
* WATER SURFACE PROFILES *
* VERSION OF NOVEMBER 1976 *
* UPDATED MAY 1984 *
* IBM-PC-XT VERSION *
* RUN DATE 07/17/86 TIME 14:01:02 *
*****

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*****
* U.S. ARMY CORPS OF ENGINEERS *
* THE HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET, SUITE D *
* DAVIS, CALIFORNIA 95616 *
* (916) 440-2105 (FTS) 448-2105 *
*****

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PROFILE THRU ECB
 W/ 0.4' DROP @ EA. P.I.

```

X X XXXXXXX XXXXX XXXXX
X X X X X X X
XXXXXX XXXX X XXXXX XXXXX
X X X X X X
X X X X X X
X X XXXXXXX XXXXX XXXXXXX

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THIS RUN EXECUTED 07/17/86 14:01:03

 HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
 ERROR CORR - 01,02,03,04,05,06
 MODIFICATION - 50,51,52,53,54,55,56
 IBM-PC-XT VERSION APRIL 1985

TICENTRAL & WEBB ROAD STORM SEWER---file="a:cenwebb.dat",disk="pburg"
 T2100 YEAR STORM FREQUENCY
 T3 EAST BR GYPSUM CR TRIB

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	2.	0.	0.	.009000	.00	.0	0.	162.000	.000
J2	NPROF	IPL0T	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
J3	VARIABLE CODES FOR SUMMARY PRINTOUT									
	100.000	150.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.015	.015	.015	.300	.500	.000	.000	.000	.000	.000
QT	3.000	850.000	500.000	420.000	.000	.000	.000	.000	.000	.000
X1	1.000	10.000	6.000	13.000	.000	.000	.000	.000	.000	.000
GR	167.000	.000	157.000	.000	157.000	6.000	157.000	9.000	167.000	9.000
GR	167.000	10.000	157.000	10.000	157.000	13.000	157.000	19.000	167.000	19.000
X1	2.000	.000	.000	.000	30.000	30.000	30.000	.000	.120	.000
X1	3.000	.000	.000	.000	36.000	20.000	28.000	.000	.400	.000
X1	4.000	.000	.000	.000	180.000	180.000	180.000	.000	.720	.000
X1	5.000	.000	.000	.000	20.000	36.000	28.000	.000	.400	.000
X1	6.000	.000	.000	.000	320.000	320.000	320.000	.000	1.280	.000
X1	7.000	.000	.000	.000	20.000	36.000	28.000	.000	.400	.000
X1	8.000	.000	.000	.000	220.000	220.000	220.000	.000	.880	.000
X1	9.000	.000	.000	.000	36.000	20.000	28.000	.000	.400	.000
X1	10.000	.000	.000	.000	120.000	120.000	120.000	.000	.480	.000

07/17/86 14:01:03

PAGE 4

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XLN	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 5.000

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

5.00	4.11	162.75	162.75	.00	164.86	2.11	.12	.13	158.64
850.	304.	242.	304.	25.	25.	25.	0.	0.	158.64
.01	12.31	9.81	12.31	.015	.015	.015	.000	158.64	.00
.004700	20.	28.	36.	2	11	0	.00	18.00	19.00

*SECNO 6.000

3265 DIVIDED FLOW

6.00	4.72	164.64	.00	.00	166.25	1.61	1.24	.15	159.92
850.	305.	239.	305.	28.	28.	28.	1.	0.	159.92
.02	10.79	8.46	10.79	.015	.015	.015	.000	159.92	.00
.003253	320.	320.	320.	3	0	0	.00	18.00	19.00

*SECNO 7.000

3265 DIVIDED FLOW

