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APPENDIX B

BEARDSLEY CANAL WASH IMPROVEMENT PROJECT

- Cost Estimate
- Concept Plan
- Hydraulic Calculation Sheets

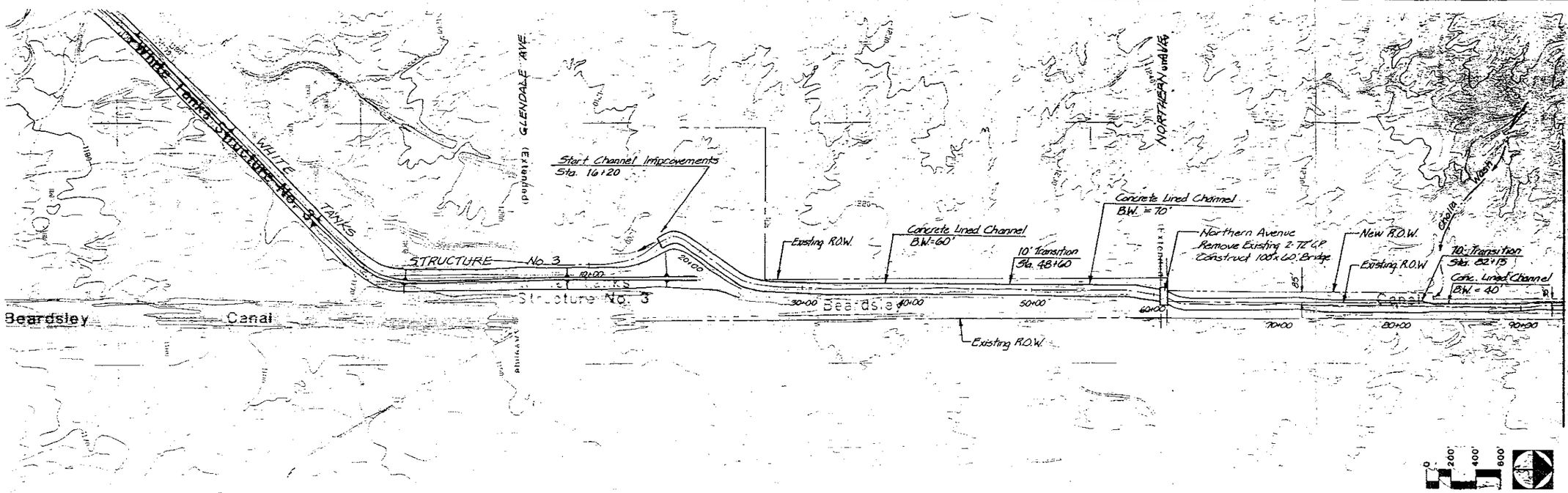
COST ESTIMATE

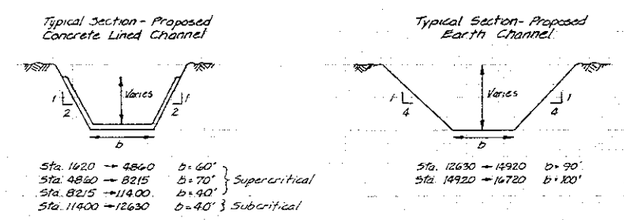
BEARDSLEY CANAL WASH IMPROVEMENT
COST ESTIMATE SHEET

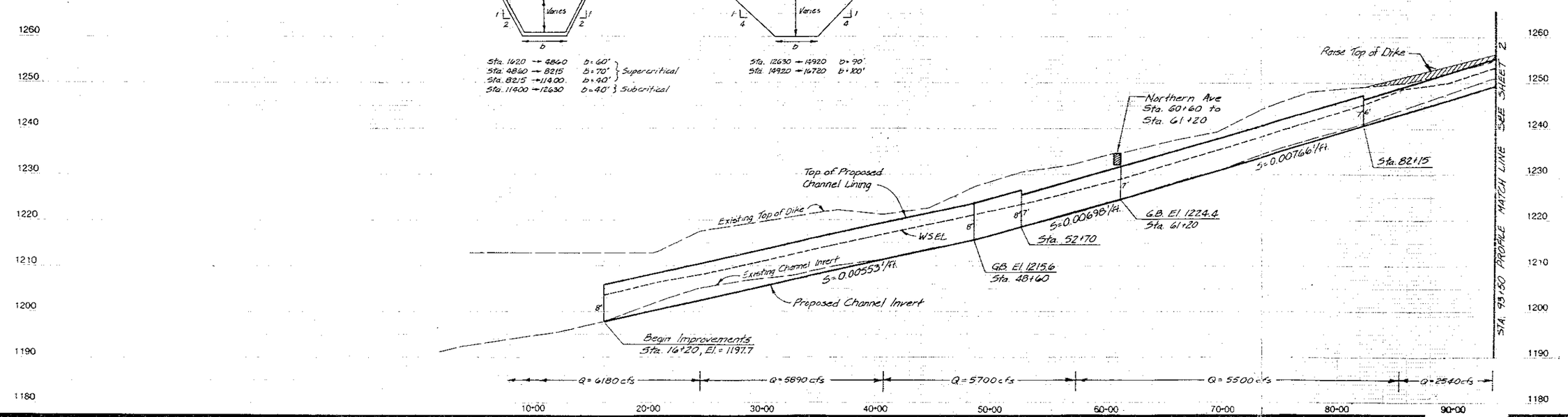
	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	COST
1.	Channel Excavation	187,200	C.Y.	$ 3	$ 561,600
2.	Channel Lining	106,400	S.Y.	$ 22	$ 2,340,800
3.	4.5' Drop Structure @ Sta. 126+30	1	EA.	$ 50,000	$ 50,000
4.	60'x100' Bridge @ Northern Ave.	6,000	S.F.	$ 60	$ 360,000
5.	3 - 12'x8'x40' B.C. @ Olive Ave.	40	L.F.	$ 1,100	$ 44,000
				Estimated Construction Cost	$ 3,356,400
				Contingencies (25%)	$ 839,100
				Total Construction Cost	$ 4,195,500
6.	R.O.W.	1,200,000	S.F.	$.15	$ 180,000
				GRAND TOTAL	**$ 4,375,500**

CONCEPT DESIGN PLAN

AND PROFILE FIGURES







The WLB Group **WLB**

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320 East Osborn Road, Suite 380
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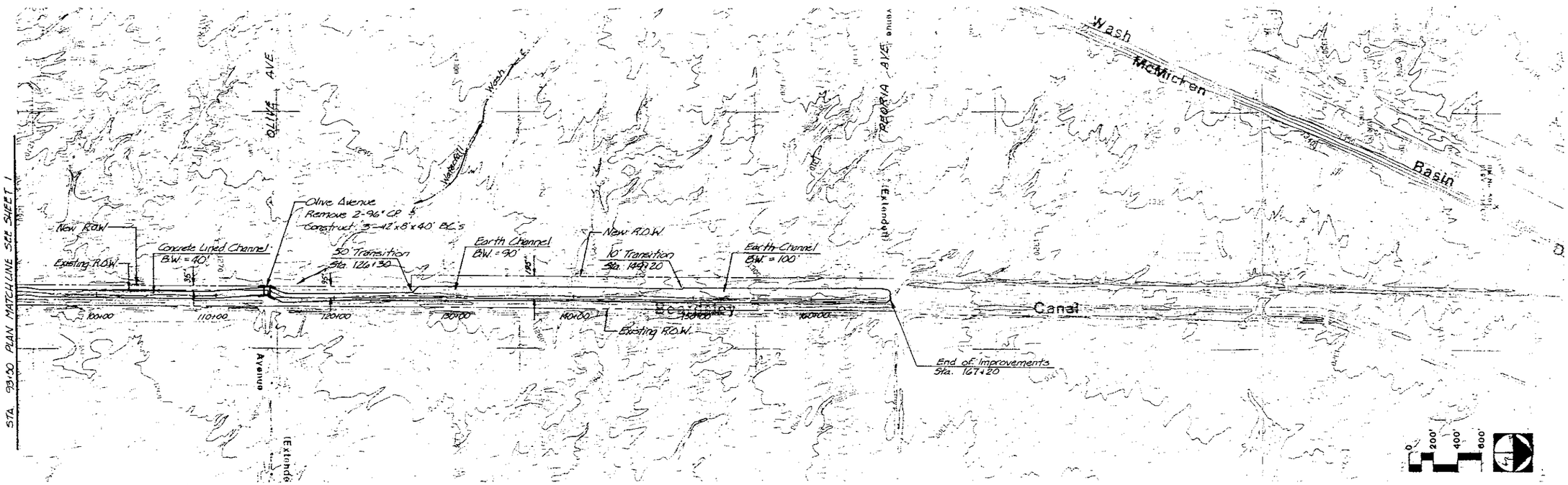
WHITE TANKS / AGUA FRIA ADMS
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

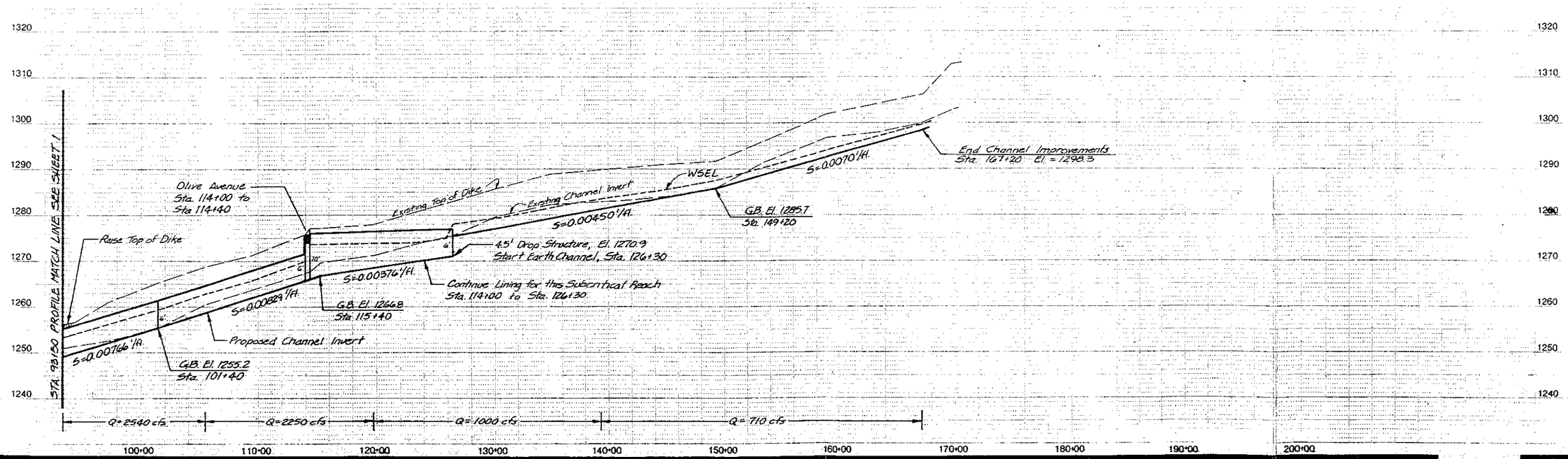
CONCEPT DESIGN
BEARDSLEY CANAL WASH IMPROVEMENT PROJECT

No.	Date	Item

Scale: 1"=400' H., 1"=5' V.
Job No. 289036
Date
Drawn By: GMA
Checked By: MTG

Sheet 1 of 2





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Project: **WHITE TANKS / AGUA FRIA ADMS**
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Sheet Title: **CONCEPT DESIGN**
BEARDSLEY CANAL WASH IMPROVEMENT PROJECT

No.	Date	Item

Revisions

Scale 1"=400'H, 1"=5'V.
Job No. 289036
Date
Drawn By GMA
Checked By MTG

Sheet 2 of 2

HYDRAULIC CALCULATION SHEETS

Includes:

- HEC-2 Model for Supercritical Flow Section from Olive Avenue Downstream to White Tanks Structure No. 3 (File: 1PLAN2.H2I)
- Culvert Analysis
- Trapezoidal Channel Analysis

```
*****************************************
*  HEC-2"WATER SURFACE PROFILES         *
*                                       *
*  Version   4.6.2;  May 1991           *
*                                       *
*  [illegible]N DATE   21MAR94   TIME   23:52:26  *
*****************************************
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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               *
*****************************************
```

BEARDSLEY CANAL WASH
IMPROVEMENT PROJECT

(2) white Tanks No. 3 to Olive avenue
Supercritical flow analysis

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

 [illegible]sion   4.6.2;  May 1991
*************************************
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```
T1      WHITE TANKS / AGUA FRIA AREA DRAINAGE MASTER PLAN
T2      100-YEAR STORM EVENT                  FILE: 1PLAN2.H2I
T3      BEARDSLEY CANAL WASH (WASH 1)
T4      THIS REACH IS DESIGNED AS A LINED CHANNEL,BW=40 TO 70 FT, SS=1:2

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0        2        0        1        0        0        .3       0     1269.91     0

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

      1        0       -1        0        0        0        0        0        0        0


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38       43        1       53       21       22       54       51        4        8
     42        5       26        0      110

NC    .022     .022     .022      .1       .3
QT       1     2245

[illegible]          DOWNSTREAM SIDE OF OLIVE AV.

                 Q = Q AT CP3

                 STARTING WSEL IS FROM COLVERT FLOW ANALYSIS BY HY-8 PROG.
```

```
X1     2.159        5      9960     10040       460       460       460
GR    1275.7     9960   1265.67      9980   1265.67     10000   1265.67     10020   1275.67     10040

X1     2.072        0         0         0       400       400       400                -3.82

QT         1     2538

                Q = .25 HYD. AT SUB 10 + Q AT CP3

X1     1.996        0         0         0       400       400       400                -3.32

X1     1.920        0         0         0       405       405       405                -3.32
```



```
X1     1.844        0         0         0       400       400       400                -3.10

X1     1.768        0         0         0       400       400       400                -3.06

X1     1.692        0         0         0       400       400       400                -3.06

QT         1     5504

                CONFLUENCE WITH CHOLLA WASH (WASH 1A)

                Q = Q AT CP10

X1     1.616        5      9945     10055       320       320       320
GR    1252.9     9945   1242.93      9965   1242.92     10000   1242.93     10035   1252.93     10055

X1     1.556        0         0         0       475       475       475                -2.45

X1     1.466        0         0         0       410       410       410                -3.64

X1     1.388        0         0         0       395       395       395                -3.14

X1     1.313        0         0         0       405       405       405                -3.03

X1     1.237        0         0         0       410       410       410                -3.10

X1     1.159        0         0         0        60        60        60                -3.14

                NORTHERN AV.

X1     1.148        0         0         0       390       390       390                -.42

X1     1.074        0         0         0       400       400       400                -2.72

QT         1     5696

                Q = .5 (Q AT CP12 + Q AT CP10)

X1      .998        0         0         0       410      4710       410                -2.79

X1      .920        5      9950     10050       395       395       395
GR    1225.6     9950   1215.6      9970   1215.6     10000   1215.6      10030   1225.6      10050

X1      .846        0         0         0       400       400       400                -2.18
```

QT 1 5888

Q = Q AT CP12

1

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X1	.770	0	0	0	390	390	390	-2.21
X1	.696	0	0	0	400	400	400	-2.15
X1	.620	0	0	0	410	410	410	-2.21
X1	.543	0	0	0	410	410	410	-2.27
X1	.465	0	0	0	395	395	395	-2.27

QT 1 6177

Q = Q AT CP12 + .7 HYD AT SUB-WT3

X1	.390	0	0	0	440	440	440	-2.18
X1	.307	0	0	0	400	400	400	-2.43

1

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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

0

CCHV= .100 CEHV= .300

*SECNO 2.159

DOWNSTREAM SIDE OF OLIVE AV.

Q = Q AT CP3

STARTING WSEL IS FROM COLVERT FLOW ANALYSIS BY HY-8 PROG.

2.159	4.24	1269.91	1269.94	1269.91	1271.76	1.85	.00	.00	1275.70
2245.0	.0	2245.0	.0	.0	205.5	.0	.0	.0	1275.67
.00	.00	10.92	.00	.000	.022	.000	.000	1265.67	9971.54
.004947	0.	0.	0.	0	4	0	.00	56.93	10028.48

*SECNO 2.072

5 INT SEC ADDED BY RAISING SEC 2.07, 2.865 FT AND MULTIPLYING BY 1.000

3301 HV CHANGED MORE THAN HVINS

1.010	3.68	1268.40	1268.98	.00	1270.97	2.58	.72	.07	1274.74

2245.0	.0	2245.0	.0	.0	174.2	.0	.5	.1	1274.72
.00	.00	12.89	.00	.000	.022	.000	.000	1264.72	9972.66
.008096	115.	115.	115.	6	5	0	.00	54.70	10027.36

1645 INT SEC ADDED BY RAISING SEC 1.01, -.955 FT AND MULTIPLYING BY 1.000

1.020	3.67	1267.43	1268.03	.00	1270.03	2.60	.94	.00	1273.79
2245.0	.0	2245.0	.0	.0	173.3	.0	1.0	.3	1273.76
.00	.00	12.95	.00	.000	.022	.000	.000	1263.76	9972.70
.008220	115.	115.	115.	3	8	0	.00	54.63	10027.33

1645 INT SEC ADDED BY RAISING SEC 1.02, -.955 FT AND MULTIPLYING BY 1.000

1

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
1.030	3.66	1266.46	1267.08	.00	1269.08	2.62	.95	.00	1272.84
2245.0	.0	2245.0	.0	.0	172.9	.0	1.4	.4	1272.81
.01	.00	12.99	.00	.000	.022	.000	.000	1262.81	9972.71
.008285	115.	115.	115.	3	8	0	.00	54.60	10027.31

1645 INT SEC ADDED BY RAISING SEC 1.03, -.955 FT AND MULTIPLYING BY 1.000

2.072	3.67	1265.52	1266.12	.00	1268.13	2.61	.95	.00	1271.88
2245.0	.0	2245.0	.0	.0	173.1	.0	1.9	.6	1271.85
.01	.00	12.97	.00	.000	.022	.000	.000	1261.85	9972.70
.008254	115.	115.	115.	0	8	0	.00	54.61	10027.32

*SECNO 1.996

Q = .25 HYD. AT SUB 10 + Q AT CP3

1.996	4.18	1262.71	1263.12	.00	1265.15	2.44	2.92	.05	1268.56
2538.0	.0	2538.0	.0	.0	202.5	.0	3.6	1.1	1268.53
.02	.00	12.53	.00	.000	.022	.000	.000	1258.53	9971.65
.006605	400.	400.	400.	5	11	0	.00	56.72	10028.37

*SECNO 1.920

1645 INT SEC ADDED BY RAISING SEC 1.92, 1.660 FT AND MULTIPLYING BY 1.000

HV CHANGED MORE THAN HVINS

1.010	3.91	1260.78	1261.47	.00	1263.63	2.85	1.48	.04	1266.90
2538.0	.0	2538.0	.0	.0	187.2	.0	4.5	1.3	1266.87
.02	.00	13.56	.00	.000	.022	.000	.000	1256.87	9972.20

.008353	200.	200.	200.	5	8	0	.00	55.65	10027.86

1645 INT SEC ADDED BY RAISING SEC 1.01, -1.660 FT AND MULTIPLYING BY 1.000

1.920	3.92	1259.13	1259.82	.00	1261.96	2.84	1.66	.01	1265.24
2538.0	.0	2538.0	.0	.0	187.8	.0	5.4	1.6	1265.21
.03	.00	13.51	.00	.000	.022	.000	.000	1255.21	9972.17
.008267	200.	200.	200.	2	8	0	.00	55.68	10027.85

1

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 1.844

1.844	4.09	1256.20	1256.72	.00	1258.78	2.57	3.11	.08	1262.14
2538.0	.0	2538.0	.0	.0	197.2	.0	7.1	2.1	1262.11
.04	.00	12.87	.00	.000	.022	.000	.000	1252.11	9971.84
.007149	405.	405.	405.	4	8	0	.00	56.35	10028.19

*SECNO 1.768

1.768	3.99	1253.04	1253.65	.00	1255.77	2.73	2.99	.02	1259.08
2538.0	.0	2538.0	.0	.0	191.4	.0	8.9	2.6	1259.05
.04	.00	13.26	.00	.000	.022	.000	.000	1249.05	9972.04
.007811	400.	400.	400.	4	8	0	.00	55.94	10027.98

*SECNO 1.692

1.692	4.03	1250.02	1250.60	.00	1252.68	2.67	3.07	.02	1256.02
2538.0	.0	2538.0	.0	.0	193.7	.0	10.7	3.2	1255.99
.05	.00	13.10	.00	.000	.022	.000	.000	1245.99	9971.96
.007538	400.	400.	400.	3	8	0	.00	56.10	10028.06

*SECNO 1.616
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

CONFLUENCE WITH CHOLLA WASH (WASH 1A)

Q = Q AT CP10

1.616	5.45	1248.37	1248.37	.00	1250.80	2.42	2.05	.82	1252.90
5504.0	.0	5504.0	.0	.0	440.6	.0	13.6	3.8	1252.93
.06	.00	12.49	.00	.000	.022	.000	.000	1242.92	9954.08
.004382	400.	400.	400.	20	11	0	.00	91.80	10045.88

*SECNO 1.556

1645 INT SEC ADDED BY RAISING SEC 1.56, 1.837 FT AND MULTIPLYING BY 1.000

3301 HV CHANGED MORE THAN HVINS

1

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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
1.010	4.85	1247.16	1247.76	.00	1250.30	3.14	.42	.07	1252.29
5504.0	.0	5504.0	.0	.0	387.1	.0	14.4	4.0	1252.32
.06	.00	14.22	.00	.000	.022	.000	.000	1242.31	9955.27
.006494	80.	80.	80.	5	5	0	.00	89.44	10044.70

1645 INT SEC ADDED BY RAISING SEC 1.01, -.612 FT AND MULTIPLYING BY 1.000

1.020	4.77	1246.46	1247.15	.00	1249.75	3.29	.54	.01	1251.68
5504.0	.0	5504.0	.0	.0	378.3	.0	15.1	4.2	1251.71
.06	.00	14.55	.00	.000	.022	.000	.000	1241.70	9955.47
.006969	80.	80.	80.	4	8	0	.00	89.04	10044.51

1645 INT SEC ADDED BY RAISING SEC 1.02, -.612 FT AND MULTIPLYING BY 1.000

1.030	4.71	1245.79	1246.55	.00	1249.17	3.38	.57	.01	1251.06
5504.0	.0	5504.0	.0	.0	373.0	.0	15.8	4.3	1251.09
.07	.00	14.76	.00	.000	.022	.000	.000	1241.08	9955.58
.007276	80.	80.	80.	4	8	0	.00	88.80	10044.39

1645 INT SEC ADDED BY RAISING SEC 1.03, -.612 FT AND MULTIPLYING BY 1.000

1.556	4.69	1245.16	1245.94	.00	1248.58	3.42	.59	.00	1250.45
5504.0	.0	5504.0	.0	.0	371.0	.0	16.4	4.5	1250.48
.07	.00	14.84	.00	.000	.022	.000	.000	1240.47	9955.63
.007399	80.	80.	80.	3	8	0	.00	88.71	10044.34

*SECNO 1.466

1.466	4.62	1241.45	1242.30	.00	1244.97	3.52	3.60	.01	1246.81
5504.0	.0	5504.0	.0	.0	365.4	.0	20.5	5.5	1246.84
.08	.00	15.06	.00	.000	.022	.000	.000	1236.83	9955.76
.007751	475.	475.	475.	4	8	0	.00	88.46	10044.21

*SECNO 1.388

1.388	4.64	1238.33	1239.16	.00	1241.81	3.48	3.15	.01	1243.67
5504.0	.0	5504.0	.0	.0	367.7	.0	23.9	6.3	1243.70
.08	.00	14.97	.00	.000	.022	.000	.000	1233.69	9955.71
.007604	410.	410.	410.	3	8	0	.00	88.56	10044.27

1

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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 1.313

1.313	4.62	1235.28	1236.13	.00	1238.79	3.50	3.02	.00	1240.64
5504.0	.0	5504.0	.0	.0	366.4	.0	27.2	7.1	1240.67
.09	.00	15.02	.00	.000	.022	.000	.000	1230.66	9955.74
.007688	395.	395.	395.	2	8	0	.00	88.50	10044.24

*SECNO 1.237

1.237	4.63	1232.19	1233.03	.00	1235.68	3.49	3.10	.00	1237.54
5504.0	.0	5504.0	.0	.0	367.2	.0	30.6	7.9	1237.57
.10	.00	14.99	.00	.000	.022	.000	.000	1227.56	9955.72
.007634	405.	405.	405.	2	8	0	.00	88.54	10044.26

*SECNO 1.159

1.159	4.62	1229.04	1229.89	.00	1232.54	3.50	3.14	.00	1234.40
5504.0	.0	5504.0	.0	.0	366.6	.0	34.1	8.7	1234.43
.11	.00	15.01	.00	.000	.022	.000	.000	1224.42	9955.73
.007670	410.	410.	410.	0	8	0	.00	88.51	10044.24

*SECNO 1.148

NORTHERN AV.

1.148	4.79	1228.79	1229.47	.00	1232.03	3.24	.43	.08	1233.98
5504.0	.0	5504.0	.0	.0	381.0	.0	34.6	8.9	1234.01
.11	.00	14.45	.00	.000	.022	.000	.000	1224.00	9955.41
.006822	60.	60.	60.	4	8	0	.00	89.16	10044.57

*SECNO 1.074

1.074	4.77	1226.05	1226.74	.00	1229.34	3.29	2.69	.00	1231.26
5504.0	.0	5504.0	.0	.0	378.1	.0	38.0	9.7	1231.29
.11	.00	14.56	.00	.000	.022	.000	.000	1221.28	9955.47
.006979	390.	390.	390.	3	8	0	.00	89.03	10044.50

*SECNO .998

Q = .5 (Q AT CP12 + Q AT CP10)

.998	5.00	1223.49	1224.08	.00	1226.64	3.15	2.65	.04	1228.47
5696.0	.0	5696.0	.0	.0	399.8	.0	41.6	10.5	1228.50
.12	.00	14.25	.00	.000	.022	.000	.000	1218.49	9954.98
.006308	400.	400.	400.	4	8	0	.00	90.00	10044.99

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 .920

1645 INT SEC ADDED BY RAISING SEC .92, 1.445 FT AND MULTIPLYING BY 1.071

3301 HV CHANGED MORE THAN HVINS

1.010	5.68	1222.73	1222.88	.00	1225.39	2.66	1.11	.15	1227.04
5696.0	.0	5696.0	.0	.0	435.0	.0	43.5	10.9	1227.04
.13	.00	13.10	.00	.000	.022	.000	.000	1217.04	9959.23
.004679	205.	205.	2355.	5	8	0	.00	88.63	10047.86

1645 INT SEC ADDED BY RAISING SEC 1.01, -1.445 FT AND MULTIPLYING BY .934

3301 HV CHANGED MORE THAN HVINS

.920	5.72	1221.32	1221.67	.00	1224.34	3.02	1.02	.04	1225.60
5696.0	.0	5696.0	.0	.0	408.7	.0	45.5	11.3	1225.60
.13	.00	13.94	.00	.000	.022	.000	.000	1215.60	9958.56
.005293	205.	205.	2355.	2	8	0	.00	82.88	10041.44

*SECNO .846

.846	5.64	1219.06	1219.49	.00	1222.18	3.12	2.15	.01	1223.42
5696.0	.0	5696.0	.0	.0	401.6	.0	49.2	12.1	1223.42
.14	.00	14.18	.00	.000	.022	.000	.000	1213.42	9958.73
.005577	395.	395.	395.	4	8	0	.00	82.54	10041.27

*SECNO .770

1645 INT SEC ADDED BY RAISING SEC .77, 1.105 FT AND MULTIPLYING BY 1.000

3301 HV CHANGED MORE THAN HVINS

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

1.010	6.14	1218.45	1218.45	.00	1221.10	2.65	.97	.29	1222.31
5792.0	.0	5792.0	.0	.0	443.5	.0	51.1	12.4	1222.31
.14	.00	13.06	.00	.000	.022	.000	.000	1212.31	9957.73
.004289	200.	200.	200.	20	8	0	.00	84.54	10042.27

1

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

1645 INT SEC ADDED BY RAISING SEC 1.01, -1.105 FT AND MULTIPLYING BY 1.000

3301 HV CHANGED MORE THAN HVINS

Q = Q AT CP12

.770	5.86	1217.07	1217.42	.00	1220.12	3.04	.94	.04	1221.21
5888.0	.0	5888.0	.0	.0	420.5	.0	53.1	12.8	1221.21
.15	.00	14.00	.00	.000	.022	.000	.000	1211.21	9958.27
.005194	200.	200.	200.	4	5	0	.00	83.45	10041.73

*SECNO .696

.696	5.74	1214.80	1215.25	.00	1218.00	3.20	2.10	.02	1219.06
5888.0	.0	5888.0	.0	.0	410.2	.0	56.9	13.6	1219.06
.15	.00	14.35	.00	.000	.022	.000	.000	1209.06	9958.52
.005595	390.	390.	390.	4	8	0	.00	82.96	10041.48

*SECNO .620

.620	5.78	1212.63	1213.05	.00	1215.77	3.15	2.21	.02	1216.85
5888.0	.0	5888.0	.0	.0	413.6	.0	60.6	14.3	1216.85
.16	.00	14.24	.00	.000	.022	.000	.000	1206.85	9958.44
.005458	400.	400.	400.	3	8	0	.00	83.12	10041.56

*SECNO .543

.543	5.76	1210.34	1210.77	.00	1213.52	3.18	2.26	.00	1214.58
5888.0	.0	5888.0	.0	.0	411.5	.0	64.5	15.1	1214.58
.17	.00	14.31	.00	.000	.022	.000	.000	1204.58	9958.49
.005543	410.	410.	410.	3	8	0	.00	83.02	10041.51

*SECNO .465

.465	5.76	1208.07	1208.51	.00	1211.24	3.18	2.27	.00	1212.31
5888.0	.0	5888.0	.0	.0	411.7	.0	68.4	15.9	1212.31
.18	.00	14.30	.00	.000	.022	.000	.000	1202.31	9958.49
.005534	410.	410.	410.	0	8	0	.00	83.03	10041.51

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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 .390

1645 INT SEC ADDED BY RAISING SEC .39, 1.090 FT AND MULTIPLYING BY 1.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1.010	6.29	1207.51	1207.51	.00	1210.22	2.71	.95	.29	1211.22
6032.5	.0	6032.5	.0	.0	456.7	.0	70.4	16.3	1211.22
.18	.00	13.21	.00	.000	.022	.000	.000	1201.22	9957.41
.004263	198.	198.	198.	20	8	0	.00	85.16	10042.57

1645 INT SEC ADDED BY RAISING SEC 1.01, -1.090 FT AND MULTIPLYING BY 1.000

3301 HV CHANGED MORE THAN HVINS

Q = Q AT CP12 + .7 HYD AT SUB-WT3

.390	6.12	1206.25	1206.53	.00	1209.28	3.03	.91	.03	1210.13
6177.0	.0	6177.0	.0	.0	441.9	.0	72.4	16.7	1210.13
.19	.00	13.98	.00	.000	.022	.000	.000	1200.13	9957.76
.004930	198.	198.	198.	3	5	0	.00	84.47	10042.24

*SECNO .307

1645 INT SEC ADDED BY RAISING SEC .31, 1.215 FT AND MULTIPLYING BY 1.000

1.010	5.91	1204.82	1205.30	.00	1208.11	3.29	1.15	.03	1208.91
6177.0	.0	6177.0	.0	.0	424.6	.0	74.6	17.1	1208.91
.19	.00	14.55	.00	.000	.022	.000	.000	1198.91	9958.17
.005553	220.	220.	220.	5	8	0	.00	83.63	10041.80

1

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

1645 INT SEC ADDED BY RAISING SEC 1.01, -1.215 FT AND MULTIPLYING BY 1.000

.307	5.92	1203.62	1204.08	.00	1206.89	3.27	1.22	.01	1207.70
6177.0	.0	6177.0	.0	.0	425.7	.0	76.7	17.5	1207.70
.19	.00	14.51	.00	.000	.022	.000	.000	1197.70	9958.15
.005513	220.	220.	220.	2	8	0	.00	83.70	10041.85

1

THIS RUN EXECUTED 21MAR94 23:52:37

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HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991

****

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

BEARDSLEY CANAL WASH (WA

SUMMARY PRINTOUT

SECNO	Q	CWSEL	SSTA	STCHL	STCHR	ENDST	DIFWSX	TOPWID	DEPTH	ELMIN	10*KS	VCH
11400	2.159	2245.00	1269.91	9971.54	9960.00	10040.00	10028.48	.00	56.93	4.24	1265.67	49.47	10.92
*10940	2.072	2245.00	1265.52	9972.70	9960.00	10040.00	10027.32	-.95	54.61	3.67	1261.85	82.54	12.97
10540	1.996	2538.00	1262.71	9971.65	9960.00	10040.00	10028.37	-2.80	56.72	4.18	1258.53	66.05	12.53
*10140	1.920	2538.00	1259.13	9972.17	9960.00	10040.00	10027.85	-1.65	55.68	3.92	1255.21	82.67	13.51
9735	1.844	2538.00	1256.20	9971.84	9960.00	10040.00	10028.19	-2.92	56.35	4.09	1252.11	71.49	12.87
9335	1.768	2538.00	1253.04	9972.04	9960.00	10040.00	10027.98	-3.16	55.94	3.99	1249.05	78.11	13.26
8935	1.692	2538.00	1250.02	9971.96	9960.00	10040.00	10028.06	-3.02	56.10	4.03	1245.99	75.38	13.10
*8535	1.616	5504.00	1248.37	9954.08	9945.00	10055.00	10045.88	-1.65	91.80	5.45	1242.92	43.82	12.49
*8215	1.556	5504.00	1245.16	9955.63	9945.00	10055.00	10044.34	-.63	88.71	4.69	1240.47	73.99	14.84
[illegible]0	1.466	5504.00	1241.45	9955.76	9945.00	10055.00	10044.21	-3.71	88.46	4.62	1236.83	77.51	15.06
7330	1.388	5504.00	1238.33	9955.71	9945.00	10055.00	10044.27	-3.12	88.56	4.64	1233.69	76.04	14.97
6935	1.313	5504.00	1235.28	9955.74	9945.00	10055.00	10044.24	-3.05	88.50	4.62	1230.66	76.88	15.02
6530	1.237	5504.00	1232.19	9955.72	9945.00	10055.00	10044.26	-3.09	88.54	4.63	1227.56	76.34	14.99
6120	1.159	5504.00	1229.04	9955.73	9945.00	10055.00	10044.24	-3.15	88.51	4.62	1224.42	76.70	15.01
5660	1.148	5504.00	1228.79	9955.41	9945.00	10055.00	10044.57	-.25	89.16	4.79	1224.00	68.22	14.45
5670	1.074	5504.00	1226.05	9955.47	9945.00	10055.00	10044.50	-2.74	89.03	4.77	1221.28	69.79	14.56
5270	.998	5696.00	1223.49	9954.98	9945.00	10055.00	10044.99	-2.55	90.00	5.00	1218.49	63.08	14.25

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21MAR94 23:52:26 PAGE 14

SECNO	Q	CWSEL	SSTA	STCHL	STCHR	ENDST	DIFWSX	TOPWID	DEPTH	ELMIN	10*KS	VCH
*4860	.920	5696.00	1221.32	9958.56	9950.00	10050.00	10041.44	-1.41	82.88	5.72	1215.60	52.93	13.94
4465	.846	5696.00	1219.06	9958.73	9950.00	10050.00	10041.27	-2.26	82.54	5.64	1213.42	55.77	14.18
[illegible]65	.770	5888.00	1217.07	9958.27	9950.00	10050.00	10041.73	-1.38	83.45	5.86	1211.21	51.94	14.00
3675	.696	5888.00	1214.80	9958.52	9950.00	10050.00	10041.48	-2.27	82.96	5.74	1209.06	55.95	14.35
3275	.620	5888.00	1212.63	9958.44	9950.00	10050.00	10041.56	-2.17	83.12	5.78	1206.85	54.58	14.24

2355	.543	5888.00	1210.34	9958.49	9950.00	10050.00	10041.51	-2.29	83.02	5.76	1204.58	55.43	14.31
2455	.465	5888.00	1208.07	9958.49	9950.00	10050.00	10041.51	-2.27	83.03	5.76	1202.31	55.34	14.30
2560	.390	6177.00	1206.25	9957.76	9950.00	10050.00	10042.24	-1.26	84.47	6.12	1200.13	49.30	13.98
* 1620	.307	6177.00	1203.62	9958.15	9950.00	10050.00	10041.85	-1.21	83.70	5.92	1197.70	55.13	14.51

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BEARDSLEY CANAL WASH (WA

SUMMARY PRINTOUT TABLE 110

	SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
	2.159	1269.91	.00	1271.76	56.93	.00	2245.00	.00	.00	.00	9960.00	10040.00	.00
*	2.072	1265.52	.00	1268.13	54.61	.00	2245.00	.00	.00	.00	9960.00	10040.00	.00
	1.996	1262.71	.00	1265.15	56.72	.00	2538.00	.00	.00	.00	9960.00	10040.00	.00
*	1.920	1259.13	.00	1261.96	55.68	.00	2538.00	.00	.00	.00	9960.00	10040.00	.00
	1.844	1256.20	.00	1258.78	56.35	.00	2538.00	.00	.00	.00	9960.00	10040.00	.00
	1.768	1253.04	.00	1255.77	55.94	.00	2538.00	.00	.00	.00	9960.00	10040.00	.00
	1.692	1250.02	.00	1252.68	56.10	.00	2538.00	.00	.00	.00	9960.00	10040.00	.00
*	1.616	1248.37	.00	1250.80	91.80	.00	5504.00	.00	.00	.00	9945.00	10055.00	.00
*	1.556	1245.16	.00	1248.58	88.71	.00	5504.00	.00	.00	.00	9945.00	10055.00	.00
	1.466	1241.45	.00	1244.97	88.46	.00	5504.00	.00	.00	.00	9945.00	10055.00	.00
	1.388	1238.33	.00	1241.81	88.56	.00	5504.00	.00	.00	.00	9945.00	10055.00	.00
	1.313	1235.28	.00	1238.79	88.50	.00	5504.00	.00	.00	.00	9945.00	10055.00	.00
	1.237	1232.19	.00	1235.68	88.54	.00	5504.00	.00	.00	.00	9945.00	10055.00	.00
	1.159	1229.04	.00	1232.54	88.51	.00	5504.00	.00	.00	.00	9945.00	10055.00	.00
	1.148	1228.79	.00	1232.03	89.16	.00	5504.00	.00	.00	.00	9945.00	10055.00	.00
	1.074	1226.05	.00	1229.34	89.03	.00	5504.00	.00	.00	.00	9945.00	10055.00	.00
	.998	1223.49	.00	1226.64	90.00	.00	5696.00	.00	.00	.00	9945.00	10055.00	.00
*	.920	1221.32	.00	1224.34	82.88	.00	5696.00	.00	.00	.00	9950.00	10050.00	.00
	.846	1219.06	.00	1222.18	82.54	.00	5696.00	.00	.00	.00	9950.00	10050.00	.00
*	.770	1217.07	.00	1220.12	83.45	.00	5888.00	.00	.00	.00	9950.00	10050.00	.00
	.696	1214.80	.00	1218.00	82.96	.00	5888.00	.00	.00	.00	9950.00	10050.00	.00

	.620	1212.63	.00	1215.77	83.12	.00	5888.00	.00	.00	.00	9950.00	10050.00	.00
	.543	1210.34	.00	1213.52	83.02	.00	5888.00	.00	.00	.00	9950.00	10050.00	.00
	.465	1208.07	.00	1211.24	83.03	.00	5888.00	.00	.00	.00	9950.00	10050.00	.00

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	SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
*	.390	1206.25	.00	1209.28	84.47	.00	6177.00	.00	.00	.00	9950.00	10050.00	.00
*	.307	1203.62	.00	1206.89	83.70	.00	6177.00	.00	.00	.00	9950.00	10050.00	.00

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SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 2.072 PROFILE= 1 INTERPOLATED X-SECTIONS USED

CAUTION SECNO= 1.920 PROFILE= 1 INTERPOLATED X-SECTIONS USED

CAUTION SECNO= 1.616 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1.616 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1.616 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 1.556 PROFILE= 1 INTERPOLATED X-SECTIONS USED

CAUTION SECNO= .920 PROFILE= 1 INTERPOLATED X-SECTIONS USED

CAUTION SECNO= .770 PROFILE= 1 INTERPOLATED X-SECTIONS USED

CAUTION SECNO= .390 PROFILE= 1 INTERPOLATED X-SECTIONS USED

CAUTION SECNO= .307 PROFILE= 1 INTERPOLATED X-SECTIONS USED

BEARDSLEY CANAL WASH IMPROVEMENT PROJECT

CURRENT DATE: 08-26-1993
CURRENT TIME: 09:01:17

FILE DATE: 06-03-1993
FILE NAME: BDSLYOLV

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

① Olive Avenue Culvert Analysis

CULV #	SITE DATA: INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	1266.00	1265.67	40.00	3 RCB	12.00	8.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: BDSLYOLV CULVERT HEADWATER ELEVATION (FT) DATE: 06-03-1993

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	1266.00	0.00	0.00	0.00	0.00	0.00	1281.00
225	1267.63	0.00	0.00	0.00	0.00	0.00	1282.51
449	1268.58	0.00	0.00	0.00	0.00	0.00	1283.39
674	1269.38	0.00	0.00	0.00	0.00	0.00	1284.13
898	1270.10	0.00	0.00	0.00	0.00	0.00	1284.79
1123	1270.78	0.00	0.00	0.00	0.00	0.00	1285.40
1347	1271.40	0.00	0.00	0.00	0.00	0.00	1285.97
1572	1271.99	0.00	0.00	0.00	0.00	0.00	1286.51
1796	1272.56	0.00	0.00	0.00	0.00	0.00	1287.01
2021	1273.11	0.00	0.00	0.00	0.00	0.00	1287.49
2245	1273.66	0.00	0.00	0.00	0.00	0.00	1287.95
6062	1288.17	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

IMPROVEMENT PROJECT

CURRENT DATE: 08-26-1993 FILE DATE: 06-03-1993
CURRENT TIME: 09:01:17 FILE NAME: BDSLYOLV

PERFORMANCE CURVE FOR CULVERT # 1 - 3 (12 BY 8) RCB

① Olive Avenue Culvert Analysis

Page 2 of 3

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	1266.00	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
225	1267.63	1.63	1.63	1-S2n	0.70	1.07	7.72	0.81	5.70	0.94
449	1268.58	2.58	2.58	1-S2n	1.11	1.69	9.40	1.33	7.38	1.42
674	1269.38	3.38	3.38	1-S2n	1.46	2.22	10.52	1.78	8.56	1.80
898	1270.10	4.10	4.10	1-S2n	1.78	2.69	11.39	2.19	9.48	2.14
1123	1270.78	4.78	4.78	1-S2n	2.06	3.12	12.12	2.57	10.26	2.44
1347	1271.40	5.40	5.40	1-S2n	2.34	3.52	12.74	2.94	10.93	2.71
1572	1271.99	5.99	5.99	1-S2n	2.59	3.91	13.30	3.28	11.52	2.97
1796	1272.56	6.56	6.56	1-S2n	2.84	4.27	13.81	3.61	12.06	3.21
2021	1273.11	7.11	7.11	1-S2n	3.09	4.62	14.27	3.93	12.54	3.44
2245	1273.66	7.66	7.66	1-S2n	3.33	4.95	14.70	4.24	12.99	3.65

El. inlet face invert 1266.00 ft El. outlet invert 1265.67 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

****** SITE DATA ****** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1266.00
OUTLET STATION (FT)	40.00
OUTLET ELEVATION (FT)	1265.67
NUMBER OF BARRELS	3
SLOPE (V-FT/H-FT)	0.0082
CULVERT LENGTH ALONG SLOPE (FT)	40.00

****** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	12.00 FT
BARREL RISE	8.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

IMPROVEMENT PROJECT

CURRENT DATE: 08-26-1993 FILE DATE: 06-03-1993
CURRENT TIME: 09:01:17 FILE NAME: BDSLYOLV

① Olive Avenue Culvert Analysis

Page 3 of 3

****
********** TAILWATER **********
****

******** REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	40.00
SIDE SLOPE H/V (X:1)	2.0
CHANNEL SLOPE V/H (FT/FT)	0.008
MANNING'S N (.01-0.1)	0.022
CHANNEL INVERT ELEVATION (FT)	1265.67
CULVERT NO.1 OUTLET INVERT ELEVATION	1265.67 FT

******** UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	1265.67	0.000	0.00	0.00	0.00
224.50	1266.61	1.036	0.94	5.70	0.49
449.00	1267.09	1.091	1.42	7.38	0.74
673.50	1267.47	1.122	1.80	8.56	0.94
898.00	1267.81	1.142	2.14	9.48	1.11
1122.50	1268.11	1.157	2.44	10.26	1.26
1347.00	1268.38	1.169	2.71	10.93	1.41
1571.50	1268.64	1.178	2.97	11.52	1.54
1796.00	1268.88	1.186	3.21	12.06	1.66
2020.50	1269.11	1.193	3.44	12.54	1.78
2245.00	1269.32	1.198	3.65	12.99	1.89

****
********** ROADWAY OVERTOPPING DATA **********
****

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	40.00
CREST LENGTH (FT)	40.00
OVERTOPPING CREST ELEVATION (FT)	1281.00

****

Bearsley Canal Vision
Improvement Project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
June 16, 1993

(3) Olive Avenue to Peoria Avenue subcritical flow analysis

Page 1 of 7

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	2245.0
Channel Bottom Slope (feet per foot).....	0.0083
Manning's Roughness Coefficient (n-value).....	0.0220
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	40.0
Channel Flow-Line Elevation at Starting Station (feet)..	1266.00
Water Surface Elevation at Starting Station (feet).....	1273.66
Starting Channel Station (feet).....	11440.00

Starting WSEL from HY-8 output of culvert at Olive Av.

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	3.65
Critical Depth (feet).....	4.27

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
2.167	11440.0	1266.00	1273.66	7.66	423.75	5.30	0.436	0.000603
	11500.0	1266.50	1273.61	7.11	385.72	5.82	0.526	0.000789
2.136	11540.0	1266.83	1273.57	6.74	360.42	6.23	0.602	0.000959

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(713) 895-8322. A manual with equations & flow chart is available.

2/7

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
June 18, 1993

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	2245.0
Channel Bottom Slope (feet per foot).....	0.0037
Manning's Roughness Coefficient (n-value).....	0.0220
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	40.0
Channel Flow-Line Elevation at Starting Station (feet)..	1266.83
Water Surface Elevation at Starting Station (feet).....	1273.57
Starting Channel Station (feet).....	11540.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	4.60
Critical Depth (feet).....	4.27

	Station (ft)	Flowline (ft)	WS Elev. ' (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
2.186 –	11540.0	1266.83	1273.57	~~6.74~~	~~360.46~~	~~6.23~~	~~0.602~~	~~0.000959~~
	11600.0	1267.05	1273.58	6.53	346.26	6.48	0.653	0.001076
	11700.0	1267.43	1273.60	6.18	323.40	6.94	0.748	0.001311
	11800.0	1267.80	1273.64	5.84	301.68	7.44	0.860	0.001604
2.267 –	11970.0	1268.44	1273.74	5.31	268.50	8.36	1.086	0.002252

==========

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TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
August 25, 1993

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	997.0
Channel Bottom Slope (feet per foot).....	0.0037
Manning's Roughness Coefficient (n-value).....	0.0220
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	40.0
Channel Flow-Line Elevation at Starting Station (feet)..	1268.44
Water Surface Elevation at Starting Station (feet).....	1273.74
Starting Channel Station (feet).....	11970.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	2.88
Critical Depth (feet).....	2.57

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
2.267 –	11970.0	1268.44	1273.74	~~5.30~~	~~268.18~~	~~3.72~~	~~0.215~~	~~0.000446~~
	12000.0	1268.55	1273.74	5.19	261.52	3.81	0.226	0.000480
	12100.0	1268.93	1273.76	4.83	239.84	4.16	0.268	0.000618
	12200.0	1269.30	1273.77	4.47	219.01	4.55	0.322	0.000808
2.330 –	12300.0	1269.67	1273.80	4.13	199.18	5.01	0.389	0.001071
	12400.0	1270.05	1273.84	3.80	180.64	5.52	0.473	0.001433
	12500.0	1270.42	1273.91	3.49	163.86	6.08	0.575	0.001920
2.392 –	12630.0	1270.90	1274.06	3.16	146.18	6.82	0.722	0.002710

Drop structure

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TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
June 7, 1993

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	997.0
Channel Bottom Slope (feet per foot).....	0.0045 .0044498
Manning's Roughness Coefficient (n-value).....	0.0220
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	40.0
Channel Flow-Line Elevation at Starting Station (feet)..	1275.40
Water Surface Elevation at Starting Station (feet).....	1276.00
Starting Channel Station (feet).....	12630.00

start at critical depth

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	2.72
Critical Depth (feet).....	2.57

Drop struc.

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
2.392 -	12630.0	1275.40	1277.97	2.57	115.77	8.61	1.152	0.005517

==========

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TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
August 25, 1993

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	997.0
Channel Bottom Slope (feet per foot).....	0.0045
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	90.0
Channel Flow-Line Elevation at Starting Station (feet)..	1275.40
Water Surface Elevation at Starting Station (feet).....	1277.97
Starting Channel Station (feet).....	12630.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	2.02
Critical Depth (feet).....	1.53

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
2392 -	12630.0	1275.40	1277.97	~~2.57~~	~~257.72~~	~~3.87~~	~~0.232~~	~~0.001989~~
	12700.0	1275.71	1278.09	2.37	235.93	4.23	0.277	0.002617
	12800.0	1276.16	1278.34	2.17	214.18	4.65	0.336	0.003540
	12900.0	1276.61	1278.68	2.07	203.35	4.90	0.373	0.004165
2.468 -	13030.0	1277.20	1279.23	2.03	199.02	5.01	0.390	0.004456
	13200.0	1277.96	1279.99	2.02	198.41	5.03	0.392	0.004500
2.553 -	13480.0	1279.22	1281.25	2.02	198.44	5.02	0.392	0.004498
2.640 -	13940.0	1281.29	1283.32	2.02	198.43	5.02	0.392	0.004498

==========

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TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
August 25, 1993

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	710.0
Channel Bottom Slope (feet per foot).....	0.0045
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	90.0
Channel Flow-Line Elevation at Starting Station (feet)..	1281.29
Water Surface Elevation at Starting Station (feet).....	1283.32
Starting Channel Station (feet).....	13940.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.66
Critical Depth (feet).....	1.22

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
2.640 –	13940.0	1281.29	1283.32	~~2.03~~	~~199.16~~	~~3.56~~	~~0.197~~	~~0.002254~~
	14000.0	1281.56	1283.44	1.88	183.33	3.87	0.233	0.002926
	14100.0	1282.01	1283.73	1.73	167.16	4.25	0.280	0.003916
	14200.0	1282.46	1284.13	1.67	161.42	4.40	0.300	0.004375
	14300.0	1282.91	1284.57	1.66	160.22	4.43	0.305	0.004479
2.741 –	14470.0	1283.67	1285.33	1.66	159.99	4.44	0.306	0.004500
2.826 –	14820.0	1285.70	1287.35	1.66	160.02	4.44	0.306	0.004497

==========

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TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
June 3, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	710.0
Channel Bottom Slope (feet per foot).....	0.0070
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	100.0
Channel Flow-Line Elevation at Starting Station (feet)..	1286.70
Water Surface Elevation at Starting Station (feet).....	1287.35
Starting Channel Station (feet).....	14920.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.37
Critical Depth (feet).....	1.14

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
2.826	~~14920.0~~	~~1285.70~~	~~1287.35~~	~~1.65~~	~~175.85~~	~~4.04~~	~~0.253~~	~~0.003708~~
	15000.0	1286.26	1287.65	1.39	146.97	4.83	0.362	0.006580
	15100.0	1286.96	1288.32	1.36	143.30	4.95	0.381	0.007134
	15200.0	1287.66	1289.03	1.37	144.46	4.91	0.375	0.006954
	15300.0	1288.36	1289.73	1.37	144.06	4.93	0.377	0.007015
2.907	15350.0	1288.71	1290.08	1.37	144.15	4.93	0.377	0.007001
	15600.0	1290.46	1291.83	1.37	144.16	4.93	0.377	0.006998
3.009	15890.0	1292.49	1293.86	1.37	144.15	4.93	0.377	0.007001
	16000.0	1293.26	1294.63	1.37	144.16	4.93	0.377	0.007000
3.081	16270.0	1295.15	1296.52	1.37	144.15	4.93	0.377	0.007000
	16500.0	1296.76	1298.13	1.37	144.16	4.93	0.377	0.007000
3.167	16720.0	1298.30	1299.67	1.37	144.16	4.93	0.377	0.007000

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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APPENDIX C

IMPROVEMENTS TO TUTHILL DIKE WASH

(Alternative No. 1)

- Summary Notes
- Cost Estimate
- Concept Design Plan and Profile Figures
- Hydraulic Calculation Sheets
- HEC-2 Model (TUT1.H2I)
- HEC-2 Model (TUT2.H2I)
- Retention Basin Analysis

SUMMARY NOTES

SUMMARY NOTES

Concept Design for Tuthill Dike Improvement

1. In general, the concept design for improving Tuthill Dike Wash is to construct a concrete lined channel from White Tanks Structure No. 4 upstream to Caterpillar Wash and improve the existing earthen channel from Caterpillar Wash upstream to Caterpillar Dike Wash. These improvements will provide conveyance for the 100-year flood without the need to raise Tuthill Dike.

2. The major flooding problem associated with Tuthill Dike Wash is the crossing at I-10. The existing box culvert is inadequate to pass the 100-year flood. The result is overtopping of the dike which causes breakout flows to the east. The solution to this problem presented in the concept design is to utilize the existing online retention basin at McDowell Road as an offline retention basin to reduce the peak discharge down to the capacity of the existing box culverts under I-10 which is 4000 cfs. The existing retention basin, however, will have to be enlarged from its existing capacity of 161 ac-ft to 334 ac-ft.

3. With the above described improvements, Tuthill Dike will not have to be raised except for a short reach, approximately 600 feet long, upstream of I-10. The purpose of raising the dike in this location is to provide the FEMA minimum of 4 feet of freeboard upstream of bridges and culverts.

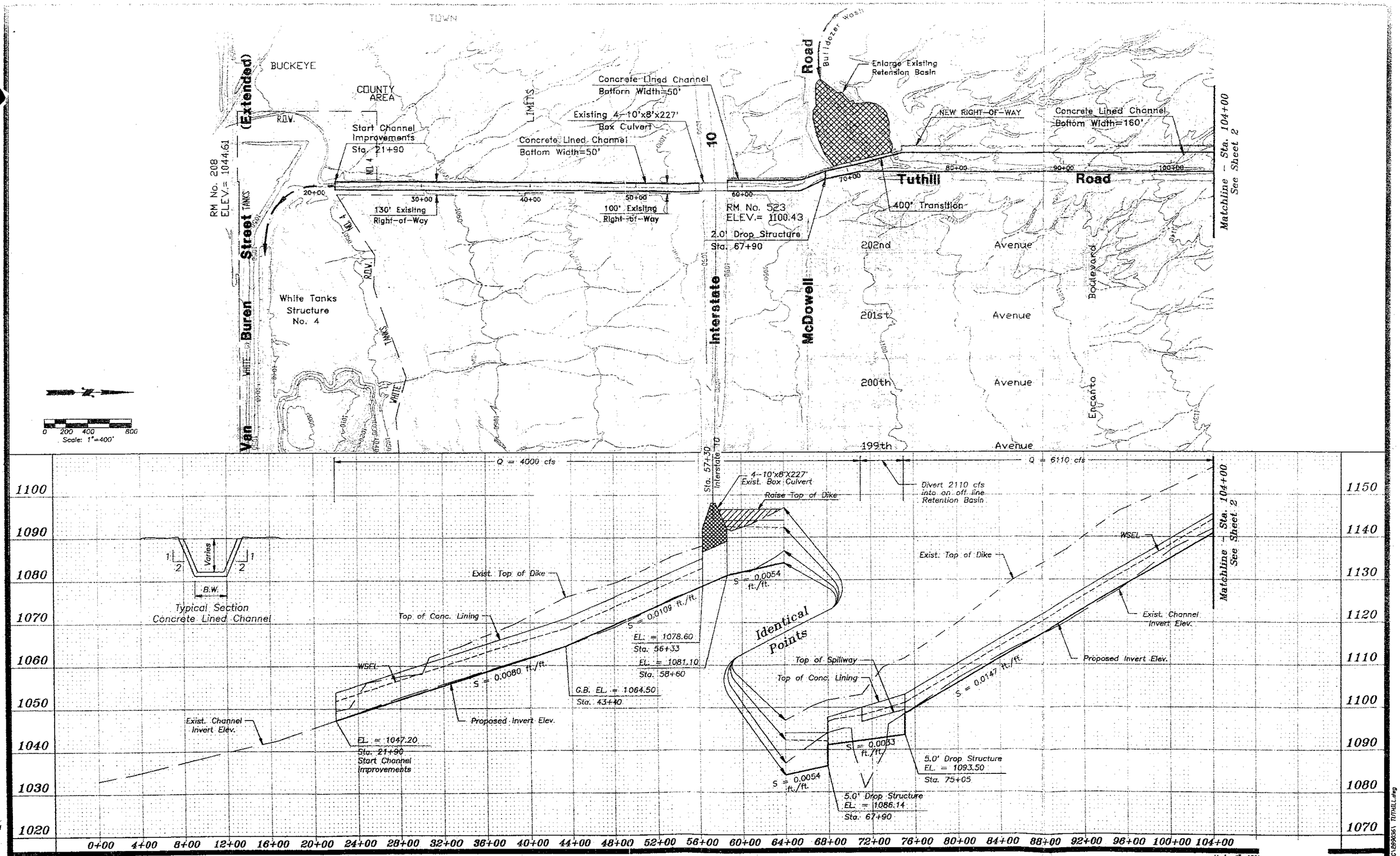
COST ESTIMATE

TUTHILL DIKE WASH
COST ESTIMATE SHEET

	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	COST
1.	Channel Excavation	854,630	C.Y.	$ 3	$ 2,563,900
2.	Channel Lining	176,114	S.Y.	$ 22	$ 3,874,500
3.	5' drop structure at sta. 67 + 90	1	EA.	$ 18,600	$ 18,600
4.	5' drop structure at sta. 75 + 05	1	EA.	$ 48,500	$ 48,500
5.	5' drop structure at sta. 166 + 20	1	EA.	$ 87,600	$ 87,600
6.	3.5' drop structure at sta. 196 + 60	1	EA.	$ 73,100	$ 73,100
7.	4.5' drop structure at sta. 211 + 50	1	EA.	$ 82,500	$ 82,500
8.	5.' drop structure at sta. 226 + 45	1	EA.	$ 59,800	$ 59,800
				Estimated Construction Cost	$ 6,808,500
				Contingencies (25%)	$ 1,702,100
				Total Construction Cost	$ 8,510,600
8.	R.O.W.	6,272,640	S.F.	$.15	$ 940,900
				GRAND TOTAL	**$ 9,451,500**

CONCEPT DESIGN

PLAN AND PROFILE FIGURES



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Engineering Planning Surveying
Landscape Architecture Urban Design
Offices located in Tucson, Phoenix
Las Vegas, and Victor Valley, Ca
3333 East Osborn, Ste. 3850
Phoenix, Arizona (602) 279-1018

Project: WHITE TANKS / AGUA FRIA ADMS
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Sheet Title: CONCEPT DESIGN
TUTHILL DIKE IMPROVEMENT PROJECT

No.	Date	Item

Revisions

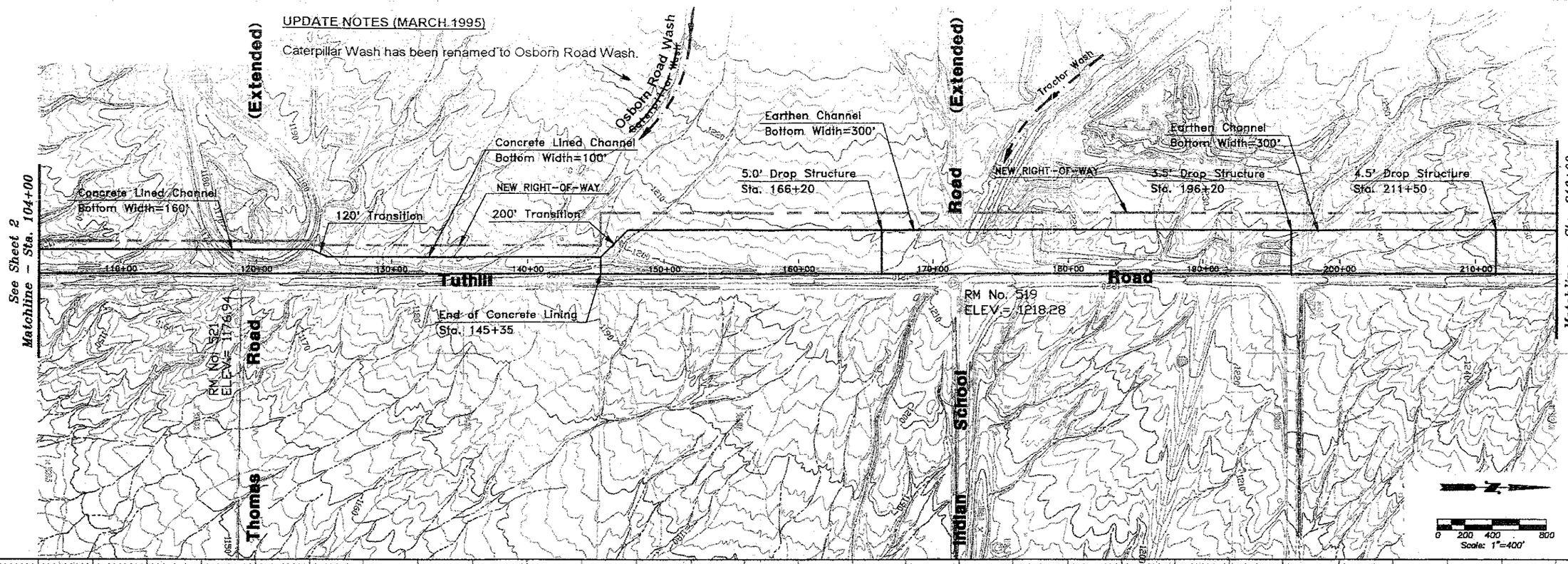
Scale	Horiz: 1"=400' Vert: 1"=10'
Job No.	289036
Date	DEC. 1994
Drawn By	R.A.C.
Checked By	M.T.G.

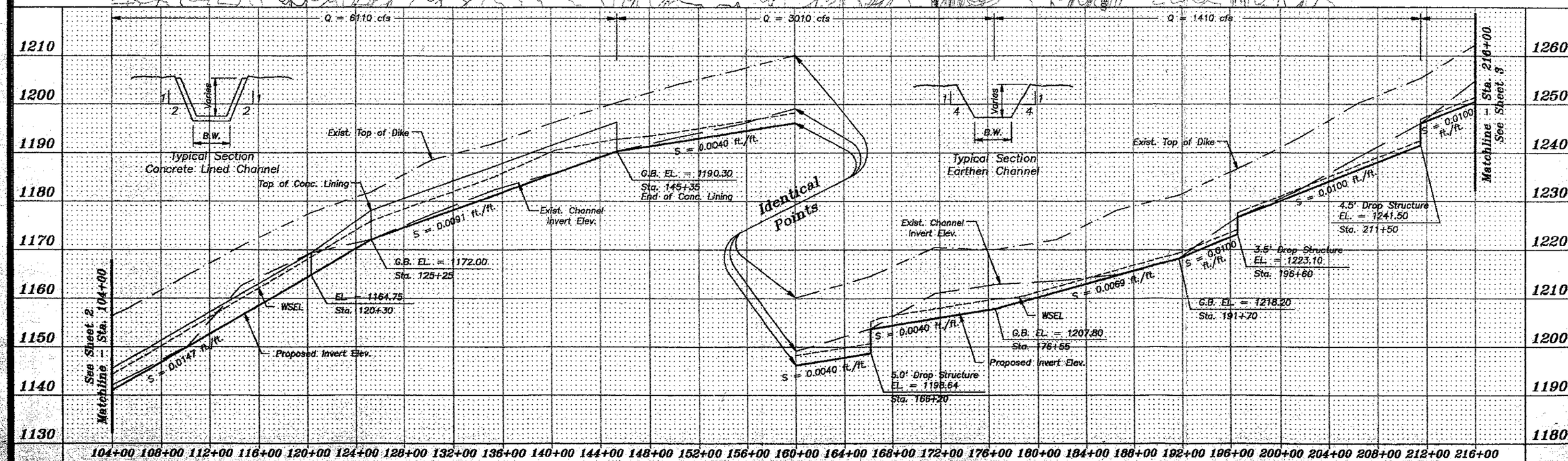
Sheet 1 of 3

D:\ACADJEN\MGT\289036\ TUTHILL.dwg

UPDATE NOTES (MARCH 1995)

Caterpillar Wash has been renamed to Osborn Road Wash.





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WHITE TANKS / AGUA FRIA ADMS
Project

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

CONCEPT DESIGN
Sheet Title

TUTHILL DIKE IMPROVEMENT PROJECT

No.	Date	Item

Revisions

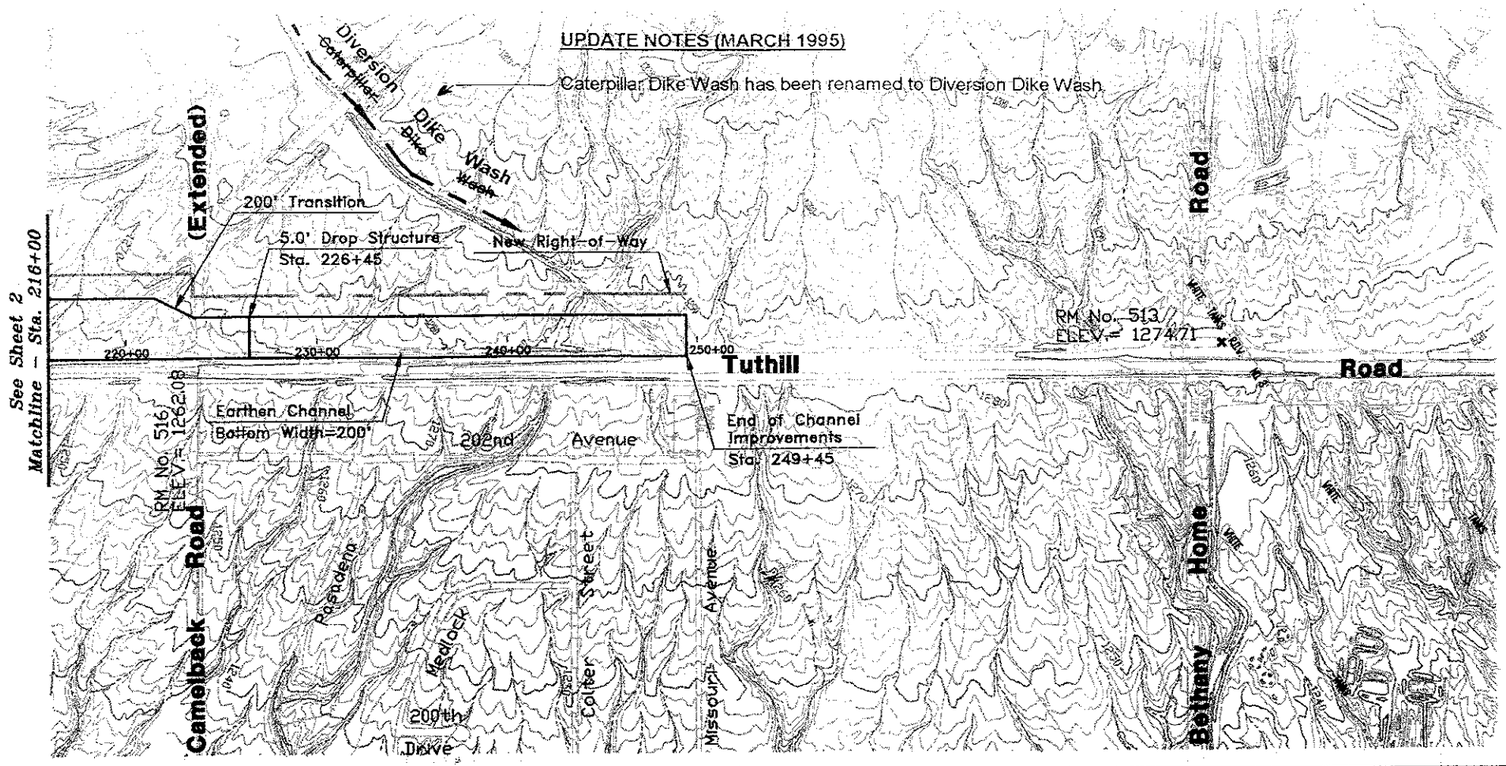
Scale	Horiz: 1"=400' Vert: 1"=10'
Job No.	289036
Date	DEC. 1994
Drawn By	R.A.C.
Checked By	M.T.C.

Sheet 2 of 3

D:\ACADDATA\RACL\289036\ TUTHILLE.dwg

UPDATE NOTES (MARCH 1995)

Caterpillar Dike Wash has been renamed to Diversion Dike Wash



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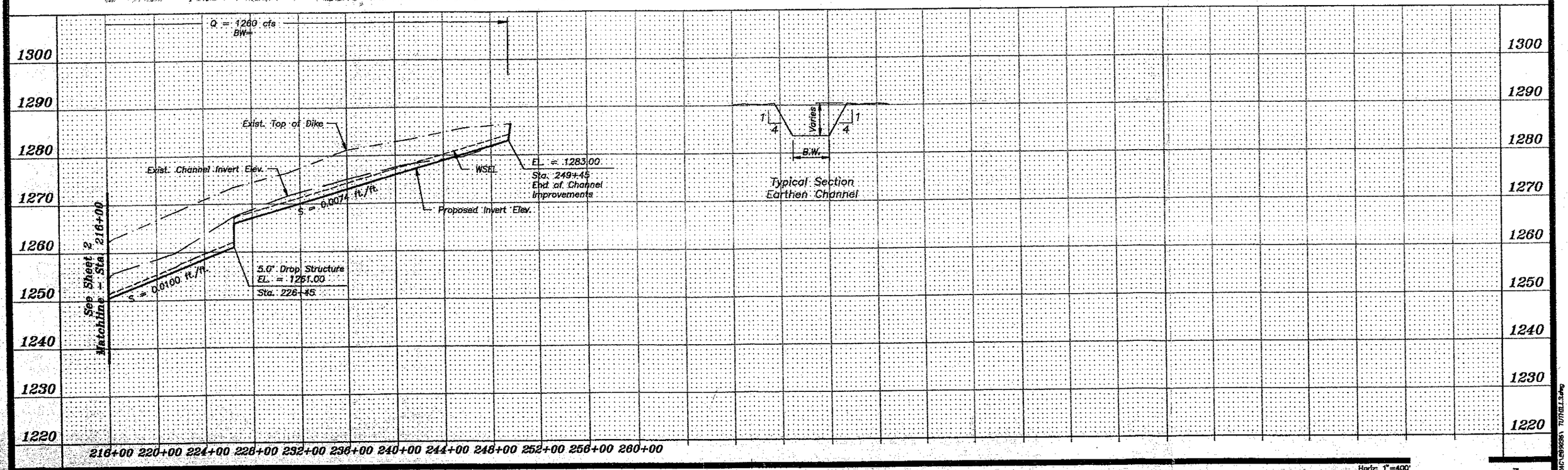

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Project: WHITE TANKS / AGUA FRIA ADMS
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Sheet Title: CONCEPT DESIGN
TUTHILL DIKE IMPROVEMENT PROJECT

No.	Date	Item

Revisions

Scale	Horiz: 1"=400' Vert: 1"=10'
Job No.	289036
Date	DEC. 1994
Drawn By	R.A.C.
Checked By	N.T.G.

Sheet 3 of 3

D:\ACAD12\ PROJ\289036\ TUTHILL3.dwg

HYDRAULIC CALCULATION SHEETS

Includes:

- Trapezoidal Channel Analysis
- Culvert Analysis
- An output summary for the HEC - 2 files TUT1.H2I and TUT2.H2I (Included within this appendix)

Tuthill Dike Wash Improvement project

THIS RUN EXECUTED 23NOV94 16:01:52

I-10 to White Tanks #4

A HEC-2 summary of a supercritical reach
(see HEC-2 file TUT1.H2I within this appendix)

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

TUTHILL DIKE WASH - WASH

SUMMARY PRINTOUT

sta	SECNO	Q	CWSEL	SSTA	STCHL	STCHR	ENDST	DIFWSX	TOPWID	DEPTH	ELMIN	10*KS	VCH
5633	1.067	4000.00	1082.78	9966.65	9955.00	10045.00	10033.35	.00	66.70	4.18	1078.60	109.19	16.42
5340	1.012	4000.00	1079.58	9966.65	9955.00	10045.00	10033.35	-3.20	66.70	4.18	1075.40	109.19	16.42
4840	.917	4000.00	1074.12	9966.65	9955.00	10045.00	10033.35	-5.46	66.70	4.17	1069.95	109.15	16.42
4340	.823	4000.00	1068.68	9966.64	9955.00	10045.00	10033.36	-5.44	66.72	4.18	1064.50	108.79	16.40
* [illegible]5	.729	4000.00	1065.10	9965.86	9955.00	10045.00	10034.14	-.99	68.29	4.58	1060.52	79.83	14.79
3345	.634	4000.00	1061.06	9965.88	9955.00	10045.00	10034.12	-4.04	68.23	4.56	1056.50	80.68	14.85
2850	.540	4000.00	1057.08	9965.88	9955.00	10045.00	10034.12	-3.98	68.25	4.56	1052.52	80.43	14.83
2190	.415	4000.00	1051.76	9965.88	9955.00	10045.00	10034.12	-5.32	68.24	4.55	1047.21	80.57	14.84

Note: Channel stations correspond to river mile stations used in HEC-2 model for Tuthill Dike Wash (see part A, Flood Study Technical Data Notebook)

Tuthill Dike Wash
Improvement project

At I-10

CURRENT DATE: 11-21-1994
CURRENT TIME: 22:00:37

FILE DATE: 08-24-1994
FILE NAME: TUTI10

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	1081.10	1078.60	227.01	4 RCB	10.00	8.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: TUTI10 CULVERT HEADWATER ELEVATION (FT) DATE: 08-24-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	1081.10	0.00	0.00	0.00	0.00	0.00	1097.50
400	1083.26	0.00	0.00	0.00	0.00	0.00	1097.91
800	1084.53	0.00	0.00	0.00	0.00	0.00	1098.15
1200	1085.63	0.00	0.00	0.00	0.00	0.00	1098.35
1600	1086.66	0.00	0.00	0.00	0.00	0.00	1098.53
2000	1087.63	0.00	0.00	0.00	0.00	0.00	1098.70
2400	1088.57	0.00	0.00	0.00	0.00	0.00	1098.86
2800	1089.50	0.00	0.00	0.00	0.00	0.00	1099.00
3200	1090.45	0.00	0.00	0.00	0.00	0.00	1099.14
3600	1091.43	0.00	0.00	0.00	0.00	0.00	1099.28
4000	1092.47	0.00	0.00	0.00	0.00	0.00	1099.40
6400	1100.34	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 11-21-1994 FILE DATE: 08-24-1994
CURRENT TIME: 22:00:37 FILE NAME: TUTI10

PERFORMANCE CURVE FOR CULVERT # 1 - 4 (10 BY 8) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	1081.10	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
400	1083.26	2.16	2.16	1-S2n	0.90	1.46	10.82	0.92	7.17	1.07
800	1084.53	3.43	3.43	1-S2n	1.41	2.32	13.40	1.49	9.30	1.62
1200	1085.63	4.53	4.53	1-S2n	1.86	3.04	14.96	2.01	10.79	2.06
1600	1086.66	5.56	5.56	1-S2n	2.27	3.68	16.10	2.48	11.97	2.44
2000	1087.63	6.53	6.53	1-S2n	2.65	4.28	17.01	2.94	12.96	2.78
2400	1088.57	7.47	7.47	1-S2n	3.02	4.83	17.78	3.37	13.81	3.09
2800	1089.50	8.40	8.40	5-S2n	3.37	5.35	18.44	3.80	14.57	3.38
3200	1090.45	9.35	9.35	5-S2n	3.71	5.85	19.04	4.20	15.26	3.66
3600	1091.43	10.33	10.33	5-S2n	4.04	6.33	19.57	4.60	15.88	3.92
4000	1092.47	11.37	11.37	5-S2n	4.36	6.79	20.06	4.99	16.46	4.17

+1081.10 = 1092.47

El. inlet face invert 1081.10 ft El. outlet invert 1078.60 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00	= 58+60
INLET ELEVATION (FT)	1081.10	= 1081.10
OUTLET STATION (FT)	227.00	= 56+33
OUTLET ELEVATION (FT)	1078.60	= 1078.60
NUMBER OF BARRELS	4	
SLOPE (V-FT/H-FT)	0.0110	
CULVERT LENGTH ALONG SLOPE (FT)	227.01	

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	8.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	1:1 BEVEL (45 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 11-21-1994
CURRENT TIME: 22:00:37

FILE DATE: 08-24-1994
FILE NAME: TUTI10

TAILWATER

******* REGULAR CHANNEL CROSS SECTION ****************

BOTTOM WIDTH (FT)	50.00
SIDE SLOPE H/V (X:1)	2.0
CHANNEL SLOPE V/H (FT/FT)	0.011
MANNING'S N (.01-0.1)	0.022
CHANNEL INVERT ELEVATION (FT)	1078.60
CULVERT NO.1 OUTLET INVERT ELEVATION	1078.60 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	1078.60	0.000	0.00	0.00	0.00
400.00	1079.67	1.222	1.07	7.17	0.73
800.00	1080.22	1.289	1.62	9.30	1.11
1200.00	1080.66	1.326	2.06	10.79	1.41
1600.00	1081.04	1.351	2.44	11.97	1.67
2000.00	1081.38	1.370	2.78	12.96	1.91
2400.00	1081.69	1.384	3.09	13.81	2.12
2800.00	1081.98	1.396	3.38	14.57	2.32
3200.00	1082.26	1.406	3.66	15.26	2.51
3600.00	1082.52	1.414	3.92	15.88	2.69
4000.00	1082.77	1.421	4.17	16.46	2.86

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	230.00
CREST LENGTH (FT)	500.00
OVERTOPPING CREST ELEVATION (FT)	1097.50

Tuthill Dike Wash
Improvent Project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 20, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	4000.0
Channel Bottom Slope (feet per foot).....	0.0054
Manning's Roughness Coefficient (n-value).....	0.0220
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	50.0
Channel Flow-Line Elevation at Starting Station (feet)..	1081.10
Water Surface Elevation at Starting Station (feet).....	1092.47
Starting Channel Station (feet).....	5860.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	5.12
Critical Depth (feet).....	5.41

Sec #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
1+10	- 5860.0	1081.10	1092.47	11.37	827.05	4.84	0.363	0.000310
1+18	- 5900.0	1081.32	1092.46	11.15	805.92	4.96	0.383	0.000334
	6000.0	1081.86	1092.45	10.59	753.77	5.31	0.437	0.000403
1+52	- 6080.0	1082.29	1092.43	10.14	712.73	5.61	0.489	0.000472
	6200.0	1082.94	1092.40	9.46	652.25	6.13	0.584	0.000608
1+98	- 6320.0	1083.58	1092.36	8.78	592.90	6.75	0.707	0.000799
	6400.0	1084.02	1092.33	8.31	553.81	7.22	0.810	0.000972
	6500.0	1084.56	1092.28	7.72	505.30	7.92	0.973	0.001266
	6600.0	1085.10	1092.21	7.11	456.73	8.76	1.191	0.001697
1+260	- 6650.0	1085.37	1092.16	6.79	432.00	9.26	1.331	0.001996
	6700.0	1085.64	1092.10	6.46	406.60	9.84	1.503	0.002383
1+287	- 6790.0	1086.12	1091.91	5.79	356.62	11.22	1.954	0.003503

5

5 Drop Structure

==========

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(713) 895-8322. A manual with equations & flow chart is available.

Tuthill Dike wash
Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 20, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	4000.0
Channel Bottom Slope (feet per foot).....	0.0033
Manning's Roughness Coefficient (n-value).....	0.0220
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	50.0
Channel Flow-Line Elevation at Starting Station (feet)..	1091.12
Water Surface Elevation at Starting Station (feet).....	1092.00
Starting Channel Station (feet).....	6790.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	5.89
Critical Depth (feet).....	5.41

Sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
1.287 –	6790.0	1091.12	1096.53	5.41	328.95	12.16	2.296	0.004449
	6850.0	1091.32	1097.10	5.79	356.33	11.23	1.957	0.003515
5' Drop structure	6900.0	1091.48	1097.31	5.83	359.26	11.13	1.925	0.003429
	7000.0	1091.81	1097.68	5.87	362.15	11.05	1.894	0.003349
1.346 –	7105.0	1092.16	1098.04	5.88	363.23	11.01	1.883	0.003319

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Tuthill Dike wash
Improvement project

At sta. 75+05, at the downstream side of the Drop structure

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
December 20, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	6110.0
Channel Bottom Slope (feet per foot).....	0.0033
Manning's Roughness Coefficient (n-value).....	0.0220
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	160.0

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	3.92
Flow Velocity (feet per second).....	9.29
Froude Number (Flow is Sub-Critical).....	0.846
Velocity Head (feet).....	1.34
Energy Head (feet).....	5.26
Cross-Sectional Area of Flow (square feet).....	657.75
Top Width of Flow (feet).....	175.68

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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THIS RUN EXECUTED 20DEC94 16:17:26

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

HEC-2 summary of a supercritical profile reach
(see HEC-2 file TUT2.H2I within this appendix

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

TUTHILL DIKE WASH - WASH

SUMMARY PRINTOUT

sta.	SECNO	Q	CWSEL	SSTA	STCHL	STCHR	ENDST	DIFWSX	TOPWID	DEPTH	ELMIN	10*KS	VCH
14535	2.753	3010.00	1192.81	9944.99	9930.00	10070.00	10055.01	.00	110.03	2.51	1190.30	90.87	11.44
*14035	2.659	6110.00	1190.46	9940.58	9930.00	10070.00	10059.42	-2.35	118.84	4.71	1185.75	44.65	11.86
*13530	2.563	6110.00	1184.98	9942.34	9930.00	10070.00	10057.66	-1.15	115.31	3.83	1181.15	90.06	14.83
13020	2.468	6110.00	1180.42	9942.37	9930.00	10070.00	10057.63	-4.56	115.26	3.82	1176.60	91.18	14.89
12525	2.373	6110.00	1175.82	9942.37	9930.00	10070.00	10057.63	-4.60	115.26	3.82	1172.00	91.01	14.88
*12030	2.279	6110.00	1167.17	9915.19	9900.00	10100.00	10084.83	-1.90	169.64	2.42	1164.75	166.86	15.34
*11455	2.170	6110.00	1158.83	9915.02	9900.00	10100.00	10085.01	-4.26	169.99	2.50	1156.33	148.05	14.79
11020	2.088	6110.00	1152.48	9914.99	9900.00	10100.00	10085.03	-6.36	170.04	2.52	1149.96	145.50	14.71
10525	1.994	6110.00	1145.21	9915.01	9900.00	10100.00	10085.02	-7.26	170.01	2.50	1142.71	146.97	14.76
10020	1.898	6110.00	1137.83	9915.00	9900.00	10100.00	10085.03	-7.39	170.03	2.51	1135.32	145.97	14.72
9525	1.805	6110.00	1130.58	9915.00	9900.00	10100.00	10085.02	-7.24	170.02	2.51	1128.07	146.45	14.74
9025	1.710	6110.00	1123.26	9915.00	9900.00	10100.00	10085.02	-7.32	170.02	2.51	1120.75	146.45	14.74
8520	1.614	6110.00	1115.87	9915.00	9900.00	10100.00	10085.03	-7.39	170.03	2.51	1113.36	146.23	14.73
8010	1.518	6110.00	1108.40	9915.00	9900.00	10100.00	10085.02	-7.47	170.02	2.51	1105.89	146.54	14.74
7505	1.422	6110.00	1101.01	9915.00	9900.00	10100.00	10085.03	-7.39	170.03	2.51	1098.50	146.23	14.73

Tuthill Dike Wash
Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 5, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	3010.0
Channel Bottom Slope (feet per foot).....	0.0040
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	300.0
Channel Flow-Line Elevation at Starting Station (feet)..	1190.30
Water Surface Elevation at Starting Station (feet).....	1192.81
Starting Channel Station (feet).....	14535.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	2.00
Critical Depth (feet).....	1.45

sec #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
2753	- 14535.0	1190.30	1192.81	~~2.51~~	~~778.20~~	~~3.87~~	~~0.232~~	~~0.001870~~
	14600.0	1190.56	1192.91	2.35	728.11	4.13	0.265	0.002322
	14700.0	1190.96	1193.13	2.17	671.02	4.49	0.312	0.003029
	14800.0	1191.36	1193.43	2.07	638.36	4.72	0.345	0.003564
	14900.0	1191.76	1193.78	2.02	623.85	4.82	0.361	0.003842
	15000.0	1192.16	1194.17	2.01	618.64	4.87	0.368	0.003949
2848	- 15035.0	1192.30	1194.31	2.01	617.90	4.87	0.368	0.003964
2943	- 15535.0	1194.30	1196.30	2.00	615.44	4.89	0.371	0.004017
3.057	- 16045.0	1196.34	1198.34	2.00	616.58	4.88	0.370	0.003992
3.148	- 16620.0	1198.64	1200.64	2.00	616.03	4.89	0.371	0.004004

5' Drop Structure

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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Tuthill Dike Wash
Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 5, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	3010.0
Channel Bottom Slope (feet per foot).....	0.0040
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	300.0
Channel Flow-Line Elevation at Starting Station (feet)..	1203.64
Water Surface Elevation at Starting Station (feet).....	1204.00
Starting Channel Station (feet).....	16620.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	2.00
Critical Depth (feet).....	1.45

sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
3.148	- 16620.0	1203.64	1205.09	1.45	444.26	6.78	0.713	0.011679
	16650.0	1203.76	1205.63	1.87	575.16	5.23	0.425	0.005011
5' Drop	16700.0	1203.96	1205.90	1.94	595.93	5.05	0.396	0.004463
structure	16750.0	1204.16	1206.13	1.97	605.30	4.97	0.384	0.004241
	16800.0	1204.36	1206.34	1.98	610.13	4.93	0.378	0.004132
	16900.0	1204.76	1206.76	2.00	614.46	4.90	0.373	0.004038
3.250	- 17155.0	1205.78	1207.78	2.00	616.50	4.88	0.370	0.003394
3.344	- 17655.0	1207.78	1209.78	2.00	616.09	4.89	0.371	0.004003

==========

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Tuthill Dike Wash
Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 5, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1410.0
Channel Bottom Slope (feet per foot).....	0.0069
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	300.0
Channel Flow-Line Elevation at Starting Station (feet)..	1207.78
Water Surface Elevation at Starting Station (feet).....	1209.78
Starting Channel Station (feet).....	17655.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.08
Critical Depth (feet).....	0.88

Sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
3,344	~~17655.0~~	~~1207.78~~	~~1209.78~~	~~2.00~~	~~616.00~~	~~2.29~~	~~0.081~~	~~0.000879~~
	17700.0	1208.09	1209.80	1.71	525.69	2.68	0.112	0.001476
	17750.0	1208.43	1209.86	1.42	435.15	3.24	0.163	0.002743
	17800.0	1208.78	1209.98	1.20	366.38	3.85	0.230	0.004828
	17850.0	1209.12	1210.22	1.10	333.55	4.23	0.277	0.006578
	17900.0	1209.47	1210.55	1.08	328.90	4.29	0.285	0.006889
	18000.0	1210.15	1211.23	1.08	329.13	4.28	0.285	0.006874
3,489	18155.0	1211.22	1212.30	1.08	329.04	4.29	0.285	0.006880
	18300.0	1212.22	1213.30	1.08	329.09	4.28	0.285	0.006877
	18500.0	1213.59	1214.67	1.08	329.06	4.28	0.285	0.006879
3,535	18660.0	1214.69	1215.77	1.08	329.08	4.28	0.285	0.006877
	18900.0	1216.34	1217.42	1.08	329.06	4.28	0.285	0.006878
3,681	19170.0	1218.20	1219.28	1.08	329.08	4.28	0.285	0.006878

==========

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Tuthill Dike Wash
Improvement Project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 5, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1410.0
Channel Bottom Slope (feet per foot).....	0.0100
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	300.0
Channel Flow-Line Elevation at Starting Station (feet)..	1218.20
Water Surface Elevation at Starting Station (feet).....	1219.28
Starting Channel Station (feet).....	19170.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	0.97
Critical Depth (feet).....	0.88

sec. #1	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
3.631	-19170.0	1218.20	1219.28	~~1.08~~	~~328.67~~	~~4.29~~	~~0.286~~	~~0.006906~~
	19200.0	1218.50	1219.46	0.96	291.74	4.83	0.363	0.010230
	19250.0	1219.00	1219.97	0.97	294.90	4.78	0.355	0.009875
	19300.0	1219.50	1220.46	0.96	293.16	4.81	0.359	0.010067
	19500.0	1221.50	1222.47	0.97	294.28	4.79	0.356	0.009941
3.524	-19660.0	1223.10	1224.07	0.97	293.33	4.81	0.359	0.010050

see Drop Structure

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Tuthill Dike Wash
Improvement Project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 5, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1410.0
Channel Bottom Slope (feet per foot).....	0.0100
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	300.0
Channel Flow-Line Elevation at Starting Station (feet)..	1225.60
Water Surface Elevation at Starting Station (feet).....	1227.00
Starting Channel Station (feet).....	19660.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	0.97
Critical Depth (feet).....	0.88

Sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
3.724	19660.0	1226.60	1227.48	0.88	266.64	5.29	0.434	0.013769
	19680.0	1226.80	1227.81	1.01	306.77	4.60	0.328	0.008669
3.5 Drop	19700.0	1227.00	1227.97	0.97	293.40	4.81	0.359	0.010039
Structure	19750.0	1227.50	1228.47	0.97	293.95	4.80	0.357	0.009981
	19800.0	1228.00	1228.97	0.97	293.68	4.80	0.358	0.010008
	19900.0	1229.00	1229.97	0.97	293.82	4.80	0.358	0.009994
	20000.0	1230.00	1230.97	0.97	293.72	4.80	0.358	0.010004
3.818	20155.0	1231.55	1232.52	0.97	293.79	4.80	0.358	0.009996
	20300.0	1233.00	1233.97	0.97	293.73	4.80	0.358	0.010003
	20500.0	1235.00	1235.97	0.97	293.79	4.80	0.358	0.009999
3.912	20650.0	1236.50	1237.47	0.97	293.75	4.80	0.358	0.010000
	20800.0	1238.00	1238.97	0.97	293.76	4.80	0.358	0.009999
	21000.0	1240.00	1240.97	0.97	293.75	4.80	0.358	0.010000
4.006	21150.0	1241.50	1242.47	0.97	293.76	4.80	0.358	0.009999

4.5 Drop Structure

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Tuthill Dike Wash
Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 5, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1260.0
Channel Bottom Slope (feet per foot).....	0.0100
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	300.0
Channel Flow-Line Elevation at Starting Station (feet)..	1246.00
Water Surface Elevation at Starting Station (feet).....	1246.10
Starting Channel Station (feet).....	21150.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	0.90
Critical Depth (feet).....	0.82

sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
4.006 –	21150.0	1246.00	1246.82	0.82	247.24	5.10	0.403	0.014111
	21170.0	1246.20	1247.15	0.95	287.84	4.38	0.298	0.008542
4.5 Drop	21200.0	1246.50	1247.39	0.89	271.42	4.64	0.335	0.010366
structure	21250.0	1247.00	1247.91	0.91	276.13	4.56	0.323	0.009797
	21300.0	1247.50	1248.40	0.90	273.50	4.61	0.330	0.010109
	21350.0	1248.00	1248.91	0.91	274.91	4.58	0.326	0.009941
	21400.0	1248.50	1249.40	0.90	274.15	4.60	0.328	0.010030
	21500.0	1249.50	1250.40	0.90	274.59	4.59	0.327	0.009978
4.101 –	21650.0	1251.00	1251.90	0.90	274.25	4.59	0.328	0.010017
	21800.0	1252.50	1253.40	0.90	274.53	4.59	0.327	0.009986
	22000.0	1254.50	1255.40	0.90	274.17	4.60	0.328	0.009995
4.196 –	22150.0	1256.00	1256.90	0.90	274.37	4.59	0.327	0.010003

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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Tuthill Dike Wash
Improvement Project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 5, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1260.0
Channel Bottom Slope (feet per foot).....	0.0100
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	200.0
Channel Flow-Line Elevation at Starting Station (feet)..	1256.00
Water Surface Elevation at Starting Station (feet).....	1256.90
Starting Channel Station (feet).....	22150.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.15
Critical Depth (feet).....	1.06

Sec #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
4.196	22150.0	1256.00	1257.06	~~1.06~~	~~217.44~~	~~5.79~~	~~0.521~~	~~0.012962~~
	22170.0	1256.20	1257.39	1.19	243.50	5.17	0.416	0.008948
	22200.0	1256.50	1257.64	1.14	233.38	5.40	0.453	0.010280
	22250.0	1257.00	1258.16	1.16	236.50	5.33	0.441	0.009845
	22300.0	1257.50	1258.65	1.15	234.77	5.37	0.447	0.010082
	22350.0	1258.00	1259.15	1.15	235.68	5.35	0.444	0.009957
	22500.0	1259.50	1260.65	1.15	235.12	5.36	0.446	0.010036
4.289	22645.0	1260.95	1262.10	1.15	235.58	5.35	0.444	0.009970

5' Drop Structure

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986 Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092 (713) 895-8322. A manual with equations & flow chart is available.

Tuthill Dike Wash
Improvement Project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 5, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1260.0
Channel Bottom Slope (feet per foot).....	0.0074
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	200.0
Channel Flow-Line Elevation at Starting Station (feet)..	1265.95
Water Surface Elevation at Starting Station (feet).....	1266.00
Starting Channel Station (feet).....	22645.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.26
Critical Depth (feet).....	1.06

Sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
4.289	-22645.0	1265.95	1267.01	1.06	217.44	5.79	0.521	0.012963
	22670.0	1266.14	1267.43	1.30	266.50	4.73	0.347	0.006662
5' Drop	22700.0	1266.36	1267.62	1.27	259.77	4.85	0.365	0.007241
Structure	22750.0	1266.73	1267.99	1.26	257.75	4.89	0.371	0.007428
	22800.0	1267.10	1268.36	1.26	257.93	4.89	0.371	0.007413
	22900.0	1267.84	1269.10	1.26	257.92	4.89	0.371	0.007412
4.375	-23095.0	1269.29	1270.54	1.26	257.91	4.89	0.371	0.007413
	23300.0	1270.81	1272.06	1.26	257.92	4.89	0.371	0.007414
4.469	-23595.0	1272.99	1274.25	1.26	257.93	4.89	0.371	0.007413
	23700.0	1273.77	1275.03	1.26	257.92	4.89	0.371	0.007412
4.563	-24090.0	1276.66	1277.92	1.26	257.58	4.89	0.372	0.007386
	24300.0	1278.22	1279.48	1.26	257.72	4.89	0.371	0.007432
4.653	-24565.0	1280.18	1281.44	1.26	258.07	4.88	0.370	0.007399
	24700.0	1281.18	1282.44	1.26	257.84	4.89	0.371	0.007420
4.745	-24945.0	1283.00	1284.26	1.26	257.97	4.88	0.370	0.007408

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

HEC - 2 MODEL
(TUT1.H2I)
FOR

The supercritical reach between I-10
and the upstream end of White Tanks
Structure No. 4

THIS RUN EXECUTED 23NOV94 16:01:48

Tuthill Dike Wash Improvement Projet

A supercritical reach from I-10 to the upstream end of White Tanks Structure No. 4

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

Version  4.6.2;  May 1991
************************************

T1      WHITE TANKS / AGUA FRIA AREA DRAINAGE MASTER PLAN
T2      100-YEAR STORM EVENT                    FILE: TUT1.H2I
T3      TUTHILL DIKE WASH - WASH "5"
T4      THIS REACH IS DESIGNED AS A LINED CHANNEL

J1  ICHECK   INQ     NINV    IDIR    STRT    METRIC  HVINS   Q       WSEL    FQ

     0       2       0       1      .011     0       .3      0       1083    0

J2  NPROF    IPLOT   PRFVS   XSECV   XSECH   FN      ALLDC   IBW     CHNIM   ITRACE

     1       0      -1       0       0       0       0       0       0       0


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38      43       1      53      21      22      54      51       4       8
    42       5      26       0     110


NC    .022    .022    .022     .1      .3
BT       1    4000

             Q=Q AT 16CWT4

             THE DOWNSTREAM END OF CULVERT AT I-10

X1   1.067       5    9950   10050     293     293     293
GR  1088.6    9955  1078.6    9975  1078.6   10000  1078.6   10025  1088.6   10045

X1   1.012       0       0       0     500     500     500              -3.20

X1    .917       0       0       0     500     500     500              -5.45

X1    .823       0       0       0     495     495     495              -5.45

X1    .729       0       0       0     500     500     500              -3.98

X1    .634       0       0       0     495     495     495              -4.02

X1    .540       0       0       0     660     660     660              -3.98
```