7.00	4.24	164.56	.00	.00	166.54	1.99	.10	.19	160.32
850.	304.	241.	304.	25.	25.	25.	1.	0.	160.32
.02	11.96	9.49	11.96	.015	.015	.015	.000	160.32	.00
.004327	20.	28.	36.	2	0	0	.00	18.00	19.00

*SECNO 8.000

3265 DIVIDED FLOW

8.00	4.56	165.76	.00	.00	167.48	1.72	.86	.08	161.20
850.	305.	240.	305.	27.	27.	27.	2.	0.	161.20
.02	11.14	8.77	11.14	.015	.015	.015	.000	161.20	.00
.003550	220.	220.	220.	5	0	0	.00	18.00	19.00

07/17/86 14:01:03

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XLN	YNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 9.000

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

9.00	4.11	165.71	165.71	.00	167.82	2.11	.11	.19	161.60
850.	304.	242.	304.	25.	25.	25.	2.	0.	161.60
.02	12.31	9.81	12.31	.015	.015	.015	.000	161.60	.00
.004702	36.	28.	20.	2	11	0	.00	18.00	19.00

*SECNO 10.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

10.00	4.81	166.89	166.20	.00	168.44	1.55	.45	.17	162.08
850.	305.	239.	305.	29.	29.	29.	2.	0.	162.08
.03	10.58	8.28	10.58	.015	.015	.015	.000	162.08	.00
.003080	120.	120.	120.	20	5	0	.00	18.00	19.00

*SECNO 11.000

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

11.00	2.80	168.30	168.30	.00	169.70	1.40	.21	.04	175.00
850.	0.	850.	0.	0.	90.	0.	2.	0.	175.00
.03	.00	9.50	.00	.015	.015	.015	.000	165.50	.00
.002891	70.	70.	70.	20	11	0	.00	32.00	32.00

*SECNO 11.100

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	GLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
11.10	3.99	169.49	.00	.00	169.97	.49	.00	.27	175.00
668.	0.	668.	0.	0.	119.	0.	2.	0.	175.00
.03	.00	5.59	.00	.015	.015	.015	.000	165.50	.00
.001104	1.	1.	1.	4	0	0	.00	30.00	32.00

*SECNO 12.000

3265 DIVIDED FLOW

12.00	3.86	169.56	.00	.00	170.08	.52	.09	.02	175.20
668.	0.	668.	0.	0.	116.	0.	2.	0.	175.20
.03	.00	5.77	.00	.015	.015	.015	.000	165.70	.00
.001202	75.	75.	75.	2	0	0	.00	30.00	32.00

PROFILE FOR STREAM EAST BR GYPSUM CR TRIB

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 SECON	156. CUMDIS	158.	160.	162.	164.	166.	168.	170.	172.	174.
1.00	0. .	I	.	.	W	.	.	.	.	.
	10. C	I	.	.	W	E	.	.	.	.
	20. C	I	.	.	W	E	.	.	.	.
2.00	30. C	I	.	.	W	E	.	.	.	.
	40. C	I	.	.	W	E	.	.	.	.
	50. C	I	.	.	W	E	.	.	.	.
3.00	60. C	I	.	.	W	E	.	.	.	.
	70. C	I	.	.	W	E	.	.	.	.
	80. C	I	.	.	W	E	.	.	.	.
	90. C	I	.	.	W	E	.	.	.	.
	100. C	I	.	.	W	E	.	.	.	.
	110. C	I	.	.	W	E	.	.	.	.
	120. C	I	.	.	W	E	.	.	.	.
	130. C	I	.	.	W	E	.	.	.	.
	140. C	I	.	.	W	E	.	.	.	.
	150. C	I	.	.	W	E	.	.	.	.
	160. C	I	.	.	W	E	.	.	.	.
	170. C	I	.	.	W	E	.	.	.	.
	180. C	I	.	.	W	E	.	.	.	.
	190. C	I	.	.	W	E	.	.	.	.
	200. C	I	.	.	W	E	.	.	.	.
	210. C	I	.	.	W	E	.	.	.	.
	220. C	I	.	.	W	E	.	.	.	.
	230. C	I	.	.	W	E	.	.	.	.
4.00	240. C	I	.	.	W	E	.	.	.	.
	250. C	I	.	.	W	E	.	.	.	.
	260. C	I	.	.	W	E	.	.	.	.
5.00	270. .	I	.	.	W	E	.	.	.	.
	280. .	C	I	.	W	E	.	.	.	.