X1	.415	0	0	0	530	530	530	-5.31

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

*PROF 1

CCHV= .100 CEHV= .300
*SECNO 1.067

Q=0 AT I6CWT4

THE DOWNSTREAM END OF CULVERT AT I-10

1.067	4.18	1082.78	1083.99	1083.00	1086.96	4.19	.00	.00	1088.60
4000.0	.0	4000.0	.0	.0	243.6	.0	.0	.0	1088.60
.00	.00	16.42	.00	.000	.022	.000	.000	1078.60	9966.65
.010919	0.	0.	0.	0	11	4	.00	66.70	10033.35

*SECNO 1.012

1.012	4.18	1079.58	1080.79	.00	1083.76	4.19	3.20	.00	1085.40
4000.0	.0	4000.0	.0	.0	243.6	.0	1.6	.4	1085.40
.00	.00	16.42	.00	.000	.022	.000	.000	1075.40	9966.65
.010919	293.	293.	293.	0	11	0	.00	66.70	10033.35

*S[illegible] .917

.917	4.17	1074.12	1075.34	.00	1078.30	4.18	5.46	.00	1079.95
4000.0	.0	4000.0	.0	.0	243.7	.0	4.4	1.2	1079.95
.01	.00	16.42	.00	.000	.022	.000	.000	1069.95	9966.65
.010915	500.	500.	500.	0	11	0	.00	66.70	10033.35

*SECNO .823

.823	4.18	1068.68	1069.89	.00	1072.85	4.18	5.45	.00	1074.50
4000.0	.0	4000.0	.0	.0	243.9	.0	7.2	2.0	1074.50
.02	.00	16.40	.00	.000	.022	.000	.000	1064.50	9966.64
.010879	500.	500.	500.	2	11	0	.00	66.72	10033.36

*SECNO .729

1645 INT SEC ADDED BY RAISING SEC .73, 2.985 FT AND MULTIPLYING BY 1.001

3301 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
WE	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
1.010	4.57	1068.07	1068.89	.00	1071.47	3.40	1.15	.23	1073.51
4000.0	.0	4000.0	.0	.0	270.3	.0	8.0	2.2	1073.51
.02	.00	14.80	.00	.000	.022	.000	.000	1063.51	9965.87
.007994	124.	124.	124.	5	11	0	.00	68.33	10034.20

1645 INT SEC ADDED BY RAISING SEC 1.01, -.995 FT AND MULTIPLYING BY 1.000

1.020	4.57	1067.08	1067.92	.00	1070.48	3.40	.99	.00	1072.51
4000.0	.0	4000.0	.0	.0	270.2	.0	8.7	2.4	1072.51
.03	.00	14.81	.00	.000	.022	.000	.000	1062.51	9965.87
.008005	124.	124.	124.	0	8	0	.00	68.30	10034.18

1645 INT SEC ADDED BY RAISING SEC 1.02, -.995 FT AND MULTIPLYING BY 1.000

1.030	4.57	1066.09	1066.92	.00	1069.49	3.40	.99	.00	1071.52
4000.0	.0	4000.0	.0	.0	270.2	.0	9.5	2.6	1071.52
.03	.00	14.81	.00	.000	.022	.000	.000	1061.52	9965.87
.008004	124.	124.	124.	0	8	0	.00	68.29	10034.16

1645 INT SEC ADDED BY RAISING SEC 1.03, -.995 FT AND MULTIPLYING BY 1.000

.729	4.58	1065.10	1065.93	.00	1068.50	3.40	.99	.00	1070.52
4000.0	.0	4000.0	.0	.0	270.4	.0	10.3	2.8	1070.52
.03	.00	14.79	.00	.000	.022	.000	.000	1060.52	9965.86
.007983	124.	124.	124.	0	8	0	.00	68.29	10034.14

*SECNO .634

.634	4.56	1061.06	1061.91	.00	1064.48	3.42	4.01	.00	1066.50
4000.0	.0	4000.0	.0	.0	269.4	.0	13.4	3.5	1066.50
.04	.00	14.85	.00	.000	.022	.000	.000	1056.50	9965.88
.008068	500.	500.	500.	3	8	0	.00	68.23	10034.12

*SECNO .540

.540	4.56	1057.08	1057.93	.00	1060.49	3.42	3.99	.00	1062.52
4000.0	.0	4000.0	.0	.0	269.7	.0	16.4	4.3	1062.52
.05	.00	14.83	.00	.000	.022	.000	.000	1052.52	9965.88
.008043	495.	495.	495.	0	8	0	.00	68.25	10034.12

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

*SECNO .415

.415	4.55	1051.76	1052.62	.00	1055.18	3.42	5.31	.00	1057.21
4000.0	.0	4000.0	.0	.0	269.5	.0	20.5	5.3	1057.21
.06	.00	14.84	.00	.000	.022	.000	.000	1047.21	9965.88
.008057	660.	660.	660.	0	8	0	.00	68.24	10034.12

THIS RUN EXECUTED 23NOV94 16:01:52

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

TUTHILL DIKE WASH - WASH

SUMMARY PRINTOUT

sta	SECNO	Q	CWSEL	SSTA	STCHL	STCHR	ENDST	DIFWSX	TOPWID	DEPTH	ELMIN	10*KS	VCH
5633	1.067	4000.00	1082.78	9966.65	9955.00	10045.00	10033.35	.00	66.70	4.18	1078.60	109.19	16.42
5340	1.012	4000.00	1079.58	9966.65	9955.00	10045.00	10033.35	-3.20	66.70	4.18	1075.40	109.19	16.42
4840	.917	4000.00	1074.12	9966.65	9955.00	10045.00	10033.35	-5.46	66.70	4.17	1069.95	109.15	16.42
4340	.823	4000.00	1068.68	9966.64	9955.00	10045.00	10033.36	-5.44	66.72	4.18	1064.50	108.79	16.40
* [illegible]	.729	4000.00	1065.10	9965.86	9955.00	10045.00	10034.14	-.99	68.29	4.58	1060.52	79.83	14.79
3345	.634	4000.00	1061.06	9965.88	9955.00	10045.00	10034.12	-4.04	68.23	4.56	1056.50	80.68	14.85
2850	.540	4000.00	1057.08	9965.88	9955.00	10045.00	10034.12	-3.98	68.25	4.56	1052.52	80.43	14.83
2190	.415	4000.00	1051.76	9965.88	9955.00	10045.00	10034.12	-5.32	68.24	4.55	1047.21	80.57	14.84

TUTHILL DIKE WASH - WASH

SUMMARY PRINTOUT TABLE 110

	SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
	1.067	1082.78	-.22	1086.96	66.70	.00	4000.00	.00	.00	.00	9955.00	10045.00	.00
	1.012	1079.58	.00	1083.76	66.70	.00	4000.00	.00	.00	.00	9955.00	10045.00	.00
	.917	1074.12	.00	1078.30	66.70	.00	4000.00	.00	.00	.00	9955.00	10045.00	.00
	.823	1068.68	.00	1072.85	66.72	.00	4000.00	.00	.00	.00	9955.00	10045.00	.00
*	.729	1065.10	.00	1068.50	68.29	.00	4000.00	.00	.00	.00	9955.00	10045.00	.00
	.634	1061.06	.00	1064.48	68.23	.00	4000.00	.00	.00	.00	9955.00	10045.00	.00
	.540	1057.08	.00	1060.49	68.25	.00	4000.00	.00	.00	.00	9955.00	10045.00	.00
	.415	1051.76	.00	1055.18	68.24	.00	4000.00	.00	.00	.00	9955.00	10045.00	.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= .729 PROFILE= 1 INTERPOLATED X-SECTIONS USED

HEC - 2 MODEL
(TUT2.H2I)
FOR

The supercritical reach between the retention basin upstream of McDowell Road and the confluence with Caterpillar Wash)

THIS RUN EXECUTED 20DEC94 16:17:18

Tuthill Dike Wash Improvement Project

The supercritical reach between the retention basin at Mcdowell Rd and the confluence with Caterpillar wash

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

 Version  4.6.2;  May 1991
************************************

T1      WHITE TANKS / AGUA FRIA AREA DRAINAGE MASTER PLAN
T2      100-YEAR STORM EVENT                    FILE: TUT2.H2I
T3      TUTHILL DIKE WASH - WASH "S"
T4      THIS REACH IS DESIGNED AS A LINED CHANNEL

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0        2        0        1     .0091       0       .3       0      1195       0

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

      1        0       -1        0        0       0        0        0        0        0


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38       43        1       53       21       22       54       51        4        9
     42        5       26        0      110

NC   .022     .022     .022      .1       .3
QT     1     3010

                Q=Q AT CP27

X1  2.753       5     9930    10070      500      500      500
GR 1200.3    9930   1190.3     9950   1190.3    10000   1190.3    10050   1200.3    10070

QT     1     6110

                Q=Q AT CP39

X1  2.659       0        0        0      505      505      505                -4.55


                CONFLUENCE WITH CATERPILLAR WASH

X1  2.563       0        0        0      500      500      500                -4.60

X1  2.468       0        0        0      505      505      505                -4.55
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	2.373	5	9930	10070	495	495	495			
GR	1182.0	9930	1172.0	9950	1172.0	10000	1172.0	10050	1182.0	10070

UPSTREAM OF THOMAS RD. "EXTENDED"

X1	2.279	5	9900	10100	575	575	575			
GR	1174.8	9900	1164.75	9920	1164.75	10000	1164.75	10080	1174.75	10100
X1	2.170	0	0	0	435	435	435		-8.42	
X1	2.088	0	0	0	495	495	495		-6.37	
X1	1.994	0	0	0	505	505	505		-7.25	
X1	1.898	0	0	0	495	495	495		-7.39	
X1	1.805	0	0	0	500	500	500		-7.25	
X1	1.710	0	0	0	505	505	505		-7.32	
X1	1.614	0	0	0	510	510	510		-7.39	
X1	1.518	0	0	0	505	505	505		-7.47	
	1.422	0	0	0	200	200	200		-7.39	

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	QLOSS	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

CCHV= .100 CEHV= .300
*SECNO 2.753

Q=Q AT CP27

2.753	2.51	1192.81	1193.27	1195.00	1194.84	2.03	.00	.00	1200.30
3010.0	.0	3010.0	.0	.0	263.2	.0	.0	.0	1200.30
.00	.00	11.44	.00	.000	.022	.000	.000	1190.30	9944.99
.009087	0.	0.	0.	0	14	4	.00	110.03	10055.01

*SECND 2.659
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

Q=Q AT CP39

2.659	4.71	1190.46	1190.46	.00	1192.64	2.18	2.75	1.32	1195.75
6110.0	.0	6110.0	.0	.0	515.4	.0	4.5	1.3	1195.75
.01	.00	11.86	.00	.000	.022	.000	.000	1185.75	9940.58
.004465	500.	500.	500.	20	14	0	.00	118.84	10059.42

*SECND 2.563

1645 INT SEC ADDED BY RAISING SEC 2.56, 3.450 FT AND MULTIPLYING BY 1.009

3301 HV CHANGED MORE THAN HVINS

1.010	3.86	1188.46	1189.27	.00	1191.77	3.31	.76	.11	1194.60
6110.0	.0	6110.0	.0	.0	418.7	.0	5.8	1.7	1194.60
.01	.00	14.59	.00	.000	.022	.000	.000	1184.60	9942.40
.008646	126.	126.	126.	6	5	0	.00	116.44	10058.84

1645 INT SEC ADDED BY RAISING SEC 1.01, -1.150 FT AND MULTIPLYING BY .997

1.020	3.84	1187.29	1188.14	.00	1190.66	3.37	1.11	.01	1193.45
6110.0	.0	6110.0	.0	.0	415.0	.0	7.0	2.0	1193.45
.02	.00	14.72	.00	.000	.022	.000	.000	1183.45	9942.41
.008865	126.	126.	126.	3	11	0	.00	116.01	10058.42

SECNO	DEPTH	DWSEL	CRIWS	WSELK	EG	HV	HL	DLOSS	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

1645 INT SEC ADDED BY RAISING SEC 1.02, -1.150 FT AND MULTIPLYING BY .997

1.030	3.83	1186.13	1186.99	.00	1189.53	3.40	1.13	.00	1192.30
6110.0	.0	6110.0	.0	.0	413.0	.0	8.2	2.3	1192.30
.02	.00	14.80	.00	.000	.022	.000	.000	1182.30	9942.39
.008972	126.	126.	126.	3	11	0	.00	115.64	10058.03

1645 INT SEC ADDED BY RAISING SEC 1.03, -1.150 FT AND MULTIPLYING BY .997

CONFLUENCE WITH CATERPILLAR WASH

2.563	3.83	1184.98	1185.85	.00	1188.39	3.41	1.13	.00	1191.15
6110.0	.0	6110.0	.0	.0	412.0	.0	9.4	2.7	1191.15
.02	.00	14.83	.00	.000	.022	.000	.000	1181.15	9942.34
.009006	126.	126.	126.	0	11	0	.00	115.31	10057.66

*SECNO 2.468

2.468	3.82	1180.42	1181.30	.00	1183.86	3.44	4.53	.00	1186.60
6110.0	.0	6110.0	.0	.0	410.4	.0	14.1	4.0	1186.60
.03	.00	14.89	.00	.000	.022	.000	.000	1176.60	9942.37
.009118	500.	500.	500.	3	11	0	.00	115.26	10057.63

*SECNO 2.373

2.373	3.82	1175.82	1176.70	.00	1179.26	3.44	4.60	.00	1182.00
6110.0	.0	6110.0	.0	.0	410.7	.0	18.9	5.3	1182.00
.04	.00	14.88	.00	.000	.022	.000	.000	1172.00	9942.37
.009101	505.	505.	505.	0	11	0	.00	115.26	10057.63

*SECNO 2.279

1645 INT SEC ADDED BY RAISING SEC 2.28, 5.438 FT AND MULTIPLYING BY .783

3301 HV CHANGED MORE THAN HVINS

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

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.42

1.010	2.72	1172.91	1174.30	.00	1177.58	4.67	1.55	.12	1180.24
6110.0	.0	6110.0	.0	.0	352.3	.0	20.0	5.7	1180.19
.04	.00	17.34	.00	.000	.022	.000	.000	1170.19	9911.42
.018407	124.	124.	124.	7	8	0	.00	133.74	10045.16

1645 INT SEC ADDED BY RAISING SEC 1.01, -1.813 FT AND MULTIPLYING BY 1.093

3301 HV CHANGED MORE THAN HVING

1.020	2.63	1171.00	1172.26	.00	1175.23	4.22	2.22	.13	1178.43
6110.0	.0	6110.0	.0	.0	370.4	.0	21.0	6.1	1178.38
.04	.00	16.49	.00	.000	.022	.000	.000	1168.38	9912.64
.017422	124.	124.	124.	3	11	0	.00	145.77	10058.42

1645 INT SEC ADDED BY RAISING SEC 1.02, -1.813 FT AND MULTIPLYING BY 1.085

1.030	2.51	1169.07	1170.24	.00	1173.00	3.93	2.14	.09	1176.61
6110.0	.0	6110.0	.0	.0	383.9	.0	22.1	6.5	1176.56
.05	.00	15.91	.00	.000	.022	.000	.000	1166.56	9913.92
.017130	124.	124.	124.	4	11	0	.00	157.70	10071.62

1645 INT SEC ADDED BY RAISING SEC 1.03, -1.813 FT AND MULTIPLYING BY 1.078

UPSTREAM OF THOMAS RD. "EXTENDED"

2.279	2.42	1167.17	1168.25	.00	1170.83	3.66	2.09	.08	1174.80
6110.0	.0	6110.0	.0	.0	398.2	.0	23.2	7.0	1174.75
.05	.00	15.34	.00	.000	.022	.000	.000	1164.75	9915.19
.016686	124.	124.	124.	3	11	0	.00	169.64	10084.83

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	QLOSS	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 2.170

1645 INT SEC ADDED BY RAISING SEC 2.17, 4.210 FT AND MULTIPLYING BY .998

3301 HV CHANGED MORE THAN HVINS

1.010	2.56	1163.10	1164.05	.00	1166.35	3.26	4.35	.12	1170.59
6110.0	.0	6110.0	.0	.0	421.8	.0	25.9	8.1	1170.54
.05	.00	14.48	.00	.000	.022	.000	.000	1160.54	9914.88
.013812	288.	288.	288.	4	11	0	.00	169.95	10084.84

1645 INT SEC ADDED BY RAISING SEC 1.01, -4.210 FT AND MULTIPLYING BY 1.002

2.170	2.50	1158.83	1159.83	.00	1162.23	3.40	4.11	.01	1166.38
6110.0	.0	6110.0	.0	.0	413.2	.0	28.7	9.2	1166.33
.06	.00	14.79	.00	.000	.022	.000	.000	1156.33	9915.02
.014805	288.	288.	288.	4	11	0	.00	169.99	10085.01

*SECNO 2.088

2.088	2.52	1152.48	1153.46	.00	1155.84	3.36	6.38	.01	1160.01
6110.0	.0	6110.0	.0	.0	415.4	.0	32.8	10.9	1159.96
.07	.00	14.71	.00	.000	.022	.000	.000	1149.96	9914.99
.014550	435.	435.	435.	3	11	0	.00	170.04	10085.03

*SECNO 1.994

1.994	2.50	1145.21	1146.21	.00	1148.59	3.38	7.24	.00	1152.76
6110.0	.0	6110.0	.0	.0	414.1	.0	37.5	12.8	1152.71
.08	.00	14.75	.00	.000	.022	.000	.000	1142.71	9915.01
.014697	495.	495.	495.	2	11	0	.00	170.01	10085.02

*SECNO 1.898

1.898	2.51	1137.83	1138.82	.00	1141.19	3.37	7.40	.00	1145.37
6110.0	.0	6110.0	.0	.0	415.0	.0	42.3	14.8	1145.32
.09	.00	14.72	.00	.000	.022	.000	.000	1135.32	9915.00
.014597	505.	505.	505.	2	11	0	.00	170.03	10085.03

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	QLOSS	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 1.805									
1.805	2.51	1130.58	1131.57	.00	1133.96	3.37	7.24	.00	1138.12
6110.0	.0	6110.0	.0	.0	414.5	.0	47.0	16.7	1138.07
.10	.00	14.74	.00	.000	.022	.000	.000	1128.07	9915.00
.014645	495.	495.	495.	2	11	0	.00	170.02	10085.02
*SECNO 1.710									
1.710	2.51	1123.26	1124.25	.00	1126.63	3.37	7.32	.00	1130.80
6110.0	.0	6110.0	.0	.0	414.5	.0	51.8	18.7	1130.75
.11	.00	14.74	.00	.000	.022	.000	.000	1120.75	9915.00
.014645	500.	500.	500.	0	11	0	.00	170.02	10085.02
*SECNO 1.614									
1.614	2.51	1115.87	1116.86	.00	1119.24	3.37	7.39	.00	1123.41
6110.0	.0	6110.0	.0	.0	414.7	.0	56.6	20.7	1123.36
.11	.00	14.73	.00	.000	.022	.000	.000	1113.36	9915.00
.014623	505.	505.	505.	2	11	0	.00	170.03	10085.03
*SECNO 1.518									
1.518	2.51	1108.40	1109.39	.00	1111.78	3.37	7.47	.00	1115.94
6110.0	.0	6110.0	.0	.0	414.5	.0	61.4	22.7	1115.89
.12	.00	14.74	.00	.000	.022	.000	.000	1105.89	9915.00
.014654	510.	510.	510.	0	11	0	.00	170.02	10085.02
*SECNO 1.422									
1.422	2.51	1101.01	1102.00	.00	1104.38	3.37	7.39	.00	1108.55
6110.0	.0	6110.0	.0	.0	414.7	.0	66.3	24.6	1108.50
.13	.00	14.73	.00	.000	.022	.000	.000	1098.50	9915.00
.014623	505.	505.	505.	2	11	0	.00	170.03	10085.03

THIS RUN EXECUTED 20DEC94 16:17:26

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

TUTHILL DIKE WASH - WASH

SUMMARY PRINTOUT

sta.	SECNO	Q	CWSEL	SSTA	STCHL	STCHR	ENDST	DIFWSX	TOPWID	DEPTH	ELMIN	10*KS	VCH
14535	2.753	3010.00	1192.81	9944.99	9930.00	10070.00	10055.01	.00	110.03	2.51	1190.30	90.87	11.44
*14035	2.659	6110.00	1190.46	9940.58	9930.00	10070.00	10059.42	-2.35	118.84	4.71	1185.75	44.65	11.86
*13530	2.563	6110.00	1184.98	9942.34	9930.00	10070.00	10057.66	-1.15	115.31	3.83	1181.15	90.06	14.83
[illegible]30	2.468	6110.00	1180.42	9942.37	9930.00	10070.00	10057.63	-4.56	115.26	3.82	1176.60	91.18	14.89
12525	2.373	6110.00	1175.82	9942.37	9930.00	10070.00	10057.63	-4.60	115.26	3.82	1172.00	91.01	14.88
*12030	2.279	6110.00	1167.17	9915.19	9900.00	10100.00	10084.83	-1.90	169.64	2.42	1164.75	166.86	15.34
*11455	2.170	6110.00	1158.83	9915.02	9900.00	10100.00	10085.01	-4.26	169.99	2.50	1156.33	148.05	14.79
11020	2.088	6110.00	1152.48	9914.99	9900.00	10100.00	10085.03	-6.36	170.04	2.52	1149.96	145.50	14.71
10525	1.994	6110.00	1145.21	9915.01	9900.00	10100.00	10085.02	-7.26	170.01	2.50	1142.71	146.97	14.76
10020	1.898	6110.00	1137.83	9915.00	9900.00	10100.00	10085.03	-7.39	170.03	2.51	1135.32	145.97	14.72
9525	1.805	6110.00	1130.58	9915.00	9900.00	10100.00	10085.02	-7.24	170.02	2.51	1128.07	146.45	14.74
9025	1.710	6110.00	1123.26	9915.00	9900.00	10100.00	10085.02	-7.32	170.02	2.51	1120.75	146.45	14.74
8520	1.614	6110.00	1115.87	9915.00	9900.00	10100.00	10085.03	-7.39	170.03	2.51	1113.36	146.23	14.73
8010	1.518	6110.00	1108.40	9915.00	9900.00	10100.00	10085.02	-7.47	170.02	2.51	1105.89	146.54	14.74
7505	1.422	6110.00	1101.01	9915.00	9900.00	10100.00	10085.03	-7.39	170.03	2.51	1098.50	146.23	14.73

T-"HILL DIKE WASH - WASH

SUMMARY PRINTOUT TABLE 110

	SECND	CWSEL	DIFKWS	SG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
	2.753	1192.81	-2.19	1194.84	110.03	.00	3010.00	.00	.00	.00	9930.00	10070.00	.00
*	2.659	1190.46	.00	1192.64	118.94	.00	6110.00	.00	.00	.00	9930.00	10070.00	.00
*	2.563	1184.98	.00	1188.39	115.31	.00	6110.00	.00	.00	.00	9930.00	10070.00	.00
	2.468	1180.42	.00	1183.86	115.26	.00	6110.00	.00	.00	.00	9930.00	10070.00	.00
	2.373	1175.82	.00	1179.26	115.26	.00	6110.00	.00	.00	.00	9930.00	10070.00	.00
*	2.279	1167.17	.00	1170.83	169.64	.00	6110.00	.00	.00	.00	9900.00	10100.00	.00
*	2.170	1158.83	.00	1162.23	169.99	.00	6110.00	.00	.00	.00	9900.00	10100.00	.00
	2.088	1152.48	.00	1155.84	170.04	.00	6110.00	.00	.00	.00	9900.00	10100.00	.00
	1.994	1145.21	.00	1148.59	170.01	.00	6110.00	.00	.00	.00	9900.00	10100.00	.00
	1.898	1137.83	.00	1141.19	170.03	.00	6110.00	.00	.00	.00	9900.00	10100.00	.00
	1.805	1130.58	.00	1133.95	170.02	.00	6110.00	.00	.00	.00	9900.00	10100.00	.00
	1.710	1123.26	.00	1126.63	170.02	.00	6110.00	.00	.00	.00	9900.00	10100.00	.00
	1.614	1115.87	.00	1119.24	170.03	.00	6110.00	.00	.00	.00	9900.00	10100.00	.00
	1.518	1108.40	.00	1111.78	170.02	.00	6110.00	.00	.00	.00	9900.00	10100.00	.00
	1.422	1101.01	.00	1104.38	170.03	.00	6110.00	.00	.00	.00	9900.00	10100.00	.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION SECNO=     2.659  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     2.659  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     2.659  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=     2.563  PROFILE=  1  INTERPOLATED X-SECTIONS USED

CAUTION SECNO=     2.279  PROFILE=  1  INTERPOLATED X-SECTIONS USED

CAUTION SECNO=     2.170  PROFILE=  1  INTERPOLATED X-SECTIONS USED
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RETENTION BASIN ANALYSIS

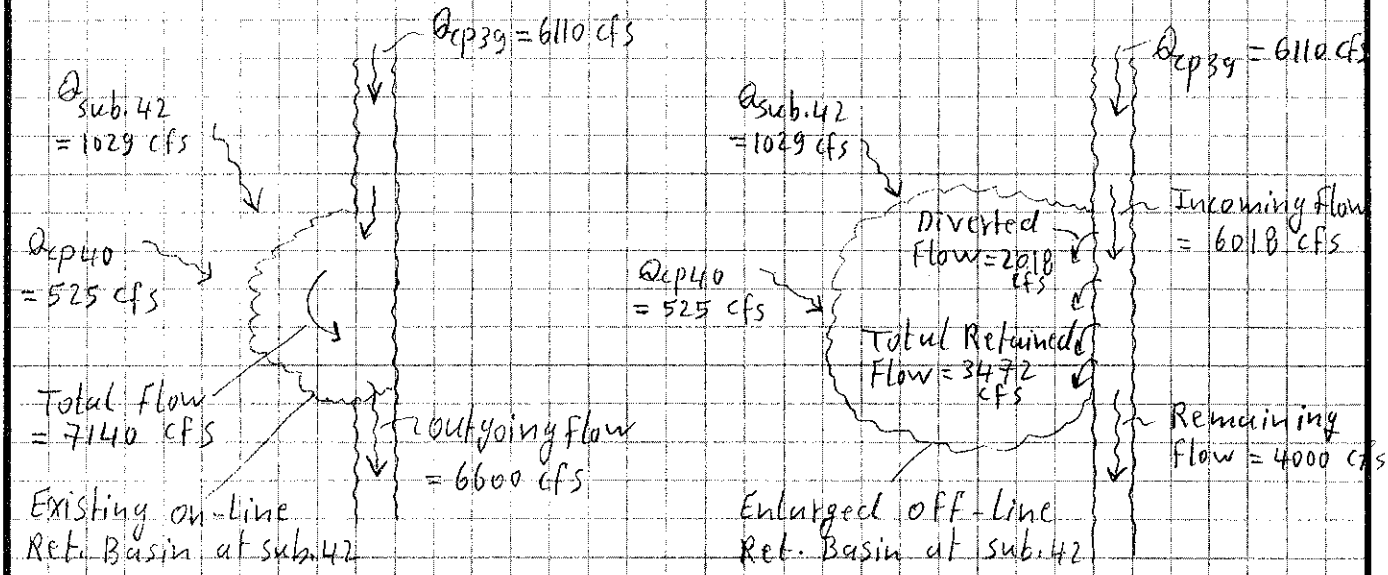
The WLB Group Inc. WLB

COMPUTATION DATA SHEET

Subject Tuthill Dike Wash Improvement Project Prepared by C.A Date

Retention Basin at subbasin 42, North of Mcdowell Road in the Caterpillar proving Ground property:

The existing on-line retention basin will be enlarged and reutilized as an off-line retention basin to retain the flow that exceeds the capacity of the downstream box culvert at I-10



Tuthill Dike Wash Exist. Conditions

Tuthill Dike Wash Improved Conditions

Spillway:

$Q = CLH^{3/2}$; $C = 2.7$ for $L = 400$ ft $\Rightarrow H = \left[\frac{2018}{2.7 \times 400}\right]^{2/3} = 1.52$ ft

Retention Volume

Retention volume required = 334 ac-ft (see HEC-1 file WTADMP5.24)

Retention volume available in the existing retention basin is 161 ac-ft (see included stage-storage table). Therefore the additional volume required is 334 − 161 = 173 ac-ft.

Form 209

The WLB Group Inc. WLB

COMPUTATION DATA SHEET

G.A 12-22-94

Subject WHITE TANKS / AGUA FRIA ADMS Prepared by JSE Date 4-27-90

STAGE - STORAGE - DISCHARGE TABLE

TANK IN SOUTHEASTERN PART OF SUBBASIN # 43

ELEV. (FT)	AREA (AC)		VOLUME (AC-FT)	DISCHARGE (CFS)
1071.5	0		0	0
		.11		
1072	.45		.11	0
		10.32		
1080	2.13		10.43	0
		31.20		
1090	4.11		41.63	0
		28.27		
* 1095	7.20		69.90	0
		7.44		
1096	7.68		77.34	163
		16.86		
1098	9.18		94.20	844
		19.46		
1100	10.28		113.66	2096
		21.04		
1102	10.76		134.70	4630
		26.08		
1104	15.32		160.78	13500

MAXIMUM EXISTING VOLUME = 161 ac-ft

* Overflow Elevation C = 2.5

at 1.0	L = 65	$Q = 2.5(65)(1)^{3/2} =$	163
at 3.0	L = 65	$Q = 2.5(65)(3)^{3/2} =$	844
at 5.0	L = 75	$Q = 2.5(75)(5)^{3/2} =$	2096
at 7.0	L = 100	$Q = 2.5(100)(7)^{3/2} =$	4630
at 9.0	L = 200	$Q = 2.5\ 200\ (9)^{3/2}$	13500

Form 209

APPENDIX D

IMPROVEMENTS TO TUTHILL DIKE WASH

(Alternative No. 2)

- Cost Estimate
- Concept Diversion Plans - Figures 5.4 and 5.5
- Culvert Analyses
- Freeboard on Tuthill Dike (Includes existing condition and Alternative No. 2)
- HEC-1 Model (WT4RET.24) with Flow Diversions
- HEC-2 Model (5RET.H2I) for Tuthill Dike Wash with Reduced Peak Flows

COST ESTIMATE

TUTHILL DIKE WASH (Alt. No. 2) COST ESTIMATE					
	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT COST	COST
1.	Dike Construction (Diversion from sub 27 into 24)	6845	C.Y.	$ 3	$ 20,500
2.	2-10' x 4' Box Culverts (Diversion from sub 22A1 into 21)	200	L.F.	$ 600	$ 120,000
3.	2-10' x 4' Box Culverts (Diversion from sub 21 into 23)	220	L.F.	$ 600	$ 132,000
4.	3-10' x 4' Box Culverts (Diversion from sub 27 into 24)	320	L.F.	$ 855	$ 273,600
5.	Raise Tuthill Dike at I-10	2200	C.Y.	$ 5	$ 11,000
6.	Raise Tuthill Dike upstream of Thomas Road and Camelback Road	2800	C.Y.	$ 5	$ 14,000
				Estimated Construction Cost	$ 571,100
				Contingencies (25%)	$ 142,800
				GRAND TOTAL	**$ 713,900**

CONCEPT DIVERSION PLANS

These two figures (figures 5.4 and 5.5) show the proposed diversions upstream of Tuthill Dike Wash

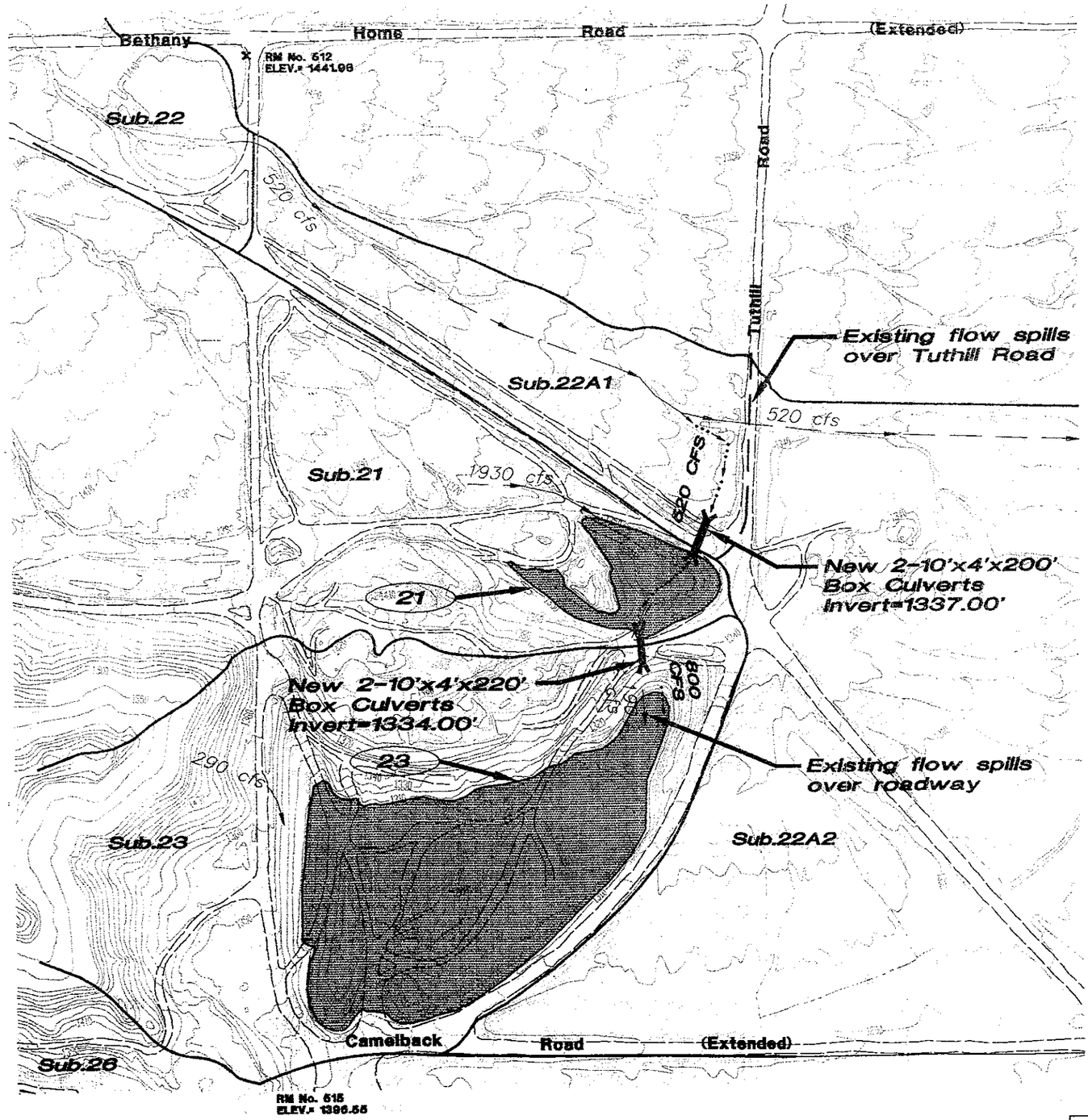


Figure 5.4

Area Drainage Master Plan
for
White Tanks Structure #4
Watershed

(Tuthill Dike Wash Alternative No. 2)
Flow diversions into
Subbasins 21 and 23

LEGEND

———	Subbasin Boundary
Sub.23	Subbasin Number
21	Existing Retention Basin at Subbasin 21
— — →	Existing Flow
···→···→	Proposed Flow
520 cfs	Existing 100–Yr Flow
520 CFS	Proposed 100–Yr Flow
	Retention Basin

North

SCALE: 1"=600'

0 300 600 1200

The WLB Group Inc.
WLB
Engineering Planning Surveying
Landscape Architecture Urban Design
Offices located in Tucson, Phoenix
Las Vegas, and Victor Valley, Ca
333 East Osborn, Ste. 380
Phoenix, Arizona (602) 279–1016

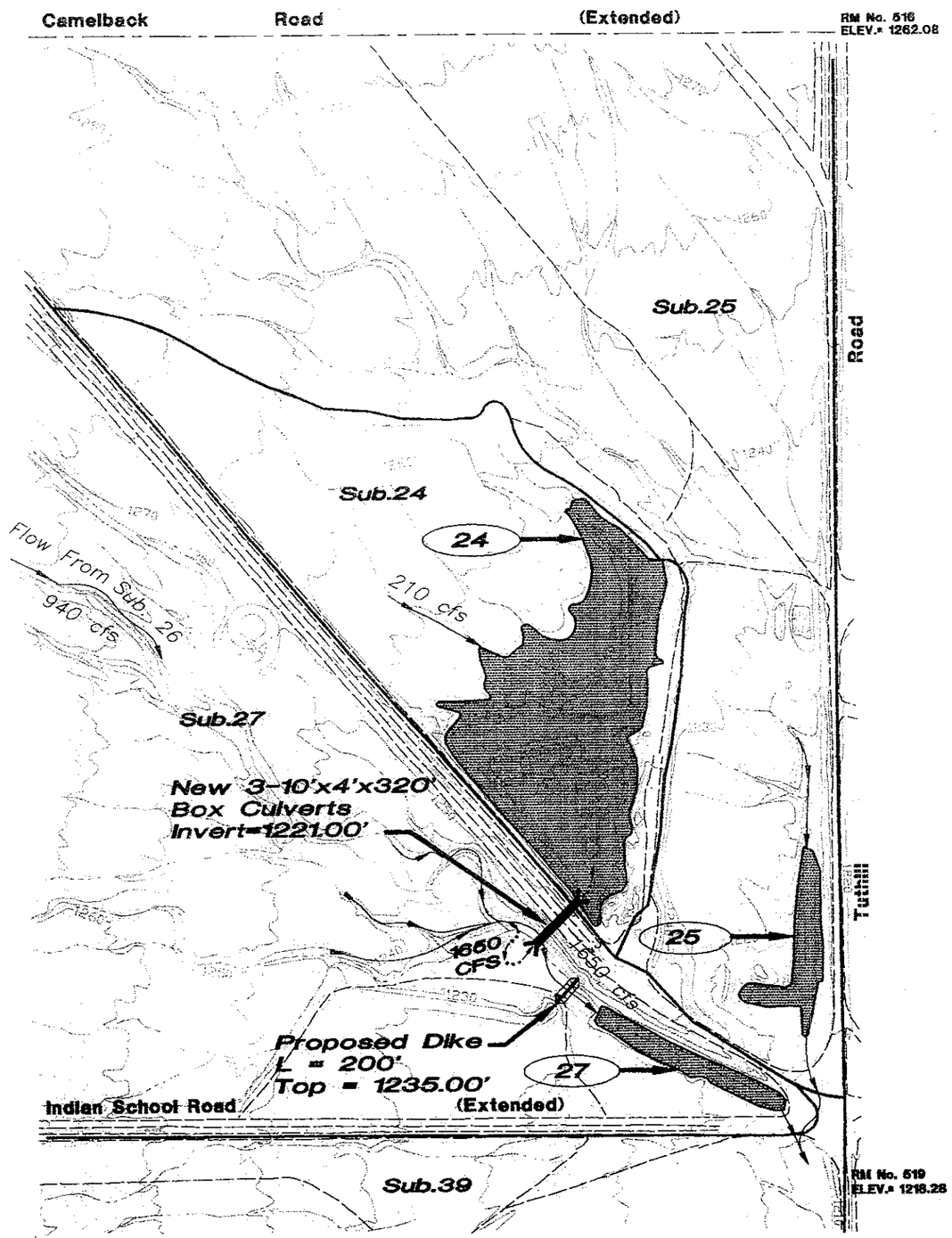


Figure 5.5

Area Drainage Master Plan
for
White Tanks Structure #4
Watershed

(Tuthill Dike Wash Alternative No. 2)
Flow diversions into
Subbasin 24

LEGEND

———	Subbasin Boundary
Sub.23	Subbasin Number
21	Existing Retention Basin at Subbasin 21
——→	Existing Flow
··→	Proposed Flow
520 cfs	Existing 100-Yr Flow
520 CFS	Proposed 100-Yr Flow
	Retention Basin

North

SCALE: 1"=600'

0 300 600 1200

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Phoenix, Arizona (602) 279-1016

CULVERT ANALYSIS

Flow Diversions
sub. 22A1 → Sub. 21

CURRENT DATE: 08-28-1994
CURRENT TIME: 18:47:41

FILE DATE: 08-28-1994
FILE NAME: 22A1-21

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	37.00	36.00	200.00	2 RCB	10.00	4.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: 22A1-21 CULVERT HEADWATER ELEVATION (FT) DATE: 08-28-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	37.00	0.00	0.00	0.00	0.00	0.00	50.00
52	37.51	0.00	0.00	0.00	0.00	0.00	50.73
104	38.44	0.00	0.00	0.00	0.00	0.00	51.14
156	38.89	0.00	0.00	0.00	0.00	0.00	51.47
208	39.30	0.00	0.00	0.00	0.00	0.00	51.77
260	39.66	0.00	0.00	0.00	0.00	0.00	52.03
312	40.02	0.00	0.00	0.00	0.00	0.00	52.29
364	40.36	0.00	0.00	0.00	0.00	0.00	52.53
416	40.66	0.00	0.00	0.00	0.00	0.00	52.76
468	41.01	0.00	0.00	0.00	0.00	0.00	52.98
520	41.34	0.00	0.00	0.00	0.00	0.00	53.19
1508	53.50	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 08-28-1994 FILE DATE: 08-28-1994
CURRENT TIME: 18:47:41 FILE NAME: 22A1-21

PERFORMANCE CURVE FOR CULVERT # 1 - 2 (10 BY 4) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	37.00	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
52	37.91	0.91	0.91	1-S2n	0.49	0.60	5.35	0.49	7.55	0.17
104	38.44	1.44	1.44	1-S2n	0.77	0.95	6.76	0.77	9.15	0.24
156	38.89	1.89	1.89	1-S2n	0.99	1.24	7.86	0.99	10.21	0.28
208	39.30	2.30	2.30	1-S2n	1.21	1.50	8.62	1.21	11.02	0.33
260	39.68	2.68	2.68	1-S2n	1.39	1.74	9.35	1.39	11.69	0.36
312	40.02	3.02	3.02	1-S2n	1.57	1.97	9.78	1.59	12.26	0.40
364	40.36	3.36	3.36	1-S2n	1.74	2.18	10.45	1.74	12.76	0.42
416	40.68	3.68	3.68	1-S2n	1.91	2.38	10.70	1.94	13.21	0.45
468	41.01	4.01	4.01	5-S2n	2.07	2.58	11.08	2.11	13.61	0.47
520	41.34	4.34	4.34	5-S2n	2.22	2.76	11.46	2.27	13.99	0.50

El. inlet face invert 37.00 ft El. outlet invert 36.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	37.00
OUTLET STATION (FT)	200.00
OUTLET ELEVATION (FT)	36.00
NUMBER OF BARRELS	2
SLOPE (V-FT/H-FT)	0.0050
CULVERT LENGTH ALONG SLOPE (FT)	200.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	4.00 FT
BARREL MATERIAL	CONCRETE
BARREL NONLINEARITY	[illegible]
INLET TYPE	[illegible]
INLET EDGE AND WALL	[illegible] (90-75 DEG. FLARE)
INLET DEPRESSION	[illegible]

CURRENT DATE: 08-28-1994
CURRENT TIME: 18:47:41

FILE DATE: 08-28-1994
FILE NAME: 22A1-21

TAILWATER

******* REGULAR CHANNEL CROSS SECTION *****************

BOTTOM WIDTH (FT)	25.00
SIDE SLOPE H/V (X:1)	[illegible]
CHANNEL SLOPE V/H (FT/FT)	0.400
MANNING'S N [illegible]	0.030
CHANNEL INVERT ELEVATION (FT)	36.00
CULVERT NO.1 OUTLET INVERT ELEVATION	36.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	T (FT)	SHEAR (PSF)
0.00	36.00	0.000	[illegible]	0.00	0.00
52.00	36.17	[illegible]	[illegible]	9.53	4.14
104.00	36.34	[illegible]	[illegible]	9.15	5.85
156.00	36.50	[illegible]	0.28	10.81	7.12
208.00	36.63	[illegible]	0.33	11.03	8.15
260.00	[illegible]	[illegible]	0.38	11.83	9.06
312.00	[illegible]	0.437	0.40	12.25	9.85
364.00	[illegible]	0.454	0.43	12.76	10.57
416.00	[illegible]	[illegible]	0.45	13.21	11.22
[illegible]	36.97	0.491	0.47	13.51	11.84
[illegible]	36.90	0.495	0.50	13.83	12.41

PRIMARY OVERTOPPING DATA

MOTION BETWEEN	LEVEL
EMBANKMENT TOP WIDTH (FT)	200.00
CREST LENGTH (FT)	70.00
OVERTOPPING CREST ELEVATION (FT)	50.00

Flow Diversions
Sub. 21 → Sub. 23

CURRENT DATE: 08-28-1994
CURRENT TIME: 18:45:15

FILE DATE: 08-28-1994
FILE NAME: 21-23

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	34.00	33.90	220.00	2 RCB	10.00	4.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: 21-23 CULVERT HEADWATER ELEVATION (FT) DATE: 08-28-1994

DISC-HARGE	1	2	3	4	5	6	ROADWAY
0	34.00	0.00	0.00	0.00	0.00	0.00	47.00
30	35.42	0.00	0.00	0.00	0.00	0.00	47.95
150	36.19	0.00	0.00	0.00	0.00	0.00	48.50
240	36.85	0.00	0.00	0.00	0.00	0.00	48.94
330	37.29	0.00	0.00	0.00	0.00	0.00	49.32
420	37.83	0.00	0.00	0.00	0.00	0.00	49.69
480	38.31	0.00	0.00	0.00	0.00	0.00	50.02
570	38.85	0.00	0.00	0.00	0.00	0.00	50.35
660	39.45	0.00	0.00	0.00	0.00	0.00	50.67
720	40.10	0.00	0.00	0.00	0.00	0.00	50.96
800	40.80	0.00	0.00	0.00	0.00	0.00	51.25
1000	52.33	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 08-28-1994
CURRENT TIME: 18:45:15

FILE DATE: 08-28-1994
FILE NAME: 21-23

PERFORMANCE CURVE FOR CULVERT # 1 - 2 (10 BY 4) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	34.00	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
80	35.42	1.22	1.42	2-M2c	1.41	0.79	5.04	0.79	8.51	0.21
160	36.19	1.93	2.19	2-M2c	2.25	1.26	6.35	1.26	10.28	0.29
240	36.85	2.54	2.85	2-M2c	2.99	1.65	7.27	1.65	11.44	0.35
320	37.39	3.09	3.39	6-FFn	4.00	2.00	4.00	4.00	12.34	0.40
400	37.63	3.59	3.83	6-FFn	4.00	2.32	5.00	4.00	13.07	0.44
480	38.31	4.09	4.31	6-FFn	4.00	2.62	6.00	4.00	13.70	0.48
560	38.85	4.62	4.85	6-FFn	4.00	2.90	7.00	4.00	14.25	0.51
640	39.45	5.19	5.45	6-FFn	4.00	3.18	8.00	4.00	14.75	0.55
720	40.10	5.82	6.10	6-FFn	4.00	3.43	9.00	4.00	15.20	0.57
800	40.80	6.52	6.80	6-FFn	4.00	3.68	10.00	4.00	15.62	0.60

El. inlet face invert 34.00 ft El. outlet invert 33.90 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	34.00
OUTLET STATION (FT)	200.00
OUTLET ELEVATION (FT)	33.90
NUMBER OF BARRELS	2
SLOPE (V-FT/H-FT)	0.0005
CULVERT LENGTH ALONG SLOPE (FT)	200.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	4.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (40-75 DEG. FLARED)
INLET DEPRESSION	NONE

CURRENT DATE: 08-28-1994
CURRENT TIME: 18:45:15

FILE DATE: 08-28-1994
FILE NAME: 21-23

TAILWATER

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	25.00
SIDE SLOPE H/V (X:1)	X100.0
CHANNEL SLOPE V/H (FT/FT)	0.400
MANNING'S N (.01-0.1)	0.030
CHANNEL INVERT ELEVATION (FT)	33.90
CULVERT NO.1 OUTLET INVERT ELEVATION	33.90 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	33.90	0.000	0.00	0.00	0.00
80.00	34.11	3.305	0.21	8.51	5.14
160.00	34.19	3.370	0.29	10.28	7.21
240.00	34.25	3.410	0.35	11.44	8.72
320.00	34.30	3.440	0.40	12.34	9.97
400.00	34.34	3.465	0.44	13.07	11.04
480.00	34.38	3.486	0.48	13.70	11.98
560.00	34.41	3.504	0.51	14.25	12.83
640.00	34.43	3.520	0.55	14.75	13.61
720.00	34.47	3.535	0.57	15.20	14.34
800.00	34.50	3.549	0.60	15.62	15.01

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	GRAVEL
EMBANKMENT TOP WIDTH (FT)	300.00
CREST LENGTH (FT)	30.00
OVERTOPPING CREST ELEVATION (FT)	47.0

Flow Diversions
Sub. 27 → Sub. 24

CURRENT DATE: 08-28-1994
CURRENT TIME: 18:50:44

FILE DATE: 08-28-1994
FILE NAME: 27-24

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

C	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
L	INLET	OUTLET	CULVERT	BARRELS				
V	ELEV.	ELEV.	LENGTH	SHAPE	SPAN	RISE	MANNING	INLET
	(FT)	(FT)	(FT)	MATERIAL	(FT)	(FT)	n	TYPE
1	21.00	19.40	320.00	3 RCB	10.00	4.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: 27-24 CULVERT HEADWATER ELEVATION (FT) DATE: 08-28-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	21.00	0.00	0.00	0.00	0.00	0.00	50.00
165	22.50	0.00	0.00	0.00	0.00	0.00	51.10
330	23.39	0.00	0.00	0.00	0.00	0.00	51.71
495	24.14	0.00	0.00	0.00	0.00	0.00	52.22
660	24.82	0.00	0.00	0.00	0.00	0.00	52.67
825	25.54	0.00	0.00	0.00	0.00	0.00	53.02
990	26.13	0.00	0.00	0.00	0.00	0.00	53.46
1155	27.24	0.00	0.00	0.00	0.00	0.00	53.87
1320	28.29	0.00	0.00	0.00	0.00	0.00	54.22
1485	29.45	0.00	0.00	0.00	0.00	0.00	54.57
1650	31.36	0.00	0.00	0.00	0.00	0.00	54.90
1663	57.11	0.00	0.00	0.00	0.00	0.00	4.00

The above [illegible] are for a point above the roadway.

CURRENT DATE: 08-28-1994
CURRENT TIME: 18:50:44

FILE DATE: 08-28-1994
FILE NAME: 27-24

PERFORMANCE CURVE FOR CULVERT # 1 - 3 (10 BY 4) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (FA)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	21.00	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
165	22.50	1.50	1.50	1-S2n	0.80	0.98	6.86	0.80	9.80	0.23
330	23.39	2.39	2.39	1-S2n	1.25	1.56	8.80	1.25	11.98	0.33
495	24.14	3.14	3.14	1-S2n	1.63	2.04	10.10	1.63	13.42	0.41
660	24.83	3.83	3.83	1-S2n	1.99	2.47	11.01	2.00	14.53	0.47
825	25.54	4.54	4.54	5-S2n	2.31	2.87	11.79	2.33	15.43	0.52
990	26.33	5.33	5.33	5-S2n	2.62	3.24	12.46	2.65	16.20	0.57
1155	27.24	6.24	6.24	5-S2n	2.92	3.59	13.01	2.96	16.86	0.61
1320	28.29	7.29	7.29	5-S2n	3.21	3.92	13.50	3.26	17.49	0.65
1485	29.49	8.49	8.49	5-S2n	3.49	4.00	13.90	3.56	18.04	0.69
1650	30.86	9.86	9.97	1-FFn	4.00	4.00	13.75	4.00	18.55	0.73

El. inlet face invert	21.00 ft	El. outlet invert	19.40 ft
El. inlet throat invert	0.00 ft	El. inlet crest	0.00 ft

***** SITE DATA ***** CULVERT INVERT *****

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	21.00
OUTLET STATION (FT)	320.00
OUTLET ELEVATION (FT)	19.40
NUMBER OF BARRELS	3
SLOPE (V/FT) (FT)	0.0050
CULVERT LENGTH [illegible] (FT)	320.00

***** CULVERT DATA SUMMARY *****

BARREL SHAPE	BOX
BARREL SPAN	[illegible] FT
BARREL RISE	[illegible] FT
BARREL MATERIAL	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

CURRENT DATE: 08-28-1994
CURRENT TIME: 18:50:44

FILE DATE: 08-28-1994
FILE NAME: 27-24

TAILWATER

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	50.00
SIDE SLOPE H/V (X:1)	X100.0
CHANNEL SLOPE V/H (FT/FT)	0.400
MANNING'S N (.01-0.1)	0.030
CHANNEL INVERT ELEVATION (FT)	19.40
CULVERT NO.1 OUTLET INVERT ELEVATION	19.40 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	19.40	0.000	0.00	0.00	0.00
165.00	19.53	3.598	0.23	9.30	5.75
330.00	19.73	3.669	0.33	11.38	8.27
495.00	19.81	3.708	0.41	13.42	10.15
660.00	19.87	3.739	0.47	14.53	11.70
825.00	19.92	3.761	0.52	15.43	13.05
990.00	19.97	3.780	0.57	16.20	14.24
1155.00	20.01	3.797	0.61	16.88	15.33
1320.00	20.05	3.812	0.65	17.49	16.32
1485.00	20.09	3.825	0.69	18.04	17.25
1650.00	20.11	3.837	0.73	18.53	18.11

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	GRAVEL
EMBANKMENT TOP WIDTH (FT)	200.00
CREST LENGTH (FT)	50.00
OVERTOPPING CREST ELEVATION (FT)	50.00

FREEBOARD
ON
TUTHILL DIKE

FREEBOARD ON TUTHILL DIKE

LOCATION	SEC.#	STATION (ft)	EXST.TOP OF DIKE (ft)	EXISTING CONDITIONS PK.FLOW (cfs)	WSEL (ft)	F.BOARD (ft)	ALTERNATIVE NO. 2 PK.FLOW (cfs)	WSEL (ft)	F.BOARD (ft)
WHITE STRUCTUE # 4	0.000	0+00		4057			3560		
	0.075	4+00		"			"		
	0.186	9+80		"			"		
	0.314	16+60		"			"		
	0.415	21+90	1049.5	"	1051.9	-2.4	"	1051.7	-2.2
	0.540	28+50	57.7	"	57.6	0.1	"	57.3	0.4
	0.634	33+45	64.4	"	61.8	2.6	"	61.6	2.8
	0.729	38+45	69.6	"	65.3	4.3	"	65.1	4.5
	0.823	43+40	76.0	"	70.9	5.1	"	70.5	5.5
	0.917	48+40	79.6	"	74.7	4.9	"	74.5	5.1
	1.012	53+40	85.6	"	80.7	4.9	"	80.3	5.3
INTERSTATE 10;I-10	1.067	56+33	88.0	4061	85.0	3.0	3580	84.5	3.5
4-10ft X 8ft B.C	1.110	58+60	92.0	"	93.1	-1.1	"	91.4	0.6
	1.118	59+00	91.5	5503	93.7	-2.2	3580	92.5	-1.0
	1.152	60+80	93.0	"	93.7	-0.7	"	92.5	0.5
	1.198	63+20	95.8	"	93.6	2.2	"	92.5	3.3
MCDOWELL RD.	1.260	66+50	100.3	6601	97.0	3.3	4250	96.2	4.1
	1.287	67+90	101.7	"	99.2	2.5	"	98.3	3.4
	1.313	69+30	106.3	"	101.0	5.3	"	99.7	6.6
	1.322	69+80	7.2	"	3.3	3.9	"	1.8	5.4
	1.362	71+90	8.5	6225	3.5	5.0	4280	1.9	6.6
	1.422	75+05	11.5	"	6.4	5.1	"	5.1	6.4
	1.518	80+10	20.0	"	13.7	6.3	"	12.7	7.3
	1.614	85+20	30.0	"	23.5	6.5	"	21.7	8.3
	1.710	90+25	37.0	6168	30.7	6.3	4210	29.1	7.9
	1.805	95+25	46.1	"	38.1	8.0	"	36.6	9.5
	1.898	100+20	51.8	"	45.3	6.5	"	44.1	7.7
	1.994	105+25	57.8	"	52.4	5.4	"	50.8	7.0
	2.088	110+20	64.7	"	59.4	5.3	"	58.0	6.7
	2.170	114+55	70.7	6110	67.4	3.3	4140	66.5	4.2
THOMAS RD."EXTEND"	2.279	120+30	77.6	"	76.6	1.0	"	75.2	2.4
	2.737	125+25	81.8	"	80.5	1.3	"	79.0	2.8
	2.468	130+30	88.5	"	84.9	3.6	"	83.6	4.9
	2.563	135+30	91.9	"	91.1	0.8	"	89.5	2.4
	2.659	140+35	96.3	"	93.9	2.4	"	92.8	3.5
	2.753	145+35	200.3	3011	197.5	2.8	945	196.4	3.9
	2.848	150+35	204.1	"	200.2	3.9	"	197.4	6.7
	2.943	155+35	7.1	"	3.4	3.7	"	1.1	6.0
	3.057	160+45	10.4	"	5.9	4.5	"	3.3	7.1
	3.148	166+20	14.5	"	8.9	5.6	"	6.3	8.2
INDIAN SCHOOL RD.	3.250	171+55	20.4	"	13.7	6.7	"	12.5	7.9
	3.344	176+55	20.0	1414	16.6	3.4	1010	15.7	4.3
	3.439	181+55	22.0	"	17.1	4.9	"	16.4	5.6
	3.535	186+60	28.1	"	17.3	10.8	"	16.9	11.2
	3.631	191+70	31.2	"	22.2	9.0	"	21.7	9.5
	3.724	196+60	36.6	"	30.4	6.2	"	30.0	6.6
	3.818	201+55	43.0	"	36.2	6.8	"	35.9	7.1
	3.912	206+50	50.2	"	43.1	7.1	"	42.5	7.7
	4.006	211+50	55.3	"	49.7	5.6	"	48.9	6.4

FREEBOARD ON TUTHILL DIKE

LOCATION	SEC.#	STATION (ft)	EXST.TOP OF DIKE (ft)	EXISTING CONDITIONS PK.FLOW (cfs)	EXISTING CONDITIONS WSEL (ft)	EXISTING CONDITIONS F.BOARD (ft)	ALTERNATIVE NO. 2 PK.FLOW (cfs)	ALTERNATIVE NO. 2 WSEL (ft)	ALTERNATIVE NO. 2 F.BOARD (ft)
	4.101	216+50	63.0	1261	57.8	5.2	820	57.5	5.5
CAMELBACK RD."EXT"	4.196	221+50	68.4	"	63.0	5.4	"	62.3	6.1
	4.289	226+45	73.5	"	70.3	3.2	"	69.9	3.6
	4.375	230+95	76.5	"	74.3	2.2	"	73.9	2.6
	4.469	235+95	81.2	"	78.2	3.0	"	77.7	3.5
	4.563	240+90	83.2	"	81.6	1.6	"	81.0	2.2
	4.653	245+65	85.7	"	83.6	2.1	"	83.0	2.7
	4.725	249+45	86.5	1108	85.3	1.2	640	84.7	1.8

NOTES:

1- REFER TO CHNALIZATION PLAN IN APPENDIX C FOR X-SECTIONS LOCATION

2- EXISTING CONDITIONS TAKEN FROM HEC-2 MODEL PREPARED IN PART A (FILE:5.H2I)

HEC-1 MODEL
(WT4 RET.24)

This model includes the flow diversions into subbasins 21, 23, and 24. Refer to concept diversion plans (figures 5.4 and 5.5). For overall drainage area map, refer to Appendix A.

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*          SEPTEMBER 1990               *
*           VERSION 4.0                 *
*                                       *
* RUN DATE  09/15/1994  TIME  10:42:21  *
*                                       *
*****************************************
```

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

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X       XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  1           ID
  2           ID          W.T. #4  WATERSHED; DIVERSIONS INTO EXISTING RET. BASINS ANALYSIS
  3           ID          -DIVERT SUB 22 & SUB 22A1 INTO RET. BASIN AT SUB 21
  4           ID          -DIVERT SUB 26 & SUB 27 INTO RET. BASIN AT SUB 24
  5           ID          -NO BREAKOUT FLOW OVR DIKE AT I-10
  6           ID                                          FILE:WT4RET.24
  7           IT      5                 300
  8           IO      5
  9           IN     15
 10           JD   4.03    .001
 11           PC   .000    .002    .005    .008    .011    .014    .017    .020    .023    .026
 12           PC   .029    .032    .035    .038    .041    .044    .048    .052    .056    .060
 13           PC   .064    .068    .072    .076    .080    .085    .090    .095    .100    .105
 14           PC   .110    .115    .120    .126    .133    .140    .147    .155    .163    .172
 15           PC   .181    .191    .203    .218    .236    .257    .283    .387    .663    .707
 16           PC   .735    .758    .776    .791    .804    .815    .825    .834    .842    .849
 17           PC   .856    .863    .869    .875    .881    .887    .893    .898    .903    .908
 18           PC   .913    .918    .922    .926    .930    .934    .938    .942    .946    .950
 19           PC   .953    .956    .959    .962    .965    .968    .971    .974    .977    .980
 20           PC   .983    .986    .989    .992    .995    .998    1.00   1.000   1.000   1.000
 21           JD   3.99      10
 22           JD   3.83      50
 23           JD   3.76     100
 24           JD   3.70     200
```

```
25          KK      18
26          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 18.
27          BA     .81
28          LG     .20     .34    3.25    1.12    9.50
29          UI    213.    719.   1128.   1731.   1159.    722.    301.    171.     49.     47.
30          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
31          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

32          KK     R18
33          KM        ROUTE FLOW FROM CP18 TO CP19.
34          RS       2              -1       0
35          RC     .08     .05     .08    7800   .0615
36          RX    1000    1030    1080    1097    1120    1140    1205    1218
37          RY    1520    1518    1514    1510    1510    1512    1518    1520

38          KK      19
39          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 19.
40          BA     .79
41          LG     .19     .33    3.31    1.07    8.70
42          UI     84.    195.    385.    496.    632.    936.    940.    708.    553.    427.
43          UI    278.    147.    120.     84.     32.     26.     26.     26.      0.      0.
44          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

45          KK    CP19
46          KM        ADD HYDROGRAPHS AT CP19.
47          HC       2
```



```
LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


48          KK     R19
49          KM        ROUTE COMBINED HYDROGRPAH AT CP19 TO CP21.
50          RS       2              -1       0
51          RC     .06     .04     .06    5772   .0246
52          RX    1000    1010    1025    1040    1055    1069    1080    1100
53          RY    1466    1464    1460    1458    1458    1460    1466    1467

54          KK      21
55          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 21.
56          BA     .79
57          LG     .19     .31    3.81     .78    4.70
58          UI     84.    191.    380.    491.    623.    915.    948.    711.    558.    430.
59          UI    291.    149.    124.     84.     37.     26.     26.     26.      0.      0.
60          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

61          KK  I1CP21
62          KM        ADD HYDROGRAPHS AT CP21.
63          HC       2

64          KK      20
65          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 20.
66          BA    1.07
67          LG     .19     .33    3.33    1.05    8.40
68          UI    119.    294.    560.    721.    938.   1414.   1211.    931.    714.    535.
69          UI    286.    200.    132.     83.     36.     36.     36.     36.      0.      0.
70          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

71          KK    SR20
72          KM        STORAGE ROUTE THROUGH RETENTION BASIN AT CP20.
73          KO       3
```

```
 74          RS       1    STOR       0       0
 75          SV       0    1.05    9.43   26.91   54.31   92.89  138.67  176.47  190.08  219.05
 76          SV  249.57
 77          SQ       0       0       0       0       0       0       0       0     265    1377
 78          SQ    2963
 79          SE    1443    1446    1450    1454    1458    1462    1466    1469    1470    1472
 80          SE    1474

 81          KK     R20
 82          KM        ROUTE REMAINDER OF FLOW AT CP20  TO CP21
 83          RS       4              -1       0
 84          RC     .06    .045     .06    6240   .0208
 85          RX    1000    1012    1025    1032    1050    1057    1070    1092
 86          RY    1424    1422    1420    1418    1418    1420    1422    1424

 87          KK  I2CP21
 88          KM        ADD HYDROGRAPHS AT CP21.
 89          HC       2
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 90          KK      22
 91          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 22
 92          BA     .57
 93          LG     .19     .33    3.38    1.03    7.40
 94          UI     77.    258.    418.    563.    888.    745.    546.    395.    215.    129.
 95          UI     79.     34.     24.     24.      0.      0.      0.      0.      0.      0.
 96          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 97          KK     R22
 98          KM        ROUTE FLOW FROM CP22 TO  CP22A1
 99          RS       3              -1       0
100          RC     .05     .03     .05    6230    .025
101          RX    1000    1030    1060    1070    1100    1115    1125    1150
102          RY    1294    1292    1290    1288    1288    1290    1292    1294

103          KK    22A1
104          KM   BASIN 22A1
105          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
106          KM    L=       .7  Lca=       .3   S=  130.4  Kn= .050  LAG=  15.2
107          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
108          BA     .07
109          LG     .15     .29    3.74     .29    1.00
110          UI     27.     83.    153.    140.     82.     32.     14.      5.      5.      0.
111          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
112          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

113          KK  CP22A1
114          KM        ADD HYDROGRAPHS AT CP22A1
115          HC       2

116          KK    CP21
117          KM        ADD HYDROGRAPHS  AT CP21
118          HC       2

119          KK    SR21
120          KM         STORAGE ROUTE THROUGH RETENTION BASIN AT CP21
121          KO       3
122          RS       1    STOR       0       0
123          SV       0     .68   20.68   57.58   95.91  102.34  117.65     130
```

```
124          SQ       0       0       0       0       0     265    1377    2000
125          SE    1319    1320    1330    1340    1347    1348    1350    1351

126          KK     R21
127          KM        ROUTE REMAINDER OF FLOW AT CP21 TO CP23
128          RS       1              -1       0
129          RC     .03     .03     .05    2340   .0196
130          RX    1000    1030    1050    1070    1145    1212    1225    1250
131          RY    1310    1306    1304    1302    1302    1304    1306    1310
```



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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


132          KK      23
133          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 23.
134          BA     .16
135          LG     .18     .32    4.04     .65   10.60
136          UI    111.    327.    471.    228.     68.     20.      0.      0.      0.      0.
137          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

138          KK    CP23
139          KM        ADD HYDROGRAPHS AT CP23
140          HC       2

141          KK    SR23
142          KM        STORAGE ROUTE THROUGH RETENTION BASIN AT CP23.
143          KO       3
144          RS       1    STOR       0       0
145          SV       0    6.04   20.38   53.82  120.38  216.24  325.98  455.42   606.1  645.49
146          SV  685.61  767.98
147          SQ       0       0       0       0       0       0       0       0       0       0
148          SQ     928    8950
149          SE    1272    1276    1280    1284    1288    1292    1296    1300    1304    1305
150          SE    1306    1308

151          KK     R23
152          KM        ROUTE REMAINDER OF FLOW AT CP23 TO CP22A2
153          RS       4              -1       0
154          RC     .05     .03     .05    4992    .005
155          RX     930     975    1000    1010    1030    1040    1041    1042
156          RY    1397  1396.5    1396    1394    1394    1396  1396.5    1397

157          KK    22A2
158          KM   BASIN 22A2
159          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
160          KM    L=        .9  Lca=       .3   S=   19.1  Kn= .050  LAG=  23.8
161          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
162          BA     .43
163          LG     .15     .29    3.74     .29    1.00
164          UI     61.    220.    344.    479.    722.    539.    389.    264.    125.     82.
165          UI     46.     19.     19.     19.      0.      0.      0.      0.      0.      0.
166          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

167          KK  CP22A2
168          KM        ADD HYDROGRAPHS AT CP22A2
169          HC       2

170          KK   R22A2
171          KM        ROUTE COMBINED HYDROGRAPHS AT CP22A2 TO CP25
172          RS       4              -1       0
173          RC     .03     .03     .05    7022   .0079
```

```
174          RX    1000    1030    1040    1047    1070    1097    1120    1200
175          RY    1255    1254    1250    1248    1250    1252    1254    1255
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

176          KK      25
177          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 25
178          BA     .46
179          LG     .15     .31    4.27     .49     .00
180          UI     53.    137.    254.    327.    437.    640.    505.    389.    295.    207.
181          UI    106.     80.     53.     22.     16.     16.     16.      0.      0.      0.
182          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

183          KK  I1CP25
184          KM        ADD HYDROGRAPHS AT CP25
185          HC       2

186          KK      26
187          KM        RUNOFF FROM SUB-BASIN 26
188          BA    1.16
189          LG     .17     .30    3.97     .68    3.10
190          UI    103.    163.    401.    532.    639.    787.   1092.   1251.    956.    788.
191          UI    637.    510.    359.    200.    171.    117.     99.     32.     32.     32.
192          UI     32.     32.      0.      0.      0.      0.      0.      0.      0.      0.
193          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

194          KK     R26
195          KM        ROUTE FLOW FROM CP26 TO CP27
196          RS       4              -1       0
197          RC     .05     .03     .05    7020   .0157
198          RX    1000    1012    1025    1040    1090    1105    1112    1120
199          RY    1250    1248    1245    1242    1242    1244    1247    1250

200          KK      27
201          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 27
202          BA    1.00
203          LG     .15     .31    4.27     .48     .30
204          UI    101.    206.    438.    567.    705.    970.   1225.    936.    750.    587.
205          UI    450.    256.    172.    129.     99.     31.     31.     31.     31.      0.
206          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
207          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

208          KK    CP27
209          KM        ADD HYDROGRAPHS AT CP27
210          HC       2

211          KK      24
212          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 24
213          BA     .14
214          LG     .35     .31    3.77     .31     .00
215          UI     21.     85.    128.    193.    241.    165.    115.     61.     34.     20.
216          UI      7.      7.      7.      0.      0.      0.      0.      0.      0.      0.
217          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```



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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

218          KK    CP24
219          KM        ADD HYDROGRAPHS AT CP24
```

```
220        HC      2

221        KK    SR24
222        KM       STORAGE ROUTE THROUGH RETENTION BASIN AT CP24
223        KO      3
224        RS      1    STOR       0       0
225        SV      0     .46    2.96    16.6      86  221.55  282.99  306.59  357.02
226        SQ      0       0       0       0       0       0       0      50    2598
227        SE   1210    1214    1216    1220    1230    1240    1243    1244    1246

228        KK     R24
229        KM       ROUTE REMAINDER OF FLOW AT CP24 TO CP25
230        RS      1              -1       0
231        RC    .05     .03     .05    1326    .021
232        RX   1000    1040    1070    1100    1200    1220    1245    1265
233        RY   1234    1232    1230    1228    1228    1230    1232    1234

234        KK   CP25
235        KM       COMBINE HYDROGRAPHS AT CP25
236        HC      2

237        KK   SR25
238        KM       STORAGE ROUTE THROUGH RETENTION BASIN AT CP25
239        KO      3
240        RS      1    STOR       0       0
241        SV      0    5.61   10.27   13.15   16.62   26.62
242        SQ      0       0       0       0     125    2273
243        SE   1204    1210    1212    1213    1214    1216

244        KK     R25
245        KM       ROUTE COMBINED REMAINDER FLOW AT CP25 TO CP39
246        RS      3              -1       0
247        RC    .03     .03     .05    5928   .0084
248        RX   1000    1010    1020    1025    1055    1085    1175    1250
249        RY   1210    1210    1210    1202    1202    1204    1206    1208

250        KK      34
251        KM       RUNOFF HYDROGRAPH FROM SUB-BASIN 34
252        BA    .36
253        LG    .20     .34    3.21    1.14   10.00
254        UI    57.    229.    343.    530.    615.    416.    284.    139.     81.     43.
255        UI    17.     17.      0.      0.      0.      0.      0.      0.      0.      0.
256        UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

257        KK      33
258        KM       RUNOFF HYDROGRAPH FROM SUB-BASIN 33
259        BA    .65
260        LG    .20     .34    3.21    1.14   10.00
261        UI    99.    392.    591.    888.   1120.    769.    535.    290.    159.     93.
262        UI    30.     30.     30.      0.      0.      0.      0.      0.      0.      0.
263        UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```



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LINE       ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

264        KK   CP33
265        KM       ADD HYDROGRAPHS AT CP33
266        HC      2

267        KK     R33
268        KM       ROUTE COMBINED HYDROGRAPHS AT CP33 TO CP35
```

```
269        RS      2              -1       0
270        RC    .08     .05     .08    4680   .0427
271        RX   1000    1015    1022    1035    1050    1068    1092    1100
272        RY   1800    1760    1720    1680    1680    1720    1760    1800

273        KK     35
274        KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 35
275        BA    .39
276        LG    .20     .34    3.21    1.14   10.00
277        UI    72.    272.    410.    672.    631.    428.    270.    119.     74.     28.
278        UI    20.     20.     0.      0.      0.      0.      0.      0.      0.      0.
279        UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

280        KK  I1CP35
281        KM        ADD HYDROGRAPHS AT CP35
282        HC      2

283        KK     32
284        KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 32
285        BA   1.29
286        LG    .20     .34    3.21    1.14   10.00
287        UI   130.    270.    570.    738.    919.   1268.   1585.   1202.    963.    753.
288        UI   575.    317.    221.    161.    121.     40.     40.     40.     40.      0.
289        UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
290        UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

291        KK   CP35
292        KM        ADD HYDROGRAPHS AT CP35
293        HC      2

294        KK    R35
295        KM        ROUTE COMBINED HYDROGRAPHS AT CP35 TO CP36
296        RS      2              -1       0
297        RC    .06    .035     .06    5070   .0355
298        RX   1000    1012    1023    1034    1045    1056    1067    1079
299        RY   1429    1428    1426    1424    1424    1426    1428    1429

300        KK     36
301        KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 36
302        BA    .24
303        LG    .16     .34    2.38    1.41    1.10
304        UI    34.    127.    197.    278.    409.    297.    212.    140.     65.     43.
305        UI    22.     11.     11.      0.      0.      0.      0.      0.      0.      0.
306        UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```



```
LINE       ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

307        KK  I1CP36
308        KM        ADD HYDROGRAPHS AT CP36
309        HC      2

310        KK     37
311        KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 37
312        BA    .95
313        LG    .19     .34    3.24    1.08    8.40
314        UI    90.    167.    373.    488.    598.    764.   1104.    941.    747.    598.
315        UI   475.    344.    190.    151.    103.     81.     28.     28.     28.     28.
316        UI    28.      0.      0.      0.      0.      0.      0.      0.      0.      0.
317        UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```

```
318        KK    CP36
319        KM        ADD HYDROGRAPHS AT CP 36
320        HC       2

321        KK     R36
322        KM        ROUTE COMBINED HYDROGRAPHS AT CP36 TO CP38
323        RS       2              -1       0
324        RC     .05     .03     .05    4836   .0198
325        RX    1000    1008    1020    1032    1050    1112    1135    1183
326        RY    1344    1342    1340    1338    1338    1340    1342    1344

327        KK      38
328        KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 38
329        BA     .76
330        LG     .17     .34    3.21     .97    4.50
331        UI    103.    354.    568.    770.   1209.    983.    720.    513.    270.    168.
332        UI    103.     36.     32.     32.      0.      0.      0.      0.      0.      0.
333        UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

334        KK    CP38
335        KM        ADD HYDROGRAPHS AT CP38
336        HC       2

337        KK    SR38
338        KM        STORAGE ROUTE THROUGH RETENTION BASIN AT CP38
339        KO       3
340        RS       1    STOR       0       0
341        SV       0    1.83   15.38   39.25   41.76   47.45   60.58
342        SQ       0       0       0       0      44    2223    6550
343        SE    1275    1280    1290  1297.5    1298    1300    1301

344        KK     R38
345        KM        ROUTE REMAINDER OF FLOW AT CP38 TO CP39
346        RS       3              -1       0
347        RC     .05     .03     .05    5438   .0167
348        RX    1000    1005    1010    1025    1055    1085    1175    1250
349        RY    1212    1211    1210    1202    1202    1204    1206    1208
```



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LINE       ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

350        KK      39
351        KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 39
352        BA     .77
353        LG     .15     .34    3.81     .63     .20
354        UI     64.     82.    232.    313.    372.    450.    565.    791.    683.    550.
355        UI    460.    376.    308.    213.    122.    106.     77.     64.     29.     20.
356        UI     20.     20.     20.     20.      0.      0.      0.      0.      0.      0.
357        UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

358        KK  I1CP39
359        KM        ADD HYDROGRAPHS AT CP39
360        HC       2

361        KK    CP39
362        KM        ADD HYDROGRAPHS AT CP39
363        HC       2

364        KK     R39
365        KM        ROUTE COMBINED HYDROGRAPH AT CP39 TO CP42
366        RS       2              -1       0
```

```
367        RC     .03     .03     .05    4836   .0141
368        RX    1000    1005    1015    1025    1055    1070    1087    1130
369        RY    1143    1142    1140    1132    1132    1136    1140    1142

370        KK      40
371        KM         RUNOFF HYDROGRAPH FROM SUB-BASIN 40
372        BA     .52
373        LG     .18     .34    3.54     .89    7.00
374        UI     73.    258.    407.    562.    862.    658.    478.    331.    158.    104.
375        UI     61.     22.     22.     22.      0.      0.      0.      0.      0.      0.
376        UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

377        KK     R40
378        KM         ROUTE FLOW FROM CP40 TO CP42
379        RS       4              -1       0
380        RC     .05     .03     .05    6396   .0086
381        RX    1000    1010    1065    1095    1135    1155    1215    1220
382        RY    1115    1114    1112    1110    1110    1112    1113    1113

383        KK      42
384        KM         RUNOFF HYDROGRAPH FROM SUB-BASIN 42
385        BA    1.18
386        LG     .21     .32    4.21     .45     .10
387        UI     98.    128.    359.    483.    575.    696.    878.   1223.   1042.    840.
388        UI    701.    573.    467.    322.    182.    163.    115.     98.     39.     30.
389        UI     30.     30.     30.     30.      0.      0.      0.      0.      0.      0.
390        UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

391        KK  I1CP42
392        KM         ADD HYDROGRAPHS AT CP42
393        HC       2
```



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LINE       ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


394        KK    CP42
395        KM         ADD HYDROGRAPHS AT CP42
396        HC       2

397        KK    SR42
398        KM         STORAGE ROUTE THROUGH RETENTION BASIN AT CP42
399        KO       3
400        RS       1    STOR       0       0
401        SV       0     .11   10.43   41.63    69.9   77.34    94.2  113.66   134.7  160.78
402        SQ       0       0       0       0       0     163     844    2096    4630   13500
403        SE  1071.5    1072    1080    1090    1095    1096    1098    1100    1102    1104

404        KK     R42
405        KM         ROUTE REMAINDER OF HYDROGRAPH AT CP42 TO CP43
406        RS       1              -1       0
407        RC     .03     .03     .05     858   .0151
408        RX     900     950    1000    1030    1060    1075    1080    1090
409        RY    1094    1088    1086    1084    1084    1086    1088    1094

410        KK    43-4
411        KM         RUNOFF HYDROGRAP FROM SUB-BASIN 43-4
412        BA     .03
413        LG     .35     .35    4.28     .41     .80
414        UI     43.    121.     54.     10.      0.      0.      0.      0.      0.      0.
415        UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```

```
416          KK  SR43-4
417          KM        STORAGE ROUTE THROUGH 2-36" CMPS FROM STA 6343+25 TO STA 6345+65 ON I10
418          RS       1    STOR       0       0
419          SV       0     .89    1.27     1.8    2.43    3.24    3.31    4.75    7.05   12.83
420          SQ       0      18      24      32      42      52      62     131     326     906
421          SE  1092.8 1094.12 1094.37 1094.65 1094.93 1095.24 1095.59    1096 1096.56 1097.79

422          KK  CP43-4
423          KM        DIVERT FLOW TO CP44 AT STA 6345+65
424          DT  DI43-4
425          DI       0      18      24      32      42      52      62     131     326     906
426          DQ       0      18      24      32      42      52      62      68      76      90

427          KK   R43-4
428          KM        ROUTE REMAINDER FROM CP43-4 TO CP43-5
429          RS       1              -1       0
430          RC     .06     .03     .04     500    .018
431          RX     800     850     930     965    1000    1020    1030    1040
432          RY  1096.5    1096    1094    1093    1093    1096    1097  1097.5

433          KK    43-5
434          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 43-5
435          BA     .02
436          LG     .35     .35    4.25     .39     .00
437          UI     27.     79.     39.      8.      0.      0.      0.      0.      0.      0.
438          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```



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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

439          KK  CP43-5
440          KM        ADD HYDROGRAPHS AT CP43-5
441          HC       2     .05

442          KK  SR43-5
443          KM        STORAGE ROUTE THROUGH 36" CMP AT STA 6349+45 ON I-10
444          RS       1    STOR       0       0
445          SV       0     .09     .24     .44     .69     1.0    1.42    2.14    2.76    3.73
446          SV    4.84    5.94
447          SQ       0       9      13      17      22      27      34      40      42      44
448          SQ     134     276
449          SE  1089.8 1091.09 1091.35 1091.64 1091.94 1092.26 1092.62 1093.13  1093.5    1094
450          SE  1094.5 1094.94

451          KK  CP43-5
452          KM        DIVERT FLOW TO CP44 AT STA 6349+45.
453          DT  DI43-5
454          DI       0       9      13      17      22      27      34      40      42      44
455          DI     134     276
456          DQ       0       9      13      17      22      27      34      40      42      44
457          DQ      46      48

458          KK   R43-5
459          KM        ROUTE REMAINDER FROM CP43-5 TO CP43-6
460          RS       1              -1       0
461          RC     .06     .03     .04     455   .0068
462          RX     800     850     930     965    1000    1020    1030    1040
463          RY    1096    1094    1093    1092    1092    1094    1096  1097.5

464          KK    43-6
465          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 43-6
```

```
466          BA     .02
467          LG     .35     .35    4.17     .38     .00
468          UI     36.     87.     27.      4.      0.      0.      0.      0.      0.      0.
469          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

470          KK  CP43-6
471          KM        ADD HYDROGRAPHS AT CP43-6
472          HC       2     .07

473          KK  SR43-6
474          KM        STORAGE ROUTE THROUGH 36" CMP AT STA 6354+00 ON I-10
475          RS       1    STOR       0       0
476          SV       0    1.59    2.29    3.18    4.29    5.62    7.39    9.53   14.20   30.25
477          SV   32.52    38.0   43.84   49.83   55.96   59.96
478          SQ       0       9      13      17      22      27      33      39      47      55
479          SQ      56     141     325     811    1440    2714
480          SE  1089.3 1090.58 1090.84 1091.12 1091.42 1091.73 1092.09 1092.47 1093.23 1095.27
481          SE  1095.5  1096.0  1096.5  1097.0  1097.5 1097.82
```



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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

482          KK  CP43-6
483          KM        DIVERT FLOW TO CP44 AT STA 6354+00.
484          DT  DI43-6
485          DI       0       9      13      17      22      27      33      39      47      55
486          DI      56     141     325     811    1440    2714
487          DQ       0       9      13      17      22      27      33      39      47      55
488          DQ      56      58      60      61      62      64

489          KK   R43-6
490          KM        ROUTE REMAINDER FROM CP43-6 TO CP43-7
491          RS       1              -1       0
492          RC     .06     .03     .04     300   .0162
493          RX     750     800     930     965    1000    1020    1030    1040
494          RY    1096    1094    1092    1090    1090    1092    1096  1097.5

495          KK    43-7
496          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 43-7
497          BA     .02
498          LG     .35     .35    4.25     .39     .00
499          UI     49.     90.     14.      0.      0.      0.      0.      0.      0.      0.
500          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

501          KK  CP43-7
502          KM        ADD HYDROGRAPHS AT CP43-7
503          HC       2     .09

504          KK  SR43-7
505          KM        STORAGE ROUTE THROUGH 36" CMP AT STA 6357+00 ON I-10
506          RS       1    STOR       0       0
507          SV       0     .27     .39     .55     .74     .98    1.30    1.78    2.23    5.12
508          SQ       0      10      13      18      23      29      35      38     101     892
509          SE  1087.6 1088.93 1089.20 1089.49 1089.80 1090.13 1090.51  1091.0 1091.39 1093.26

510          KK  CP43-7
511          KM        DIVERT FLOW AT STA 6357+00.
512          DT  DI43-7
513          DI       0      10      13      18      23      29      35      38     101     892
514          DQ       0      10      13      18      23      29      35      38      40      42
```

```
515          KK   R43-7
516          KM        ROUTE REMAINDER FROM CP43-7 TO CP43-8
517          RS       1              -1       0
518          RC     .06     .03     .04     385    .018
519          RX     700     800     850     965    1000    1020    1030    1040
520          RY    1094    1093    1092    1090    1090    1092    1096  1097.5

521          KK    43-8
522          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 43-8
523          BA     .01
524          LG     .35     .35    4.25     .39     .00
525          UI     36.     37.      4.      0.      0.      0.      0.      0.      0.      0.
526          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```



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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


527          KK  CP43-8
528          KM        ADD HYDROGRAPHS AT CP43-8
529          HC       2     .10

530          KK  SR43-8
531          KM        STORAGE ROUTE THROUGH 36" CMP AT STA 6360+85 ON I-10
532          RS       1    STOR       0       0
533          SV       0     .22     .32     .46     .63     .89    1.74    3.41    4.93     6.3
534          SV    6.87
535          SQ       0       8      12      15      20      24      30      36      39     129
536          SQ     186
537          SE  1085.1 1086.38 1086.62 1086.88 1087.15 1087.48 1088.28 1089.33  1090.0  1090.5
538          SE  1090.7

539          KK  CP43-8
540          KM        DIVERT FLOW TO CP44 AT STA 6360+85.
541          DT  DI43-8
542          DI       0       8      12      15      20      24      30      36      39     129
543          DI     186
544          DQ       0       8      12      15      20      24      30      36      39      41
545          DQ      43

546          KK   R43-8
547          KM        ROUTE REMAINDER FROM CP43-8 TO CP43.
548          RS       1              -1       0
549          RC     .06     .03     .04     600    .008
550          RX     800     850     930     965    1000    1020    1030    1040
551          RY    1096    1092    1090    1088    1088    1090    1096  1097.5

552          KK      43
553          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 43
554          BA     .01
555          LG     .35     .35    4.29     .41     .60
556          UI     25.     45.      7.      0.      0.      0.      0.      0.      0.      0.
557          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

558          KK  I1CP43
559          KM        ADD HYDROGRAPHS AT CP43
560          HC       2     .11

561          KK    CP43
562          KM        ADD HYDROGRAPHS AT CP43.
563          HC       2   14.67
```

```
564          KK    SR43
565          KM        STORAGE ROUTE THROUGH 4-10X8 BC'S AT STA 6366+85 ON I-10.
566          KM        RAISE DIKE ELEVATION TO 1097.5 AND CHECK WSEL AND CAPACITY OF 4-10X8
567          KM        BC'S WITH NO BREAKOUT FLOW OVER DIKE TO THE EAST.
568          KO       3
569          RS       1    STOR       0       0
570          SV       0     .52    4.33   16.22   24.89   28.79   33.09   37.88   51.24   65.35
571          SV   95.72
572          SQ       0    1020    1965    3065    3600    3794    3984    4173    4521    4800
573          SQ    5172
```



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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

574          SE  1081.2 1085.18 1087.60 1090.19  1091.5  1092.0  1092.5  1093.0  1094.0 1094.81
575          SE  1096.0

576          KK     R43
577          KM        ROUTE FLOW FROM CP43 TO CP44
578          RS       2              -1       0
579          RC     .05     .03     .05    4000   .0083
580          RX     800     900     965    1000    1050    1100    1200    1300
581          RY    1076    1075    1075    1064    1064    1071    1071    1075

582          KK  CP43-4
583          KM        RETURN DIVERT AT CP43-4
584          DR  DI43-4

585          KK  RD43-4
586          KM        ROUTE DIVERTED FLOW FROM CP43-4 TO CP44
587          RS       2              -1       0
588          RC    .045     .03    .045    4200   .0067
589          RX     910     940     970     990    1000    1020    1060    1100
590          RY    1064    1063    1062    1060    1060    1062    1063    1064

591          KK  CP43-5
592          KM        RETURN DIVERT AT CP43-5
593          DR  DI43-5

594          KK  RD43-5
595          KM        ROUTE DIVERTED FLOW FROM CP43-5 TO CP44
596          RS       2              -1       0
597          RC    .045     .03    .045    4100   .0067
598          RX     910     940     970     990    1000    1020    1060    1100
599          RY    1064    1063    1062    1060    1060    1062    1063    1064

600          KK  I1CWT4
601          KM        ADD HYDROGRAPHS AT CPWT4
602          HC       2     .05

603          KK  CP43-6
604          KM        RETURN DIVERT AT CP43-6
605          DR  DI43-6

606          KK  RD43-6
607          KM        ROUTE DIVERTED FLOW FROM CP43-6 TO CP44
608          RS       2              -1       0
609          RC    .045     .03    .045    4000   .0067
610          RX     910     940     970     990    1000    1020    1060    1100
611          RY    1064    1063    1062    1060    1060    1062    1063    1064

612          KK  I2CWT4
```

```
613          KM        ADD HYDROGRAPHS AT CPWT4
614          HC       2     .07
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

615          KK  CP43-7
616          KM        RETURN DIVERT AT CP43-7
617          DR  DI43-7

618          KK  RD43-7
619          KM        ROUTE DIVERTED FLOW FROM CP43-7 TO CP44
620          RS       2              -1       0
621          RC    .045     .03    .045    4000   .0067
622          RX     910     940     970     990    1000    1020    1060    1100
623          RY    1064    1063    1062    1060    1060    1062    1063    1064

624          KK  I3CWT4
625          KM        ADD HYDROGRAPHS AT CPWT4
626          HC       2     .09

627          KK  CP43-8
628          KM        RETURN DIVERT AT CP43-8
629          DR  DI43-8

630          KK  RD43-8
631          KM        ROUTE DIVERTED FLOW FROM CP43-8 TO CP44
632          RS       2              -1       0
633          RC    .045     .03    .045    4000   .0067
634          RX     910     940     970     990    1000    1020    1060    1100
635          RY    1064    1063    1062    1060    1060    1062    1063    1064

636          KK  I4CWT4
637          KM        ADD HYDROGRAPHS AT CPWT4
638          HC       2     .10

639          KK      44
640          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 44
641          BA     .22
642          LG     .35     .35    4.14     .37     .00
643          UI     33.    133.    200.    301.    379.    260.    181.     98.     54.     31.
644          UI     10.     10.     10.      0.      0.      0.      0.      0.      0.      0.
645          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

646          KK  I5CWT4
647          KM        ADD HYDROGRAPHS AT CPWT4
648          HC       2     .32

649          KK  I6CWT4
650          KM        ADD HYDROGRAPHS AT CPWT4.
651          HC       2   14.89

652          KK    45-1
653          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 45-1
654          BA     .08
655          LG     .21     .34    4.19     .38     .60
656          UI     33.    102.    189.    155.     86.     31.     13.      6.      0.      0.
657          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
```

```
658          KK  SR45-1
659          KM        STORAGE ROUTE THROUGH 1-12X12 BC, 2-42" CMP AND 3-36" CMP FROM STA. 6368
660          KM        +00 TO STA. 6375+20 ON I-10 (100' TO 800' EAST OF TUTHILL RD.).
661          RS       1    STOR       0       0
662          SV       0     .85    2.23    5.73   11.22   14.61   19.71
663          SQ       0      51     156    1200    3130    4161    5509
664          SE  1083.1 1084.78  1086.0  1087.4  1089.0  1089.5  1090.0

665          KK  CP45-1
666          KM        DIVERT FLOW AT STA 6375+20
667          DT  DI45-1
668          DI       0      51     156    1200    3130    4161    5509
669          DQ       0      51     156     305     480     543     610

670          KK   R45-1
671          KM        ROUTE REMAINDER FROM CP45-1 TO CP45
672          RS       1              -1       0
673          RC     .04     .03     .04    1200   .0042
674          RX     850     900     930     965    1000    1020    1030    1040
675          RY    1086    1085    1084    1083    1083    1086    1090    1091

676          KK      45
677          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 45
678          BA     .38
679          LG     .17     .33    3.94     .34     .20
680          UI     36.     64.    145.    190.    232.    293.    427.    384.    301.    244.
681          UI    194.    148.     82.     60.     45.     36.     13.     11.     11.     11.
682          UI     11.      0.      0.      0.      0.      0.      0.      0.      0.      0.
683          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

684          KK    CP45
685          KM        ADD HYDROGRAPHS AT CP45
686          HC       2     .46

687          KK    SR45
688          KM        STORAGE ROUTE THROUGH 9-36" CMP'S FROM STA 6379+84 TO STA 6390+50 ON
689          KM        I-10.
690          RS       1    STOR       0       0
691          SV       0    1.84    5.95   18.55   23.27   29.04
692          SQ       0      41     132     317    1462    3517
693          SE  1081.1 1082.74  1084.0  1086.0  1086.5  1087.0

694          KK    CP45
695          KM        DIVERT FLOW TO WT4 AT STA 6390+50.
696          DT    DI45
697          DI       0      41     132     317    1462    3517
698          DQ       0      41     132     317     362     392

699          KK     R45
700          KM        ROUTE REMAINDER FROM CP45 TO CP46-1.
701          RS       1              -1       0
702          RC     .04     .03     .04    1500   .0031
703          RX     850     900     930     965    1000    1020    1030    1040
704          RY    1083    1082    1081    1080    1080    1082    1083    1084
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

705          KK    46-1
```

```
706        KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 46-1
707        BA     .15
708        LG     .19     .35    4.23     .39     .60
709        UI     19.     60.    101.    133.    203.    208.    151.    111.     75.     37.
710        UI     26.     16.      6.      6.      6.      0.      0.      0.      0.      0.
711        UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

712        KK  CP46-1
713        KM        ADD HYDROGRAPHS AT CP46-1
714        HC       2     .61

715        KK  SR46-1
716        KM        STORAGE ROUTE THROUGH 5-36 CMP'S FROM STA 6395+75 TO STA 6400+60 ON
717        KM        I-10.
718        RS       1    STOR       0       0
719        SV       0    1.07    4.71     9.0    11.7   14.88   18.65   23.01
720        SQ       0      39     128     183     199     610    1351    2310
721        SE  1078.3  1080.0  1081.5  1082.5  1083.0  1083.5  1084.0  1084.5

722        KK  CP46-1
723        KM        DIVERT FLOW AT STA 6400+60.
724        DT  DI46-1
725        DI       0      39     128     183     199     610    1351    2310
726        DQ       0      39     128     183     199     210     225     244

727        KK   R46-1
728        KM        ROUTE REMAINDER FROM CP46-1 TO CP46.
729        RS       1              -1       0
730        RC     .04     .03     .04    2355   .0057
731        RX     700     900     930     965    1000    1020    1030    1040
732        RY    1076  1075.5    1075    1074    1074    1078    1080    1082

733        KK      46
734        KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 46
735        BA     .85
736        LG     .19     .34    4.25     .45     .40
737        UI     61.     61.    184.    265.    322.    373.    441.    539.    741.    706.
738        UI    567.    488.    409.    345.    291.    208.    129.    104.     94.     61.
739        UI     61.     19.     19.     19.     19.     19.     19.     19.      0.      0.
740        UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

741        KK  I1CP46
742        KM        ADD HYDROGRAPHS AT CP46
743        HC       2    1.46

744        KK    232A
745        KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 232A
746        BA     .61
747        LG     .35     .33    4.08     .36     .00
748        UI     85.    303.    478.    660.   1012.    771.    561.    388.    185.    122.
749        UI     72.     26.     26.     26.      0.      0.      0.      0.      0.      0.
750        UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```



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LINE       ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

751        KK   R232A
752        KM        ROUTE FLOW FROM CP232A TO CP28
753        RS       4              -1
754        RC     .07    .035     .07    4400   .0043
755        RX    1000    1001    1020    1030    1045    1060    1119    1120
```

```
RY    1181    1181    1180    1178    1178    1180    1181    1181

KK      28
KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 28
BA     .86
LG     .15     .35    4.02     .52     .10
UI     76.    119.    295.    392.    470.    578.    798.    929.    711.    587.
UI    473.    381.    272.    153.    127.     89.     76.     24.     23.     23.
UI     23.     23.      0.      0.      0.      0.      0.      0.      0.      0.
UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

KK    CP28
KM        ADD HYDROGRAPHS  AT CP28
HC       2    1.47

KK     R28
KM        ROUTE FLOW FROM CP28 TO CP30
RS       2              -1
RC     .03     .03     .05    2400    .027
RX    1000    1001    1035    1050    1065    1075    1085    1095
RY    1165    1165    1164    1162    1162    1164    1166    1168

KK      30
KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 30
BA     .28
LG     .15     .35    3.27     .97     .20
UI     36.    116.    193.    257.    400.    380.    277.    203.    132.     63.
UI     45.     26.     11.     11.     11.      0.      0.      0.      0.      0.
UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

KK  I1CP30
KM        ADD HYDROGRAPHS AT CP30
HC       2

KK      29
KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 29
BA     .22
LG     .15     .35    3.52     .78     .00
UI     31.    113.    176.    245.    370.    276.    199.    135.     64.     42.
UI     23.     10.     10.     10.      0.      0.      0.      0.      0.      0.
UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

KK    SR29
KM        STORAGE ROUTE THROUGH RETENTION BASIN AT CP29
KO       3
RS       1    STOR       0       0
SV       0    0.99   12.73   23.45   36.25   50.68   54.76   59.33   83.20
SQ       0       0       0       0       0       0       0      88    6226
SE  1164.5    1166    1170    1172    1174    1176  1177.5    1178    1180
```



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LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

KK     R29
KM        ROUTE REMAINDER OF FLOW AT CP29 TO CP30
RS       1              -1       0
RC     .05     .03     .05    1200   .0021
RX    1000    1042    1052    1060    1082    1090    1140    1170
RY    1171    1170    1168    1166    1166    1168    1170    1172

KK    CP30
```

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805          KM        ADD HYDROGRAPHS AT CP30
806          HC       2

807          KK     R30
808          KM        ROUTE COMBINED HYDROGRAPHS AT CP30 TO CP31
809          RS       4              -1       0
810          RC     .03     .03     .05    6770   .0069
811          RX    1000    1025    1045    1070    1095    1110    1200    1550
812          RY    1157    1156    1154    1152    1152    1154    1156    1158

813          KK      31
814          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 31
815          BA     .71
816          LG     .19     .35    3.76     .68     .20
817          UI     60.     83.    224.    299.    358.    434.    565.    752.    613.    500.
818          UI    413.    336.    268.    171.    105.     98.     60.     52.     18.     18.
819          UI     18.     18.     18.      0.      0.      0.      0.      0.      0.      0.
820          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

821          KK    CP31
822          KM        ADD HYDROGRAPHS AT CP31
823          HC       2

824          KK     R31
825          KM        ROUTE COMBINED HYDROGRAPH AT CP31 TO CP46
826          RS       5              -1       0
827          RC     .03     .03     .05    5800   .0082
828          RX    1000    1012    1024    1035    1045    1053    1065    1098
829          RY    1093    1092    1090    1088    1088    1090    1092    1094

830          KK    CP46
831          KM        ADD HYDROGRAPHS AT CP46.
832          HC       2    4.14

833          KK    SR46
834          KM        STORAGE ROUTE THROUGH 5-10'X4' BC'S AT STA 6419+30 ON I-10.
835          RS       1    STOR       0       0
836          SV       0    1.08    3.13    4.28    5.18    7.54   12.96
837          SQ       0     730    1460    1680    1834    2090    2420
838          SE  1065.4 1068.42 1070.53  1071.4  1072.0  1073.0  1074.3
```



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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

839          KK     R46
840          KM        ROUTE REMAINDER OF FLOW AT CP46 TO CPWT4
841          RS       2              -1       0
842          RC     .03     .03     .05    6800   .0067
843          RX     910     930     940     950    1000    1020    1200    1400
844          RY    1065    1064    1064    1060    1060    1064    1064    1065

845          KK  CP45-1
846          KM        RETURN DIVERT AT  CP45-1
847          DR  DI45-1

848          KK  RD45-1
849          KM        ROUTE DIVERTED FLOW FROM CP45-1 TO CPWT4
850          RS       2              -1       0
851          RC    .045     .03    .045    4100   .0067
852          RX     910     940     970     990    1000    1020    1060    1100
853          RY    1064    1063    1062    1060    1060    1062    1063    1064
```

```
854          KK    CP45
855          KM        RETURN DIVERT AT CP45
856          DR    DI45

857          KK    RD45
858          KM        ROUTE DIVERTED FLOW FROM  CP45  TO CPWT4.
859          RS       2              -1       0
860          RC    .045     .03    .045    4200   .0067
861          RX     910     940     970     990    1000    1020    1060    1100
862          RY    1064    1063    1062    1060    1060    1062    1063    1064

863          KK  I7CWT4
864          KM        ADD HYDROGRAPHS AT CPWT4
865          HC       2     .46

866          KK  CP46-1
867          KM        RETURN DIVERT AT CP46-1
868          DR  DI46-1

869          KK  RD46-1
870          KM        ROUTE DIVERTED FLOW FROM CP46-1 TO CPWT4
871          RS       3              -1       0
872          RC    .045     .03    .045    4900   .0067
873          RX     910     940     970     990    1000    1020    1060    1100
874          RY    1064    1063    1062    1060    1060    1062    1063    1064

875          KK  I8CWT4
876          KM        ADD HYDROGRAPHS AT CPWT4
877          HC       2     .61

878          KK     WT4
879          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN WT4
880          BA     .77
881          LG     .35     .35    4.17     .38     .40
882          UI    108.    384.    604.    835.   1279.    973.    707.    488.    232.    153.
883          UI     90.     33.     33.     33.      0.      0.      0.      0.      0.      0.
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

884          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

885          KK  I9CWT4
886          KM        ADD HYDROGRAPHS AT CPWT4
887          HC       2    1.38

888          KK  I10WT4
889          KM        ADD HYDROGRAPHS AT CPWT4
890          HC       2    4.91

891          KK   CPWT4
892          KM        ADD ENTIRE FLOW TOGETHER THAT GETS TO WHITE TANKS STRUCTURE NO 4.
893          HC       2    19.8

894          KK   SRWT4
895          KM        STORAGE ROUTE TROUGH WHITE TANKS STRUCTURE NO. 4.
896          KO       3
897          RS       1    STOR       0       0
898          SV       0    2.81      51     148     277     543    1269    1396    1690    2045
899          SV    2246
900          SQ       0       0       0       0       0       0       0     375    2600    6150
```

```
901          SQ   14700
902          SE     997    1000    1010    1020    1030    1040    1049    1050    1052    1054
903          SE    1055
904          ZZ
```

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*          SEPTEMBER 1990               *
*           VERSION 4.0                 *
*                                       *
*  RUN DATE  09/15/1994  TIME  10:42:21 *
*                                       *
*****************************************
```

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

```
W.T. #4  WATERSHED; DIVERSIONS INTO EXISTING RET. BASINS ANALYSIS
-DIVERT SUB 22 & SUB 22A1 INTO RET. BASIN AT SUB 21
-DIVERT SUB 26 & SUB 27 INTO RET. BASIN AT SUB 24
-NO BREAKOUT FLOW OVR DIKE AT I-10
                                    FILE:WT4RET.24

 8 IO        OUTPUT CONTROL VARIABLES
                 IPRNT          5  PRINT CONTROL
                 IPLOT          0  PLOT CONTROL
                 QSCAL         0.  HYDROGRAPH PLOT SCALE

 IT          HYDROGRAPH TIME DATA
                  NMIN          5  MINUTES IN COMPUTATION INTERVAL
                 IDATE      1   0  STARTING DATE
                 ITIME       0000  STARTING TIME
                    NQ        300  NUMBER OF HYDROGRAPH ORDINATES
                NDDATE      2   0  ENDING DATE
                NDTIME       0055  ENDING TIME
                 ICENT         19  CENTURY MARK

            COMPUTATION INTERVAL     .08 HOURS
                 TOTAL TIME BASE   24.92 HOURS

       ENGLISH UNITS
            DRAINAGE AREA          SQUARE MILES
            PRECIPITATION DEPTH    INCHES
            LENGTH, ELEVATION      FEET
            FLOW                   CUBIC FEET PER SECOND
            STORAGE VOLUME         ACRE-FEET
            SURFACE AREA           ACRES
            TEMPERATURE            DEGREES FAHRENHEIT

10 JD        INDEX STORM NO. 1
                 STRM        4.03  PRECIPITATION DEPTH
                 TRDA         .00  TRANSPOSITION DRAINAGE AREA

11 PI          PRECIPITATION PATTERN
                 .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                 .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                 .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                 .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                 .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                 .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
```

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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.01	.01	.01	.01	.01	.01	.01	.01	.03	.03
.03	.09	.09	.09	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00		

21 JD INDEX STORM NO. 2

STRM 3.99 PRECIPITATION DEPTH

TRDA 10.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
.01	.01	.01	.01	.01	.01	.01	.01	.03	.03
.03	.09	.09	.09	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00		

22 JD INDEX STORM NO. 3

STRM 3.83 PRECIPITATION DEPTH

TRDA 50.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
.01	.01	.01	.01	.01	.01	.01	.01	.03	.03
.03	.09	.09	.09	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00		

23 JD INDEX STORM NO. 4

STRM 3.76 PRECIPITATION DEPTH

TRDA 100.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
.01	.01	.01	.01	.01	.01	.01	.01	.03	.03
.03	.09	.09	.09	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00

24 JD        INDEX STORM NO. 5
                STRM        3.70  PRECIPITATION DEPTH
                TRDA      200.00  TRANSPOSITION DRAINAGE AREA

 0 PI         PRECIPITATION PATTERN
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .01      .00      .01
                .01      .01      .01      .01      .01      .01      .01      .01      .03      .03
                .03      .09      .09      .09      .01      .01      .01      .01      .01      .01
                .01      .01      .01      .01      .01      .01      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00
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             *            *
71 KK        *     SR20   *
             *            *
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73 KO        OUTPUT CONTROL VARIABLES
                IPRNT           3  PRINT CONTROL
                IPLOT           0  PLOT CONTROL
                QSCAL          0.  HYDROGRAPH PLOT SCALE

           HYDROGRAPH ROUTING DATA

74 RS        STORAGE ROUTING
                NSTPS           1  NUMBER OF SUBREACHES
                 ITYP        STOR  TYPE OF INITIAL CONDITION
                RSVRIC        .00  INITIAL CONDITION
```

X .00 WORKING R AND D COEFFICIENT

75 SV	STORAGE	.0	1.0	9.4	26.9	54.3	92.9	138.7	176.5	190.1	219.1
		249.6									
77 SQ	DISCHARGE	0.	0.	0.	0.	0.	0.	0.	0.	265.	1377.
		2963.									
79 SE	ELEVATION	1443.00	1446.00	1450.00	1454.00	1458.00	1462.00	1466.00	1469.00	1470.00	1472.00
		1474.00									

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HYDROGRAPH AT STATION SR20
TRANSPOSITION AREA .0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 0.	.08		0.	0.	0.	0.
		(INCHES)	.000	.000	.000	.000
		(AC-FT)	0.	0.	0.	0.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
54.	24.92	54.	28.	27.	27.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1457.98	24.92	1457.90	1452.14	1451.81	1451.81

CUMULATIVE AREA = 1.07 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR20
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 0.	.08		0.	0.	0.	0.
		(INCHES)	.000	.000	.000	.000
		(AC-FT)	0.	0.	0.	0.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
53.	24.92	53.	28.	27.	27.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1457.86	24.92	1457.77	1452.07	1451.74	1451.74

CUMULATIVE AREA = 1.07 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR20
TRANSPOSITION AREA 50.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 0.	.08		0.	0.	0.	0.
		(INCHES)	.000	.000	.000	.000
		(AC-FT)	0.	0.	0.	0.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
50.	24.92	49.	26.	25.	25.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1457.36	24.92	1457.27	1451.79	1451.47	1451.47

CUMULATIVE AREA = 1.07 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR20
TRANSPOSITION AREA 100.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 0.	.08		0.	0.	0.	0.
		(INCHES)	.000	.000	.000	.000
		(AC-FT)	0.	0.	0.	0.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
48.	24.92	48.	25.	24.	24.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1457.13	24.92	1457.05	1451.66	1451.35	1451.35

CUMULATIVE AREA = 1.07 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR20
TRANSPOSITION AREA 200.0 SQ MI

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR

```
+   (CFS)       (HR)
                          (CFS)
+       0.       .08                  0.          0.          0.          0.
                       (INCHES)     .000        .000        .000        .000
                        (AC-FT)       0.          0.          0.          0.

 PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
                                        6-HR       24-HR       72-HR     24.92-HR
+  (AC-FT)      (HR)
      47.     24.92                    47.         25.         24.         24.

  PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
                                        6-HR       24-HR       72-HR     24.92-HR
+   (FEET)      (HR)
   1456.94     24.92                1456.86     1451.55     1451.24     1451.24

                        CUMULATIVE AREA =    1.07 SQ MI

      ***            ***             ***            ***            ***


                        INTERPOLATED HYDROGRAPH AT     SR20

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+       0.       .08                  0.          0.          0.          0.
                       (INCHES)     .000        .000        .000        .000
                        (AC-FT)       0.          0.          0.          0.

                        CUMULATIVE AREA =    1.07 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          ***************
          *             *
 119 KK   *      SR21   *
          *             *
          ***************

 121 KO          OUTPUT CONTROL VARIABLES
                       IPRNT          3  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL         0.  HYDROGRAPH PLOT SCALE

             HYDROGRAPH ROUTING DATA

 122 RS          STORAGE ROUTING
                       NSTPS          1  NUMBER OF SUBREACHES
                        ITYP       STOR  TYPE OF INITIAL CONDITION
                      RSVRIC        .00  INITIAL CONDITION
                           X        .00 WORKING R AND D COEFFICIENT

 123 SV            STORAGE         .0        .7      20.7      57.6      95.9     102.3     117.7     130.0

 124 SQ          DISCHARGE         0.        0.        0.        0.        0.      265.     1377.     2000.
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125 SE	ELEVATION	1319.00	1320.00	1330.00	1340.00	1347.00	1348.00	1350.00	1351.00

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HYDROGRAPH AT STATION SR21
TRANSPOSITION AREA .0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 843.	12.83		107.	29.	28.	28.
		(INCHES)	.244	.263	.263	.263
		(AC-FT)	53.	57.	57.	57.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
110.	12.83	98.	53.	51.	51.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1349.04	12.83	1347.33	1335.11	1334.52	1334.52

CUMULATIVE AREA = 4.10 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR21
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 791.	12.83		102.	28.	27.	27.
		(INCHES)	.232	.251	.251	.251
		(AC-FT)	51.	55.	55.	55.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
110.	12.83	98.	53.	51.	51.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1348.95	12.83	1347.32	1335.10	1334.50	1334.50

CUMULATIVE AREA = 4.10 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR21
TRANSPOSITION AREA 50.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
589.	12.92		82.	23.	22.	22.
		(INCHES)	.187	.205	.205	.205
		(AC-FT)	41.	45.	45.	45.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
107.	12.92	98.	53.	51.	51.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1348.58	12.92	1347.27	1335.02	1334.44	1334.44

CUMULATIVE AREA = 4.10 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR21
TRANSPOSITION AREA 100.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
487.	12.92		74.	20.	20.	20.
		(INCHES)	.167	.185	.185	.185
		(AC-FT)	37.	40.	40.	40.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
105.	12.92	98.	52.	50.	50.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1348.40	12.92	1347.25	1334.99	1334.40	1334.40

CUMULATIVE AREA = 4.10 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR21
TRANSPOSITION AREA 200.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
424.	13.00		66.	19.	18.	18.
		(INCHES)	.151	.168	.168	.168
		(AC-FT)	33.	37.	37.	37.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR

```
+  (AC-FT)      (HR)
     105.      13.00                    97.         52.         50.         50.

 PEAK STAGE    TIME                              MAXIMUM AVERAGE STAGE
                                          6-HR       24-HR       72-HR     24.92-HR
+   (FEET)      (HR)
   1348.29     13.00                  1347.24     1334.96     1334.38     1334.38

                          CUMULATIVE AREA =    4.10 SQ MI

      ***             ***             ***             ***             ***


                          INTERPOLATED HYDROGRAPH AT     SR21

  PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
                                          6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                            (CFS)
+     796.      12.83                     103.         28.         27.         27.
                         (INCHES)       .233        .252        .252        .252
                          (AC-FT)        51.         55.         55.         55.

                          CUMULATIVE AREA =    4.10 SQ MI


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            *              *
  141 KK    *      SR23    *
            *              *
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  143 KO          OUTPUT CONTROL VARIABLES
                        IPRNT          3  PRINT CONTROL
                        IPLOT          0  PLOT CONTROL
                        QSCAL         0.  HYDROGRAPH PLOT SCALE

                HYDROGRAPH ROUTING DATA

  144 RS          STORAGE ROUTING
                        NSTPS          1  NUMBER OF SUBREACHES
                         ITYP       STOR  TYPE OF INITIAL CONDITION
                       RSVRIC        .00  INITIAL CONDITION
                            X        .00 WORKING R AND D COEFFICIENT

  145 SV            STORAGE          .0       6.0      20.4      53.8     120.4     216.2     326.0     455.4     606.1     645.5
                                  685.6     768.0

  147 SQ          DISCHARGE          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
                                   928.     8950.

  149 SE          ELEVATION      1272.00   1276.00   1280.00   1284.00   1288.00   1292.00   1296.00   1300.00   1304.00   1305.00
                                 1306.00   1308.00

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                HYDROGRAPH AT STATION     SR23
               TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.92-HR
+  (CFS)       (HR)
                        (CFS)
+      0.       .08                 0.          0.          0.          0.
                     (INCHES)     .000        .000        .000        .000
                      (AC-FT)       0.          0.          0.          0.

 PEAK STORAGE  TIME                       MAXIMUM AVERAGE STORAGE
                                   6-HR       24-HR       72-HR     24.92-HR
+ (AC-FT)      (HR)
     68.      24.92                 66.         31.         30.         30.

 PEAK STAGE    TIME                        MAXIMUM AVERAGE STAGE
                                   6-HR       24-HR       72-HR     24.92-HR
+  (FEET)      (HR)
  1284.83     24.92            1284.71     1278.49     1278.25     1278.25

                     CUMULATIVE AREA =    4.26 SQ MI


***          ***          ***          ***          ***

                HYDROGRAPH AT STATION     SR23
               TRANSPOSITION AREA     10.0 SQ MI

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.92-HR
+  (CFS)       (HR)
                        (CFS)
+      0.       .08                 0.          0.          0.          0.
                     (INCHES)     .000        .000        .000        .000
                      (AC-FT)       0.          0.          0.          0.

 PEAK STORAGE  TIME                       MAXIMUM AVERAGE STORAGE
                                   6-HR       24-HR       72-HR     24.92-HR
+ (AC-FT)      (HR)
     65.      24.92                 63.         30.         29.         29.

 PEAK STAGE    TIME                        MAXIMUM AVERAGE STAGE
                                   6-HR       24-HR       72-HR     24.92-HR
+  (FEET)      (HR)
  1284.67     24.92            1284.55     1278.40     1278.16     1278.16

                     CUMULATIVE AREA =    4.26 SQ MI


***          ***          ***          ***          ***

                HYDROGRAPH AT STATION     SR23
               TRANSPOSITION AREA     50.0 SQ MI

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.92-HR
+  (CFS)       (HR)
                        (CFS)
+      0.       .08                 0.          0.          0.          0.
```

```
                    (INCHES)      .000        .000        .000        .000
                     (AC-FT)        0.          0.          0.          0.

 PEAK STORAGE   TIME                      MAXIMUM AVERAGE STORAGE
                                   6-HR       24-HR       72-HR     24.92-HR
+  (AC-FT)      (HR)
      54.     24.92                 52.         24.         24.         24.

  PEAK STAGE    TIME                       MAXIMUM AVERAGE STAGE
                                   6-HR       24-HR       72-HR     24.92-HR
+   (FEET)      (HR)
   1284.02     24.92            1283.81     1277.92     1277.71     1277.71

                    CUMULATIVE AREA =    4.26 SQ MI


      ***           ***           ***           ***           ***

                     HYDROGRAPH AT STATION     SR23
                   TRANSPOSITION AREA    100.0 SQ MI

  PEAK FLOW     TIME                       MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                         (CFS)
+       0.       .08                 0.          0.          0.          0.
                    (INCHES)      .000        .000        .000        .000
                     (AC-FT)        0.          0.          0.          0.

 PEAK STORAGE   TIME                      MAXIMUM AVERAGE STORAGE
                                   6-HR       24-HR       72-HR     24.92-HR
+  (AC-FT)      (HR)
      49.     24.92                 48.         22.         21.         21.

  PEAK STAGE    TIME                       MAXIMUM AVERAGE STAGE
                                   6-HR       24-HR       72-HR     24.92-HR
+   (FEET)      (HR)
   1283.47     24.92            1283.26     1277.64     1277.43     1277.43

                    CUMULATIVE AREA =    4.26 SQ MI


      ***           ***           ***           ***           ***

                     HYDROGRAPH AT STATION     SR23
                   TRANSPOSITION AREA    200.0 SQ MI

  PEAK FLOW     TIME                       MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                         (CFS)
+       0.       .08                 0.          0.          0.          0.
                    (INCHES)      .000        .000        .000        .000
                     (AC-FT)        0.          0.          0.          0.

 PEAK STORAGE   TIME                      MAXIMUM AVERAGE STORAGE
                                   6-HR       24-HR       72-HR     24.92-HR
+  (AC-FT)      (HR)
      45.     24.92                 44.         20.         19.         19.

  PEAK STAGE    TIME                       MAXIMUM AVERAGE STAGE
                                   6-HR       24-HR       72-HR     24.92-HR
```

```
+   (FEET)      (HR)
   1283.00     24.92                1282.79     1277.40     1277.20     1277.20

                        CUMULATIVE AREA =    4.26 SQ MI

     ***            ***            ***            ***            ***


                        INTERPOLATED HYDROGRAPH AT     SR23

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+       0.       .08                  0.          0.          0.          0.
                       (INCHES)     .000        .000        .000        .000
                        (AC-FT)       0.          0.          0.          0.

                        CUMULATIVE AREA =    4.26 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            ***************
            *             *
  221 KK    *      SR24   *
            *             *
            ***************

  223 KO          OUTPUT CONTROL VARIABLES
                        IPRNT           3  PRINT CONTROL
                        IPLOT           0  PLOT CONTROL
                        QSCAL          0.  HYDROGRAPH PLOT SCALE

               HYDROGRAPH ROUTING DATA

  224 RS          STORAGE ROUTING
                        NSTPS           1  NUMBER OF SUBREACHES
                         ITYP        STOR  TYPE OF INITIAL CONDITION
                       RSVRIC         .00  INITIAL CONDITION
                            X         .00 WORKING R AND D COEFFICIENT

  225 SV            STORAGE          .0        .5       3.0      16.6      86.0     221.6     283.0     306.6     357.0

  226 SQ          DISCHARGE          0.        0.        0.        0.        0.        0.        0.       50.     2598.

  227 SE          ELEVATION     1210.00   1214.00   1216.00   1220.00   1230.00   1240.00   1243.00   1244.00   1246.00

                                                                  ***

     ***            ***            ***            ***            ***


                         HYDROGRAPH AT STATION     SR24
                       TRANSPOSITION AREA       .0 SQ MI

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
```

		(CFS)				
+	0.	.08	0.	0.	0.	0.
		(INCHES)	.000	.000	.000	.000
		(AC-FT)	0.	0.	0.	0.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
125.	24.92	124.	64.	62.	62.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1232.84	24.92	1232.82	1223.48	1222.98	1222.98

CUMULATIVE AREA = 2.30 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR24
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 0.	.08	0.	0.	0.	0.
		(INCHES) .000	.000	.000	.000
		(AC-FT) 0.	0.	0.	0.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
122.	24.92	122.	63.	60.	60.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1232.68	24.92	1232.66	1223.39	1222.89	1222.89

CUMULATIVE AREA = 2.30 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR24
TRANSPOSITION AREA 50.0 SQ MI

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 0.	.08	0.	0.	0.	0.
		(INCHES) .000	.000	.000	.000
		(AC-FT) 0.	0.	0.	0.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
113.	24.92	113.	58.	56.	56.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1232.02	24.92	1232.00	1223.02	1222.54	1222.54

CUMULATIVE AREA = 2.30 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR24
TRANSPOSITION AREA 100.0 SQ MI

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 0.	.08	0.	0.	0.	0.
		(INCHES) .000	.000	.000	.000
		(AC-FT) 0.	0.	0.	0.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
110.	24.92	109.	56.	54.	54.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1231.74	24.92	1231.71	1222.85	1222.38	1222.38

CUMULATIVE AREA = 2.30 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR24
TRANSPOSITION AREA 200.0 SQ MI

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 0.	.08	0.	0.	0.	0.
		(INCHES) .000	.000	.000	.000
		(AC-FT) 0.	0.	0.	0.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
106.	24.92	106.	54.	52.	52.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1231.49	24.92	1231.47	1222.71	1222.24	1222.24

CUMULATIVE AREA = 2.30 SQ MI

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                    INTERPOLATED HYDROGRAPH AT     SR24

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.92-HR
+  (CFS)       (HR)
                          (CFS)
+      0.       .08                   0.          0.          0.          0.
                        (INCHES)     .000        .000        .000        .000
                         (AC-FT)       0.          0.          0.          0.

                    CUMULATIVE AREA =    2.30 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *             *
 237 KK   *      SR25   *
          *             *
          ***************

 239 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

            HYDROGRAPH ROUTING DATA

 240 RS          STORAGE ROUTING
                      NSTPS           1  NUMBER OF SUBREACHES
                       ITYP        STOR  TYPE OF INITIAL CONDITION
                     RSVRIC         .00  INITIAL CONDITION
                          X         .00 WORKING R AND D COEFFICIENT

 241 SV            STORAGE          .0       5.6      10.3      13.1      16.6      26.6

 242 SQ          DISCHARGE          0.        0.        0.        0.      125.     2273.

 243 SE          ELEVATION     1204.00   1210.00   1212.00   1213.00   1214.00   1216.00

                                                                 ***

     ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION     SR25
                    TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.92-HR
+  (CFS)       (HR)
                          (CFS)
    960.     12.50                  85.         21.         20.         20.
                        (INCHES)     .106        .106        .106        .106
                         (AC-FT)      42.         42.         42.         42.

 PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
                                     6-HR       24-HR       72-HR     24.92-HR
+  (AC-FT)     (HR)
```

21.	12.50		14.	7.	7.	7.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.92-HR
1214.78	12.50	1213.28	1208.92	1208.74	1208.74

CUMULATIVE AREA = 7.45 SQ MI

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HYDROGRAPH AT STATION SR25
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
		(CFS)				
+ 944.	12.50		83.	21.	20.	20.
		(INCHES)	.104	.104	.104	.104
		(AC-FT)	41.	41.	41.	41.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.92-HR
+ 20.	12.50	14.	7.	7.	7.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.92-HR
1214.76	12.50	1213.28	1208.92	1208.74	1208.74

CUMULATIVE AREA = 7.45 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR25
TRANSPOSITION AREA 50.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
		(CFS)				
+ 872.	12.50		76.	19.	18.	18.
		(INCHES)	.095	.095	.095	.095
		(AC-FT)	38.	38.	38.	38.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.92-HR
+ 20.	12.50	14.	7.	7.	7.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.92-HR
1214.70	12.50	1213.27	1208.91	1208.73	1208.73

CUMULATIVE AREA = 7.45 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR25
TRANSPOSITION AREA 100.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 838.	12.50		73.	18.	18.	18.
		(INCHES)	.091	.091	.091	.091
		(AC-FT)	36.	36.	36.	36.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
20.	12.50	14.	7.	7.	7.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1214.66	12.50	1213.26	1208.90	1208.72	1208.72

CUMULATIVE AREA = 7.45 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR25
TRANSPOSITION AREA 200.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 809.	12.50		70.	18.	17.	17.
		(INCHES)	.088	.088	.088	.088
		(AC-FT)	35.	35.	35.	35.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
20.	12.50	14.	7.	7.	7.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1214.64	12.50	1213.26	1208.90	1208.72	1208.72

CUMULATIVE AREA = 7.45 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT SR25

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 945.	12.50		83.	21.	20.	20.

```
                    (INCHES)      .104        .104        .104        .104
                     (AC-FT)       41.         41.         41.         41.

                    CUMULATIVE AREA =    7.45 SQ MI


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          ***************
          *             *
337 KK    *      SR38   *
          *             *
          ***************

339 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

             HYDROGRAPH ROUTING DATA

340 RS          STORAGE ROUTING
                      NSTPS           1  NUMBER OF SUBREACHES
                       ITYP        STOR  TYPE OF INITIAL CONDITION
                     RSVRIC         .00  INITIAL CONDITION
                          X         .00 WORKING R AND D COEFFICIENT

341 SV            STORAGE          .0       1.8      15.4      39.3      41.8      47.5      60.6

342 SQ          DISCHARGE          0.        0.        0.        0.       44.     2223.     6550.

343 SE          ELEVATION     1275.00   1280.00   1290.00   1297.50   1298.00   1300.00   1301.00

                                                                 ***

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN       44. TO     6550.
                THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
                THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

     ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION     SR38
                     TRANSPOSITION AREA       .0 SQ MI

  PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                            (CFS)
+    3276.     12.50                363.         95.         92.         92.
                         (INCHES)   .728        .762        .762        .762
                          (AC-FT)   180.        189.        189.        189.

  PEAK STORAGE  TIME                        MAXIMUM AVERAGE STORAGE
                                     6-HR       24-HR       72-HR     24.92-HR
+  (AC-FT)      (HR)
      51.      12.50                 42.         25.         24.         24.

  PEAK STAGE    TIME                        MAXIMUM AVERAGE STAGE
                                     6-HR       24-HR       72-HR     24.92-HR
```

+ (FEET)	(HR)				
1300.24	12.50	1298.17	1291.02	1290.43	1290.43

CUMULATIVE AREA = 4.64 SQ MI

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HYDROGRAPH AT STATION SR38
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 3215.	12.50		356.	93.	90.	90.
		(INCHES)	.714	.747	.747	.747
		(AC-FT)	177.	185.	185.	185.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
50.	12.50	42.	25.	24.	24.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1300.23	12.50	1298.17	1290.99	1290.40	1290.40

CUMULATIVE AREA = 4.64 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR38
TRANSPOSITION AREA 50.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 2973.	12.50		327.	86.	83.	83.
		(INCHES)	.655	.687	.687	.687
		(AC-FT)	162.	170.	170.	170.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
50.	12.50	42.	25.	24.	24.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1300.17	12.50	1298.15	1290.89	1290.31	1290.31

CUMULATIVE AREA = 4.64 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR38
TRANSPOSITION AREA 100.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 2866.	12.50		314.	82.	79.	79.
		(INCHES)	.629	.661	.661	.661
		(AC-FT)	156.	164.	164.	164.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
49.	12.50	42.	25.	24.	24.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1300.15	12.50	1298.14	1290.84	1290.26	1290.26

CUMULATIVE AREA = 4.64 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR38
TRANSPOSITION AREA 200.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 2774.	12.50		303.	80.	77.	77.
		(INCHES)	.607	.638	.638	.638
		(AC-FT)	150.	158.	158.	158.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
49.	12.50	42.	25.	24.	24.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1300.13	12.50	1298.13	1290.80	1290.22	1290.22

CUMULATIVE AREA = 4.64 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT SR38

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
+ 3220.	12.50		357.	93.	90.	90.
		(INCHES)	.715	.749	.749	.749
		(AC-FT)	177.	185.	185.	185.

CUMULATIVE AREA = 4.64 SQ MI

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397 KK    *      SR42   *
          *             *
          ***************

399 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

            HYDROGRAPH ROUTING DATA

400 RS          STORAGE ROUTING
                      NSTPS          1  NUMBER OF SUBREACHES
                       ITYP       STOR  TYPE OF INITIAL CONDITION
                     RSVRIC        .00  INITIAL CONDITION
                          X        .00 WORKING R AND D COEFFICIENT

401 SV            STORAGE         .0       .1      10.4      41.6      69.9      77.3      94.2     113.7     134.7     160.8

402 SQ          DISCHARGE         0.       0.        0.        0.        0.      163.      844.     2096.     4630.    13500.

403 SE          ELEVATION     1071.50   1072.00   1080.00   1090.00   1095.00   1096.00   1098.00   1100.00   1102.00   1104.00

                                                                  ***

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN     4630. TO     13500.
                THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
                THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

     ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION     SR42
                     TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.92-HR
+  (CFS)       (HR)
                          (CFS)
+   4502.     12.83                 563.        146.        140.        140.
                         (INCHES)   .359        .372        .372        .372
                          (AC-FT)   279.        289.        289.        289.

 PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
                                     6-HR       24-HR       72-HR     24.92-HR
  (AC-FT)      (HR)
     134.     12.83                  82.         40.         39.         39.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
                                     6-HR       24-HR       72-HR     24.92-HR
+  (FEET)      (HR)
```

1101.90	12.83	1096.46	1084.71	1084.22	1084.22

CUMULATIVE AREA = 14.56 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR42
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 4385.	12.83		549.	142.	137.	137.
		(INCHES)	.351	.364	.364	.364
		(AC-FT)	272.	282.	282.	282.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
133.	12.83	82.	40.	39.	39.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1101.81	12.83	1096.44	1084.70	1084.21	1084.21

CUMULATIVE AREA = 14.56 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR42
TRANSPOSITION AREA 50.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 3815.	12.83		495.	129.	124.	124.
		(INCHES)	.316	.328	.328	.328
		(AC-FT)	245.	255.	255.	255.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
128.	12.83	81.	40.	38.	38.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1101.36	12.83	1096.37	1084.65	1084.17	1084.17

CUMULATIVE AREA = 14.56 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR42
TRANSPOSITION AREA 100.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
3594.	12.92		471.	123.	118.	118.
		(INCHES)	.301	.313	.313	.313
		(AC-FT)	234.	243.	243.	243.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
126.	12.92	81.	40.	38.	38.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1101.18	12.92	1096.34	1084.63	1084.15	1084.15

CUMULATIVE AREA = 14.56 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR42
TRANSPOSITION AREA 200.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
3437.	12.92		451.	117.	113.	113.
		(INCHES)	.288	.300	.300	.300
		(AC-FT)	224.	233.	233.	233.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
125.	12.92	81.	40.	38.	38.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1101.06	12.92	1096.32	1084.61	1084.13	1084.13

CUMULATIVE AREA = 14.56 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT SR42

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
4252.	12.83		536.	139.	134.	134.
		(INCHES)	.343	.355	.355	.355
		(AC-FT)	266.	276.	276.	276.

CUMULATIVE AREA = 14.56 SQ MI

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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

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            *             *
564 KK      *      SR43   *
            *             *
            ***************

568 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

569 RS          STORAGE ROUTING
                      NSTPS          1  NUMBER OF SUBREACHES
                       ITYP       STOR  TYPE OF INITIAL CONDITION
                     RSVRIC        .00  INITIAL CONDITION
                          X        .00 WORKING R AND D COEFFICIENT

570 SV            STORAGE         .0       .5      4.3     16.2     24.9     28.8     33.1     37.9     51.2     65.3
                                 95.7

572 SQ          DISCHARGE         0.     1020.    1965.    3065.    3600.    3794.    3984.    4173.    4521.    4800.
                                5172.

574 SE          ELEVATION     1081.20  1085.18  1087.60  1090.19  1091.50  1092.00  1092.50  1093.00  1094.00  1094.81
                             1096.00

                                                                  ***

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN        0. TO     1020.
                THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
                THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

     ***            ***            ***            ***            ***

                       HYDROGRAPH AT STATION     SR43
                     TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.92-HR
+  (CFS)       (HR)
                         (CFS)
+   3744.     13.00                  562.        146.        141.        141.
                       (INCHES)     .356        .370        .370        .370
                        (AC-FT)     279.        290.        290.        290.

 PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
                                     6-HR       24-HR       72-HR     24.92-HR
  (AC-FT)      (HR)
     28.      13.00                    2.          1.          1.          1.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
                                     6-HR       24-HR       72-HR     24.92-HR
+  (FEET)      (HR)
  1091.87     13.00               1083.01     1081.68     1081.66     1081.66
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CUMULATIVE AREA = 14.67 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR43
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 3660.	13.00		549.	143.	137.	137.
		(INCHES)	.348	.361	.361	.361
		(AC-FT)	272.	283.	283.	283.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
26.	13.00	2.	1.	1.	1.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1091.67	13.00	1082.97	1081.67	1081.65	1081.65

CUMULATIVE AREA = 14.67 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR43
TRANSPOSITION AREA 50.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 3306.	13.00		495.	129.	124.	124.
		(INCHES)	.313	.327	.327	.327
		(AC-FT)	245.	255.	255.	255.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
20.	13.00	2.	0.	0.	0.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1090.78	13.00	1082.83	1081.63	1081.61	1081.61

CUMULATIVE AREA = 14.67 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR43
TRANSPOSITION AREA 100.0 SQ MI

PEAK FLOW TIME MAXIMUM AVERAGE FLOW

			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 3162.	13.00		471.	123.	118.	118.
		(INCHES)	.298	.311	.311	.311
		(AC-FT)	234.	243.	243.	243.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
18.	13.00	1.	0.	0.	0.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1090.43	13.00	1082.77	1081.61	1081.60	1081.60

CUMULATIVE AREA = 14.67 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR43
TRANSPOSITION AREA 200.0 SQ MI

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 3036.	13.00	451.	118.	113.	113.
		(INCHES)	.286	.298	.298	.298
		(AC-FT)	223.	233.	233.	233.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
16.	13.00	1.	0.	0.	0.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1090.12	13.00	1082.71	1081.60	1081.58	1081.58

CUMULATIVE AREA = 14.67 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT SR43

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
3581.	13.00	536.	139.	134.	134.
		(INCHES)	.340	.353	.353	.353
		(AC-FT)	266.	276.	276.	276.

CUMULATIVE AREA = 14.67 SQ MI

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WARNING --- ROUTED OUTFLOW (    597.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    726.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    768.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    694.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    537.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    590.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    693.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    718.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    650.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    522.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    581.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    663.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    677.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    617.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    506.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    569.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    635.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    643.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    590.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    587.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    714.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    757.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    684.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    529.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    581.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    683.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    707.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    641.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    515.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    572.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    653.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
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WARNING --- ROUTED OUTFLOW (    667.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    608.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    560.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    626.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    633.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    581.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    548.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    670.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    711.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    644.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    543.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    640.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    665.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    604.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    536.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    613.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    627.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    573.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    526.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    588.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    596.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    547.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    531.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    650.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    692.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    627.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    527.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    622.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    646.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    587.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    520.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE
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WARNING --- ROUTED OUTFLOW (    595.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    609.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    557.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    510.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    571.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    579.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    531.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    516.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    633.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    675.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    612.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    513.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    606.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    630.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    573.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    506.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    580.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    594.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    543.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    556.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    565.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    518.) IS GREATER THAN MAXIMUM OUTFLOW (    503.) IN STORAGE-OUTFLOW TABLE


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          *            *
791 KK    *      SR29  *
          *            *
          **************

793 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE

               HYDROGRAPH ROUTING DATA
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794 RS          STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       STOR  TYPE OF INITIAL CONDITION
                    RSVRIC        .00  INITIAL CONDITION
                         X        .00 WORKING R AND D COEFFICIENT

795 SV            STORAGE        .0      1.0     12.7     23.5     36.3     50.7     54.8     59.3     83.2

796 SQ          DISCHARGE        0.       0.       0.       0.       0.       0.       0.      88.   6226.

797 SE          ELEVATION    1164.50  1166.00  1170.00  1172.00  1174.00  1176.00  1177.50  1178.00  1180.00

                                                                  ***

     ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION     SR29
                    TRANSPOSITION AREA       .0 SQ MI

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR      72-HR     24.92-HR
+   (CFS)       (HR)
                           (CFS)
+       0.       .08                 0.          0.         0.          0.
                         (INCHES)   .000        .000       .000        .000
                          (AC-FT)     0.          0.         0.          0.

 PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
                                     6-HR       24-HR      72-HR     24.92-HR
+  (AC-FT)      (HR)
      9.      13.17                  9.          5.         5.          5.

  PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
                                     6-HR       24-HR      72-HR     24.92-HR
+   (FEET)      (HR)
   1168.80     13.17            1168.80     1166.78    1166.70     1166.70

                      CUMULATIVE AREA =     .22 SQ MI

     ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION     SR29
                    TRANSPOSITION AREA     10.0 SQ MI

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR      72-HR     24.92-HR
+   (CFS)       (HR)
                           (CFS)
+       0.       .08                 0.          0.         0.          0.
                         (INCHES)   .000        .000       .000        .000
                          (AC-FT)     0.          0.         0.          0.

 PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
                                     6-HR       24-HR      72-HR     24.92-HR
  (AC-FT)       (HR)
      9.      13.17                  9.          5.         5.          5.

  PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
                                     6-HR       24-HR      72-HR     24.92-HR
+   (FEET)      (HR)
   1168.74     13.17            1168.73     1166.75    1166.67     1166.67
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CUMULATIVE AREA = .22 SQ MI

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HYDROGRAPH AT STATION SR29
TRANSPOSITION AREA 50.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 0.	.08		0.	0.	0.	0.
		(INCHES)	.000	.000	.000	.000
		(AC-FT)	0.	0.	0.	0.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
8.	13.17	8.	4.	4.	4.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1168.49	13.17	1168.48	1166.62	1166.54	1166.54

CUMULATIVE AREA = .22 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR29
TRANSPOSITION AREA 100.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 0.	.08		0.	0.	0.	0.
		(INCHES)	.000	.000	.000	.000
		(AC-FT)	0.	0.	0.	0.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
8.	13.17	8.	4.	4.	4.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1168.39	13.17	1168.39	1166.56	1166.48	1166.48

CUMULATIVE AREA = .22 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SR29
TRANSPOSITION AREA 200.0 SQ MI

PEAK FLOW TIME MAXIMUM AVERAGE FLOW

			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 0.	.08		0.	0.	0.	0.
		(INCHES)	.000	.000	.000	.000
		(AC-FT)	0.	0.	0.	0.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
8.	13.17	8.	4.	4.	4.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1168.31	13.17	1168.30	1166.52	1166.45	1166.45

CUMULATIVE AREA = .22 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT SR29

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 0.	.08	0.	0.	0.	0.
		(INCHES)	.000	.000	.000	.000
		(AC-FT)	0.	0.	0.	0.

CUMULATIVE AREA = .22 SQ MI

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          **************
          *            *
894 KK    *    SRWT4   *
          *            *
          **************

896 KO        OUTPUT CONTROL VARIABLES
                   IPRNT          3  PRINT CONTROL
                   IPLOT          0  PLOT CONTROL
                   QSCAL         0.  HYDROGRAPH PLOT SCALE

            HYDROGRAPH ROUTING DATA

897 RS        STORAGE ROUTING
                   NSTPS          1  NUMBER OF SUBREACHES
                    ITYP       STOR  TYPE OF INITIAL CONDITION
                  RSVRIC        .00  INITIAL CONDITION
                       X        .00 WORKING R AND D COEFFICIENT

898 SV          STORAGE         .0      2.8     51.0    148.0    277.0    543.0   1269.0   1396.0   1690.0   2045.0
                              2246.0
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900 SQ	DISCHARGE	0.	0.	0.	0.	0.	0.	0.	375.	2600.	6150.
		14700.									
2 SE	ELEVATION	997.00	1000.00	1010.00	1020.00	1030.00	1040.00	1049.00	1050.00	1052.00	1054.00
		1055.00									

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HYDROGRAPH AT STATION SRWT4
TRANSPOSITION AREA .0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 0.	.08		0.	0.	0.	0.
		(INCHES)	.000	.000	.000	.000
		(AC-FT)	0.	0.	0.	0.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
560.	24.92	556.	267.	257.	257.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1040.21	24.92	1040.16	1018.74	1017.94	1017.94

CUMULATIVE AREA = 19.80 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SRWT4
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 0.	.08		0.	0.	0.	0.
		(INCHES)	.000	.000	.000	.000
		(AC-FT)	0.	0.	0.	0.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
549.	24.92	544.	262.	252.	252.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1040.07	24.92	1040.00	1018.60	1017.80	1017.80

CUMULATIVE AREA = 19.80 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SRWT4
TRANSPOSITION AREA 50.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 0.	.08		0.	0.	0.	0.
		(INCHES)	.000	.000	.000	.000
		(AC-FT)	0.	0.	0.	0.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
502.	24.92	498.	239.	230.	230.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1038.48	24.92	1038.32	1017.72	1016.96	1016.96

CUMULATIVE AREA = 19.80 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SRWT4
TRANSPOSITION AREA 100.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 0.	.08		0.	0.	0.	0.
		(INCHES)	.000	.000	.000	.000
		(AC-FT)	0.	0.	0.	0.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
482.	24.92	478.	229.	221.	221.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1037.72	24.92	1037.57	1017.33	1016.58	1016.58

CUMULATIVE AREA = 19.80 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION SRWT4
TRANSPOSITION AREA 200.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 0.	.08		0.	0.	0.	0.
		(INCHES)	.000	.000	.000	.000

	(AC-FT)	0.	0.	0.	0.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
(AC-FT)	(HR)				
465.	24.92	461.	221.	212.	212.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
1037.07	24.92	1036.92	1017.00	1016.26	1016.26

CUMULATIVE AREA = 19.80 SQ MI

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INTERPOLATED HYDROGRAPH AT SRWT4

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 0.	.08		0.	0.	0.	0.
		(INCHES)	.000	.000	.000	.000
		(AC-FT)	0.	0.	0.	0.

CUMULATIVE AREA = 19.80 SQ MI

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	18	923.	12.17	73.	21.	20.	.81		
+	ROUTED TO	R18	750.	12.33	73.	21.	20.	.81		
+	HYDROGRAPH AT	19	622.	12.42	71.	20.	19.	.79		
+	2 COMBINED AT	CP19	1353.	12.33	144.	40.	39.	1.60		
+	ROUTED TO	R19	1248.	12.42	144.	40.	39.	1.60		
	HYDROGRAPH AT	21	688.	12.42	74.	20.	19.	.79		
+	2 COMBINED AT	I1CP21	1933.	12.42	217.	60.	58.	2.39		
+	HYDROGRAPH AT	20	861.	12.33	97.	27.	26.	1.07		

	ROUTED TO						
+		SR20	0.	.08	0.	0.	0.	1.07
	ROUTED TO						
+		R20	0.	.08	0.	0.	0.	1.07
	2 COMBINED AT						
+		I2CP21	1933.	12.42	217.	60.	58.	3.46
	HYDROGRAPH AT						
+		22	525.	12.25	50.	14.	13.	.57
	ROUTED TO						
+		R22	493.	12.42	50.	14.	13.	.57
	HYDROGRAPH AT						
+		22A1	134.	12.08	10.	2.	2.	.07
	2 COMBINED AT						
+		CP22A1	516.	12.42	60.	16.	16.	.64
	2 COMBINED AT						
+		CP21	2445.	12.42	277.	76.	73.	4.10
	ROUTED TO						
+		SR21	796.	12.83	103.	28.	27.	4.10
	ROUTED TO						
+		R21	729.	12.92	103.	28.	27.	4.10
	HYDROGRAPH AT						
+		23	289.	12.08	18.	5.	5.	.16
	2 COMBINED AT						
+		CP23	732.	12.92	118.	33.	32.	4.26
	ROUTED TO						
+		SR23	0.	.08	0.	0.	0.	4.26
	ROUTED TO						
+		R23	0.	.08	0.	0.	0.	4.26
	HYDROGRAPH AT						
+		22A2	642.	12.25	60.	15.	15.	.43
	2 COMBINED AT						
+		CP22A2	639.	12.25	60.	15.	15.	4.69
	ROUTED TO						
+		R22A2	553.	12.50	60.	15.	15.	4.69
	HYDROGRAPH AT						
+		25	500.	12.33	50.	12.	12.	.46
	2 COMBINED AT						
+		I1CP25	1008.	12.42	109.	27.	26.	5.15
	HYDROGRAPH AT						
+		26	943.	12.50	115.	30.	29.	1.16
	ROUTED TO						

+	R26	886.	12.67	115.	30.	29.	1.16
HYDROGRAPH AT							
+	27	999.	12.42	110.	28.	27.	1.00
2 COMBINED AT							
+	CP27	1648.	12.50	225.	57.	55.	2.16
HYDROGRAPH AT							
+	24	207.	12.25	18.	5.	4.	.14
2 COMBINED AT							
+	CP24	1721.	12.50	243.	62.	60.	2.30
ROUTED TO							
+	SR24	0.	.08	0.	0.	0.	2.30
ROUTED TO							
+	R24	0.	.08	0.	0.	0.	2.30
2 COMBINED AT							
+	CP25	1008.	12.42	109.	27.	26.	7.45
ROUTED TO							
+	SR25	945.	12.50	83.	21.	20.	7.45
ROUTED TO							
+	R25	766.	12.75	83.	21.	20.	7.45
HYDROGRAPH AT							
	34	361.	12.25	33.	9.	9.	.36
HYDROGRAPH AT							
+	33	643.	12.25	59.	17.	16.	.65
2 COMBINED AT							
+	CP33	1003.	12.25	91.	26.	25.	1.01
ROUTED TO							
+	R33	955.	12.33	91.	26.	25.	1.01
HYDROGRAPH AT							
+	35	400.	12.25	35.	10.	10.	.39
2 COMBINED AT							
+	I1CP35	1297.	12.25	127.	36.	35.	1.40
HYDROGRAPH AT							
+	32	956.	12.42	117.	33.	32.	1.29
2 COMBINED AT							
+	CP35	2155.	12.33	243.	69.	67.	2.69
ROUTED TO							
+	R35	2089.	12.42	243.	69.	67.	2.69
HYDROGRAPH AT							
+	36	193.	12.25	16.	4.	4.	.24
2 COMBINED AT							
+	I1CP36	2217.	12.42	258.	73.	70.	2.93

HYDROGRAPH AT							
+	37	672.	12.42	85.	24.	23.	.95
2 COMBINED AT							
	CP36	2886.	12.42	343.	97.	93.	3.88
ROUTED TO							
+	R36	2810.	12.50	343.	96.	93.	3.88
HYDROGRAPH AT							
+	38	715.	12.25	64.	17.	17.	.76
2 COMBINED AT							
+	CP38	3253.	12.42	407.	113.	109.	4.64
ROUTED TO							
+	SR38	3220.	12.50	357.	93.	90.	4.64
ROUTED TO							
+	R38	3133.	12.58	355.	93.	90.	4.64
HYDROGRAPH AT							
+	39	588.	12.50	74.	18.	18.	.77
2 COMBINED AT							
+	I1CP39	3708.	12.58	427.	112.	108.	5.41
2 COMBINED AT							
+	CP39	4139.	12.67	503.	131.	126.	12.86
ROUTED TO							
+	R39	4072.	12.67	502.	130.	126.	12.86
HYDROGRAPH AT							
+	40	525.	12.25	48.	13.	13.	.52
ROUTED TO							
+	R40	427.	12.50	48.	13.	13.	.52
HYDROGRAPH AT							
+	42	1029.	12.50	131.	33.	32.	1.18
2 COMBINED AT							
+	I1CP42	1454.	12.50	179.	46.	44.	1.70
2 COMBINED AT							
+	CP42	5205.	12.67	673.	175.	168.	14.56
ROUTED TO							
+	SR42	4252.	12.83	536.	139.	134.	14.56
ROUTED TO							
+	R42	4249.	12.83	536.	139.	134.	14.56
HYDROGRAPH AT							
	43-4	64.	12.00	3.	1.	1.	.03
ROUTED TO							
+	SR43-4	22.	12.17	3.	1.	1.	.03
DIVERSION TO							
+	DI43-4	22.	12.17	3.	1.	1.	.03

	HYDROGRAPH AT						
+		CP43-4	0.	.08	0.	0.	0.	.03
	ROUTED TO						
+		R43-4	0.	.08	0.	0.	0.	.03
	HYDROGRAPH AT						
+		43-5	43.	12.00	2.	1.	1.	.02
	2 COMBINED AT						
+		CP43-5	43.	12.00	2.	1.	1.	.05
	ROUTED TO						
+		SR43-5	19.	12.17	2.	1.	1.	.05
	DIVERSION TO						
+		DI43-5	19.	12.17	2.	1.	1.	.05
	HYDROGRAPH AT						
+		CP43-5	0.	.08	0.	0.	0.	.05
	ROUTED TO						
+		R43-5	0.	.08	0.	0.	0.	.05
	HYDROGRAPH AT						
+		43-6	45.	12.00	2.	1.	1.	.02
	2 COMBINED AT						
+		CP43-6	45.	12.00	2.	1.	1.	.07
	ROUTED TO						
+		SR43-6	6.	12.17	2.	1.	1.	.07
	DIVERSION TO						
+		DI43-6	6.	12.17	2.	1.	1.	.07
	HYDROGRAPH AT						
+		CP43-6	0.	.08	0.	0.	0.	.07
	ROUTED TO						
+		R43-6	0.	.08	0.	0.	0.	.07
	HYDROGRAPH AT						
+		43-7	45.	12.00	2.	1.	1.	.02
	2 COMBINED AT						
+		CP43-7	45.	12.00	2.	1.	1.	.09
	ROUTED TO						
+		SR43-7	20.	12.08	2.	1.	1.	.09
	DIVERSION TO						
+		DI43-7	20.	12.08	2.	1.	1.	.09
	HYDROGRAPH AT						
		CP43-7	0.	.08	0.	0.	0.	.09
	ROUTED TO						
+		R43-7	0.	.08	0.	0.	0.	.09
	HYDROGRAPH AT						

+	43-8	23.	12.00	1.	0.	0.	.01
2 COMBINED AT							
+	CP43-8	23.	12.00	1.	0.	0.	.10
ROUTED TO							
+	SR43-8	12.	12.08	1.	0.	0.	.10
DIVERSION TO							
+	DI43-8	12.	12.08	1.	0.	0.	.10
HYDROGRAPH AT							
+	CP43-8	0.	.08	0.	0.	0.	.10
ROUTED TO							
+	R43-8	0.	.08	0.	0.	0.	.10
HYDROGRAPH AT							
+	43	23.	12.00	1.	0.	0.	.01
2 COMBINED AT							
+	I1CP43	22.	12.00	1.	0.	0.	.11
2 COMBINED AT							
+	CP43	4249.	12.83	536.	139.	134.	14.67
ROUTED TO							
+	SR43	3581.	13.00	536.	139.	134.	14.67
ROUTED TO							
	R43	3538.	13.08	535.	139.	134.	14.67
HYDROGRAPH AT							
+	CP43-4	22.	12.17	3.	1.	1.	.03
ROUTED TO							
+	RD43-4	14.	12.67	3.	1.	1.	.03
HYDROGRAPH AT							
+	CP43-5	19.	12.17	2.	1.	1.	.05
ROUTED TO							
+	RD43-5	13.	12.58	2.	1.	1.	.05
2 COMBINED AT							
+	I1CWT4	27.	12.67	5.	1.	1.	.05
HYDROGRAPH AT							
+	CP43-6	6.	12.17	2.	1.	1.	.07
ROUTED TO							
+	RD43-6	4.	13.17	2.	1.	1.	.07
2 COMBINED AT							
+	I2CWT4	29.	12.67	8.	2.	2.	.07
HYDROGRAPH AT							
+	CP43-7	20.	12.08	2.	1.	1.	.09
ROUTED TO							
+	RD43-7	12.	12.58	2.	1.	1.	.09

	2 COMBINED AT						
+		I3CWT4	41.	12.58	10.	3.	2.	.09
	HYDROGRAPH AT						
		CP43-8	12.	12.08	1.	0.	0.	.10
	ROUTED TO						
+		RD43-8	5.	12.58	1.	0.	0.	.10
	2 COMBINED AT						
+		I4CWT4	46.	12.58	11.	3.	3.	.10
	HYDROGRAPH AT						
+		44	300.	12.25	25.	6.	6.	.22
	2 COMBINED AT						
+		I5CWT4	323.	12.25	36.	9.	9.	.32
	2 COMBINED AT						
+		I6CWT4	3564.	13.08	565.	148.	142.	14.89
	HYDROGRAPH AT						
+		45-1	143.	12.08	9.	2.	2.	.08
	ROUTED TO						
+		SR45-1	107.	12.25	9.	2.	2.	.08
	DIVERSION TO						
+		DI45-1	107.	12.25	9.	2.	2.	.08
	HYDROGRAPH AT						
+		CP45-1	0.	.08	0.	0.	0.	.08
	ROUTED TO						
+		R45-1	0.	.08	0.	0.	0.	.08
	HYDROGRAPH AT						
+		45	401.	12.42	48.	12.	12.	.38
	2 COMBINED AT						
+		CP45	401.	12.42	48.	12.	12.	.46
	ROUTED TO						
+		SR45	209.	12.75	48.	12.	12.	.46
	DIVERSION TO						
+		DI45	209.	12.75	48.	12.	12.	.46
	HYDROGRAPH AT						
+		CP45	0.	.08	0.	0.	0.	.46
	ROUTED TO						
+		R45	0.	.08	0.	0.	0.	.46
	HYDROGRAPH AT						
		46-1	184.	12.25	18.	4.	4.	.15
	2 COMBINED AT						
+		CP46-1	183.	12.25	17.	4.	4.	.61
	ROUTED TO						
+		SR46-1	107.	12.50	17.	4.	4.	.61

	DIVERSION TO						
+		DI46-1	107.	12.50	17.	4.	4.	.61
	HYDROGRAPH AT						
+		CP46-1	0.	.08	0.	0.	0.	.61
	ROUTED TO						
+		R46-1	0.	.08	0.	0.	0.	.61
	HYDROGRAPH AT						
+		46	651.	12.58	94.	24.	23.	.85
	2 COMBINED AT						
+		I1CP46	651.	12.58	94.	24.	23.	1.46
	HYDROGRAPH AT						
+		232A	810.	12.25	72.	18.	17.	.61
	ROUTED TO						
+		R232A	636.	12.58	72.	18.	17.	.61
	HYDROGRAPH AT						
+		28	747.	12.50	89.	22.	22.	.86
	2 COMBINED AT						
+		CP28	1374.	12.50	161.	40.	39.	1.47
	ROUTED TO						
+		R28	1353.	12.58	161.	40.	39.	1.47
	HYDROGRAPH AT						
+		30	244.	12.33	21.	5.	5.	.28
	2 COMBINED AT						
+		I1CP30	1475.	12.50	182.	45.	44.	1.75
	HYDROGRAPH AT						
+		29	228.	12.25	18.	5.	4.	.22
	ROUTED TO						
+		SR29	0.	.08	0.	0.	0.	.22
	ROUTED TO						
+		R29	0.	.08	0.	0.	0.	.22
	2 COMBINED AT						
+		CP30	1475.	12.50	182.	45.	44.	1.97
	ROUTED TO						
+		R30	1358.	12.75	182.	45.	44.	1.97
	HYDROGRAPH AT						
+		31	525.	12.50	63.	16.	15.	.71
	2 COMBINED AT						
		CP31	1712.	12.67	245.	61.	59.	2.68
	ROUTED TO						
+		R31	1689.	12.83	245.	61.	59.	2.68
	2 COMBINED AT						

+		CP46	2191.	12.75	338.	85.	82.	4.14
	ROUTED TO							
+		SR46	2099.	12.92	338.	85.	82.	4.14
	ROUTED TO							
+		R46	2030.	13.00	338.	85.	82.	4.14
	HYDROGRAPH AT							
+		CP45-1	107.	12.25	9.	2.	2.	.08
	ROUTED TO							
+		RD45-1	76.	12.42	9.	2.	2.	.08
	HYDROGRAPH AT							
+		CP45	209.	12.75	48.	12.	12.	.46
	ROUTED TO							
+		RD45	199.	13.00	48.	12.	12.	.46
	2 COMBINED AT							
+		I7CWT4	230.	12.83	57.	14.	14.	.46
	HYDROGRAPH AT							
+		CP46-1	107.	12.50	17.	4.	4.	.61
	ROUTED TO							
+		RD46-1	94.	12.83	17.	4.	4.	.61
	2 COMBINED AT							
		I8CWT4	324.	12.83	75.	19.	18.	.61
	HYDROGRAPH AT							
+		WT4	997.	12.25	88.	22.	21.	.77
	2 COMBINED AT							
+		I9CWT4	1070.	12.25	162.	41.	39.	1.38
	2 COMBINED AT							
+		I10WT4	2358.	13.00	499.	125.	121.	4.91
	2 COMBINED AT							
+		CPWT4	5757.	13.08	1038.	267.	257.	19.80
	ROUTED TO							
+		SRWT4	0.	.08	0.	0.	0.	19.80

*** NORMAL END OF HEC-1 ***

HEC-2 MODEL
(5RET.H2I)
for

Tuthill Dike Wash
with reduced
Peak Flows

```
1*********************************************
*  HEC-2 WATER SURFACE PROFILES             *
*                                           *
*  Version   4.6.2;  May 1991               *
*                                           *
*  RUN DATE    14SEP94    TIME   20:51:26   *
*********************************************
```

```
*****************************************
*  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
```

1

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THIS RUN EXECUTED 14SEP94 20:51:26

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

Version   4.6.2;  May 1991
****************************************
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```
T1      WHITE TANKS / AGUA FRIA AREA DRAINAGE MASTER STUDY
T2      100 - YEAR STORM EVENT      FLOODPLAIN RUN
T3      TUTHILL DIKE WASH - WASH "5" -
T4      THIS RUN IS FROM FILE 5.H2I WITH PEAK FLOWS FROM THE HEC1 FILE WT4DET.24
T5      REFLECTING DIVERSION OF FLOW FROM SUB. (22&22A1) AND FROM (26&27)INTO
T6      THE DET. BASINS AT SUB. 23 & 24 RESP. AND NO BREAKOUT FLOW OVER THE
T7      TUTHILL DIKE AT I-10.                          FILE:5RET.H2I
T8
```

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	2	0	0	0.0044	0	0	0	1040.0	0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	0	0	0	0	0	0	0	0

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	43	1	53	21	22	54	51	4	8
42	5	26	0	110	0	200			

NC	.03	.04	.03	.1	.3		
QT	2	3560	3560				
ET			9.1			9945.48	10068.73

Q @ X1 = 0.000 TO X1 = 1.012 EQUALS Q AT I6CWT4

MATCH FLOODPLAIN INTO 100-YEAR PONDING WSEL BEHIND WHITE TANKS
STRUCTURE # 4

X1	0.000	8	9940	10075	0	0	0			
GR	1042	9880	1040	9940	1034	9975	1033	10000	1034	10035
GR	1040	10075	1050	10120	1054	10140				
ET			9.1						9910	10073.38
X1	0.075	8	9960	10070	400	400	400			
GR	1042	9860	1040	9910	1036	9960	1035	10000	1036	10025
GR	1040	10070	1050	10110	1054	10125				

1

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ET			9.1						9950	10068.55
X1	0.186	9	9970	10050	580	580	580			
GR	1044	9730	1042.5	9840	1044	9950	1040	9970	1038.5	10000
GR	1039	10040	1040	10050	1050	10100	1054	10130		
ET			9.1						9925	10080
X1	0.314	14	9950	10080	500	720	680			
GR	1050	9135	1048	9350	1047	9680	1048	9760	1049	9870
GR	1048	9950	1044	9970	1042.5	10000	1044	10050	1046	10070
GR	1048	10080	1050	10090	1052	10100	1054	10110		
ET			9.1						9940	10175
[illegible]	0.415	13	9940	10060	300	800	530			
GR	1052.3	9250	1051.8	9650	1051	9875	1050	9940	1049.5	9960
GR	1047.2	10000	1048	10010	1050	10060	1051.2	10100	1050	10140
GR	1052	10275	1052	10315	1052.3	10335				
ET			9.1						9911.75	10110
X1	0.540	11	9930	10040	660	650	660			
GR	1057.7	9910	1056	9930	1054	9960	1053	10000	1054	10030
GR	1056	10040	1056	10050	1055.3	10060	1056	10070	1056.9	10250
GR	1057.8	10335								
ET			9.1						9950.98	10105
X1	0.634	10	9970	10040	495	495	495			
GR	1062.4	9935	1062	9950	1058	9970	1056.8	10000	1058	10040
GR	1060	10055	1060.3	10105	1062	10170	1062	10240	1062.3	10290
ET			9.1						9953.52	10085
X1	0.729	16	9960	10085	500	500	500			
GR	1069.6	9920	1068	9940	1066	9950	1064	9960	1062	9970
GR	1060.7	10000	1062	10030	1061.7	10040	1062	10055	1064	10085
GR	1065.8	10275	1065.5	10385	1066	10460	1065.8	10485	1066	10505
GR	1068	10625								
ET			9.1						9952.71	10045.27
X1	0.823	11	9955	10030	495	495	495			
[illegible]	1076	9925	1074	9940	1072	9950	1070	9955	1068	9960
[illegible]	1066	9965	1064.5	10000	1066	10010	1068	10020	1070	10030
GR	1071.2	10050								
ET			9.1						9956.30	10050
X1	0.917	11	9965	10040	500	500	500			
GR	1079.6	9915	1078	9940	1076	9950	1074	9960	1072	9965

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GR     1070       9970     1069.3     10000       1070      10030       1074      10040       1076      10130
GR   1076.2      10150

ET                           9.1                                                            9936.36   10028.56
     1.012         11       9940     10020        500        500        500
GR   1085.6       9920       1084      9925       1082       9930       1080       9940       1078       9945
GR     1076       9950     1075.7     10000       1076      10010       1078      10015       1080      10020
GR   1081.7      10040
1
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NC     .016       .016       .016        .3         .5
QT        2       3580       3580
ET                           9.11                                                            9977.7      10022

          Q @ X1 = 1.067 TO X1 = 1.110 EQUALS SR AT CP43
          FLOW LEFT OVER AFTER WEIR FLOW OVER DIKE UPSTREAM OF CULVERT

          4 - 10ft x 8ft x 227ft BC AT INTERSTATE 10

X1    1.067          7     9977.7    10022.0        293        293        293
X3       10                                                                      1088       1088
GR     1088     9915.0    1078.64     9977.7    1078.64    9978.64    1078.64    10000.0    1078.64    10021.4
GR   1078.9    10022.0       1086      10075

SC    4.016         .5        2.6          0          8         10        227        8.1    1081.16    1078.64
ET                           9.11                                                               9950      10022

          EFFECTIVE FLOW OPTION IS INCORPORATED FOR THE NEXT 5 UPSTREAM CROSS
          SECTIONS AS A RESULT OF PONDING AND UPSTREAM AND DOWNSTREAM EXPANSION
          AND CONTRATION FLOW SITUATIONS.

          ACTUAL MAPPED LIMITS CORRESPOND TO WATER SURFACE ELEVATIONS AND ARE
          SHOWN CORRECTLY ON THE FLOODPLAIN WORK MAP.

X1    1.110          8     9977.7    10022.0        227        227        227
X2        0          0          2    1089.16     1091.5
X3       10                                                                      1092       1099
BT        5       9950       1092               9978.6       1099              10000       1099
BT    10022       1099               10100       1099
GR     1092       9950    1081.16     9977.7     1081.1    9978.6     1081.1    10000     1081.1     10021.
GR   1081.1      10022       1088      10100       1096      11850

NC      .03        .04        .03         .3         .5
QT        2       3580       3580
ET                           9.1                                                                9920      10100

          Q @ X1 = 1.118 TO X1  = 1.198 EQUALS STORAGE ROUTED Q AT CP43

X1    1.118         13       9920      10030         40         40         40
X3                                     9920                   10100
GR     1096       9500       1094       9860     1091.5       9920       1090       9945    1081.52     9978.6
GR   1081.5      10000     1081.5     10021.    1081.5    10021.4       1082      10030       1084      10200
     1086       10260       1088      10500       1096      11850

NC      .03        .04        .03         .1         .3
ET                           9.1                                                                9930      10150
X1    1.152         15       9930      10045        180        180        180
X3                                     9930                   10150
GR     1093       9930       1086       9980       1082      10000       1082      10025       1086      10045
```

```
GR     1088      10080     1087.5    10110     1088.5    10175     1088      10215     1087      10330
GR   1088.5      10365      1088     10410      1090     10480   1090.2      10515   1095.5      10900
1
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ET                          9.1                                                   9925      10200
X1   1.198         18      9945     10030       235       235       240
X3                                   9925                10200
GR  1095.8       9925      1094      9935      1092      9940      1090      9945      1088      9960
GR    1086       9975    1085.3     10000      1086     10015      1088     10020      1090     10030
GR    1091      10080      1090     10190      1090     10225    1090.3     10350    1091.1     10420
GR    1092      10480      1094     10600      1096     10800

NC     .03        .04       .03        .3        .5
QT       2       4250      4250
ET                          9.1                                                   9945      10200

          Q @ X1 = 1.260 TO X1 = 1.322 EQUALS ROUTED Q AT CP42


          UPSTREAM OF MCDOWELL ROAD

X1   1.260         14      9975     10045       340       315       330
X3                                   9945                10200
GR  1100.3       9945      1100      9955      1098      9960      1096      9965      1094      9975
GR    1092       9980    1091.5     10000      1092     10020      1094     10045    1094.7     10210
GR    1096      10335      1096     10370      1098     10395      1100     10405

                            9.1                                                  9973.96     10145
X1   1.287         10      9980     10145       160       120       140
GR  1101.7       9960      1100      9970      1098      9980      1096      9990      1094     10000
GR    1096      10110      1098     10145      1100     10180      1102     10190    1102.4     10220

ET                6.1       9.1                         9920.14     10080                9920.14     10080

          THE NEXT THREE UPSTREAM CROSS SECTIONS FLOW THROUGH A DETENTIION
          BASIN AND EFFECTIVE FLOW LIMITS ARE IMPOSED TO MODEL THIS SITUATION
          CORRECTLY.  MAPPED LIMITS ARE SMOWN ON THE FLOODPLAIN MAP TO
          CORRECTLY DEPICT THE ACTUAL PONDING AREA.

          CONFLUENCE OF BULLDOZER WASH

X1   1.313         11      9950     10025       145       135       140
GR  1106.3       9880      1106      9895      1104      9905      1100      9925      1096      9950
GR    1095      10000      1096     10025      1098     10050      1100     10070      1102     10090
GR  1102.2      10175

ET                6.1       9.1                         9875.9     10110                9875.9     10110
X1   1.322          8      9930     10110       150       150        50
GR  1107.2       9850      1100      9900      1096      9930      1095     10000      1096     10110
GR    1100      10270      1103     10350    1103.7     10550

QT       2       4280      4280
[illegible]    .03        .04       .03        .1        .3
[illegible]       6.1       9.1                         9877.24     10100                9877.24     10100
1
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```

Q AT X1 = 1.362 TO X1 = 1.614 EQUALS (Q AT CP39 + 1/5 HYDROGRAPH AT 42)

```
X1    1.362      36    9950   10045     150     300     210
GR   1108.5    9835    1108    9840    1106    9850    1104    9870    1102    9905
     1100      9920    1098    9925    1096    9930    1094    9935    1092    9940
GR   1090      9950    1088    9960    1086    9970    1084    9980    1082   10000
GR   1082     10010    1084   10015    1086   10025    1088   10035    1090   10045
GR   1092     10060    1094   10075    1094   10130    1092   10150    1090   10165
GR   1090     10185    1092   10505    1094   10510    1096   10520    1098   10525
GR   1100     10530    1102   10535    1104   10540    1106   10545    1108   10550
GR   1110     10555

NC    .04       .05     .03
ET                     9.1                                            9948.99   10045
X1    1.422      19    9945   10045     315     315     315
GR   1111.5    9910    1110    9935    1108    9945    1106    9950    1104    9960
GR   1102      9965    1100    9980  1098.5   10000    1100   10020    1102   10030
GR   1104     10035    1106   10040    1108   10045    1110   10050    1112   10060
GR   1114     10220    1114   10390    1112   10430    1110   10580

ET                     9.1                                            9969.4    10090
X1    1.518      21    9975   10055     495     495     505
GR   1120      9960    1110    9975    1108    9985  1106.9   10000    1108   10030
GR   1110     10040    1112   10055    1114   10065  1115.3   10090    1114   10105
GR   1112     10120    1110   10130  1109.4   10145    1110   10155    1112   10170
GR   1113.8   10185    1112   10200  1111.2   10215    1112   10225    1114   10240
GR   1115.3   10265

ET                     9.1                                            9967.72   10110
X1    1.614      17    9975   10055     510     505     510
     1130      9915    1128    9945    1126    9955    1124    9965    1122    9975
GR   1120      9980    1118    9985    1116    9990    1114    9995  1113.9   10000
GR   1114     10010    1116   10020    1118   10030    1120   10045    1122   10055
GR   1122.7   10110    1124   10180

QT       2     4210    4210
ET                     9.1                                             9965    10070
```

Q @ X1 = 1.710 TO 2.088 EQUALS (Q AT 1.362 + Q AT CP39)/2

```
X1    1.710      23    9965   10070     505     510     505
GR   1137      9925    1136    9955    1134    9960    1132    9965    1130    9970
GR   1128      9980    1126    9985    1124    9990    1122    9995    1120   10000
GR   1122     10010    1124   10020    1124   10025    1124   10030    1126   10035
GR   1128     10040    1130   10045    1132   10070  1132.4   10120    1132   10175
GR   1131.5   10200    1132   10230  1132.7   10315

ET                     9.1                                            9969.75   10050
X1    1.805      20    9970   10050     500     500     500
GR   1146.1    9925    1146    9950    1144    9955    1142    9960    1140    9965
GR   1138      9970    1136    9975    1134    9980    1132    9985    1130    9990
GR   1128      9995  1127.6   10000    1128   10005    1130   10015    1132   10020
GR   1134     10030    1136   10040    1138   10050    1140   10125  1141.1   10160
```



```
ET                     9.1                                            9972.07   10070
X1    1.898      16    9980   10020     495     495     495
GR   1151.8    9930    1150    9965    1140    9980    1138    9990  1137.3   10000
GR   1138     10010    1140   10020    1141   10025    1140   10030  1139.7   10045
```

```
GR     1140      10060     1142      10070     1144      10105     1146      10155     1148      10195
GR     1150      10240

ET                         9.1                                                          9969.06   10092.81
       1.994     15        9975      10050     505       505       505
GR     1157.8    9925      1156      9960      1150      9975      1144      9990      1143.5    10000
GR     1144      10005     1146      10010     1147.3    10020     1146      10025     1145.7    10030
GR     1146      10035     1150      10050     1152      10090     1154      10105     1154.5    10150

ET                         9.1                                                          9971.45   10055
X1     2.088     18        9975      10055     495       495       495
GR     1164.7    9925      1164      9945      1162      9955      1160      9970      1158      9975
GR     1152      9985      1150.1    10000     1152      10015     1154      10030     1159      10055
GR     1156.3    10075     1158      10090     1160      10105     1161      10190     1160.5    10280
GR     1162      10295     1163      10350     1164      10395

QT     2         4140      4140
ET                         9.1                                                          9964.34   10128.93

          Q @ X1 = 2.170 TO X1  = 2.659 EQUALS Q AT CP39

X1     2.170     11        9940      10135     430       445       435
GR     1170.7    9940      1170      9960      1164      9970      1162.6    10000     1164      10025
GR     1164      10055     1162.7    10080     1164      10105     1166      10115     1168      10135
GR     1169      10165

ET                         9.1                                                          9945.88   10039.91

          UPSTREAM OF THOMAS ROAD EXTENDED

       2.279     5         9940      10045     580       570       575
GR     1177.6    9940      1170      9985      1169.3    10000     1170      10030     1180      10045

ET                         9.1                                                          9950.04   10080
X1     2.373     12        9960      10015     495       495       495
GR     1181.8    9925      1180      9960      1174      9960      1172      10000     1174      10015
GR     1176      10040     1178      10055     1179      10080     1178      10110     1178      10130
GR     1180      10165     1182      10180

ET                         9.1                                                          9941.03   10080
X1     2.468     13        9975      10015     505       505       505
GR     1188.5    9910      1188      9920      1180      9975      1178      9985      1177.3    10000
GR     1178      10010     1180      10015     1180      10025     1179.1    10040     1180      10055
GR     1182      10065     1184      10080     1185.5    10145
1
   14SEP94     20:51:26                                                                          PAGE    7

ET                         9.1                                                          9944.81   10100

          CONFLUENCE OF CATERPILLAR WASH

X1     2.563     13        9980      10025     500       500       500
GR     1191.9    9930      1190      9965      1184      9980      1182.3    10000     1184      10025
       1186      10035     1188      10045     1190      10120     1190.6    10170     1190      10200
GR     1188      10230     1190      10275     1192      10300

ET                         9.1                                                          9968.55   10100
X1     2.659     13        9975      10025     505       505       505
GR     1196.3    9940      1196      9965      1190      9975      1188      9985      1186      9990
GR     1185.8    10000     1186      10005     1188      10025     1190      10045     1192      10115
```

```
GR     1192      10135      1194      10160      1194.4      10185

QT        2        945       945
ET                          9.1                                                    9917.67      10110

          Q @ X1=3.753 TO X1=3.250 EQUALS STORAGE ROUTED FLOW AT CP25

X1    2.753         20      9975      10070       495        495       500
GR   1200.3       9895      1200       9905      1196.1      9925      1197.3     9960      1196       9975
GR   1195.8       9980      1196       9985      1190.3     10000      1192      10015      1194      10020
GR   1194.5      10030      1194      10040      1193.5     10045      1194      10055      1196      10070
GR   1197.6      10110    1196.8      10135       1198      10180      1200      10235      1202      10315

ET                          9.1                                                       9964      10080
X1    2.848         14      9980      10025       495        495       500
GR   1204.1       9950      1200       9965       1198       9980      1196       9990    1193.2      10000
GR     1194      10015    1197.9      10025      1196.4     10035      1198      10045      1200      10075
GR     1202      10120      1204      10190       1206      10320      1208      10435

ET                          9.1                                                     9960.5    10067.9
X1    2.943         15      9945      10020       500        500       500
GR   1207.1       9945      1200       9975       1198       9985      1196       9995    1195.8      10000
GR     1200      10015    1200.5      10020       1200      10025    1199.1      10035      1200      10040
GR     1202      10050      1204      10075       1206      10225      1208      10315      1210      10405

ET                          9.1                                                       9975      10075
X1    3.057         17      9985      10020       505        510       510
GR   1210.4       9920      1210       9935       1208       9970      1202       9985      1200       9995
GR   1199.4      10000      1200      10015       1202      10020    1203.1      10025      1202      10030
GR   1201.5      10035      1202      10040       1204      10055      1206      10150      1208      10250
       1210      10365      1212      10490

ET                          9.1                                                     9977.7      10100
X1    3.148         11      9975      10030       575        580       575
GR   1214.5       9940      1214       9965       1210       9975      1204       9985      1200       9995
GR     1204      10015      1206      10030       1208      10175      1210      10240      1212      10420
GR     1214      10600
1
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ET                          9.1                                                     9939.62      10150

          DOWNSTREAM OF INDIAN SCHOOL ROAD EXTENDED

          CONFLUENCE OF TRACTOR WASH

X1    3.250         12      9970      10120       515        505       535
GR   1220.4       9830      1220       9840       1218       9845      1216       9900      1214       9935
GR     1212       9970    1210.9      10000       1212      10120      1214      10195      1216      10375
GR     1218      10480      1220      10580

QT        2       1010      1010
ET                          9.1                                                     9978.43      10150

          Q @ X1 = 3.344 TO X1 = 3.912 EQUALS Q AT CP25

X1    3.344         14      9985      10115       495        505       500
GR     1220       9965      1218       9975       1214       9985    1212.8      10000      1214      10015
GR   1214.5      10035      1214      10055       1214      10115      1216      10165      1218      10275
GR     1220      10355      1222      10385       1224      10405      1226      10435
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ET			9.1						9974.83	10150
X1	3.439	11	9980	10150	500	500	500			
GR	1222	9960	1220	9970	1214	9980	1213.5	10000	1214	10150
	1216	10200	1218	10230	1220	10295	1222	10340	1224	10370
GR	1226	10400								
ET			9.1						9976.87	10089.39
X1	3.535	14	9980	10080	500	500	505			
GR	1228.1	9950	1228	9955	1220	9970	1216	9980	1214.9	10000
GR	1216	10030	1214.8	10075	1216	10080	1218	10095	1220	10125
GR	1222	10185	1224	10355	1226	10515	1228	10640		
ET			9.1						9976.66	10031.7
X1	3.631	9	9980	10025	510	510	510			
GR	1231.2	9920	1230	9965	1220	9980	1218.2	10000	1220	10025
GR	1222	10030	1224	10045	1226	10075	1226.3	10095		
ET			9.1						9975.82	10070
X1	3.724	17	9980	10030	495	480	490			
GR	1236.6	9920	1236	9940	1234	9950	1232	9960	1230	9980
GR	1228	9995	1226.6	10000	1228	10015	1230	10030	1230	10070
GR	1230	10115	1228	10125	1228	10130	1228	10145	1228	10155
GR	1230	10165	1232	10185						
ET			9.1						9981.34	10070
X1	3.818	24	9985	10030	495	500	495			
GR	1243	9935	1242	9965	1240	9975	1234	9985	1232.3	10000
GR	1234	10015	1235.3	10030	1234	10060	1235.8	10135	1235.3	10155
GR	1235.7	10180	1235.6	10205	1236	10230	1238	10295	1238.2	10310
	1238	10320	1236.8	10340	1238	10360	1238.5	10405	1238.7	10460
GR	1238	10520	1236.6	10550	1238	10570	1240	10605		

1

ET			9.1						9972.29	10070
X1	3.912	20	9980	10015	495	495	495			
GR	1250.2	9900	1250	9905	1248	9960	1240	9980	1239.1	10000
GR	1240	10015	1242	10030	1242	10035	1241.8	10040	1242	10050
GR	1244	10090	1244.9	10135	1244.4	10160	1244.8	10220	1244.3	10290
GR	1246	10375	1246.9	10460	1247.6	10510	1246.4	10570	1248	10610
QT	2	820	820							
ET			9.1						9980.86	10041.56

Q @ X1 = 4.006 TO X1 = 4.653 EQUALS (Q AT CP25 + Q AT CP22A2)/2

X1	4.006	12	9980	10045	500	505	500			
GR	1255.3	9940	1254	9970	1250	9980	1246	9990	1246	10000
GR	1246	10010	1248	10025	1250	10045	1252	10075	1253.4	10190
GR	1254	10280	1254.6	10315						
ET			9.1						9920	10070
	4.101	17	9975	10040	495	500	500			
	1263	9840	1262	9895	1260	9910	1258	9915	1257.2	9940
GR	1256.5	9975	1256	9980	1255.8	10000	1256	10020	1256.5	10040
GR	1256.8	10105	1258	10140	1260	10210	1261	10275	1262	10340
GR	1264	10380	1266	10435						
ET			9.1						9967.46	10058.08

```
X1    4.196        11      9965     10025       500       495       500
GR   1268.4      9895      1268      9900      1266      9955      1264      9965      1262      9970
GR     1260      9980    1259.8     10000      1260     10010      1262     10025      1264     10090
GR   1265.1     10100
ET                          9.1                                                     9949.59     10070

          UPSTREAM OF CAMELBACK ROAD EXTENDED

X1    4.289        15      9985     10010       495       495       495
GR   1273.5      9885      1272      9895    1271.9      9925      1270      9955      1268      9985
GR   1267.4     10000      1268     10010      1270     10125      1272     10205    1272.2     10240
GR     1272     10280    1271.8     10295      1272     10315      1274     10365      1276     10460

ET                          9.1                                                     9992.08     10090
X1    4.375        15      9995     10025       445       445       450
GR   1276.5      9920    1276.3      9925    1276.6      9960      1276      9990      1272      9995
GR   1271.7     10000      1272     10025    1272.7     10055    1272.2     10070      1274     10110
GR     1276     10155      1278     10270      1280     10380      1282     10470      1284     10530

ET                          9.1                                                     9984.54     10090
X1    4.469        13      9995     10045       500       500       500
GR   1281.2      9920    1280.7      9955      1280      9980      1278      9985      1276      9995
GR   1275.1     10000      1276     10045    1276.9     10050    1276.1     10055      1278     10150
GR     1280     10250      1282     10300    1283.6     10365
1
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ET                          9.1                                                     9973.24     10070
X1    4.563        10      9985     10040       500       495       495
GR   1283.2      9950      1282      9970      1280      9985    1278.1     10000      1280     10040
GR     1282     10150      1284     10230      1286     10300      1288     10380      1290     10475

ET                          9.1                                                     9960.95     10070
X1    4.653        12      9965     10040       475       475       475
GR   1285.7      9905    1284.8      9940      1284      9960      1282      9965      1280      9975
GR   1279.7     10000      1280     10030      1282     10040      1284     10100      1286     10200
GR     1286     10230      1288     10245

QT        2       640       640
ET                          9.1                                                     9970.14     10070

          Q @ X1= 4.725 EQUALS Q @ CP22A2

          CONFLUENCE OF CATERPILLAR DIKE WASH

X1    4.725         8      9965     10040       380       380       380
GR   1286.5      9965      1283      9980      1283     10000      1283     10020      1284     10040
GR     1286     10105      1288     10225      1290     10360
1
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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
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CCHV=     .100 CEHV=     .300
*SECNO  .000

        Q @ X1 = 0.000 TO X1  = 1.012 EQUALS Q AT I6CWT4

        MATCH FLOODPLAIN INTO 100-YEAR PONDING WSEL BEHIND WHITE TANKS
        STRUCTURE # 4

     .000      5.69   1038.69       .00   1040.00   1039.67       .98       .00       .00   1040.00
   3560.0        .0    3560.0        .0        .0     449.1        .0        .0        .0   1040.00
     .00       .00      7.93       .00      .000      .030      .000      .000   1033.00   9947.63
  .004379        0.        0.        0.         0         0         4       .00    118.65  10066.28


*SECNO  .075
     .075      5.48   1040.48       .00       .00   1041.13       .65      1.43       .03   1036.00
   3560.0     616.7    2942.9        .4     127.0     435.5        .5       4.6       1.3   1040.00
     .02      4.86      6.76       .77      .030      .030      .040      .000   1035.00   9897.95
  .002978      400.      400.      400.         2         0         0       .00    173.98  10071.93


*SECNO  .186

3265 DIVIDED FLOW


3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
     .186      4.76   1043.26   1043.26       .00   1044.58      1.31      2.29       .20   1040.00
   3560.0     216.2    3243.7     100.1      69.5     338.7      26.6      11.3       4.0   1040.00
     .04      3.11      9.58      3.76      .030      .030      .040      .000   1038.50   9783.94
  .005468      580.      580.      580.         2        11         0       .00    224.76  10066.32


*SECNO  .314

3265 DIVIDED FLOW

     .314      4.86   1047.36   1046.93       .00   1048.50      1.14      3.91       .02   1048.00
   3560.0      34.8    3525.2        .0      27.7     409.8        .0      17.9       7.3   1048.00
     .06      1.26      8.60       .00      .030      .030      .000      .000   1042.50   9558.63
  .006146      500.      680.      720.         5        13         0       .00    274.47  10076.84


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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  .415
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
     .415      4.51   1051.71   1051.71       .00   1052.37       .66      3.07       .05   1050.00
   3560.0     455.5    2601.2     503.3     150.0     350.4     187.8      24.9      12.0   1050.00
```

.08	3.04	7.42	2.68	.030	.030	.040	.000	1047.20	9674.86
.005390	300.	530.	800.	3	11	0	.00	580.68	10255.54

NO .540
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

.540	4.33	1057.33	1057.33	.00	1058.20	.87	3.61	.06	1056.00
3560.0	29.2	2943.9	586.9	10.4	361.2	213.8	34.5	19.2	1056.00
.11	2.81	8.15	2.75	.030	.030	.040	.000	1053.00	9914.36
.005567	660.	660.	650.	3	11	0	.00	376.16	10290.52

*SECNO .634
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

.634	4.75	1061.55	1061.55	.00	1062.82	1.27	2.85	.12	1058.00
3560.0	174.5	2867.4	518.1	31.5	290.7	138.4	40.4	22.5	1058.00
.12	5.53	9.87	3.74	.030	.030	.040	.000	1056.80	9952.24
.005948	495.	495.	495.	4	8	0	.00	200.64	10152.88

*SECNO .729
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

.729	4.38	1065.08	1065.08	.00	1066.25	1.16	3.23	.01	1064.00
3560.0	8.0	3423.8	128.2	2.9	388.2	62.0	45.7	25.1	1064.00
.14	2.72	8.82	2.07	.030	.030	.040	.000	1060.70	9954.58
.007022	500.	500.	500.	3	9	0	.00	244.78	10199.37

*SECNO .823

3301 HV CHANGED MORE THAN HVINS

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

1

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
.823	5.99	1070.49	1070.49	.00	1072.53	2.03	3.75	.26	1070.00
3560.0	.5	3556.8	2.7	.3	310.6	2.0	50.0	26.9	1070.00
.15	1.68	11.45	1.32	.030	.030	.040	.000	1064.50	9953.77
.008220	495.	495.	495.	20	11	0	.00	84.43	10038.20

*SECNO .917

.917	5.16	1074.46	1074.23	.00	1076.20	1.74	3.65	.03	1072.00
3560.0	36.6	3518.0	5.4	7.8	330.6	4.8	53.8	28.0	1074.00
.16	4.67	10.64	1.13	.030	.030	.040	.000	1069.30	9957.69
.006517	500.	500.	500.	4	11	0	.00	103.08	10060.77

*SECNO 1.012

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

1.012	4.63	1080.33	1080.33	.00	1082.31	1.97	3.71	.07	1080.00
3560.0	.4	3558.9	.7	.3	315.6	.7	57.6	29.1	1080.00
.18	1.36	11.28	1.03	.030	.030	.040	.000	1075.70	9938.34
.008529	500.	500.	500.	20	11	0	.00	85.57	10023.91

CCHV= .300 CEHV= .500
*SECNO 1.067

3301 HV CHANGED MORE THAN HVINS

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1088.00 ELREA= 1088.00

Q @ X1 = 1.067 TO X1 = 1.110 EQUALS SR AT CP43
FLOW LEFT OVER AFTER WEIR FLOW OVER DIKE UPSTREAM OF CULVERT

4 - 10ft x 8ft x 227ft BC AT INTERSTATE 10

1.067	5.86	1084.50	1084.50	.00	1087.45	2.96	1.10	.49	1078.64
3580.0	.0	3580.0	.0	.0	259.3	.0	59.5	29.5	1078.90
.18	.00	13.80	.00	.000	.016	.000	.000	1078.64	9977.70
.002097	293.	293.	293.	20	11	0	.00	44.30	10022.00

1

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
	4	.016	.50	2.60	.00	8.00	10.00	227.00	8	1	1081.16	1078.64

CHART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

*SECNO 1.110

SPECIAL CULVERT INLET CONTROL + WEIR FLOW, EG = 1092.33

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.55

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1092.41	1092.17	4.88	0.	3553.	7.878	320.0	1092.00	1.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1092.00 ELREA= 1099.00

EFFECTIVE FLOW OPTION IS INCORPORATED FOR THE NEXT 5 UPSTREAM CROSS SECTIONS AS A RESULT OF PONDING AND UPSTREAM AND DOWNSTREAM EXPANSION AND CONTRATION FLOW SITUATIONS.