	290. C	I	.	.	W	E	.	.	.	.
	300. C	I	.	.	W	E	.	.	.	.
	310. C	I	.	.	W	E	.	.	.	.
	320. C	I	.	.	W	E	.	.	.	.
	330. C	I	.	.	W	E	.	.	.	.
	340. C	I	.	.	W	E	.	.	.	.
	350. C	I	.	.	W	E	.	.	.	.
	360. C	I	.	.	W	E	.	.	.	.
	370. C	I	.	.	W	E	.	.	.	.
	380. C	I	.	.	W	E	.	.	.	.
	390. C	I	.	.	W	E	.	.	.	.
	400. C	I	.	.	W	E	.	.	.	.
	410. C	I	.	.	W	E	.	.	.	.
	420. C	I	.	.	W	E	.	.	.	.
	430. C	I	.	.	W	E	.	.	.	.
	440. C	I	.	.	W	E	.	.	.	.
	450. C	I	.	.	W	E	.	.	.	.
	460. C	I	.	.	W	E	.	.	.	.
	470. C	I	.	.	W	E	.	.	.	.
	480. C	I	.	.	W	E	.	.	.	.
	490. C	I	.	.	W	E	.	.	.	.

	500.	C	.	I.	.	.	W	E	.	M.	.	.	.	.	.	.	.	.	.	.
	510.	C	.	I.	.	.	W	E	.	M.	.	.	.	.	.	.	.	.	.	.
	520.	C	.	I.	.	.	W	E	.	M.	.	.	.	.	.	.	.	.	.	.
	530.	C	.	I.	.	.	W	E	.	M.	.	.	.	.	.	.	.	.	.	.
	540.	C	.	I.	.	.	W	E	.	M.	.	.	.	.	.	.	.	.	.	.
	550.	C	.	I.	.	.	W	E	.	M.	.	.	.	.	.	.	.	.	.	.
	560.	C	.	I.	.	.	W	E	.	M.	.	.	.	.	.	.	.	.	.	.
	570.	C	.	I.	.	.	W	E	.	M.	.	.	.	.	.	.	.	.	.	.
	580.	C	.	I.	.	.	W	E	.	M.	.	.	.	.	.	.	.	.	.	.
6.00	590.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	600.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	610.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
7.00	620.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	630.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	640.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	650.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	660.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	670.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	680.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	690.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	700.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	710.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	720.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	730.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	740.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	750.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	760.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	770.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	780.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	790.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	800.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	810.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	820.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	830.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
8.00	840.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	850.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	860.	C	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
9.00	870.	.	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	880.	.	.	I	.	.	W	E	.	M	.	.	.	.	.	.	.	.	.	.
	890.	.	.	I	.	.	CW	E	.	M	.	.	.	.	.	.	.	.	.	.
	900.	.	.	I	.	.	CW	E	.	M	.	.	.	.	.	.	.	.	.	.
	910.	.	.	I	.	.	C.W	E	.	M	.	.	.	.	.	.	.	.	.	.
	920.	.	.	I	.	.	CW	E	.	M	.	.	.	.	.	.	.	.	.	.
	930.	.	.	I	.	.	CW	E	.	M	.	.	.	.	.	.	.	.	.	.
	940.	.	.	I	.	.	CW	E	.	M	.	.	.	.	.	.	.	.	.	.
	950.	.	.	I	.	.	CW	E	.	M	.	.	.	.	.	.	.	.	.	.
	960.	.	.	I	.	.	CW	E	.	M	.	.	.	.	.	.	.	.	.	.
	970.	.	.	I	.	.	.CW	E	.	M	.	.	.	.	.	.	.	.	.	.
	980.	.	.	I	.	.	.CW	E	.	M	.	.	.	.	.	.	.	.	.	.
10.00	990.	.	.	I	.	.	.CW	E	.	M	.	.	.	.	.	.	.	.	.	.
	1000.	.	.	I	L	.	.CW	E	.	M	.	.	.	.	.	.	.	.	.	.
	1010.	.	.	I	.	.	L	CW	E	.	M	.	.	.	.	.	.	.	.	.