ACTUAL MAPPED LIMITS CORRESPOND TO WATER SURFACE ELEVATIONS AND ARE SHOWN CORRECTLY ON THE FLOODPLAIN WORK MAP.

1.110	10.27	1091.37	.00	.00	1092.33	.96	4.88	.00	1081.16
3580.0	.0	3580.0	.0	.0	454.4	.0	61.4	29.8	1081.10
.19	.00	7.88	.00	.000	.016	.000	.000	1081.10	9977.70
.000323	227.	227.	227.	4	0	0	.00	44.30	10022.00

CCHV= .300 CEHV= .500
*SECNO 1.118

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 9920.0 10100.0 TYPE= 1 TARGET= 180.000

Q @ X1 = 1.118 TO X1 = 1.198 EQUALS STORAGE ROUTED Q AT CP43

1.118	11.02	1092.52	.00	.00	1092.60	.09	.01	.26	1091.50
3580.0	.0	2088.9	1491.1	.0	835.7	707.7	62.3	29.9	1082.00
.19	.00	2.50	2.11	.000	.030	.040	.000	1081.50	9920.00
.000175	40.	40.	40.	2	0	0	.00	180.00	10100.00

CCHV= .100 CEHV= .300
*SECNO 1.152

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .70

3470 ENCROACHMENT STATIONS= 9930.0 10150.0 TYPE= 1 TARGET= 220.000

1.152	10.52	1092.52	.00	.00	1092.66	.14	.04	.02	1143.00
3580.0	.0	2521.3	1058.7	.0	756.1	525.2	68.1	30.7	1086.00
.21	.00	3.33	2.02	.000	.030	.040	.000	1082.00	9933.40
.000359	180.	180.	180.	2	0	0	.00	216.60	10150.00

*SECNO 1.198

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .49

3470 ENCROACHMENT STATIONS= 9925.0 10200.0 TYPE= 1 TARGET= 275.000

1.198	7.16	1092.46	.00	.00	1092.91	.45	.15	.09	1090.00
3580.0	17.5	2795.2	767.4	7.6	468.4	338.7	73.8	32.0	1090.00

.22	2.30	5.97	2.27	.030	.030	.040	.000	1085.30	9938.84
.001512	235.	240.	235.	2	0	0	.00	261.16	10200.00

V= .300 CEHV= .500
*SECNO 1.260

3301 HV CHANGED MORE THAN HVINS

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

3470 ENCROACHMENT STATIONS= 9945.0 10200.0 TYPE= 1 TARGET= 255.000

Q @ X1 = 1.260 TO X1 = 1.322 EQUALS ROUTED Q AT CP42

UPSTREAM OF MCDOWELL ROAD

1.260	4.74	1096.24	1096.24	.00	1097.41	1.17	.97	.36	1094.00
4250.0	57.7	2805.7	1386.5	12.5	277.1	296.9	79.0	33.8	1094.00
.24	4.61	10.13	4.67	.030	.030	.040	.000	1091.50	9964.39
.006733	340.	330.	315.	20	23	0	.00	235.61	10200.00

1

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 1.287
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1.287	4.28	1098.28	1098.28	.00	1099.66	1.38	1.09	.11	1098.00
4250.0	.2	4249.1	.6	.2	450.5	.7	80.6	34.4	1098.00
.24	1.27	9.43	.97	.030	.030	.040	.000	1094.00	9978.62
.009537	160.	140.	120.	20	11	0	.00	171.21	10149.83

*SECNO 1.313
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9920.1 10080.0 TYPE= 1 TARGET= 159.860

THE NEXT THREE UPSTREAM CROSS SECTIONS FLOW THROUGH A DETENTIION
BASIN AND EFFECTIVE FLOW LIMITS ARE IMPOSED TO MODEL THIS SITUATION
CORRECTLY. MAPPED LIMITS ARE SMOWN ON THE FLOODPLAIN MAP TO
CORRECTLY DEPICT THE ACTUAL PONDING AREA.

CONFLUENCE OF BULLDOZER WASH

1.313	4.72	1099.72	1099.72	.00	1101.39	1.67	1.17	.15	1096.00
4250.0	275.4	3511.0	463.6	43.2	316.4	82.7	82.1	34.9	1096.00
.24	6.37	11.10	5.60	.030	.030	.040	.000	1095.00	9926.76

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   .007367      145.      140.      135.         2         8         0       .00    140.42  10067.18


*SECNO 1.322

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.99


3470 ENCROACHMENT STATIONS=     9875.9   10110.0  TYPE=      1  TARGET=      234.100
     1.322      6.73   1101.73       .00       .00   1101.91       .19       .07       .45   1096.00
    4250.0     294.3    3955.7        .0     122.1    1120.6        .0      83.3      35.3 100000.00
       .25      2.41      3.53       .00      .030      .030      .000      .000   1095.00   9888.02
   .000462      150.       50.      150.         3         0         0       .00    221.98  10110.00


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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


CCHV=     .100 CEHV=     .300
*SECNO 1.362

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.12


3470 ENCROACHMENT STATIONS=     9877.2   10100.0  TYPE=      1  TARGET=      222.760

         Q AT X1 = 1.362 TO X1 = 1.614 EQUALS (Q AT CP39 + 1/5 HYDROGRAPH AT 42)

     1.362     19.88   1101.88       .00       .00   1101.95       .06       .02       .01   1090.00
    4280.0     321.3    3439.0     519.6     239.8    1563.9     493.6      92.1      36.3   1090.00
       .28      1.34      2.20      1.05      .030      .030      .040      .000   1082.00   9905.88
   .000048      150.      210.      300.         2         0         0       .00    194.12  10100.00


*SECNO 1.422

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
     1.422      6.58   1105.08   1105.08       .00   1107.27      2.19       .05       .64   1108.00
    4280.0        .0    4280.0        .0        .0     360.0        .0     101.7      37.3   1108.00
       .28       .00     11.89       .00      .000      .030      .000      .000   1098.50   9954.62
   .008351      315.      315.      315.        20        17         0       .00     83.07  10037.69


*SECNO 1.518

3265 DIVIDED FLOW
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3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
[illegible]0 CRITICAL DEPTH ASSUMED

1.518	5.83	1112.73	1112.73	.00	1114.28	1.56	3.84	.06	1110.00
4280.0	18.8	3629.0	632.2	5.6	337.8	156.6	106.7	38.8	1112.00
.30	3.37	10.74	4.04	.040	.030	.050	.000	1106.90	9970.91
.006957	495.	505.	495.	20	15	0	.00	185.71	10230.45

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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 1.614

3301 HV CHANGED MORE THAN HVINS

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

1.614	7.79	1121.69	1121.69	.00	1123.99	2.30	3.88	.22	1122.00
4280.0	.0	4280.0	.0	.0	351.5	.0	111.7	40.3	1122.00
.31	.00	12.18	.00	.000	.030	.000	.000	1113.90	9975.77
.008379	510.	510.	505.	20	11	0	.00	77.69	10053.46

*SECNO 1.710
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

Q @ X1 = 1.710 TO 2.088 EQUALS (Q AT 1.362 + Q AT CP39)/2

1.710	9.13	1129.13	1129.13	.00	1131.62	2.49	4.24	.06	1132.00
4210.0	.0	4210.0	.0	.0	332.6	.0	115.6	41.2	1132.00
.32	.00	12.66	.00	.000	.030	.000	.000	1120.00	9974.35
.008414	505.	505.	510.	20	11	0	.00	68.47	10042.82

*SECNO 1.805
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1.805	8.97	1136.57	1136.57	.00	1139.02	2.44	4.16	.00	1138.00
4210.0	.0	4210.0	.0	.0	335.5	.0	119.5	42.0	1138.00
.33	.00	12.55	.00	.000	.030	.000	.000	1127.60	9973.57
.008245	500.	500.	500.	20	8	0	.00	69.30	10042.87

*SECNO 1.898

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1

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
1.898	6.78	1144.08	1144.08	.00	1145.95	1.87	3.60	.06	1140.00
4210.0	52.9	2920.0	1237.1	12.5	230.0	231.0	124.1	43.1	1140.00
.35	4.25	12.69	5.36	.040	.030	.050	.000	1137.30	9973.89
.006469	495.	495.	495.	20	15	0	.00	133.00	10106.89

*SECNO 1.994
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1.994	7.34	1150.84	1150.84	.00	1153.09	2.24	3.61	.11	1150.00
4210.0	1.6	4197.8	10.6	.9	348.8	7.1	128.9	44.5	1150.00
.36	1.77	12.03	1.49	.040	.030	.050	.000	1143.50	9972.89
.007923	505.	505.	505.	20	8	0	.00	94.00	10066.89

*SECNO 2.088

5 DIVIDED FLOW

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

2.088	7.90	1158.00	1158.00	.00	1160.12	2.12	3.80	.01	1158.00
4210.0	.0	4156.6	53.4	.0	353.2	23.4	133.0	45.6	1159.00
.37	.00	11.77	2.29	.000	.030	.050	.000	1150.10	9975.01
.007454	495.	495.	495.	20	8	0	.00	102.51	10089.97

*SECNO 2.170

3301 HV CHANGED MORE THAN HVINS

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

Q @ X1 = 2.170 TO X1 = 2.659 EQUALS Q AT CP39

2.170	3.91	1166.51	1166.51	.00	1167.94	1.43	3.66	.07	1170.70
4140.0	.0	4140.0	.0	.0	431.5	.0	137.1	46.9	1168.00
.38	.00	9.60	.00	.000	.030	.000	.000	1162.60	9965.82
.009610	430.	435.	445.	20	8	0	.00	154.28	10120.10

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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 2.279

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

UPSTREAM OF THOMAS ROAD EXTENDED

2.279	5.93	1175.23	1175.23	.00	1177.37	2.14	5.20	.21	1177.60
4140.0	.0	4140.0	.0	.0	352.7	.0	142.3	48.4	1180.00
.40	.00	11.74	.00	.000	.030	.000	.000	1169.30	9954.02
.008533	580.	575.	570.	9	14	0	.00	83.83	10037.85

*SECNO 2.373

3301 HV CHANGED MORE THAN HVINS

2.373	7.02	1179.02	1178.49	.00	1180.45	1.44	3.01	.07	1180.00
4140.0	.0	3446.0	694.0	.0	331.0	188.6	147.2	50.0	1174.00
.41	.00	10.41	3.68	.000	.030	.050	.000	1172.00	9960.00
.004553	495.	495.	495.	4	8	0	.00	187.81	10147.81

*SECNO 2.468
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2.468	6.31	1183.61	1183.61	.00	1185.50	1.89	2.85	.14	1180.00
4140.0	206.7	2799.6	1133.7	44.7	218.0	193.5	152.9	51.8	1180.00
.42	4.62	12.84	5.86	.040	.030	.050	.000	1177.30	9950.20
.007151	505.	505.	505.	20	11	0	.00	126.85	10077.05

*SECNO 2.563

3265 DIVIDED FLOW

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

1

CONFLUENCE OF CATERPILLAR WASH

2.563	7.23	1189.53	1189.53	.00	1191.43	1.90	2.96	.00	1184.00
4140.0	187.8	3445.2	507.0	38.2	287.0	158.0	158.3	53.6	1184.00
.44	4.92	12.01	3.21	.040	.030	.050	.000	1182.30	9966.18
.004985	500.	500.	500.	20	8	0	.00	193.37	10264.37

*SECNO 2.659
7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

2.659	7.03	1192.83	1192.83	.00	1194.46	1.63	2.57	.03	1190.00
4140.0	20.4	3271.9	847.8	6.7	288.1	225.9	164.1	55.8	1188.00
.45	3.04	11.36	3.75	.040	.030	.050	.000	1185.80	9970.28
.005180	505.	505.	505.	3	8	0	.00	175.13	10145.41

*SECNO 2.753

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .40

Q @ X1=3.753 TO X1=3.250 EQUALS STORAGE ROUTED FLOW AT CP25

2.753	6.06	1196.36	.00	.00	1196.58	.22	1.98	.14	1196.00
945.0	.8	943.6	.6	1.9	249.2	1.6	168.5	57.4	1196.00
.49	.42	3.79	.38	.040	.030	.050	.000	1190.30	9923.68
.001654	495.	500.	495.	3	0	0	.00	116.92	10078.95

*SECNO 2.848

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2.848	4.23	1197.43	1197.43	.00	1198.62	1.19	1.64	.29	1198.00
945.0	.0	932.6	12.4	.0	105.8	6.8	170.6	58.4	1197.90
.50	.00	8.82	1.82	.000	.030	.050	.000	1193.20	9982.87
.009277	495.	500.	495.	3	19	0	.00	54.17	10041.41

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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 2.943

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.51

2.943	5.26	1201.06	.00	.00	1201.63	.57	2.95	.06	1207.10
945.0	.0	879.0	66.0	.0	140.7	29.4	172.2	59.2	1200.50
.53	.00	6.25	2.24	.000	.030	.050	.000	1195.80	9970.54
.004070	500.	500.	500.	3	0	0	.00	74.75	10045.28

*SECNO 3.057

3.057	3.92	1203.32	.00	.00	1204.25	.93	2.52	.11	1202.00
945.0	4.6	865.1	75.3	2.2	107.2	29.9	174.0	60.0	1202.00
.55	2.10	8.07	2.52	.040	.030	.050	.000	1199.40	9981.70
.006117	505.	510.	510.	3	0	0	.00	68.19	10049.89

*SECNO 3.148

3.148	6.31	1206.31	.00	.00	1206.89	.58	2.61	.04	1210.00
945.0	.0	943.1	1.9	.0	153.9	3.7	176.0	60.9	1206.00
.57	.00	6.13	.52	.000	.030	.050	.000	1200.00	9981.13
.003489	575.	575.	580.	1	0	0	.00	72.14	10053.28

*SECNO 3.250
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

DOWNSTREAM OF INDIAN SCHOOL ROAD EXTENDED

CONFLUENCE OF TRACTOR WASH

3.250	1.62	1212.52	1212.52	.00	1213.04	.52	3.20	.01	1212.00
945.0	4.1	934.0	7.0	2.4	161.0	5.1	178.0	62.4	1212.00
.60	1.70	5.80	1.36	.040	.030	.050	.000	1210.90	9960.85
.012494	515.	535.	505.	20	14	0	.00	178.77	10139.62

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 3.344

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.05

Q @ X1 = 3.344 TO X1 = 3.912 EQUALS Q AT CP25

3.344	2.89	1215.69	.00	.00	1215.94	.26	2.88	.03	1214.00
1010.0	6.5	948.8	54.7	3.5	226.8	35.4	180.5	64.5	1214.00
.63	1.84	4.18	1.54	.040	.030	.050	.000	1212.80	9980.79
.003402	495.	500.	505.	5	0	0	.00	176.28	10157.07

*SECNO 3.439

02 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.65

3.439	2.91	1216.41	.00	.00	1216.47	.06	.51	.02	1214.00
1010.0	4.1	947.6	58.4	4.8	452.6	71.9	185.1	66.8	1214.00
.70	.84	2.09	.81	.040	.030	.050	.000	1213.50	9975.98
.000484	500.	500.	500.	4	0	0	.00	230.20	10206.18

*SECNO 3.535

1 HV CHANGED MORE THAN HVINS

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

3.535	2.09	1216.89	1216.89	.00	1217.61	.73	.67	.20	1216.00
1010.0	2.2	1002.4	5.5	1.0	146.2	2.9	189.0	68.8	1216.00
.72	2.21	6.86	1.85	.040	.030	.050	.000	1214.80	9977.78
.011589	500.	505.	500.	20	19	0	.00	108.87	10086.65

*SECNO 3.631

3.631	3.47	1221.67	1221.60	.00	1222.81	1.14	5.07	.12	1220.00
1010.0	5.7	996.2	8.1	2.1	115.7	3.5	190.6	69.7	1220.00
.74	2.71	8.61	2.33	.040	.030	.050	.000	1218.20	9977.49
.008623	510.	510.	510.	7	14	0	.00	51.68	10029.18

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 3.724
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3.724	3.42	1230.02	1230.02	.00	1230.69	.67	4.83	.05	1230.00
1010.0	.0	637.0	373.0	.0	84.9	82.6	192.2	71.0	1230.00
.76	.04	7.50	4.52	.000	.030	.050	.000	1226.60	9979.81
.011462	495.	490.	480.	14	5	0	.00	185.38	10165.19

*SECNO 3.818
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3.818	3.56	1235.86	1235.86	.00	1236.42	.55	4.38	.01	1234.00
1010.0	7.8	698.7	303.5	2.9	99.7	131.8	194.5	73.5	1235.30
.78	2.68	7.01	2.30	.040	.030	.050	.000	1232.30	9981.89
.006990	495.	495.	500.	3	8	0	.00	239.65	10221.55

*SECNO 3.912
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3.912	3.41	1242.51	1242.51	.00	1243.52	1.01	3.46	.14	1240.00
1010.0	27.2	885.6	97.2	7.9	103.7	37.1	196.7	75.3	1240.00
.80	3.44	8.54	2.62	.040	.030	.050	.000	1239.10	9973.71
.006987	495.	495.	495.	20	8	0	.00	86.57	10060.28

*SECNO 4.006
3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

Q @ X1 = 4.006 TO X1 = 4.653 EQUALS (Q AT CP25 + Q AT CP22A2)/2

4.006	2.92	1248.92	1248.92	.00	1249.92	1.01	4.20	.00	1250.00
820.0	.0	820.0	.0	.0	101.9	.0	198.1	76.1	1250.00
.82	.00	8.05	.00	.000	.030	.000	.000	1246.00	9982.71
.010818	500.	500.	505.	20	15	0	.00	51.45	10034.16

*SECNO 4.101

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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

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4.101	1.70	1257.50	1257.50	.00	1257.98	.48	5.11	.05	1256.50
820.0	64.2	599.8	156.0	24.3	95.4	62.6	199.7	77.5	1256.50
.85	2.65	6.29	2.49	.040	.030	.050	.000	1255.80	9930.55
.009663	495.	500.	500.	3	14	0	.00	194.94	10125.49

*SECNO 4.196
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4.196	2.52	1262.32	1262.32	.00	1263.25	.93	5.02	.14	1264.00
820.0	.0	818.5	1.5	.0	105.9	1.7	201.4	79.0	1262.00
.86	.00	7.73	.90	.000	.030	.050	.000	1259.80	9969.19
.010467	500.	500.	495.	2	14	0	.00	66.30	10035.49

*SECNO 4.289
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

UPSTREAM OF CAMELBACK ROAD EXTENDED

4.289	2.53	1269.93	1269.93	.00	1270.50	.57	4.67	.04	1268.00
820.0	94.1	436.9	289.0	28.0	55.8	107.5	203.1	80.3	1268.00
.89	3.36	7.82	2.69	.040	.030	.050	.000	1267.40	9955.99
.008556	495.	495.	495.	20	5	0	.00	165.20	10121.20

*SECNO 4.375

4.375	2.20	1273.90	.00	.00	1274.51	.61	4.00	.01	1272.00
820.0	6.6	473.4	340.0	2.2	61.4	100.1	204.9	81.8	1272.00
.91	2.94	7.71	3.40	.040	.030	.050	.000	1271.70	9992.63
.009323	445.	450.	445.	3	0	0	.00	115.08	10107.71

*SECNO 4.469

4.469	2.56	1277.66	.00	.00	1278.16	.49	3.64	.01	1276.00
820.0	17.0	656.0	146.9	6.9	105.5	72.7	206.9	83.3	1276.00
.94	2.47	6.22	2.02	.040	.030	.050	.000	1275.10	9986.70
.005833	500.	500.	500.	4	0	0	.00	146.32	10133.02

1

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 4.563
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4.563	2.91	1281.01	1281.01	.00	1281.74	.73	3.43	.07	1280.00
820.0	8.2	763.5	48.3	3.8	107.8	28.0	208.8	84.8	1280.00
.96	2.14	7.08	1.72	.040	.030	.050	.000	1278.10	9977.43
.008377	500.	495.	495.	3	8	0	.00	118.09	10095.52

*SECNO 4.653

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.36

4.653	3.28	1282.98	.00	.00	1283.20	.22	1.41	.05	1282.00
820.0	1.0	808.7	10.2	1.2	211.6	14.3	210.8	86.0	1282.00
.99	.85	3.82	.72	.040	.030	.050	.000	1279.70	9962.56
.001505	475.	475.	475.	4	0	0	.00	106.77	10069.33

*SECNO 4.725
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

Q @ X1= 4.725 EQUALS Q @ CP22A2

CONFLUENCE OF CATERPILLAR DIKE WASH

4.725	1.67	1284.67	1284.67	.00	1285.32	.65	1.09	.13	1286.50
640.0	.0	629.0	11.0	.0	96.4	7.4	212.2	86.9	1284.00
1.01	.00	6.53	1.49	.000	.030	.050	.000	1283.00	9972.83
.010778	380.	380.	380.	20	8	0	.00	89.04	10061.87

1

OFILE FOR STREAM TUTHILL DIKE WASH - WASH

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	1033.	1083.	1133.	1183.	1233.	1283.	1333.	1383.	1433.	1483.
SECNO	CUMDIS									
.00	0.	IEM	.	.	.	.	.	.	.	.	.	.
	50.	IEM	.	.	.	.	.	.	.	.	.	.
	100.	IEM	.	.	.	.	.	.	.	.	.	.
	150.	IEM	.	.	.	.	.	.	.	.	.	.
	200.	IEM	.	.	.	.	.	.	.	.	.	.
	250.	IWE	.	.	.	.	.	.	.	.	.	.
	300.	IWE	.	.	.	.	.	.	.	.	.	.
	350.	IWE	.	.	.	.	.	.	.	.	.	.
.08	400.	IWE	.	.	.	.	.	.	.	.	.	.
	450.	ILE	.	.	.	.	.	.	.	.	.	.
	500.	CIE	.	.	.	.	.	.	.	.	.	.
	550.	CIE	.	.	.	.	.	.	.	.	.	.
	600.	CIE	.	.	.	.	.	.	.	.	.	.
	650.	CIE	.	.	.	.	.	.	.	.	.	.
	700.	CIE	.	.	.	.	.	.	.	.	.	.
	750.	CIE	.	.	.	.	.	.	.	.	.	.
	800.	CIE	.	.	.	.	.	.	.	.	.	.
	850.	CIE	.	.	.	.	.	.	.	.	.	.
	900.	CIE	.	.	.	.	.	.	.	.	.	.
	950.	CIE	.	.	.	.	.	.	.	.	.	.
.19	1000.	.IE	.	.	.	.	.	.	.	.	.	.
	1050.	.IE	.	.	.	.	.	.	.	.	.	.
	1100.	.IE	.	.	.	.	.	.	.	.	.	.
	1150.	.IE	.	.	.	.	.	.	.	.	.	.
	1200.	.IWE	.	.	.	.	.	.	.	.	.	.
	1250.	.IWE	.	.	.	.	.	.	.	.	.	.
	1300.	.IWE	.	.	.	.	.	.	.	.	.	.
	1350.	. WE	.	.	.	.	.	.	.	.	.	.
	1400.	. IE	.	.	.	.	.	.	.	.	.	.
	1450.	. IE	.	.	.	.	.	.	.	.	.	.
	1500.	. IE	.	.	.	.	.	.	.	.	.	.
	1550.	. IE	.	.	.	.	.	.	.	.	.	.
	1600.	. IE	.	.	.	.	.	.	.	.	.	.
	1650.	. IE	.	.	.	.	.	.	.	.	.	.
.31	1700.	. IE	.	.	.	.	.	.	.	.	.	.
	1750.	. IE	.	.	.	.	.	.	.	.	.	.
	1800.	. IE	.	.	.	.	.	.	.	.	.	.
	1850.	. IEM	.	.	.	.	.	.	.	.	.	.
	1900.	. IEM	.	.	.	.	.	.	.	.	.	.
	1950.	. IEM	.	.	.	.	.	.	.	.	.	.
	2000.	. IWE	.	.	.	.	.	.	.	.	.	.
	2050.	. WE	.	.	.	.	.	.	.	.	.	.
	2100.	. IE	.	.	.	.	.	.	.	.	.	.
	2150.	. IE	.	.	.	.	.	.	.	.	.	.
.41	2200.	. IE	.	.	.	.	.	.	.	.	.	.
	2250.	. IE	.	.	.	.	.	.	.	.	.	.
	2300.	. IE	.	.	.	.	.	.	.	.	.	.
	2350.	. IE	.	.	.	.	.	.	.	.	.	.
	2400.	. IE	.	.	.	.	.	.	.	.	.	.
	2450.	. IE	.	.	.	.	.	.	.	.	.	.
	2500.	. IE	.	.	.	.	.	.	.	.	.	.
	2550.	. IE	.	.	.	.	.	.	.	.	.	.
	2600.	. WE	.	.	.	.	.	.	.	.	.	.
	2650.	. IE	.	.	.	.	.	.	.	.	.	.
	2700.	. IE	.	.	.	.	.	.	.	.	.	.
	2750.	. IE	.	.	.	.	.	.	.	.	.	.
	2800.	. IE	.	.	.	.	.	.	.	.	.	.
.54	2850.	. IE	.	.	.	.	.	.	.	.	.	.

	2900.	.	IE	.	.	.	.	.	.	.	.	.	.
	2950.	.	IE	.	.	.	.	.	.	.	.	.	.
	3000.	.	IE	.	.	.	.	.	.	.	.	.	.
	3050.	.	IE	.	.	.	.	.	.	.	.	.	.
	3100.	.	IWE	.	.	.	.	.	.	.	.	.	.
	3150.	.	IWE	.	.	.	.	.	.	.	.	.	.
	3200.	.	WE	.	.	.	.	.	.	.	.	.	.
	3250.	.	IE	.	.	.	.	.	.	.	.	.	.
	3300.	.	IE	.	.	.	.	.	.	.	.	.	.
.63	3350.	.	IE	.	.	.	.	.	.	.	.	.	.
	3400.	.	IE	.	.	.	.	.	.	.	.	.	.
	3450.	.	IE	.	.	.	.	.	.	.	.	.	.
	3500.	.	IE	.	.	.	.	.	.	.	.	.	.
	3550.	.	IE	.	.	.	.	.	.	.	.	.	.
	3600.	.	IE	.	.	.	.	.	.	.	.	.	.
	3650.	.	IEM	.	.	.	.	.	.	.	.	.	.
	3700.	.	IEM	.	.	.	.	.	.	.	.	.	.
	3750.	.	IWE	.	.	.	.	.	.	.	.	.	.
	3800.	.	IWE	.	.	.	.	.	.	.	.	.	.
.73	3850.	.	WE	.	.	.	.	.	.	.	.	.	.
	3900.	.	IE	.	.	.	.	.	.	.	.	.	.
	3950.	.	IE	.	.	.	.	.	.	.	.	.	.
	4000.	.	IE	.	.	.	.	.	.	.	.	.	.
	4050.	.	IE	.	.	.	.	.	.	.	.	.	.
	4100.	.	IE	.	.	.	.	.	.	.	.	.	.
	4150.	.	IE	.	.	.	.	.	.	.	.	.	.
	4200.	.	IWE	.	.	.	.	.	.	.	.	.	.
	4250.	.	IWE	.	.	.	.	.	.	.	.	.	.
	4300.	.	IWE	.	.	.	.	.	.	.	.	.	.
.82	4350.	.	IWE	.	.	.	.	.	.	.	.	.	.
	4400.	.	ILE	.	.	.	.	.	.	.	.	.	.
	4450.	.	ILE	.	.	.	.	.	.	.	.	.	.
	4500.	.	IE	.	.	.	.	.	.	.	.	.	.
	4550.	.	IE	.	.	.	.	.	.	.	.	.	.
	4600.	.	IE	.	.	.	.	.	.	.	.	.	.
	4650.	.	IE	.	.	.	.	.	.	.	.	.	.
	4700.	.	IE	.	.	.	.	.	.	.	.	.	.
	4750.	.	IE	.	.	.	.	.	.	.	.	.	.
	4800.	.	IWE.	.	.	.	.	.	.	.	.	.	.
.92	4850.	.	IWE.	.	.	.	.	.	.	.	.	.	.
	4900.	.	IWE.	.	.	.	.	.	.	.	.	.	.
	4950.	.	IE.	.	.	.	.	.	.	.	.	.	.
	5000.	.	IE.	.	.	.	.	.	.	.	.	.	.
	5050.	.	IE.	.	.	.	.	.	.	.	.	.	.
	5100.	.	IE.	.	.	.	.	.	.	.	.	.	.
	5150.	.	IE.	.	.	.	.	.	.	.	.	.	.
	5200.	.	IE.	.	.	.	.	.	.	.	.	.	.
	5250.	.	IWE	.	.	.	.	.	.	.	.	.	.
	5300.	.	IWE	.	.	.	.	.	.	.	.	.	.
1.01	5350.	.	WE	.	.	.	.	.	.	.	.	.	.
	5400.	.	IE	.	.	.	.	.	.	.	.	.	.
	5450.	.	IE	.	.	.	.	.	.	.	.	.	.
	5500.	.	IE	.	.	.	.	.	.	.	.	.	.
	5550.	.	IWE	.	.	.	.	.	.	.	.	.	.
	5600.	.	IWE	.	.	.	.	.	.	.	.	.	.
1.07	5650.	.	IWE	.	.	.	.	.	.	.	.	.	.
	5700.	C	I.E	.	.	.	.	.	.	.	.	.	.
	5750.	C	I.E	.	.	.	.	.	.	.	.	.	.
	5800.	C	I.WE	.	.	.	.	.	.	.	.	.	.
	5850.	C	I E	.	.	.	.	.	.	.	.	.	.
1.11	5900.	C	I E	.	.	.	.	.	.	.	.	.	.
1.12	5950.	C	I EM	.	.	.	.	.	.	.	.	.	.

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      6000.  C        I EM L    .        .        .        .        .        .        .        .        .
      6050.  C        I EM   L  .        .        .        .        .        .        .        .        .
 1.15 6100.  C        IREM      . L      .        .        .        .        .        .        .        .
      6150.  C        IREM      L        .        .        .        .        .        .        .        .
      6200.  C        IREM    L .        .        .        .        .        .        .        .        .
      6250.  C        IREM L    .        .        .        .        .        .        .        .        .
      6300.  C        IREL      .        .        .        .        .        .        .        .        .
 1.20 6350.  C        ILEM      .        .        .        .        .        .        .        .        .
      6400.  C        .IEM      .        .        .        .        .        .        .        .        .
      6450.  C        .IEM      .        .        .        .        .        .        .        .        .
      6500.  C        .IEM      .        .        .        .        .        .        .        .        .
      6550.  C        .IWE      .        .        .        .        .        .        .        .        .
      6600.  C        .IWE      .        .        .        .        .        .        .        .        .
 1.26 6650.  .        . IE      .        .        .        .        .        .        .        .        .
      6700.  .        . IEM     .        .        .        .        .        .        .        .        .
      6750.  .        . IEM     .        .        .        .        .        .        .        .        .
 1.29 6800.  .        . IEM     .        .        .        .        .        .        .        .        .
      6850.  .        . IEM     .        .        .        .        .        .        .        .        .
      6900.  .        . IWE     .        .        .        .        .        .        .        .        .
 1.31 6950.  .        . IWE     .        .        .        .        .        .        .        .        .
 1.32 7000.  C        . ILE     .        .        .        .        .        .        .        .        R
      7050.  C        . I E     .        .        .        .        .        .        .        .        R
      7100.  C        .IL EM    .        .        .        .        .        .        .        .        R
      7150.  C        .IL EM    .        .        .        .        .        .        .        .        R
 1.36 7200.  C        IL  EM    .        .        .        .        .        .        .        .        .
      7250.  C        I L EM    .        .        .        .        .        .        .        .        .
      7300.  C        .I LEM    .        .        .        .        .        .        .        .        .
      7350.  C        .I LEM    .        .        .        .        .        .        .        .        .
      7400.  C        . I EM    .        .        .        .        .        .        .        .        .
      7450.  C        . I WE    .        .        .        .        .        .        .        .        .
      7500.  .   C    .  IWE    .        .        .        .        .        .        .        .        .
 1.42 7550.  .        .  IWE    .        .        .        .        .        .        .        .        .
      7600.  .        .  I EM   .        .        .        .        .        .        .        .        .
      7650.  .        .  I EM   .        .        .        .        .        .        .        .        .
      7700.  .        .   IEM   .        .        .        .        .        .        .        .        .
      7750.  .        .   IEM   .        .        .        .        .        .        .        .        .
      7800.  .        .   IWE   .        .        .        .        .        .        .        .        .
      7850.  .        .   IWE   .        .        .        .        .        .        .        .        .
      7900.  .        .   IWE   .        .        .        .        .        .        .        .        .
      7950.  .        .   ILE   .        .        .        .        .        .        .        .        .
      8000.  .        .    IE   .        .        .        .        .        .        .        .        .
 1.52 8050.  .        .    IE   .        .        .        .        .        .        .        .        .
      8100.  .        .    IEM  .        .        .        .        .        .        .        .        .
      8150.  .        .    IWE  .        .        .        .        .        .        .        .        .
      8200.  .        .    IWE  .        .        .        .        .        .        .        .        .
      8250.  .        .    ILE  .        .        .        .        .        .        .        .        .
      8300.  .        .    I E  .        .        .        .        .        .        .        .        .
      8350.  .        .     IE  .        .        .        .        .        .        .        .        .
      8400.  .        .     IWE .        .        .        .        .        .        .        .        .
      8450.  .        .     IWE .        .        .        .        .        .        .        .        .
      8500.  .        .     I E .        .        .        .        .        .        .        .        .
 1.61 8550.  .        .     I E .        .        .        .        .        .        .        .        .
      8600.  .        .     I E .        .        .        .        .        .        .        .        .
      8650.  .        .     I WE.        .        .        .        .        .        .        .        .
      8700.  .        .      IWE.        .        .        .        .        .        .        .        .
      8750.  .        .      IWE.        .        .        .        .        .        .        .        .
      8800.  .        .      IWE.        .        .        .        .        .        .        .        .
      8850.  .        .      I E.        .        .        .        .        .        .        .        .
      8900.  .        .      I E.        .        .        .        .        .        .        .        .
      8950.  .        .      I EM        .        .        .        .        .        .        .        .
      9000.  .        .      I WE        .        .        .        .        .        .        .        .
 1.71 9050.  .        .      I WE        .        .        .        .        .        .        .        .
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      9100.  .        .      IWE       .        .        .        .        .        .        .        .
      9150.  .        .      I E       .        .        .        .        .        .        .        .
      9200.  .        .      I E       .        .        .        .        .        .        .        .
      9250.  .        .      I EM      .        .        .        .        .        .        .        .
      9300.  .        .      I EM      .        .        .        .        .        .        .        .
      9350.  .        .      I WE      .        .        .        .        .        .        .        .
      9400.  .        .      I WE      .        .        .        .        .        .        .        .
      9450.  .        .       IWE      .        .        .        .        .        .        .        .
      9500.  .        .       I.E      .        .        .        .        .        .        .        .
1.80  9550.  .        .       I.EM     .        .        .        .        .        .        .        .
      9600.  .        .       I.EM     .        .        .        .        .        .        .        .
      9650.  .        .       I.EM     .        .        .        .        .        .        .        .
      9700.  .        .        IWE     .        .        .        .        .        .        .        .
      9750.  .        .        IWE     .        .        .        .        .        .        .        .
      9800.  .        .        IWEM    .        .        .        .        .        .        .        .
      9850.  .        .        ILEM    .        .        .        .        .        .        .        .
      9900.  .        .        ILEM    .        .        .        .        .        .        .        .
      9950.  .        .        ILEM    .        .        .        .        .        .        .        .
     10000.  .        .        .IEM    .        .        .        .        .        .        .        .
1.90 10050.  .        .        .IWE    .        .        .        .        .        .        .        .
     10100.  .        .        .IWE    .        .        .        .        .        .        .        .
     10150.  .        .        .IWEM   .        .        .        .        .        .        .        .
     10200.  .        .        .ILEM   .        .        .        .        .        .        .        .
     10250.  .        .        .ILEM   .        .        .        .        .        .        .        .
     10300.  .        .        .ILEM   .        .        .        .        .        .        .        .
     10350.  .        .        . IEM   .        .        .        .        .        .        .        .
     10400.  .        .        . IWE   .        .        .        .        .        .        .        .
     10450.  .        .        . IWE   .        .        .        .        .        .        .        .
     10500.  .        .        . IWE   .        .        .        .        .        .        .        .
1.99 10550.  .        .        . ILE   .        .        .        .        .        .        .        .
     10600.  .        .        . I E   .        .        .        .        .        .        .        .
     10650.  .        .        . I EM  .        .        .        .        .        .        .        .
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     12150.  .        .        .      I E.        .        .        .        .        .        .        .
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     12200.  .        .        .      I E.       .        .        .        .        .        .        .
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     15250.  C        .        .         . IEL   .        .        .        .        .        .        .
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	15400.	C	.	.	.	IWEM	.	.	.	.	.	.	.
	15450.	C	.	.	.	IWEM	.	.	.	.	.	.	.
	15500.	C	.	.	.	IEL	.	.	.	.	.	.	.
2.94	15550.	C	.	.	.	IEL	.	.	.	.	.	.	.
	15600.	C	.	.	.	IEL	.	.	.	.	.	.	.
	15650.	C	.	.	.	IEL	.	.	.	.	.	.	.
	15700.	C	.	.	.	IEL	.	.	.	.	.	.	.
	15750.	C	.	.	.	IEM	.	.	.	.	.	.	.
	15800.	C	.	.	.	IEM	.	.	.	.	.	.	.
	15850.	C	.	.	.	IEM	.	.	.	.	.	.	.
	15900.	C	.	.	.	IEM	.	.	.	.	.	.	.
	15950.	C	.	.	.	IEM	.	.	.	.	.	.	.
	16000.	C	.	.	.	IEM	.	.	.	.	.	.	.
3.06	16050.	C	.	.	.	IEM	.	.	.	.	.	.	.
	16100.	C	.	.	.	IE M	.	.	.	.	.	.	.
	16150.	C	.	.	.	IE M	.	.	.	.	.	.	.
	16200.	C	.	.	.	IE M	.	.	.	.	.	.	.
	16250.	C	.	.	.	IE M	.	.	.	.	.	.	.
	16300.	C	.	.	.	IE M	.	.	.	.	.	.	.
	16350.	C	.	.	.	IWEM	.	.	.	.	.	.	.
	16400.	C	.	.	.	IWEM	.	.	.	.	.	.	.
	16450.	C	.	.	.	IWEM	.	.	.	.	.	.	.
	16500.	C	.	.	.	IREM	.	.	.	.	.	.	.
	16550.	C	.	.	.	IREM	.	.	.	.	.	.	.
	16600.	C	.	.	.	I EM	.	.	.	.	.	.	.
3.15	16650.	C	.	.	.	I EM	.	.	.	.	.	.	.
	16700.	C	.	.	.	IEM	.	.	.	.	.	.	.
	16750.	C	.	.	.	IEM	.	.	.	.	.	.	.
	16800.	C	.	.	.	IELM	.	.	.	.	.	.	.
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	16900.	C	.	.	.	IELM	.	.	.	.	.	.	.
	16950.	C	.	.	.	ELM	.	.	.	.	.	.	.
	17000.	C	.	.	.	WEM	.	.	.	.	.	.	.
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3.25	17200.	.	.	.	.	EM	.	.	.	.	.	.	.
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	17450.	C	.	.	.	EM	.	.	.	.	.	.	.
	17500.	C	.	.	.	EM	.	.	.	.	.	.	.
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	17600.	C	.	.	.	EM	.	.	.	.	.	.	.
	17650.	C	.	.	.	WE	.	.	.	.	.	.	.
3.34	17700.	C	.	.	.	IE	.	.	.	.	.	.	.
	17750.	C	.	.	.	IE	.	.	.	.	.	.	.
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	18350.	C	.	.	.	IEM	.	.	.	.	.	.	.

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	18500.	C	.	.	.	IE M.	.	.	.	.	.	.
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3.63	19200.	.	.	.	.	IEM.	.	.	.	.	.	.
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	21600.	.	.	.	.	.	IEM	.	.	.	.	.	.
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	23050.	C	.	.	.	.	EM.	.	.	.	.	.	.
4.38	23100.	C	.	.	.	.	EM.	.	.	.	.	.	.
	23150.	C	.	.	.	.	EM.	.	.	.	.	.	.
	23200.	C	.	.	.	.	EM.	.	.	.	.	.	.
	23250.	C	.	.	.	.	WE.	.	.	.	.	.	.
	23300.	C	.	.	.	.	WE.	.	.	.	.	.	.
	23350.	C	.	.	.	.	IE.	.	.	.	.	.	.
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	23450.	C	.	.	.	.	IE.	.	.	.	.	.	.
	23500.	C	.	.	.	.	IE.	.	.	.	.	.	.
	23550.	C	.	.	.	.	IEM	.	.	.	.	.	.
4.47	23600.	C	.	.	.	.	IEM	.	.	.	.	.	.
	23650.	C	.	.	.	.	IEM	.	.	.	.	.	.
	23700.	C	.	.	.	.	EM	.	.	.	.	.	.
	23750.	C	.	.	.	.	EM	.	.	.	.	.	.
	23800.	C	.	.	.	.	EM	.	.	.	.	.	.
	23850.	C	.	.	.	.	EM	.	.	.	.	.	.
	23900.	C	.	.	.	.	EM	.	.	.	.	.	.
	23950.	C	.	.	.	.	WE	.	.	.	.	.	.
	24000.	C	.	.	.	.	WE	.	.	.	.	.	.
	24050.	.	.	.	C	.	IE	.	.	.	.	.	.
4.56	24100.	.	.	.	.	.	IE	.	.	.	.	.	.
	24150.	.	.	.	C	.	IE	.	.	.	.	.	.
	24200.	C	.	.	.	.	IE	.	.	.	.	.	.
	24250.	C	.	.	.	.	IE	.	.	.	.	.	.
	24300.	C	.	.	.	.	IE	.	.	.	.	.	.
	24350.	C	.	.	.	.	IE	.	.	.	.	.	.
	24400.	C	.	.	.	.	IE	.	.	.	.	.	.
	24450.	C	.	.	.	.	IE	.	.	.	.	.	.
	24500.	C	.	.	.	.	IE	.	.	.	.	.	.
	24550.	C	.	.	.	.	IEM	.	.	.	.	.	.

```
    4.65 24600.  C        .        .        .        .        IEM       .        .        .        .        .
         24650.  C        .        .        .        .        IEM       .        .        .        .        .
         24700.  C        .        .        .        .         EM       .        .        .        .        .
         24750.  C        .        .        .        .         EM       .        .        .        .        .
         24800.  C        .        .        .        .         EM       .        .        .        .        .
         24850.  C        .        .        .        .         EM       .        .        .        .        .
         24900.  C        .        .        .        .         EL       .        .        .        .        .
    4.72 24950.  .        .        .        .        .         EL       .        .        .        .        .
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T1      WHITE TANKS/AGUA FRIA AREA DRAINAGE MASTER STUDY
T2      100-YEAR STORM EVENT        FLOODWAY RUN
T3      TUTHILL DIKE WASH - WASH "5"

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

                3                                                          1039.06

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     15                 -1
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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 2
0

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

3470 ENCROACHMENT STATIONS=     9945.5   10068.7  TYPE=      1  TARGET=      123.250

          Q @ X1 = 0.000 TO X1  = 1.012 EQUALS Q AT I6CWT4

          MATCH FLOODPLAIN INTO 100-YEAR PONDING WSEL BEHIND WHITE TANKS
          STRUCTURE # 4

      .000      6.06   1039.06       .00   1038.69   1039.87       .81       .00       .00 100000.00
    3560.0        .0    3560.0        .0        .0     493.6        .0        .0        .0 100000.00
      .00       .00      7.21       .00      .000      .030      .000      .000   1033.00   9945.48
   .003363       0.        0.        0.         0         0         0       .00    123.25  10068.73

*SECNO  .075

3470 ENCROACHMENT STATIONS=     9910.0   10073.4  TYPE=      1  TARGET=      163.380
      .075      5.49   1040.49       .00   1040.48   1041.14       .65      1.26       .02   1036.00
    3560.0     612.4    2947.2        .4     124.7     436.9        .5       4.8       1.3   1040.00
      .02      4.91      6.75       .78      .030      .030      .040      .000   1035.00   9910.00
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   .002957      400.      400.      400.         2         0         0       .00    161.98  10071.98


*SECNO  .186

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9950.0   10068.5  TYPE=      1  TARGET=      118.550
      .186      4.43   1042.93   1042.93   1043.26   1044.64      1.71      2.62       .32   1040.00
    3560.0     118.5    3352.6      88.9      21.4     311.7      21.4      10.9       3.1   1040.00
       .03      5.53     10.76      4.15      .030      .030      .040      .000   1038.50   9955.36
   .007703      580.      580.      580.         2        15         0       .00    109.27  10064.64


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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  .314

3301 HV CHANGED MORE THAN HVINS


3470 ENCROACHMENT STATIONS=     9925.0   10080.0  TYPE=      1  TARGET=      155.000
      .314      5.23   1047.73       .00   1047.36   1048.68       .95      3.96       .08   1048.00
    3560.0        .0    3560.0        .0        .0     455.3        .0      17.2       4.9 100000.00
       .06       .00      7.82       .00      .000      .030      .000      .000   1042.50   9951.35
   .004589      500.      680.      720.         2         0         0       .00    127.30  10078.65


*SECNO  .415
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9940.0   10175.0  TYPE=      1  TARGET=      235.000
      .415      4.49   1051.69   1051.69   1051.71   1052.75      1.06      3.22       .03   1050.00
    3560.0        .0    3054.3     505.7        .0     347.8     137.3      23.4       7.5   1050.00
       .08       .00      8.78      3.68      .000      .030      .040      .000   1047.20   9940.00
   .007761      300.      530.      800.         2        15         0       .00    235.00  10175.00


*SECNO  .540
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9911.8   10110.0  TYPE=      1  TARGET=      198.250
      .540      4.21   1057.21   1057.21   1057.33   1058.42      1.21      5.01       .04   1056.00
    3560.0      26.3    3204.8     328.9       8.6     348.2      87.7      30.4      10.7   1056.00
       .10      3.05      9.20      3.75      .030      .030      .040      .000   1053.00   9915.76
   .007457      660.      660.      650.         3        11         0       .00    194.24  10110.00


*SECNO  .634
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7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9951.0 10105.0 TYPE= 1 TARGET= 154.020

.634	4.70	1061.50	1061.50	1061.55	1062.90	1.41	3.45	.06	1058.00
3560.0	175.1	2937.0	447.9	30.5	286.7	104.7	35.3	12.7	1058.00
.11	5.73	10.25	4.28	.030	.030	.040	.000	1056.80	9952.52
.006534	495.	495.	495.	1	8	0	.00	152.47	10105.00

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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

*SECNO .729

3470 ENCROACHMENT STATIONS= 9953.5 10085.0 TYPE= 1 TARGET= 131.480

.729	4.41	1065.11	.00	1065.08	1066.38	1.27	3.47	.01	1064.00
3560.0	8.9	3551.1	.0	3.1	392.4	.0	40.0	14.3	100000.00
.13	2.85	9.05	.00	.030	.030	.000	.000	1060.70	9954.41
.007371	500.	500.	500.	2	0	0	.00	130.59	10085.00

*SECNO .823

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9952.7 10045.3 TYPE= 1 TARGET= 92.560

.823	5.99	1070.49	1070.49	1070.49	1072.53	2.04	3.86	.23	1070.00
3560.0	.5	3556.9	2.6	.3	310.3	2.0	44.0	15.5	1070.00
.14	1.67	11.46	1.31	.030	.030	.040	.000	1064.50	9953.78
.008250	495.	495.	495.	6	11	0	.00	84.34	10038.12

*SECNO .917

3470 ENCROACHMENT STATIONS= 9956.3 10050.0 TYPE= 1 TARGET= 93.700

.917	5.17	1074.47	.00	1074.46	1076.20	1.74	3.65	.03	1072.00
3560.0	36.7	3518.0	5.2	7.9	330.9	3.5	47.8	16.6	1074.00
.15	4.67	10.63	1.48	.030	.030	.040	.000	1069.30	9957.67
.006497	500.	500.	500.	2	0	0	.00	92.33	10050.00

*SECNO 1.012
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9936.4 10028.6 TYPE= 1 TARGET= 92.199

1.012	4.63	1080.33	1080.33	1080.33	1082.31	1.98	3.71	.07	1080.00
3560.0	.4	3559.0	.7	.3	315.3	.6	51.6	17.6	1080.00
.16	1.36	11.29	1.03	.030	.030	.040	.000	1075.70	9938.36
.008554	500.	500.	500.	20	11	0	.00	85.51	10023.87

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

CCHV= .300 CEHV= .500
*SECNO 1.067

3301 HV CHANGED MORE THAN HVINS

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

3470 ENCROACHMENT STATIONS= 9977.7 10022.0 TYPE= 1 TARGET= 44.300

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1088.00 ELREA= 1088.00

Q @ X1 = 1.067 TO X1 = 1.110 EQUALS SR AT CP43
FLOW LEFT OVER AFTER WEIR FLOW OVER DIKE UPSTREAM OF CULVERT

4 - 10ft x 8ft x 227ft BC AT INTERSTATE 10

1.067	5.86	1084.50	1084.50	1084.50	1087.46	2.96	1.22	.49	1078.64
3580.0	.0	3580.0	.0	.0	259.3	.0	53.5	18.0	100000.00
.17	.00	13.80	.00	.000	.016	.000	.000	1078.64	9977.70
.002457	293.	293.	293.	20	11	0	.00	44.30	10022.00

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	4	.016	.50	2.60	.00	8.00	10.00	227.00	8	1	1081.16	1078.64

CHART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

*SECNO 1.110
BTCARD, BRIDGE STENCL= 9950.00 STENCR= 10022.00

SPECIAL CULVERT INLET CONTROL + WEIR FLOW, EG = 1092.33

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.41

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1092.41	1092.17	4.88	0.	3553.	7.870	320.0	1092.00	1.

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

3470 ENCROACHMENT STATIONS= 9950.0 10022.0 TYPE= 1 TARGET= 72.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1092.00 ELREA= 1099.00

EFFECTIVE FLOW OPTION IS INCORPORATED FOR THE NEXT 5 UPSTREAM CROSS SECTIONS AS A RESULT OF PONDING AND UPSTREAM AND DOWNSTREAM EXPANSION AND CONTRATION FLOW SITUATIONS.

ACTUAL MAPPED LIMITS CORRESPOND TO WATER SURFACE ELEVATIONS AND ARE SHOWN CORRECTLY ON THE FLOODPLAIN WORK MAP.

1.110	10.27	1091.37	.00	1091.37	1092.33	.96	4.88	.00	1081.16
3580.0	.0	3580.0	.0	.0	454.9	.0	55.4	18.2	100000.00
.18	.00	7.87	.00	.000	.016	.000	.000	1081.10	9977.70
.000425	227.	227.	227.	6	0	0	.00	44.30	10022.00

CCHV= .300 CEHV= .500
*SECNO 1.118

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.56

3470 ENCROACHMENT STATIONS= 9920.0 10100.0 TYPE= 1 TARGET= 180.000

Q @ X1 = 1.118 TO X1 = 1.198 EQUALS STORAGE ROUTED Q AT CP43

1.118	11.02	1092.52	.00	1092.52	1092.60	.09	.01	.26	1091.50
3580.0	.0	2088.9	1491.1	.0	835.8	707.8	56.3	18.4	1082.00
.18	.00	2.50	2.11	.000	.030	.040	.000	1081.50	9920.00
.000175	40.	40.	40.	2	0	0	.00	180.00	10100.00

CCHV= .100 CEHV= .300
*SECNO 1.152

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .70

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

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3470 ENCROACHMENT STATIONS=     9930.0   10150.0  TYPE=      1  TARGET=      220.000
    1.152     10.52   1092.52       .00   1092.52   1092.66       .14       .04       .02   1143.00
   3580.0        .0    2521.3    1058.7        .0     756.1     525.3      62.1      19.2   1086.00
      .20       .00      3.33      2.02      .000      .030      .040      .000   1082.00   9933.40
  .000359      180.      180.      180.         2         0         0       .00    216.60  10150.00


*SECNO 1.198

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .49


3470 ENCROACHMENT STATIONS=     9925.0   10200.0  TYPE=      1  TARGET=      275.000
    1.198      7.16   1092.46       .00   1092.46   1092.91       .45       .15       .09   1090.00
   3580.0      17.5    2794.9     767.7       7.6     468.4     338.9      67.9      20.5   1090.00
      .21      2.30      5.97      2.27      .030      .030      .040      .000   1085.30   9938.84
  .001511      235.      240.      235.         2         0         0       .00    261.16  10200.00


CCHV=     .300 CEHV=     .500
*SECNO 1.260

3301 HV CHANGED MORE THAN HVINS

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

3470 ENCROACHMENT STATIONS=     9945.0   10200.0  TYPE=      1  TARGET=      255.000

          Q @ X1 = 1.260 TO X1 = 1.322 EQUALS ROUTED Q AT CP42


          UPSTREAM OF MCDOWELL ROAD

    1.260      4.74   1096.24   1096.24   1096.24   1097.41      1.17       .97       .36   1094.00
   4250.0      57.8    2805.7    1386.6      12.5     277.1     296.9      73.1      22.3   1094.00
      .22      4.61     10.12      4.67      .030      .030      .040      .000   1091.50   9964.39
  .006732      340.      330.      315.        20        23         0       .00    235.61  10200.00


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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


*SECNO 1.287
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9974.0   10145.0  TYPE=      1  TARGET=      171.040
    1.287      4.26   1098.26   1098.26   1098.28   1099.66      1.39      1.10       .11   1098.00
   4250.0        .2    4249.8        .0        .2     448.6        .0      74.7      22.9 100000.00
      .23      1.25      9.47       .00      .030      .030      .000      .000   1094.00   9978.68
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.009693	160.	140.	120.	20	15	0	.00	166.32	10145.00

*SECNO 1.313
35 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9920.1 10080.0 TYPE= 1 TARGET= 159.860

THE NEXT THREE UPSTREAM CROSS SECTIONS FLOW THROUGH A DETENTIION BASIN AND EFFECTIVE FLOW LIMITS ARE IMPOSED TO MODEL THIS SITUATION CORRECTLY. MAPPED LIMITS ARE SMOWN ON THE FLOODPLAIN MAP TO CORRECTLY DEPICT THE ACTUAL PONDING AREA.

CONFLUENCE OF BULLDOZER WASH

1.313	4.72	1099.72	1099.72	1099.72	1101.39	1.67	1.18	.14	1096.00
4250.0	275.6	3510.5	463.9	43.3	316.6	82.8	76.1	23.4	1096.00
.23	6.37	11.09	5.60	.030	.030	.040	.000	1095.00	9926.74
.007350	145.	140.	135.	2	8	0	.00	140.46	10067.21

*SECNO 1.322

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.99

70 ENCROACHMENT STATIONS= 9875.9 10110.0 TYPE= 1 TARGET= 234.100

1.322	6.72	1101.72	.00	1101.73	1101.91	.19	.07	.45	1096.00
4250.0	294.3	3955.7	.0	122.1	1120.4	.0	77.3	23.7	100000.00
.24	2.41	3.53	.00	.030	.030	.000	.000	1095.00	9888.02
.000463	150.	50.	150.	3	0	0	.00	221.98	10110.00

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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

CCHV= .100 CEHV= .300
*SECNO 1.362

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.12

3470 ENCROACHMENT STATIONS= 9877.2 10100.0 TYPE= 1 TARGET= 222.760

Q AT X1 = 1.362 TO X1 = 1.614 EQUALS (Q AT CP39 + 1/5 HYDROGRAPH AT 42)

1.362	19.88	1101.88	.00	1101.88	1101.95	.06	.02	.01	1090.00
4280.0	321.3	3439.1	519.6	239.8	1563.8	493.5	86.1	24.7	1090.00
.27	1.34	2.20	1.05	.030	.030	.040	.000	1082.00	9905.88
.000048	150.	210.	300.	2	0	0	.00	194.12	10100.00

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*SECNO 1.422

3301 HV CHANGED MORE THAN HVINS

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

3470 ENCROACHMENT STATIONS=     9949.0   10045.0  TYPE=      1  TARGET=       96.010
     1.422      6.58   1105.08   1105.08   1105.08   1107.27      2.19       .05       .64 100000.00
    4280.0        .0    4280.0       .0        .0     360.0        .0      95.7      25.7 100000.00
       .27       .00     11.89       .00      .000      .030      .000      .000   1098.50   9954.62
   .008350      315.      315.      315.        20        17         0       .00     83.07  10037.69


*SECNO 1.518
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9969.4   10090.0  TYPE=      1  TARGET=      120.600
     1.518      6.06   1112.96   1112.96   1112.73   1115.15      2.20      4.13       .00   1110.00
    4280.0      25.0    4251.3       3.7       6.6     356.2       2.3      99.9      26.7   1112.00
       .29      3.81     11.94      1.60      .040      .030      .050      .000   1106.90   9970.57
   .008004      495.      505.      495.        20        11         0       .00     89.21  10059.78


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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 1.614
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9967.7   10110.0  TYPE=      1  TARGET=      142.280
     1.614      7.78   1121.68   1121.68   1121.69   1124.00      2.32      4.20       .04   1122.00
    4280.0        .0    4280.0       .0        .0     350.2        .0     104.1      27.7   1122.00
       .30       .00     12.22       .00      .000      .030      .000      .000   1113.90   9975.81
   .008463      510.      510.      505.        20        11         0       .00     77.57  10053.38


*SECNO 1.710
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9965.0   10070.0  TYPE=      1  TARGET=      105.000

          Q @ X1 = 1.710 TO 2.088 EQUALS (Q AT 1.362 + Q AT CP39)/2

     1.710      9.13   1129.13   1129.13   1129.13   1131.62      2.49      4.26       .05   1132.00
    4210.0        .0    4210.0       .0        .0     332.5        .0     108.1      28.6 100000.00
       .31       .00     12.66       .00      .000      .030      .000      .000   1120.00   9974.35
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   .008415      505.      505.      510.        20        11         0       .00     68.47  10042.82


*SECNO 1.805
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9969.8   10050.0  TYPE=      1  TARGET=       80.250
     1.805      8.98   1136.58   1136.58   1136.57   1139.02      2.44      4.16       .00   1138.00
    4210.0        .0    4210.0       .0        .0     335.6        .0     111.9      29.3 100000.00
       .32       .00     12.54       .00      .000      .030      .000      .000   1127.60   9973.56
   .008239      500.      500.      500.        20         8         0       .00     69.32  10042.88


*SECNO 1.898
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
1
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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


70 ENCROACHMENT STATIONS=     9972.1   10070.0  TYPE=      1  TARGET=       97.930
     1.898      6.61   1143.91   1143.91   1144.08   1146.11      2.20      3.92       .02   1140.00
    4210.0      51.5    3020.3    1138.2      11.5     223.4     185.0     116.2      30.3   1140.00
       .33      4.49     13.52      6.15      .040      .030      .050      .000   1137.30   9974.13
   .007624      495.      495.      495.        20        19         0       .00     95.87  10070.00


*SECNO 1.994
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9969.1   10092.8  TYPE=      1  TARGET=      123.750
     1.994      7.36   1150.86   1150.86   1150.84   1153.09      2.23      3.91       .01   1150.00
    4210.0       1.6    4197.3      11.0        .9     349.9       7.4     120.7      31.4   1150.00
       .34      1.78     12.00      1.50      .040      .030      .050      .000   1143.50   9972.85
   .007844      505.      505.      505.        20         8         0       .00     94.31  10067.17


*SECNO 2.088
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9971.5   10055.0  TYPE=      1  TARGET=       83.550
     2.088      7.74   1157.84   1157.84   1158.00   1160.20      2.36      4.02       .04   1158.00
    4210.0        .0    4210.0       .0        .0     341.3        .0     124.7      32.3 100000.00
       .35       .00     12.34       .00      .000      .030      .000      .000   1150.10   9975.27
   .008410      495.      495.      495.        20         8         0       .00     73.91  10049.18


*SECNO 2.170
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3301 HV CHANGED MORE THAN HVINS

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

3470 ENCROACHMENT STATIONS= 9964.3 10128.9 TYPE= 1 TARGET= 164.590

Q @ X1 = 2.170 TO X1 = 2.659 EQUALS Q AT CP39

1

2.170	3.93	1166.53	1166.53	1166.51	1167.94	1.41	3.86	.10	100000.00
4140.0	.0	4140.0	.0	.0	434.5	.0	128.6	33.5	100000.00
.37	.00	9.53	.00	.000	.030	.000	.000	1162.60	9965.78
.009405	430.	435.	445.	20	8	0	.00	154.51	10120.30

*SECNO 2.279

3301 HV CHANGED MORE THAN HVINS

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

3470 ENCROACHMENT STATIONS= 9945.9 10039.9 TYPE= 1 TARGET= 94.030

UPSTREAM OF THOMAS ROAD EXTENDED

2.279	5.93	1175.23	1175.23	1175.23	1177.37	2.14	5.15	.22	100000.00
4140.0	.0	4140.0	.0	.0	352.8	.0	133.8	35.1	100000.00
.38	.00	11.73	.00	.000	.030	.000	.000	1169.30	9954.02
.008528	580.	575.	570.	20	14	0	.00	83.83	10037.85

*SECNO 2.373

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 9950.0 10080.0 TYPE= 1 TARGET= 129.960

2.373	6.99	1178.99	.00	1179.02	1180.53	1.54	3.10	.06	1180.00
4140.0	.0	3512.0	628.0	.0	329.4	141.8	138.4	36.2	1174.00
.39	.00	10.66	4.43	.000	.030	.050	.000	1172.00	9960.00
.004800	495.	495.	495.	2	0	0	.00	119.75	10079.75

*SECNO 2.468
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9941.0 10080.0 TYPE= 1 TARGET= 138.970

2.468	6.31	1183.61	1183.61	1183.61	1185.50	1.89	2.92	.10	1180.00
4140.0	207.3	2798.1	1134.6	44.9	218.3	194.0	143.8	37.6	1180.00
.41	4.62	12.82	5.85	.040	.030	.050	.000	1177.30	9950.15
.007110	505.	505.	505.	20	11	0	.00	126.96	10077.11

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 2.563
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9944.8 10100.0 TYPE= 1 TARGET= 155.190

CONFLUENCE OF CATERPILLAR WASH

2.563	7.17	1189.47	1189.47	1189.53	1191.54	2.07	3.07	.05	1184.00
4140.0	189.4	3521.2	429.4	37.4	284.4	109.8	148.9	39.1	1184.00
.42	5.07	12.38	3.91	.040	.030	.050	.000	1182.30	9966.33
.005370	500.	500.	500.	20	8	0	.00	133.67	10100.00

*SECNO 2.659
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

70 ENCROACHMENT STATIONS= 9968.5 10100.0 TYPE= 1 TARGET= 131.450

2.659	6.86	1192.66	1192.66	1192.83	1194.54	1.88	2.88	.02	1190.00
4140.0	18.5	3364.1	757.4	5.9	279.3	175.9	154.1	40.7	1188.00
.43	3.16	12.05	4.31	.040	.030	.050	.000	1185.80	9970.58
.006078	505.	505.	505.	2	11	0	.00	129.42	10100.00

*SECNO 2.753

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .50

3470 ENCROACHMENT STATIONS= 9917.7 10110.0 TYPE= 1 TARGET= 192.330

Q @ X1=3.753 TO X1=3.250 EQUALS STORAGE ROUTED FLOW AT CP25

2.753	6.26	1196.56	.00	1196.36	1196.75	.19	2.04	.17	1196.00
945.0	2.9	940.3	1.8	5.5	268.7	3.9	158.3	42.2	1196.00
.47	.52	3.50	.46	.040	.030	.050	.000	1190.30	9922.63
.001279	495.	500.	495.	3	0	0	.00	131.39	10084.05

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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 2.848

3265 DIVIDED FLOW


3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9964.0   10080.0  TYPE=      1  TARGET=      116.000
    2.848      4.23   1197.43   1197.43   1197.43   1198.62      1.19      1.36       .30   1198.00
    945.0       .0     932.5      12.5       .0     106.0       6.9     160.6      43.2   1197.90
      .49      .00      8.80      1.82      .000      .030      .050      .000   1193.20   9982.84
  .009216     495.      500.      495.         4        14         0       .00     54.29  10041.45


*SECNO 2.943

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.50


3470 ENCROACHMENT STATIONS=     9960.5   10067.9  TYPE=      1  TARGET=      107.400
    2.943      5.25   1201.05       .00   1201.06   1201.62       .57      2.94       .06 100000.00
    945.0       .0     879.1      65.9       .0     140.5      29.3     162.2      44.0   1200.50
      .51      .00      6.26      2.25      .000      .030      .050      .000   1195.80   9970.55
  .004086     500.      500.      500.         3         0         0       .00     74.72  10045.27


*SECNO 3.057

3470 ENCROACHMENT STATIONS=     9975.0   10075.0  TYPE=      1  TARGET=      100.000
    3.057      3.92   1203.32       .00   1203.32   1204.25       .93      2.52       .11   1202.00
    945.0       4.6     865.0      75.4       2.2     107.2      30.0     164.0      44.8   1202.00
      .53      2.09      8.07      2.52      .040      .030      .050      .000   1199.40   9981.70
  .006102     505.      510.      510.         3         0         0       .00     68.21  10049.91


*SECNO 3.148
1
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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


3470 ENCROACHMENT STATIONS=     9977.7   10100.0  TYPE=      1  TARGET=      122.300
    3.148      6.31   1206.31       .00   1206.31   1206.89       .58      2.61       .04 100000.00
    945.0       .0     943.1       1.9       .0     153.9       3.7     166.0      45.7   1206.00
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.56	.00	6.13	.52	.000	.030	.050	.000	1200.00	9981.13
.003495	575.	575.	580.	1	0	0	.00	72.03	10053.16

CNO 3.250
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9939.6 10150.0 TYPE= 1 TARGET= 210.380

DOWNSTREAM OF INDIAN SCHOOL ROAD EXTENDED

CONFLUENCE OF TRACTOR WASH

3.250	1.62	1212.52	1212.52	1212.52	1213.04	.52	3.20	.01	1212.00
945.0	4.1	934.0	6.9	2.4	160.8	5.1	168.0	47.2	1212.00
.58	1.70	5.81	1.36	.040	.030	.050	.000	1210.90	9960.86
.012523	515.	535.	505.	20	14	0	.00	178.73	10139.59

*SECNO 3.344

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.05

3470 ENCROACHMENT STATIONS= 9978.4 10150.0 TYPE= 1 TARGET= 171.570

Q @ X1 = 3.344 TO X1 = 3.912 EQUALS Q AT CP25

3.344	2.89	1215.69	.00	1215.69	1215.94	.26	2.88	.03	1214.00
1010.0	6.5	945.3	58.3	3.5	226.4	34.3	170.5	49.2	1214.00
.62	1.83	4.17	1.70	.040	.030	.050	.000	1212.80	9980.80
.003393	495.	500.	505.	5	0	0	.00	169.20	10150.00

*SECNO 3.439

1

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

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.51

3470 ENCROACHMENT STATIONS= 9974.8 10150.0 TYPE= 1 TARGET= 175.170

3.439	2.94	1216.44	.00	1216.41	1216.51	.07	.55	.02	1214.00
1010.0	4.4	1005.6	.0	5.0	456.9	.0	174.6	51.2	100000.00
.68	.89	2.20	.00	.040	.030	.000	.000	1213.50	9975.94
.000538	500.	500.	500.	4	0	0	.00	174.06	10150.00

*SECNO 3.535

3301 HV CHANGED MORE THAN HVINS

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

) ENCROACHMENT STATIONS= 9976.9 10089.4 TYPE= 1 TARGET= 112.520

3.535	2.09	1216.89	1216.89	1216.89	1217.61	.73	.74	.20	1216.00
1010.0	2.2	1002.4	5.4	1.0	146.2	2.9	178.2	52.9	1216.00
.70	2.21	6.86	1.85	.040	.030	.050	.000	1214.80	9977.78
.011589	500.	505.	500.	20	19	0	.00	108.87	10086.65

*SECNO 3.631

3470 ENCROACHMENT STATIONS= 9976.7 10031.7 TYPE= 1 TARGET= 55.040

3.631	3.47	1221.67	1221.60	1221.67	1222.81	1.14	5.07	.12	1220.00
1010.0	5.7	996.2	8.1	2.1	115.7	3.5	179.8	53.8	1220.00
.72	2.71	8.61	2.33	.040	.030	.050	.000	1218.20	9977.49
.008623	510.	510.	510.	7	14	0	.00	51.68	10029.18

*SECNO 3.724
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9975.8 10070.0 TYPE= 1 TARGET= 94.180

3.724	4.11	1230.71	1230.71	1230.02	1231.63	.92	4.09	.02	1230.00
1010.0	4.2	946.1	59.7	2.1	119.5	28.4	181.3	54.6	1230.00
.74	2.01	7.92	2.10	.040	.030	.050	.000	1226.60	9975.82
.008110	495.	490.	480.	20	11	0	.00	94.18	10070.00

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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

*SECNO 3.818
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9981.3 10070.0 TYPE= 1 TARGET= 88.660

3.818	3.53	1235.83	1235.83	1235.86	1236.74	.90	4.46	.00	1234.00
1010.0	8.9	816.9	184.2	2.8	98.2	52.6	183.0	55.7	1235.30
.75	3.17	8.32	3.50	.040	.030	.050	.000	1232.30	9981.95
.010027	495.	495.	500.	4	15	0	.00	88.05	10070.00

*SECNO 3.912
7185 MINIMUM SPECIFIC ENERGY
20 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9972.3 10070.0 TYPE= 1 TARGET= 97.710

3.912	3.41	1242.51	1242.51	1242.51	1243.52	1.01	4.12	.03	1240.00
1010.0	27.2	885.8	97.1	7.9	103.7	37.0	184.7	56.6	1240.00
.77	3.45	8.54	2.62	.040	.030	.050	.000	1239.10	9973.72
.007006	495.	495.	495.	3	8	0	.00	86.52	10060.24

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*SECNO 4.006
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9980.9   10041.6  TYPE=      1  TARGET=       60.699

          Q @ X1 = 4.006 TO X1 = 4.653 EQUALS (Q AT CP25 + Q AT CP22A2)/2

     4.006      2.93   1248.93   1248.93   1248.92   1249.92      1.00      4.19       .00 100000.00
     820.0        .0     820.0       .0        .0     102.4        .0     186.2      57.4 100000.00
       .79       .00      8.01       .00      .000      .030      .000      .000   1246.00   9982.69
   .010679      500.      500.      505.        20        11         0       .00     51.57  10034.26


*SECNO 4.101
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9920.0   10070.0  TYPE=      1  TARGET=      150.000
     4.101      1.77   1257.57   1257.57   1257.50   1258.13       .56      5.17       .04   1256.50
     820.0      77.1     655.9      87.0      27.2      99.5      29.9     187.7      58.5   1256.50
       .81      2.84      6.59      2.91      .040      .030      .050      .000   1255.80   9928.56
   .010033      495.      500.      500.         3        14         0       .00    141.44  10070.00


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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


*SECNO 4.196

3470 ENCROACHMENT STATIONS=     9967.5   10058.1  TYPE=      1  TARGET=       90.620
     4.196      2.54   1262.34   1262.33   1262.32   1263.25       .90      5.01       .10 100000.00
     820.0        .0     818.2       1.8        .0     107.3       2.0     189.2      59.7   1262.00
       .83       .00      7.63       .93      .000      .030      .050      .000   1259.80   9969.13
   .010032      500.      500.      495.         5        11         0       .00     67.16  10036.29


*SECNO 4.289
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9949.6   10070.0  TYPE=      1  TARGET=      120.410

          UPSTREAM OF CAMELBACK ROAD EXTENDED

     4.289      2.46   1269.86   1269.86   1269.93   1270.52       .66      4.94       .02   1268.00
     820.0      91.0     444.0     285.1      25.9      53.9      80.1     190.7      60.8   1268.00
       .85      3.52      8.23      3.56      .040      .030      .050      .000   1267.40   9957.15
   .009934      495.      495.      495.        10         8         0       .00    112.85  10070.00


*SECNO 4.375
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3470 ENCROACHMENT STATIONS=     9992.1   10090.0  TYPE=      1  TARGET=      97.920
     4.375      2.27   1273.97      .00   1273.90   1274.54      .56      4.01      .01   1272.00
     820.0       6.8     469.3    343.8       2.4      63.7     98.0     192.4     61.8   1272.00
       .88      2.81      7.37     3.51      .040      .030     .050      .000   1271.70   9992.53
   .008117      445.      450.     445.         4         0        0       .00     97.46  10090.00


*SECNO 4.469

3470 ENCROACHMENT STATIONS=     9984.5   10090.0  TYPE=      1  TARGET=     105.460
     4.469      2.52   1277.62      .00   1277.66   1278.17      .55      3.63       .00   1276.00
     820.0      16.7     667.6    135.8       6.5     103.1     52.1     194.2      63.0   1276.00
       .90      2.57      6.47     2.61      .040      .030     .050      .000   1275.10   9986.94
   .006523      500.      500.     500.         4         0        0       .00    103.06  10090.00


*SECNO 4.563
1
   14SEP94      20:51:26                                                                          PAGE   45


    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


3470 ENCROACHMENT STATIONS=     9973.2   10070.0  TYPE=      1  TARGET=      96.760
     4.563      2.94   1281.04   1280.98   1281.01   1281.74      .70      3.53       .04   1280.00
     820.0       8.7     760.6     50.7       4.1     109.7     23.2     195.9      64.1   1280.00
       .92      2.12      6.93     2.19      .040      .030     .050      .000   1278.10   9977.17
   .007837      500.      495.     495.         6         8        0       .00     92.83  10070.00


*SECNO 4.653

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.26


3470 ENCROACHMENT STATIONS=     9961.0   10070.0  TYPE=      1  TARGET=     109.050
     4.653      3.26   1282.96      .00   1282.98   1283.19      .23      1.40       .05   1282.00
     820.0       1.0     809.1      9.9       1.2     210.5     13.9     197.9      65.2   1282.00
       .96       .85      3.84      .71      .040      .030     .050      .000   1279.70   9962.59
   .001532      475.      475.     475.         4         0        0       .00    106.30  10068.89


*SECNO 4.725
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9970.1   10070.0  TYPE=      1  TARGET=      99.860

        Q @ X1= 4.725 EQUALS Q @ CP22A2

        CONFLUENCE OF CATERPILLAR DIKE WASH

     4.725      1.67   1284.67   1284.67   1284.67   1285.32      .66      1.11       .13 100000.00
     640.0        .0     629.2     10.8        .0      95.9      7.2     199.3      66.0   1284.00
       .97       .00      6.56     1.49      .000      .030     .050      .000   1283.00   9972.86
```

.010936 380. 380. 380. 20 11 0 .00 88.81 10061.66

THIS RUN EXECUTED 14SEP94 20:52:34

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

TUTHILL DIKE WASH - WASH

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	SSTA	STCHL	STCHR	ENDST	DIFWSX	TOPWID	DEPTH	ELMIN	10*KS	VCH
	.000	3560.00	1038.69	9947.63	9940.00	10075.00	10066.28	.00	118.65	5.69	1033.00	43.79	7.93
	.000	3560.00	1039.06	9945.48	9940.00	10075.00	10068.73	.00	123.25	6.06	1033.00	33.63	7.21
	.075	3560.00	1040.48	9897.95	9960.00	10070.00	10071.93	1.79	173.98	5.48	1035.00	29.78	6.76
	.075	3560.00	1040.49	9910.00	9960.00	10070.00	10071.98	1.43	161.98	5.49	1035.00	29.57	6.75
*	.186	3560.00	1043.26	9783.94	9970.00	10050.00	10066.32	2.78	224.76	4.76	1038.50	54.68	9.58
*	.186	3560.00	1042.93	9955.36	9970.00	10050.00	10064.64	2.43	109.27	4.43	1038.50	77.03	10.76
	.314	3560.00	1047.36	9558.63	9950.00	10080.00	10076.84	4.10	274.47	4.86	1042.50	61.46	8.60
	.314	3560.00	1047.73	9951.35	9950.00	10080.00	10078.65	4.80	127.30	5.23	1042.50	45.89	7.82
*	.415	3560.00	1051.71	9674.86	9940.00	10060.00	10255.54	4.35	580.68	4.51	1047.20	53.90	7.42
*	.415	3560.00	1051.69	9940.00	9940.00	10060.00	10175.00	3.96	235.00	4.49	1047.20	77.61	8.78
*	.540	3560.00	1057.33	9914.36	9930.00	10040.00	10290.52	5.62	376.16	4.33	1053.00	55.67	8.15
*	.540	3560.00	1057.21	9915.76	9930.00	10040.00	10110.00	5.52	194.24	4.21	1053.00	74.57	9.20
*	.634	3560.00	1061.55	9952.24	9970.00	10040.00	10152.88	4.22	200.64	4.75	1056.80	59.48	9.87
*	.634	3560.00	1061.50	9952.52	9970.00	10040.00	10105.00	4.28	152.47	4.70	1056.80	65.34	10.25
*	.729	3560.00	1065.08	9954.58	9960.00	10085.00	10199.37	3.53	244.78	4.38	1060.70	70.22	8.82
	.729	3560.00	1065.11	9954.41	9960.00	10085.00	10085.00	3.62	130.59	4.41	1060.70	73.71	9.05
*	.823	3560.00	1070.49	9953.77	9955.00	10030.00	10038.20	5.41	84.43	5.99	1064.50	82.20	11.45
*	.823	3560.00	1070.49	9953.78	9955.00	10030.00	10038.12	5.37	84.34	5.99	1064.50	82.50	11.46
	.917	3560.00	1074.46	9957.69	9965.00	10040.00	10060.77	3.97	103.08	5.16	1069.30	65.17	10.64
	.917	3560.00	1074.47	9957.67	9965.00	10040.00	10050.00	3.98	92.33	5.17	1069.30	64.97	10.63
*	1.012	3560.00	1080.33	9938.34	9940.00	10020.00	10023.91	5.87	85.57	4.63	1075.70	85.29	11.28
*	1.012	3560.00	1080.33	9938.36	9940.00	10020.00	10023.87	5.86	85.51	4.63	1075.70	85.54	11.29

	SECNO	Q	CWSEL	SSTA	STCHL	STCHR	ENDST	DIFWSX	TOPWID	DEPTH	ELMIN	10*KS	VCH
	1.067	3580.00	1084.50	9977.70	9977.70	10022.00	10022.00	4.16	44.30	5.86	1078.64	20.97	13.80
	1.067	3580.00	1084.50	9977.70	9977.70	10022.00	10022.00	4.17	44.30	5.86	1078.64	24.57	13.80
*	1.110	3580.00	1091.37	9977.70	9977.70	10022.00	10022.00	6.87	44.30	10.27	1081.10	3.23	7.88
*	1.110	3580.00	1091.37	9977.70	9977.70	10022.00	10022.00	6.87	44.30	10.27	1081.10	4.25	7.87
	1.118	3580.00	1092.52	9920.00	9920.00	10030.00	10100.00	1.15	180.00	11.02	1081.50	1.75	2.50
*	1.118	3580.00	1092.52	9920.00	9920.00	10030.00	10100.00	1.15	180.00	11.02	1081.50	1.75	2.50
*	1.152	3580.00	1092.52	9933.40	9930.00	10045.00	10150.00	.01	216.60	10.52	1082.00	3.59	3.33
*	1.152	3580.00	1092.52	9933.40	9930.00	10045.00	10150.00	.01	216.60	10.52	1082.00	3.59	3.33
*	1.198	3580.00	1092.46	9938.84	9945.00	10030.00	10200.00	-.06	261.16	7.16	1085.30	15.12	5.97
*	1.198	3580.00	1092.46	9938.84	9945.00	10030.00	10200.00	-.06	261.16	7.16	1085.30	15.11	5.97
*	1.260	4250.00	1096.24	9964.39	9975.00	10045.00	10200.00	3.78	235.61	4.74	1091.50	67.33	10.13
*	1.260	4250.00	1096.24	9964.39	9975.00	10045.00	10200.00	3.78	235.61	4.74	1091.50	67.32	10.12
*	1.287	4250.00	1098.28	9978.62	9980.00	10145.00	10149.83	2.03	171.21	4.28	1094.00	95.37	9.43
*	1.287	4250.00	1098.26	9978.68	9980.00	10145.00	10145.00	2.02	166.32	4.26	1094.00	96.93	9.47
*	1.313	4250.00	1099.72	9926.76	9950.00	10025.00	10067.18	1.44	140.42	4.72	1095.00	73.67	11.10
*	1.313	4250.00	1099.72	9926.74	9950.00	10025.00	10067.21	1.46	140.46	4.72	1095.00	73.50	11.09
*	1.322	4250.00	1101.73	9888.02	9930.00	10110.00	10110.00	2.01	221.98	6.73	1095.00	4.62	3.53
*	1.322	4250.00	1101.72	9888.02	9930.00	10110.00	10110.00	2.00	221.98	6.72	1095.00	4.63	3.53
*	1.362	4280.00	1101.88	9905.88	9950.00	10045.00	10100.00	.16	194.12	19.88	1082.00	.48	2.20
*	1.362	4280.00	1101.88	9905.88	9950.00	10045.00	10100.00	.16	194.12	19.88	1082.00	.48	2.20
*	1.422	4280.00	1105.08	9954.62	9945.00	10045.00	10037.69	3.19	83.07	6.58	1098.50	83.51	11.89
*	1.422	4280.00	1105.08	9954.62	9945.00	10045.00	10037.69	3.19	83.07	6.58	1098.50	83.50	11.89
*	1.518	4280.00	1112.73	9970.91	9975.00	10055.00	10230.45	7.65	185.71	5.83	1106.90	69.57	10.74
*	1.518	4280.00	1112.96	9970.57	9975.00	10055.00	10059.78	7.88	89.21	6.06	1106.90	80.04	11.94
*	1.614	4280.00	1121.69	9975.77	9975.00	10055.00	10053.46	8.97	77.69	7.79	1113.90	83.79	12.18
*	1.614	4280.00	1121.68	9975.81	9975.00	10055.00	10053.38	8.72	77.57	7.78	1113.90	84.63	12.22
*	1.710	4210.00	1129.13	9974.35	9965.00	10070.00	10042.82	7.44	68.47	9.13	1120.00	84.14	12.66
*	1.710	4210.00	1129.13	9974.35	9965.00	10070.00	10042.82	7.45	68.47	9.13	1120.00	84.15	12.66
*	1.805	4210.00	1136.57	9973.57	9970.00	10050.00	10042.87	7.44	69.30	8.97	1127.60	82.45	12.55
*	1.805	4210.00	1136.58	9973.56	9970.00	10050.00	10042.88	7.45	69.32	8.98	1127.60	82.39	12.54
*	1.898	4210.00	1144.08	9973.89	9980.00	10020.00	10106.89	7.50	133.00	6.78	1137.30	64.69	12.69
*	1.898	4210.00	1143.91	9974.13	9980.00	10020.00	10070.00	7.34	95.87	6.61	1137.30	76.24	13.52
*	1.994	4210.00	1150.84	9972.89	9975.00	10050.00	10066.89	6.77	94.00	7.34	1143.50	79.23	12.03
*	1.994	4210.00	1150.86	9972.85	9975.00	10050.00	10067.17	6.95	94.31	7.36	1143.50	78.44	12.00

	SECNO	Q	CWSEL	SSTA	STCHL	STCHR	ENDST	DIFWSX	TOPWID	DEPTH	ELMIN	10*KS	VCH
*	2.088	4210.00	1158.00	9975.01	9975.00	10055.00	10089.97	7.15	102.51	7.90	1150.10	74.54	11.77