	1020.	.	.	I	.	.	.	CWL	E	.	M	.	.	.	.	.	.	.	.	.
	1030.	.	.	I	.	.	.	CW	EL	.	M	.	.	.	.	.	.	.	.	.
	1040.	.	.	I	.	.	I	CW	E	L	.	M	.	.	.	.	.	.	.	.
	1050.	.	.	I	.	.	I	W	E	.	L	M	.	.	.	.	.	.	.	.
11.00	1060.	.	.	I	.	.	I	W	E	.	.	L	.	.	.	.	.	.	.	.
11.10	1070.	C	.	I	.	.	I	.	WE	.	.	.	L	.	.	.	.	.	.	.
	1080.	C	.	I	.	.	I	.	WE	.	.	.	L	.	.	.	.	.	.	.
	1090.	C	.	I	.	.	I	.	WE	.	.	.	L	.	.	.	.	.	.	.
	1100.	C	.	I	.	.	I	.	WE	.	.	.	L	.	.	.	.	.	.	.
	1110.	C	.	I	.	.	I	.	WE	.	.	.	L	.	.	.	.	.	.	.
	1120.	C	.	I	.	.	I	.	WE	.	.	.	L	.	.	.	.	.	.	.
12.00	1130.	C	.	I	.	.	I	.	WE	.	.	.	L	.	.	.	.	.	.	.

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	GLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 2

CCHV= .300 CEHV= .500

*SECNO 1.000

2096 WSEL NOT GIVEN,AVG OF MAX,MIN USED

3265 DIVIDED FLOW

3720 CRITICAL DEPTH ASSUMED

1.00	2.89	159.89	159.89	.00	161.36	1.47	.00	.00	157.00
500.	177.	147.	177.	17.	17.	17.	0.	0.	157.00
.00	10.20	8.45	10.20	.015	.015	.015	.000	157.00	.00
.004351	0.	0.	0.	0	18	0	.00	18.00	19.00

*SECNO 2.000

3265 DIVIDED FLOW

2.00	3.39	160.51	.00	.00	161.58	1.07	.10	.12	157.12
500.	178.	145.	178.	20.	20.	20.	0.	0.	157.12
.00	8.72	7.10	8.72	.015	.015	.015	.000	157.12	.00
.002763	30.	30.	30.	7	0	0	.00	18.00	19.00

*SECNO 3.000

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

3.00	2.89	160.41	160.41	.00	161.88	1.47	.10	.20	157.52
500.	177.	147.	177.	17.	17.	17.	0.	0.	157.52
.00	10.20	8.46	10.20	.015	.015	.015	.000	157.52	.00
.004353	36.	28.	20.	2	11	0	.00	18.00	19.00

*SECNO 4.000

3265 DIVIDED FLOW

4.00	3.16	161.40	.00	.00	162.64	1.24	.69	.07	158.24
500.	177.	146.	177.	19.	19.	19.	0.	0.	158.24
.01	9.38	7.70	9.38	.015	.015	.015	.000	158.24	.00
.003413	180.	180.	180.	3	0	0	.00	18.00	19.00

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

*SECNO 5.000

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

5.00	2.88	161.52	161.52	.00	163.00	1.47	.11	.12	158.64
500.	177.	147.	177.	17.	17.	17.	0.	0.	158.64
.01	10.22	8.48	10.22	.015	.015	.015	.000	158.64	.00
.004381	20.	28.	36.	3	11	0	.00	18.00	19.00

*SECNO 6.000

3265 DIVIDED FLOW

6.00	3.14	163.06	.00	.00	164.30	1.24	1.23	.07	159.92
500.	177.	146.	177.	19.	19.	19.	1.	0.	159.92
.02	9.39	7.71	9.39	.015	.015	.015	.000	159.92	.00
.003420	320.	320.	320.	2	0	0	.00	18.00	19.00

*SECNO 7.000

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

7.00	2.88	163.20	163.20	.00	164.68	1.47	.11	.12	160.32
500.	177.	147.	177.	17.	17.	17.	1.	0.	160.32
.02	10.22	8.48	10.22	.015	.015	.015	.000	160.32	.00
.004381	20.	28.	36.	3	11	0	.00	18.00	19.00

*SECNO 8.000

3265 DIVIDED FLOW

8.00	3.16	164.36	.00	.00	165.59	1.23	.84	.07	161.20
500.	177.	145.	177.	19.	19.	19.	1.	0.	161.20
.03	9.35	7.68	9.35	.015	.015	.015	.000	161.20	.00
.003379	220.	220.	220.	3	0	0	.00	18.00	19.00

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

*SECNO 9.000

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

9.00	2.88	164.48	164.48	.00	165.96	1.47	.11	.12	161.60
500.	177.	147.	177.	17.	17.	17.	1.	0.	161.60
.03	10.22	8.48	10.22	.015	.015	.015	.000	161.60	.00
.004381	36.	28.	20.	3	11	0	.00	18.00	19.00

*SECNO 10.000

3265 DIVIDED FLOW

10.00	3.23	165.31	.00	.00	166.49	1.18	.44	.09	162.08
500.	177.	145.	177.	19.	19.	19.	1.	0.	162.08
.03	9.15	7.49	9.15	.015	.015	.015	.000	162.08	.00
.003171	120.	120.	120.	6	0	0	.00	18.00	19.00

*SECNO 11.000

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

11.00	1.96	167.46	167.46	.00	168.45	.99	.22	.06	175.00
500.	0.	500.	0.	0.	63.	0.	1.	0.	175.00
.03	.00	7.98	.00	.015	.015	.015	.000	165.50	.00
.003092	70.	70.	70.	20	14	0	.00	32.00	32.00

*SECNO 11.100

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

11.10	2.78	168.28	.00	.00	168.64	.36	.00	.19	175.00
400.	0.	400.	0.	0.	83.	0.	1.	0.	175.00
.03	.00	4.81	.00	.015	.015	.015	.000	165.50	.00
.001089	1.	1.	1.	4	0	0	.00	30.00	32.00

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SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XLN	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 12.000

3265 DIVIDED FLOW

12.00	2.65	168.35	1.00	.00	168.74	.39	.09	.02	175.20
400.	0.	400.	0.	0.	79.	0.	1.	0.	175.20
.04	.00	5.03	.00	.015	.015	.015	.000	165.70	.00
.001242	75.	75.	75.	2	0	0	.00	30.00	32.00

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SECNO	DEPTH	CWSEL	CRIS	WSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 3

CCHV= .300 CEHV= .500

*SECNO 1.000

2096 WSEL NOT GIVEN,AVG OF MAX,MIN USED

3265 DIVIDED FLOW

3720 CRITICAL DEPTH ASSUMED

1.00	2.56	159.56	159.56	.00	160.87	1.31	.00	.00	157.00
420.	148.	124.	148.	15.	15.	15.	0.	0.	157.00
.00	9.61	8.07	9.61	.015	.015	.015	.000	157.00	.00
.004312	0.	0.	0.	0	17	0	.00	18.00	19.00

*SECNO 2.000

3265 DIVIDED FLOW

2.00	3.01	160.13	.00	.00	161.08	.95	.10	.11	157.12
420.	149.	123.	149.	18.	18.	18.	0.	0.	157.12
.00	8.22	6.78	8.22	.015	.015	.015	.000	157.12	.00
.002717	30.	30.	30.	7	0	0	.00	18.00	19.00

*SECNO 3.000

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

3.00	2.57	160.09	160.09	.00	161.39	1.30	.09	.18	157.52
420.	148.	124.	148.	15.	15.	15.	0.	0.	157.52
.00	9.59	8.06	9.59	.015	.015	.015	.000	157.52	.00
.004287	36.	28.	20.	2	11	0	.00	18.00	19.00

*SECNO 4.000

3265 DIVIDED FLOW

4.00	2.78	161.02	.00	.00	162.14	1.12	.69	.05	158.24
420.	148.	123.	148.	17.	17.	17.	0.	0.	158.24
.01	8.91	7.42	8.91	.015	.015	.015	.000	158.24	.00
.003450	180.	180.	180.	3	0	0	.00	18.00	19.00

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

*SECNO 5.000

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