*	2.088	4210.00	1157.84	9975.27	9975.00	10055.00	10049.18	6.98	73.91	7.74	1150.10	84.10	12.34
*	2.170	4140.00	1166.51	9965.82	9940.00	10135.00	10120.10	8.51	154.28	3.91	1162.60	96.10	9.60
*	2.170	4140.00	1166.53	9965.78	9940.00	10135.00	10120.30	8.69	154.51	3.93	1162.60	94.05	9.53
	2.279	4140.00	1175.23	9954.02	9940.00	10045.00	10037.85	8.72	83.83	5.93	1169.30	85.33	11.74
*	2.279	4140.00	1175.23	9954.02	9940.00	10045.00	10037.85	8.70	83.83	5.93	1169.30	85.28	11.73
	2.373	4140.00	1179.02	9960.00	9960.00	10015.00	10147.81	3.78	187.81	7.02	1172.00	45.53	10.41
	2.373	4140.00	1178.99	9960.00	9960.00	10015.00	10079.75	3.76	119.75	6.99	1172.00	48.00	10.66
*	2.468	4140.00	1183.61	9950.20	9975.00	10015.00	10077.05	4.59	126.85	6.31	1177.30	71.51	12.84
*	2.468	4140.00	1183.61	9950.15	9975.00	10015.00	10077.11	4.63	126.96	6.31	1177.30	71.10	12.82
*	2.563	4140.00	1189.53	9966.18	9980.00	10025.00	10264.37	5.92	193.37	7.23	1182.30	49.85	12.01
*	2.563	4140.00	1189.47	9966.33	9980.00	10025.00	10100.00	5.85	133.67	7.17	1182.30	53.70	12.38
*	2.659	4140.00	1192.83	9970.28	9975.00	10025.00	10145.41	3.31	175.13	7.03	1185.80	51.80	11.36
*	2.659	4140.00	1192.66	9970.58	9975.00	10025.00	10100.00	3.19	129.42	6.86	1185.80	60.78	12.05
*	2.753	945.00	1196.36	9923.68	9975.00	10070.00	10078.95	3.53	116.92	6.06	1190.30	16.54	3.79
*	2.753	945.00	1196.56	9922.63	9975.00	10070.00	10084.05	3.91	131.39	6.26	1190.30	12.79	3.50
*	2.848	945.00	1197.43	9982.87	9980.00	10025.00	10041.41	1.07	54.17	4.23	1193.20	92.77	8.82
*	2.848	945.00	1197.43	9982.84	9980.00	10025.00	10041.45	.87	54.29	4.23	1193.20	92.16	8.80
*	2.943	945.00	1201.06	9970.54	9945.00	10020.00	10045.28	3.63	74.75	5.26	1195.80	40.70	6.25
*	2.943	945.00	1201.05	9970.55	9945.00	10020.00	10045.27	3.62	74.72	5.25	1195.80	40.86	6.26
	3.057	945.00	1203.32	9981.70	9985.00	10020.00	10049.89	2.26	68.19	3.92	1199.40	61.17	8.07
	3.057	945.00	1203.32	9981.70	9985.00	10020.00	10049.91	2.27	68.21	3.92	1199.40	61.02	8.07
	3.148	945.00	1206.31	9981.13	9975.00	10030.00	10053.28	2.99	72.14	6.31	1200.00	34.89	6.13
	3.148	945.00	1206.31	9981.13	9975.00	10030.00	10053.16	2.99	72.03	6.31	1200.00	34.95	6.13
*	3.250	945.00	1212.52	9960.85	9970.00	10120.00	10139.62	6.21	178.77	1.62	1210.90	124.94	5.80
*	3.250	945.00	1212.52	9960.86	9970.00	10120.00	10139.59	6.21	178.73	1.62	1210.90	125.23	5.81
*	3.344	1010.00	1215.69	9980.79	9985.00	10115.00	10157.07	3.16	176.28	2.89	1212.80	34.02	4.18
*	3.344	1010.00	1215.69	9980.80	9985.00	10115.00	10150.00	3.16	169.20	2.89	1212.80	33.93	4.17
*	3.439	1010.00	1216.41	9975.98	9980.00	10150.00	10206.18	.72	230.20	2.91	1213.50	4.84	2.09
*	3.439	1010.00	1216.44	9975.94	9980.00	10150.00	10150.00	.75	174.06	2.94	1213.50	5.38	2.20
*	3.535	1010.00	1216.89	9977.78	9980.00	10080.00	10086.65	.48	108.87	2.09	1214.80	115.89	6.86
*	3.535	1010.00	1216.89	9977.78	9980.00	10080.00	10086.65	.45	108.87	2.09	1214.80	115.89	6.86
	3.631	1010.00	1221.67	9977.49	9980.00	10025.00	10029.18	4.78	51.68	3.47	1218.20	86.23	8.61
	3.631	1010.00	1221.67	9977.49	9980.00	10025.00	10029.18	4.78	51.68	3.47	1218.20	86.23	8.61

1

	SECNO	Q	CWSEL	SSTA	STCHL	STCHR	ENDST	DIFWSX	TOPWID	DEPTH	ELMIN	10*KS	VCH
	3.724	1010.00	1230.02	9979.81	9980.00	10030.00	10165.19	8.35	185.38	3.42	1226.60	114.62	7.50
*	3.724	1010.00	1230.71	9975.82	9980.00	10030.00	10070.00	9.04	94.18	4.11	1226.60	81.10	7.92
*	3.818	1010.00	1235.86	9981.89	9985.00	10030.00	10221.55	5.85	239.65	3.56	1232.30	69.90	7.01
*	3.818	1010.00	1235.83	9981.95	9985.00	10030.00	10070.00	5.12	88.05	3.53	1232.30	100.27	8.32

*	3.912	1010.00	1242.51	9973.71	9980.00	10015.00	10060.28	6.65	86.57	3.41	1239.10	69.87	8.54
*	3.912	1010.00	1242.51	9973.72	9980.00	10015.00	10060.24	6.68	86.52	3.41	1239.10	70.06	8.54
*	4.006	820.00	1248.92	9982.71	9980.00	10045.00	10034.16	6.40	51.45	2.92	1246.00	108.18	8.05
	4.006	820.00	1248.93	9982.69	9980.00	10045.00	10034.26	6.41	51.57	2.93	1246.00	106.79	8.01
*	4.101	820.00	1257.50	9930.55	9975.00	10040.00	10125.49	8.59	194.94	1.70	1255.80	96.63	6.29
*	4.101	820.00	1257.57	9928.56	9975.00	10040.00	10070.00	8.64	141.44	1.77	1255.80	100.33	6.59
*	4.196	820.00	1262.32	9969.19	9965.00	10025.00	10035.49	4.82	66.30	2.52	1259.80	104.67	7.73
	4.196	820.00	1262.34	9969.13	9965.00	10025.00	10036.29	4.78	67.16	2.54	1259.80	100.32	7.63
*	4.289	820.00	1269.93	9955.99	9985.00	10010.00	10121.20	7.61	165.20	2.53	1267.40	85.56	7.82
*	4.289	820.00	1269.86	9957.15	9985.00	10010.00	10070.00	7.51	112.85	2.46	1267.40	99.34	8.23
	4.375	820.00	1273.90	9992.63	9995.00	10025.00	10107.71	3.97	115.08	2.20	1271.70	93.23	7.71
	4.375	820.00	1273.97	9992.53	9995.00	10025.00	10090.00	4.12	97.46	2.27	1271.70	81.17	7.37
	4.469	820.00	1277.66	9986.70	9995.00	10045.00	10133.02	3.76	146.32	2.56	1275.10	58.33	6.22
	4.469	820.00	1277.62	9986.94	9995.00	10045.00	10090.00	3.64	103.06	2.52	1275.10	65.23	6.47
*	4.563	820.00	1281.01	9977.43	9985.00	10040.00	10095.52	3.34	118.09	2.91	1278.10	83.77	7.08
	4.563	820.00	1281.04	9977.17	9985.00	10040.00	10070.00	3.43	92.83	2.94	1278.10	78.37	6.93
*	4.653	820.00	1282.98	9962.56	9965.00	10040.00	10069.33	1.97	106.77	3.28	1279.70	15.05	3.82
*	4.653	820.00	1282.96	9962.59	9965.00	10040.00	10068.89	1.92	106.30	3.26	1279.70	15.32	3.84
*	4.725	640.00	1284.67	9972.83	9965.00	10040.00	10061.87	1.70	89.04	1.67	1283.00	107.78	6.53
*	4.725	640.00	1284.67	9972.86	9965.00	10040.00	10061.66	1.70	88.81	1.67	1283.00	109.36	6.56

TUTHILL DIKE WASH - WASH

SUMMARY PRINTOUT TABLE 110

	SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
	.000	1038.69	-1.31	1039.67	118.65	.00	3560.00	.00	.00	.00	9940.00	10075.00	.00
	.000	1039.06	.37	1039.87	123.25	.00	3560.00	.00	123.25	9945.48	9940.00	10075.00	10068.73
	.075	1040.48	.00	1041.13	173.98	616.74	2942.90	.36	.00	.00	9960.00	10070.00	.00
	.075	1040.49	.01	1041.14	161.98	612.44	2947.18	.38	163.38	9910.00	9960.00	10070.00	10073.38
*	.186	1043.26	.00	1044.58	224.76	216.17	3243.69	100.14	.00	.00	9970.00	10050.00	.00
*	.186	1042.93	-.34	1044.64	109.27	118.50	3352.62	88.87	118.55	9950.00	9970.00	10050.00	10068.55
	.314	1047.36	.00	1048.50	274.47	34.82	3525.18	.00	.00	.00	9950.00	10080.00	.00
	.314	1047.73	.37	1048.68	127.30	.00	3560.00	.00	155.00	9925.00	9950.00	10080.00	10080.00
*	.415	1051.71	.00	1052.37	580.68	455.53	2601.17	503.30	.00	.00	9940.00	10060.00	.00
*	.415	1051.69	-.02	1052.75	235.00	.00	3054.29	505.71	235.00	9940.00	9940.00	10060.00	10175.00
	.540	1057.33	.00	1058.20	376.16	29.17	2943.90	586.93	.00	.00	9930.00	10040.00	.00
*	.540	1057.21	-.12	1058.42	194.24	26.32	3204.76	328.91	198.25	9911.75	9930.00	10040.00	10110.00
*	.634	1061.55	.00	1062.82	200.64	174.45	2867.40	518.15	.00	.00	9970.00	10040.00	.00
*	.634	1061.50	-.06	1062.90	152.47	175.12	2937.01	447.86	154.02	9950.98	9970.00	10040.00	10105.00

*	.729	1065.08	.00	1066.25	244.78	7.99	3423.84	128.17	.00	.00	9960.00	10085.00	.00
	.729	1065.11	.03	1066.38	130.59	8.89	3551.11	.00	131.48	9953.52	9960.00	10085.00	10085.00
*	.823	1070.49	.00	1072.53	84.43	.51	3556.83	2.66	.00	.00	9955.00	10030.00	.00
	.823	1070.49	.00	1072.53	84.34	.50	3556.90	2.60	92.56	9952.71	9955.00	10030.00	10045.27
	.917	1074.46	.00	1076.20	103.08	36.61	3517.98	5.41	.00	.00	9965.00	10040.00	.00
	.917	1074.47	.00	1076.20	92.33	36.74	3518.02	5.23	93.70	9956.30	9965.00	10040.00	10050.00
*	1.012	1080.33	.00	1082.31	85.57	.38	3558.95	.67	.00	.00	9940.00	10020.00	.00
*	1.012	1080.33	.00	1082.31	85.51	.37	3558.98	.66	92.20	9936.36	9940.00	10020.00	10028.56
*	1.067	1084.50	.00	1087.45	44.30	.00	3580.00	.00	.00	.00	9977.70	10022.00	.00
*	1.067	1084.50	.00	1087.46	44.30	.00	3580.00	.00	44.30	9977.70	9977.70	10022.00	10022.00
*	1.110	1091.37	.00	1092.33	44.30	.00	3580.00	.00	.00	.00	9977.70	10022.00	.00
*	1.110	1091.37	.00	1092.33	44.30	.00	3580.00	.00	72.00	9950.00	9977.70	10022.00	10022.00
	1.118	1092.52	.00	1092.60	180.00	.00	2088.88	1491.12	180.00	9920.00	9920.00	10030.00	10100.00
*	1.118	1092.52	.00	1092.60	180.00	.00	2088.90	1491.10	180.00	9920.00	9920.00	10030.00	10100.00
*	1.152	1092.52	.00	1092.66	216.60	.00	2521.34	1058.66	220.00	9930.00	9930.00	10045.00	10150.00
*	1.152	1092.52	.00	1092.66	216.60	.00	2521.29	1058.71	220.00	9930.00	9930.00	10045.00	10150.00
*	1.198	1092.46	.00	1092.91	261.16	17.47	2795.18	767.35	275.00	9925.00	9945.00	10030.00	10200.00
*	1.198	1092.46	.00	1092.91	261.16	17.48	2794.86	767.66	275.00	9925.00	9945.00	10030.00	10200.00

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	SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
*	1.260	1096.24	.00	1097.41	235.61	57.75	2805.72	1386.53	255.00	9945.00	9975.00	10045.00	10200.00
*	1.260	1096.24	.00	1097.41	235.61	57.75	2805.66	1386.58	255.00	9945.00	9975.00	10045.00	10200.00
*	1.287	1098.28	.00	1099.66	171.21	.24	4249.11	.64	.00	.00	9980.00	10145.00	.00
*	1.287	1098.26	-.01	1099.66	166.32	.22	4249.78	.00	171.04	9973.96	9980.00	10145.00	10145.00
*	1.313	1099.72	.00	1101.39	140.42	275.43	3510.96	463.61	159.86	9920.14	9950.00	10025.00	10080.00
*	1.313	1099.72	.00	1101.39	140.46	275.62	3510.48	463.91	159.86	9920.14	9950.00	10025.00	10080.00
*	1.322	1101.73	.00	1101.91	221.98	294.32	3955.68	.00	234.10	9875.90	9930.00	10110.00	10110.00
*	1.322	1101.72	.00	1101.91	221.98	294.27	3955.73	.00	234.10	9875.90	9930.00	10110.00	10110.00
*	1.362	1101.88	.00	1101.95	194.12	321.34	3439.02	519.64	222.76	9877.24	9950.00	10045.00	10100.00
*	1.362	1101.88	.00	1101.95	194.12	321.32	3439.06	519.62	222.76	9877.24	9950.00	10045.00	10100.00
*	1.422	1105.08	.00	1107.27	83.07	.00	4280.00	.00	.00	.00	9945.00	10045.00	.00
*	1.422	1105.08	.00	1107.27	83.07	.00	4280.00	.00	96.01	9948.99	9945.00	10045.00	10045.00
*	1.518	1112.73	.00	1114.28	185.71	18.78	3629.04	632.18	.00	.00	9975.00	10055.00	.00
*	1.518	1112.96	.23	1115.15	89.21	24.99	4251.35	3.66	120.60	9969.40	9975.00	10055.00	10090.00
*	1.614	1121.69	.00	1123.99	77.69	.00	4280.00	.00	.00	.00	9975.00	10055.00	.00
	1.614	1121.68	-.02	1124.00	77.57	.00	4280.00	.00	142.28	9967.72	9975.00	10055.00	10110.00
*	1.710	1129.13	.00	1131.62	68.47	.00	4210.00	.00	.00	.00	9965.00	10070.00	.00
*	1.710	1129.13	.00	1131.62	68.47	.00	4210.00	.00	105.00	9965.00	9965.00	10070.00	10070.00
*	1.805	1136.57	.00	1139.02	69.30	.00	4210.00	.00	.00	.00	9970.00	10050.00	.00
*	1.805	1136.58	.00	1139.02	69.32	.00	4210.00	.00	80.25	9969.75	9970.00	10050.00	10050.00

*	1.898	1144.08	.00	1145.95	133.00	52.93	2920.02	1237.05	.00	.00	9980.00	10020.00	.00
*	1.898	1143.91	-.16	1146.11	95.87	51.48	3020.29	1138.23	97.93	9972.07	9980.00	10020.00	10070.00
	1.994	1150.84	.00	1153.09	94.00	1.58	4197.81	10.61	.00	.00	9975.00	10050.00	.00
	1.994	1150.86	.01	1153.09	94.31	1.64	4197.34	11.02	123.75	9969.06	9975.00	10050.00	10092.81
*	2.088	1158.00	.00	1160.12	102.51	.00	4156.56	53.44	.00	.00	9975.00	10055.00	.00
*	2.088	1157.84	-.16	1160.20	73.91	.00	4210.00	.00	83.55	9971.45	9975.00	10055.00	10055.00
*	2.170	1166.51	.00	1167.94	154.28	.00	4140.00	.00	.00	.00	9940.00	10135.00	.00
*	2.170	1166.53	.02	1167.94	154.51	.00	4140.00	.00	164.59	9964.34	9940.00	10135.00	10128.93
*	2.279	1175.23	.00	1177.37	83.83	.00	4140.00	.00	.00	.00	9940.00	10045.00	.00
*	2.279	1175.23	.00	1177.37	83.83	.00	4140.00	.00	94.03	9945.88	9940.00	10045.00	10039.91
	2.373	1179.02	.00	1180.45	187.81	.00	3446.04	693.96	.00	.00	9960.00	10015.00	.00
	2.373	1178.99	-.03	1180.53	119.75	.00	3512.01	627.99	129.96	9950.04	9960.00	10015.00	10080.00
*	2.468	1183.61	.00	1185.50	126.85	206.70	2799.56	1133.74	.00	.00	9975.00	10015.00	.00
*	2.468	1183.61	.01	1185.50	126.96	207.28	2798.13	1134.58	138.97	9941.03	9975.00	10015.00	10080.00

	SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
*	2.563	1189.53	.00	1191.43	193.37	187.76	3445.20	507.04	.00	.00	9980.00	10025.00	.00
*	2.563	1189.47	-.06	1191.54	133.67	189.43	3521.18	429.39	155.19	9944.81	9980.00	10025.00	10100.00
*	2.659	1192.83	.00	1194.46	175.13	20.35	3271.85	847.79	.00	.00	9975.00	10025.00	.00
*	2.659	1192.66	-.18	1194.54	129.42	18.55	3364.08	757.37	131.45	9968.55	9975.00	10025.00	10100.00
*	2.753	1196.36	.00	1196.58	116.92	.79	943.59	.61	.00	.00	9975.00	10070.00	.00
*	2.753	1196.56	.20	1196.75	131.39	2.86	940.33	1.80	192.33	9917.67	9975.00	10070.00	10110.00
*	2.848	1197.43	.00	1198.62	54.17	.00	932.63	12.37	.00	.00	9980.00	10025.00	.00
*	2.848	1197.43	.01	1198.62	54.29	.00	932.48	12.52	116.00	9964.00	9980.00	10025.00	10080.00
*	2.943	1201.06	.00	1201.63	74.75	.00	878.95	66.05	.00	.00	9945.00	10020.00	.00
*	2.943	1201.05	.00	1201.62	74.72	.00	879.11	65.89	107.40	9960.50	9945.00	10020.00	10067.90
	3.057	1203.32	.00	1204.25	68.19	4.56	865.15	75.30	.00	.00	9985.00	10020.00	.00
	3.057	1203.32	.00	1204.25	68.21	4.57	865.02	75.41	100.00	9975.00	9985.00	10020.00	10075.00
	3.148	1206.31	.00	1206.89	72.14	.00	943.06	1.94	.00	.00	9975.00	10030.00	.00
	3.148	1206.31	.00	1206.89	72.03	.00	943.09	1.91	122.30	9977.70	9975.00	10030.00	10100.00
*	3.250	1212.52	.00	1213.04	178.77	4.06	933.97	6.97	.00	.00	9970.00	10120.00	.00
*	3.250	1212.52	.00	1213.04	178.73	4.05	934.00	6.95	210.38	9939.62	9970.00	10120.00	10150.00
*	3.344	1215.69	.00	1215.94	176.28	6.51	948.83	54.66	.00	.00	9985.00	10115.00	.00
*	3.344	1215.69	.00	1215.94	169.20	6.47	945.27	58.26	171.57	9978.43	9985.00	10115.00	10150.00
	3.439	1216.41	.00	1216.47	230.20	4.05	947.56	58.38	.00	.00	9980.00	10150.00	.00
	3.439	1216.44	.03	1216.51	174.06	4.40	1005.60	.00	175.17	9974.83	9980.00	10150.00	10150.00
*	3.535	1216.89	.00	1217.61	108.87	2.17	1002.37	5.45	.00	.00	9980.00	10080.00	.00
*	3.535	1216.89	.00	1217.61	108.87	2.17	1002.37	5.45	112.52	9976.87	9980.00	10080.00	10089.39
	3.631	1221.67	.00	1222.81	51.68	5.66	996.21	8.12	.00	.00	9980.00	10025.00	.00

	3.631	1221.67	.00	1222.81	51.68	5.66	996.21	8.12	55.04	9976.66	9980.00	10025.00	10031.70
*	3.724	1230.02	.00	1230.69	185.38	.00	636.97	373.02	.00	.00	9980.00	10030.00	.00
*	3.724	1230.71	.69	1231.63	94.18	4.21	946.06	59.73	94.18	9975.82	9980.00	10030.00	10070.00
	3.818	1235.86	.00	1236.42	239.65	7.75	698.73	303.52	.00	.00	9985.00	10030.00	.00
*	3.818	1235.83	-.03	1236.74	88.05	8.87	816.95	184.18	88.66	9981.34	9985.00	10030.00	10070.00
*	3.912	1242.51	.00	1243.52	86.57	27.20	885.57	97.23	.00	.00	9980.00	10015.00	.00
*	3.912	1242.51	.00	1243.52	86.52	27.18	885.76	97.06	97.71	9972.29	9980.00	10015.00	10070.00
*	4.006	1248.92	.00	1249.92	51.45	.00	820.00	.00	.00	.00	9980.00	10045.00	.00
*	4.006	1248.93	.01	1249.92	51.57	.00	820.00	.00	60.70	9980.86	9980.00	10045.00	10041.56
*	4.101	1257.50	.00	1257.98	194.94	64.21	599.81	155.98	.00	.00	9975.00	10040.00	.00
*	4.101	1257.57	.06	1258.13	141.44	77.12	655.85	87.03	150.00	9920.00	9975.00	10040.00	10070.00

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	SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
*	4.196	1262.32	.00	1263.25	66.30	.00	818.47	1.53	.00	.00	9965.00	10025.00	.00
	4.196	1262.34	.02	1263.25	67.16	.00	818.18	1.82	90.62	9967.46	9965.00	10025.00	10058.08
*	4.289	1269.93	.00	1270.50	165.20	94.11	436.91	288.99	.00	.00	9985.00	10010.00	.00
*	4.289	1269.86	-.08	1270.52	112.85	90.97	443.98	285.05	120.41	9949.59	9985.00	10010.00	10070.00
	4.375	1273.90	.00	1274.51	115.08	6.60	473.39	340.00	.00	.00	9995.00	10025.00	.00
	4.375	1273.97	.07	1274.54	97.46	6.84	469.33	343.83	97.92	9992.08	9995.00	10025.00	10090.00
	4.469	1277.66	.00	1278.16	146.32	17.05	656.01	146.94	.00	.00	9995.00	10045.00	.00
	4.469	1277.62	-.05	1278.17	103.06	16.67	667.57	135.76	105.46	9984.54	9995.00	10045.00	10090.00
*	4.563	1281.01	.00	1281.74	118.09	8.19	763.51	48.31	.00	.00	9985.00	10040.00	.00
	4.563	1281.04	.04	1281.74	92.83	8.67	760.65	50.68	96.76	9973.24	9985.00	10040.00	10070.00
*	4.653	1282.98	.00	1283.20	106.77	1.02	808.73	10.25	.00	.00	9965.00	10040.00	.00
*	4.653	1282.96	-.01	1283.19	106.30	.99	809.08	9.94	109.05	9960.95	9965.00	10040.00	10070.00
*	4.725	1284.67	.00	1285.32	89.04	.00	629.02	10.98	.00	.00	9965.00	10040.00	.00
*	4.725	1284.67	-.01	1285.32	88.81	.00	629.21	10.78	99.86	9970.14	9965.00	10040.00	10070.00

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SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION SECNO=      .186  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      .186  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      .186  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      .186  PROFILE=  2  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      .415  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      .415  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      .415  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      .415  PROFILE=  2  MINIMUM SPECIFIC ENERGY
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CAUTION SECNO=      .540  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      .540  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      .540  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      .540  PROFILE=  2  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      .634  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      .634  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      .634  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      .634  PROFILE=  2  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      .729  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      .729  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      .823  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      .823  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      .823  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      .823  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      .823  PROFILE=  2  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=     1.012  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.012  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.012  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     1.012  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.012  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.012  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=     1.067  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.067  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.067  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     1.067  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.067  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.067  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=     1.110  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     1.110  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     1.118  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     1.152  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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CAUTION SECNO=      2.468  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

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CAUTION SECNO=      3.535  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.535  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

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FLOODWAY DATA, TUTHILL DIKE WASH - WASH
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WATER SURFACE ELEVATION WITHOUT FLOODWAY	DIFFERENCE
.000	123.	494.	7.2	1039.1	1038.7	.4
.075	162.	562.	6.3	1040.5	1040.5	.0
.186	109.	355.	10.0	1043.0	1043.3	-.3
.314	127.	455.	7.8	1047.8	1047.4	.4
.415	235.	485.	7.3	1051.7	1051.7	.0
.540	194.	445.	8.0	1057.2	1057.3	-.1
.634	152.	422.	8.4	1061.5	1061.6	-.1
.729	131.	396.	9.0	1065.1	1065.1	.0
.823	84.	313.	11.4	1070.5	1070.5	.0
.917	92.	342.	10.4	1074.5	1074.5	.0
1.012	86.	316.	11.3	1080.3	1080.3	.0
1.067	44.	259.	13.8	1084.5	1084.5	.0
1.110	44.	455.	7.9	1091.4	1091.4	.0
1.118	180.	1544.	2.3	1092.5	1092.5	.0
1.152	217.	1281.	2.8	1092.5	1092.5	.0
1.198	261.	815.	4.4	1092.5	1092.5	.0
1.260	236.	587.	7.2	1096.2	1096.2	.0
1.287	166.	449.	9.5	1098.3	1098.3	.0
1.313	140.	443.	9.6	1099.7	1099.7	.0
1.322	222.	1242.	3.4	1101.7	1101.7	.0
1.362	194.	2297.	1.9	1101.9	1101.9	.0
1.422	83.	360.	11.9	1105.1	1105.1	.0
1.518	89.	365.	11.7	1112.9	1112.7	.2
1.614	78.	350.	12.2	1121.7	1121.7	.0
1.710	68.	333.	12.7	1129.1	1129.1	.0
1.805	69.	336.	12.5	1136.6	1136.6	.0
1.898	96.	420.	10.0	1143.9	1144.1	-.2
1.994	94.	358.	11.8	1150.8	1150.8	.0
2.088	74.	341.	12.3	1157.8	1158.0	-.2
2.170	155.	435.	9.5	1166.5	1166.5	.0
2.279	84.	353.	11.7	1175.2	1175.2	.0
2.373	120.	471.	8.8	1179.0	1179.0	.0
2.468	127.	457.	9.1	1183.6	1183.6	.0
2.563	134.	432.	9.6	1189.4	1189.5	-.1
2.659	129.	461.	9.0	1192.6	1192.8	-.2
2.753	161.	278.	3.4	1196.6	1196.4	.2
2.848	59.	113.	8.4	1197.4	1197.4	.0
2.943	75.	170.	5.6	1201.1	1201.1	.0
3.057	68.	139.	6.8	1203.3	1203.3	.0
3.148	72.	158.	6.0	1206.3	1206.3	.0

3.250	179.	168.	5.6	1212.5	1212.5	.0
3.344	169.	264.	3.8	1215.7	1215.7	.0

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FLOODWAY DATA, TUTHILL DIKE WASH - WASH
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WATER SURFACE ELEVATION WITHOUT FLOODWAY	DIFFERENCE
3.439	174.	462.	2.2	1216.4	1216.4	.0
3.535	109.	150.	6.7	1216.9	1216.9	.0
3.631	52.	121.	8.3	1221.7	1221.7	.0
3.724	94.	150.	6.7	1230.7	1230.0	.7
3.818	88.	154.	6.6	1235.9	1235.9	.0
3.912	87.	149.	6.8	1242.5	1242.5	.0
4.006	52.	102.	8.0	1248.9	1248.9	.0
4.101	141.	157.	5.2	1257.6	1257.5	.1
4.196	67.	109.	7.5	1262.3	1262.3	.0
4.289	113.	160.	5.1	1269.8	1269.9	-.1
4.375	97.	164.	5.0	1274.0	1273.9	.1
4.469	103.	162.	5.1	1277.7	1277.7	.0
4.563	93.	137.	6.0	1281.0	1281.0	.0
4.653	106.	226.	3.6	1283.0	1283.0	.0
4.725	89.	103.	6.2	1284.7	1284.7	.0

APPENDIX E

IMPROVEMENTS TO JACKRABBIT TRAIL WASH

- Cost Estimate
- Concept Design Plan and Profile Figures
- Hydraulic Calculation Sheet
- HEC-2 Model (JAKI10.H2I)

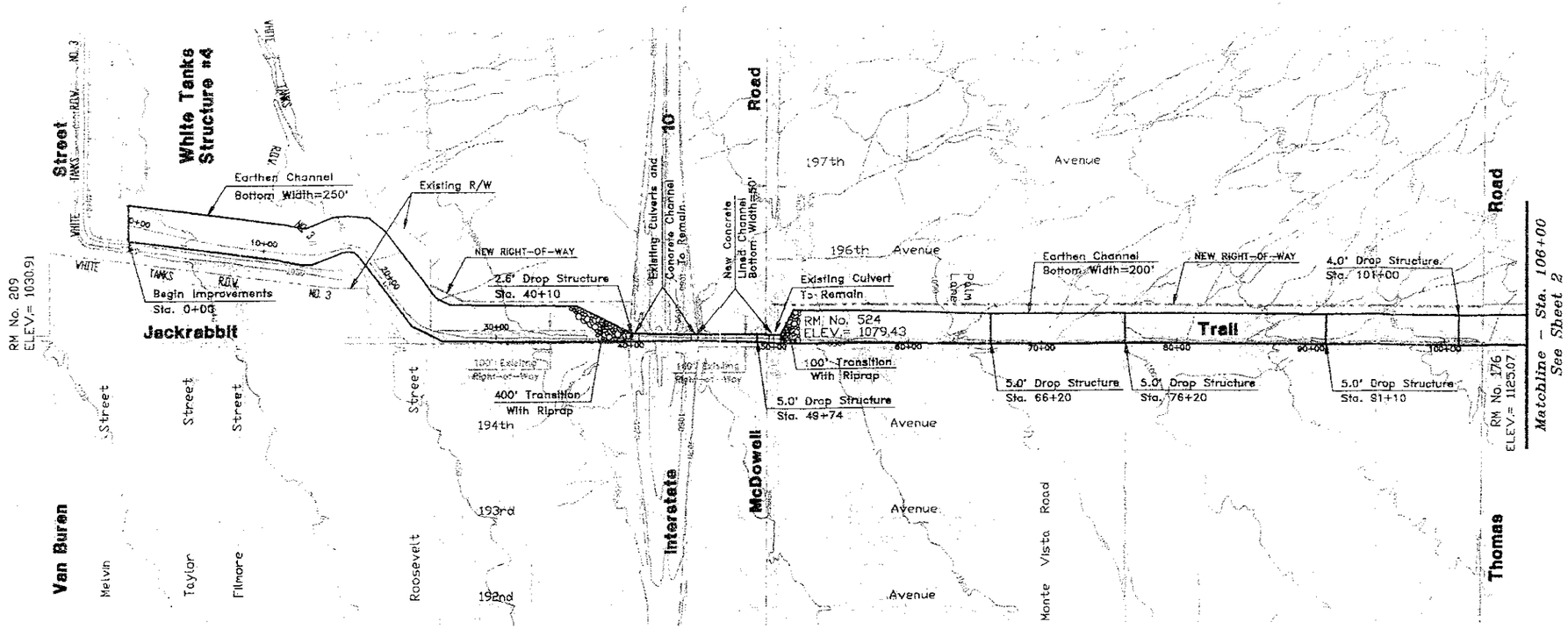
COST ESTIMATE

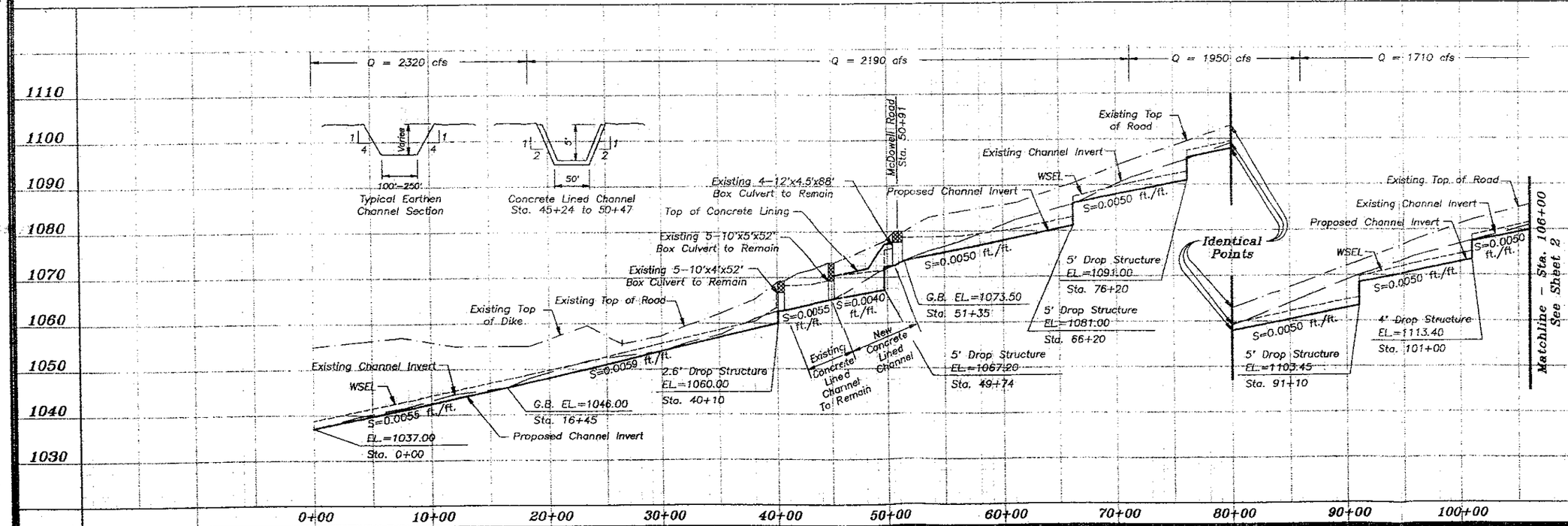
JACKRABIT TRAIL WASH
COST ESTIMATE SHEET

	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	COST
1.	Channel Excavation	1,000,000	C.Y.	$ 3	$ 3,000,000
2.	Fill at proposed Dike	3,890	C.Y.	$ 3	$ 11,700
3.	2.6' drop structure at sta. 40 + 10	1	EA..	$ 16,900	$ 16,900
4.	5.0' drop structure at sta. 49 + 74	1	EA.	$ 18,100	$ 18,100
5.	Concrete lining (I-10 to McDowell Road)	4,205	S.Y.	$ 22	$ 92,500
6.	5.0' drop structure at sta. 66 + 20	1	EA.	$ 66,300	$ 66,300
7.	5.0' drop structure at sta. 76 + 20	1	EA.	$ 66,300	$ 66,300
8.	5.0' drop structure at sta. 91 + 10	1	EA.	$ 66,300	$ 66,300
9.	4.0' drop structure at sta. 101 + 00	1	EA.	$ 53,000	$ 53,000
10.	5.0' drop structure at sta. 116 + 25	1	EA.	$ 66,300	$ 66,300
11.	4 - 10' x 4' B.C. at Indian School Road	30	L.F.	$ 1,100	$ 33,000
12.	3 - 10' x 5' B.C. at Medlock Drive	50	L.F.	$ 900	$ 45,000
13.	24" CMP	2750	L.F.	$ 40	$ 110,000
				Estimated Construction Cost	$ 3,645,400
				Contingencies (25%)	$ 911,400
				Total Construction Cost	$ 4,556,800
13.	R.O.W.	4,974,140	S.F.	$.15	$ 746,100
				GRAND TOTAL	**$ 5,302,900**

CONCEPT DESIGN

PLAN AND PROFILE FIGURES





The WLB Group Inc. **WLB**

Engineering Planning Surveying
Landscape Architecture Urban Design
Offices located in Tucson, Phoenix
Las Vegas, and Victor Valley, Ca
333 East Osborn, Ste. 380
Phoenix, Arizona (602) 279-1016

Project: WHITE TANKS/AGUA FRIA ADMS
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Sheet Title: CONCEPT DESIGN
JACKRABBIT TRAIL WASH IMPROVEMENT PROJECT

No.	Date	Item

Revisions

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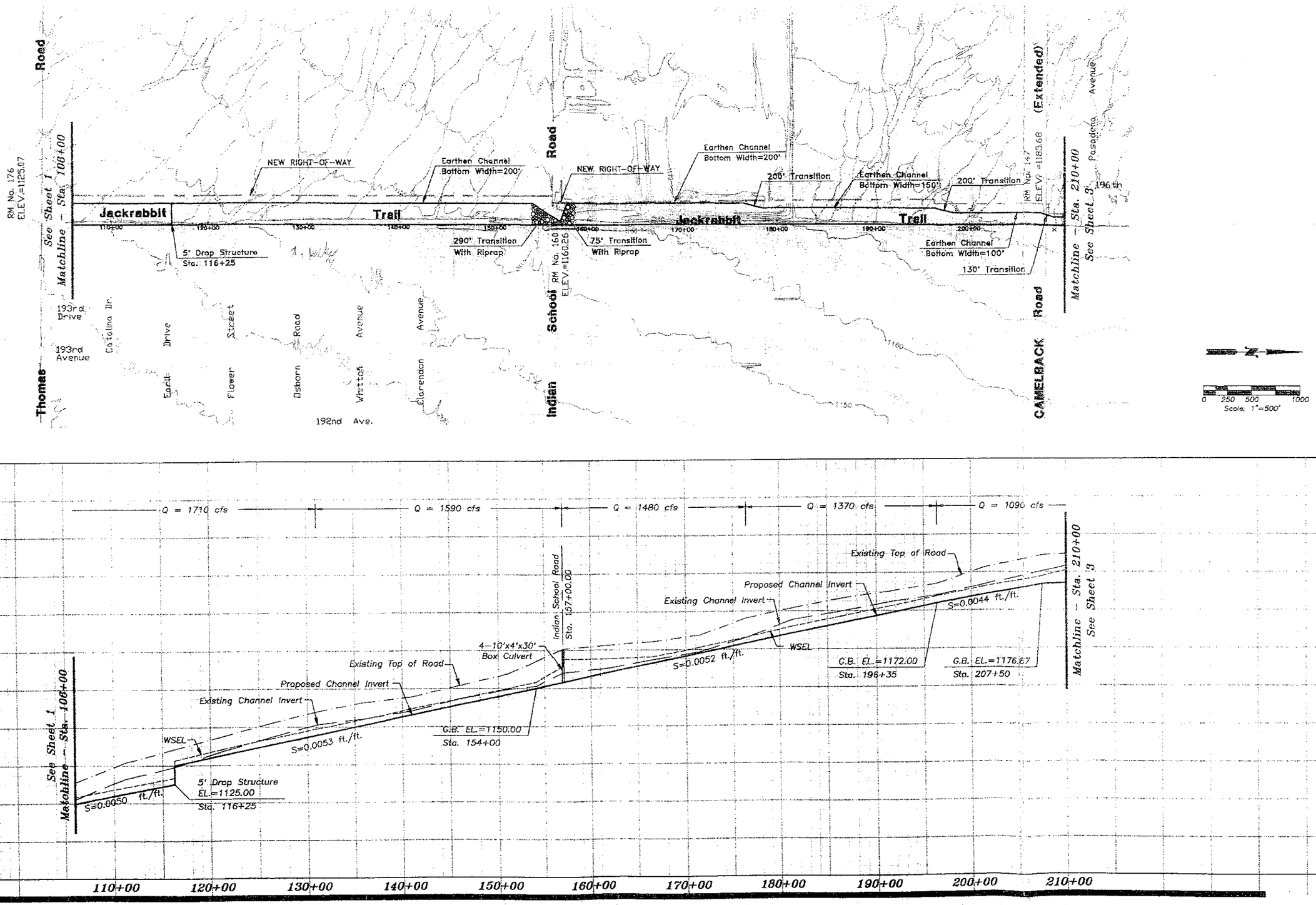
Job No.	289036
Date	DEC. 1994
Drawn By	R.A.C.
Checked By	M.T.G.

Sheet 1 of 3



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Scale	AS SHOWN
Job No.	289036
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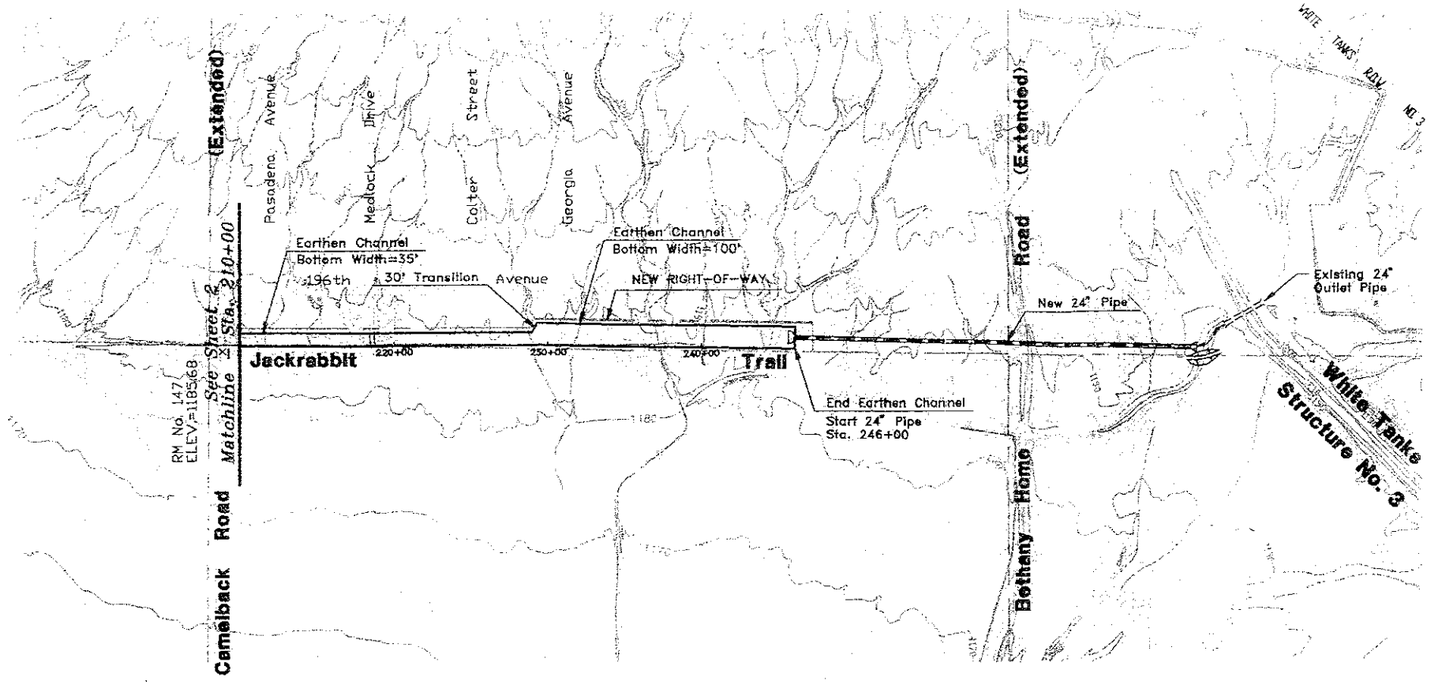
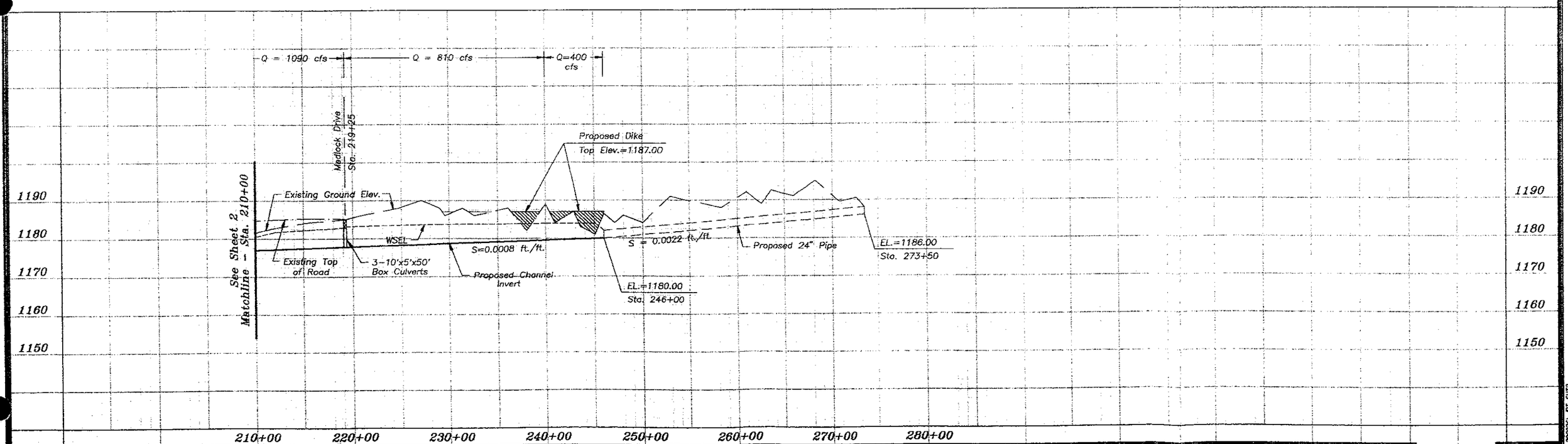
Sheet 2 of 3





The WLB Group Inc.

WLB

Engineering Planning Surveying
Landscape Architecture Urban Design
Offices located in Tucson, Phoenix
Las Vegas, and Victor Valley, Ca
333 East Osborn, Ste. 380
Phoenix, Arizona (602) 279-1016

Project: WHITE TANKS/AGUA FRIA ADMS
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Sheet Title: CONCEPT DESIGN
JACKRABBIT TRAIL WASH IMPROVEMENT PROJECT

No.	Date	Item

Revisions

Scale	AS SHOWN
Job No.	289036
Date	DEC. 1994
Drawn By	R.A.C.
Checked By	M.T.C.

Sheet 3 of 3

D:\ACAD12\PROJ\289036\JRT-SHT3

Jackrabbit Trail Wash
Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 1, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	2320.0
Channel Bottom Slope (feet per foot).....	0.0055
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	250.0
Channel Flow-Line Elevation at Starting Station (feet)..	1037.00
Water Surface Elevation at Starting Station (feet).....	1038.74
Starting Channel Station (feet).....	0.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.74
Critical Depth (feet).....	1.38

sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
.000	- 0.0	1037.00	1038.74	1.74	447.11	5.19	0.418	0.005445
.070	- 370.0	1039.03	1040.77	1.73	444.95	5.21	0.422	0.005532
.142	- 750.0	1041.12	1042.86	1.74	446.23	5.20	0.420	0.005481
.228	- 1205.0	1043.63	1045.36	1.73	445.43	5.21	0.421	0.005512
.312	- 1645.0	1046.05	1047.78	1.74	445.94	5.20	0.420	0.005492

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Note: channel stations correspond to river mile stations used in HEC-2 model for Jackrabbit Trail Wash (see part A, Flood Study Technical Data Notebook)

Jackrabbit Trail wash
Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 1, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	2320.0
Channel Bottom Slope (feet per foot).....	0.0059
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	250.0
Channel Flow-Line Elevation at Starting Station (feet)..	1046.05
Water Surface Elevation at Starting Station (feet).....	1047.78
Starting Channel Station (feet).....	1645.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.70
Critical Depth (feet).....	1.38

sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
.312	– 1645.0	1046.05	1047.78	1.73	444.47	5.22	0.423	0.005552
	1700.0	1046.37	1048.08	1.71	438.11	5.30	0.435	0.005819
.348	– 1835.0	1047.17	1048.87	1.70	435.82	5.32	0.440	0.005919

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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Jackrabbit Trail Wash
Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 1, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	2130.0
Channel Bottom Slope (feet per foot).....	0.0059
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	250.0
Channel Flow-Line Elevation at Starting Station (feet)..	1047.17
Water Surface Elevation at Starting Station (feet).....	1048.87
Starting Channel Station (feet).....	1835.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.64
Critical Depth (feet).....	1.33

sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
.348	~~1835.0~~	~~1047.17~~	~~1048.87~~	~~1.70~~	~~436.56~~	~~5.02~~	~~0.391~~	~~0.005246~~
	1900.0	1047.55	1049.20	1.65	423.62	5.17	0.415	0.005787
	2000.0	1048.14	1049.78	1.64	420.86	5.20	0.420	0.005912
.440	2325.0	1050.06	1051.70	1.64	421.28	5.20	0.420	0.005893
.499	2635.0	1051.89	1053.53	1.64	421.03	5.20	0.420	0.005904
.566	2990.0	1053.98	1055.63	1.64	421.18	5.20	0.420	0.005897
.610	3220.0	1055.34	1056.98	1.64	421.09	5.20	0.420	0.005901
.668	3525.0	1057.14	1058.78	1.64	421.13	5.20	0.420	0.005899
.722	3810.0	1058.82	1060.46	1.64	421.11	5.20	0.420	0.005901

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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Downstream Trans. Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 1, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	2190.0
Channel Bottom Slope (feet per foot).....	0.0059
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	60.0
Channel Flow-Line Elevation at Starting Station (feet)..	1058.82
Water Surface Elevation at Starting Station (feet).....	1060.46
Starting Channel Station (feet).....	3810.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	3.67
Critical Depth (feet).....	3.21

Sec #1

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
.722 –	3810.0	1058.82	1062.03	~~3.21~~	~~233.68~~	~~9.37~~	~~1.364~~	~~0.005508~~
	3850.0	1059.06	1062.69	3.63	270.82	8.09	1.015	0.006132
	3900.0	1059.35	1063.01	3.66	272.93	8.02	1.000	0.005993
	3960.0	1059.70	1063.37	3.67	273.87	8.00	0.993	0.005932
.759 –	4010.0	1060.00	1063.67	3.67	274.14	7.99	0.991	0.005915

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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Jackrabbit Trail Wash
Improvement project

THIS RUN EXECUTED 01DEC94 14:36:30

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2: May 1991
****

A HEC-2 output summary for a subcritical reach between I-10 and Mcdowell Rd.
(see HEC-2 file JAKI10.H2I within this appendix)

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

JACKRABBIT TRAIL WASH -

SUMMARY PRINTOUT

Sta.	SECNO	Q	CWSEL	SSTA	STCHL	STCHR	ENDST	DIFWSX	TOPWID	DEPTH	ELMIN	10*KS	VCH
* —	.758	2190.00	1063.70	9967.61	9960.00	10040.00	10032.39	.00	64.78	3.70	1060.00	49.82	10.33
* 4010	.759	2190.00	1066.30	9972.52	9972.30	10028.00	10027.71	2.61	55.19	3.70	1062.60	52.97	10.88
		B.C at I-10											
* 4062	.769	2190.00	1068.25	9972.30	9972.30	10028.00	10028.00	1.94	55.70	5.45	1062.80	15.21	7.39
[illegible]2	.792	2190.00	1068.29	9964.55	9972.00	10028.00	10028.63	.04	64.08	4.79	1063.50	26.93	8.97
4342	.822	2190.00	1068.61	9969.96	9972.00	10028.00	10028.18	.33	58.22	4.21	1064.40	43.27	10.35
4472	.847	2190.00	1069.32	9973.70	9973.30	10028.00	10027.14	.71	53.44	4.22	1065.10	37.70	9.90
		B.C at I-10											
* 4524	.857	2190.00	1070.41	9973.52	9973.30	10028.00	10027.42	1.09	53.90	5.01	1065.40	21.83	8.31
4974	.942	2190.00	1071.50	9966.40	9965.00	10035.00	10033.60	1.09	67.20	4.30	1067.20	29.57	8.69
		Drop struc.											
* 4979	.943	2190.00	1075.90	9967.60	9965.00	10035.00	10032.40	4.40	64.80	3.70	1072.20	45.58	10.31
* 5047	.956	2190.00	1076.24	9973.35	9973.30	10026.80	10026.75	.34	53.40	3.74	1072.50	54.27	10.99
		B.C at Mcdowell Rd.											
* 5135	.973	2190.00	1078.61	9973.32	9973.30	10026.80	10026.78	2.38	53.46	5.11	1073.50	20.21	8.02

Transient Trail [illegible]
Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 1, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	2190.0
Channel Bottom Slope (feet per foot).....	0.0050
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	200.0
Channel Flow-Line Elevation at Starting Station (feet)..	1073.50
Water Surface Elevation at Starting Station (feet).....	1078.61
Starting Channel Station (feet).....	5135.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.97
Critical Depth (feet).....	1.53

sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
.973	– 5135.0	1073.50	1078.61	~~5.11~~	~~1126.45~~	~~1.94~~	~~0.059~~	~~0.000198~~
	5150.0	1073.57	1078.61	5.04	1108.69	1.98	0.061	0.000208
	5200.0	1073.82	1078.62	4.79	1049.94	2.09	0.068	0.000247
	5250.0	1074.07	1078.62	4.55	991.92	2.21	0.076	0.000295
	5300.0	1074.32	1078.63	4.30	934.67	2.34	0.085	0.000356
1.016	– 5367.0	1074.66	1078.64	3.98	859.36	2.55	0.101	0.000464
	5400.0	1074.82	1078.65	3.82	822.91	2.66	0.110	0.000532
	5500.0	1075.32	1078.68	3.36	716.05	3.06	0.145	0.000827
1.064	– 5620.0	1075.92	1078.76	2.83	598.04	3.66	0.208	0.001470
	5700.0	1076.32	1078.84	2.52	528.98	4.14	0.266	0.002179
	5800.0	1076.82	1079.04	2.21	462.16	4.74	0.349	0.003365
	5900.0	1077.32	1079.36	2.04	424.20	5.16	0.414	0.004439
	6000.0	1077.82	1079.80	1.98	411.44	5.32	0.440	0.004900
1.159	– 6120.0	1078.42	1080.39	1.97	408.96	5.36	0.445	0.004997
1.254	– 6620.0	1080.92	1082.89	1.97	408.83	5.36	0.446	0.005002

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Improvement Project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 1, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	2190.0
Channel Bottom Slope (feet per foot).....	0.0050
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	200.0
Channel Flow-Line Elevation at Starting Station (feet)..	1086.00
Water Surface Elevation at Starting Station (feet).....	1087.00
Starting Channel Station (feet).....	6620.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.97
Critical Depth (feet).....	1.53

Sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
1+254	- 6620.0	1086.00	1087.53	1.53	316.21	6.93	0.745	0.011519
	6650.0	1086.15	1088.06	1.91	396.88	5.52	0.473	0.005507
	6700.0	1086.40	1088.35	1.95	404.30	5.42	0.456	0.005186
	6800.0	1086.90	1088.87	1.97	408.47	5.36	0.446	0.005017
1+348	- 7120.0	1088.50	1090.47	1.97	409.07	5.35	0.445	0.004393

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Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 1, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1950.0
Channel Bottom Slope (feet per foot).....	0.0050
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	200.0
Channel Flow-Line Elevation at Starting Station (feet)..	1088.50
Water Surface Elevation at Starting Station (feet).....	1090.47
Starting Channel Station (feet).....	7120.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.84
Critical Depth (feet).....	1.42

Sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
1.348	- 7120.0	1088.50	1090.47	~~1.97~~	~~409.52~~	~~4.76~~	~~0.352~~	~~0.002944~~
	7200.0	1088.90	1090.78	1.88	389.31	5.01	0.390	0.004646
	7300.0	1089.40	1091.24	1.84	381.65	5.11	0.405	0.004955
	7400.0	1089.90	1091.74	1.84	380.71	5.12	0.407	0.004995
	7500.0	1090.40	1092.24	1.84	380.62	5.12	0.408	0.004999
1.443	- 7620.0	1091.00	1092.84	1.84	380.61	5.12	0.408	0.004999

==========

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Jackrabbit Trail [illegible]
Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 1, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1950.0
Channel Bottom Slope (feet per foot).....	0.0050
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	200.0
Channel Flow-Line Elevation at Starting Station (feet)..	1096.00
Water Surface Elevation at Starting Station (feet).....	1097.00
Starting Channel Station (feet).....	7620.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.84
Critical Depth (feet).....	1.42

sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
1.443	-7620.0	1096.00	1097.42	1.42	292.25	6.67	0.691	0.011806
	7650.0	1096.15	1097.94	1.79	371.29	5.25	0.428	0.005419
	7700.0	1096.40	1098.22	1.82	377.16	5.17	0.415	0.005150
	7800.0	1096.90	1098.73	1.83	380.37	5.13	0.408	0.005011
1.536	- 8110.0	1098.45	1100.29	1.84	380.72	5.12	0.407	0.004996
1.631	- 8610.0	1100.95	1102.79	1.84	380.54	5.12	0.408	0.005003

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Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 1, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1710.0
Channel Bottom Slope (feet per foot).....	0.0050
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	200.0
Channel Flow-Line Elevation at Starting Station (feet)..	1100.95
Water Surface Elevation at Starting Station (feet).....	1102.79
Starting Channel Station (feet).....	8610.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.70
Critical Depth (feet).....	1.30

Sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
1.631	- 8610.0	1100.95	1102.79	~~1.84~~	~~381.54~~	~~4.48~~	~~0.312~~	~~0.003815~~
	8700.0	1101.40	1103.13	1.73	358.05	4.78	0.354	0.004688
	8800.0	1101.90	1103.60	1.70	351.64	4.86	0.367	0.004971
1.725	- 9110.0	1103.45	1105.15	1.70	350.73	4.88	0.369	0.005013

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Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 1, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1710.0
Channel Bottom Slope (feet per foot).....	0.0050
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	200.0
Channel Flow-Line Elevation at Starting Station (feet)..	1108.45
Water Surface Elevation at Starting Station (feet).....	1109.00
Starting Channel Station (feet).....	9110.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.70
Critical Depth (feet).....	1.30

Sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
1.725	- 9110.0	1108.45	1109.75	1.30	267.35	6.40	0.635	0.012142
	9130.0	1108.55	1110.16	1.61	331.69	5.16	0.413	0.006011
	9150.0	1108.65	1110.29	1.64	338.77	5.05	0.396	0.005612
	9200.0	1108.90	1110.58	1.68	346.99	4.93	0.377	0.005191
	9300.0	1109.40	1111.10	1.70	350.87	4.87	0.369	0.005007
1.818	- 9600.0	1110.90	1112.60	1.70	351.09	4.87	0.368	0.004997
1.913	- 10100.0	1113.40	1115.10	1.70	350.97	4.87	0.369	0.005002

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Zuppke [illegible] project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 1, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1710.0
Channel Bottom Slope (feet per foot).....	0.0050
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	200.0
Channel Flow-Line Elevation at Starting Station (feet)..	1117.40
Water Surface Elevation at Starting Station (feet).....	1118.00
Starting Channel Station (feet).....	10100.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.70
Critical Depth (feet).....	1.30

Sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
1.913	- 10100.0	1117.40	1118.70	1.30	267.35	6.40	0.635	0.012142
	10120.0	1117.50	1119.11	1.61	331.69	5.16	0.413	0.006011
	10150.0	1117.65	1119.30	1.65	341.32	5.01	0.390	0.005477
	10200.0	1117.90	1119.58	1.68	347.71	4.92	0.376	0.005157
	10300.0	1118.40	1120.10	1.70	350.88	4.87	0.369	0.005007
2.008	- 10600.0	1119.90	1121.60	1.70	351.09	4.87	0.368	0.004997
2.107	- 11125.0	1122.52	1124.22	1.70	350.97	4.87	0.369	0.005002
2.202	- 11625.0	1125.02	1126.72	1.70	351.05	4.87	0.368	0.004999

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TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Tortuguita Trail wash
Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 1, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1710.0
Channel Bottom Slope (feet per foot).....	0.0053
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	200.0
Channel Flow-Line Elevation at Starting Station (feet)..	1130.00
Water Surface Elevation at Starting Station (feet).....	1131.00
Starting Channel Station (feet).....	11625.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.67
Critical Depth (feet).....	1.30

Sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
2.202 –	11625.0	1130.00	1131.30	1.30	267.35	6.40	0.635	0.012142
	11650.0	1130.13	1131.76	1.63	336.03	5.09	0.402	0.005763
	11700.0	1130.40	1132.05	1.66	342.25	5.00	0.388	0.005429
	11800.0	1130.93	1132.60	1.67	344.82	4.96	0.382	0.005298
2.296 –	12125.0	1132.65	1134.32	1.67	344.77	4.96	0.382	0.005301
2.389 –	12615.0	1135.25	1136.92	1.67	344.79	4.96	0.382	0.005299
2.482 –	13105.0	1137.84	1139.51	1.67	344.77	4.96	0.382	0.005301

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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Jackson's Lake Wash
Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 1, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1590.0
Channel Bottom Slope (feet per foot).....	0.0053
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	200.0
Channel Flow-Line Elevation at Starting Station (feet)..	1137.84
Water Surface Elevation at Starting Station (feet).....	1139.51
Starting Channel Station (feet).....	13105.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.60
Critical Depth (feet).....	1.24

sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
2.482	- 13105.0	1137.84	1139.51	~~1.67~~	~~345.16~~	~~4.61~~	~~0.330~~	~~0.004566~~
	13200.0	1138.34	1139.95	1.60	330.92	4.80	0.358	0.005236
2.576	- 13600.0	1140.46	1142.06	1.59	328.94	4.83	0.363	0.005339
2.670	- 14100.0	1143.11	1144.71	1.60	330.20	4.82	0.360	0.005273
2.765	- 14600.0	1145.76	1147.36	1.60	329.34	4.83	0.362	0.005318
2.860	- 15100.0	1148.41	1150.01	1.60	329.92	4.82	0.361	0.005288
2.912	-15400.0	1150.00	1151.60	1.60	329.57	4.82	0.361	0.005306

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

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Increase Inlet at Improvement project

At Indian school Rd.

CURRENT DATE: 12-01-1994
CURRENT TIME: 18:26:31

FILE DATE: 12-01-1994
FILE NAME: JAKIND

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.04	0.00	20.00	4 RCB	10.00	4.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: JAKIND CULVERT HEADWATER ELEVATION (FT) DATE: 12-01-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.04	0.00	0.00	0.00	0.00	0.00	100.00
148	1.31	0.00	0.00	0.00	0.00	0.00	100.62
296	2.05	0.00	0.00	0.00	0.00	0.00	100.98
444	2.66	0.00	0.00	0.00	0.00	0.00	101.29
592	3.22	0.00	0.00	0.00	0.00	0.00	101.56
740	3.73	0.00	0.00	0.00	0.00	0.00	101.80
888	4.21	0.00	0.00	0.00	0.00	0.00	102.05
1036	4.67	0.00	0.00	0.00	0.00	0.00	102.27
1184	5.10	0.00	0.00	0.00	0.00	0.00	102.48
1332	5.42	0.00	0.00	0.00	0.00	0.00	102.68
1480	6.02	0.00	0.00	0.00	0.00	0.00	102.87
7992	103.89	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 12-01-1994 FILE DATE: 12-01-1994
CURRENT TIME: 18:26:31 FILE NAME: JAKIND

PERFORMANCE CURVE FOR CULVERT # 1 - 4 (10 BY 4) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.04	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
148	1.31	1.15	1.27	3-M1t	0.83	0.75	3.95	0.94	3.24	0.94
296	2.05	1.83	2.01	3-M1t	1.30	1.20	5.26	1.41	4.16	1.41
444	2.66	2.41	2.62	3-M1t	1.70	1.57	6.24	1.78	4.79	1.78
592	3.22	2.93	3.18	3-M1t	2.07	1.90	7.05	2.10	5.28	2.10
740	3.73	3.40	3.69	3-M2t	2.41	2.20	7.76	2.38	5.69	2.38
888	4.21	3.86	4.17	3-M2t	2.74	2.49	8.39	2.64	6.04	2.64
1036	4.67	4.34	4.63	3-M2t	3.05	2.76	8.98	2.88	6.35	2.88
1184	5.10	4.84	5.06	3-M2t	3.35	3.01	9.52	3.11	6.63	3.11
1332	5.42	5.38	5.15	6-FFn	4.00	3.26	8.32	4.00	6.88	3.32
1480	6.02	5.98	5.64	6-FFn	4.00	3.50	9.25	4.00	7.11	3.52

+ 1151.55 = 1157.53

El. inlet face invert 0.04 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00	= 157+10
INLET ELEVATION (FT)	0.04	= 1151.55
OUTLET STATION (FT)	20.00	= 156+90
OUTLET ELEVATION (FT)	0.00	= 1151.51
NUMBER OF BARRELS	4	
SLOPE (V-FT/H-FT)	0.0020	
CULVERT LENGTH ALONG SLOPE (FT)	20.00	

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	4.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 12-01-1994
CURRENT TIME: 19:26:31

FILE DATE: 12-01-1994
FILE NAME: JAKIND

TAILWATER

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	45.00
SIDE SLOPE H/V (X:1)	4.0
CHANNEL SLOPE V/H (FT/FT)	0.005
MANNING'S N (.01-0.1)	0.030
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
148.00	0.94	0.591	0.94	3.24	0.30
296.00	1.41	0.618	1.41	4.16	0.46
444.00	1.78	0.633	1.78	4.79	0.58
592.00	2.10	0.643	2.10	5.28	0.68
740.00	2.38	0.650	2.38	5.69	0.77
888.00	2.64	0.655	2.64	6.04	0.86
1036.00	2.88	0.659	2.88	6.35	0.94
1184.00	3.11	0.663	3.11	6.63	1.01
1332.00	3.32	0.666	3.32	6.88	1.08
1480.00	3.52	0.668	3.52	7.11	1.14

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

Jackrabbit [illegible] Wash
Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 1, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1480.0
Channel Bottom Slope (feet per foot).....	0.0052
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	200.0
Channel Flow-Line Elevation at Starting Station (feet)..	1151.55
Water Surface Elevation at Starting Station (feet).....	1157.53
Starting Channel Station (feet).....	15710.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.54
Critical Depth (feet).....	1.18

Sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
2.973	- 15710.0	1151.55	1157.53	~~5.98~~	~~1329.04~~	~~1.11~~	~~0.019~~	~~0.000053~~
	15750.0	1151.76	1157.53	5.77	1287.85	1.15	0.021	0.000060
	15800.0	1152.02	1157.53	5.51	1224.38	1.21	0.023	0.000070
	15900.0	1152.54	1157.53	5.00	1099.25	1.35	0.028	0.000098
	16000.0	1153.06	1157.54	4.48	976.61	1.52	0.036	0.000142
	16100.0	1153.58	1157.55	3.97	856.71	1.73	0.046	0.000214
3.059	- 16150.0	1153.84	1157.55	3.71	797.88	1.85	0.053	0.000268
	16200.0	1154.10	1157.56	3.46	739.93	2.00	0.062	0.000340
	16300.0	1154.62	1157.58	2.96	627.45	2.36	0.086	0.000576
	16400.0	1155.14	1157.62	2.48	521.50	2.84	0.125	0.001042
	16500.0	1155.66	1157.71	2.05	427.70	3.46	0.186	0.001974
	16600.0	1156.18	1157.91	1.73	357.78	4.14	0.266	0.003520
3.154	- 16655.0	1156.46	1158.09	1.62	335.03	4.42	0.303	0.004358
	16700.0	1156.70	1158.27	1.58	325.14	4.55	0.322	0.004804
	16800.0	1157.22	1158.76	1.54	317.52	4.66	0.337	0.005190
	16900.0	1157.74	1159.28	1.54	317.34	4.66	0.338	0.005199
3.247	- 17145.0	1159.01	1160.55	1.54	317.33	4.66	0.338	0.005200
3.342	- 17645.0	1161.61	1163.15	1.54	317.33	4.66	0.338	0.005200

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
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Jackrabbit Trail [illegible]
Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 1, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1370.0
Channel Bottom Slope (feet per foot).....	0.0052
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	150.0
Channel Flow-Line Elevation at Starting Station (feet)..	1161.61
Water Surface Elevation at Starting Station (feet).....	1163.15
Starting Channel Station (feet).....	17645.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.74
Critical Depth (feet).....	1.36

Sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
3.342	- 17645.0	1161.61	1163.15	~~1.54~~	~~240.49~~	~~5.70~~	~~0.504~~	~~0.007856~~
	17700.0	1161.90	1163.62	1.72	270.37	5.07	0.399	0.005383
	17800.0	1162.42	1164.16	1.74	273.25	5.01	0.390	0.005202
3.436	- 18140.0	1164.18	1165.93	1.74	273.30	5.01	0.390	0.005198
3.530	- 18640.0	1166.78	1168.52	1.74	273.27	5.01	0.390	0.005201
3.625	- 19140.0	1169.38	1171.13	1.74	273.29	5.01	0.390	0.005199
3.719	- 19635.0	1171.96	1173.70	1.74	273.27	5.01	0.390	0.005201

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986 Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092 (713) 895-8322. A manual with equations & flow chart is available.

Jacksboro Tank Drain
Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 1, 1994

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PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1090.0
Channel Bottom Slope (feet per foot).....	0.0044
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	100.0
Channel Flow-Line Elevation at Starting Station (feet)..	1171.96
Water Surface Elevation at Starting Station (feet).....	1173.70
Starting Channel Station (feet).....	19635.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	2.02
Critical Depth (feet).....	1.51

Sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
3.719	- 19635.0	1171.96	1173.70	~~1.74~~	~~186.11~~	~~5.86~~	~~0.533~~	~~0.007302~~
	19700.0	1172.25	1174.22	1.97	212.71	5.12	0.408	0.004783
	19800.0	1172.69	1174.70	2.01	217.31	5.02	0.391	0.004470
3.813	- 20135.0	1174.16	1176.18	2.02	218.80	4.98	0.385	0.004375
3.930	- 20750.0	1176.87	1178.88	2.02	218.17	5.00	0.388	0.004415

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TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 1, 1994

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PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1090.0
Channel Bottom Slope (feet per foot).....	0.0008
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	35.0
Channel Flow-Line Elevation at Starting Station (feet)..	1176.87
Water Surface Elevation at Starting Station (feet).....	1178.88
Starting Channel Station (feet).....	20750.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	5.50
Critical Depth (feet).....	2.78

Sec. #	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
3.930	- 20750.0	1176.87	1179.65	~~2.78~~	~~128.31~~	~~8.49~~	~~1.121~~	~~0.010189~~
	20800.0	1176.91	1180.56	3.65	180.90	6.03	0.564	0.003786
	20850.0	1176.95	1180.80	3.85	194.37	5.61	0.488	0.003085
	20900.0	1176.99	1181.00	4.01	204.37	5.33	0.442	0.002675
	20950.0	1177.03	1181.16	4.13	212.45	5.13	0.409	0.002396
	21000.0	1177.07	1181.29	4.22	219.26	4.97	0.384	0.002191
4.016	- 21205.0	1177.23	1181.76	4.52	240.12	4.54	0.320	0.001695
	21400.0	1177.39	1182.10	4.71	253.34	4.30	0.287	0.001457
4.086	- 21575.0	1177.53	1182.36	4.83	262.29	4.16	0.268	0.001322
	21800.0	1177.71	1182.66	4.95	271.29	4.02	0.251	0.001202
4.152	- 21910.0	1177.80	1182.80	5.00	274.90	3.97	0.244	0.001159

@ Medlock Drive

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TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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(713) 895-8322. A manual with equations & flow chart is available.

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Improvement Project

At Medlock Drive

CURRENT DATE: 12-01-1994
CURRENT TIME: 13:46:00

FILE DATE: 12-01-1994
FILE NAME: JAKMDLK

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.02	0.00	30.00	3 RCB	10.00	5.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: JAKMDLK CULVERT HEADWATER ELEVATION (FT) DATE: 12-01-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.02	0.00	0.00	0.00	0.00	0.00	100.00
81	1.41	0.00	0.00	0.00	0.00	0.00	100.41
162	2.13	0.00	0.00	0.00	0.00	0.00	100.66
243	2.70	0.00	0.00	0.00	0.00	0.00	100.86
324	3.20	0.00	0.00	0.00	0.00	0.00	101.04
405	3.64	0.00	0.00	0.00	0.00	0.00	101.21
486	4.05	0.00	0.00	0.00	0.00	0.00	101.36
567	4.43	0.00	0.00	0.00	0.00	0.00	101.51
648	4.79	0.00	0.00	0.00	0.00	0.00	101.66
729	5.12	0.00	0.00	0.00	0.00	0.00	101.79
810	5.45	0.00	0.00	0.00	0.00	0.00	101.92
7452	103.30	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 12-01-1994 FILE DATE: 12-01-1994
CURRENT TIME: 18:46:00 FILE NAME: JAKMDLK

PERFORMANCE CURVE FOR CULVERT # 1 - 3 (10 BY 5) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.02	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
81	1.41	0.94	1.39	3-M1t	0.90	0.61	2.06	1.31	1.54	1.31
162	2.13	1.49	2.10	3-M1t	1.43	0.97	2.77	1.95	1.94	1.95
243	2.70	1.95	2.68	3-M1t	1.87	1.27	3.31	2.45	2.21	2.45
324	3.20	2.36	3.17	3-M1t	2.28	1.54	3.76	2.87	2.42	2.87
405	3.64	2.75	3.62	3-M1t	2.66	1.79	4.15	3.25	2.60	3.25
486	4.05	3.11	4.02	3-M1t	3.03	2.02	4.51	3.59	2.74	3.59
567	4.43	3.45	4.40	3-M1t	3.38	2.24	4.85	3.90	2.88	3.90
648	4.79	3.77	4.76	3-M1t	3.72	2.44	5.16	4.19	2.99	4.19
729	5.12	4.08	5.10	3-M1t	4.05	2.64	5.45	4.46	3.10	4.46
810	5.45	4.38	5.42	3-M1t	4.38	2.84	5.73	4.71	3.19	4.71

+ 1177.82 = 1183.20

El. inlet face invert 0.02 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00	= 219+40
INLET ELEVATION (FT)	0.02	= 1177.82
OUTLET STATION (FT)	30.00	= 219+10
OUTLET ELEVATION (FT)	0.00	= 1177.80
NUMBER OF BARRELS	3	
SLOPE (V-FT/H-FT)	0.0008	
CULVERT LENGTH ALONG SLOPE (FT)	30.00	

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	5.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 12-01-1994
CURRENT TIME: 10:46:00

FILE DATE: 12-01-1994
FILE NAME: JAKMDLK

TAILWATER

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	35.00
SIDE SLOPE H/V (X:1)	4.0
CHANNEL SLOPE V/H (FT/FT)	0.001
MANNING'S N (.01-0.1)	0.030
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
81.00	1.31	0.237	1.31	1.54	0.06
162.00	1.95	0.245	1.95	1.94	0.10
243.00	2.45	0.249	2.45	2.21	0.12
324.00	2.88	0.252	2.87	2.42	0.14
405.00	3.25	0.254	3.25	2.60	0.16
486.00	3.59	0.255	3.59	2.74	0.18
567.00	3.90	0.257	3.90	2.88	0.19
648.00	4.19	0.258	4.19	2.99	0.21
729.00	4.46	0.258	4.46	3.10	0.22
810.00	4.71	0.259	4.71	3.19	0.23

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

Jackrabbit Trail Water
Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 1, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	810.0
Channel Bottom Slope (feet per foot).....	0.0008
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	35.0
Channel Flow-Line Elevation at Starting Station (feet)..	1177.82
Water Surface Elevation at Starting Station (feet).....	1183.24
Starting Channel Station (feet).....	21940.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	4.71
Critical Depth (feet).....	2.32

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
Medlock Drive –	21940.0	1177.82	1183.24	5.42	307.21	2.64	0.108	0.000469
	22070.0	1177.92	1183.30	5.38	303.72	2.67	0.110	0.000484
	22200.0	1178.03	1183.36	5.33	300.42	2.70	0.113	0.000499
	22470.0	1178.24	1183.49	5.25	294.08	2.75	0.118	0.000530
	22710.0	1178.44	1183.62	5.19	289.03	2.80	0.122	0.000556
	22900.0	1178.59	1183.73	5.14	285.40	2.84	0.125	0.000576

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Jackrabbit Trail [illegible]
Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 1, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	810.0
Channel Bottom Slope (feet per foot).....	0.0008
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	100.0
Channel Flow-Line Elevation at Starting Station (feet)..	1178.59
Water Surface Elevation at Starting Station (feet).....	1183.73
Starting Channel Station (feet).....	22900.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	2.80
Critical Depth (feet).....	1.25

Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
22900.0	1178.59	1183.73	~~5.14~~	~~619.68~~	~~1.31~~	~~0.027~~	~~0.000098~~
22960.0	1178.64	1183.74	5.10	613.69	1.32	0.027	0.000101
23140.0	1178.78	1183.75	4.97	595.93	1.36	0.029	0.000110
23260.0	1178.88	1183.77	4.89	584.30	1.39	0.030	0.000117
23610.0	1179.16	1183.81	4.65	551.31	1.47	0.034	0.000139
23800.0	1179.31	1183.83	4.52	534.04	1.52	0.036	0.000153
24000.0	1179.47	1183.86	4.39	516.39	1.57	0.038	0.000170

==========

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Improvement project

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 1, 1994

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PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	400.0
Channel Bottom Slope (feet per foot).....	0.0008
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	100.0
Channel Flow-Line Elevation at Starting Station (feet)..	1179.47
Water Surface Elevation at Starting Station (feet).....	1183.86
Starting Channel Station (feet).....	24000.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.85
Critical Depth (feet).....	0.78

Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
24000.0	1179.47	1183.86	~~4.39~~	~~516.09~~	~~0.78~~	~~0.009~~	~~0.000041~~
24100.0	1179.55	1183.86	4.31	505.83	0.79	0.010	0.000044
24190.0	1179.62	1183.87	4.25	496.68	0.81	0.010	0.000047
24290.0	1179.70	1183.87	4.17	486.58	0.82	0.010	0.000050
24360.0	1179.76	1183.88	4.12	479.56	0.83	0.011	0.000052
24510.0	1179.88	1183.88	4.00	464.66	0.86	0.012	0.000057
24600.0	1179.95	1183.89	3.94	455.82	0.88	0.012	0.000060

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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HYDRAULIC CALCULATION SHEETS

Include:

- Trapezoidal Channel Analysis
- Culvert Analysis
- An output summary for the HEC-2 file JAKI10.H2I (Included within this appendix)

HEC-2 MODEL

(JAKI10.H2I)

Jackrabbit Trail Wash
Improvement profile

THIS RUN EXECUTED 01DEC94 14:36:22

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

HEC-2 analysis for a subcritical reach between I-10 and Mcdowell Road

```
T1      WHITE TANKS / AGUA FRIA AREA DRAINAGE MASTER PLAN
T2      100 - YEAR STORM EVENT                  FILE: JAKI10.H2I
T3      JACKRABBIT TRAIL WASH - WASH 4  IMPROVEMENT
T4      NOTE THAT ELEVATIONS USED REFLECT IMPROVEMENTS AROUND MCDOWELL RD. AND
T5      JACKRABBIT TRAIL INTERSECTION

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0        2        0        0    .00592       0        0        0      1063       0

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     -1        0       -1        0        0       0        0        0        0        0


VARIABLE CODES FOR SUMMARY PRINTOUT

     38       43        1       53       21       22       54       51        4        8
     42        5       26        0      110

QT       1     2190
NC    .016     .016     .022       .1       .3

          A SECTION AT THE DROP STRUCTUR AT THE DOWNST. END OF CULVERT

X1   0.758        5     9960    10040        0        0        0
GR  1067.5     9960     1060     9975     1060    10000     1060    10025   1067.5    10040

NC    .016     .016     .022       .3       .5

          5 - 10ft x 4ft x 52ft BC  AT I-10,DOWNSTREAM END
          SEC. 0.759 TO SEC. 0.847 ,EXIST. CONCRETE LINED CHANNEL AT I-10
          Q EQUALS Q AT CP46.

X1   0.759        9    9972.3  10028.0       10       10       10
X3      10                                                     1069.1   1069.1
GR  1069.1     9930    1067.5   9972.3   1062.6   9973.2   1062.6    10000   1062.6  10026.8
GR  1067.5  10028.0     1068    10100     1068    10305     1069    10540

SB       1      1.5      2.5        0    53.67     3.67      200        0   1062.8   1062.6
X1   0.769        7    9972.3  10028.0       52       52       52
         0        0        1   1066.8   1069.5
X3      10                                                     1069.2   1069.2
BT       6     9930   1069.2            9972.3   1069.2            9973.2   1069.2
BT  10026.   1069.2             10028   1069.2            10110     1070
```

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     1069.2      9930    1067.7    9972.3    1062.8    9973.2    1062.8     10000    1062.8     10026.
GR   1067.7   10028.0      1070     10110

X1    0.792        10    9972.0   10028.0       120       120       120
GR   1070.9      9940    1067.5    9972.0    1067.5    9973.3    1063.5    9977.0    1063.5     10000
GR   1063.5     10023    1067.5   10026.8    1067.5     10028      1070     10030      1080     10045

X1    0.822        10    9972.0   10028.0       160       160       160
GR   1071.9      9940    1068.4      9972    1068.4    9973.3    1064.4      9977    1064.4     10000
GR   1064.4     10023    1068.4   10026.8    1068.4     10028    1070.9     10030    1080.9     10045


          SEC. 0.759 TO SEC. 0.847 ,EXIST. CONCRETE LINED CHANNEL AT I-10
          5 - 10ft x 5ft x 52ft BC  AT I-10 UPSTREAM END

X1    0.847         8    9973.3   10028.0       130       130       130
X3       10                                                        1071.7    1071.7
GR   1073.2      9930    1071.7    9973.3    1065.1    9974.4    1065.1     10000    1065.1    10025.6
GR   1071.7     10028      1072     10080      1076     10320

SB        1       1.5       2.5         0     53.67      3.67       250         0    1065.4     1065.1
X1    0.857         7    9973.3   10028.0        52        52        52
X2        0         0         1    1070.4    1071.7
X3       10                                                        1071.7    1071.7
BT        6      9925    1073.2              9973.3    1071.7              9974.4    1071.7
     10025.      1072              10028      1072               10100    1073.5
GR   1073.2      9925    1071.7    9973.3    1065.4    9974.4    1065.4     10000    1065.4    10025.6
GR    1072   10028.0    1073.5     10100

NC    .016      .016      .022        .3        .5

          INTRODUCE A CONCRETE LINED CHNNEL FROM I-10 TO MCDOWELL RD.
          INRODUCE A DROP STRUCTURE AT THIS SECTION

X1    .942         6      9965     10035       450       450       450
GR   1077.8      9925    1072.2      9965    1067.2      9975    1067.2     10000    1067.2     10025
GR   1072.2     10035

X1    .943         6      9965     10035         5         5         5
GR   1077.8      9925    1077.2      9965    1072.2      9975    1072.2     10000    1072.2     10025
GR   1077.2     10035

NC    .016      .016      .022        .3        .5

          MCDOWELL ROAD
          4 - 12 FT X 4.5 FT X 88 FT BOX CULVERTS

X1    0.956        10    9973.3   10026.8        68        68        68
X3       10                                                        1079.9    1079.9
GR   1079.9      9940    1079.9    9973.3    1072.5    9973.4    1072.5     10000    1072.5    10026.7
GR   1080.1   10026.8    1080.3     10140    1078.8     10420      1080     10905      1082     11225
```

SB	1.05	1.5	2.6	0	51.25	3.25	216	0	1073.5	1072.5
X1	0.973	10	9973.3	10026.8	88	88	88			
X2	0	0	1	1078	1079.9					
X3	10							1079.9	1079.9	
BT	9	9940	1079.9		9973.3	1080		9973.4	1080	
BT	10026.	1080.1		10028	1080.1		10140	1080.3		10420
BT	1078.8		10905	1080		11225	1082			
GR	1079.9	9940	1079.9	9973.3	1073.5	9973.4	1073.5	10000	1073.5	10026.7
GR	1080.1	10026.8	1080.3	10140	1078.8	10420	1080	10905	1082	11225

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	DLOSS	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

CCHV= .100 CEHV= .300
*SECNO .758
3720 CRITICAL DEPTH ASSUMED

A SECTION AT THE DROP STRUCTUR AT THE DOWNST. END OF CULVERT

.758	3.70	1063.70	1063.70	1063.00	1065.35	1.66	.00	.00	1067.50
2190.0	.0	2190.0	.0	.0	212.1	.0	.0	.0	1067.50
.00	.00	10.33	.00	.000	.022	.000	.000	1060.00	9967.61
.004982	0.	0.	0.	0	11	0	.00	64.78	10032.39

CCHV= .300 CEHV= .500
*SECNO .759
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3735 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1069.10 ELREA= 1069.10

5 - 10ft x 4ft x 52ft BC AT I-10,DOWNSTREAM END
SEC. 0.759 TO SEC. 0.847 ,EXIST. CONCRETE LINED CHANNEL AT I-10
Q EQUALS Q AT CP46.

.759	3.70	1066.30	1066.30	.00	1068.14	1.84	.05	.09	1067.50
2190.0	.0	2190.0	.0	.0	201.3	.0	.0	.0	1067.50
.00	.00	10.88	.00	.000	.022	.000	.000	1062.60	9972.52
.005297	10.	10.	10.	20	5	0	.00	55.19	10027.71

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1065.64 , NOT 1066.30 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	CDFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.00	1.50	2.50	.00	53.67	3.67	200.00	.00	1062.80	1062.60

*SECNO .769

3301 HV CHANGED MORE THAN HVINS

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

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.87

PRESSURE FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1069.09	1068.82	.00	0.	2190.	200.	200.	1066.80	1069.50	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1069.20 ELREA= 1069.20

.769	5.45	1068.25	.00	.00	1069.09	.85	.96	.00	1067.70
2190.0	.0	2190.0	.0	.0	296.3	.0	.3	.1	1067.70
.00	.00	7.39	.00	.000	.022	.000	.000	1062.80	9972.30
.001521	52.	52.	52.	3	0	0	.00	55.70	10028.00

*SECNO .792

.792	4.79	1068.29	.00	.00	1069.53	1.24	.24	.20	1067.50
2190.0	7.6	2181.9	.5	2.9	243.3	.3	1.1	.2	1067.50
.01	2.59	8.97	1.90	.016	.022	.016	.000	1063.50	9964.55
.002693	120.	120.	120.	2	0	0	.00	64.08	10028.63

*SECNO .822

.822	4.21	1068.61	.00	.00	1070.28	1.66	.54	.21	1068.40
2190.0	.3	2189.7	.0	.2	211.5	.0	1.9	.5	1068.40
.01	1.41	10.35	.06	.016	.022	.016	.000	1064.40	9969.96
.004327	160.	160.	160.	0	0	0	.00	58.22	10028.18

*SECNO .847

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1071.70 ELREA= 1071.70

SEC. 0.759 TO SEC. 0.847 ,EXIST. CONCRETE LINED CHANNEL AT I-10
5 - 10ft x 5ft x 52ft BC AT I-10 UPSTREAM END

.847	4.22	1069.32	.00	.00	1070.85	1.52	.52	.04	1071.70
2190.0	.0	2190.0	.0	.0	221.2	.0	2.6	.6	1071.70
.01	.00	9.90	.00	.000	.022	.000	.000	1065.10	9973.70
.003770	130.	130.	130.	4	0	0	.00	53.44	10027.14

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 BRIDGE

5227 DOWNSTREAM ELEV IS 1068.14 , NOT 1069.32 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	CDFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.00	1.50	2.50	.00	53.67	3.67	250.00	.00	1065.40	1065.10

*SECND .857
CLASS B LOW FLOW

3420 BRIDGE W.S.= 1069.16 BRIDGE VELOCITY= 11.21 CALCULATED CHANNEL AREA= 188.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1071.11	1071.49	.00	0.	2190.	250.	250.	1070.40	1071.70	0.

5 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1071.70 ELREA= 1071.70

.857	5.01	1070.41	.00	.00	1071.49	1.07	.64	.00	1071.70
2190.0	.0	2190.0	.0	.0	263.4	.0	2.9	.7	1072.00
.02	.00	8.31	.00	.000	.022	.000	.000	1065.40	9973.52
.002183	52.	52.	52.	0	0	0	.00	53.90	10027.42

CCHV= .300 CEHV= .500
*SECND .942

INTRODUCE A CONCRETE LINED CHNNEL FROM I-10 TO MCDOWELL RD.
INRODUCE A DROP STRUCTURE AT THIS SECTION

.942	4.30	1071.50	.00	.00	1072.67	1.17	1.14	.05	1072.20
2190.0	.0	2190.0	.0	.0	252.0	.0	5.5	1.3	1072.20
.03	.00	8.69	.00	.000	.022	.000	.000	1067.20	9966.40
.002957	450.	450.	450.	3	0	0	.00	67.20	10033.60

*SECND .943
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

.943	3.70	1075.90	1075.90	.00	1077.55	1.65	.02	.24	1077.20
2190.0	.0	2190.0	.0	.0	212.4	.0	5.6	1.3	1077.20
.03	.00	10.31	.00	.000	.022	.000	.000	1072.20	9967.60
.004958	5.	5.	5.	20	11	0	.00	64.80	10032.40

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

CCHV= .300 CEHV= .500
*SECNO .956
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1079.90 ELREA= 1079.90

MCDOWELL ROAD
4 - 12 FT X 4.5 FT X 88 FT BOX CULVERTS

.956	3.74	1076.24	1076.24	.00	1078.11	1.87	.35	.11	1079.90
2190.0	.0	2190.0	.0	.0	199.4	.0	5.9	1.4	1080.10
.03	.00	10.99	.00	.000	.022	.000	.000	1072.50	9973.35
.005427	68.	68.	68.	2	5	0	.00	53.40	10026.75

SPECIAL BRIDGE

3227 DOWNSTREAM ELEV IS 1075.65 , NOT 1076.24 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.50	2.60	.00	51.25	3.25	216.00	.00	1073.50	1072.50

*SECNO .973

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.64

CLASS B LOW FLOW

3420 BRIDGE W.S.= 1077.01 BRIDGE VELOCITY= 11.37 CALCULATED CHANNEL AREA= 169.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1078.63	1079.61	.00	0.	2190.	216.	216.	1078.00	1079.90	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1079.90 ELREA= 1079.90

.973	5.11	1078.61	.00	.00	1079.61	1.00	1.50	.00	1079.90
2190.0	.0	2190.0	.0	.0	272.9	.0	6.4	1.5	1080.10
.03	.00	8.02	.00	.000	.022	.000	.000	1073.50	9973.32
.002021	88.	88.	88.	0	0	0	.00	53.46	10026.78

THIS RUN EXECUTED 01DEC94 14:36:30

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

JACKRABBIT TRAIL WASH -

SUMMARY PRINTOUT

Sta.	SECNO	Q	CWSEL	SSTA	STCHL	STCHR	ENDST	DIFWSX	TOPWID	DEPTH	ELMIN	10*KS	VCH
* —	.758	2190.00	1063.70	9967.61	9960.00	10040.00	10032.39	.00	64.78	3.70	1060.00	49.82	10.33
* 4010	.759	2190.00	1066.30	9972.52	9972.30	10028.00	10027.71	2.61	55.19	3.70	1062.60	52.97	10.88
		B.C at I-10											
* 4062	.769	2190.00	1068.25	9972.30	9972.30	10028.00	10028.00	1.94	55.70	5.45	1062.80	15.21	7.39
4182	.792	2190.00	1068.29	9964.55	9972.00	10028.00	10028.63	.04	64.08	4.79	1063.50	26.93	8.97
4342	.822	2190.00	1068.61	9969.96	9972.00	10028.00	10028.18	.33	58.22	4.21	1064.40	43.27	10.35
4472	.847	2190.00	1069.32	9973.70	9973.30	10028.00	10027.14	.71	53.44	4.22	1065.10	37.70	9.90
		B.C at I-10											
* 4524	.857	2190.00	1070.41	9973.52	9973.30	10028.00	10027.42	1.09	53.90	5.01	1065.40	21.83	8.31
4974	.942	2190.00	1071.50	9966.40	9965.00	10035.00	10033.60	1.09	67.20	4.30	1067.20	29.57	8.69
		Drop struc.											
* 4979	.943	2190.00	1075.90	9967.60	9965.00	10035.00	10032.40	4.40	64.80	3.70	1072.20	49.58	10.31
* 5047	.956	2190.00	1076.24	9973.35	9973.30	10026.80	10026.75	.34	53.40	3.74	1072.50	54.27	10.99
		B.C at Mcdowell Rd.											
* 5135	.973	2190.00	1078.61	9973.32	9973.30	10026.80	10026.78	2.38	53.46	5.11	1073.50	20.21	8.02

KRABBIT TRAIL WASH -

SUMMARY PRINTOUT TABLE 110

	SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
*	.758	1063.70	.70	1065.35	64.78	.00	2190.00	.00	.00	.00	9960.00	10040.00	.00
*	.759	1066.30	.00	1068.14	55.19	.00	2190.00	.00	.00	.00	9972.30	10028.00	.00
*	.769	1068.25	.00	1069.09	55.70	.00	2190.00	.00	.00	.00	9972.30	10028.00	.00
	.792	1068.29	.00	1069.53	64.08	7.63	2181.90	.48	.00	.00	9972.00	10028.00	.00
	.822	1068.61	.00	1070.28	58.22	.32	2189.68	.00	.00	.00	9972.00	10028.00	.00
	.847	1069.32	.00	1070.85	53.44	.00	2190.00	.00	.00	.00	9973.30	10028.00	.00
*	.857	1070.41	.00	1071.49	53.90	.00	2190.00	.00	.00	.00	9973.30	10028.00	.00
	.942	1071.50	.00	1072.67	67.20	.00	2190.00	.00	.00	.00	9965.00	10035.00	.00
*	.943	1075.90	.00	1077.55	64.80	.00	2190.00	.00	.00	.00	9965.00	10035.00	.00
	.956	1076.24	.00	1078.11	53.40	.00	2190.00	.00	.00	.00	9973.30	10026.80	.00
*	.973	1078.61	.00	1079.61	53.46	.00	2190.00	.00	.00	.00	9973.30	10026.80	.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION SECNO=      .758  PROFILE=  1  CRITICAL DEPTH ASSUMED

CAUTION SECNO=      .759  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      .759  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      .759  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=      .769  PROFILE=  1  HYDRAULIC JUMP D.S.
WARNING SECNO=      .769  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=      .857  PROFILE=  1  HYDRAULIC JUMP D.S.

CAUTION SECNO=      .943  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      .943  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      .943  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=      .956  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      .956  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      .973  PROFILE=  1  HYDRAULIC JUMP D.S.
WARNING SECNO=      .973  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
```

APPENDIX F

ESTELLA FREEWAY CHANNEL

- Concept Design Summary Notes
- Cost Estimate
- Concept Design Plan and Profile Figures
- Hydraulic Calculation Sheets

CONCEPT DESIGN SUMMARY NOTES

ESTRELLA FREEWAY CHANNEL

CONCEPT DESIGN SUMMARY NOTES

1. Estrella Freeway extends from S.R.85 northerly into Grand Avenue. The concept channel design starts at the Gila River at Sta. 57+20 which is about one mile south of S.R.85 and follows the freeway alignment along its west side to Bell Road.