5.00	2.56	161.20	161.20	.00	162.51	1.31	.11	.09	158.64
420.	148.	124.	148.	15.	15.	15.	0.	0.	158.64
.01	9.61	8.07	9.61	.015	.015	.015	.000	158.64	.00
.004314	20.	28.	36.	3	11	0	.00	18.00	19.00

*SECNO 6.000

3265 DIVIDED FLOW

6.00	2.75	162.67	.00	.00	163.81	1.14	1.24	.05	159.92
420.	148.	124.	148.	17.	17.	17.	1.	0.	159.92
.02	8.97	7.48	8.97	.015	.015	.015	.000	159.92	.00
.003518	320.	320.	320.	2	0	0	.00	18.00	19.00

*SECNO 7.000

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

7.00	2.56	162.88	162.88	.00	164.19	1.31	.11	.09	160.32
420.	148.	124.	148.	15.	15.	15.	1.	0.	160.32
.02	9.61	8.07	9.61	.015	.015	.015	.000	160.32	.00
.004312	20.	28.	36.	4	11	0	.00	18.00	19.00

*SECNO 8.000

3265 DIVIDED FLOW

8.00	2.77	163.97	.00	.00	165.10	1.12	.85	.06	161.20
420.	148.	123.	148.	17.	17.	17.	1.	0.	161.20
.03	8.92	7.42	8.92	.015	.015	.015	.000	161.20	.00
.003451	220.	220.	220.	3	0	0	.00	18.00	19.00

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SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XLN	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 9.000

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

9.00	2.56	164.16	164.16	.00	165.47	1.31	.11	.09	161.60
420.	148.	124.	148.	15.	15.	15.	1.	0.	161.60
.03	9.61	8.07	9.61	.015	.015	.015	.000	161.60	.00
.004313	36.	28.	20.	3	11	0	.00	18.00	19.00

*SECNO 10.000

3265 DIVIDED FLOW

10.00	2.86	164.94	.00	.00	165.99	1.05	.44	.08	162.08
420.	148.	123.	148.	17.	17.	17.	1.	0.	162.08
.03	8.61	7.15	8.61	.015	.015	.015	.000	162.08	.00
.003120	120.	120.	120.	5	0	0	.00	18.00	19.00

*SECNO 11.000

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

11.00	1.74	167.24	167.24	.00	168.12	.88	.22	.05	175.00
420.	0.	420.	0.	0.	56.	0.	1.	0.	175.00
.03	.00	7.53	.00	.015	.015	.015	.000	165.50	.00
.003164	70.	70.	70.	20	14	0	.00	32.00	32.00

*SECNO 11.100

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

11.10	2.50	168.00	.00	.00	168.30	.30	.00	.17	175.00
330.	0.	330.	0.	0.	75.	0.	1.	0.	175.00
.03	.00	4.42	.00	.015	.015	.015	.000	165.50	.00
.001008	1.	1.	1.	4	0	0	.00	30.00	32.00

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SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XLN	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 12.000

3265 DIVIDED FLOW

12.00	2.36	168.06	.00	.00	168.40	.34	.08	.02	175.20
330.	0.	330.	0.	0.	71.	0.	1.	0.	175.20
.04	.00	4.66	.00	.015	.015	.015	.000	165.70	.00
.001179	75.	75.	75.	2	0	0	.00	30.00	32.00

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
 ERROR CORR - 01,02,03,04,05,06
 MODIFICATION - 50,51,52,53,54,55,56
 IBM-PC-XT VERSION APRIL 1985

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

EAST BR GYPSUM CR TRIB

SUMMARY PRINTOUT TABLE 100

SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
-------	-------	------	-------	-------	-----	-------	-------	----	-------	-------	-----	----

EAST BR GYPSUM CR TRIB

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRWS	EG	10K*S	VCH	AREA	.01K	
*	1.000	.00	.00	.00	157.00	850.00	161.11	161.11	163.22	47.02	9.81	74.05	123.9
*	1.000	.00	.00	.00	157.00	500.00	159.89	159.89	161.36	43.51	8.45	51.99	75.8
*	1.000	.00	.00	.00	157.00	420.00	159.56	159.56	160.87	43.12	8.07	46.15	63.96
	2.000	30.00	.00	.00	157.12	850.00	162.00	.00	163.51	29.74	8.16	87.75	155.8
	2.000	30.00	.00	.00	157.12	500.00	160.51	.00	161.58	27.63	7.10	61.11	95.12
	2.000	30.00	.00	.00	157.12	420.00	160.13	.00	161.08	27.17	6.78	54.28	80.57
	3.000	28.00	.00	.00	157.52	850.00	161.94	.00	163.77	38.68	9.07	79.57	136.6
*	3.000	28.00	.00	.00	157.52	500.00	160.41	160.41	161.88	43.53	8.46	51.98	75.79
*	3.000	28.00	.00	.00	157.52	420.00	160.09	160.09	161.39	42.87	8.06	46.25	64.1
	4.000	180.00	.00	.00	158.24	850.00	162.63	.00	164.49	39.45	9.15	78.99	135.33
	4.000	180.00	.00	.00	158.24	500.00	161.40	.00	162.64	34.13	7.70	56.66	85.58
	4.000	180.00	.00	.00	158.24	420.00	161.02	.00	162.14	34.50	7.42	49.90	71.50
*	5.000	28.00	.00	.00	158.64	850.00	162.75	162.75	164.86	47.00	9.81	74.06	123.98
*	5.000	28.00	.00	.00	158.64	500.00	161.52	161.52	163.00	43.81	8.48	51.86	75.54
*	5.000	28.00	.00	.00	158.64	420.00	161.20	161.20	162.51	43.14	8.07	46.15	63.95
	6.000	320.00	.00	.00	159.92	850.00	164.64	.00	166.25	32.53	8.46	84.86	149.04
	6.000	320.00	.00	.00	159.92	500.00	163.06	.00	164.30	34.20	7.71	56.62	85.50
	6.000	320.00	.00	.00	159.92	420.00	162.67	.00	163.81	35.18	7.48	49.56	70.81
	7.000	28.00	.00	.00	160.32	850.00	164.56	.00	166.54	43.27	9.49	76.35	129.22
*	7.000	28.00	.00	.00	160.32	500.00	163.20	163.20	164.68	43.81	8.48	51.86	75.54
*	7.000	28.00	.00	.00	160.32	420.00	162.88	162.88	164.19	43.12	8.07	46.16	63.96
	8.000	220.00	.00	.00	161.20	850.00	165.76	.00	167.48	35.50	8.77	82.14	142.66
	8.000	220.00	.00	.00	161.20	500.00	164.36	.00	165.59	33.79	7.68	56.86	86.01
	8.000	220.00	.00	.00	161.20	420.00	163.97	.00	165.10	34.51	7.42	49.89	71.49
*	9.000	28.00	.00	.00	161.60	850.00	165.71	165.71	167.82	47.02	9.81	74.05	123.96
*	9.000	28.00	.00	.00	161.60	500.00	164.48	164.48	165.96	43.81	8.48	51.86	75.54
*	9.000	28.00	.00	.00	161.60	420.00	164.16	164.16	165.47	43.13	8.07	46.15	63.96
*	10.000	120.00	.00	.00	162.08	850.00	166.89	166.20	168.44	30.80	8.28	86.61	153.16
	10.000	120.00	.00	.00	162.08	500.00	165.31	.00	166.49	31.71	7.49	58.17	88.80
	10.000	120.00	.00	.00	162.08	420.00	164.94	.00	165.99	31.20	7.15	51.69	75.19
*	11.000	70.00	.00	.00	165.50	850.00	168.30	168.30	169.70	28.91	9.50	89.50	158.09