2. The stations and ground elevations were extracted form the Estrella Freeway Location Study Plan (reference 12).

3. The channel is concrete lined with 2:1 side slopes and for the most part having a longitudinal slope of 0.2%. The bottom width varies form 10′ to 100′.

4. The concrete lining extends at least one foot above the WSEL.

5. The peak flows range form 10,700 cfs at the Gila River to 800 cfs at Bell Road. They were extracted form the HEC-1 analysis (file: WTADMP5.24) for the ADMP (appendix A).

6. Hydraulically, the channel is designed for subcritical flow with a normal depth of about 8.0 ft. and velocities that could reach 15.0 ft/sec and hence the necessity of lining. Several drop structures are included to maintain subcritical flow. Culverts are also introduced at crossings with arterial streets.

7. The hydraulic grade line is shown on the concept design by assuming that the backwater will start at the critical depth at each drop structure and then transition to normal depth at the next upstream drainage structure. It was also assumed that the water surface elevation at the upstream side of each box culvert will continue at the same level to the next upstream drainage structure.

8. The channel alignment crosses both the RID Canal and the Buckeye Canal. It was assumed that each of these canals will be conveyed under the Estrella Freeway Channel in box culverts. The design of the culverts is not included in the concept design, however the cost estimate includes a budget of $100,000 for each crossing.

COST ESTIMATE

ESTRELLA FREEWAY CHANNEL
COST ESTIMATE SHEET

	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	COST
1.	Channel Excavation	3,819,729	C.Y.	$ 3	$ 11,459,200
2.	Concrete Lining (6" thick)	1,033,281	S.Y.	$ 25	$ 25,832,000
3.	Siphon at Buckeye Canal	1	EA..	$ 100,000	$ 100,000
4.	3.5' drop structure at sta. 104 + 00	1	EA.	$ 27,900	$ 27,900
5.	10 - 12' x 8' x 300' B.C. at S.R.85 & S.P.R.R.	300	L.F.	$ 4,670	$ 1,401,000
6.	5.0' drop structure at sta. 120 + 00	1	EA.	$ 32,900	$ 32,900
7.	5.0' drop structure at sta. 136 + 00	1	EA.	$ 32,900	$ 32,900
8.	10 - 12' x 8' x 50' B.C. at Dunlap Road	50	L.F.	$ 4,670	$ 233,500
9.	4.5' drop structure at sta. 151 + 00	1	EA.	$31,200	$ 31,200
10.	4.0' drop structure at sta. 164 + 00	1	EA.	$ 29,600	$ 29,600
11.	10 - 12' x 8' x 50' B.C. at Lower Buckeye Road	50	L.F.	$ 4,670	$ 233,500

ESTRELLA FREEWAY CHANNEL					
	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT COST	COST
12.	5.0' drop structure at sta. 180 + 00	1	EA.	$ 32,900	$ 32,900
13.	5.0' drop structure at sta. 200 + 00	1	EA.	$ 32,900	$ 32,900
14.	4.5' drop structure at sta. 216 + 00	1	EA.	$ 31,200	$ 31,200
15.	10 - 12' x 8' x 50' B.C. at Yuma Road	50	L.F.	$ 4,670	$ 233,500
16.	5.0' drop structure at sta. 233 + 00	1	EA.	$ 32,900	$ 32,900
17.	5.0' drop structure at sta. 250 + 00	1	EA.	$ 32,900	$ 32,900
18.	5.0' drop structure at sta. 268 + 00	1	EA.	$ 32,900	$ 32,900
19.	10 - 12' x 8' x 50 B.C. at Vanburan Street	50	L.F.	$ 4,670	$ 233,500
20.	5.0' drop structure at sta. 284 + 00	1	EA.	$ 32,900	$ 32,900
21.	5.0' drop structure at sta. 297 + 00	1	EA.	$32,900	$ 32,900
22.	Siphon at RID Canal	1	EA.	$ 100,00	100,000
23.	4.5' drop structure at sta. 312 + 00	1	EA	$ 31,200	$ 31,200
24.	10 - 12' x 8' x 600' B.C at I-10	600	L.F.	$4,670	$ 2,802,000

ESTRELLA FREEWAY CHANNEL					
	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT COST	COST
25.	10 - 12' x 10' x 50' B.C. at McDowell Road	50	L.F.	$ 4,965	$ 248,300
26.	10 - 12' x 10' x 50' B.C. at Cotton Lane	50	L.F.	$ 4,965	$ 248,300
27.	5.0' drop structure at sta. 341 + 00	1	EA.	$ 28,800	$ 28,800
28.	5.0' drop structure at sta. 366 + 00	1	EA.	$ 28,800	$ 28,800
29.	9 - 12' x 8' x 50' B.C. at Thomas Road	50	L.F.	$ 4,109	$ 209,500
30.	5.0' drop structure at sta. 393 + 00	1	EA.	$ 27,400	$ 27,400
31.	4.0' drop structure at sta. 414 + 00	1	EA.	$ 24,600	$ 24,600
32.	9 - 12' x 8' x 50' B.C. at Indian School Road	50	L.F.	$ 4,190	$ 209,500
33.	4.0' drop structure at sta. 444 + 00	1	EA.	$ 24,600	$ 24,600
34.	5.0' drop structure at sta. 476 + 00	1	EA.	$ 27,400	$ 27,400
35.	9 - 12' x 8' x 50' B.C. at Camelback Road	50	L.F.	$ 4,190	$ 209,500
36.	5.0' drop structure at sta. 504 + 00	1	EA.	$ 26,000	$ 26,000

ESTRELLA FREEWAY CHANNEL					
	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT COST	COST
37.	5.0' drop structure at sta. 531 + 00	1	EA.	$ 26,000	$ 26,000
38.	8 - 12' x 8' x 50' B.C. at Bethany Home Road	50	L.F.	$ 3,710	$ 185,500
39.	5.0' drop structure at sta. 555 + 00	1	EA.	$ 24.600	$24,600
40.	5.0' drop structure at sta. 580 + 00	1	EA.	$ 24,600	$ 24,600
41.	8 - 12' x 8' x 50' B.C. at Glendale Avenue	50	L.F.	$ 3,710	$ 185,500
42.	5.0' drop structure at sta. 607 + 00	1	EA.	$ 20,500	$ 20,500
43.	4.5' drop structure at sta. 633 + 00	1	EA.	$ 19,500	$ 19,500
44.	7 - 12' x 8' x 50' B.C. at Northern Avenue	50	L.F.	$ 3,225	$161,300
45.	5.0' drop structure at sta. 658 + 00	1	EA.	$ 17,700	$ 17,700
46.	5.0' drop structure at sta. 672 + 00	1	EA.	$ 17,700	$ 17,700
47.	5.0' drop structure at sta. 685 + 00	1	EA.	$ 17,700	$ 17,700

ESTRELLA FEREEWAY CHANNEL					
	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT COST	COST
48.	5.0' drop structure at sta. 696 + 00	1	EA.	$ 17,700	$ 17,700
49.	6 - 12' x 8' x 50' B.C. at Olive Avenue	50	L.F.	$ 2,525	$ 126,300
50.	4.0' drop structure at sta. 711 + 00	1	EA.	$ 14,800	$ 14,800
51.	3.0' drop structure at sta. 736 + 00	1	EA.	$ 13,200	$ 13,200
52.	6 - 12' x 8' x 50' B.C. at Peoria Avenue	50	L.F.	$ 2,525	$ 126,300
53.	4.0' drop structure at sta. 764 + 00	1	EA.	$11,100	$ 11,100
54.	4.0' drop structure at sta. 780 + 00	1	EA.	$ 11,100	$ 11,100
55.	4.0' drop structure at sta. 798 + 00	1	EA.	$ 11,100	$ 11,100
56.	4 - 12' x 8' x 50' B.C. at Cactus Road	50	L.F.	$ 1,745	$ 87,300
57.	5.0' drop sturcture at sta. 813 + 00	1	EA.	$ 10,400	$ 10,400
58.	4.0' drop sturcture at sta. 839 + 00	1	EA.	$ 9,400	$ 9,400
59.	4 - 8' x 6' x 50' B.C. at Waddell Road	50	L.F.	$ 955	$ 47,800

ESTRELLA FREEWAY CHANNEL					
	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT COST	COST
60.	5.0' drop structure at sta. 866 + 00	1	EA.	$ 7,400	$ 7,400
61.	3.5' drop structure at sta. 882 + 00	1	EA.	$6,400	$ 6,400
62.	3.0' drop structure at sta. 899 + 00	1	EA.	$ 6,100	$ 6,100
63.	2 - 8' x 5' x 50' B.C. at Greenway Road	50	L.F.	$ 505	$ 25,300
64.	5.0' drop structure at sta. 924 + 00	1	EA.	$ 7,300	$ 7,300
65.	5.0' drop structure at sta. 949 + 00	1	EA.	$ 7,300	$ 7,300
				Estimated Construction Cost	$ 45,635,000
				Contingencies (25%)	$ 11,408,800
				Total Construction Cost	$ 57,043,800
66.	R.O.W.	9,655,100	S.F.	$ .15	$ 1,448,300
				GRAND TOTAL	**$ 58,492,100**

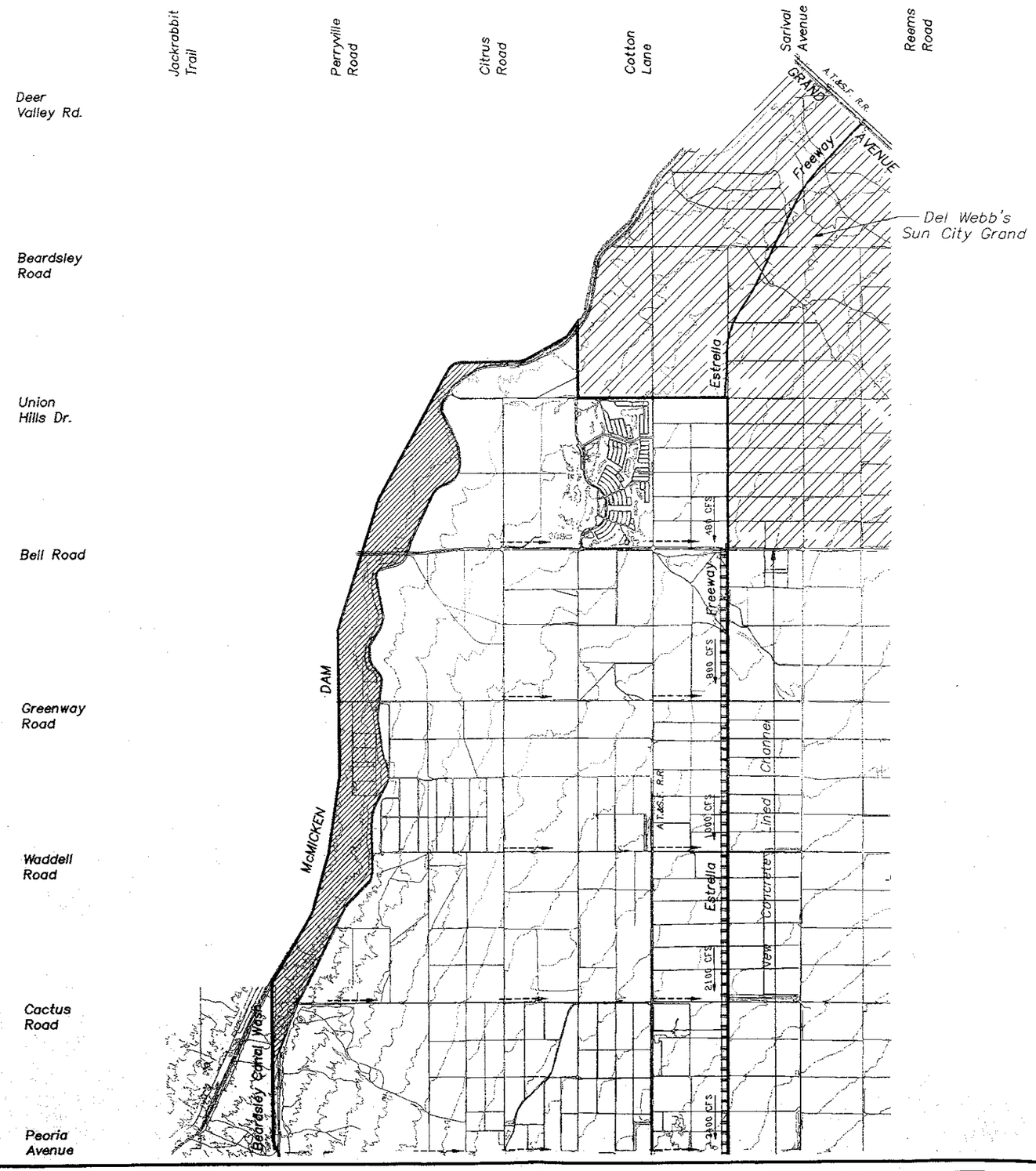
CONCEPT DESIGN

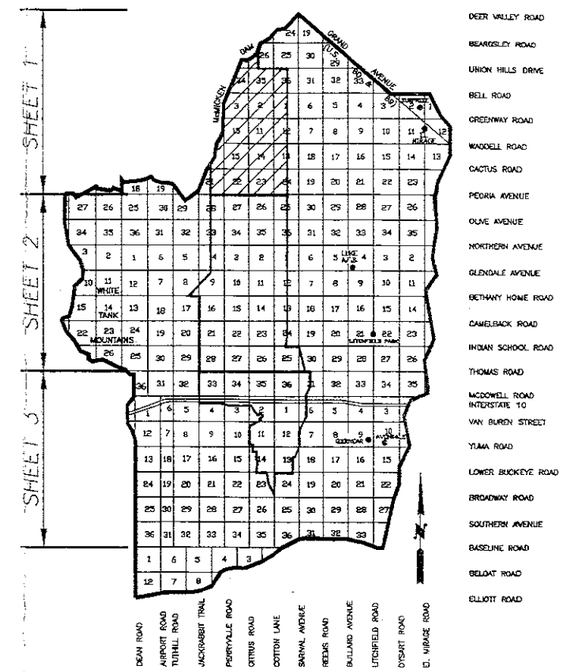
PLAN AND PROFILE FIGURES

Figure 7.2-1

Area Drainage Master Plan
for
Estrella Freeway Watershed
Sheet 1 of 3

WHITE TANKS/AGUA FRIA
AREA DRAINAGE MASTER STUDY





Location Map

Legend

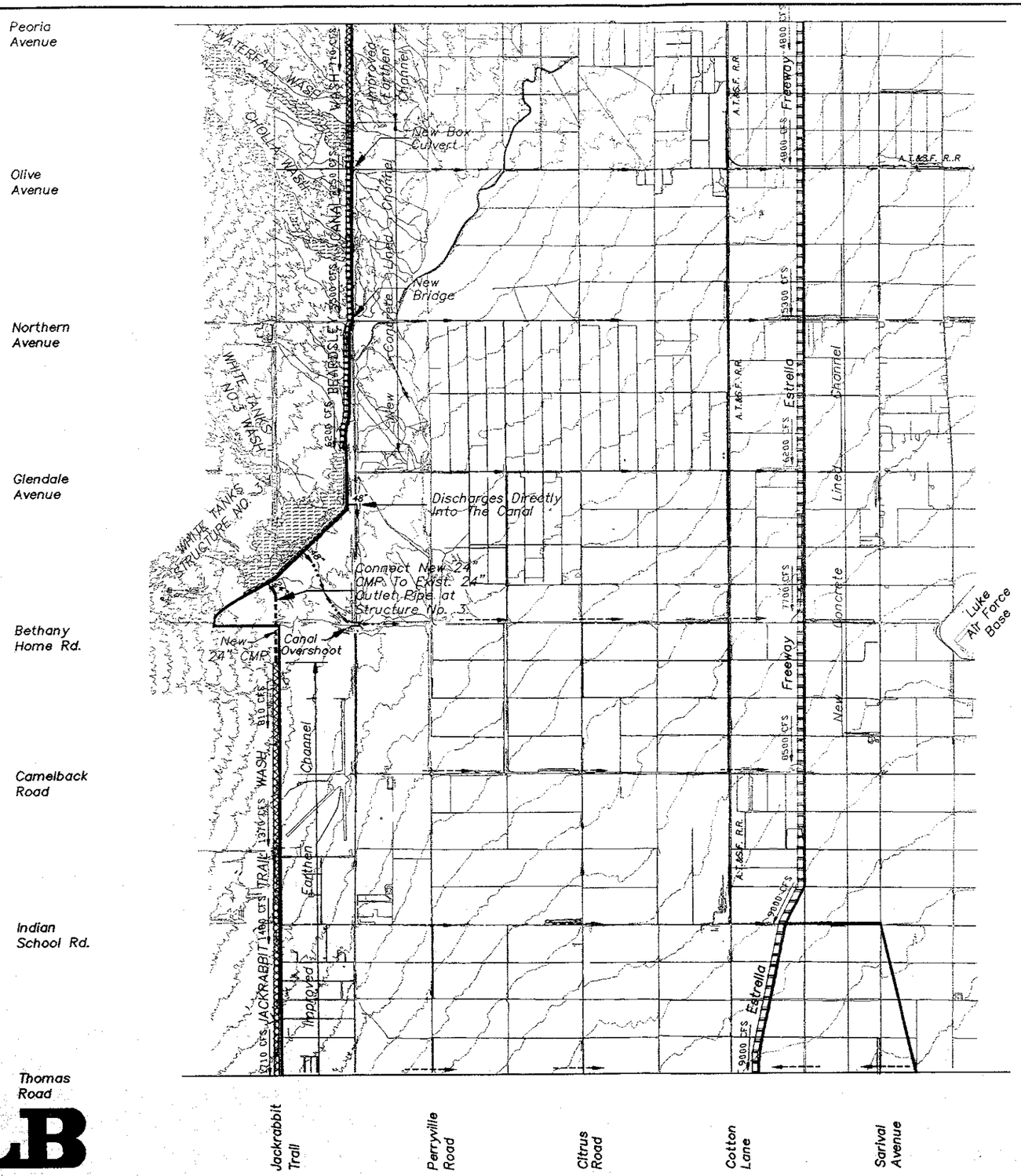
1800 CFS	Proposed Condition Peak Flow
	100 – Year Floodplain
	Retained Area Behind Beardsley Canal
48"	48" C.M.P. Gated Outlet
	Watershed Boundary
	Railroads
	Existing Channels
	Future Local Drainage System

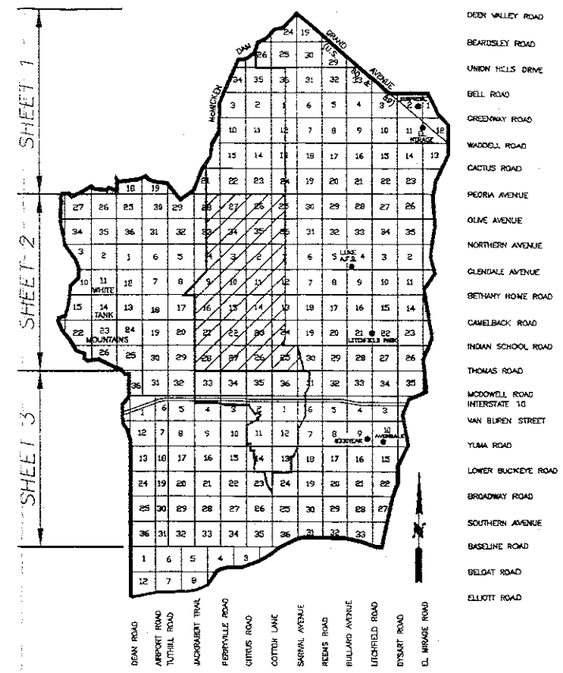
The WLB Group INC. WLB

Figure 7.2-2

Area Drainage Master Plan for Estrella Freeway Watershed Sheet 2 Of 3

WHITE TANKS/AGUA FRIA AREA DRAINAGE MASTER STUDY





Location Map

Legend

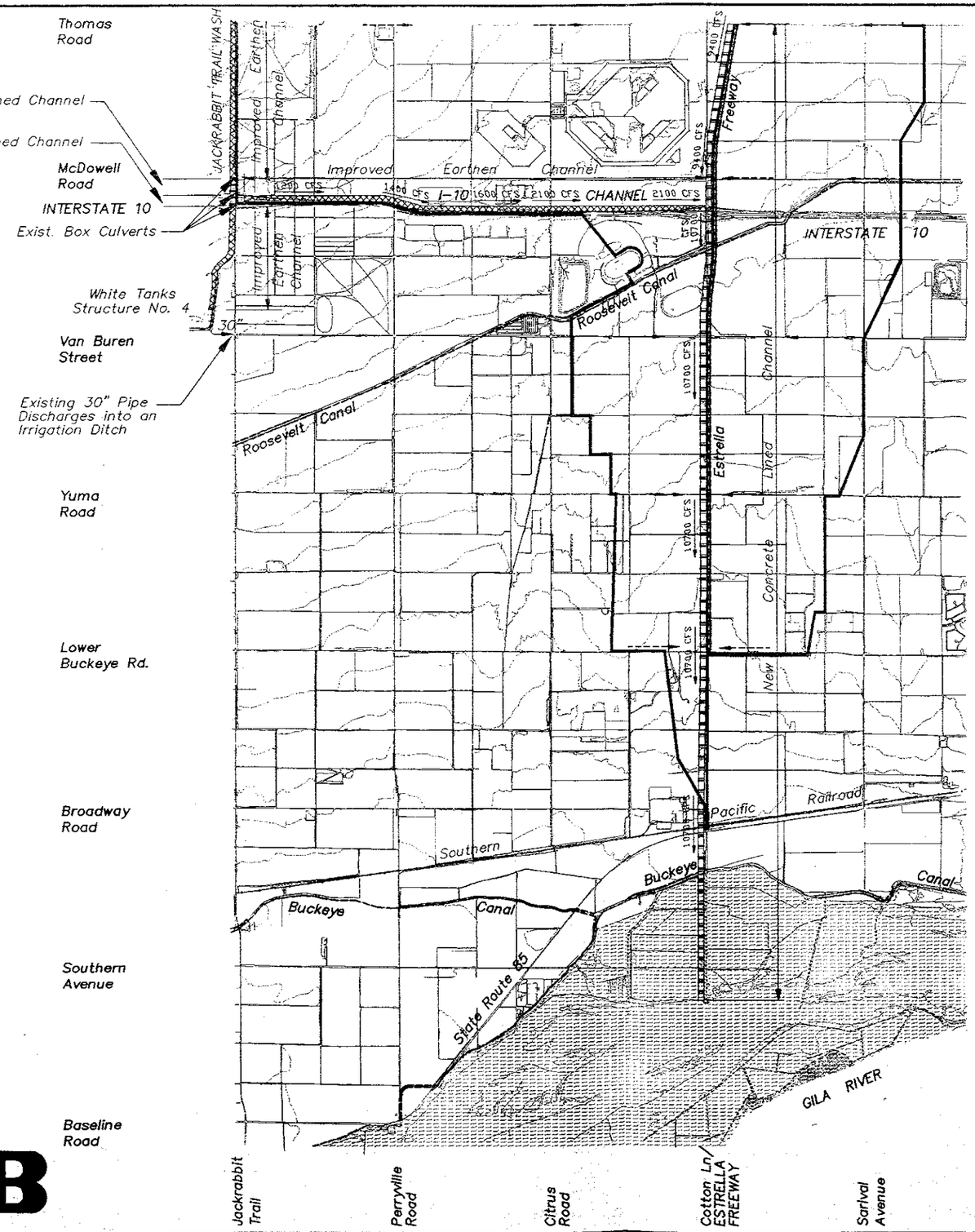
1800 CFS	Proposed Condition Peak Flow
	100 – Year Floodplain
	Retained Area Behind Beardsley Canal
48"	48" C.M.P. Gated Outlet
	Watershed Boundary
	Railroads
	Existing Channels
	Future Local Drainage System

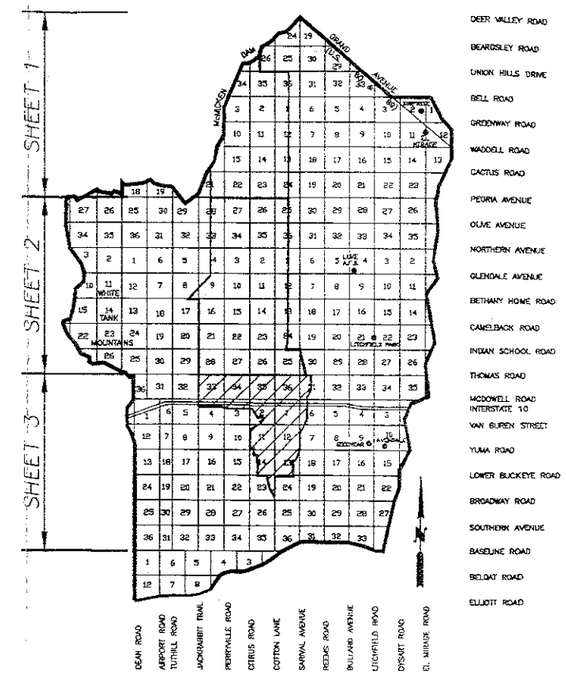
The WLB Group INC. **WLB**

Figure 7.2-3

Area Drainage Master Plan for Estrella Freeway Watershed Sheet 3 of 3

WHITE TANKS/AGUA FRIA AREA DRAINAGE MASTER STUDY



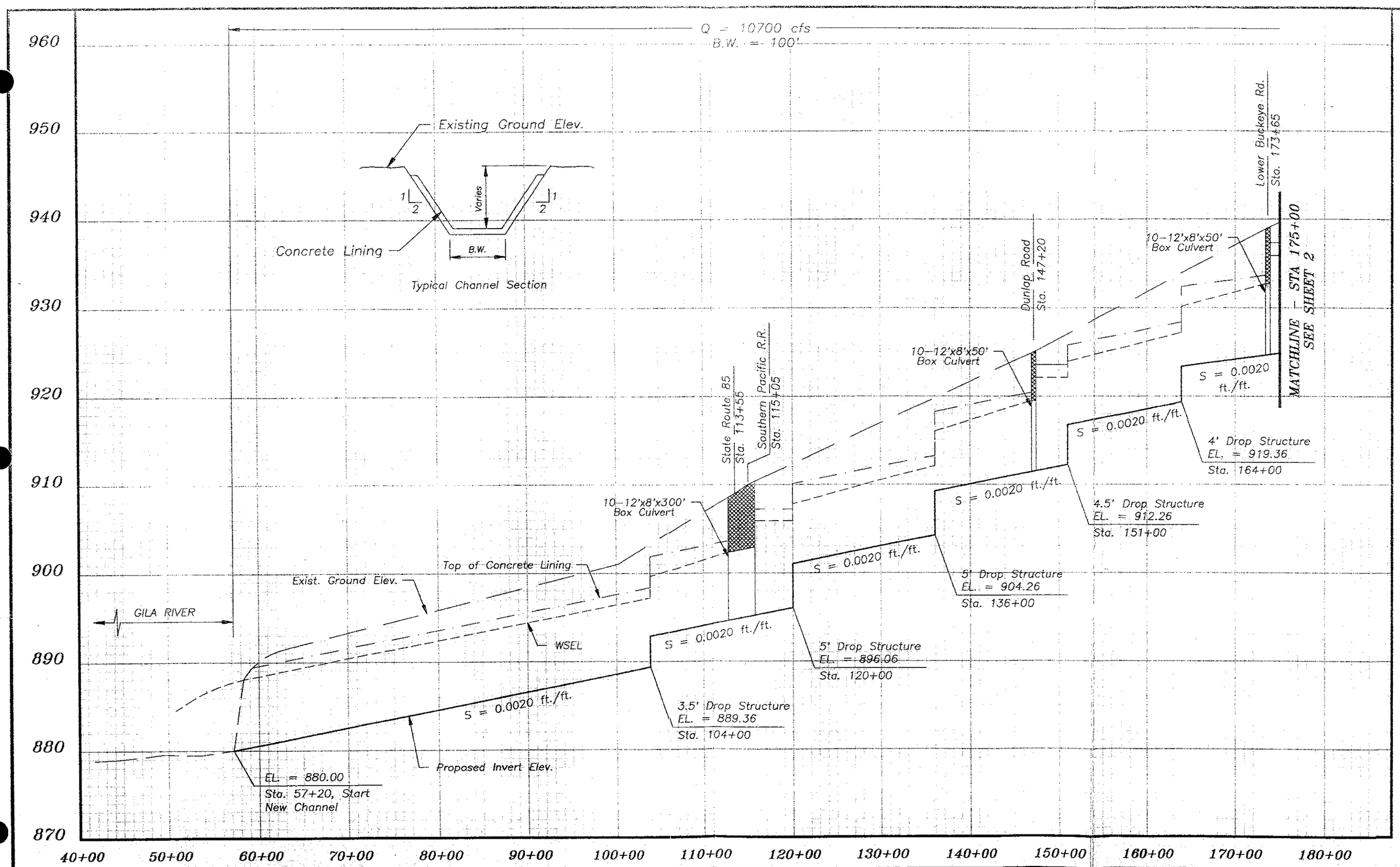


Location Map

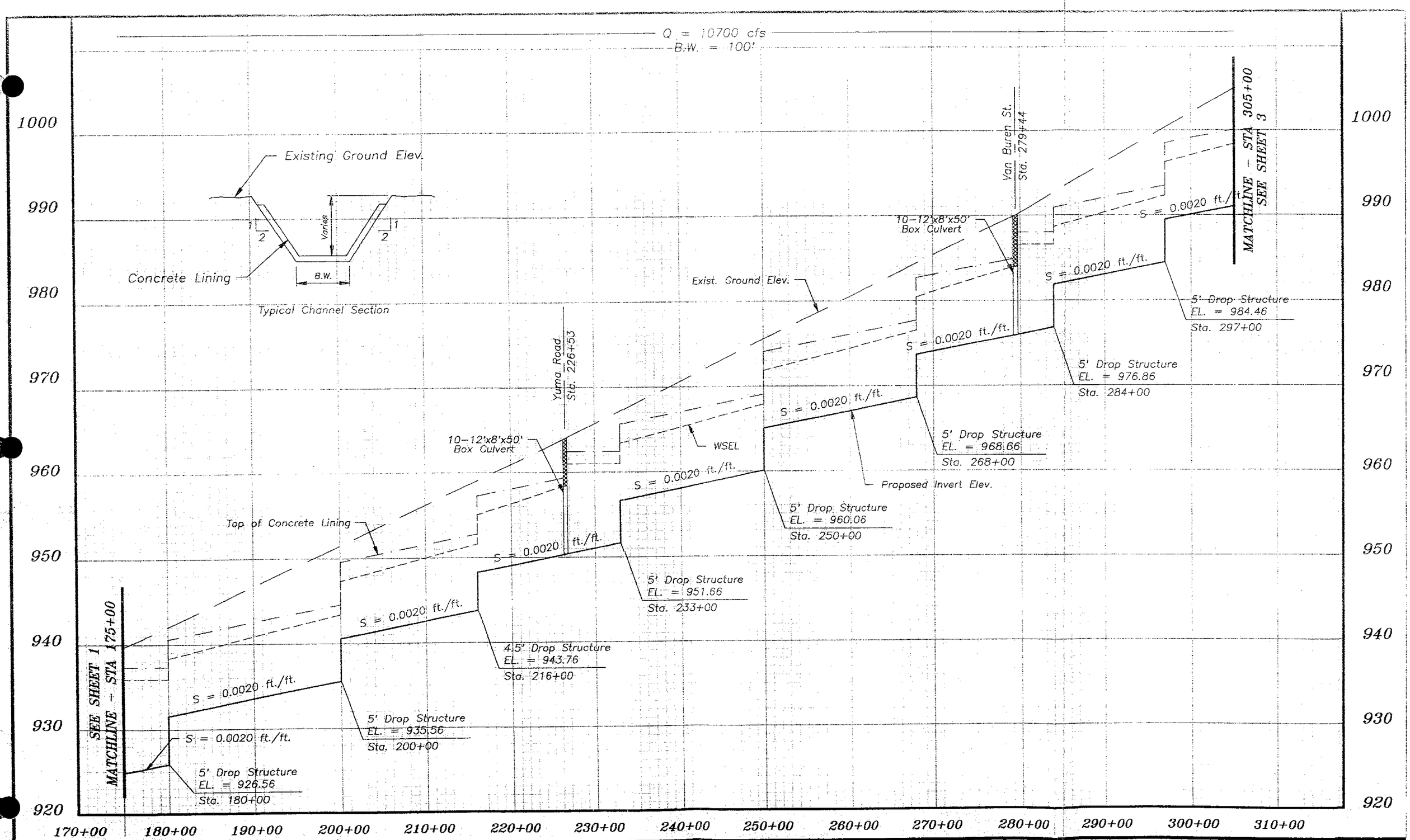
Legend

- 1000 CFS — Proposed Condition Peak Flow
- 100 – Year Floodplain
- Retained Area Behind Beardsley Canal
- 48" — 48" C.M.P. Gated Outlet
- Watershed Boundary
- Railroads
- Existing Channels
- Future Local Drainage System

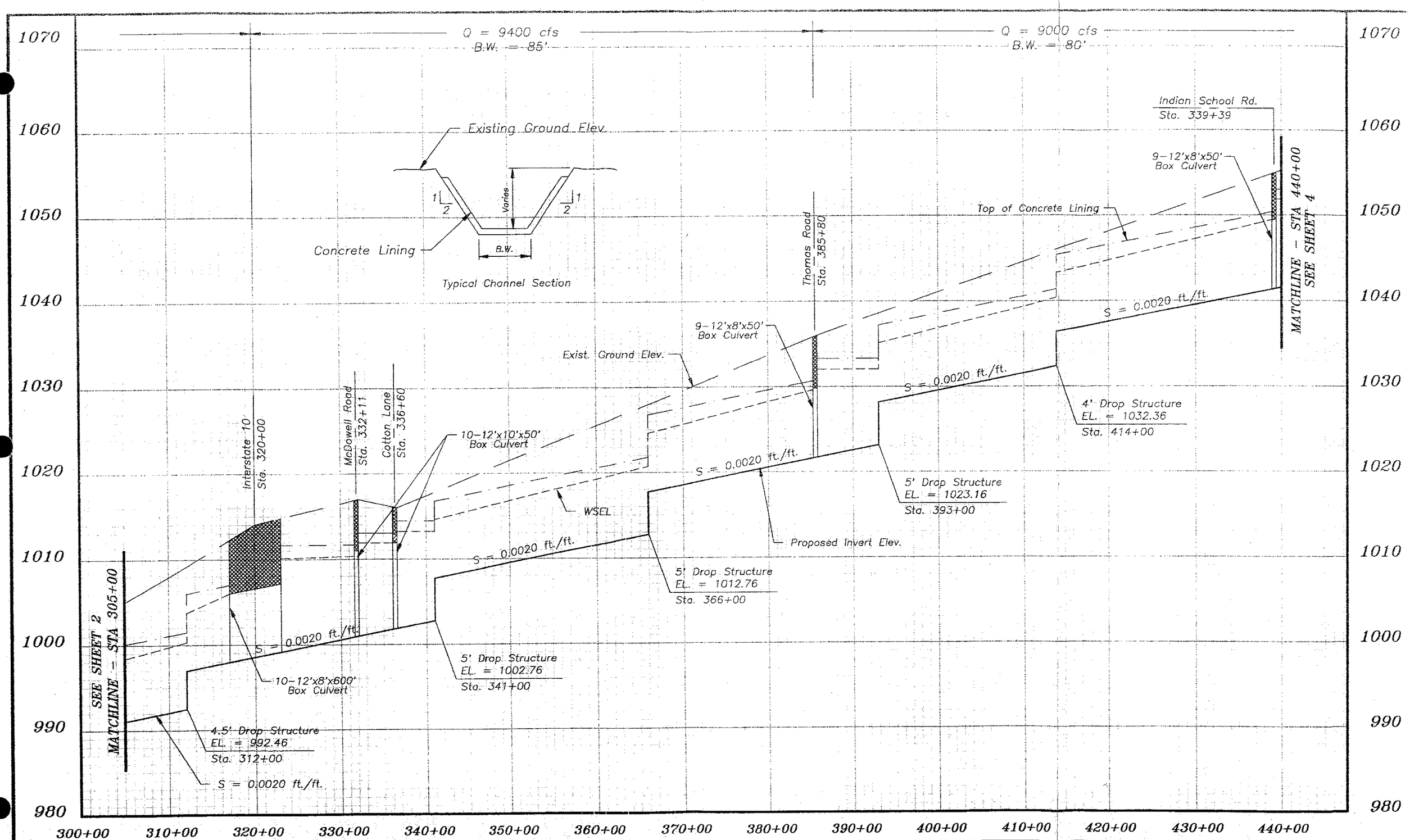
The WLB Group INC. **WLB**



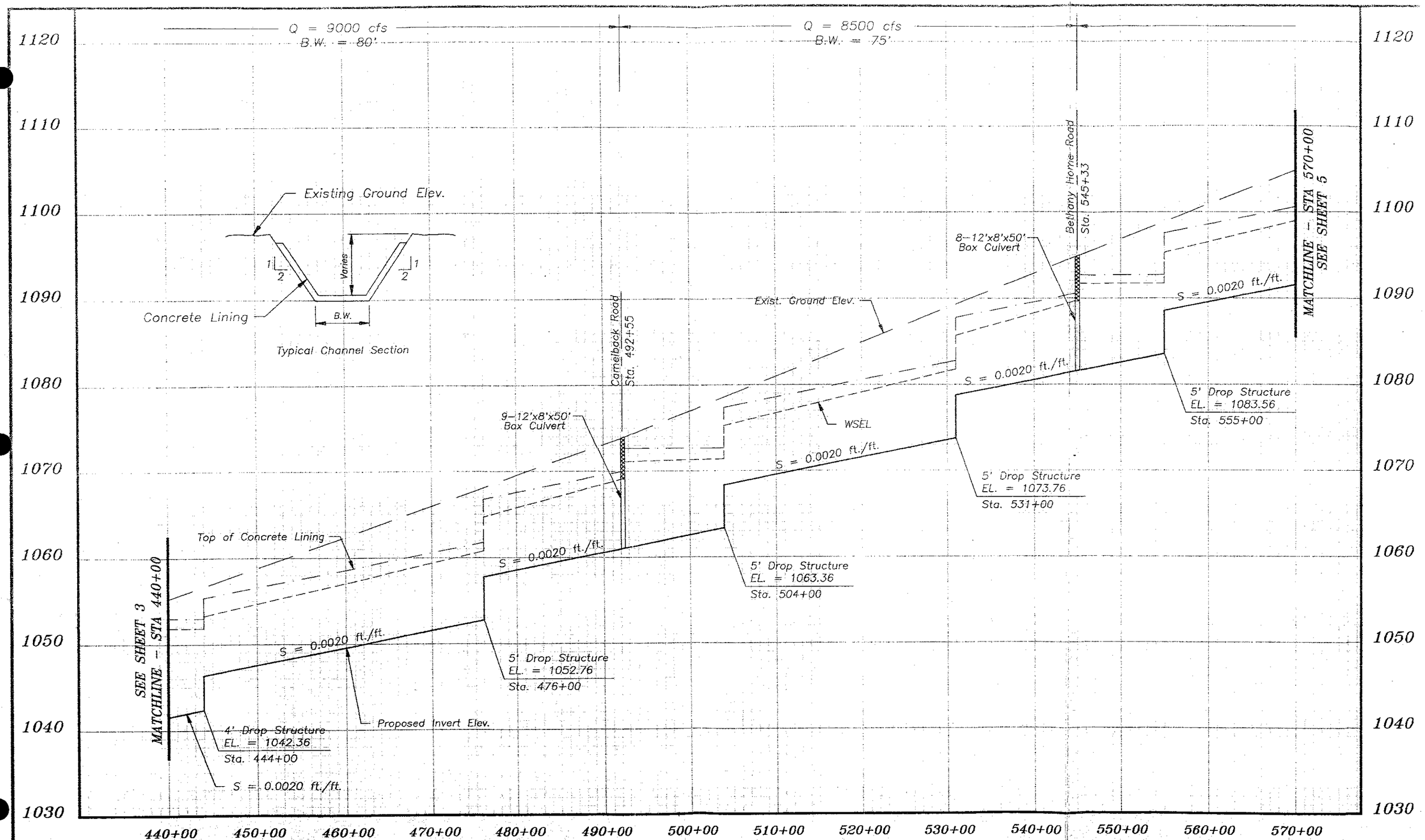
The WLB Group Inc. **WLB**	*White Tanks / Agua Fria ADMS* *Flood Control District of Maricopa County*	*Concept Design* *Estrella Freeway Channel*	*Scale: Horiz.: 1"=1000'* *Job No.: 289036* *Vert.: 1"=10'* *Date: Dec. 1994* *Checked By: G.M.A.* *Sheet: 1 of 7*



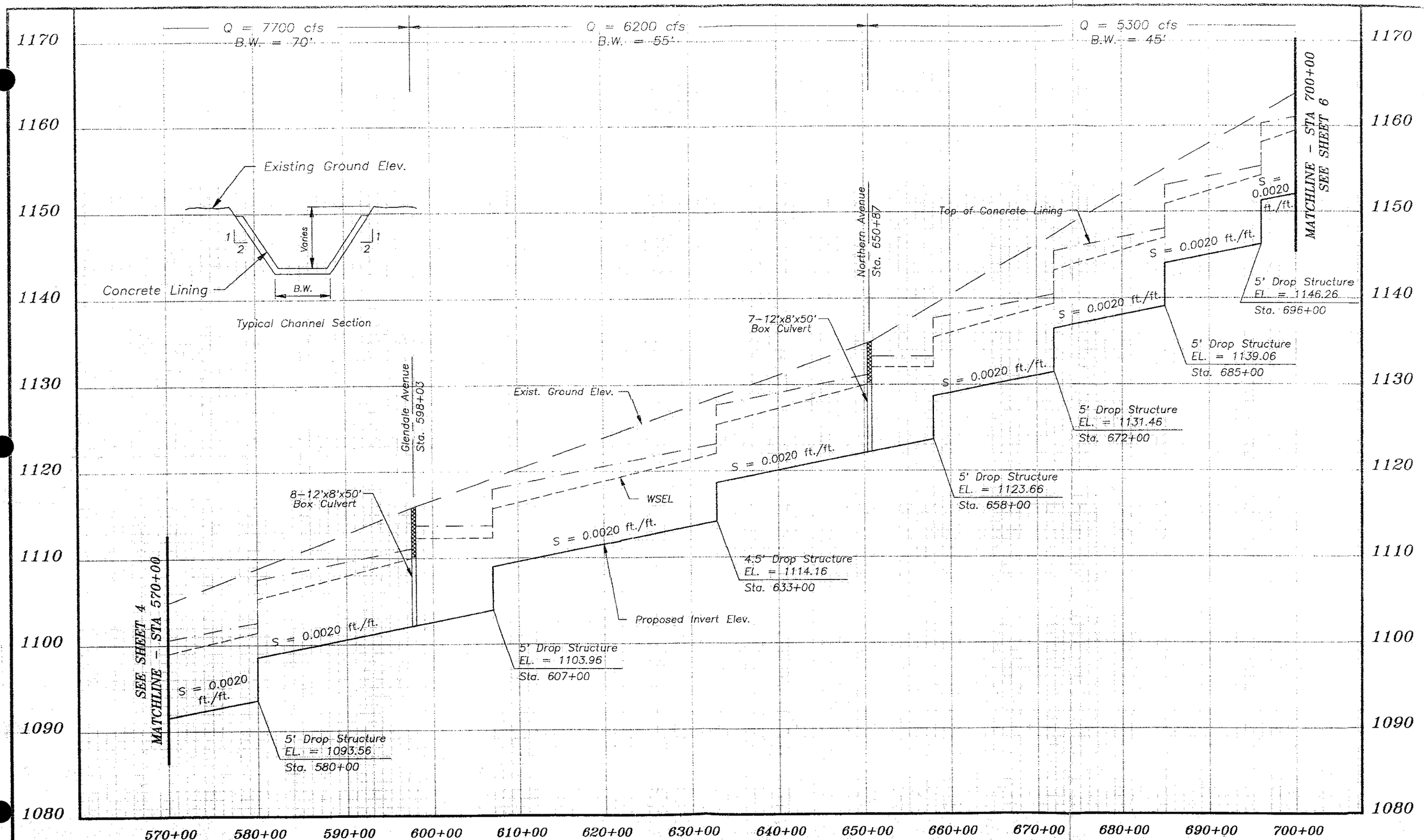
The WLB Group WLB	White Tanks / Agua Fria ADMS Flood Control District of Maricopa County	Concept Design Estrella Freeway Channel	Scale: Horiz.: 1"=1000' Vert.: 1"=10' Checked By: G.M.A. Job No.: 289036 Date: Dec. 1994 Sheet: 2 of 7



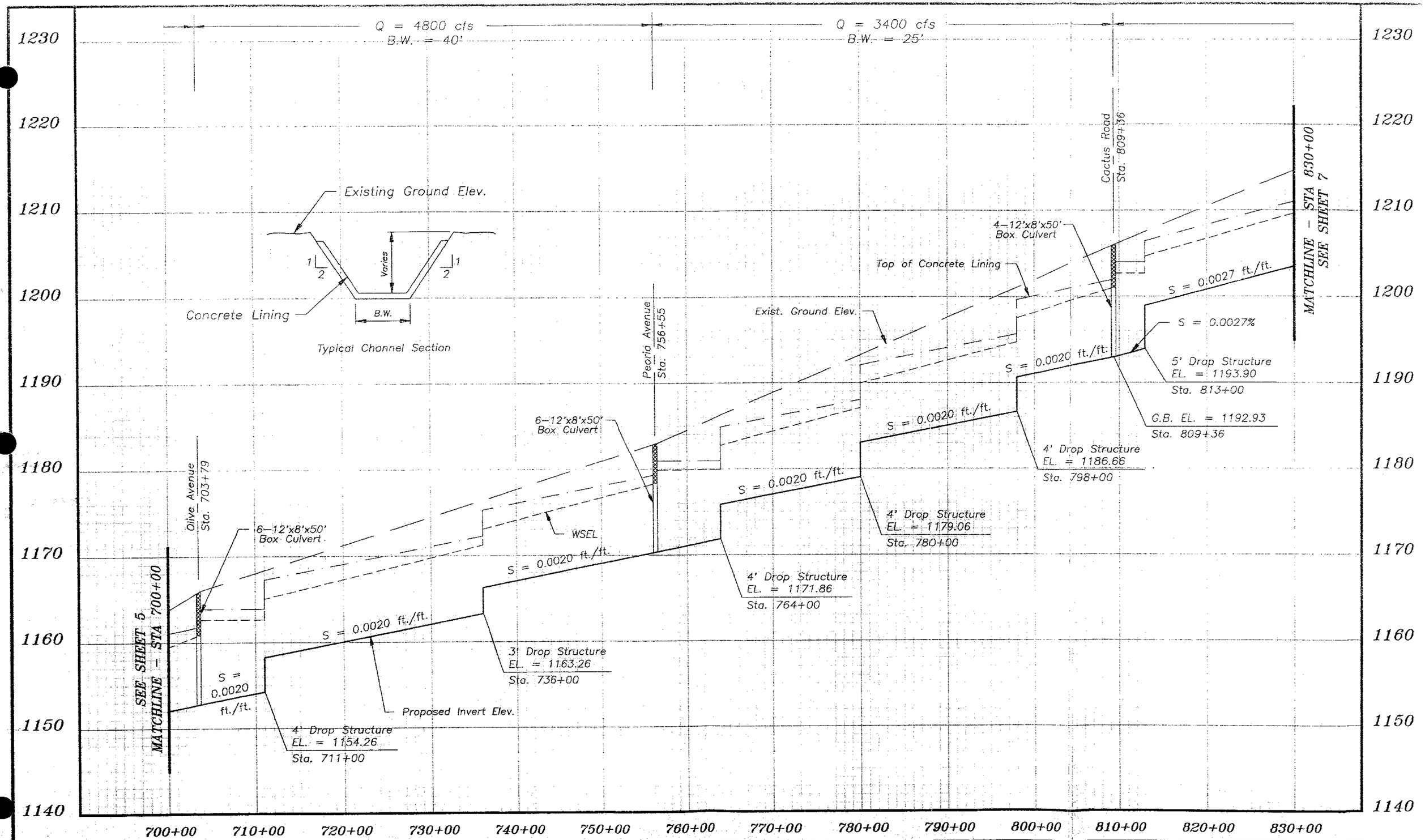
The WLB Group Inc. **WLB**	White Tanks / Agua Fria ADMS Flood Control District of Maricopa County	Concept Design Estrella Freeway Channel	Scale: Horiz.: 1"=1000' Job No.: 289036 Vert.: 1"=10' Date: Dec. 1994 Checked By: G.M.A. Sheet: 3 of 7



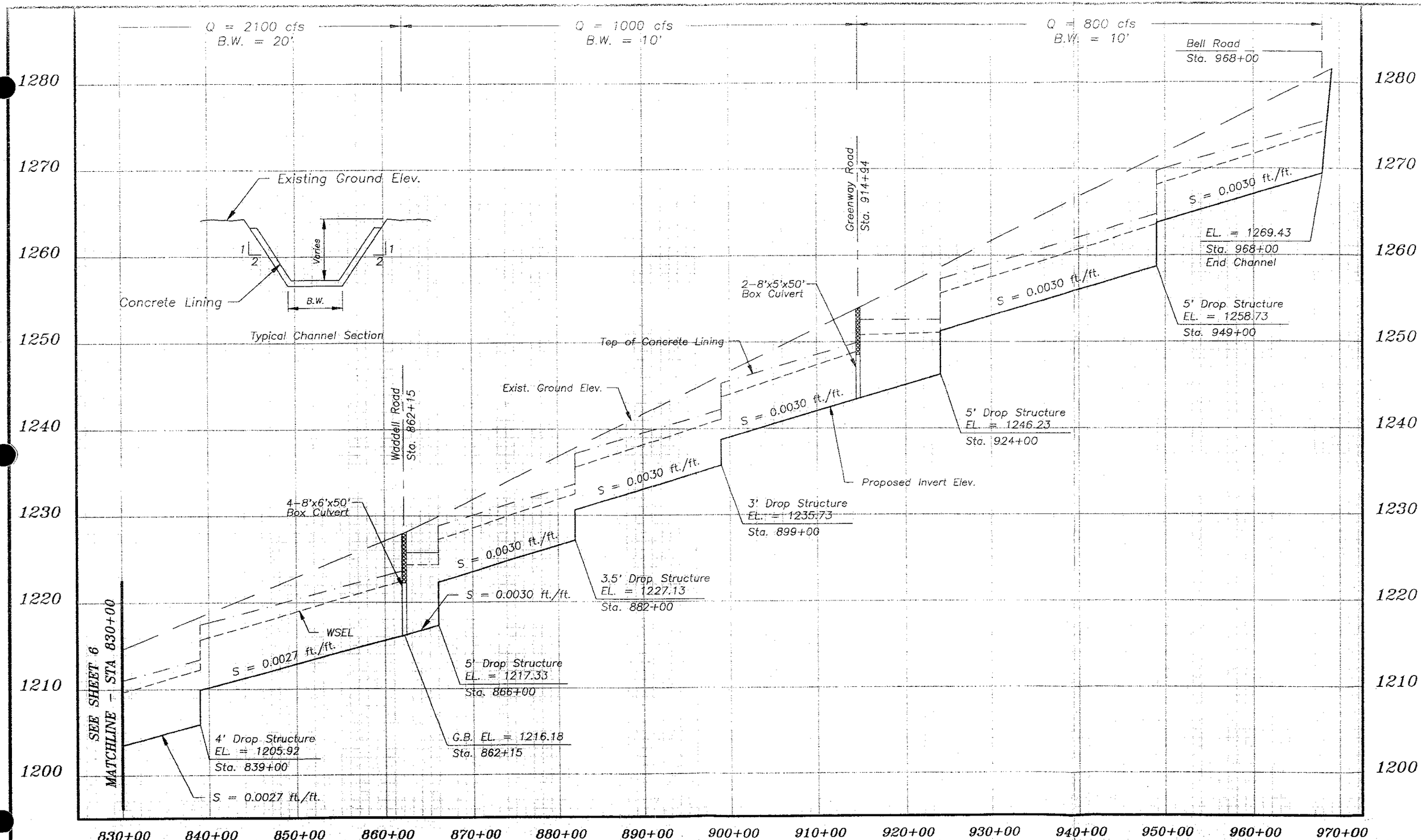
The WLB Group Inc. WLB	White Tanks / Agua Fria ADMS Flood Control District of Maricopa County	Concept Design Estrella Freeway Channel	Scale: Horiz.: 1"=1000' Vert.: 1"=10' Checked By: G.M.A.
			Job No.: 289036 Date: Dec. 1994 Sheet: 4 of 7



The WLB Group **WLB**	*White Tanks / Agua Fria ADMS* *Flood Control District of Maricopa County*	*Concept Design* *Estrella Freeway Channel*	*Scale: Horiz.: 1"=1000'* *Job No.: 289036* *Vert.: 1"=10'* *Date: Dec. 1994* *Checked By: G.M.A.* *Sheet: 5 of 7*



The WLB Group Inc. **WLB**	*White Tanks / Agua Fria ADMS* *Flood Control District of Maricopa County*	*Concept Design* *Estrella Freeway Channel*	*Scale: Horiz.: 1"=1000'* *Vert.: 1"=10'* *Checked By: G.M.A.* *Job No.: 289036* *Date: Dec. 1994* *Sheet: 6 of 7*



The WLB Group Inc. **WLB**	*White Tanks / Agua Fria ADMS* *Flood Control District of Maricopa County*	*Concept Design* *Estrella Freeway Channel*	*Scale: Horiz.: 1"=1000'* *Job No.: 289036* *Vert.: 1"=10'* *Date: Dec. 1994* *Checked By: G.M.A.* *Sheet: 7 of 7*

HYDRAULIC CALCULATION SHEETS

Includes Trapezoidal Channel Analysis
and Culvert Analysis

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
November 1, 1994

Estrella Freeway channel

Gila River to I-10

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	10700.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	100.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	7.83
Flow Velocity (feet per second).....	11.82
Froude Number (Flow is Sub-Critical).....	0.793
Velocity Head (feet).....	2.17
Energy Head (feet).....	10.00
Cross-Sectional Area of Flow (square feet).....	905.57
Top Width of Flow (feet).....	131.32

$d_c = 6.76$

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986 Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092 (713) 895-8322. A manual with equations & flow chart is available.

Estrella Freeway Channel

At S.R. 85 & S.P.R.R

1/3

CURRENT DATE: 11-02-1994
CURRENT TIME: 16:25:23

FILE DATE: 10-29-1994
FILE NAME: ESTSP&85

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.60	0.00	300.00	10 RCB	12.00	8.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: ESTSP&85 CULVERT HEADWATER ELEVATION (FT) DATE: 10-29-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.60	0.00	0.00	0.00	0.00	0.00	100.00
1070	2.87	0.00	0.00	0.00	0.00	0.00	102.31
2140	4.22	0.00	0.00	0.00	0.00	0.00	103.67
3210	5.35	0.00	0.00	0.00	0.00	0.00	104.81
4280	6.39	0.00	0.00	0.00	0.00	0.00	105.83
5350	7.29	0.00	0.00	0.00	0.00	0.00	106.76
6420	8.15	0.00	0.00	0.00	0.00	0.00	107.64
7490	8.99	0.00	0.00	0.00	0.00	0.00	108.47
8560	9.75	0.00	0.00	0.00	0.00	0.00	109.25
9630	10.49	0.00	0.00	0.00	0.00	0.00	110.01
10700	11.28	0.00	0.00	0.00	0.00	0.00	110.74
49220	111.91	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 11-02-1994 FILE DATE: 10-29-1994
CURRENT TIME: 16:25:23 FILE NAME: ESTSP&85

PERFORMANCE CURVE FOR CULVERT # 1 - 10 (12 BY 8) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.60	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
1070	2.87	2.08	2.27	3-M1t	1.43	1.35	4.44	2.01	5.13	2.01
2140	4.22	3.29	3.62	3-M1t	2.29	2.15	5.88	3.03	6.65	3.03
3210	5.35	4.32	4.75	3-M1t	3.02	2.82	6.93	3.86	7.73	3.86
4280	6.39	5.26	5.79	3-M1t	3.69	3.41	7.80	4.57	8.57	4.57
5350	7.29	6.10	6.69	3-M1t	4.34	3.96	8.55	5.22	9.29	5.22
6420	8.15	6.90	7.55	3-M1t	4.95	4.47	9.21	5.81	9.91	5.81
7490	8.99	7.69	8.39	3-M1t	5.55	4.96	9.82	6.36	10.45	6.36
8560	9.75	8.50	9.15	3-M1t	6.13	5.42	10.38	6.87	10.95	6.87
9630	10.49	9.34	9.89	3-M1t	6.70	5.86	10.90	7.36	11.40	7.36
10700	11.28	10.23	10.68	6-FFn	8.00	6.29	11.15	8.00	11.82	7.83

El. inlet face invert 0.60 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	0.60
OUTLET STATION (FT)	300.00
OUTLET ELEVATION (FT)	0.00
NUMBER OF BARRELS	10
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	300.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	12.00 FT
BARREL RISE	8.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 11-02-1994
CURRENT TIME: 16:25:23

FILE DATE: 10-29-1994
FILE NAME: ESTSP&85

TAILWATER

******* REGULAR CHANNEL CROSS SECTION ***********

BOTTOM WIDTH (FT)	100.00
SIDE SLOPE H/V (X:1)	2.0
CHANNEL SLOPE V/H (FT/FT)	0.002
MANNING'S N (.01-0.1)	0.020
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
1070.00	2.01	0.638	2.01	5.13	0.25
2140.00	3.03	0.673	3.03	6.65	0.38
3210.00	3.86	0.693	3.86	7.73	0.48
4280.00	4.57	0.707	4.57	8.57	0.57
5350.00	5.22	0.717	5.22	9.29	0.65
6420.00	5.81	0.724	5.81	9.91	0.73
7490.00	6.36	0.731	6.36	10.45	0.79
8560.00	6.87	0.736	6.87	10.95	0.86
9630.00	7.36	0.741	7.36	11.40	0.92
10700.00	7.83	0.744	7.83	11.82	0.98

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
November 1, 1994

Estrella Freeway channel
Gila River to I-10

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	10700.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	100.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	7.83
Flow Velocity (feet per second).....	11.82
Froude Number (Flow is Sub-Critical).....	0.793
Velocity Head (feet).....	2.17
Energy Head (feet).....	10.00
Cross-Sectional Area of Flow (square feet).....	905.57
Top Width of Flow (feet).....	131.32

$d_c = 6.76$

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Estrella Freeway channel

CURRENT DATE: 11-02-1994
CURRENT TIME: 14:37:07

FILE DATE: 11-01-1994
FILE NAME: ESTDWNST

At: Dunlap Rd. *
Lower Buckeye Rd.
Yuma Rd.
Vanburan St.

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.10	0.00	50.00	10 RCB	12.00	8.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: ESTDWNST CULVERT HEADWATER ELEVATION (FT) DATE: 11-01-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.10	0.00	0.00	0.00	0.00	0.00	100.00
1070	2.49	0.00	0.00	0.00	0.00	0.00	102.31
2140	3.85	0.00	0.00	0.00	0.00	0.00	103.67
3210	4.97	0.00	0.00	0.00	0.00	0.00	104.81
4280	5.97	0.00	0.00	0.00	0.00	0.00	105.83
5350	6.88	0.00	0.00	0.00	0.00	0.00	106.76
6420	7.73	0.00	0.00	0.00	0.00	0.00	107.64
7490	8.54	0.00	0.00	0.00	0.00	0.00	108.47
8560	9.30	0.00	0.00	0.00	0.00	0.00	109.25
9630	10.04	0.00	0.00	0.00	0.00	0.00	110.01
10700	10.65	0.00	0.00	0.00	0.00	0.00	110.74
49220	111.41	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 11-02-1994 FILE DATE: 11-01-1994
CURRENT TIME: 14:37:07 FILE NAME: ESTDWNST

PERFORMANCE CURVE FOR CULVERT # 1 - 10 (12 BY 8) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.10	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
1070	2.49	2.08	2.39	3-M1t	1.43	1.35	4.44	2.01	5.13	2.01
2140	3.85	3.29	3.75	3-M1t	2.29	2.15	5.88	3.03	6.65	3.03
3210	4.97	4.32	4.87	3-M1t	3.02	2.82	6.93	3.86	7.73	3.86
4280	5.97	5.26	5.87	3-M1t	3.70	3.41	7.80	4.57	8.57	4.57
5350	6.88	6.10	6.78	3-M1t	4.34	3.96	8.55	5.22	9.29	5.22
6420	7.73	6.90	7.63	3-M1t	4.95	4.47	9.21	5.81	9.91	5.81
7490	8.54	7.69	8.44	3-M1t	5.55	4.96	9.82	6.36	10.45	6.36
8560	9.30	8.50	9.20	3-M1t	6.13	5.42	10.38	6.87	10.95	6.87
9630	10.04	9.34	9.94	3-M1t	6.71	5.86	10.90	7.36	11.40	7.36
10700	10.65	10.23	10.55	6-FFn	8.00	6.29	11.15	8.00	11.82	7.83

El. inlet face invert 0.10 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	0.10
OUTLET STATION (FT)	50.00
OUTLET ELEVATION (FT)	0.00
NUMBER OF BARRELS	10
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	50.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	12.00 FT
BARREL RISE	8.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 11-02-1994
CURRENT TIME: 14:37:07

FILE DATE: 11-01-1994
FILE NAME: ESTDWNST

TAILWATER

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	100.00
SIDE SLOPE H/V (X:1)	2.0
CHANNEL SLOPE V/H (FT/FT)	0.002
MANNING'S N (.01-0.1)	0.020
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
1070.00	2.01	0.638	2.01	5.13	0.25
2140.00	3.03	0.673	3.03	6.65	0.38
3210.00	3.86	0.693	3.86	7.73	0.48
4280.00	4.57	0.707	4.57	8.57	0.57
5350.00	5.22	0.717	5.22	9.29	0.65
6420.00	5.81	0.724	5.81	9.91	0.73
7490.00	6.36	0.731	6.36	10.45	0.79
8560.00	6.87	0.736	6.87	10.95	0.86
9630.00	7.36	0.741	7.36	11.40	0.92
10700.00	7.83	0.744	7.83	11.82	0.98

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
November 1, 1994

Estrella Freeway channel
Gila River to I-10

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	10700.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	100.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	7.93
Flow Velocity (feet per second).....	11.82
Froude Number (Flow is Sub-Critical).....	0.793
Velocity Head (feet).....	2.17
Energy Head (feet).....	10.00
Cross-Sectional Area of Flow (square feet).....	905.57
Top Width of Flow (feet).....	131.32

$d_c = 6.76$

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Estrella freeway channel

CURRENT DATE: 11-02-1994
CURRENT TIME: 14:37:07

FILE DATE: 11-01-1994
FILE NAME: ESTDWNST

At: Dunlap Rd.
Lower Buckeye Rd. *
Yuma Rd.
Vanburan St.

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.10	0.00	50.00	10 RCB	12.00	8.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: ESTDWNST CULVERT HEADWATER ELEVATION (FT) DATE: 11-01-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.10	0.00	0.00	0.00	0.00	0.00	100.00
1070	2.49	0.00	0.00	0.00	0.00	0.00	102.31
2140	3.85	0.00	0.00	0.00	0.00	0.00	103.67
3210	4.97	0.00	0.00	0.00	0.00	0.00	104.81
4280	5.97	0.00	0.00	0.00	0.00	0.00	105.83
5350	6.88	0.00	0.00	0.00	0.00	0.00	106.76
6420	7.73	0.00	0.00	0.00	0.00	0.00	107.64
7490	8.54	0.00	0.00	0.00	0.00	0.00	108.47
8560	9.30	0.00	0.00	0.00	0.00	0.00	109.25
9630	10.04	0.00	0.00	0.00	0.00	0.00	110.01
10700	10.65	0.00	0.00	0.00	0.00	0.00	110.74
49220	111.41	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CU[illegible]T DATE: 11-02-1994 FILE DATE: 11-01-1994
CURRENT TIME: 14:37:07 FILE NAME: ESTDWNST

PERFORMANCE CURVE FOR CULVERT # 1 - 10 (12 BY 8) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.10	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
1070	2.49	2.08	2.39	3-M1t	1.43	1.35	4.44	2.01	5.13	2.01
2140	3.85	3.29	3.75	3-M1t	2.29	2.15	5.88	3.03	6.65	3.03
3210	4.97	4.32	4.87	3-M1t	3.02	2.82	6.93	3.86	7.73	3.86
4280	5.97	5.26	5.87	3-M1t	3.70	3.41	7.80	4.57	8.57	4.57
5350	6.88	6.10	6.78	3-M1t	4.34	3.96	8.55	5.22	9.29	5.22
6420	7.73	6.90	7.63	3-M1t	4.95	4.47	9.21	5.81	9.91	5.81
7490	8.54	7.69	8.44	3-M1t	5.55	4.96	9.82	6.36	10.45	6.36
8560	9.30	8.50	9.20	3-M1t	6.13	5.42	10.38	6.87	10.95	6.87
9630	10.04	9.34	9.94	3-M1t	6.71	5.86	10.90	7.36	11.40	7.36
10700	10.65	10.23	10.55	6-FFn	8.00	6.29	11.15	8.00	11.82	7.83

El. inlet face invert 0.10 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

[illegible]SITE DATA *** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	0.10
OUTLET STATION (FT)	50.00
OUTLET ELEVATION (FT)	0.00
NUMBER OF BARRELS	10
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	50.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	12.00 FT
BARREL RISE	8.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 11-02-1994
CURRENT TIME: 14:37:07

FILE DATE: 11-01-1994
FILE NAME: ESTDWNST

TAILWATER

******* REGULAR CHANNEL CROSS SECTION ***********

BOTTOM WIDTH (FT)	100.00
SIDE SLOPE H/V (X:1)	2.0
CHANNEL SLOPE V/H (FT/FT)	0.002
MANNING'S N (.01-0.1)	0.020
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
1070.00	2.01	0.638	2.01	5.13	0.25
2140.00	3.03	0.673	3.03	6.65	0.38
3210.00	3.86	0.693	3.86	7.73	0.48
4280.00	4.57	0.707	4.57	8.57	0.57
5350.00	5.22	0.717	5.22	9.29	0.65
6420.00	5.81	0.724	5.81	9.91	0.73
7490.00	6.36	0.731	6.36	10.45	0.79
8560.00	6.87	0.736	6.87	10.95	0.86
9630.00	7.36	0.741	7.36	11.40	0.92
10700.00	7.83	0.744	7.83	11.82	0.98

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
November 1, 1994

Estrella Freeway channel
Gila River to I-10

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	10700.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	100.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	7.83
Flow Velocity (feet per second).....	11.82
Froude Number (Flow is Sub-Critical).....	0.793
Velocity Head (feet).....	2.17
Energy Head (feet).....	10.00
Cross-Sectional Area of Flow (square feet).....	905.57
Top Width of Flow (feet).....	131.32

$d_c = 6.76$

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986 Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092 (713) 895-8322. A manual with equations & flow chart is available.

Estrella freeway channel

CURRENT DATE: 11-02-1994
CURRENT TIME: 14:37:07

FILE DATE: 11-01-1994
FILE NAME: ESTDWNST

At: Dunlap Rd.
Lower Buckeye Rd.
Yuma Rd. *
Vanburan St.

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.10	0.00	50.00	10 RCB	12.00	8.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: ESTDWNST CULVERT HEADWATER ELEVATION (FT) DATE: 11-01-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.10	0.00	0.00	0.00	0.00	0.00	100.00
1070	2.49	0.00	0.00	0.00	0.00	0.00	102.31
2140	3.85	0.00	0.00	0.00	0.00	0.00	103.67
3210	4.97	0.00	0.00	0.00	0.00	0.00	104.81
4280	5.97	0.00	0.00	0.00	0.00	0.00	105.83
5350	6.88	0.00	0.00	0.00	0.00	0.00	106.76
6420	7.73	0.00	0.00	0.00	0.00	0.00	107.64
7490	8.54	0.00	0.00	0.00	0.00	0.00	108.47
8560	9.30	0.00	0.00	0.00	0.00	0.00	109.25
9630	10.04	0.00	0.00	0.00	0.00	0.00	110.01
10700	10.65	0.00	0.00	0.00	0.00	0.00	110.74
49220	111.41	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 11-02-1994 FILE DATE: 11-01-1994
CURRENT TIME: 14:37:07 FILE NAME: ESTDWNST

PERFORMANCE CURVE FOR CULVERT # 1 - 10 (12 BY 8) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.10	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
1070	2.49	2.08	2.39	3-M1t	1.43	1.35	4.44	2.01	5.13	2.01
2140	3.85	3.29	3.75	3-M1t	2.29	2.15	5.88	3.03	6.65	3.03
3210	4.97	4.32	4.87	3-M1t	3.02	2.82	6.93	3.86	7.73	3.86
4280	5.97	5.26	5.87	3-M1t	3.70	3.41	7.80	4.57	8.57	4.57
5350	6.88	6.10	6.78	3-M1t	4.34	3.96	8.55	5.22	9.29	5.22
6420	7.73	6.90	7.63	3-M1t	4.95	4.47	9.21	5.81	9.91	5.81
7490	8.54	7.69	8.44	3-M1t	5.55	4.96	9.82	6.36	10.45	6.36
8560	9.30	8.50	9.20	3-M1t	6.13	5.42	10.38	6.87	10.95	6.87
9630	10.04	9.34	9.94	3-M1t	6.71	5.86	10.90	7.36	11.40	7.36
10700	10.65	10.23	10.55	6-FFn	8.00	6.29	11.15	8.00	11.82	7.83

El. inlet face invert 0.10 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	0.10
OUTLET STATION (FT)	50.00
OUTLET ELEVATION (FT)	0.00
NUMBER OF BARRELS	10
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	50.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	12.00 FT
BARREL RISE	8.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 11-02-1994
CURRENT TIME: 14:37:07

FILE DATE: 11-01-1994
FILE NAME: ESTDWNST

TAILWATER

******* REGULAR CHANNEL CROSS SECTION ***********

BOTTOM WIDTH (FT)	100.00
SIDE SLOPE H/V (X:1)	2.0
CHANNEL SLOPE V/H (FT/FT)	0.002
MANNING'S N (.01-0.1)	0.020
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
1070.00	2.01	0.638	2.01	5.13	0.25
2140.00	3.03	0.673	3.03	6.65	0.38
3210.00	3.86	0.693	3.86	7.73	0.48
4280.00	4.57	0.707	4.57	8.57	0.57
5350.00	5.22	0.717	5.22	9.29	0.65
6420.00	5.81	0.724	5.81	9.91	0.73
7490.00	6.36	0.731	6.36	10.45	0.79
8560.00	6.87	0.736	6.87	10.95	0.86
9630.00	7.36	0.741	7.36	11.40	0.92
10700.00	7.83	0.744	7.83	11.82	0.98

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
November 1, 1994

Estrella Freeway channel
Gila River to I-10

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	10700.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	100.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	7.83
Flow Velocity (feet per second).....	11.82
Froude Number (Flow is Sub-Critical).....	0.793
Velocity Head (feet).....	2.17
Energy Head (feet).....	10.00
Cross-Sectional Area of Flow (square feet).....	905.57
Top Width of Flow (feet).....	131.32

$d_c = 6.76$

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986 Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092 (713) 895-8322. A manual with equations & flow chart is available.

Estrella Freeway channel

CURRENT DATE: 11-02-1994
CURRENT TIME: 14:37:07

FILE DATE: 11-01-1994
FILE NAME: ESTDWNST

At: Dunlap Rd.
Lower Buckeye Rd.
Yuma Rd.
Vanburan St. *

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.10	0.00	50.00	10 RCB	12.00	8.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: ESTDWNST CULVERT HEADWATER ELEVATION (FT) DATE: 11-01-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.10	0.00	0.00	0.00	0.00	0.00	100.00
1070	2.49	0.00	0.00	0.00	0.00	0.00	102.31
2140	3.85	0.00	0.00	0.00	0.00	0.00	103.67
3210	4.97	0.00	0.00	0.00	0.00	0.00	104.81
4280	5.97	0.00	0.00	0.00	0.00	0.00	105.83
5350	6.88	0.00	0.00	0.00	0.00	0.00	106.76
6420	7.73	0.00	0.00	0.00	0.00	0.00	107.64
7490	8.54	0.00	0.00	0.00	0.00	0.00	108.47
8560	9.30	0.00	0.00	0.00	0.00	0.00	109.25
9630	10.04	0.00	0.00	0.00	0.00	0.00	110.01
10700	10.65	0.00	0.00	0.00	0.00	0.00	110.74
49220	111.41	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 11-02-1994 FILE DATE: 11-01-1994
CURRENT TIME: 14:37:07 FILE NAME: ESTDWNST

PERFORMANCE CURVE FOR CULVERT # 1 - 10 (12 BY 8) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.10	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
1070	2.49	2.08	2.39	3-M1t	1.43	1.35	4.44	2.01	5.13	2.01
2140	3.85	3.29	3.75	3-M1t	2.29	2.15	5.88	3.03	6.65	3.03
3210	4.97	4.32	4.87	3-M1t	3.02	2.82	6.93	3.86	7.73	3.86
4280	5.97	5.26	5.87	3-M1t	3.70	3.41	7.80	4.57	8.57	4.57
5350	6.88	6.10	6.78	3-M1t	4.34	3.96	8.55	5.22	9.29	5.22
6420	7.73	6.90	7.63	3-M1t	4.95	4.47	9.21	5.81	9.91	5.81
7490	8.54	7.69	8.44	3-M1t	5.55	4.96	9.82	6.36	10.45	6.36
8560	9.30	8.50	9.20	3-M1t	6.13	5.42	10.38	6.87	10.95	6.87
9630	10.04	9.34	9.94	3-M1t	6.71	5.86	10.90	7.36	11.40	7.36
10700	10.65	10.23	10.55	6-FFn	8.00	6.29	11.15	8.00	11.82	7.83

El. inlet face invert 0.10 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	0.10
OUTLET STATION (FT)	50.00
OUTLET ELEVATION (FT)	0.00
NUMBER OF BARRELS	10
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	50.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	12.00 FT
BARREL RISE	8.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 11-02-1994
CURRENT TIME: 14:37:07

FILE DATE: 11-01-1994
FILE NAME: ESTDWNST

TAILWATER

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	100.00
SIDE SLOPE H/V (X:1)	2.0
CHANNEL SLOPE V/H (FT/FT)	0.002
MANNING'S N (.01-0.1)	0.020
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
1070.00	2.01	0.638	2.01	5.13	0.25
2140.00	3.03	0.673	3.03	6.65	0.38
3210.00	3.86	0.693	3.86	7.73	0.48
4280.00	4.57	0.707	4.57	8.57	0.57
5350.00	5.22	0.717	5.22	9.29	0.65
6420.00	5.81	0.724	5.81	9.91	0.73
7490.00	6.36	0.731	6.36	10.45	0.79
8560.00	6.87	0.736	6.87	10.95	0.86
9630.00	7.36	0.741	7.36	11.40	0.92
10700.00	7.83	0.744	7.83	11.82	0.98

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
November 1, 1994

Estrella Freeway channel

Gila River to I-10

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	10700.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	100.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	7.83
Flow Velocity (feet per second).....	11.82
Froude Number (Flow is Sub-Critical).....	0.793
Velocity Head (feet).....	2.17
Energy Head (feet).....	10.00
Cross-Sectional Area of Flow (square feet).....	905.57
Top Width of Flow (feet).....	131.32

$d_c = 6.76$

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Estrella Freeway Channel

At I-10

CURRENT DATE: 11-02-1994
CURRENT TIME: 15:30:46

FILE DATE: 11-02-1994
FILE NAME: ESTI10

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	1.20	0.00	600.00	10 RCB	12.00	8.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: ESTI10 CULVERT HEADWATER ELEVATION (FT) DATE: 11-02-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	1.20	0.00	0.00	0.00	0.00	0.00	100.00
1070	3.47	0.00	0.00	0.00	0.00	0.00	102.31
2140	4.80	0.00	0.00	0.00	0.00	0.00	103.67
3210	5.92	0.00	0.00	0.00	0.00	0.00	104.81
4280	6.93	0.00	0.00	0.00	0.00	0.00	105.83
5350	7.84	0.00	0.00	0.00	0.00	0.00	106.76
6420	8.72	0.00	0.00	0.00	0.00	0.00	107.64
7490	9.52	0.00	0.00	0.00	0.00	0.00	108.47
8560	10.31	0.00	0.00	0.00	0.00	0.00	109.25
9630	11.07	0.00	0.00	0.00	0.00	0.00	110.01
10700	12.03	0.00	0.00	0.00	0.00	0.00	110.74
49220	113.58	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

2/3

RENT DATE: 11-02-1994 FILE DATE: 11-02-1994
CURRENT TIME: 15:30:46 FILE NAME: EST110

PERFORMANCE CURVE FOR CULVERT # 1 - 10 (12 BY 8) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	1.20	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
1070	3.47	2.08	2.27	3-M1t	1.43	1.35	4.44	2.01	5.13	2.01
2140	4.80	3.29	3.60	3-M1t	2.29	2.15	5.88	3.03	6.65	3.03
3210	5.92	4.32	4.72	3-M1t	3.02	2.82	6.93	3.86	7.73	3.86
4280	6.93	5.26	5.73	3-M1t	3.69	3.41	7.80	4.57	8.57	4.57
5350	7.84	6.10	6.64	3-M1t	4.34	3.96	8.55	5.22	9.29	5.22
6420	8.72	6.90	7.52	3-M1t	4.95	4.47	9.21	5.81	9.91	5.81
7490	9.52	7.69	8.32	3-M1t	5.55	4.96	9.82	6.36	10.45	6.36
8560	10.31	8.50	9.11	3-M1t	6.13	5.42	10.38	6.87	10.95	6.87
9630	11.07	9.34	9.87	3-M1t	6.70	5.86	10.90	7.36	11.40	7.36
10700	12.03	10.23	10.83	6-FFn	8.00	6.29	11.15	8.00	11.82	7.83

El. inlet face invert 1.20 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1.20
OUTLET STATION (FT)	600.00
OUTLET ELEVATION (FT)	0.00
NUMBER OF BARRELS	10
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	600.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	12.00 FT
BARREL RISE	8.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 11-02-1994
CURRENT TIME: 15:30:46

FILE DATE: 11-02-1994
FILE NAME: EST110

TAILWATER

******* REGULAR CHANNEL CROSS SECTION ********

BOTTOM WIDTH (FT)	100.00
SIDE SLOPE H/V (X:1)	2.0
CHANNEL SLOPE V/H (FT/FT)	0.002
MANNING'S N (.01-0.1)	0.020
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
1070.00	2.01	0.638	2.01	5.13	0.25
2140.00	3.03	0.673	3.03	6.65	0.38
3210.00	3.86	0.693	3.86	7.73	0.48
4280.00	4.57	0.707	4.57	8.57	0.57
5350.00	5.22	0.717	5.22	9.29	0.65
6420.00	5.81	0.724	5.81	9.91	0.73
7490.00	6.36	0.731	6.36	10.45	0.79
8560.00	6.87	0.736	6.87	10.95	0.86
9630.00	7.36	0.741	7.36	11.40	0.92
10700.00	7.83	0.744	7.83	11.82	0.98

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

Estrella Freeway channel

I-10 to Thomas Rd.

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
November 1, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	9400.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	85.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	7.94
Flow Velocity (feet per second).....	11.74
Froude Number (Flow is Sub-Critical).....	0.790
Velocity Head (feet).....	2.14
Energy Head (feet).....	10.08
Cross-Sectional Area of Flow (square feet).....	800.56
Top Width of Flow (feet).....	116.75

$d_c = 6.85$

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Estrella Freeway Channel
1/3 At Mcdowell Rd.

CURRENT DATE: 11-06-1994
CURRENT TIME: 15:13:58

FILE DATE: 11-06-1994
FILE NAME: ESTMCD

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.10	0.00	50.00	10 RCB	12.00	10.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: ESTMCD CULVERT HEADWATER ELEVATION (FT) DATE: 11-06-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	9.40	0.00	0.00	0.00	0.00	0.00	100.00
940	9.51	0.00	0.00	0.00	0.00	0.00	102.12
1880	9.56	0.00	0.00	0.00	0.00	0.00	103.37
2820	9.64	0.00	0.00	0.00	0.00	0.00	104.41
3760	9.74	0.00	0.00	0.00	0.00	0.00	105.35
4700	9.88	0.00	0.00	0.00	0.00	0.00	106.20
5640	9.97	0.00	0.00	0.00	0.00	0.00	107.01
6580	10.17	0.00	0.00	0.00	0.00	0.00	107.76
7520	10.40	0.00	0.00	0.00	0.00	0.00	108.49
8460	10.67	0.00	0.00	0.00	0.00	0.00	109.18
9400	10.96	0.00	0.00	0.00	0.00	0.00	109.85
61100	110.93	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

ENT DATE: 11-06-1994 FILE DATE: 11-06-1994
CURRENT TIME: 15:13:58 FILE NAME: ESTMCD

PERFORMANCE CURVE FOR CULVERT # 1 - 10 (12 BY 10) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	9.40	0.00	9.30	0-NF	0.00	0.00	0.00	0.00	0.00	9.40
940	9.51	1.91	9.41	3-Mlt	1.30	1.24	0.83	9.40	0.00	9.40
1880	9.56	3.02	9.46	3-Mlt	2.10	1.97	1.67	9.40	0.00	9.40
2820	9.64	3.96	9.54	3-Mlt	2.75	2.58	2.50	9.40	0.00	9.40
3760	9.74	4.79	9.64	3-Mlt	3.37	3.13	3.33	9.40	0.00	9.40
4700	9.88	5.58	9.78	3-Mlt	3.95	3.63	4.17	9.40	0.00	9.40
5640	9.97	6.31	9.87	3-Mlt	4.50	4.10	5.00	9.40	0.00	9.40
6580	10.17	7.00	10.07	3-Mlt	5.05	4.55	5.83	9.40	0.00	9.40
7520	10.40	7.66	10.30	3-Mlt	5.57	4.97	6.67	9.40	0.00	9.40
8460	10.67	8.29	10.57	3-Mlt	6.08	5.38	7.50	9.40	0.00	9.40
9400	10.96	8.91	10.86	3-Mlt	6.58	5.77	8.33	9.40	0.00	9.40

El. inlet face invert 0.10 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

*** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	0.10
OUTLET STATION (FT)	50.00
OUTLET ELEVATION (FT)	0.00
NUMBER OF BARRELS	10
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	50.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	12.00 FT
BARREL RISE	10.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

RENT DATE: 11-06-1994
CURRENT TIME: 15:13:58

FILE DATE: 11-06-1994
FILE NAME: ESTMCD

TAILWATER

CONSTANT WATER SURFACE ELEVATION
9.40

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
November 1, 1994

Estrella freeway channel
I-10 to Thomas Rd.

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	9400.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	85.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	7.94
Flow Velocity (feet per second).....	11.74
Froude Number (Flow is Sub-Critical).....	0.790
Velocity Head (feet).....	2.14
Energy Head (feet).....	10.08
Cross-Sectional Area of Flow (square feet).....	800.56
Top Width of Flow (feet).....	116.75

$d_c = 6.85$

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Estrella Freeway Channel
At Cotton Lane
(between Mcdowell st & Thomas Rd

CURRENT DATE: 11-06-1994
CURRENT TIME: 15:18:17

FILE DATE: 11-06-1994
FILE NAME: ESTCOT

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.10	0.00	50.00	10 RCB	12.00	10.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: ESTCOT CULVERT HEADWATER ELEVATION (FT) DATE: 11-06-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	10.00	0.00	0.00	0.00	0.00	0.00	100.00
940	10.11	0.00	0.00	0.00	0.00	0.00	102.12
1880	10.15	0.00	0.00	0.00	0.00	0.00	103.37
2820	10.22	0.00	0.00	0.00	0.00	0.00	104.41
3760	10.31	0.00	0.00	0.00	0.00	0.00	105.35
4700	10.43	0.00	0.00	0.00	0.00	0.00	106.20
5640	10.51	0.00	0.00	0.00	0.00	0.00	107.01
6580	10.68	0.00	0.00	0.00	0.00	0.00	107.76
7520	10.89	0.00	0.00	0.00	0.00	0.00	108.49
8460	11.12	0.00	0.00	0.00	0.00	0.00	109.18
9400	11.38	0.00	0.00	0.00	0.00	0.00	109.85
61100	110.93	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 11-06-1994 FILE DATE: 11-06-1994
CURRENT TIME: 15:18:17 FILE NAME: ESTCOT

PERFORMANCE CURVE FOR CULVERT # 1 - 10 (12 BY 10) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	10.00	0.00	9.90	0-NF	0.00	0.00	0.00	0.00	0.00	10.00
940	10.11	1.91	10.01	3-M1t	1.30	1.24	0.78	10.00	0.00	10.00
1880	10.15	3.02	10.05	3-M1t	2.10	1.97	1.57	10.00	0.00	10.00
2820	10.22	3.96	10.12	3-M1t	2.75	2.58	2.35	10.00	0.00	10.00
3760	10.31	4.79	10.21	3-M1t	3.37	3.13	3.13	10.00	0.00	10.00
4700	10.43	5.58	10.33	3-M1t	3.95	3.63	3.92	10.00	0.00	10.00
5640	10.51	6.31	10.41	3-M1t	4.50	4.10	4.70	10.00	0.00	10.00
6580	10.68	7.00	10.58	3-M1t	5.05	4.55	5.48	10.00	0.00	10.00
7520	10.89	7.66	10.79	3-M1t	5.57	4.97	6.27	10.00	0.00	10.00
8460	11.12	8.29	11.02	3-M1t	6.08	5.38	7.05	10.00	0.00	10.00
9400	11.38	8.91	11.28	3-M1t	6.58	5.77	7.83	10.00	0.00	10.00

El. inlet face invert 0.10 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	0.10
OUTLET STATION (FT)	50.00
OUTLET ELEVATION (FT)	0.00
NUMBER OF BARRELS	10
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	50.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	12.00 FT
BARREL RISE	10.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

ENT DATE: 11-06-1994
CURRENT TIME: 15:18:17

FILE DATE: 11-06-1994
FILE NAME: ESTCOT

TAILWATER

CONSTANT WATER SURFACE ELEVATION
10.00

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
November 1, 1994

Estrella freeway channel
I-10 to Thomas Rd.

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	9400.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	85.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	7.94
Flow Velocity (feet per second).....	11.74
Froude Number (Flow is Sub-Critical).....	0.790
Velocity Head (feet).....	2.14
Energy Head (feet).....	10.08
Cross-Sectional Area of Flow (square feet).....	800.56
Top Width of Flow (feet).....	116.75

$d_c = 6.85$

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Estrella Freeway Channel

1/3

At Thomas Rd.

CURRENT DATE: 11-02-1994
CURRENT TIME: 14:46:30

FILE DATE: 10-30-1994
FILE NAME: ESTTOM

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.10	0.00	50.00	9 RCB	12.00	8.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: ESTTOM CULVERT HEADWATER ELEVATION (FT) DATE: 10-30-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.10	0.00	0.00	0.00	0.00	0.00	100.00
900	2.43	0.00	0.00	0.00	0.00	0.00	102.06
1800	3.73	0.00	0.00	0.00	0.00	0.00	103.27
2700	4.82	0.00	0.00	0.00	0.00	0.00	104.29
3600	5.78	0.00	0.00	0.00	0.00	0.00	105.19
4500	6.65	0.00	0.00	0.00	0.00	0.00	106.03
5400	7.47	0.00	0.00	0.00	0.00	0.00	106.81
6300	8.24	0.00	0.00	0.00	0.00	0.00	107.54
7200	8.97	0.00	0.00	0.00	0.00	0.00	108.25
8100	9.67	0.00	0.00	0.00	0.00	0.00	108.92
9000	10.34	0.00	0.00	0.00	0.00	0.00	109.57
44100	110.45	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 11-02-1994 FILE DATE: 10-30-1994
CURRENT TIME: 14:46:30 FILE NAME: ESTTOM

PERFORMANCE CURVE FOR CULVERT # 1 - 9 (12 BY 8) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.10	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
900	2.43	1.99	2.33	3-M1t	1.36	1.29	4.18	1.99	5.08	1.99
1800	3.73	3.15	3.63	3-M1t	2.18	2.06	5.54	3.01	6.57	3.01
2700	4.82	4.13	4.72	3-M1t	2.88	2.69	6.53	3.83	7.62	3.83
3600	5.78	5.02	5.68	3-M1t	3.52	3.26	7.35	4.53	8.44	4.53
4500	6.65	5.83	6.55	3-M1t	4.13	3.79	8.06	5.17	9.14	5.17
5400	7.47	6.59	7.37	3-M1t	4.72	4.28	8.70	5.75	9.73	5.75
6300	8.24	7.33	8.14	3-M1t	5.28	4.74	9.27	6.29	10.26	6.29
7200	8.97	8.07	8.87	3-M1t	5.83	5.18	9.80	6.80	10.74	6.80
8100	9.67	8.84	9.57	3-M1t	6.37	5.60	10.30	7.28	11.17	7.28
9000	10.34	9.64	10.24	3-M1t	6.90	6.01	10.77	7.74	11.57	7.74

El. inlet face invert 0.10 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	0.10
OUTLET STATION (FT)	50.00
OUTLET ELEVATION (FT)	0.00
NUMBER OF BARRELS	9
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	50.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	12.00 FT
BARREL RISE	8.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

3/3

CURRENT DATE: 11-02-1994
CURRENT TIME: 14:46:30

FILE DATE: 10-30-1994
FILE NAME: ESTTOM

TAILWATER

******* REGULAR CHANNEL CROSS SECTION ****************

BOTTOM WIDTH (FT)	85.00
SIDE SLOPE H/V (X:1)	2.0
CHANNEL SLOPE V/H (FT/FT)	0.002
MANNING'S N (.01-0.1)	0.020
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
900.00	1.99	0.634	1.99	5.08	0.25
1800.00	3.01	0.668	3.01	6.57	0.38
2700.00	3.83	0.687	3.83	7.62	0.48
3600.00	4.53	0.699	4.53	8.44	0.57
4500.00	5.17	0.708	5.17	9.14	0.64
5400.00	5.75	0.715	5.75	9.73	0.72
6300.00	6.29	0.721	6.29	10.26	0.79
7200.00	6.80	0.726	6.80	10.74	0.85
8100.00	7.28	0.730	7.28	11.17	0.91
9000.00	7.74	0.733	7.74	11.57	0.97

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
November 1, 1994

Estrella Freeway channel
Thomas Rd. to Camelback Rd.