*	11.000	70.00	.00	.00	165.50	500.00	167.46	167.46	168.45	30.92	7.98	62.64	89.91
*	11.000	70.00	.00	.00	165.50	420.00	167.24	167.24	168.12	31.64	7.53	55.76	74.67
	11.100	1.00	.00	.00	165.50	668.00	169.49	.00	169.97	11.04	5.59	119.40	201.06
	11.100	1.00	.00	.00	165.50	400.00	168.28	.00	168.64	10.89	4.81	83.18	121.19
	11.100	1.00	.00	.00	165.50	330.00	168.00	.00	168.30	10.08	4.42	74.74	103.93

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRWS	EG	10K*6	VCH	AREA	.01K
12.000	75.00	.00	.00	165.70	668.00	169.56	.00	170.08	12.02	5.77	115.76	192.69
12.000	75.00	.00	.00	165.70	400.00	168.35	.00	168.74	12.42	5.03	79.47	113.52
12.000	75.00	.00	.00	165.70	330.00	168.06	.00	168.40	11.79	4.66	70.82	96.12

EAST BR GYPSUM CR TRIB

SUMMARY PRINTOUT TABLE 150

	SECD	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	1.000	850.00	161.11	.00	.00	-.89	18.00	.00
*	1.000	500.00	159.89	-1.23	.00	.00	18.00	.00
*	1.000	420.00	159.56	-.32	.00	.00	18.00	.00
	2.000	850.00	162.00	.00	.89	.00	18.00	30.00
	2.000	500.00	160.51	-1.49	.62	.00	18.00	30.00
	2.000	420.00	160.13	-.38	.57	.00	18.00	30.00
	3.000	850.00	161.94	.00	-.07	.00	18.00	28.00
*	3.000	500.00	160.41	-1.53	-.10	.00	18.00	28.00
*	3.000	420.00	160.09	-.32	-.04	.00	18.00	28.00
	4.000	850.00	162.63	.00	.69	.00	18.00	180.00
	4.000	500.00	161.40	-1.23	.99	.00	18.00	180.00
	4.000	420.00	161.02	-.38	.93	.00	18.00	180.00
*	5.000	850.00	162.75	.00	.13	.00	18.00	28.00
*	5.000	500.00	161.52	-1.23	.12	.00	18.00	28.00
*	5.000	420.00	161.20	-.32	.19	.00	18.00	28.00
	6.000	850.00	164.64	.00	1.89	.00	18.00	320.00
	6.000	500.00	163.06	-1.58	1.54	.00	18.00	320.00
	6.000	420.00	162.67	-.39	1.47	.00	18.00	320.00
	7.000	850.00	164.56	.00	-.08	.00	18.00	28.00
*	7.000	500.00	163.20	-1.36	.14	.00	18.00	28.00
*	7.000	420.00	162.88	.732	.21	.00	18.00	28.00
	8.000	850.00	165.76	.00	1.21	.00	18.00	220.00
	8.000	500.00	164.36	-1.40	1.16	.00	18.00	220.00
	8.000	420.00	163.97	-.39	1.09	.00	18.00	220.00
*	9.000	850.00	165.71	.00	-.05	.00	18.00	28.00
*	9.000	500.00	164.48	-1.23	.12	.00	18.00	28.00
*	9.000	420.00	164.16	-.32	.19	.00	18.00	28.00
*	10.000	850.00	166.89	.00	1.18	.00	18.00	120.00
	10.000	500.00	165.31	-1.58	.83	.00	18.00	120.00
	10.000	420.00	164.94	-.37	.78	.00	18.00	120.00
*	11.000	850.00	168.30	.00	1.40	.00	32.00	70.00
*	11.000	500.00	167.46	-.84	2.14	.00	32.00	70.00
*	11.000	420.00	167.24	-.21	2.30	.00	32.00	70.00
	11.100	668.00	169.49	.00	1.19	.00	30.00	1.00
	11.100	400.00	168.28	-1.21	.82	.00	30.00	1.00
	11.100	330.00	168.00	-.28	.75	.00	30.00	1.00

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SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
12.000	668.00	169.56	.00	.07	.00	30.00	75.00
12.000	400.00	168.35	-1.21	.07	.00	30.00	75.00
12.000	330.00	168.06	-.29	.06	.00	30.00	75.00