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	9000.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	80.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	8.00
Flow Velocity (feet per second).....	11.73
Froude Number (Flow is Sub-Critical).....	0.789
Velocity Head (feet).....	2.14
Energy Head (feet).....	10.13
Cross-Sectional Area of Flow (square feet).....	767.53
Top Width of Flow (feet).....	111.98

$d_c = 6.90$

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Estrella Freeway channel

At Indian school Rd.

CURRENT DATE: 11-02-1994
CURRENT TIME: 14:48:43

FILE DATE: 11-01-1994
FILE NAME: ESTIND

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.10	0.00	50.00	9 RCB	12.00	8.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: ESTIND CULVERT HEADWATER ELEVATION (FT) DATE: 11-01-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.10	0.00	0.00	0.00	0.00	0.00	100.00
900	2.47	0.00	0.00	0.00	0.00	0.00	102.06
1800	3.79	0.00	0.00	0.00	0.00	0.00	103.27
2700	4.88	0.00	0.00	0.00	0.00	0.00	104.29
3600	5.85	0.00	0.00	0.00	0.00	0.00	105.19
4500	6.73	0.00	0.00	0.00	0.00	0.00	106.03
5400	7.56	0.00	0.00	0.00	0.00	0.00	106.81
6300	8.33	0.00	0.00	0.00	0.00	0.00	107.54
7200	9.06	0.00	0.00	0.00	0.00	0.00	108.25
8100	9.76	0.00	0.00	0.00	0.00	0.00	108.92
9000	10.44	0.00	0.00	0.00	0.00	0.00	109.57
44100	110.45	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 11-02-1994 FILE DATE: 11-01-1994
CURRENT TIME: 14:48:43 FILE NAME: ESTIND

PERFORMANCE CURVE FOR CULVERT # 1 - 9 (12 BY 8) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.10	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
900	2.47	1.99	2.37	3-M1t	1.36	1.29	4.03	2.07	5.18	2.07
1800	3.79	3.15	3.69	3-M1t	2.18	2.06	5.35	3.12	6.70	3.12
2700	4.88	4.13	4.78	3-M1t	2.88	2.69	6.31	3.96	7.76	3.96
3600	5.85	5.02	5.75	3-M1t	3.52	3.26	7.10	4.69	8.59	4.69
4500	6.73	5.83	6.63	3-M1t	4.13	3.79	7.79	5.35	9.28	5.35
5400	7.56	6.59	7.46	3-M1t	4.72	4.28	8.41	5.95	9.88	5.95
6300	8.33	7.33	8.23	3-M1t	5.28	4.74	8.97	6.51	10.41	6.51
7200	9.06	8.07	8.96	3-M1t	5.83	5.18	9.48	7.03	10.89	7.03
8100	9.76	8.84	9.66	3-M1t	6.37	5.60	9.97	7.52	11.33	7.52
9000	10.44	9.64	10.34	3-M1t	6.90	6.01	10.42	8.00	11.73	8.00

El. inlet face invert 0.10 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	0.10
OUTLET STATION (FT)	50.00
OUTLET ELEVATION (FT)	0.00
NUMBER OF BARRELS	9
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	50.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	12.00 FT
BARREL RISE	8.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 11-02-1994
CURRENT TIME: 14:48:43

FILE DATE: 11-01-1994
FILE NAME: ESTIND

TAILWATER

******* REGULAR CHANNEL CROSS SECTION ***********

BOTTOM WIDTH (FT)	80.00
SIDE SLOPE H/V (X:1)	2.0
CHANNEL SLOPE V/H (FT/FT)	0.002
MANNING'S N (.01-0.1)	0.020
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
900.00	2.07	0.635	2.07	5.18	0.26
1800.00	3.12	0.669	3.12	6.70	0.39
2700.00	3.96	0.687	3.96	7.76	0.49
3600.00	4.69	0.699	4.69	8.59	0.58
4500.00	5.35	0.707	5.35	9.28	0.67
5400.00	5.95	0.714	5.95	9.88	0.74
6300.00	6.51	0.719	6.51	10.41	0.81
7200.00	7.03	0.724	7.03	10.89	0.88
8100.00	7.53	0.728	7.52	11.33	0.94
9000.00	8.00	0.731	8.00	11.73	1.00

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
November 1, 1994

Estrella Freeway channel
Thomas Rd. to Camelback Rd

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	9000.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	80.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	8.00
Flow Velocity (feet per second).....	11.73
Froude Number (Flow is Sub-Critical).....	0.789
Velocity Head (feet).....	2.14
Energy Head (feet).....	10.13
Cross-Sectional Area of Flow (square feet).....	767.53
Top Width of Flow (feet).....	111.98

$d_c = 6.90$

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Estrella Freeway channel
At Camelback Rd.

1/3

CURRENT DATE: 11-02-1994
CURRENT TIME: 14:51:44

FILE DATE: 10-30-1994
FILE NAME: ESTCAM

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.10	0.00	50.00	9 RCB	12.00	8.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: ESTCAM CULVERT HEADWATER ELEVATION (FT) DATE: 10-30-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.10	0.00	0.00	0.00	0.00	0.00	100.00
850	2.38	0.00	0.00	0.00	0.00	0.00	101.99
1700	3.66	0.00	0.00	0.00	0.00	0.00	103.14
2550	4.71	0.00	0.00	0.00	0.00	0.00	104.13
3400	5.65	0.00	0.00	0.00	0.00	0.00	105.00
4250	6.49	0.00	0.00	0.00	0.00	0.00	105.80
5100	7.28	0.00	0.00	0.00	0.00	0.00	106.55
5950	8.03	0.00	0.00	0.00	0.00	0.00	107.26
6800	8.74	0.00	0.00	0.00	0.00	0.00	107.94
7650	9.42	0.00	0.00	0.00	0.00	0.00	108.59
8500	10.07	0.00	0.00	0.00	0.00	0.00	109.21
44200	110.94	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 11-02-1994 FILE DATE: 10-30-1994
CURRENT TIME: 14:51:44 FILE NAME: ESTCAM

PERFORMANCE CURVE FOR CULVERT # 1 - 9 (12 BY 8) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.10	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
850	2.38	1.91	2.28	3-M1t	1.31	1.25	3.94	2.00	5.07	2.00
1700	3.66	3.03	3.56	3-M1t	2.09	1.98	5.22	3.01	6.56	3.01
2550	4.71	3.97	4.61	3-M1t	2.77	2.59	6.16	3.83	7.60	3.83
3400	5.65	4.83	5.55	3-M1t	3.39	3.14	6.94	4.54	8.42	4.54
4250	6.49	5.61	6.39	3-M1t	3.97	3.64	7.61	5.17	9.10	5.17
5100	7.28	6.34	7.18	3-M1t	4.52	4.12	8.21	5.75	9.69	5.75
5950	8.03	7.05	7.93	3-M1t	5.06	4.56	8.75	6.29	10.21	6.29
6800	8.74	7.74	8.64	3-M1t	5.59	4.99	9.26	6.80	10.68	6.80
7650	9.42	8.45	9.32	3-M1t	6.10	5.39	9.73	7.28	11.11	7.28
8500	10.07	9.19	9.97	3-M1t	6.61	5.79	10.17	7.74	11.51	7.74

El. inlet face invert 0.10 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	0.10
OUTLET STATION (FT)	50.00
OUTLET ELEVATION (FT)	0.00
NUMBER OF BARRELS	9
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	50.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	12.00 FT
BARREL RISE	8.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 11-02-1994
CURRENT TIME: 14:51:44

FILE DATE: 10-30-1994
FILE NAME: ESTCAM

TAILWATER

******* REGULAR CHANNEL CROSS SECTION ***********

BOTTOM WIDTH (FT)	80.00
SIDE SLOPE H/V (X:1)	2.0
CHANNEL SLOPE V/H (FT/FT)	0.002
MANNING'S N (.01-0.1)	0.020
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
850.00	2.00	0.633	2.00	5.07	0.25
1700.00	3.01	0.666	3.01	6.56	0.38
2550.00	3.83	0.684	3.83	7.60	0.48
3400.00	4.54	0.696	4.54	8.42	0.57
4250.00	5.17	0.705	5.17	9.10	0.64
5100.00	5.75	0.712	5.75	9.69	0.72
5950.00	6.29	0.718	6.29	10.21	0.79
6800.00	6.80	0.722	6.80	10.68	0.85
7650.00	7.28	0.726	7.28	11.11	0.91
8500.00	7.74	0.729	7.74	11.51	0.97

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
November 1, 1994

Estrella Freeway Channel

Camelback Rd. to Bethany Home R

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	8500.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	75.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	8.01
Flow Velocity (feet per second).....	11.66
Froude Number (Flow is Sub-Critical).....	0.788
Velocity Head (feet).....	2.11
Energy Head (feet).....	10.12
Cross-Sectional Area of Flow (square feet).....	728.81
Top Width of Flow (feet).....	107.03

$d_c = 6.90$

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Estrella Freeway channel

At Bethany Home Rd

CURRENT DATE: 11-02-1994
CURRENT TIME: 14:54:11

FILE DATE: 10-30-1994
FILE NAME: ESTBET

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.10	0.00	50.00	8 RCB	12.00	8.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: ESTBET CULVERT HEADWATER ELEVATION (FT) DATE: 10-30-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.10	0.00	0.00	0.00	0.00	0.00	100.00
770	2.37	0.00	0.00	0.00	0.00	0.00	101.85
1540	3.65	0.00	0.00	0.00	0.00	0.00	102.94
2310	4.71	0.00	0.00	0.00	0.00	0.00	103.86
3080	5.64	0.00	0.00	0.00	0.00	0.00	104.68
3850	6.49	0.00	0.00	0.00	0.00	0.00	105.43
4620	7.29	0.00	0.00	0.00	0.00	0.00	106.13
5390	8.04	0.00	0.00	0.00	0.00	0.00	106.80
6160	8.76	0.00	0.00	0.00	0.00	0.00	107.43
6930	9.44	0.00	0.00	0.00	0.00	0.00	108.04
7700	10.10	0.00	0.00	0.00	0.00	0.00	108.62
39270	110.83	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 11-02-1994 FILE DATE: 10-30-1994
CURRENT TIME: 14:54:11 FILE NAME: ESTBET

PERFORMANCE CURVE FOR CULVERT # 1 - 8 (12 BY 8) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.10	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
770	2.37	1.94	2.27	3-M1t	1.33	1.26	4.10	1.95	4.99	1.95
1540	3.65	3.07	3.55	3-M1t	2.12	2.00	5.44	2.95	6.45	2.95
2310	4.71	4.02	4.61	3-M1t	2.80	2.63	6.42	3.75	7.47	3.75
3080	5.64	4.89	5.54	3-M1t	3.43	3.18	7.23	4.44	8.27	4.44
3850	6.49	5.68	6.39	3-M1t	4.02	3.69	7.92	5.06	8.94	5.06
4620	7.29	6.42	7.19	3-M1t	4.59	4.17	8.55	5.63	9.52	5.63
5390	8.04	7.14	7.94	3-M1t	5.13	4.62	9.12	6.16	10.03	6.16
6160	8.76	7.85	8.66	3-M1t	5.67	5.05	9.65	6.65	10.49	6.65
6930	9.44	8.57	9.34	3-M1t	6.19	5.46	10.14	7.12	10.91	7.12
7700	10.10	9.33	10.00	3-M1t	6.70	5.86	10.60	7.57	11.29	7.57

El. inlet face invert 0.10 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	0.10
OUTLET STATION (FT)	50.00
OUTLET ELEVATION (FT)	0.00
NUMBER OF BARRELS	8
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	50.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	12.00 FT
BARREL RISE	8.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

RENT DATE: 11-02-1994
CURRENT TIME: 14:54:11

FILE DATE: 10-30-1994
FILE NAME: ESTBET

TAILWATER

******* REGULAR CHANNEL CROSS SECTION ****************

BOTTOM WIDTH (FT)	75.00
SIDE SLOPE H/V (X:1)	2.0
CHANNEL SLOPE V/H (FT/FT)	0.002
MANNING'S N (.01-0.1)	0.020
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
770.00	1.96	0.629	1.95	4.99	0.24
1540.00	2.95	0.662	2.95	6.45	0.37
2310.00	3.75	0.680	3.75	7.47	0.47
3080.00	4.44	0.692	4.44	8.27	0.55
3850.00	5.06	0.700	5.06	8.94	0.63
4620.00	5.63	0.707	5.63	9.52	0.70
5390.00	6.16	0.712	6.16	10.03	0.77
6160.00	6.65	0.717	6.65	10.49	0.83
6930.00	7.12	0.720	7.12	10.91	0.89
7700.00	7.57	0.723	7.57	11.29	0.94

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
November 1, 1994

Estrella Freeway Channel
Bethany Home Rd. to Glendale Av

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	7700.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	70.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	7.85
Flow Velocity (feet per second).....	11.45
Froude Number (Flow is Sub-Critical).....	0.784
Velocity Head (feet).....	2.04
Energy Head (feet).....	9.88
Cross-Sectional Area of Flow (square feet).....	672.43
Top Width of Flow (feet).....	101.39

$d_c = 6.74$

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

1/3

Estrella Freeway Channel

At Glendale Av.

CURRENT DATE: 11-02-1994
CURRENT TIME: 14:56:26

FILE DATE: 10-30-1994
FILE NAME: ESTGLN

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.10	0.00	50.00	8 RCB	12.00	8.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: ESTGLN CULVERT HEADWATER ELEVATION (FT) DATE: 10-30-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.10	0.00	0.00	0.00	0.00	0.00	100.00
770	2.42	0.00	0.00	0.00	0.00	0.00	101.85
1540	3.72	0.00	0.00	0.00	0.00	0.00	102.94
2310	4.78	0.00	0.00	0.00	0.00	0.00	103.86
3080	5.73	0.00	0.00	0.00	0.00	0.00	104.68
3850	6.59	0.00	0.00	0.00	0.00	0.00	105.43
4620	7.39	0.00	0.00	0.00	0.00	0.00	106.13
5390	8.14	0.00	0.00	0.00	0.00	0.00	106.80
6160	8.85	0.00	0.00	0.00	0.00	0.00	107.43
6930	9.54	0.00	0.00	0.00	0.00	0.00	108.04
7700	10.20	0.00	0.00	0.00	0.00	0.00	108.62
39270	110.83	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 11-02-1994 FILE DATE: 10-30-1994
CURRENT TIME: 14:56:26 FILE NAME: ESTGLN

PERFORMANCE CURVE FOR CULVERT # 1 - 8 (12 BY 8) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.10	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
770	2.42	1.94	2.32	3-M1t	1.33	1.26	3.94	2.04	5.11	2.04
1540	3.72	3.07	3.62	3-M1t	2.12	2.00	5.22	3.07	6.59	3.07
2310	4.78	4.02	4.68	3-M1t	2.80	2.63	6.17	3.90	7.62	3.90
3080	5.73	4.89	5.63	3-M1t	3.43	3.18	6.95	4.62	8.42	4.62
3850	6.59	5.68	6.49	3-M1t	4.02	3.69	7.63	5.26	9.10	5.26
4620	7.39	6.42	7.29	3-M1t	4.59	4.17	8.23	5.85	9.67	5.85
5390	8.14	7.14	8.04	3-M1t	5.13	4.62	8.78	6.39	10.19	6.39
6160	8.85	7.85	8.75	3-M1t	5.67	5.05	9.29	6.90	10.65	6.90
6930	9.54	8.57	9.44	3-M1t	6.19	5.46	9.77	7.39	11.06	7.39
7700	10.20	9.33	10.10	3-M1t	6.70	5.86	10.22	7.84	11.46	7.84

El. inlet face invert 0.10 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	0.10
OUTLET STATION (FT)	50.00
OUTLET ELEVATION (FT)	0.00
NUMBER OF BARRELS	8
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	50.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	12.00 FT
BARREL RISE	8.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

ENT DATE: 11-02-1994
CURRENT TIME: 14:56:26

FILE DATE: 10-30-1994
FILE NAME: ESTGLN

TAILWATER

******* REGULAR CHANNEL CROSS SECTION ****************

BOTTOM WIDTH (FT)	70.00
SIDE SLOPE H/V (X:1)	2.0
CHANNEL SLOPE V/H (FT/FT)	0.002
MANNING'S N (.01-0.1)	0.020
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
770.00	2.04	0.631	2.04	5.11	0.25
1540.00	3.07	0.663	3.07	6.59	0.38
2310.00	3.90	0.680	3.90	7.62	0.49
3080.00	4.62	0.691	4.62	8.42	0.58
3850.00	5.26	0.699	5.26	9.10	0.66
4620.00	5.85	0.705	5.85	9.67	0.73
5390.00	6.39	0.710	6.39	10.19	0.80
6160.00	6.91	0.714	6.90	10.65	0.86
6930.00	7.39	0.717	7.39	11.06	0.92
7700.00	7.84	0.721	7.84	11.46	0.98

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
November 1, 1994

Estrella Freeway channel

Glendale Av. to Northern Av.

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	6200.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	55.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	7.85
Flow Velocity (feet per second).....	11.17
Froude Number (Flow is Sub-Critical).....	0.776
Velocity Head (feet).....	1.94
Energy Head (feet).....	9.79
Cross-Sectional Area of Flow (square feet).....	555.24
Top Width of Flow (feet).....	86.41

$d_c = 6.73$

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Estrella Freeway channel
At Northern Av.

CURRENT DATE: 11-02-1994
CURRENT TIME: 14:58:41

FILE DATE: 10-30-1994
FILE NAME: ESTNOR

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.10	0.00	50.00	7 RCB	12.00	8.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: ESTNOR CULVERT HEADWATER ELEVATION (FT) DATE: 10-30-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.10	0.00	0.00	0.00	0.00	0.00	100.00
620	2.38	0.00	0.00	0.00	0.00	0.00	101.60
1240	3.64	0.00	0.00	0.00	0.00	0.00	102.56
1860	4.67	0.00	0.00	0.00	0.00	0.00	103.34
2480	5.58	0.00	0.00	0.00	0.00	0.00	104.05
3100	6.41	0.00	0.00	0.00	0.00	0.00	104.70
3720	7.17	0.00	0.00	0.00	0.00	0.00	105.31
4340	7.89	0.00	0.00	0.00	0.00	0.00	105.88
4960	8.57	0.00	0.00	0.00	0.00	0.00	106.43
5580	9.22	0.00	0.00	0.00	0.00	0.00	106.96
6200	9.84	0.00	0.00	0.00	0.00	0.00	107.46
34100	109.22	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

ENT DATE: 11-02-1994 FILE DATE: 10-30-1994
CURRENT TIME: 14:58:41 FILE NAME: ESTNOR

PERFORMANCE CURVE FOR CULVERT # 1 - 7 (12 BY 8) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.10	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
620	2.38	1.83	2.28	3-M1t	1.25	1.19	3.58	2.06	5.09	2.06
1240	3.64	2.90	3.54	3-M1t	2.00	1.90	4.76	3.10	6.53	3.10
1860	4.67	3.80	4.57	3-M1t	2.65	2.48	5.63	3.93	7.52	3.93
2480	5.58	4.63	5.48	3-M1t	3.24	3.01	6.35	4.65	8.30	4.65
3100	6.41	5.38	6.31	3-M1t	3.79	3.49	6.98	5.29	8.94	5.29
3720	7.17	6.08	7.07	3-M1t	4.32	3.94	7.54	5.88	9.48	5.88
4340	7.89	6.74	7.79	3-M1t	4.83	4.37	8.05	6.41	9.98	6.41
4960	8.57	7.39	8.47	3-M1t	5.33	4.78	8.53	6.92	10.41	6.92
5580	9.22	8.05	9.12	3-M1t	5.82	5.17	8.98	7.40	10.81	7.40
6200	9.84	8.72	9.74	3-M1t	6.30	5.54	9.40	7.85	11.17	7.85

El. inlet face invert 0.10 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	0.10
OUTLET STATION (FT)	50.00
OUTLET ELEVATION (FT)	0.00
NUMBER OF BARRELS	7
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	50.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	12.00 FT
BARREL RISE	8.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

ENT DATE: 11-02-1994
CURRENT TIME: 14:58:41

FILE DATE: 10-30-1994
FILE NAME: ESTNOR

TAILWATER

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	55.00
SIDE SLOPE H/V (X:1)	2.0
CHANNEL SLOPE V/H (FT/FT)	0.002
MANNING'S N (.01-0.1)	0.020
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
620.00	2.06	0.625	2.06	5.09	0.26
1240.00	3.10	0.654	3.10	6.53	0.39
1860.00	3.93	0.669	3.93	7.52	0.49
2480.00	4.65	0.678	4.65	8.30	0.58
3100.00	5.29	0.685	5.29	8.94	0.66
3720.00	5.88	0.690	5.88	9.48	0.73
4340.00	6.41	0.694	6.41	9.98	0.80
4960.00	6.92	0.698	6.92	10.41	0.86
5580.00	7.40	0.700	7.40	10.81	0.92
6200.00	7.85	0.703	7.85	11.17	0.98

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

Estrella freeway channel
Northern Av. to Olive Av.

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
November 1, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	5300.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	45.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	7.94
Flow Velocity (feet per second).....	10.97
Froude Number (Flow is Sub-Critical).....	0.771
Velocity Head (feet).....	1.87
Energy Head (feet).....	9.80
Cross-Sectional Area of Flow (square feet).....	483.02
Top Width of Flow (feet).....	76.74

$d_c = 6.79$

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986 Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092 (713) 895-8322. A manual with equations & flow chart is available.

1/3

Estrella Freeway channel
At Olive Avenue

CURRENT DATE: 11-06-1994
CURRENT TIME: 15:20:22

FILE DATE: 10-31-1994
FILE NAME: ESTOLV

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.10	0.00	50.00	6 RCB	12.00	8.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: ESTOLV CULVERT HEADWATER ELEVATION (FT) DATE: 10-31-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.10	0.00	0.00	0.00	0.00	0.00	100.00
530	2.42	0.00	0.00	0.00	0.00	0.00	101.45
1060	3.68	0.00	0.00	0.00	0.00	0.00	102.30
1590	4.72	0.00	0.00	0.00	0.00	0.00	103.01
2120	5.62	0.00	0.00	0.00	0.00	0.00	103.65
2650	6.45	0.00	0.00	0.00	0.00	0.00	104.23
3180	7.21	0.00	0.00	0.00	0.00	0.00	104.78
3710	7.93	0.00	0.00	0.00	0.00	0.00	105.30
4240	8.60	0.00	0.00	0.00	0.00	0.00	105.79
4770	9.25	0.00	0.00	0.00	0.00	0.00	106.27
5300	9.87	0.00	0.00	0.00	0.00	0.00	106.72
29150	108.65	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 11-06-1994
CURRENT TIME: 15:20:22

FILE DATE: 10-31-1994
FILE NAME: ESTOLV

PERFORMANCE CURVE FOR CULVERT # 1 - 6 (12 BY 8) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.10	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
530	2.42	1.83	2.32	3-M1t	1.25	1.19	3.49	2.11	5.11	2.11
1060	3.68	2.90	3.58	3-M1t	2.00	1.89	4.65	3.17	6.52	3.17
1590	4.72	3.80	4.62	3-M1t	2.64	2.48	5.51	4.01	7.48	4.01
2120	5.62	4.62	5.52	3-M1t	3.23	3.00	6.22	4.73	8.22	4.73
2650	6.45	5.37	6.35	3-M1t	3.78	3.49	6.85	5.37	8.85	5.37
3180	7.21	6.06	7.11	3-M1t	4.31	3.94	7.41	5.96	9.37	5.96
3710	7.93	6.73	7.83	3-M1t	4.82	4.36	7.93	6.50	9.84	6.50
4240	8.60	7.38	8.50	3-M1t	5.32	4.77	8.40	7.01	10.25	7.01
4770	9.25	8.03	9.15	3-M1t	5.80	5.16	8.85	7.48	10.63	7.48
5300	9.87	8.71	9.77	3-M1t	6.28	5.53	9.28	7.93	10.98	7.93

El. inlet face invert 0.10 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	0.10
OUTLET STATION (FT)	50.00
OUTLET ELEVATION (FT)	0.00
NUMBER OF BARRELS	6
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	50.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	12.00 FT
BARREL RISE	8.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 11-06-1994
CURRENT TIME: 15:20:22

FILE DATE: 10-31-1994
FILE NAME: ESTOLV

TAILWATER

******* REGULAR CHANNEL CROSS SECTION ****************

BOTTOM WIDTH (FT)	45.00
SIDE SLOPE H/V (X:1)	2.0
CHANNEL SLOPE V/H (FT/FT)	0.002
MANNING'S N (.01-0.1)	0.020
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
530.00	2.11	0.620	2.11	5.11	0.26
1060.00	3.17	0.646	3.17	6.52	0.40
1590.00	4.01	0.658	4.01	7.48	0.50
2120.00	4.73	0.666	4.73	8.22	0.59
2650.00	5.38	0.672	5.37	8.85	0.67
3180.00	5.96	0.677	5.96	9.37	0.74
3710.00	6.50	0.680	6.50	9.84	0.81
4240.00	7.01	0.683	7.01	10.25	0.87
4770.00	7.48	0.685	7.48	10.63	0.93
5300.00	7.93	0.687	7.93	10.98	0.99

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
November 1, 1994

Estrella Freeway Channel
Olive Av. to Peoria Av.

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	4800.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	40.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	7.94
Flow Velocity (feet per second).....	10.82
Froude Number (Flow is Sub-Critical).....	0.767
Velocity Head (feet).....	1.82
Energy Head (feet).....	9.76
Cross-Sectional Area of Flow (square feet).....	443.65
Top Width of Flow (feet).....	71.76

$d_c = 6.79$

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

1/3 At Peoria Av.

CURRENT DATE: 11-02-1994
CURRENT TIME: 15:00:48

FILE DATE: 11-01-1994
FILE NAME: ESTPEO

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.10	0.00	50.00	6 RCB	12.00	8.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: ESTPEO CULVERT HEADWATER ELEVATION (FT) DATE: 11-01-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.10	0.00	0.00	0.00	0.00	0.00	100.00
480	2.44	0.00	0.00	0.00	0.00	0.00	101.36
960	3.61	0.00	0.00	0.00	0.00	0.00	102.15
1440	4.61	0.00	0.00	0.00	0.00	0.00	102.82
1920	5.48	0.00	0.00	0.00	0.00	0.00	103.42
2400	6.27	0.00	0.00	0.00	0.00	0.00	103.96
2880	7.00	0.00	0.00	0.00	0.00	0.00	104.48
3360	7.69	0.00	0.00	0.00	0.00	0.00	104.96
3840	8.33	0.00	0.00	0.00	0.00	0.00	105.42
4320	8.94	0.00	0.00	0.00	0.00	0.00	105.86
4800	9.53	0.00	0.00	0.00	0.00	0.00	106.29
29280	109.59	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

ENT DATE: 11-02-1994 FILE DATE: 11-01-1994
CURRENT TIME: 15:00:48 FILE NAME: ESTPED

PERFORMANCE CURVE FOR CULVERT # 1 - 6 (12 BY 8) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.10	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
480	2.44	1.71	2.34	3-M1t	1.17	1.12	3.13	2.13	5.10	2.13
960	3.61	2.71	3.51	3-M1t	1.87	1.77	4.18	3.19	6.49	3.19
1440	4.61	3.55	4.51	3-M1t	2.48	2.32	4.96	4.04	7.42	4.04
1920	5.48	4.32	5.38	3-M1t	3.01	2.81	5.61	4.76	8.16	4.76
2400	6.27	5.02	6.17	3-M1t	3.52	3.26	6.18	5.40	8.76	5.40
2880	7.00	5.68	6.90	3-M1t	4.02	3.68	6.69	5.98	9.27	5.98
3360	7.69	6.29	7.59	3-M1t	4.48	4.08	7.16	6.52	9.72	6.52
3840	8.33	6.89	8.23	3-M1t	4.94	4.46	7.60	7.02	10.12	7.02
4320	8.94	7.48	8.84	3-M1t	5.39	4.83	8.01	7.49	10.49	7.49
4800	9.53	8.07	9.43	3-M1t	5.83	5.18	8.40	7.94	10.82	7.94

El. inlet face invert 0.10 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	0.10
OUTLET STATION (FT)	50.00
OUTLET ELEVATION (FT)	0.00
NUMBER OF BARRELS	6
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	50.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	12.00 FT
BARREL RISE	8.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

ENT DATE: 11-02-1994
CURRENT TIME: 15:00:48

FILE DATE: 11-01-1994
FILE NAME: ESTPEO

TAILWATER

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	40.00
SIDE SLOPE H/V (X:1)	2.0
CHANNEL SLOPE V/H (FT/FT)	0.002
MANNING'S N (.01-0.1)	0.020
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
480.00	2.13	0.616	2.13	5.10	0.26
960.00	3.19	0.640	3.19	6.49	0.40
1440.00	4.04	0.651	4.03	7.42	0.50
1920.00	4.76	0.659	4.76	8.16	0.59
2400.00	5.40	0.664	5.40	8.76	0.67
2880.00	5.98	0.668	5.98	9.27	0.75
3360.00	6.52	0.671	6.52	9.72	0.81
3840.00	7.02	0.673	7.02	10.12	0.88
4320.00	7.49	0.675	7.49	10.49	0.94
4800.00	7.94	0.677	7.94	10.82	0.99

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
November 1, 1994

Estrella Freeway channel
Peoria Av. to Cactus Rd.

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	3400.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	25.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	8.06
Flow Velocity (feet per second).....	10.26
Froude Number (Flow is Sub-Critical).....	0.752
Velocity Head (feet).....	1.64
Energy Head (feet).....	9.69
Cross-Sectional Area of Flow (square feet).....	331.30
Top Width of Flow (feet).....	57.23

$d_c = 6.87$

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

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Estrella Freeway
At Cactus Rd.

CURRENT DATE: 11-02-1994
CURRENT TIME: 15:03:17

FILE DATE: 10-31-1994
FILE NAME: ESTCAC

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.10	0.00	50.00	4 RCB	12.00	8.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: ESTCAC CULVERT HEADWATER ELEVATION (FT) DATE: 10-31-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.10	0.00	0.00	0.00	0.00	0.00	100.00
340	2.57	0.00	0.00	0.00	0.00	0.00	101.07
680	3.78	0.00	0.00	0.00	0.00	0.00	101.71
1020	4.81	0.00	0.00	0.00	0.00	0.00	102.24
1360	5.70	0.00	0.00	0.00	0.00	0.00	102.72
1700	6.50	0.00	0.00	0.00	0.00	0.00	103.15
2040	7.24	0.00	0.00	0.00	0.00	0.00	103.56
2380	7.93	0.00	0.00	0.00	0.00	0.00	103.94
2720	8.58	0.00	0.00	0.00	0.00	0.00	104.31
3060	9.20	0.00	0.00	0.00	0.00	0.00	104.66
3400	9.79	0.00	0.00	0.00	0.00	0.00	105.00
19380	108.08	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

C[illegible]T DATE: 11-02-1994 FILE DATE: 10-31-1994
CURRENT TIME: 15:03:17 FILE NAME: ESTCAC

PERFORMANCE CURVE FOR CULVERT # 1 - 4 (12 BY 8) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.10	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
340	2.57	1.78	2.47	3-M1t	1.22	1.16	3.13	2.26	5.10	2.26
680	3.78	2.82	3.68	3-M1t	1.95	1.84	4.22	3.36	6.38	3.36
1020	4.81	3.70	4.71	3-M1t	2.58	2.42	5.04	4.22	7.24	4.22
1360	5.70	4.50	5.60	3-M1t	3.15	2.93	5.73	4.94	7.89	4.94
1700	6.50	5.23	6.40	3-M1t	3.68	3.40	6.35	5.58	8.43	5.58
2040	7.24	5.91	7.14	3-M1t	4.19	3.84	6.91	6.15	8.89	6.15
2380	7.93	6.56	7.83	3-M1t	4.69	4.25	7.42	6.68	9.29	6.68
2720	8.58	7.18	8.48	3-M1t	5.17	4.65	7.90	7.17	9.65	7.17
3060	9.20	7.81	9.10	3-M1t	5.64	5.03	8.36	7.63	9.97	7.63
3400	9.79	8.45	9.69	3-M1f	6.10	5.39	8.85	8.00	10.27	8.06

El. inlet face invert 0.10 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	0.10
OUTLET STATION (FT)	50.00
OUTLET ELEVATION (FT)	0.00
NUMBER OF BARRELS	4
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	50.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	12.00 FT
BARREL RISE	8.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 11-02-1994
CURRENT TIME: 15:03:17

FILE DATE: 10-31-1994
FILE NAME: ESTCAC

TAILWATER

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	25.00
SIDE SLOPE H/V (X:1)	2.0
CHANNEL SLOPE V/H (FT/FT)	0.002
MANNING'S N (.01-0.1)	0.020
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
340.00	2.26	0.597	2.26	5.10	0.28
680.00	3.36	0.614	3.36	6.38	0.42
1020.00	4.22	0.621	4.22	7.24	0.53
1360.00	4.94	0.626	4.94	7.89	0.62
1700.00	5.58	0.629	5.58	8.43	0.70
2040.00	6.15	0.631	6.15	8.89	0.77
2380.00	6.68	0.633	6.68	9.29	0.83
2720.00	7.17	0.635	7.17	9.65	0.89
3060.00	7.63	0.636	7.63	9.97	0.95
3400.00	8.06	0.637	8.06	10.27	1.00

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
November 1, 1994

Estrella Freeway Channel
Cactus Rd. to Waddell Rd.

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	2100.0
Channel Bottom Slope (feet per foot).....	0.0027
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	20.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	6.32
Flow Velocity (feet per second).....	10.17
Froude Number (Flow is Sub-Critical).....	0.840
Velocity Head (feet).....	1.61
Energy Head (feet).....	7.93
Cross-Sectional Area of Flow (square feet).....	206.47
Top Width of Flow (feet).....	45.30

$d_c = 5.74$

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Estrella freeway channel
At Waddell Rd.

CURRENT DATE: 11-02-1994
C[illegible] TIME: 15:05:32

FILE DATE: 11-01-1994
FILE NAME: ESTWAD

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.14	0.00	50.00	4 RCB	8.00	6.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: ESTWAD CULVERT HEADWATER ELEVATION (FT) DATE: 11-01-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.14	0.00	0.00	0.00	0.00	0.00	100.00
190	1.72	0.00	0.00	0.00	0.00	0.00	100.73
380	3.05	0.00	0.00	0.00	0.00	0.00	101.16
570	3.91	0.00	0.00	0.00	0.00	0.00	101.52
760	4.66	0.00	0.00	0.00	0.00	0.00	101.84
950	5.35	0.00	0.00	0.00	0.00	0.00	102.14
1140	5.99	0.00	0.00	0.00	0.00	0.00	102.41
1330	6.62	0.00	0.00	0.00	0.00	0.00	102.67
1520	7.17	0.00	0.00	0.00	0.00	0.00	102.92
1710	7.72	0.00	0.00	0.00	0.00	0.00	103.16
1900	8.26	0.00	0.00	0.00	0.00	0.00	103.39
9690	107.10	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

RENT DATE: 11-02-1994 FILE DATE: 11-01-1994
CURRENT TIME: 15:05:32 FILE NAME: ESTWAD

PERFORMANCE CURVE FOR CULVERT # 1 - 4 (8 BY 6) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.14	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
190	1.72	1.58	1.58	1-S2n	1.03	1.03	5.78	1.03	4.87	1.67
380	3.05	2.51	2.91	3-M1t	1.65	1.64	4.78	2.49	6.12	2.49
570	3.91	3.30	3.77	3-M1t	2.19	2.15	5.70	3.13	6.95	3.13
760	4.66	4.01	4.53	3-M1t	2.68	2.60	6.48	3.67	7.59	3.67
950	5.35	4.65	5.22	3-M1t	3.15	3.02	7.16	4.14	8.11	4.14
1140	5.99	5.27	5.85	3-M1t	3.61	3.41	7.79	4.57	8.55	4.57
1330	6.62	5.87	6.49	3-M1t	4.04	3.78	8.36	4.97	8.94	4.97
1520	7.17	6.49	7.03	3-M1t	4.47	4.13	8.90	5.34	9.29	5.34
1710	7.72	7.15	7.58	3-M1t	4.90	4.47	9.41	5.68	9.60	5.68
1900	8.26	7.85	8.12	3-M1f	5.31	4.79	9.90	6.00	9.89	6.00

El. inlet face invert 0.14 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

*** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	0.14
OUTLET STATION (FT)	50.00
OUTLET ELEVATION (FT)	0.00
NUMBER OF BARRELS	4
SLOPE (V-FT/H-FT)	0.0027
CULVERT LENGTH ALONG SLOPE (FT)	50.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	8.00 FT
BARREL RISE	6.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 11-02-1994
CURRENT TIME: 15:05:32

FILE DATE: 11-01-1994
FILE NAME: ESTWAD

TAILWATER

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	20.00
SIDE SLOPE H/V (X:1)	2.0
CHANNEL SLOPE V/H (FT/FT)	0.003
MANNING'S N (.01-0.1)	0.020
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
190.00	1.67	0.665	1.67	4.87	0.28
380.00	2.49	0.684	2.49	6.12	0.42
570.00	3.13	0.693	3.13	6.95	0.53
760.00	3.67	0.698	3.67	7.59	0.62
950.00	4.14	0.702	4.14	8.11	0.70
1140.00	4.57	0.705	4.57	8.55	0.77
1330.00	4.97	0.707	4.97	8.94	0.84
1520.00	5.34	0.709	5.34	9.29	0.90
1710.00	5.68	0.710	5.68	9.60	0.96
1900.00	6.00	0.712	6.00	9.89	1.01

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

Estrella Freeway Channel
Waddell Rd. to Greenway Rd.

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
November 1, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1000.0
Channel Bottom Slope (feet per foot).....	0.0030
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	10.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	5.37
Flow Velocity (feet per second).....	8.97
Froude Number (Flow is Sub-Critical).....	0.841
Velocity Head (feet).....	1.25
Energy Head (feet).....	6.62
Cross-Sectional Area of Flow (square feet).....	111.44
Top Width of Flow (feet).....	31.49

$d_c = 4.91$

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986 Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092 (713) 895-8322. A manual with equations & flow chart is available.

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Estrella Freeway Channel

At Greenway Rd.

CURRENT DATE: 11-02-1994
CURRENT TIME: 15:09:43

FILE DATE: 10-31-1994
FILE NAME: ESTGRN

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.10	0.00	50.00	2 RCB	8.00	5.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: ESTGRN CULVERT HEADWATER ELEVATION (FT) DATE: 10-31-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.10	0.00	0.00	0.00	0.00	0.00	100.00
80	1.75	0.00	0.00	0.00	0.00	0.00	100.41
160	2.65	0.00	0.00	0.00	0.00	0.00	100.65
240	3.40	0.00	0.00	0.00	0.00	0.00	100.85
320	4.06	0.00	0.00	0.00	0.00	0.00	101.03
400	4.67	0.00	0.00	0.00	0.00	0.00	101.20
480	5.23	0.00	0.00	0.00	0.00	0.00	101.36
560	5.77	0.00	0.00	0.00	0.00	0.00	101.50
640	6.28	0.00	0.00	0.00	0.00	0.00	101.64
720	6.62	0.00	0.00	0.00	0.00	0.00	101.78
800	7.32	0.00	0.00	0.00	0.00	0.00	101.90
4000	104.66	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

RENT DATE: 11-02-1994
CURRENT TIME: 15:09:43

FILE DATE: 10-31-1994
FILE NAME: ESTGRN

PERFORMANCE CURVE FOR CULVERT # 1 - 2 (8 BY 5) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.10	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
80	1.75	1.41	1.65	3-M1t	1.03	0.92	3.51	1.42	4.38	1.42
160	2.65	2.24	2.55	3-M1t	1.63	1.46	4.79	2.09	5.41	2.09
240	3.40	2.95	3.30	3-M1t	2.15	1.92	5.77	2.60	6.08	2.60
320	4.06	3.58	3.96	3-M1t	2.64	2.32	6.61	3.02	6.59	3.02
400	4.67	4.15	4.57	3-M1t	3.10	2.69	7.36	3.40	7.02	3.40
480	5.23	4.71	5.13	3-M1t	3.55	3.04	8.05	3.73	7.38	3.73
560	5.77	5.28	5.67	3-M1t	3.98	3.37	8.68	4.03	7.69	4.03
640	6.28	5.88	6.18	3-M2t	4.40	3.68	9.28	4.31	7.97	4.31
720	6.62	6.52	6.38	6-FFn	5.00	3.99	9.00	5.00	8.23	4.57
800	7.32	7.22	7.07	6-FFn	5.00	4.28	10.00	5.00	8.46	4.82

El. inlet face invert 0.10 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

*** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	0.10
OUTLET STATION (FT)	50.00
OUTLET ELEVATION (FT)	0.00
NUMBER OF BARRELS	2
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	50.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	8.00 FT
BARREL RISE	5.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 11-02-1994
CURRENT TIME: 15:09:43

FILE DATE: 10-31-1994
FILE NAME: ESTGRN

TAILWATER

******* REGULAR CHANNEL CROSS SECTION ***********

BOTTOM WIDTH (FT)	10.00
SIDE SLOPE H/V (X:1)	2.0
CHANNEL SLOPE V/H (FT/FT)	0.003
MANNING'S N (.01-0.1)	0.020
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
80.00	1.42	0.647	1.42	4.38	0.27
160.00	2.09	0.659	2.09	5.41	0.39
240.00	2.60	0.665	2.60	6.08	0.49
320.00	3.02	0.668	3.02	6.59	0.57
400.00	3.40	0.671	3.39	7.02	0.64
480.00	3.73	0.673	3.73	7.38	0.70
560.00	4.03	0.675	4.03	7.69	0.75
640.00	4.31	0.677	4.31	7.97	0.81
720.00	4.57	0.678	4.57	8.23	0.86
800.00	4.82	0.679	4.82	8.46	0.90

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	100.00

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION
November 1, 1994

Estrella Freeway Channel
Greenway Rd. to Bell Rd.

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	800.0
Channel Bottom Slope (feet per foot).....	0.0030
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	10.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	4.82
Flow Velocity (feet per second).....	8.46
Froude Number (Flow is Sub-Critical).....	0.830
Velocity Head (feet).....	1.11
Energy Head (feet).....	5.93
Cross-Sectional Area of Flow (square feet).....	94.55
Top Width of Flow (feet).....	29.26

$d_c = 4.36$

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

APPENDIX G

I-10 CHANNEL

- Cost Estimate
- Concept Design Plan and Profile Figures
- Hydraulic Calculation Sheets

COST ESTIMATE

I-10 CHANNEL
COST ESTIMATE SHEET

	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	COST
1.	Channel Excavation	295, 260	C.Y.	$ 3	$ 885,800
2.	10 - 10' x 5' B.C. at Citrus Road	50	L.F.	$ 3135	$ 156,800
3.	3' drop structure at sta. 55 + 00	1	EA.	$ 15,600	$ 15,600
4.	3' drop structure at sta. 70 + 00	1	EA.	$ 15,600	$ 15,600
5.	3' drop structure at sta. 77 + 50	1	EA.	$ 15,600	$ 15,600
6.	2' drop structure at sta. 85 + 00	1	EA.	$ 9,900	$ 9,900
7.	2' drop structure at sta. 110 + 00	1	EA.	$ 9,900	$ 9,900
8.	6 - 10' x 5' B.C. at Perryville Road	40	L.F.	$ 1,690	$ 67,600
9.	5' drop structure at sta. 120 + 00	1	EA.	$ 13,400	$ 13,400
10.	5' drop structure at sta. 133 + 30	1	EA.	$ 13,400	$ 13,400
				Estimated Construction Cost	$ 1,203,600
				Contingencies (25%)	$ 300,900
				Total Construction Cost	$ 1,504,500
11.	R.O.W.	905,000	S.F.	$.15	$ 135,800
				GRAND TOTAL	**$ 1,640,300**

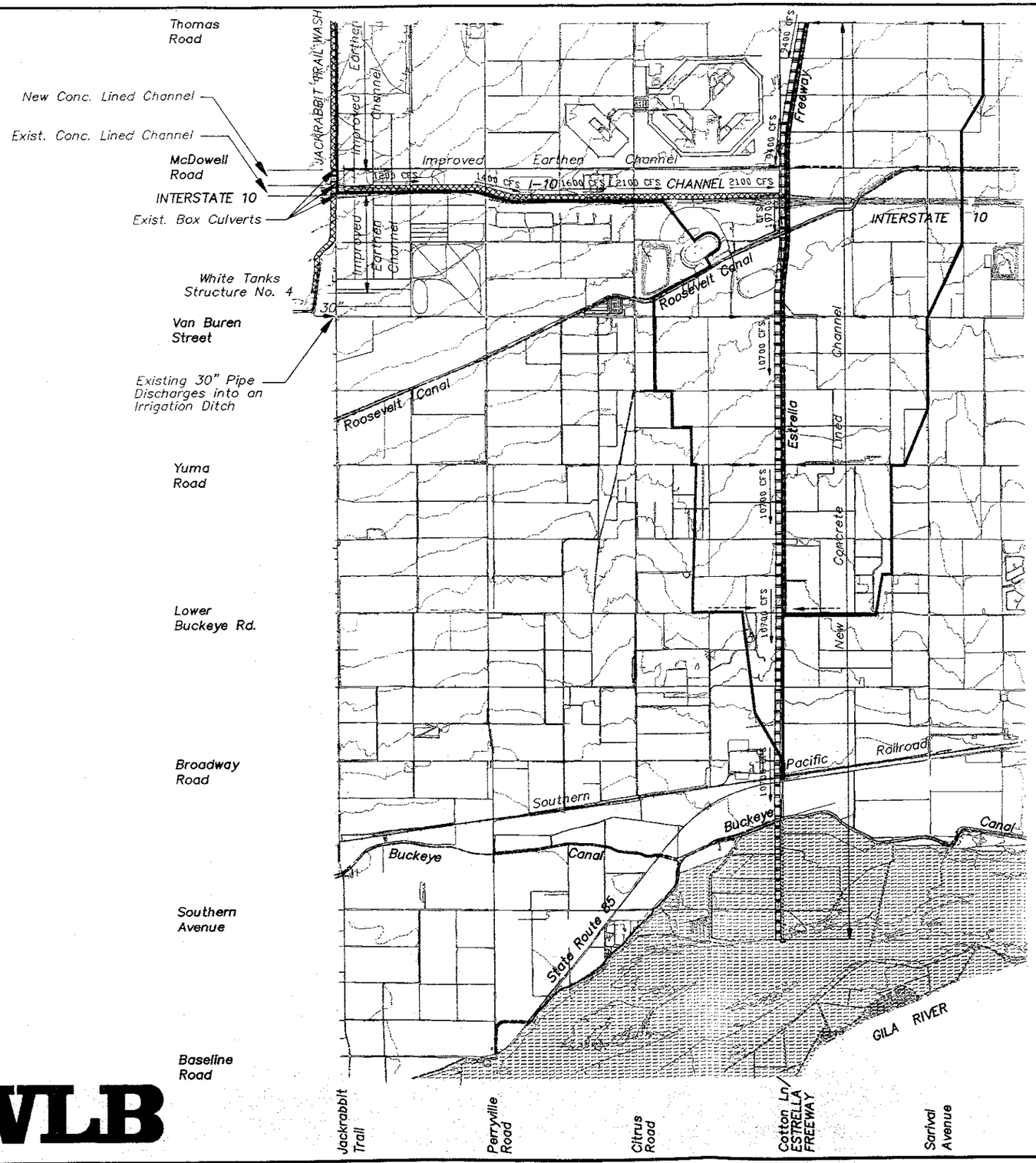
CONCEPT DESIGN

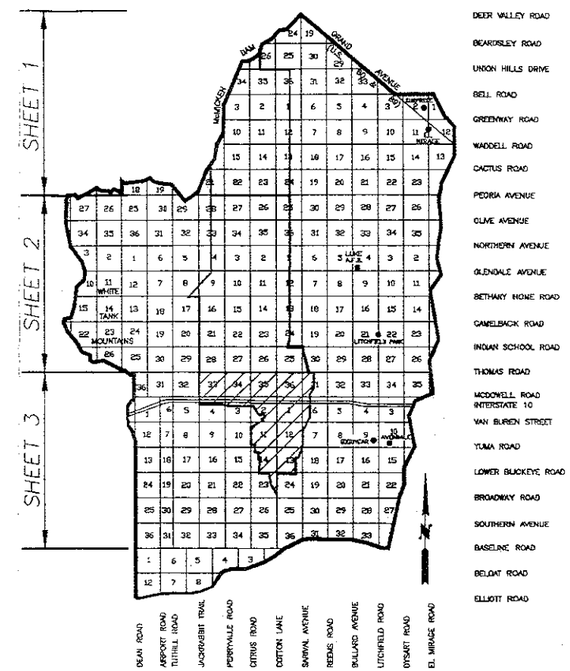
PLAN AND PROFILE FIGURES

Figure 7.2-3

Area Drainage Master Plan
for
Estrella Freeway Watershed
Sheet 3 of 3

WHITE TANKS/AGUA FRIA
AREA DRAINAGE MASTER STUDY



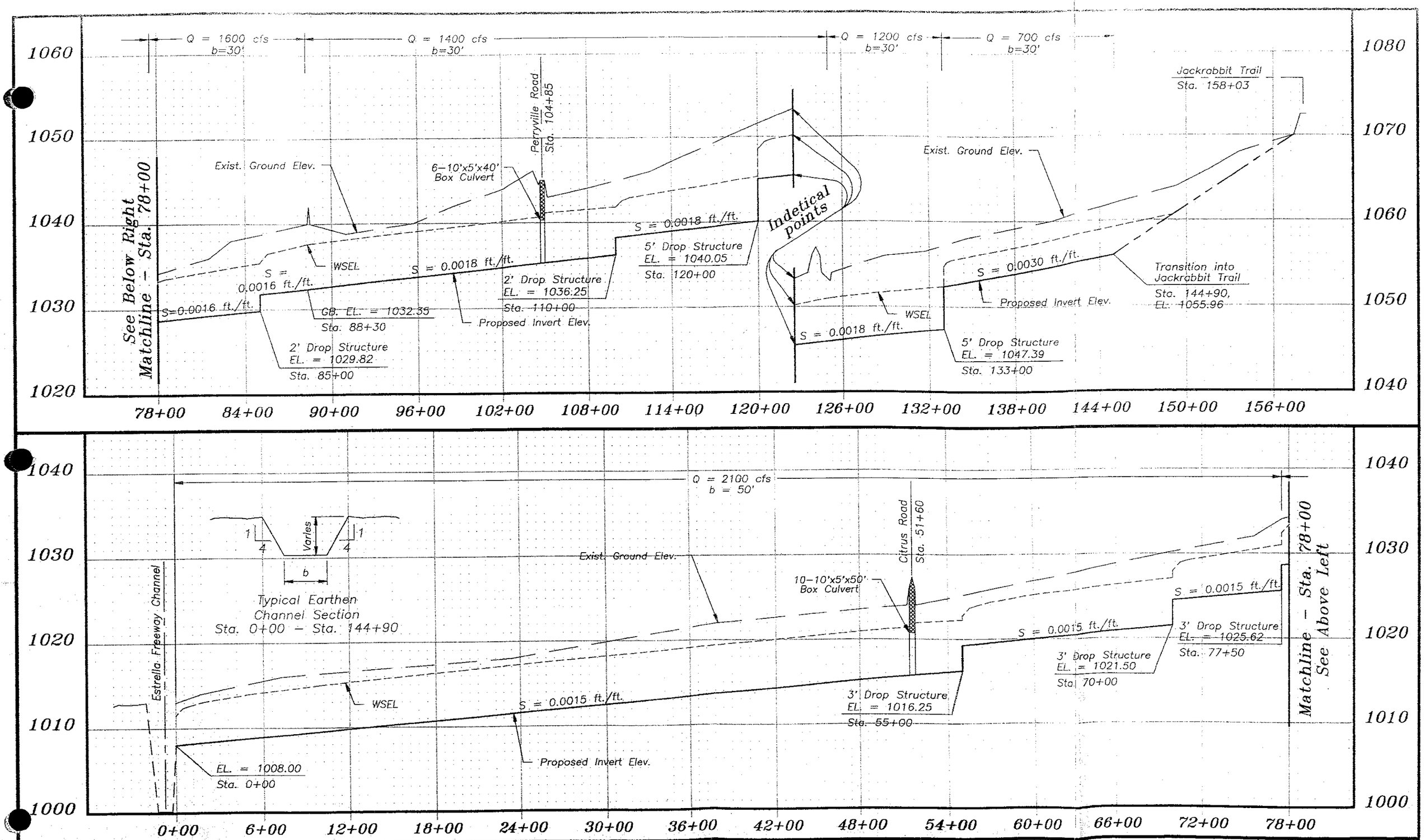


Location Map

Legend

1800 CFS	Proposed Condition Peak Flow
	100 – Year Floodplain
	Retained Area Behind Beardsley Canal
48"	48" C.M.P. Gated Outlet
	Watershed Boundary
	Railroads
	Existing Channels
	Future Local Drainage System

The WLB Group INC. WLB



The WLB Group Inc. WLB	White Tanks / Agua Fria ADMS Flood Control District of Maricopa County	Concept Design I-10 Channel	Scale: Horiz.: 1"=600' Vert.: 1"=10' Checked By: G.M.A.
			Job No.: 289036 Date: Dec. 1994 Sheet: 1 of 1

HYDRAULIC CALCULATION SHEETS

Includes Trapezoidal Channel Analysis
and Culvert Analysis

I-10 Channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
August 3, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	2100.0
Channel Bottom Slope (feet per foot).....	0.0015
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	50.0
Channel Flow-Line Elevation at Starting Station (feet)..	1008.00
Water Surface Elevation at Starting Station (feet).....	1009.00
Starting Channel Station (feet).....	0.00

→ start at d_c; this channel discharges into the proposed Estrella Freeway channel with a lower Invert at this point.

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	5.70
Critical Depth (feet).....	3.45

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
@ cotton lane —	0.0	1008.00	1011.45	3.45	219.83	9.55	1.417	0.009409
	50.0	1008.07	1012.39	4.32	290.27	7.23	0.813	0.004186
	100.0	1008.15	1012.67	4.52	308.12	6.82	0.721	0.003524
	200.0	1008.30	1013.09	4.79	331.40	6.34	0.624	0.002858
	500.0	1008.75	1013.96	5.21	368.66	5.70	0.504	0.002106
	1000.0	1009.50	1014.98	5.48	394.12	5.33	0.441	0.001741
	1500.0	1010.25	1015.84	5.59	404.62	5.19	0.418	0.001615
	2000.0	1011.00	1016.65	5.65	409.72	5.13	0.408	0.001559
	2500.0	1011.75	1017.42	5.67	412.32	5.09	0.403	0.001531
	3000.0	1012.50	1018.19	5.69	413.69	5.08	0.400	0.001516
	3500.0	1013.25	1018.94	5.69	414.42	5.07	0.399	0.001509
	4000.0	1014.00	1019.70	5.70	414.81	5.06	0.398	0.001505
	4500.0	1014.75	1020.45	5.70	415.01	5.06	0.398	0.001503
	5000.0	1015.50	1021.20	5.70	415.13	5.06	0.397	0.001501
Citrus Rd. —	5135.0	1015.70	1021.40	5.70	415.14	5.06	0.397	0.001501

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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(713) 895-8322. A manual with equations & flow chart is available.

1/3

I-10 Channel

At Citrus Road

[illegible] 08-08-1994 FILE DATE: 08-08-1994

[illegible] TIME: [illegible] FILE NAME: X

FHWA CULVERT ANALYSIS

HY-8, VERSION 4.0

SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
0.08	0.00	50.00	10 RCB	10.00	5.00	.012	CONVENTIONAL

FILE: X CULVERT HEADWATER ELEVATION (FT) DATE: 08-08-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.08	0.00	0.00	0.00	0.00	0.00	10.00
210	1.52	0.00	0.00	0.00	0.00	0.00	10.78
420	2.42	0.00	0.00	0.00	0.00	0.00	11.24
630	3.05	0.00	0.00	0.00	0.00	0.00	11.63
840	3.65	0.00	0.00	0.00	0.00	0.00	11.97
1050	4.08	0.00	0.00	0.00	0.00	0.00	12.29
1260	4.53	0.00	0.00	0.00	0.00	0.00	12.58
1470	4.94	0.00	0.00	0.00	0.00	0.00	12.86
1680	5.31	0.00	0.00	0.00	0.00	0.00	13.12
1890	5.72	0.00	0.00	0.00	0.00	0.00	13.38
2100	6.12	0.00	0.00	0.00	0.00	0.00	13.62
5670	14.05	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 09-09-1994 FILE DATE: [illegible]
CURRENT TIME: 09:01:11 FILE NAME: _____

PERFORMANCE CURVE FOR CULVERT # 1 - 10 (10 BY 5) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAIL WATER ELEV. (ft)	TAIL WATER DEPTH (ft)
0	0.08	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	[illegible]	0.00
210	1.62	0.79	1.54	3-M1t	0.62	0.52	1.35	1.56	[illegible]	1.56
420	2.42	1.36	2.34	3-M1t	0.99	0.82	1.80	2.33	[illegible]	2.33
630	3.05	1.65	2.98	3-M1t	1.28	1.07	2.15	2.93	[illegible]	2.93
840	3.60	1.99	3.52	3-M1t	1.56	1.30	2.43	3.45	[illegible]	3.45
1050	4.08	2.31	4.01	3-M1t	1.80	1.51	2.69	3.91	[illegible]	3.91
1260	4.52	2.62	4.45	3-M1t	2.04	1.71	2.92	4.32	[illegible]	4.32
1470	4.94	2.91	4.86	3-M1t	2.27	1.88	3.13	4.70	[illegible]	4.70
1680	5.31	3.18	5.23	3-M1f	2.49	2.07	3.36	5.00	[illegible]	5.06
1890	5.72	3.44	5.65	4-FFt	2.70	2.24	3.78	5.00	[illegible]	5.39
2100	6.12	3.70	6.04	4-FFt	2.91	2.40	4.20	5.00	[illegible]	5.70

+ 1015.8 = 1021.84

El. inlet face invert 0.08 ft El. outlet invert [illegible] ft
El. inlet throat invert 0.00 ft El. inlet crest [illegible] ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00	= 51+85
INLET ELEVATION (FT)	0.08	= 1015.78
OUTLET STATION (FT)	50.00	= 51+35
OUTLET ELEVATION (FT)	0.00	= 1015.70
NUMBER OF BARRELS	10	
SLOPE (V-FT/H-FT)	0.0015	
CULVERT LENGTH ALONG SLOPE (FT)	50.00	

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	5.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 06-09-1994
CURRENT TIME: 06:21:11

FILE DATE: 02-05-1994
FILE NAME: X

TAILWATER

******* REGULAR CHANNEL CROSS SECTION ******************

BOTTOM WIDTH (FT)	50.00
SIDE SLOPE H/V (X:1)	4.0
CHANNEL SLOPE V/H (FT/FT)	0.002
MANNING'S N (.01-0.1)	0.030
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
210.00	1.56	0.338	1.56	2.39	0.15
420.00	2.33	0.351	2.33	3.04	0.22
630.00	2.93	0.358	2.93	3.48	0.28
840.00	3.45	0.362	3.45	3.82	0.32
1050.00	3.91	0.365	3.91	4.10	0.37
1260.00	4.32	0.368	4.32	4.34	0.40
1470.00	4.70	0.369	4.70	4.55	0.44
1680.00	5.06	0.371	5.06	4.73	0.47
1890.00	5.39	0.372	5.39	4.90	0.50
2100.00	5.70	0.373	5.70	5.06	0.53

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	40.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	10.00

I-10 Channel

TRAPEZOIDAL [illegible]
STANDARD STEP WATER [illegible] PROFILE
August [illegible]

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	2100.0
Channel Bottom Slope (feet per foot).....	0.0015
Manning's Roughness Coefficient ('n' value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	50.0
Channel Flow-Line Elevation at Starting Station (feet)..	1015.78
Water Surface Elevation at Starting Station (feet).....	1021.90
Starting Channel Station (feet).....	5185.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	5.70
Critical Depth (feet).....	3.45

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
citrus Rd. –	5185.0	1015.78	1021.90	6.12	455.82	4.61	0.330	0.001152
	5250.0	1015.88	1021.97	6.09	453.29	4.63	0.333	0.001170
	5300.0	1015.95	1022.03	6.08	451.42	4.65	0.336	0.001184
	5400.0	1016.10	1022.14	6.04	447.93	4.69	0.341	0.001210
3' Drop – structure	5500.0	1016.25	1022.26	6.01	444.73	4.72	0.346	0.001235

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

I-10 channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
August 3, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	2100.0
Channel Bottom Slope (feet per foot).....	0.0015
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	50.0
Channel Flow-Line Elevation at Starting Station (feet)..	1019.25
Water Surface Elevation at Starting Station (feet).....	1022.26
Starting Channel Station (feet).....	5500.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	5.70
Critical Depth (feet).....	3.45

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
3' Drop Structure	5500.0	1019.25	1022.70	3.45	219.83	9.55	1.417	0.009409
	5550.0	1019.32	1023.64	4.32	290.27	7.23	0.813	0.004186
	5600.0	1019.40	1023.92	4.52	308.12	6.82	0.721	0.003524
	5700.0	1019.55	1024.34	4.79	331.40	6.34	0.624	0.002858
	5800.0	1019.70	1024.66	4.96	346.73	6.06	0.570	0.002510
	6000.0	1020.00	1025.19	5.19	367.17	5.72	0.508	0.002130
	6200.0	1020.30	1025.63	5.33	380.04	5.53	0.474	0.001931
	6500.0	1020.75	1026.21	5.46	392.46	5.35	0.445	0.001762
	6700.0	1021.05	1026.57	5.52	397.86	5.28	0.433	0.001694
3' Drop Structure	7000.0	1021.50	1027.08	5.58	403.55	5.20	0.420	0.001627

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

I-10 Channel

TRAPEZOIDAL CHANNEL ANALYSIS
[illegible] STEP WATER SURFACE PROFILE
August 9, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	2100.0
Channel Bottom Slope (feet per foot).....	0.0015
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	50.0
Channel Flow-Line Elevation at Starting Station (feet)..	1024.50
Water Surface Elevation at Starting Station (feet).....	1027.08
Starting Channel Station (feet).....	7000.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	5.70
Critical Depth (feet).....	3.45

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
3' Drop Structure –	7000.0	1024.50	1027.95	3.45	219.83	9.55	1.417	0.009409
	7050.0	1024.57	1028.89	4.32	250.27	7.23	0.813	0.004186
	7100.0	1024.65	1029.17	4.52	309.12	6.82	0.721	0.003524
	7200.0	1024.80	1029.59	4.79	331.40	6.34	0.624	0.002858
	7300.0	1024.95	1029.91	4.96	346.73	5.06	0.570	0.002510
	7400.0	1025.10	1030.19	5.09	358.03	5.87	0.534	0.002290
	7500.0	1025.25	1030.44	5.19	366.82	5.72	0.509	0.002136
3' Drop Structure –	7750.0	1025.62	1030.98	5.36	382.46	5.49	0.468	0.001896

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1985
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

I-10 Channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
August 9, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1800.0
Channel Bottom Slope (feet per foot).....	0.0015
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	30.0
Channel Flow-Line Elevation at Starting Station (feet)..	1028.62
Water Surface Elevation at Starting Station (feet).....	1030.98
Starting Channel Station (feet).....	7750.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	5.93
Critical Depth (feet).....	3.74

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
3' Drop Structure -	7750.0	1028.62	1032.36	3.74	168.28	9.51	1.404	0.009494
	7800.0	1028.70	1033.32	4.62	223.66	7.15	0.795	0.004269
	7850.0	1028.78	1033.60	4.82	237.76	6.73	0.703	0.003600
	7900.0	1028.86	1033.83	4.97	247.88	6.45	0.647	0.003205
	8000.0	1029.02	1034.20	5.18	262.48	6.10	0.577	0.002734
	8200.0	1029.34	1034.77	5.43	280.79	5.70	0.504	0.002267
3' Drop Structure -	8500.0	1029.82	1035.45	5.63	295.96	5.41	0.454	0.001960

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

I-10 Channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
October 12, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1600.0
Channel Bottom Slope (feet per foot).....	0.0016
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	30.0
Channel Flow-Line Elevation at Starting Station (feet)..	1031.82
Water Surface Elevation at Starting Station (feet).....	1035.45
Starting Channel Station (feet).....	8500.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	5.93
Critical Depth (feet).....	3.74

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
2' Drop -	8500.0	1031.82	1035.56	3.74	168.28	9.51	1.404	0.009494
Structure	8550.0	1031.90	1036.52	4.62	223.66	7.15	0.795	0.004269
	8600.0	1031.98	1036.80	4.82	237.76	6.73	0.703	0.003600
	8650.0	1032.06	1037.03	4.97	247.88	6.45	0.647	0.003205
	8700.0	1032.14	1037.22	5.08	255.81	6.25	0.607	0.002936
	8830.0	1032.35	1037.64	5.29	270.93	5.91	0.542	0.002504

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

I-10 channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
October 12, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1400.0
Channel Bottom Slope (feet per foot).....	0.0018
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	30.0
Channel Flow-Line Elevation at Starting Station (feet)..	1032.35
Water Surface Elevation at Starting Station (feet).....	1037.64
Starting Channel Station (feet).....	8830.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	5.38
Critical Depth (feet).....	3.47

Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
8830.0	1032.35	1037.64	5.29	270.64	5.17	0.416	0.001922
8900.0	1032.48	1037.78	5.30	271.38	5.16	0.413	0.001908
9000.0	1032.66	1037.97	5.31	272.29	5.14	0.410	0.001890
9200.0	1033.02	1038.35	5.33	273.71	5.11	0.406	0.001863
9500.0	1033.56	1038.91	5.35	275.10	5.09	0.402	0.001837
9700.0	1033.92	1039.28	5.36	275.68	5.08	0.400	0.001827
10000.0	1034.46	1039.82	5.37	276.26	5.07	0.399	0.001816
10300.0	1035.00	1040.37	5.37	276.61	5.06	0.398	0.001810
10465.0	1035.29	1040.67	5.37	276.73	5.06	0.397	0.001807

Perryville Road

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

3-10 Channel
At Perryville Rd.

-/3

PRINT DATE: 08-09-1994
PRINT TIME: 17:24:03

FILE DATE: 08-09-1994
FILE NAME: X1

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.07	0.00	40.00	6 RCB	10.00	5.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: X1 CULVERT HEADWATER ELEVATION (FT) DATE: 08-09-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.07	0.00	0.00	0.00	0.00	0.00	10.00
140	1.61	0.00	0.00	0.00	0.00	0.00	10.60
280	2.39	0.00	0.00	0.00	0.00	0.00	10.94
420	3.00	0.00	0.00	0.00	0.00	0.00	11.24
560	3.52	0.00	0.00	0.00	0.00	0.00	11.50
700	3.96	0.00	0.00	0.00	0.00	0.00	11.74
840	4.40	0.00	0.00	0.00	0.00	0.00	11.97
980	4.79	0.00	0.00	0.00	0.00	0.00	12.18
1120	5.15	0.00	0.00	0.00	0.00	0.00	12.39
1260	5.50	0.00	0.00	0.00	0.00	0.00	12.58
1400	5.88	0.00	0.00	0.00	0.00	0.00	12.77
3540	13.28	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 08-09-1994 FILE DATE: 09-[illegible]
CURRENT TIME: 17:34:02 FILE NAME: [illegible]

PERFORMANCE CURVE FOR CULVERT # 1 - 6 (10 BY 5) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (FA)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.07	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	[illegible]
140	1.61	0.85	1.54	3-M1t	0.63	0.53	1.51	1.54	2.81	[illegible]
280	2.39	1.35	2.32	3-M1t	1.00	0.88	2.05	2.28	3.14	2.28
420	3.00	1.77	2.93	3-M1t	1.29	1.15	2.46	2.85	3.56	2.85
560	3.52	2.14	3.45	3-M1t	1.57	1.40	2.80	3.33	3.88	3.1[illegible]
700	3.98	2.48	3.91	3-M1t	1.82	1.62	3.11	3.75	4.15	3.75
840	4.40	2.81	4.33	3-M1t	2.06	1.83	3.39	4.13	4.37	4.13
980	4.79	3.12	4.71	3-M1t	2.29	2.03	3.65	4.48	4.57	4.48
1120	5.15	3.41	5.07	3-M1t	2.52	2.22	3.89	4.80	4.75	4.8[illegible]
1260	5.50	3.69	5.43	4-FFt	2.73	2.40	4.20	5.00	4.91	[illegible]
1400	5.88	3.96	5.81	4-FFt	2.94	2.57	4.67	5.00	5.05	5.32

+1035.36 = 1041.17

El. inlet face invert 0.07 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00	= 105+05
INLET ELEVATION (FT)	0.07	= 1035.36
OUTLET STATION (FT)	40.00	= 104+65
OUTLET ELEVATION (FT)	0.00	= 1035.29
NUMBER OF BARRELS	6	
SLOPE (V-FT/H-FT)	0.0018	
CULVERT LENGTH ALONG SLOPE (FT)	40.00	

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	5.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

PRINT DATE: 08-09-1994 FILE DATE: 08-09-1994
CURRENT TIME: 17:04:02 FILE NAME: K1

TAILWATER

******* REGULAR CHANNEL CROSS SECTION ****************

BOTTOM WIDTH (FT)	30.00
SIDE SLOPE H/V (X:1)	4.0
CHANNEL SLOPE V/H (FT/FT)	0.002
MANNING'S N (.01-0.1)	0.030
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
140.00	1.54	0.356	1.54	2.51	0.17
280.00	2.28	0.367	2.28	3.14	0.26
420.00	2.85	0.372	2.85	3.56	0.32
560.00	3.33	0.375	3.33	3.88	0.37
700.00	3.75	0.377	3.75	4.15	0.42
840.00	4.13	0.379	4.13	4.37	0.45
980.00	4.48	0.381	4.48	4.57	0.50
1120.00	4.80	0.382	4.80	4.75	0.54
1260.00	5.10	0.383	5.10	4.91	0.57
1400.00	5.38	0.384	5.38	5.05	0.60

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	40.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	10.00

I-10 Channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
October 12, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1400.0
Channel Bottom Slope (feet per foot).....	0.0018
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	30.0
Channel Flow-Line Elevation at Starting Station (feet)..	1035.36
Water Surface Elevation at Starting Station (feet).....	1041.17
Starting Channel Station (feet).....	10505.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	5.38
Critical Depth (feet).....	3.47

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
Perryville Road –	10505.0	1035.36	1041.17	5.81	309.32	4.53	0.318	0.001328
	10600.0	1035.53	1041.29	5.76	305.46	4.58	0.326	0.001375
	10800.0	1035.89	1041.56	5.67	298.55	4.69	0.341	0.001465
2' Drop structure –	11000.0	1036.25	1041.85	5.60	293.14	4.78	0.354	0.001541

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

I-10 Channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
October 12, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1400.0
Channel Bottom Slope (feet per foot).....	0.0018
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	30.0
Channel Flow-Line Elevation at Starting Station (feet)..	1038.25
Water Surface Elevation at Starting Station (feet).....	1041.85
Starting Channel Station (feet).....	11000.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	5.38
Critical Depth (feet).....	3.47

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
2' Drop struc.	-11000.0	1038.25	1041.85	3.60	159.84	8.76	1.191	0.008408
	11050.0	1038.34	1042.61	4.27	200.87	6.97	0.754	0.004416
	11100.0	1038.43	1042.90	4.47	214.03	6.54	0.664	0.003697
	11200.0	1038.61	1043.33	4.72	230.48	6.07	0.573	0.003005
	11300.0	1038.79	1043.66	4.87	240.82	5.81	0.525	0.002659
	11500.0	1039.15	1044.21	5.06	253.93	5.51	0.472	0.002295
5' Drop struc.	-12000.0	1040.05	1045.32	5.27	269.15	5.20	0.420	0.001952

==========

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I-10 Channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
October 12, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1400.0
Channel Bottom Slope (feet per foot).....	0.0018
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	30.0
Channel Flow-Line Elevation at Starting Station (feet)..	1045.05
Water Surface Elevation at Starting Station (feet).....	1045.32
Starting Channel Station (feet).....	12000.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	5.38
Critical Depth (feet).....	3.47

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
5' Drop struc. -	12000.0	1045.05	1048.52	3.47	152.03	9.21	1.317	0.009691
	12050.0	1045.14	1049.45	4.31	203.30	6.89	0.736	0.004269
	12100.0	1045.23	1049.72	4.49	215.62	6.49	0.655	0.003621
	12200.0	1045.41	1050.14	4.73	231.39	6.05	0.568	0.002973
	12300.0	1045.59	1050.47	4.88	241.45	5.80	0.522	0.002640
	12400.0	1045.77	1050.75	4.98	248.62	5.63	0.492	0.002434
	12510.0	1045.97	1051.03	5.06	254.49	5.50	0.470	0.002281

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

I-10 channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
October 12, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1200.0
Channel Bottom Slope (feet per foot).....	0.0018
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	30.0
Channel Flow-Line Elevation at Starting Station (feet)..	1045.97
Water Surface Elevation at Starting Station (feet).....	1051.03
Starting Channel Station (feet).....	12510.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	4.97
Critical Depth (feet).....	3.17

Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
12510.0	1045.97	1051.03	5.06	254.21	4.72	0.346	0.001681
12600.0	1046.13	1051.18	5.05	253.34	4.74	0.348	0.001697
12800.0	1046.49	1051.52	5.03	251.80	4.77	0.353	0.001726
13170.0	1047.16	1052.16	5.00	249.97	4.80	0.358	0.001761
13300.0	1047.39	1052.39	4.99	249.58	4.81	0.359	0.001769

5' Drop Struc.

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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(713) 895-8322. A manual with equations & flow chart is available.

I-10 Channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
October 12, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	700.0
Channel Bottom Slope (feet per foot).....	0.0030
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	30.0
Channel Flow-Line Elevation at Starting Station (feet)..	1052.39
Water Surface Elevation at Starting Station (feet).....	1053.00
Starting Channel Station (feet).....	13300.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	3.27
Critical Depth (feet).....	2.30

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
5' Drop – Struc.	13300.0	1052.39	1054.69	2.30	90.33	7.75	0.933	0.010828
	13320.0	1052.45	1055.19	2.74	112.02	6.25	0.606	0.005804
	13350.0	1052.54	1055.42	2.88	119.51	5.86	0.533	0.004817
	13400.0	1052.69	1055.70	3.01	126.46	5.54	0.476	0.004097
	13500.0	1052.99	1056.13	3.14	133.50	5.24	0.427	0.003508
	14000.0	1054.49	1057.79	3.30	142.35	4.92	0.375	0.002921
	14490.0	1055.96	1059.23	3.27	140.92	4.97	0.383	0.003006

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
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APPENDIX H

REEMS ROAD CHANNEL

- Cost Estimate
- Concept Design Plan and Profile Figures
- Hydraulic Calculation Sheets

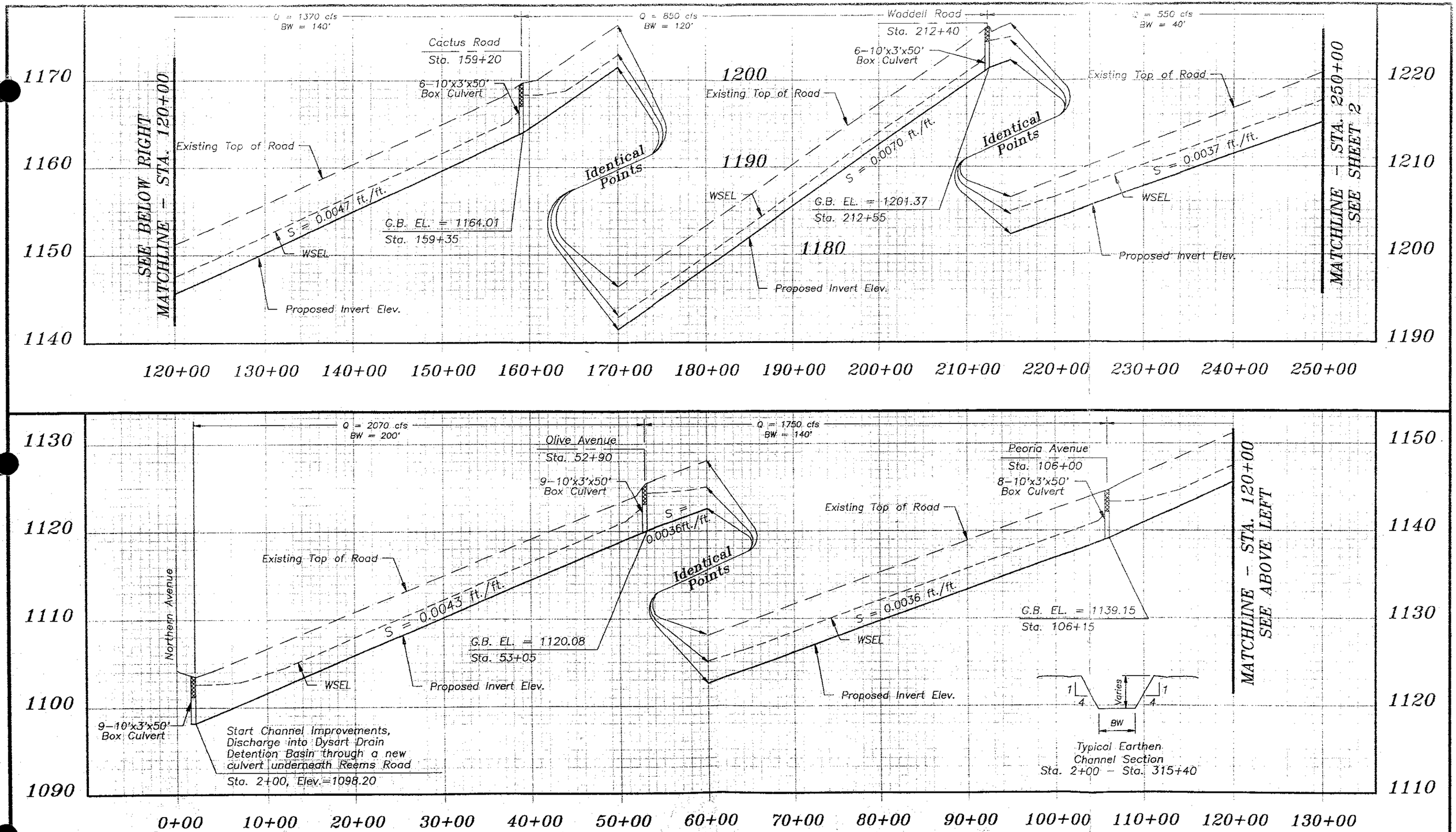
COST ESTIMATE

COST ESTIMATE SHEET
REEMS ROAD CHANNEL

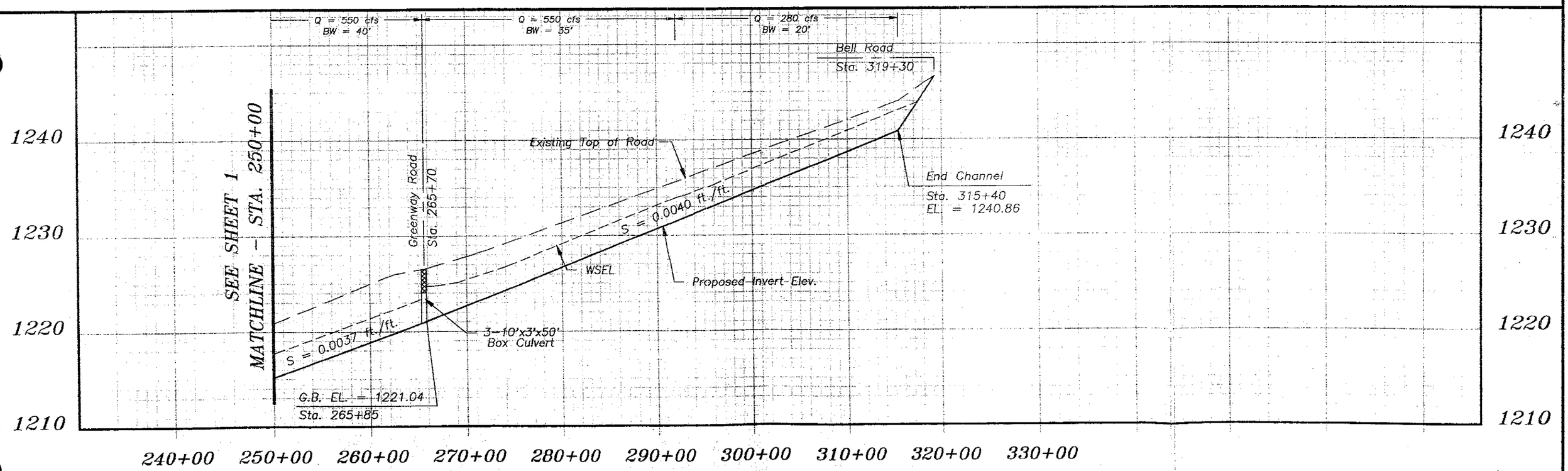
	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	COST
1.	Channel Excavation	815,285	C.Y.	$ 3	$ 2,445,900
2.	9 - 10' x 3' B.C. underneath Reems Road at Northern Avenue	50	L.F.	$ 2,565	$ 128,300
3.	9 - 10' x 3' B.C. at Olive Avenue	50	L.F.	$ 2,565	$ 128,300
4.	8 - 10' x 3' B.C. at Peoria Avenue	50	L.F.	$ 2,265	$ 113,300
5.	6 - 10' x 3' B.C. at Cactus Road	50	L.F.	$ 1,535	$ 76,800
6.	6 - 10' x 3' B.C. at Waddell Road	50	L.F.	$ 1,535	$ 76,800
7.	3 - 10' x 3' B.C. at Greenway Road	50	L.F.	$ 850	$ 42,500
				Estimated Construction Cost	$ 3,011,900
				Contingencies (25%)	$ 753,000
				Total Construction Cost	$ 3,764,900
8.	R.O.W.	5,538,100	S.F.	$.15	$ 830,700
				GRAND TOTAL	**$ 4,595,600**

CONCEPT DESIGN

PLAN AND PROFILE FIGURES



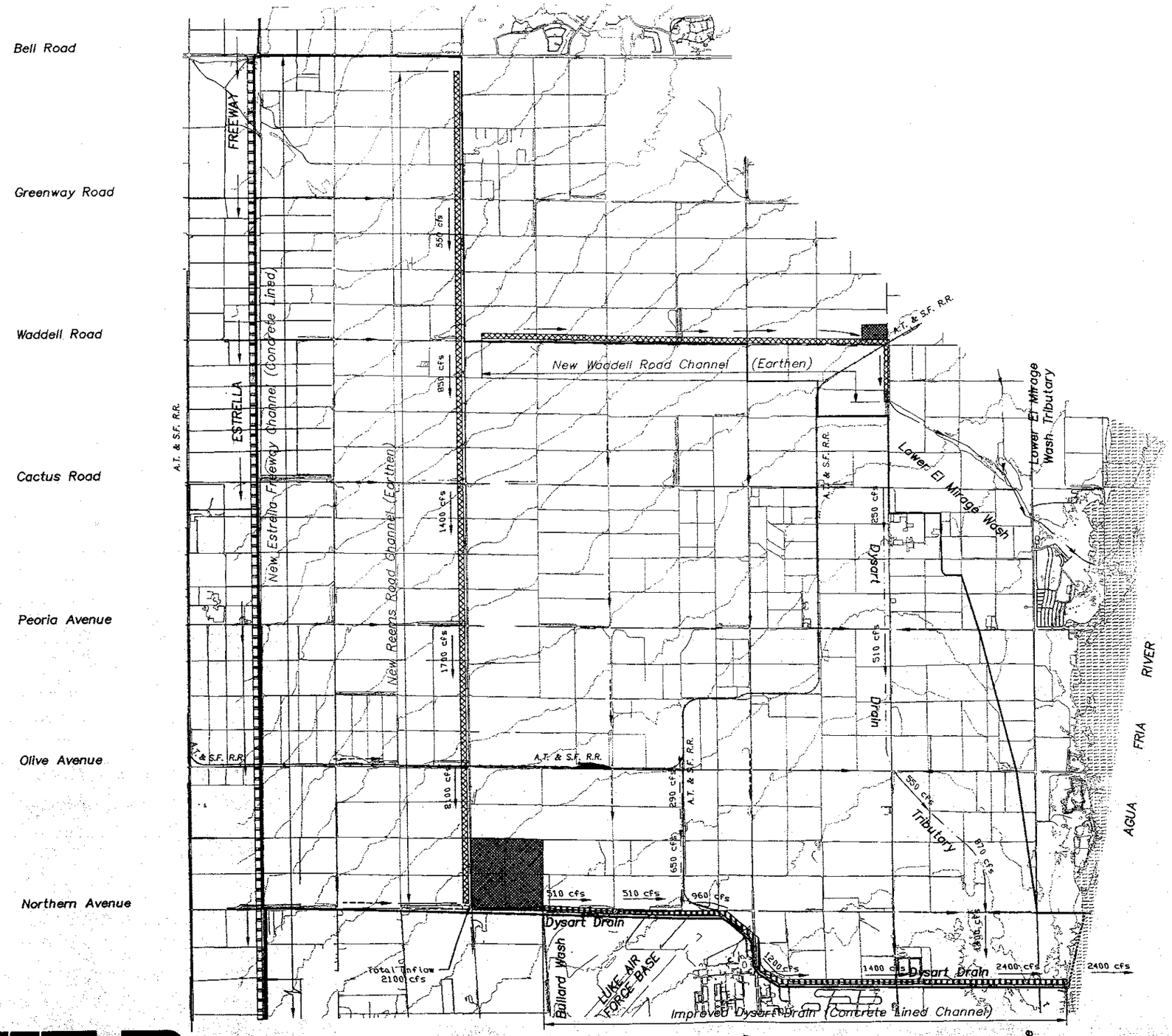
The WLB Group Inc. **WLB**	*White Tanks / Agua Fria ADMS* *Flood Control District of Maricopa County*	*Concept Design* *Reems Road Channel*	*Scale: Horiz.: 1"=1000'* *Job No.: 289036* *Vert.: 1"=10'* *Date: Dec. 1994* *Checked By: G.M.A.* *Sheet: 1 of 2*



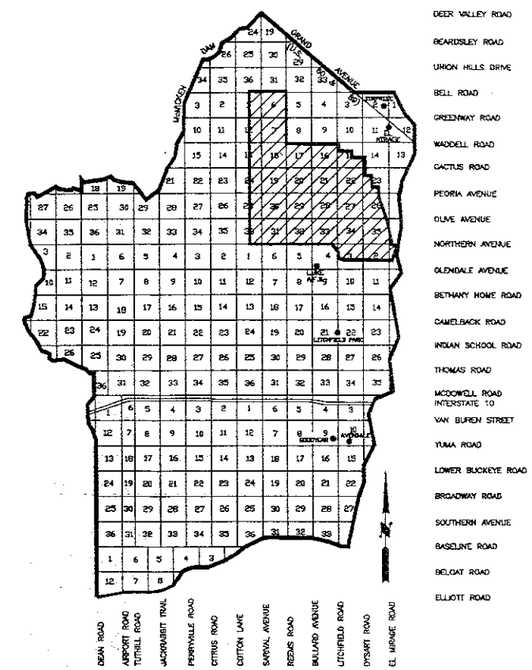
The WLB Group Inc. WLB	White Tanks / Agua Fria ADMS Flood Control District of Maricopa County	Concept Design Reems Road Channel	Scale: Horiz.: 1"=1000' Job No.: 289036 Vert.: 1"=10' Date: Dec. 1994 Checked By: G.M.A. Sheet: 2 of 2

Figure 10.4

Area Drainage Master Plan for Dysart Drain Watershed



WHITE TANKS/AGUA FRIA AREA DRAINAGE MASTER STUDY



Location Map

Legend

- 1800 CFS — Proposed Condition Peak Flow
- 100 – Year Floodplain
- New Detention Basin
- Watershed Boundary
- Railroads
- Future Local Drainage System

The WLB Group INC. WLB

HYDRAULIC CALCULATION SHEETS

Includes Trapezoidal Channel Analysis
and Culvert Analysis

CURRENT DATE: 11-20-1994
CURRENT TIME: 18:31:36

FILE DATE: 11-20-1994
FILE NAME: RMREEM

(under the Reems Rd at Northern ...)

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.10	0.00	50.00	9 RCB	10.00	3.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: RMREEM CULVERT HEADWATER ELEVATION (FT) DATE: 11-20-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.10	0.00	0.00	0.00	0.00	0.00	10.00
212	1.05	0.00	0.00	0.00	0.00	0.00	10.43
424	1.60	0.00	0.00	0.00	0.00	0.00	10.68
636	2.06	0.00	0.00	0.00	0.00	0.00	10.89
848	2.47	0.00	0.00	0.00	0.00	0.00	11.08
1060	2.84	0.00	0.00	0.00	0.00	0.00	11.24
1272	3.19	0.00	0.00	0.00	0.00	0.00	11.40
1484	3.53	0.00	0.00	0.00	0.00	0.00	11.56
1696	3.84	0.00	0.00	0.00	0.00	0.00	11.71
1908	4.15	0.00	0.00	0.00	0.00	0.00	11.85
2120	4.51	0.00	0.00	0.00	0.00	0.00	11.98
4452	12.70	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CUR DATE: 11-20-1994 FILE DATE: 11-20-1994
CURRENT TIME: 18:31:35 FILE NAME: RMREEM

PERFORMANCE CURVE FOR CULVERT # 1 - 9 (10 BY 3) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.10	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
212	1.05	0.85	0.95	3-M1t	0.62	0.56	3.06	0.77	2.67	0.77
424	1.60	1.36	1.50	3-M1t	0.97	0.89	4.05	1.16	3.48	1.16
636	2.06	1.78	1.96	3-M1t	1.26	1.16	4.77	1.48	4.06	1.48
848	2.47	2.16	2.37	3-M1t	1.53	1.41	5.37	1.75	4.52	1.75
1060	2.84	2.52	2.74	3-M1t	1.77	1.63	5.88	2.00	4.90	2.00
1272	3.15	2.86	3.09	3-M1t	2.00	1.84	6.34	2.23	5.24	2.23
1484	3.53	3.20	3.43	3-M1t	2.23	2.04	6.76	2.44	5.54	2.44
1696	3.94	3.57	3.74	3-M1t	2.44	2.23	7.14	2.64	5.82	2.64
1908	4.15	3.96	4.05	3-M1t	2.65	2.41	7.50	2.83	6.07	2.83
2120	4.51	4.40	4.41	4-FFt	3.00	2.59	7.85	3.00	6.30	3.01

+ 1098.20 = 1102.61

El. inlet face invert 0.10 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00	2+00
INLET ELEVATION (FT)	0.10	1098.20
OUTLET STATION (FT)	50.00	
OUTLET ELEVATION (FT)	0.00	1098.10
NUMBER OF BARRELS	9	
SLOPE (V-FT/H-FT)	0.0020	
CULVERT LENGTH ALONG SLOPE (FT)	50.00	

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	3.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 11-20-1994 FILE DATE: 11-20-1994
CURRENT TIME: 18:31:36 FILE NAME: RMREEM

TAILWATER

******* REGULAR CHANNEL CROSS SECTION ****************

BOTTOM WIDTH (FT)	100.00
SIDE SLOPE H/V (X:1)	4.0
CHANNEL SLOPE V/H (FT/FT)	0.004
MANNING'S N (.01-0.1)	0.030
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
212.00	0.77	0.537	0.77	2.67	0.21
424.00	1.16	0.569	1.16	3.48	0.31
636.00	1.48	0.588	1.48	4.06	0.40
848.00	1.75	0.601	1.75	4.52	0.47
1060.00	2.00	0.611	2.00	4.90	0.54
1272.00	2.23	0.619	2.23	5.24	0.60
1484.00	2.44	0.625	2.44	5.54	0.65
1696.00	2.64	0.631	2.64	5.82	0.71
1908.00	2.83	0.636	2.83	6.07	0.76
2120.00	3.01	0.640	3.01	6.30	0.81

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	40.00
CREST LENGTH (FT)	250.00
OVERTOPPING CREST ELEVATION (FT)	10.00

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
November 17, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	2070.0
Channel Bottom Slope (feet per foot).....	0.0043
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	200.0
Channel Flow-Line Elevation at Starting Station (feet)..	1098.20
Water Surface Elevation at Starting Station (feet).....	1102.61
Starting Channel Station (feet).....	200.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.99
Critical Depth (feet).....	1.48

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
Northern Av.	200.0	1098.20	1102.61	4.41	959.79	2.16	0.072	0.000293
	250.0	1098.41	1102.62	4.20	911.28	2.27	0.080	0.000345
	300.0	1098.63	1102.63	4.00	863.50	2.40	0.089	0.000408
	350.0	1098.84	1102.64	3.79	816.55	2.54	0.100	0.000487
	400.0	1099.06	1102.65	3.59	770.56	2.69	0.112	0.000585
	450.0	1099.27	1102.67	3.40	725.68	2.85	0.126	0.000708
	500.0	1099.49	1102.70	3.21	682.15	3.03	0.143	0.000863
	600.0	1099.92	1102.76	2.84	600.67	3.45	0.184	0.001295
	700.0	1100.35	1102.87	2.52	529.57	3.91	0.237	0.001939
	800.0	1100.78	1103.05	2.27	474.07	4.37	0.296	0.002770
	900.0	1101.21	1103.31	2.10	438.56	4.72	0.346	0.003561
	1000.0	1101.64	1103.67	2.03	421.67	4.91	0.374	0.004043
	1200.0	1102.50	1104.49	1.99	413.17	5.01	0.390	0.004318
	1500.0	1103.79	1105.78	1.99	413.88	5.00	0.388	0.004295
	2000.0	1105.94	1107.93	1.99	413.64	5.00	0.389	0.004303
	2500.0	1108.09	1110.08	1.99	413.77	5.00	0.389	0.004299
	3000.0	1110.24	1112.23	1.99	413.70	5.00	0.389	0.004301
	3500.0	1112.39	1114.38	1.99	413.73	5.00	0.389	0.004300
	4000.0	1114.54	1116.53	1.99	413.72	5.00	0.389	0.004300
	4500.0	1116.69	1118.68	1.99	413.73	5.00	0.389	0.004300
	5000.0	1118.84	1120.83	1.99	413.72	5.00	0.389	0.004300
	5075.0	1119.16	1121.15	1.99	413.72	5.00	0.389	0.004300
Olive Av.	5275.0	1120.02	1122.01	1.99	413.72	5.00	0.389	0.004300

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

CURRENT DATE: 11-20-1994
CURRENT TIME: 18:34:08

FILE DATE: 11-20-1994
FILE NAME: RMOLV

At Olive Av.

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.06	0.00	30.00	9 RCB	10.00	3.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: RMOLV CULVERT HEADWATER ELEVATION (FT) DATE: 11-20-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.06	0.00	0.00	0.00	0.00	0.00	10.00
207	1.00	0.00	0.00	0.00	0.00	0.00	10.42
414	1.54	0.00	0.00	0.00	0.00	0.00	10.67
621	1.99	0.00	0.00	0.00	0.00	0.00	10.87
828	2.40	0.00	0.00	0.00	0.00	0.00	11.06
1035	2.76	0.00	0.00	0.00	0.00	0.00	11.22
1242	3.11	0.00	0.00	0.00	0.00	0.00	11.38
1449	3.43	0.00	0.00	0.00	0.00	0.00	11.53
1656	3.75	0.00	0.00	0.00	0.00	0.00	11.68
1863	4.04	0.00	0.00	0.00	0.00	0.00	11.82
2070	4.35	0.00	0.00	0.00	0.00	0.00	11.95
4347	12.14	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 11-20-1994 FILE DATE: 11-20-1994
CURRENT TIME: 18:34:08 FILE NAME: RMOLV

PERFORMANCE CURVE FOR CULVERT # 1 - 9 (10 BY 3) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.06	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
207	1.00	0.84	0.94	3-M1t	0.62	0.55	3.03	0.76	2.65	0.76
414	1.54	1.33	1.48	3-M1t	0.96	0.87	4.01	1.15	3.45	1.15
621	1.99	1.76	1.93	3-M1t	1.24	1.14	4.73	1.46	4.02	1.46
828	2.40	2.13	2.34	3-M1t	1.50	1.38	5.31	1.73	4.48	1.73
1035	2.76	2.47	2.70	3-M1t	1.74	1.60	5.83	1.97	4.86	1.97
1242	3.11	2.81	3.05	3-M1t	1.97	1.81	6.28	2.20	5.20	2.20
1449	3.43	3.14	3.37	3-M1t	2.19	2.01	6.69	2.41	5.49	2.41
1656	3.75	3.50	3.69	3-M1t	2.40	2.20	7.07	2.60	5.77	2.60
1863	4.04	3.88	3.98	3-M1t	2.60	2.37	7.42	2.79	6.01	2.79
2070	4.35	4.29	4.28	6-FFn	3.00	2.55	7.67	3.00	6.24	2.96

+ 1120.08 = 1124.37

El. inlet face invert 0.06 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00	53+05
INLET ELEVATION (FT)	0.06	1120.08
OUTLET STATION (FT)	30.00	52+75
OUTLET ELEVATION (FT)	0.00	1120.02
NUMBER OF BARRELS	9	
SLOPE (V-FT/H-FT)	0.0020	
CULVERT LENGTH ALONG SLOPE (FT)	30.00	

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	3.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 11-20-1994 FILE DATE: 11-20-1994
CURRENT TIME: 18:34:08 FILE NAME: RMOLV

TAILWATER

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	100.00
SIDE SLOPE H/V (X:1)	4.0
CHANNEL SLOPE V/H (FT/FT)	0.004
MANNING'S N (.01-0.1)	0.030
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
207.00	0.76	0.536	0.76	2.65	0.20
414.00	1.15	0.568	1.15	3.45	0.31
621.00	1.46	0.587	1.46	4.02	0.39
828.00	1.73	0.600	1.73	4.48	0.46
1035.00	1.97	0.610	1.97	4.86	0.53
1242.00	2.20	0.618	2.20	5.20	0.59
1449.00	2.41	0.624	2.40	5.49	0.64
1656.00	2.60	0.630	2.60	5.77	0.70
1863.00	2.79	0.635	2.79	6.01	0.75
2070.00	2.96	0.639	2.96	6.24	0.80

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	20.00
CREST LENGTH (FT)	250.00
OVERTOPPING CREST ELEVATION (FT)	10.00

Reeves Road Ch

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
November 17, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1750.0
Channel Bottom Slope (feet per foot).....	0.0036
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	140.0
Channel Flow-Line Elevation at Starting Station (feet)..	1120.08
Water Surface Elevation at Starting Station (feet).....	1124.37
Starting Channel Station (feet).....	5305.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	2.34
Critical Depth (feet).....	1.67

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
olive Av.	5305.0	1120.08	1124.37	4.29	674.22	2.60	0.105	0.000456
	5350.0	1120.24	1124.38	4.14	648.40	2.70	0.113	0.000514
	5400.0	1120.42	1124.40	3.98	620.32	2.82	0.124	0.000590
	5450.0	1120.60	1124.42	3.82	592.95	2.95	0.135	0.000679
	5500.0	1120.78	1124.44	3.66	566.38	3.09	0.148	0.000783
	5600.0	1121.14	1124.51	3.36	516.17	3.39	0.178	0.001047
	5700.0	1121.50	1124.59	3.09	470.77	3.72	0.215	0.001397
	5800.0	1121.86	1124.71	2.85	431.64	4.05	0.255	0.001836
	5900.0	1122.22	1124.88	2.66	400.35	4.37	0.297	0.002329
	6000.0	1122.58	1125.10	2.52	377.86	4.63	0.333	0.002797
	6200.0	1123.30	1125.68	2.37	354.98	4.93	0.377	0.003411
	6400.0	1124.02	1126.36	2.34	349.79	5.00	0.389	0.003574
	7000.0	1126.18	1128.52	2.33	348.70	5.02	0.391	0.003611
	7500.0	1127.98	1130.32	2.34	349.13	5.01	0.390	0.003596
	8000.0	1129.78	1132.12	2.34	348.98	5.01	0.390	0.003601
	8500.0	1131.58	1133.92	2.34	349.03	5.01	0.390	0.003600
	9000.0	1133.38	1135.72	2.34	349.02	5.01	0.390	0.003600
	9500.0	1135.18	1137.52	2.34	349.02	5.01	0.390	0.003600
	10000.0	1136.98	1139.32	2.34	349.02	5.01	0.390	0.003600
	10485.0	1138.73	1141.06	2.34	349.02	5.01	0.390	0.003600
oria Av.	10585.0	1139.09	1141.42	2.34	349.02	5.01	0.390	0.003600

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

CURRENT DATE: 11-20-1994
CURRENT TIME: 18:37:02

FILE DATE: 11-20-1994
FILE NAME: RMPED

At Peoria Av.

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.06	0.00	30.00	8 RCB	10.00	3.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: RMPED CULVERT HEADWATER ELEVATION (FT) DATE: 11-20-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.06	0.00	0.00	0.00	0.00	0.00	10.00
175	0.98	0.00	0.00	0.00	0.00	0.00	10.38
350	1.51	0.00	0.00	0.00	0.00	0.00	10.60
525	1.95	0.00	0.00	0.00	0.00	0.00	10.78
700	2.34	0.00	0.00	0.00	0.00	0.00	10.95
875	2.70	0.00	0.00	0.00	0.00	0.00	11.09
1050	3.03	0.00	0.00	0.00	0.00	0.00	11.24
1225	3.35	0.00	0.00	0.00	0.00	0.00	11.37
1400	3.65	0.00	0.00	0.00	0.00	0.00	11.50
1575	3.93	0.00	0.00	0.00	0.00	0.00	11.62
1750	4.24	0.00	0.00	0.00	0.00	0.00	11.74
3850	12.07	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 11-20-1994 FILE DATE: 11-20-1994
CURRENT TIME: 18:37:02 FILE NAME: RMPED

PERFORMANCE CURVE FOR CULVERT # 1 - 8 (10 BY 3) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.06	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
175	0.98	0.81	0.92	3-M1t	0.60	0.53	2.84	0.77	2.44	0.77
350	1.51	1.29	1.45	3-M1t	0.93	0.84	3.76	1.16	3.18	1.16
525	1.95	1.70	1.89	3-M1t	1.21	1.10	4.43	1.48	3.70	1.48
700	2.34	2.06	2.28	3-M1t	1.45	1.34	4.99	1.75	4.11	1.75
875	2.70	2.39	2.64	3-M1t	1.69	1.55	5.47	2.00	4.46	2.00
1050	3.03	2.71	2.97	3-M1t	1.91	1.75	5.89	2.23	4.77	2.23
1225	3.35	3.03	3.29	3-M1t	2.12	1.94	6.28	2.44	5.04	2.44
1400	3.65	3.36	3.59	3-M1t	2.32	2.12	6.64	2.64	5.28	2.64
1575	3.93	3.70	3.87	3-M1t	2.52	2.30	6.97	2.82	5.51	2.82
1750	4.24	4.08	4.18	4-FFt	3.00	2.46	7.29	3.00	5.72	3.00

+1139.15 = 1143.33

El. inlet face invert 0.06 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00	106+15
INLET ELEVATION (FT)	0.06	1139.15
OUTLET STATION (FT)	30.00	105+85
OUTLET ELEVATION (FT)	0.00	1139.09
NUMBER OF BARRELS	8	
SLOPE (V-FT/H-FT)	0.0020	
CULVERT LENGTH ALONG SLOPE (FT)	30.00	

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	3.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 11-20-1994
CURRENT TIME: 18:37:06

FILE DATE: 11-20-1994
FILE NAME: RMPEO

TAILWATER

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	90.00
SIDE SLOPE H/V (X:1)	4.0
CHANNEL SLOPE V/H (FT/FT)	0.004
MANNING'S N (.01-0.1)	0.030
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
175.00	0.77	0.490	0.77	2.44	0.17
350.00	1.16	0.519	1.16	3.18	0.26
525.00	1.48	0.536	1.48	3.70	0.33
700.00	1.75	0.548	1.75	4.11	0.39
875.00	2.00	0.556	2.00	4.46	0.45
1050.00	2.23	0.563	2.23	4.77	0.50
1225.00	2.44	0.569	2.44	5.04	0.55
1400.00	2.64	0.574	2.63	5.28	0.59
1575.00	2.82	0.578	2.82	5.51	0.63
1750.00	3.00	0.581	3.00	5.72	0.67

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	20.00
CREST LENGTH (FT)	250.00
OVERTOPPING CREST ELEVATION (FT)	10.00

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
November 17, 1994

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PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1370.0
Channel Bottom Slope (feet per foot).....	0.0047
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	140.0
Channel Flow-Line Elevation at Starting Station (feet)..	1139.15
Water Surface Elevation at Starting Station (feet).....	1143.33
Starting Channel Station (feet).....	10615.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.87
Critical Depth (feet).....	1.42

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
Peoria Av. —	10615.0	1139.15	1143.33	4.18	655.09	2.09	0.068	0.000305
	10650.0	1139.31	1143.34	4.02	627.60	2.18	0.074	0.000349
	10700.0	1139.55	1143.34	3.80	588.96	2.33	0.084	0.000425
	10750.0	1139.78	1143.36	3.57	551.14	2.49	0.096	0.000523
	10800.0	1140.02	1143.37	3.35	514.27	2.66	0.110	0.000649
	10850.0	1140.25	1143.39	3.14	478.51	2.86	0.127	0.000813
	10900.0	1140.49	1143.42	2.93	444.12	3.08	0.148	0.001029
	11000.0	1140.96	1143.50	2.54	381.34	3.59	0.200	0.001665
	11200.0	1141.90	1143.91	2.01	296.88	4.61	0.331	0.003697
	11400.0	1142.84	1144.70	1.86	273.72	5.01	0.389	0.004796
	11600.0	1143.78	1145.65	1.87	275.81	4.97	0.383	0.004681
	12000.0	1145.66	1147.53	1.87	275.28	4.98	0.385	0.004710
	12500.0	1148.01	1149.88	1.87	275.56	4.97	0.384	0.004695
	13000.0	1150.36	1152.23	1.87	275.40	4.97	0.384	0.004703
	13500.0	1152.71	1154.58	1.87	275.48	4.97	0.384	0.004698
	14000.0	1155.06	1156.93	1.87	275.43	4.97	0.384	0.004701
	14500.0	1157.41	1159.28	1.87	275.47	4.97	0.384	0.004700
	15000.0	1159.76	1161.63	1.87	275.45	4.97	0.384	0.004700
	15765.0	1163.35	1165.22	1.87	275.46	4.97	0.384	0.004700
ches Rd. —	15905.0	1164.01	1165.88	1.87	275.46	4.97	0.384	0.004700

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TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

CURRENT DATE: 11-20-1994
CURRENT TIME: 18:39:47

FILE DATE: 11-20-1994
FILE NAME: RMCAC

Rancho [illegible] Canyon

At Cactus Road

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.06	0.00	30.00	6 RCB	10.00	3.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: RMCAC CULVERT HEADWATER ELEVATION (FT) DATE: 11-20-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.06	0.00	0.00	0.00	0.00	0.00	10.00
137	0.98	0.00	0.00	0.00	0.00	0.00	10.32
274	1.52	0.00	0.00	0.00	0.00	0.00	10.51
411	1.97	0.00	0.00	0.00	0.00	0.00	10.66
548	2.37	0.00	0.00	0.00	0.00	0.00	10.81
685	2.74	0.00	0.00	0.00	0.00	0.00	10.93
822	3.08	0.00	0.00	0.00	0.00	0.00	11.06
959	3.41	0.00	0.00	0.00	0.00	0.00	11.17
1096	3.72	0.00	0.00	0.00	0.00	0.00	11.28
1233	4.02	0.00	0.00	0.00	0.00	0.00	11.38
1370	4.32	0.00	0.00	0.00	0.00	0.00	11.48
2877	11.99	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 11-20-1994 FILE DATE: 11-20-1994
CURRENT TIME: 18:39:47 FILE NAME: RMCAC

PERFORMANCE CURVE FOR CULVERT # 1 - 6 (10 BY 3) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.06	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
137	0.98	0.84	0.92	3-M1t	0.61	0.55	3.20	0.71	2.64	0.71
274	1.52	1.33	1.46	3-M1t	0.95	0.87	4.24	1.08	3.43	1.08
411	1.97	1.75	1.91	3-M1t	1.24	1.14	5.00	1.37	3.98	1.37
548	2.37	2.12	2.31	3-M1t	1.50	1.38	5.63	1.62	4.42	1.62
685	2.74	2.46	2.68	3-M1t	1.74	1.60	6.18	1.85	4.79	1.85
822	3.08	2.79	3.02	3-M1t	1.96	1.80	6.66	2.06	5.11	2.06
959	3.41	3.13	3.35	3-M1t	2.18	2.00	7.11	2.25	5.40	2.25
1096	3.72	3.48	3.66	3-M1t	2.39	2.18	7.51	2.43	5.66	2.43
1233	4.02	3.85	3.96	3-M1t	2.59	2.36	7.89	2.60	5.89	2.60
1370	4.32	4.26	4.06	6-FFn	3.00	2.54	7.61	3.00	6.11	2.77

+1164.07 = 1168.33

El. inlet face invert 0.06 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00	159+35
INLET ELEVATION (FT)	0.06	1164.07
OUTLET STATION (FT)	30.00	159+05
OUTLET ELEVATION (FT)	0.00	1164.01
NUMBER OF BARRELS	6	
SLOPE (V-FT/H-FT)	0.0020	
CULVERT LENGTH ALONG SLOPE (FT)	30.00	

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	3.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 11-20-1994
CURRENT TIME: 18:39:47

FILE DATE: 11-20-1994
FILE NAME: RMCAC

TAILWATER

******* REGULAR CHANNEL CROSS SECTION ****************

BOTTOM WIDTH (FT)	70.00
SIDE SLOPE H/V (X:1)	4.0
CHANNEL SLOPE V/H (FT/FT)	0.005
MANNING'S N (.01-0.1)	0.030
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
137.00	0.71	0.550	0.71	2.64	0.21
274.00	1.08	0.582	1.08	3.43	0.32
411.00	1.37	0.600	1.37	3.98	0.40
548.00	1.62	0.612	1.62	4.42	0.47
685.00	1.85	0.622	1.85	4.79	0.54
822.00	2.06	0.629	2.06	5.11	0.60
959.00	2.25	0.635	2.25	5.40	0.66
1096.00	2.43	0.640	2.43	5.66	0.71
1233.00	2.60	0.644	2.60	5.89	0.76
1370.00	2.77	0.648	2.77	6.11	0.81

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	20.00
CREST LENGTH (FT)	250.00
OVERTOPPING CREST ELEVATION (FT)	10.00

Reeves Road Channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
November 17, 1994

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PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	850.0
Channel Bottom Slope (feet per foot).....	0.0070
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	120.0
Channel Flow-Line Elevation at Starting Station (feet)..	1164.07
Water Surface Elevation at Starting Station (feet).....	1168.33
Starting Channel Station (feet).....	15935.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.37
Critical Depth (feet).....	1.14

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
Cactus Rd.	15935.0	1164.07	1168.33	4.26	583.79	1.46	0.033	0.000148
	16000.0	1164.52	1168.33	3.81	514.89	1.65	0.042	0.000217
	16050.0	1164.87	1168.34	3.46	463.17	1.84	0.052	0.000301
	16100.0	1165.22	1168.34	3.12	412.66	2.06	0.066	0.000431
	16200.0	1165.92	1168.37	2.44	316.68	2.68	0.112	0.000990
	16300.0	1166.62	1168.45	1.83	232.51	3.66	0.208	0.002640
	16400.0	1167.32	1168.75	1.42	178.69	4.76	0.351	0.006141
	16450.0	1167.67	1169.05	1.37	172.05	4.94	0.379	0.006937
	16600.0	1168.72	1170.09	1.37	171.33	4.96	0.382	0.007032
	16800.0	1170.12	1171.49	1.37	171.72	4.95	0.380	0.006981
	17000.0	1171.52	1172.89	1.37	171.49	4.96	0.381	0.007012
	17200.0	1172.92	1174.29	1.37	171.63	4.95	0.381	0.006993
	17500.0	1175.02	1176.39	1.37	171.54	4.96	0.381	0.007005
	17700.0	1176.42	1177.79	1.37	171.60	4.95	0.381	0.006996
	18000.0	1178.52	1179.89	1.37	171.55	4.95	0.381	0.007002
	18200.0	1179.92	1181.29	1.37	171.59	4.95	0.381	0.006998
	18500.0	1182.02	1183.39	1.37	171.57	4.95	0.381	0.007002
	18700.0	1183.42	1184.79	1.37	171.58	4.95	0.381	0.006999
	19000.0	1185.52	1186.89	1.37	171.57	4.95	0.381	0.007000
	19200.0	1186.92	1188.29	1.37	171.58	4.95	0.381	0.007000
	19500.0	1189.02	1190.39	1.37	171.57	4.95	0.381	0.007000
	19700.0	1190.42	1191.79	1.37	171.58	4.95	0.381	0.007000
	20000.0	1192.52	1193.89	1.37	171.58	4.95	0.381	0.007000
	20200.0	1193.92	1195.29	1.37	171.58	4.95	0.381	0.006999
	20500.0	1196.02	1197.39	1.37	171.57	4.95	0.381	0.007000
	20700.0	1197.42	1198.79	1.37	171.58	4.95	0.381	0.007001
	21000.0	1199.52	1200.89	1.37	171.58	4.95	0.381	0.007000
	21125.0	1200.40	1201.77	1.37	171.58	4.95	0.381	0.006999
Waddell Rd.	21225.0	1201.10	1202.47	1.37	171.58	4.95	0.381	0.007000

CURRENT DATE: 11-20-1994
CURRENT TIME: 18:42:07

FILE DATE: 11-20-1994
FILE NAME: RMWAD

Rocky Mount Channel

At Waddell Road

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.06	0.00	30.00	6 RCB	10.00	3.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: RMWAD CULVERT HEADWATER ELEVATION (FT) DATE: 11-20-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.06	0.00	0.00	0.00	0.00	0.00	10.00
85	0.73	0.00	0.00	0.00	0.00	0.00	10.23
170	1.12	0.00	0.00	0.00	0.00	0.00	10.37
255	1.44	0.00	0.00	0.00	0.00	0.00	10.48
340	1.74	0.00	0.00	0.00	0.00	0.00	10.58
425	2.01	0.00	0.00	0.00	0.00	0.00	10.68
510	2.26	0.00	0.00	0.00	0.00	0.00	10.77
595	2.50	0.00	0.00	0.00	0.00	0.00	10.85
680	2.73	0.00	0.00	0.00	0.00	0.00	10.93
765	2.95	0.00	0.00	0.00	0.00	0.00	11.00
850	3.16	0.00	0.00	0.00	0.00	0.00	11.08
2805	11.47	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 11-20-1994 FILE DATE: 11-20-1994
CURRENT TIME: 18:42:07 FILE NAME: RMWAD

PERFORMANCE CURVE FOR CULVERT # 1 - 6 (10 BY 3) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.06	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
85	0.73	0.61	0.67	3-M1t	0.44	0.40	2.97	0.48	2.48	0.48
170	1.12	0.97	1.06	3-M1t	0.70	0.63	3.93	0.72	3.24	0.72
255	1.44	1.27	1.38	3-M1t	0.91	0.83	4.63	0.92	3.78	0.92
340	1.74	1.53	1.68	3-M2t	1.09	1.00	5.21	1.09	4.21	1.09
425	2.01	1.79	1.95	3-M2t	1.26	1.16	5.71	1.24	4.57	1.24
510	2.26	2.02	2.20	3-M2t	1.43	1.31	6.15	1.38	4.89	1.38
595	2.50	2.24	2.44	3-M2t	1.58	1.45	6.55	1.51	5.17	1.51
680	2.73	2.45	2.67	3-M2t	1.73	1.59	6.92	1.64	5.43	1.64
765	2.95	2.66	2.89	3-M2t	1.87	1.72	7.27	1.75	5.67	1.75
850	3.16	2.86	3.10	3-M2t	2.01	1.84	7.59	1.87	5.88	1.87

+1201.37 = 1204.47

El. inlet face invert 0.06 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00	212+55
INLET ELEVATION (FT)	0.06	1201.37
OUTLET STATION (FT)	30.00	212+25
OUTLET ELEVATION (FT)	0.00	1201.31
NUMBER OF BARRELS	6	
SLOPE (V-FT/H-FT)	0.0020	
CULVERT LENGTH ALONG SLOPE (FT)	30.00	

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	3.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 11-20-1994
CURRENT TIME: 18:42:07

FILE DATE: 11-20-1994
FILE NAME: RMWAD

TAILWATER

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	70.00
SIDE SLOPE H/V (X:1)	4.0
CHANNEL SLOPE V/H (FT/FT)	0.007
MANNING'S N (.01-0.1)	0.030
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
85.00	0.48	0.633	0.48	2.48	0.21
170.00	0.72	0.673	0.72	3.24	0.31
255.00	0.92	0.695	0.92	3.78	0.40
340.00	1.09	0.711	1.09	4.21	0.47
425.00	1.24	0.723	1.24	4.57	0.54
510.00	1.38	0.733	1.38	4.89	0.60
595.00	1.51	0.741	1.51	5.17	0.66
680.00	1.64	0.748	1.64	5.43	0.71
765.00	1.75	0.754	1.75	5.67	0.77
850.00	1.87	0.759	1.87	5.88	0.81

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	20.00
CREST LENGTH (FT)	250.00
OVERTOPPING CREST ELEVATION (FT)	10.00

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
November 17, 1994

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PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	550.0
Channel Bottom Slope (feet per foot).....	0.0027
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	40.0
Channel Flow-Line Elevation at Starting Station (feet)..	1201.37
Water Surface Elevation at Starting Station (feet).....	1204.47
Starting Channel Station (feet).....	21225.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	2.36
Critical Depth (feet).....	1.70

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
Waddell Rd.	21225.0	1201.37	1204.47	3.10	162.44	3.39	0.178	0.001394
	21250.0	1201.46	1204.50	3.03	158.19	3.48	0.188	0.001506
	21300.0	1201.65	1204.56	2.91	150.29	3.66	0.208	0.001749
	21350.0	1201.83	1204.63	2.80	143.26	3.84	0.229	0.002012
	21400.0	1202.02	1204.72	2.70	137.17	4.01	0.250	0.002286
	21500.0	1202.39	1204.93	2.55	127.85	4.30	0.287	0.002812
	21600.0	1202.76	1205.21	2.45	122.10	4.50	0.315	0.003222
	21700.0	1203.13	1205.53	2.40	119.04	4.62	0.331	0.003474
	21800.0	1203.50	1205.87	2.38	117.60	4.68	0.340	0.003601
	21900.0	1203.87	1206.23	2.37	116.98	4.70	0.343	0.003658
	22000.0	1204.24	1206.60	2.36	116.72	4.71	0.345	0.003682
	22500.0	1206.09	1208.44	2.36	116.47	4.72	0.346	0.003706
	23000.0	1207.94	1210.30	2.36	116.56	4.72	0.346	0.003698
	23500.0	1209.79	1212.14	2.36	116.52	4.72	0.346	0.003701
	24000.0	1211.64	1214.00	2.36	116.54	4.72	0.346	0.003700
	24500.0	1213.49	1215.85	2.36	116.53	4.72	0.346	0.003700
	25000.0	1215.34	1217.70	2.36	116.53	4.72	0.346	0.003700
	25500.0	1217.19	1219.55	2.36	116.53	4.72	0.346	0.003700
	26000.0	1219.04	1221.40	2.36	116.53	4.72	0.346	0.003700
Greenway Rd.	26555.0	1221.09	1223.45	2.36	116.53	4.72	0.346	0.003700

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TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

CURRENT DATE: 11-20-1994
CURRENT TIME: 18:44:36

FILE DATE: 11-20-1994
FILE NAME: RMGRE

At Greenway Road

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.06	0.00	30.00	3 RCB	10.00	3.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: RMGRE CULVERT HEADWATER ELEVATION (FT) DATE: 11-20-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.06	0.00	0.00	0.00	0.00	0.00	10.00
55	0.87	0.00	0.00	0.00	0.00	0.00	10.18
110	1.34	0.00	0.00	0.00	0.00	0.00	10.28
165	1.72	0.00	0.00	0.00	0.00	0.00	10.36
220	2.07	0.00	0.00	0.00	0.00	0.00	10.44
275	2.39	0.00	0.00	0.00	0.00	0.00	10.51
330	2.68	0.00	0.00	0.00	0.00	0.00	10.57
385	2.96	0.00	0.00	0.00	0.00	0.00	10.64
440	3.23	0.00	0.00	0.00	0.00	0.00	10.70
495	3.48	0.00	0.00	0.00	0.00	0.00	10.75
550	3.73	0.00	0.00	0.00	0.00	0.00	10.80
1375	11.09	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 11-20-1994 FILE DATE: 11-20-1994
CURRENT TIME: 18:44:36 FILE NAME: RMGRE

PERFORMANCE CURVE FOR CULVERT # 1 - 3 (10 BY 3) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.06	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
55	0.87	0.72	0.81	3-M1t	0.53	0.47	2.74	0.67	2.19	0.67
110	1.34	1.15	1.28	3-M1t	0.82	0.75	3.66	1.00	2.82	1.00
165	1.72	1.50	1.66	3-M1t	1.07	0.98	4.33	1.27	3.24	1.27
220	2.07	1.83	2.01	3-M1t	1.29	1.19	4.89	1.50	3.58	1.50
275	2.39	2.13	2.33	3-M1t	1.50	1.38	5.38	1.70	3.86	1.70
330	2.68	2.40	2.62	3-M1t	1.69	1.56	5.82	1.89	4.10	1.89
385	2.96	2.67	2.90	3-M1t	1.88	1.73	6.22	2.06	4.32	2.06
440	3.23	2.93	3.17	3-M1t	2.06	1.89	6.59	2.22	4.51	2.22
495	3.48	3.20	3.42	3-M1t	2.23	2.04	6.94	2.38	4.68	2.38
550	3.73	3.49	3.67	3-M1t	2.40	2.19	7.27	2.52	4.84	2.52

+1221.04 = 1224.71

El. inlet face invert 0.06 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00	265+85
INLET ELEVATION (FT)	0.06	1221.04
OUTLET STATION (FT)	30.00	265+55
OUTLET ELEVATION (FT)	0.00	1220.98
NUMBER OF BARRELS	3	
SLOPE (V-FT/H-FT)	0.0020	
CULVERT LENGTH ALONG SLOPE (FT)	30.00	

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	3.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 11-20-1994
CURRENT TIME: 18:44:36

FILE DATE: 11-20-1994
FILE NAME: RMGRE

TAILWATER

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	35.00
SIDE SLOPE H/V (X:1)	4.0
CHANNEL SLOPE V/H (FT/FT)	0.004
MANNING'S N (.01-0.1)	0.030
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
55.00	0.67	0.473	0.67	2.19	0.15
110.00	1.00	0.496	1.00	2.82	0.23
165.00	1.27	0.508	1.27	3.24	0.29
220.00	1.50	0.516	1.50	3.58	0.35
275.00	1.70	0.522	1.70	3.86	0.39
330.00	1.89	0.526	1.89	4.10	0.44
385.00	2.06	0.530	2.06	4.32	0.48
440.00	2.22	0.533	2.22	4.51	0.51
495.00	2.38	0.535	2.38	4.68	0.55
550.00	2.52	0.538	2.52	4.84	0.58

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	20.00
CREST LENGTH (FT)	250.00
OVERTOPPING CREST ELEVATION (FT)	10.00

Reems Road Ch...

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
November 17, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	550.0
Channel Bottom Slope (feet per foot).....	0.0040
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	35.0
Channel Flow-Line Elevation at Starting Station (feet)..	1221.04
Water Surface Elevation at Starting Station (feet).....	1224.71
Starting Channel Station (feet).....	26585.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	2.47
Critical Depth (feet).....	1.83

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
Greenway Rd.	26585.0	1221.04	1224.71	3.67	182.33	3.02	0.141	0.000943
	26600.0	1221.10	1224.72	3.62	179.08	3.07	0.146	0.000992
	26700.0	1221.50	1224.80	3.30	159.03	3.46	0.186	0.001395
	26800.0	1221.90	1224.92	3.02	142.12	3.87	0.233	0.001929
	26900.0	1222.30	1225.09	2.79	128.98	4.26	0.282	0.002555
	27000.0	1222.70	1225.34	2.64	120.00	4.58	0.326	0.003153
	27200.0	1223.50	1225.99	2.49	111.86	4.92	0.375	0.003872
	27400.0	1224.30	1226.77	2.47	110.69	4.97	0.383	0.003994
	28000.0	1226.70	1229.17	2.47	110.60	4.97	0.384	0.004003
	28500.0	1228.70	1231.17	2.47	110.64	4.97	0.384	0.003999
	29000.0	1230.70	1233.17	2.47	110.62	4.97	0.384	0.004001
	29200.0	1231.50	1233.97	2.47	110.63	4.97	0.384	0.004000

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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(713) 895-8322. A manual with equations & flow chart is available.

Reems Road Channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
November 17, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	280.0
Channel Bottom Slope (feet per foot).....	0.0040
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	20.0
Channel Flow-Line Elevation at Starting Station (feet)..	1231.50
Water Surface Elevation at Starting Station (feet).....	1233.97
Starting Channel Station (feet).....	29200.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	2.21
Critical Depth (feet).....	1.63

Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
29200.0	1231.50	1233.97	2.47	73.80	3.79	0.223	0.002624
29250.0	1231.70	1234.09	2.39	70.62	3.96	0.244	0.002972
29300.0	1231.90	1234.23	2.33	68.25	4.10	0.261	0.003274
29400.0	1232.30	1234.55	2.25	65.39	4.28	0.285	0.003698
29500.0	1232.70	1234.92	2.22	64.22	4.36	0.295	0.003893
29600.0	1233.10	1235.31	2.21	63.81	4.39	0.299	0.003964
30000.0	1234.70	1236.90	2.20	63.54	4.41	0.301	0.004012
30500.0	1236.70	1238.91	2.21	63.64	4.40	0.301	0.003994
31000.0	1238.70	1240.91	2.21	63.60	4.40	0.301	0.004002
-31540.0	1240.86	1243.07	2.21	63.62	4.40	0.301	0.003999

@ Bell Rd.

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APPENDIX I

WADDELL ROAD CHANNEL

- Cost Estimate
- Concept Design Plan and Profile Figures
- Hydraulic Calculation Sheets
- Detention Basin Design

COST ESTIMATE

WADDELL ROAD CHANNEL
COST ESTIMATE

	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT COST	COST
1.	Channel Excavation	294,654	C.Y.	$ 3.0	$ 884,400
2.	Detension Basin Excavation	32,555	C.Y.	$ 3.0	$ 97,700
3.	3.0' drop structure at sta. 28 + 00	1	EA.	$ 15,600	$ 15,600
4.	3.5' drop structure at sta. 90 + 00	1	EA.	$ 16,500	$ 16,500
5.	3.0' drop structure at sta. 100 + 00	1	EA.	$ 15,600	$ 15,600
6.	2.0' drop structure at sta. 123 +00	1	EA.	$ 13,300	$ 13,300
7.	2.0' drop structure at sta. 140 + 00	1	EA.	$ 11,300	$11,300
8.	4.0' drop structure at sta. 166 + 00	1	EA.	$ 11,600	$11,600
9.	5 - 10' x 4' B.C. under Dysart Road at El Mirage Wash	50	L.F.	$ 1,355	$ 67,800
10.	4 - 10' x 4' B.C. under Waddel Road at Dysart Road	50	L.F.	$ 1,100	$ 55,000
11.	5 - 10' x 4' B.C. 1/2 mile west of Dysart Road	30	L.F.	$ 1,355	$ 40,700
12.	5 - 10' x 4' B.C. at Litchfield Road	50	L.F.	$ 1,355	$ 67,800
13.	4 - 10' x 4' B.C. 1/2 mile west of Litchfield Road	30	L.F.	$ 1,100	$ 33,000
14.	4 - 10' x 3' B.C. at Bullard Avenue	50	L.F.	$ 1040	$ 52,000
15.	3 - 10' x 3' B.C. 1/2 mile west of Bullard Avenue	30	L.F.	$ 805	$ 24,200

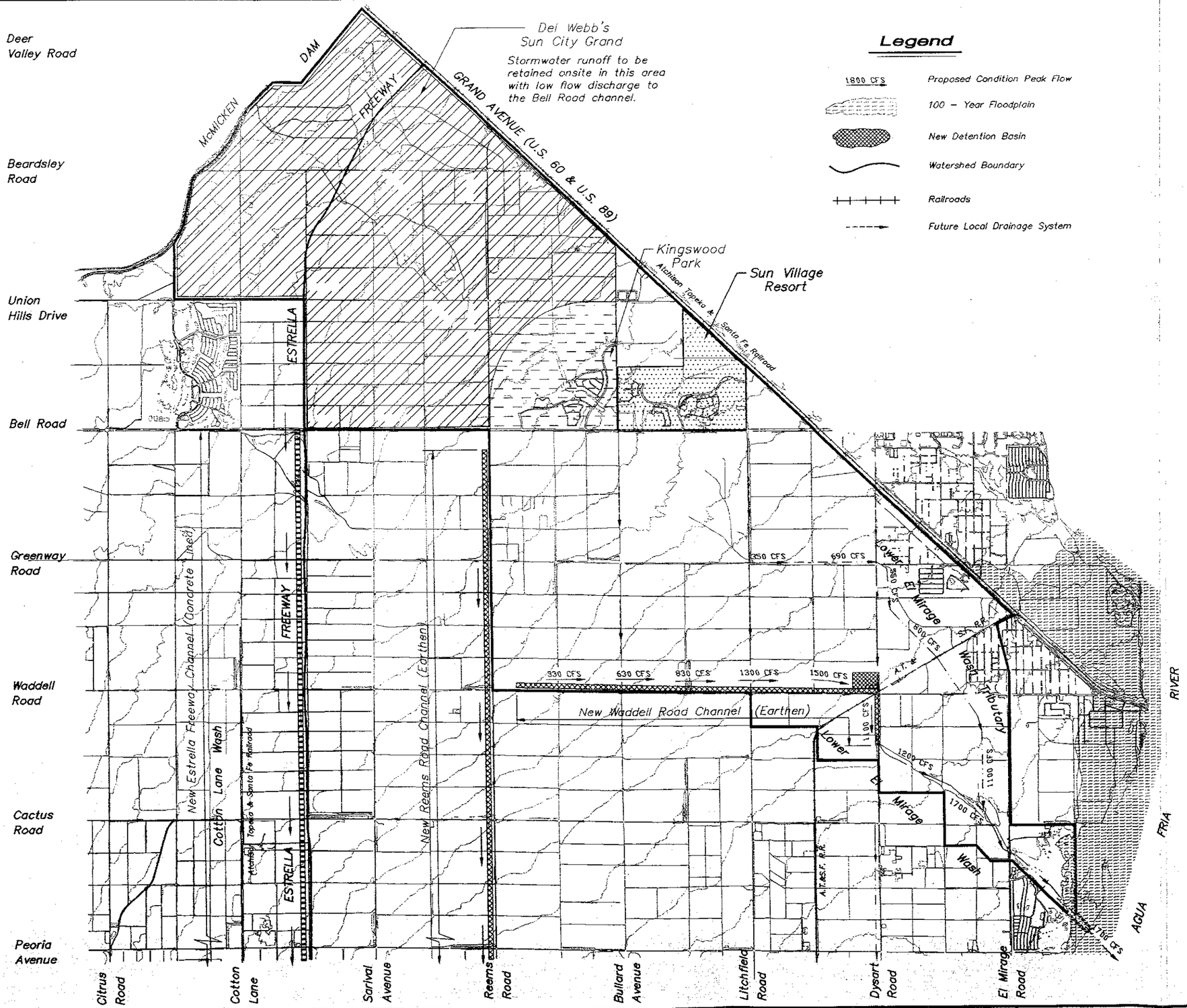
WADDELL ROAD CHANNEL					
16.	Detention Basin Inflow Spillway	1	EA.	$ 50,000	$ 50,000
				Estimated Construction Cost	$ 1,456,100
				Contingencies (25%)	$ 364,000
				Total Construction Cost	$ 1,820,100
17.	R.O.W	2,483,125	S.F.	$ .15	$ 372,500
				GRAND TOTAL	**$ 2,192,600**

CONCEPT DESIGN

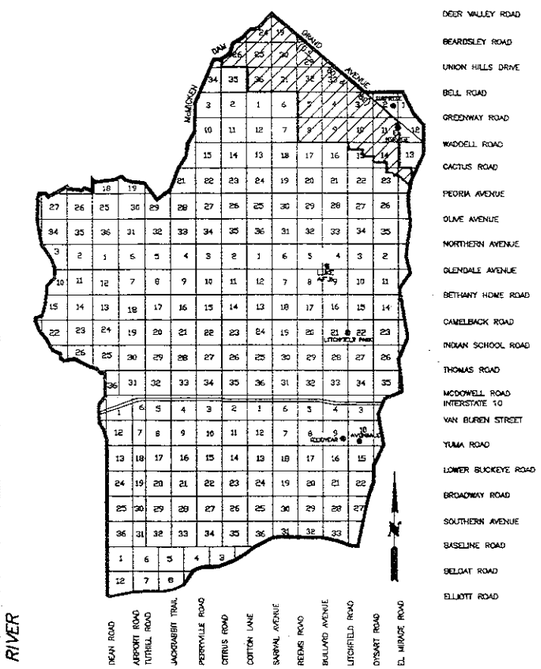
PLAN AND PROFILE FIGURES

Figure 9.2

Area Drainage Master Plan for Lower El Mirage Watershed

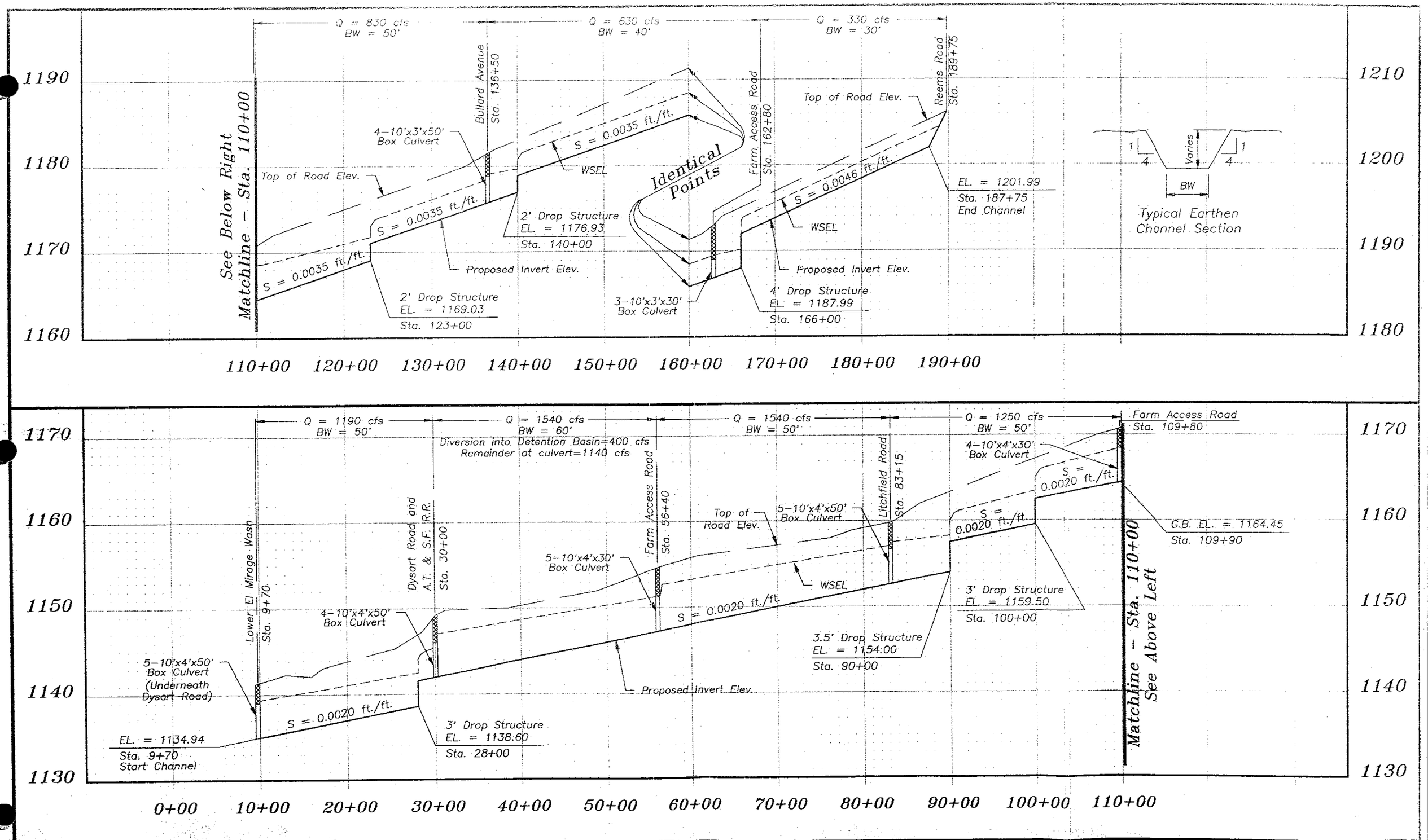


WHITE TANKS/AGUA FRIA AREA DRAINAGE MASTER STUDY



Location Map

The WLB Group INC. WLB



The WLB Group Inc. **WLB**	*White Tanks / Agua Fria ADMS* *Flood Control District of Maricopa County*	*Concept Design* *Waddell Road Channel*	*Scale: Horiz.: 1"=1000'* *Job No.: 289036* *Vert.: 1"=10'* *Date: Dec. 1994* *Checked By: G.M.A.* *Sheet: 1 of 1*

HYDRAULIC CALCULATION SHEETS

Includes Trapezoidal Channel Analysis
and Culvert Analysis

1/2

(Underneath Dysart Road at El Mirage Wash)

CURRENT DATE: 10-12-1994
CURRENT TIME: 13:50:31

FILE DATE: 10-04-1994
FILE NAME: WADMIR

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.08	0.00	40.00	5 RCB	10.00	4.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: WADMIR CULVERT HEADWATER ELEVATION (FT) DATE: 10-04-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.08	0.00	0.00	0.00	0.00	0.00	100.00
119	1.06	0.00	0.00	0.00	0.00	0.00	100.85
238	1.61	0.00	0.00	0.00	0.00	0.00	101.35
357	2.08	0.00	0.00	0.00	0.00	0.00	101.76
476	2.48	0.00	0.00	0.00	0.00	0.00	102.14
595	2.86	0.00	0.00	0.00	0.00	0.00	102.49
714	3.21	0.00	0.00	0.00	0.00	0.00	102.81
833	3.54	0.00	0.00	0.00	0.00	0.00	103.11
952	3.86	0.00	0.00	0.00	0.00	0.00	103.40
1071	4.16	0.00	0.00	0.00	0.00	0.00	103.67
1190	4.45	0.00	0.00	0.00	0.00	0.00	103.94
9996	104.06	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

ENT DATE: 10-12-1994 FILE DATE: 10-04-1994
CURRENT TIME: 13:50:31 FILE NAME: WADMIR

PERFORMANCE CURVE FOR CULVERT # 1 - 5 (10 BY 4) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.08	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
119	1.06	0.86	0.98	3-M1t	0.61	0.56	2.90	0.82	2.24	0.82
238	1.61	1.37	1.53	3-M1t	0.97	0.89	3.87	1.23	2.87	1.23
357	2.08	1.79	2.00	3-M1t	1.27	1.17	4.58	1.56	3.31	1.56
476	2.48	2.17	2.40	3-M1t	1.54	1.41	5.18	1.84	3.65	1.84
595	2.86	2.53	2.78	3-M1t	1.78	1.64	5.70	2.09	3.93	2.09
714	3.21	2.86	3.13	3-M1t	2.02	1.85	6.17	2.31	4.18	2.31
833	3.54	3.17	3.46	3-M1t	2.24	2.05	6.60	2.52	4.39	2.52
952	3.86	3.47	3.78	3-M1t	2.46	2.25	7.00	2.72	4.59	2.72
1071	4.16	3.77	4.08	3-M1t	2.67	2.43	7.37	2.91	4.76	2.91
1190	4.45	4.07	4.37	3-M1t	2.87	2.61	7.72	3.08	4.92	3.08

+1134.94 = 1139.31

El. inlet face invert 0.08 ft El. outlet invert 0.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00	9+70
INLET ELEVATION (FT)	0.08	1134.94
OUTLET STATION (FT)	40.00	
OUTLET ELEVATION (FT)	0.00	
NUMBER OF BARRELS	5	
SLOPE (V-FT/H-FT)	0.0020	
CULVERT LENGTH ALONG SLOPE (FT)	40.00	

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	4.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

ENT DATE: 10-12-1994
CURRENT TIME: 13:50:31

FILE DATE: 10-04-1994
FILE NAME: WADMIR

TAILWATER

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH (FT)	60.00
SIDE SLOPE H/V (X:1)	6.0
CHANNEL SLOPE V/H (FT/FT)	0.004
MANNING'S N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
119.00	0.82	0.435	0.82	2.24	0.20
238.00	1.23	0.456	1.23	2.87	0.31
357.00	1.56	0.467	1.56	3.31	0.39
476.00	1.84	0.475	1.84	3.65	0.46
595.00	2.09	0.480	2.09	3.93	0.52
714.00	2.31	0.484	2.31	4.18	0.58
833.00	2.53	0.487	2.52	4.39	0.63
952.00	2.72	0.490	2.72	4.59	0.68
1071.00	2.91	0.492	2.91	4.76	0.73
1190.00	3.08	0.494	3.08	4.92	0.77

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	40.00
CREST LENGTH (FT)	50.00
OVERTOPPING CREST ELEVATION (FT)	100.00

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
October 12, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1190.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	50.0
Channel Flow-Line Elevation at Starting Station (feet)..	1134.94
Water Surface Elevation at Starting Station (feet).....	1139.31
Starting Channel Station (feet).....	970.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	3.87
Critical Depth (feet).....	2.43

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
El Mirage Wash –	970.0	1134.94	1139.31	4.37	294.89	4.04	0.253	0.001284
	1000.0	1135.00	1139.35	4.35	292.80	4.06	0.256	0.001311
	1050.0	1135.10	1139.41	4.31	289.48	4.11	0.262	0.001355
	1100.0	1135.20	1139.47	4.27	286.37	4.16	0.268	0.001398
	1200.0	1135.40	1139.60	4.20	280.77	4.24	0.279	0.001480
	1500.0	1136.00	1140.05	4.05	268.22	4.44	0.306	0.001690
	2000.0	1137.00	1140.92	3.92	257.72	4.62	0.331	0.001898
	2500.0	1138.00	1141.88	3.88	254.37	4.68	0.340	0.001972
3' Drop struc. –	2800.0	1138.60	1142.47	3.87	253.73	4.69	0.342	0.001986

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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(713) 895-8322. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
October 12, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1190.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	50.0
Channel Flow-Line Elevation at Starting Station (feet)..	1141.60
Water Surface Elevation at Starting Station (feet).....	1142.00
Starting Channel Station (feet).....	2800.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	3.87
Critical Depth (feet).....	2.43

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
3' Drop struc. –	2800.0	1141.60	1144.03	2.43	145.08	8.20	1.045	0.010384
	2820.0	1141.64	1144.55	2.91	179.31	6.64	0.684	0.005515
	2850.0	1141.70	1144.79	3.09	192.73	6.17	0.592	0.004453
	2900.0	1141.80	1145.07	3.27	206.06	5.77	0.518	0.003655
Woodwell Rd –	2970.0	1141.94	1145.36	3.42	217.59	5.47	0.464	0.003114

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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(713) 895-8322. A manual with equations & flow chart is available.

Waddell Rd. Culvert
under Waddell Rd. at Dysart Rd

[illegible] FILE DATE: [illegible]
[illegible] FILE NAME: WADDYS

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULVERT NO.	SITE DATA: INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	CULVERT SHAPE, MATERIAL, INLET: BARRELS	SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.08	0.00	40.00	4	RCP	10.00	4.00	.012	CONVENTIONAL
2									
3									
4									
5									
6									

FILE: WADDYS CULVERT HEADWATER ELEVATION (FT) DATE: 10-05-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.08	0.00	0.00	0.00	0.00	0.00	100.00
114	1.22	0.00	0.00	0.00	0.00	0.00	100.82
228	1.86	0.00	0.00	0.00	0.00	0.00	101.30
342	2.39	0.00	0.00	0.00	0.00	0.00	101.71
455	2.85	0.00	0.00	0.00	0.00	0.00	102.08
570	3.29	0.00	0.00	0.00	0.00	0.00	102.42
684	3.68	0.00	0.00	0.00	0.00	0.00	102.73
798	4.06	0.00	0.00	0.00	0.00	0.00	103.02
912	4.41	0.00	0.00	0.00	0.00	0.00	103.30
1026	4.75	0.00	0.00	0.00	0.00	0.00	103.57
1140	5.08	0.00	0.00	0.00	0.00	0.00	103.83
8094	105.55	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

/3

[illegible] DATE: [illegible]

[illegible] TIME: [illegible]

[illegible] DATE: [illegible]

[illegible] NAME: [illegible]

[illegible] FOR CULVERT # [illegible]

DISCHARGE FLOW (cfs)	HEADWATER WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	0.08	0.00	0.00	6-NF	0.00	0.00	0.00	0.00	0.00	0.00
114	1.52	0.97	1.14	6-M1t	0.69	0.62	2.84	1.00	2.11	1.00
228	1.85	1.54	1.78	3-M1t	1.09	1.01	3.79	1.50	2.71	1.50
342	2.39	2.02	2.31	3-M1t	1.43	1.32	4.43	1.90	3.12	1.90
456	2.86	2.46	2.78	3-M1t	1.73	1.60	5.07	2.25	3.44	2.25
570	3.29	2.85	3.21	3-M1t	2.02	1.85	5.58	2.55	3.71	2.55
684	3.68	3.22	3.60	3-M1t	2.28	2.09	6.03	2.83	3.94	2.83
798	4.05	3.58	3.97	3-M1t	2.54	2.32	6.45	3.05	4.14	3.09
912	4.41	3.94	4.33	3-M1t	2.79	2.53	6.84	3.33	4.32	3.33
1026	4.75	4.30	4.67	3-M1t	3.03	2.74	7.21	3.56	4.49	3.56
1140	5.08	4.65	5.00	3-M1t	3.26	2.94	7.55	3.78	4.64	3.78

+ 1142.0 = 1147.0

El. inlet face invert	0.08 ft	El. outlet invert	0.00 ft
El. inlet throat invert	0.00 ft	El. inlet crest	0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00	30+00
INLET ELEVATION (FT)	0.08	1142.00
OUTLET STATION (FT)	40.00	29+70
OUTLET ELEVATION (FT)	0.00	1141.94
NUMBER OF BARRELS	4	
SLOPE (V-FT/H-FT)	0.0020	
CULVERT LENGTH ALONG SLOPE (FT)	40.00	

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	[illegible] FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

[illegible]

TAILWATER

******* REGULAR CHANNEL CROSS SECTION *******

BOTTOM WIDTH (FT)	50.00
SIDE SLOPE H/V (X:1)	4.0
CHANNEL SLOPE V/H (FT/FT)	0.002
MANNING'S N (0.01-0.1)	0.030
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
114.00	1.00	0.371	1.00	2.11	0.12
228.00	1.50	0.399	1.50	2.71	0.19
342.00	1.90	0.398	1.90	3.12	0.24
456.00	2.25	0.404	2.25	3.44	0.28
570.00	2.56	0.409	2.55	3.71	0.32
684.00	2.83	0.412	2.82	3.94	0.35
798.00	3.09	0.415	3.09	4.14	0.39
912.00	3.33	0.417	3.33	4.32	0.42
1026.00	3.56	0.419	3.56	4.49	0.44
1140.00	3.78	0.421	3.78	4.64	0.47

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	40.00
CREST LENGTH (FT)	50.00
OVERTOPPING CREST ELEVATION (FT)	100.00

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
October 11, 1994

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PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1540.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	60.0
Channel Flow-Line Elevation at Starting Station (feet)..	1142.00
Water Surface Elevation at Starting Station (feet).....	1147.00
Starting Channel Station (feet).....	3000.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	4.09
Critical Depth (feet).....	2.58

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
Dysart Rd. —	3000.0	1142.00	1147.00	5.00	400.00	3.85	0.230	0.000967
	3050.0	1142.10	1147.04	4.94	394.28	3.91	0.237	0.001008
	3100.0	1142.20	1147.09	4.89	388.80	3.96	0.244	0.001050
	3200.0	1142.40	1147.18	4.78	378.53	4.07	0.257	0.001135
	3300.0	1142.60	1147.29	4.69	369.20	4.17	0.270	0.001221
	3400.0	1142.80	1147.40	4.60	360.81	4.27	0.283	0.001305
	3500.0	1143.00	1147.52	4.52	353.34	4.36	0.295	0.001387
	3600.0	1143.20	1147.66	4.46	346.76	4.44	0.306	0.001465
	3700.0	1143.40	1147.80	4.40	341.03	4.52	0.317	0.001539
	3800.0	1143.60	1147.94	4.34	336.08	4.58	0.326	0.001606
	3900.0	1143.80	1148.10	4.30	331.85	4.64	0.334	0.001666
	4000.0	1144.00	1148.26	4.26	328.28	4.69	0.342	0.001720
	4500.0	1145.00	1149.14	4.14	317.18	4.86	0.366	0.001903
	5000.0	1146.00	1150.10	4.10	313.42	4.91	0.375	0.001971
Farm Access Road —	5630.0	1147.26	1151.35	4.09	312.12	4.93	0.378	0.001995

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TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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(713) 895-8322. A manual with equations & flow chart is available.

Alternative cross road ½ mile west of [illegible] Rd. 1/3

[illegible]

[illegible]

DULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	[illegible] (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.04	0.00	[illegible]	5 ALB	10.00	4.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: WADFARM1 CULVERT TAILWATER ELEVATION (FT) DATE: 09-05-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.04	0.00	0.00	0.00	0.00	0.00	100.00
154	1.27	0.00	0.00	0.00	0.00	0.00	101.01
308	1.96	0.00	0.00	0.00	0.00	0.00	101.60
462	2.52	0.00	0.00	0.00	0.00	0.00	102.10
616	3.01	0.00	0.00	0.00	0.00	0.00	102.54
770	3.46	0.00	0.00	0.00	0.00	0.00	102.95
924	3.88	0.00	0.00	0.00	0.00	0.00	103.33
1078	4.28	0.00	0.00	0.00	0.00	0.00	103.69
1232	4.65	0.00	0.00	0.00	0.00	0.00	104.03
1386	5.01	0.00	0.00	0.00	0.00	0.00	104.36
1540	5.42	0.00	0.00	0.00	0.00	0.00	104.67
10164	107.47	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

[illegible]

Q (cfs)	HW ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	[illegible] VEL. (ft/s)	[illegible] DEPTH (ft)	[illegible]	[illegible]
0	[illegible]	[illegible]	0.00	[illegible]	0.00	0.00	0.00	[illegible]	[illegible]	[illegible]
154	1.17	1.02	1.23	[illegible]	0.73	0.67	3.55	[illegible]	[illegible]	1.05
308	1.56	[illegible]	1.92	[illegible]	1.15	1.05	3.80	1.62	[illegible]	[illegible]
462	2.32	2.13	2.48	[illegible]	1.51	1.39	4.50	2.05	[illegible]	2.05
616	2.71	2.50	2.97	[illegible]	1.83	1.68	5.05	1.43	[illegible]	1.43
770	3.06	2.90	3.42	[illegible]	2.12	1.95	5.55	2.70	[illegible]	1.75
924	3.68	3.40	3.84	[illegible]	2.41	2.20	6.04	3.06	[illegible]	[illegible]
1078	4.12	3.78	4.24	[illegible]	2.68	2.44	6.46	3.34	[illegible]	1.34
1232	4.63	4.17	4.61	[illegible]	2.94	2.67	6.86	3.80	[illegible]	[illegible]
1386	5.01	4.58	4.97	[illegible]	3.20	2.89	7.20	3.85	[illegible]	[illegible]
1540	5.42	5.01	5.38	[illegible]	3.45	3.10	7.70	4.00	[illegible]	[illegible]

+1147.30 = 1152.68

El. inlet face invert 0.04 ft El. outlet invert [illegible] ft
El. inlet throat invert 0.00 ft El. inlet crest [illegible] ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00	= 56+50
INLET ELEVATION (FT)	0.04	= 1147.30
OUTLET STATION (FT)	20.00	= 56+30
OUTLET ELEVATION (FT)	0.00	= 1147.26
NUMBER OF BARRELS	5	
SLOPE (V-FT/H-FT)	0.0020	
CULVERT LENGTH ALONG SLOPE (FT)	20.00	

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	[illegible] FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

[illegible]

[illegible]

[illegible]

******* [illegible]	[illegible] CROSS SECTION *******	
[illegible]	[illegible]	60.00
[illegible]	[illegible]	4.0
[illegible]	[illegible] (FT/FT)	0.002
[illegible]	[illegible]	0.030
[illegible]	[illegible] ELEVATION (FT)	0.00
[illegible]	[illegible] INVERT ELEVATION	0.00 FT

******* [illegible] RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	[illegible]	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	[illegible]	0.000	0.00	0.00	0.00
154.00	[illegible]	0.378	1.03	2.22	0.13
308.00	[illegible]	0.396	1.52	2.85	0.21
462.00	[illegible]	0.405	2.05	3.30	0.26
616.00	[illegible]	0.413	2.43	3.64	0.30
770.00	1.75	0.418	2.76	3.92	0.34
924.00	[illegible]	0.421	3.05	4.18	0.39
1078.00	[illegible]	0.424	3.34	4.40	0.42
1232.00	[illegible]	0.427	3.60	4.60	0.45
1386.00	4.85	0.429	3.85	4.78	0.48
1540.00	[illegible]	0.431	4.09	4.94	0.51

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	30.00
CREST LENGTH [illegible]	50.00
[illegible]	[illegible]

Waddell Rd Cross

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
October 11, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1540.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	50.0
Channel Flow-Line Elevation at Starting Station (feet)..	1147.30
Water Surface Elevation at Starting Station (feet).....	1152.68
Starting Channel Station (feet).....	5650.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	4.46
Critical Depth (feet).....	2.85

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
Farm Access Road –	5650.0	1147.30	1152.68	5.38	384.78	4.00	0.249	0.001002
	5700.0	1147.40	1152.72	5.32	379.61	4.06	0.256	0.001042
	6000.0	1148.00	1153.03	5.03	352.97	4.36	0.296	0.001282
	6500.0	1149.00	1153.71	4.71	324.08	4.75	0.351	0.001638
	7000.0	1150.00	1154.55	4.55	310.33	4.96	0.382	0.001856
	7500.0	1151.00	1155.49	4.49	305.03	5.05	0.396	0.001951
	8000.0	1152.00	1156.47	4.47	303.24	5.08	0.400	0.001984
Litchfield Rd. –	8300.0	1152.60	1157.06	4.46	302.85	5.09	0.402	0.001992

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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[illegible] Rd. Culvert
at Litchfield Rd.

RUN DATE: [illegible]
[illegible]

FILE DATE: [illegible]
FILE NAME: [illegible]

[illegible]
[illegible]

	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARREL SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING N	INLET TYPE
1	0.06	0.00	30.00	[illegible]	10.00	4.00	.018	[illegible]
2								
3								
4								
5								
6								

FILE: WADLIT CULVERT HEADWATER ELEVATION (FT) DATE: [illegible]

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.06	0.00	0.00	0.00	0.00	0.00	[illegible]
125	1.20	0.00	0.00	0.00	0.00	0.00	[illegible]
250	1.83	0.00	0.00	0.00	0.00	0.00	[illegible]
375	2.34	0.00	0.00	0.00	0.00	0.00	[illegible]
500	2.76	0.00	0.00	0.00	0.00	0.00	[illegible]
625	3.15	0.00	0.00	0.00	0.00	0.00	[illegible]
750	3.57	0.00	0.00	0.00	0.00	0.00	[illegible]
875	3.92	0.00	0.00	0.00	0.00	0.00	[illegible]
1000	4.25	0.00	0.00	0.00	0.00	0.00	[illegible]
1125	4.57	0.00	0.00	0.00	0.00	0.00	[illegible]
1250	4.87	0.00	0.00	0.00	0.00	0.00	[illegible]
10000	104.12	0.00	0.00	0.00	0.00	0.00	[illegible]

The above Q and HW are for a point above the roadway.

13

[illegible]

[illegible]

INFORMATION [illegible] CULVERT [illegible] FOR

FLOW (cfs)	HEAD WATER ELEV. (ft)	INLET WATER DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (FA)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	INLET VEL. (fps)	INLET DEPTH (ft)
0	0.06	0.00	0.60	3-M2	0.00	0.00	0.00	0.00	0.00	0.00
125	1.20	0.89	0.14	3-M1t	0.62	0.52	1.35	1.06	2.18	1.06
250	1.83	1.41	1.77	3-M1t	1.00	0.93	3.15	1.59	2.73	1.59
375	2.24	1.85	2.28	3-M1t	1.31	1.21	3.73	2.01	2.88	2.01
500	2.75	2.25	2.72	3-M1t	1.59	1.45	4.22	2.37	3.53	2.37
625	3.15	2.51	3.12	3-M1t	1.84	1.70	4.64	2.69	3.85	2.95
750	3.57	2.95	3.51	3-M1t	2.09	1.92	5.02	2.99	4.06	2.99
875	3.92	3.27	3.86	3-M1t	2.28	2.12	5.37	3.20	4.26	3.16
1000	4.25	3.59	4.19	3-M1t	2.54	2.32	5.70	3.51	4.45	3.51
1125	4.57	3.90	4.51	3-M1t	2.75	2.51	6.00	3.75	4.62	3.75
1250	4.87	4.22	4.81	3-M1t	2.97	2.69	6.29	3.97	4.78	3.97

+ 1152.66 = 1157.47

El. inlet face invert	0.06 ft	El. outlet invert	0.00 ft
El. inlet throat invert	0.00 ft	El. inlet crest	0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00	= 83+30
INLET ELEVATION (FT)	0.06	= 1152.66
OUTLET STATION (FT)	30.00	= 83+00
OUTLET ELEVATION (FT)	0.00	= 1152.6
NUMBER OF BARRELS	5	
SLOPE (V-FT/H-FT)	0.0020	
CULVERT LENGTH ALONG SLOPE (FT)	30.00	

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	[illegible] FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

[illegible]

[illegible]

[illegible]

******* REGULAR CHANNEL CROSS SECTION *******

BOTTOM WIDTH (FT)	50.00
SIDE SLOPE H/V (X:1)	1.0
CHANNEL SLOPE V/H (FT/FT)	0.005
MANNINGS N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	0.00
CULVERT NO.1 OUTLET INVERT ELEVATION	0.00 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
0.00	0.00	0.000	0.00	0.00	0.00
125.00	1.06	0.374	1.06	2.18	0.[illegible]
250.00	1.59	0.391	1.59	2.79	0.31
375.00	2.01	0.400	2.01	3.42	0.35
500.00	2.37	0.406	2.37	3.96	0.39
625.00	2.69	0.411	2.69	3.62	0.34
750.00	2.99	0.414	2.99	4.06	0.37
875.00	3.26	0.417	3.26	4.25	0.41
1000.00	3.51	0.419	3.51	4.45	0.44
1125.00	3.75	0.421	3.75	4.62	0.47
1250.00	3.97	0.422	3.97	4.79	0.50

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	20.00
CREST LENGTH (FT)	50.00
OVERTOPPING CREST ELEVATION (FT)	100.00

Walden Rd Channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
October 11, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1250.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	50.0
Channel Flow-Line Elevation at Starting Station (feet)..	1152.66
Water Surface Elevation at Starting Station (feet).....	1157.47
Starting Channel Station (feet).....	8330.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	3.97
Critical Depth (feet).....	2.50

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
Litchfield Rd.	-8330.0	1152.66	1157.47	4.81	333.04	3.75	0.219	0.000998
	8400.0	1152.80	1157.53	4.73	326.24	3.83	0.228	0.001059
	8500.0	1153.00	1157.63	4.63	317.26	3.94	0.241	0.001148
	8800.0	1153.60	1157.98	4.38	295.47	4.23	0.278	0.001409
3.5 Drop struc.	9000.0	1154.00	1158.25	4.25	285.04	4.39	0.299	0.001563

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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(713) 895-8322. A manual with equations & flow chart is available.

Waddell Rd. Channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
October 11, 1994

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PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1250.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	50.0
Channel Flow-Line Elevation at Starting Station (feet)..	1157.50
Water Surface Elevation at Starting Station (feet).....	1158.00
Starting Channel Station (feet).....	9000.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	3.97
Critical Depth (feet).....	2.50

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
3.5' Drop struc.	9000.0	1157.50	1160.00	2.50	150.35	8.31	1.073	0.010293
	9050.0	1157.60	1160.86	3.26	205.81	6.07	0.573	0.004047
	9100.0	1157.70	1161.11	3.41	216.93	5.76	0.516	0.003467
	9500.0	1158.50	1162.38	3.88	254.10	4.92	0.376	0.002183
3' Drop — struc.	10000.0	1159.50	1163.45	3.95	260.02	4.81	0.359	0.002041

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TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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Wadell

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
October 11, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	1250.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	50.0
Channel Flow-Line Elevation at Starting Station (feet)..	1162.50
Water Surface Elevation at Starting Station (feet).....	1163.00
Starting Channel Station (feet).....	10000.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	3.97
Critical Depth (feet).....	2.50

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
3' Drop Struc. -	10000.0	1162.50	1165.00	2.50	150.35	8.31	1.073	0.010293
	10050.0	1162.60	1165.86	3.26	205.81	6.07	0.573	0.004047
	10100.0	1162.70	1166.11	3.41	216.93	5.76	0.516	0.003467
	10300.0	1163.10	1166.81	3.71	240.39	5.20	0.420	0.002566
Farm Access Road -	10500.0	1163.50	1167.32	3.82	249.76	5.00	0.389	0.002295
	10970.0	1164.44	1168.38	3.94	258.85	4.83	0.362	0.002068

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TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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(713) 895-8322. A manual with equations & flow chart is available.

[illegible] FILE: [illegible]
[illegible] TIME: [illegible]

[illegible] FILE DATE: [illegible]
FILE NAME: WADFARM2

At u farm access road by mile [illegible] of Lirgfield Rd

[illegible]
HYDRAULIC ANALYSIS
HY-8, VERSION 4.0

[illegible]	[illegible]	[illegible]	[illegible]	CULVERT SHAPE, MATERIAL, INLET				
[illegible]	INLET ELEV. (FT)	TAILWATER ELEV. (FT)	[illegible] (FT)	BARREL SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	0.04	[illegible]	11.00	A RCP	10.00	4.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: WADFARM2 [illegible] HEADWATER ELEVATION (FT) DATE: 09-08-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.04	0.00	0.00	0.00	0.00	0.00	100.00
83	0.99	0.00	0.00	0.00	0.00	0.00	100.57
166	1.51	0.00	0.00	0.00	0.00	0.00	101.06
249	1.94	0.00	0.00	0.00	0.00	0.00	101.39
332	2.32	0.00	0.00	0.00	0.00	0.00	101.68
415	2.67	0.00	0.00	0.00	0.00	0.00	101.95
498	2.99	0.00	0.00	0.00	0.00	0.00	102.20
581	3.30	0.00	0.00	0.00	0.00	0.00	102.45
664	3.59	0.00	0.00	0.00	0.00	0.00	102.67
747	3.86	0.00	0.00	0.00	0.00	0.00	102.89
830	4.12	0.00	0.00	0.00	0.00	0.00	103.10
7968	103.29	0.00	0.00	0.00	0.00	0.00	0.00

The above 0 and HW are for a point above the roadway.

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0	0.04	0.00	0.00	0-NF	0.00	0.00	3.00	0.00	0.00	0.00
83	0.96	0.79	0.95	3-M1t	0.55	0.51	3.50	0.93	1.97	0.82
165	1.51	1.25	1.47	3-M1t	0.89	0.81	3.89	1.25	2.42	1.25
249	1.94	1.53	1.90	3-M1t	1.16	1.07	3.93	1.58	2.79	1.52
332	2.32	1.58	2.08	3-M1t	1.40	1.29	4.43	1.87	3.09	1.87
415	2.67	2.03	2.63	3-M1t	1.63	1.50	4.97	2.13	3.33	2.12
498	2.99	2.11	2.95	3-M1t	1.84	1.69	5.25	2.36	3.54	2.36
581	3.30	2.29	3.26	3-M1t	2.04	1.88	5.62	2.58	3.73	2.58
664	3.59	2.15	3.55	3-M1t	2.24	2.05	5.96	2.79	3.90	2.79
747	3.86	3.40	3.82	3-M1t	2.43	2.22	6.27	2.98	4.05	2.98
830	4.13	3.63	4.09	3-M1t	2.61	2.38	6.55	3.16	4.19	3.16

+ 1164.48 = 1168.57

El. inlet face invert	0.04 ft	El. outlet invert	0.00 ft
El. inlet throat invert	0.00 ft	El. inlet crest	0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00	= 109+90
INLET ELEVATION (FT)	0.04	= 1164.48
OUTLET STATION (FT)	80.00	= 109+70
OUTLET ELEVATION (FT)	0.00	= 1164.44
NUMBER OF BARRELS	4	
SLOPE (V-FT/H-FT)	0.0020	
CULVERT LENGTH ALONG SLOPE (FT)	20.00	

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	4.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

[illegible]

[illegible]

[illegible]

********** [illegible] ********

[illegible] (FT)	50.00
[illegible]	[illegible]
[illegible]	0.013
[illegible]	0.030
[illegible] ELEVATION (FT)	0.00
[illegible] OUTLET INVERT ELEVATION	0.00 FT

********** [illegible] RATING CURVE FOR [illegible] CHANNEL

FLOW (CFS)	HEAD (FT)	PROJECT NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
[illegible]	0.00	0.000	[illegible]	0.00	0.00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	0.381	[illegible]	2.42	0.15
245.00	[illegible]	0.391	[illegible]	2.79	0.20
329.00	[illegible]	0.397	[illegible]	3.09	0.23
413.00	2.13	0.402	2.13	3.23	0.27
498.00	2.35	0.406	2.35	3.54	0.30
581.00	2.58	0.409	2.58	3.73	0.32
664.00	2.73	0.412	2.73	3.90	0.35
747.00	2.98	0.414	2.98	4.05	0.37
830.00	3.16	0.416	3.16	4.19	0.39

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	30.00
CREST LENGTH (FT)	50.00
OVERTOPPING CREST ELEVATION (FT)	100.00

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
October 11, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	830.0
Channel Bottom Slope (feet per foot).....	0.0035
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	50.0
Channel Flow-Line Elevation at Starting Station (feet)..	1164.45
Water Surface Elevation at Starting Station (feet).....	1168.54
Starting Channel Station (feet).....	10990.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	2.70
Critical Depth (feet).....	1.94

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
Farm Access Road -	10990.0	1164.45	1168.54	4.09	271.41	3.06	0.145	0.000794
	11050.0	1164.66	1168.58	3.92	257.07	3.23	0.162	0.000930
	11100.0	1164.83	1168.61	3.77	245.73	3.38	0.177	0.001061
	11200.0	1165.18	1168.70	3.51	224.96	3.69	0.211	0.001374
	11500.0	1166.23	1169.18	2.94	181.76	4.57	0.324	0.002577
	11700.0	1166.93	1169.70	2.77	169.14	4.91	0.374	0.003191
	12000.0	1167.98	1170.68	2.70	164.07	5.06	0.397	0.003495
2' Drop struc. -	12300.0	1169.03	1171.73	2.70	163.99	5.06	0.398	0.003500

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986 Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092 (713) 895-8322. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
October 11, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	830.0
Channel Bottom Slope (feet per foot).....	0.0035
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	50.0
Channel Flow-Line Elevation at Starting Station (feet)..	1171.03
Water Surface Elevation at Starting Station (feet).....	1171.73
Starting Channel Station (feet).....	12300.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	2.70
Critical Depth (feet).....	1.94

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
2' Drop Struc. -	12300.0	1171.03	1172.97	1.94	111.91	7.42	0.854	0.011085
	12350.0	1171.20	1173.75	2.55	153.19	5.42	0.456	0.004291
	12400.0	1171.38	1173.98	2.60	156.97	5.29	0.434	0.003989
	12500.0	1171.73	1174.38	2.65	160.92	5.16	0.413	0.003703
	12600.0	1172.08	1174.76	2.68	162.56	5.11	0.405	0.003593
	12700.0	1172.43	1175.12	2.69	163.31	5.08	0.401	0.003544
	13000.0	1173.48	1176.18	2.70	164.01	5.06	0.398	0.003499
	13300.0	1174.53	1177.23	2.70	163.99	5.06	0.398	0.003500
Bullard Av. -	13635.0	1175.70	1178.40	2.70	163.99	5.06	0.398	0.003500

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
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(713) 895-8322. A manual with equations & flow chart is available.

[illegible]

B At Bullard Ave.

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]							
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	[illegible] LENGTH (FT)	[illegible] (FT)	SPAN (FT)	RISE (FT)	MANNING N	INLET TYPE
1	0.05	0.00	[illegible]	[illegible]	10.00	3.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: WADBGL CULVERT [illegible] ELEVATION (FT) DATE: 08-05-1994

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	0.05	0.00	0.00	0.00	0.00	0.00	100.00
62	0.80	0.00	0.00	0.00	0.00	0.00	100.55
126	1.21	0.00	0.00	0.00	0.00	0.00	100.88
189	1.57	0.00	0.00	0.00	0.00	0.00	101.15
252	1.88	0.00	0.00	0.00	0.00	0.00	101.40
315	2.16	0.00	0.00	0.00	0.00	0.00	101.62
378	2.43	0.00	0.00	0.00	0.00	0.00	101.84
441	2.68	0.00	0.00	0.00	0.00	0.00	102.03
504	2.92	0.00	0.00	0.00	0.00	0.00	102.22
567	3.16	0.00	0.00	0.00	0.00	0.00	102.40
630	3.38	0.00	0.00	0.00	0.00	0.00	102.56
5985	103.11	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

[illegible]

[illegible]

[illegible]

DIS-CHARGE (cfs)	TAIL-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL HEAD (ft)	FLOW TYPE (#4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TOTAL ENERGY VEL. (fps)	TOTAL ENERGY (ft)
0	0.05	0.00	0.00	3-M2t	0.00	0.00	0.00	0.00	0.00	0.00
63	0.80	0.65	0.74	3-M1t	0.47	0.42	2.13	0.50	2.61	0.61
126	1.21	1.04	1.15	3-M1t	0.75	0.68	3.49	0.60	3.61	0.90
189	1.57	1.35	1.51	3-M1t	0.97	0.85	4.13	0.74	3.03	1.14
252	1.88	1.65	1.82	3-M1t	1.17	1.07	4.55	1.35	3.36	1.32
315	2.16	1.92	2.10	3-M1t	1.36	1.25	5.10	1.54	3.63	1.54
378	2.43	2.17	2.37	3-M1t	1.53	1.41	5.50	1.72	3.87	1.72
441	2.68	2.41	2.62	3-M1t	1.70	1.56	5.67	1.88	4.09	1.88
504	2.92	2.63	2.85	3-M1t	1.86	1.71	6.21	2.03	4.28	2.03
567	3.16	2.86	3.10	3-M1t	2.01	1.84	6.53	2.17	4.45	2.17
630	3.39	3.09	3.32	3-M1t	2.16	1.99	6.83	2.30	4.62	2.30

+ 1175.76 = 1179.08

El. inlet face invert	0.05 ft	El. outlet invert	0.00 ft
El. inlet throat invert	0.00 ft	El. inlet crest	0.00 ft

** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00	= 136+65
INLET ELEVATION (FT)	0.05	= 1175.76
OUTLET STATION (FT)	30.00	= 136+35
OUTLET ELEVATION (FT)	0.00	= 1175.70
NUMBER OF BARRELS	4	
SLOPE (V-FT/H-FT)	0.0020	
CULVERT LENGTH ALONG SLOPE (FT)	30.00	

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	3.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

13

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]
[illegible]	5[illegible].00
[illegible]	4.6
[illegible]	0.009 .0035
[illegible]	0.030
[illegible]	0.05
[illegible]	[illegible] FT

[illegible] RATING CURVE - [illegible] DISCHARGE CHANNEL

[illegible]	[illegible] (FT)	PROJECT NUMBER	[illegible]	VOL (CFS)	S-BAR (PER)
[illegible]	1.39	0.[illegible]	[illegible]	[illegible]	0.[illegible]
[illegible]	1.60	0.419	[illegible]	[illegible]	[illegible]
[illegible]	1.80	0.465	[illegible]	[illegible]	0.[illegible]
[illegible]	1.94	0.499	[illegible]	[illegible]	0.[illegible]
[illegible]	1.35	0.508	[illegible]	2.36	0.30
[illegible]	1.54	0.515	[illegible]	2.63	0.34
[illegible]	1.72	0.521	[illegible]	2.87	0.38
[illegible]	1.85	0.526	[illegible]	4.05	0.41
[illegible]	2.02	0.529	[illegible]	4.35	0.44
[illegible]	2.17	0.533	[illegible]	4.46	0.47
[illegible]	2.31	0.535	[illegible]	4.62	0.50

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
[illegible] TOP WIDTH (FT)	30.00
CREST LENGTH (FT)	50.00
[illegible]	[illegible]

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
October 11, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	630.0
Channel Bottom Slope (feet per foot).....	0.0035
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	40.0
Channel Flow-Line Elevation at Starting Station (feet)..	1175.76
Water Surface Elevation at Starting Station (feet).....	1179.08
Starting Channel Station (feet).....	13665.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	2.59
Critical Depth (feet).....	1.85

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
Bullard Av. –	13665.0	1175.76	1179.08	3.32	176.89	3.56	0.197	0.001427
	13700.0	1175.88	1179.12	3.24	171.40	3.68	0.210	0.001564
	13750.0	1176.06	1179.18	3.13	164.17	3.84	0.229	0.001773
	13800.0	1176.23	1179.26	3.03	157.72	3.99	0.248	0.001993
	13900.0	1176.58	1179.44	2.86	147.23	4.28	0.284	0.002437
2' Drop struc. –	14000.0	1176.93	1179.68	2.74	139.92	4.50	0.315	0.002829

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TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986 Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092 (713) 895-8322. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
October 11, 1994

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PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	630.0
Channel Bottom Slope (feet per foot).....	0.0035
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	40.0
Channel Flow-Line Elevation at Starting Station (feet)..	1178.93
Water Surface Elevation at Starting Station (feet).....	1179.68
Starting Channel Station (feet).....	14000.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	2.59
Critical Depth (feet).....	1.85

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
2' Drop struc.	14000.0	1178.93	1180.78	1.85	87.75	7.18	0.800	0.011343
	14050.0	1179.10	1181.56	2.45	122.16	5.16	0.413	0.004221
	14100.0	1179.28	1181.78	2.50	125.01	5.04	0.394	0.003943
	14200.0	1179.63	1182.18	2.55	127.97	4.92	0.376	0.003680
	14300.0	1179.98	1182.55	2.57	129.17	4.88	0.369	0.003580
	14500.0	1180.68	1183.26	2.58	130.01	4.85	0.365	0.003512
	14800.0	1181.73	1184.32	2.59	130.17	4.84	0.364	0.003500
	15000.0	1182.43	1185.02	2.59	130.17	4.84	0.364	0.003500
	15500.0	1184.18	1186.77	2.59	130.16	4.84	0.364	0.003500
Farm Access Road	16150.0	1186.45	1189.04	2.59	130.16	4.84	0.364	0.003500
	16270.0	1186.87	1189.46	2.59	130.16	4.84	0.364	0.003500

==========

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At a farm access road ½ mile [illegible] of [illegible] Rd.

[illegible]

[illegible]

[illegible] DATA				CULVERT [illegible]		
INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SKEW	SIZE (FT)	ADDITIONAL
0.04	0.00	88.00	1 CSP	[illegible]	[illegible]	

FILE: WADFARMC CULVERT HEADWATER ELEVATION (FT) [illegible] 1994

DISCHARGE	1	2	3	4	5	[illegible]	ROADWAY
0	0.04	0.00	0.00	0.00	0.00	[illegible]	100.00
33	0.62	0.00	0.00	0.00	0.00	[illegible]	100.35
66	0.95	0.00	0.00	0.00	0.00	[illegible]	100.57
99	1.22	0.00	0.00	0.00	0.00	[illegible]	100.75
132	1.47	0.00	0.00	0.00	0.00	[illegible]	100.91
165	1.65	0.00	0.00	0.00	0.00	[illegible]	101.05
198	1.80	0.00	0.00	0.00	0.00	[illegible]	101.19
231	2.10	0.00	0.00	0.00	0.00	[illegible]	101.32
264	2.29	0.00	0.00	0.00	0.00	[illegible]	101.44
297	2.47	0.00	0.00	0.00	0.00	[illegible]	101.56
330	2.65	0.00	0.00	0.00	0.00	[illegible]	101.63
4488	103.05	0.00	0.00	0.00	0.00	[illegible]	0.00

The above Q and HW are for a point above the roadway.

[illegible]

[illegible]

[illegible]

SITE	HEAD	INLET	OUTLET							
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0	[illegible]	[illegible]	[illegible]	[illegible]	0.10	[illegible]	[illegible]	[illegible]	[illegible]	0.00
10	[illegible]	[illegible]	[illegible]	[illegible]	0.35	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
30	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
100	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
110	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
120	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
130	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
140	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
150	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
160	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
170	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
180	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

+1186.91 = 1189.52

El. inlet face invert	[illegible] ft	El. outlet invert	0.00 ft
El. inlet throat invert	[illegible] ft	El. inlet crest	0.00 ft

***** SITE DATA ***** CULVERT INLET ***********

INLET STATION (FT)	0.00	= 162+90
INLET ELEVATION (FT)	0.04	= 1186.91
OUTLET STATION (FT)	20.00	= 162+70
OUTLET ELEVATION (FT)	0.00	= 1186.87
NUMBER OF BARRELS	5	
SLOPE (V/H)	0.0020	
INLET TRUNK BLOCK SLOPE (FT)	20.00	

***** CULVERT [illegible] SUMMARY **********

BARREL SHAPE	BOX
BARREL DIA.	10.00 FT
BARREL RISE	3.00 FT
[illegible]	[illegible]
BARREL MANNINGS N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

13

[illegible]

[illegible]

[illegible]

[illegible]

BOTTOM WIDTH (FT)	16.00
SIDE SLOPE (H/V) (:1)	4.0
CHANNEL SLOPE V/H (FT/FT)	0.004
MANNING'S N (0.01-0.1)	0.030
CHANNEL INVERT ELEVATION (FT)	0.00
TAILWATER ELEVATION (FT)	0.00 FT

10035

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	A.G.H. (FT)	FROUDE NUMBER	DEPTH (FT)	VEL. (FPS)	SHEAR (PSF)
[illegible]	0.00	0.000	0.00	0.00	0.00
33.00	0.46	0.440	0.46	1.70	0.10
65.00	0.70	0.455	0.70	2.61	0.15
95.00	0.89	0.479	0.89	2.56	0.19
130.00	1.05	0.486	1.05	2.84	0.23
165.00	1.20	0.492	1.20	3.06	0.26
198.00	1.33	0.501	1.33	3.26	0.29
231.00	1.46	0.505	1.46	3.46	0.32
264.00	1.58	0.508	1.57	3.62	0.34
297.00	1.69	0.512	1.68	3.77	0.37
330.00	1.79	0.515	1.79	3.91	0.39

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	30.00
CREST LENGTH (FT)	50.00
OVERTOPPING CREST ELEVATION (FT)	100.00

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
October 11, 1994

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PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	330.0
Channel Bottom Slope (feet per foot).....	0.0035
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	30.0
Channel Flow-Line Elevation at Starting Station (feet)..	1186.91
Water Surface Elevation at Starting Station (feet).....	1189.52
Starting Channel Station (feet).....	16290.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	2.08
Critical Depth (feet).....	1.45

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
Farm Access Road	16290.0	1186.91	1189.52	2.61	105.55	3.13	0.152	0.001531
	16340.0	1187.08	1189.59	2.50	100.04	3.30	0.169	0.001788
	16380.0	1187.22	1189.65	2.42	96.17	3.43	0.183	0.002005
	16450.0	1187.47	1189.78	2.31	90.57	3.64	0.206	0.002388
	16500.0	1187.64	1189.89	2.24	87.48	3.77	0.221	0.002642
4' Drop Struc.	16600.0	1187.99	1190.15	2.16	83.29	3.96	0.244	0.003050

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Wadell Rd. Channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
November 17, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	330.0
Channel Bottom Slope (feet per foot).....	0.0046
Manning's Roughness Coefficient (n-value).....	0.0300
Channel Side Slope - Left Side (horizontal/vertical)....	4.00
Channel Side Slope - Right Side (horizontal/vertical)...	4.00
Channel Bottom Width (feet).....	30.0
Channel Flow-Line Elevation at Starting Station (feet)..	1191.99
Water Surface Elevation at Starting Station (feet).....	1192.00
Starting Channel Station (feet).....	16600.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.92
Critical Depth (feet).....	1.45

Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
4' Drop structure — 16600.0	1191.99	1193.44	1.45	52.02	6.34	0.625	0.012323
16620.0	1192.08	1193.86	1.78	66.20	4.98	0.386	0.006000
16650.0	1192.22	1194.06	1.84	68.96	4.79	0.356	0.005317
16700.0	1192.45	1194.34	1.89	70.97	4.65	0.336	0.004883
16800.0	1192.91	1194.83	1.92	72.22	4.57	0.324	0.004639
16900.0	1193.37	1195.29	1.92	72.39	4.56	0.323	0.004607
17000.0	1193.83	1195.75	1.92	72.41	4.56	0.322	0.004602
17500.0	1196.13	1198.05	1.92	72.43	4.56	0.322	0.004599
18000.0	1198.43	1200.35	1.92	72.42	4.56	0.322	0.004600
18500.0	1200.73	1202.65	1.92	72.42	4.56	0.322	0.004600
18775.0	1201.99	1203.92	1.92	72.42	4.56	0.322	0.004600

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DETENTION BASIN DESIGN

DETENTION BASIN DESIGN

The Waddell Road Channel requires a detention basin to reduce the peak flow that is discharged into Lower El Mirage Wash which has an existing 100 year peak flow of 1300 cfs. Without a detention basin, the Waddell Road Channel would discharge in excess of 1500 cfs to the Wash. Therefor, a detention basin is required to reduce the peak discharge down to a rate less than 1300 cfs.

Design Parameters:

1. Peak discharge in Waddell Road Channel at Dysart Road (CP 138) = 1540 cfs. Refer to HEC-1 analysis in Appendix A. Also refer to attached hydrograph for CP 138.

2. Reduce peak flow in channel to 1140 cfs by diverting 400 cfs into detention basin. Detention basin will be offline type, that is, the 400 cfs will come from the peak of the hydrograph.

3. Required Volume = 15.2 ac-ft. This is the volume of the hydrograph (CP 138) above a peak flow of 1140 cfs. Refer to attached hydrograph.

4. Basin Depth = 6 feet. (allows low flow pipe to drain basin back into the Waddell Road Channel).

5. Water Depth = 5 feet (provides 1 foot of freeboard).

6. Volume of excavation which includes detention volume and freeboard is 20.2 acres.

7. Land Area Required = 4.3 acres based on 8:1 side slopes.

8. Inflow Spillway Length = 150 feet assumes depth over spillway of 1 foot and a coefficient of discharge = 2.7.

1/2

	[illegible]	[illegible]				[illegible]	[illegible]	0.	*		[illegible]	[illegible]	[illegible]	*	1	1845	225	[illegible]
1	[illegible]	[illegible]				0610	[illegible]	0.	*	1	[illegible]	[illegible]	571.	*	1	1850	[illegible]	[illegible]
1	[illegible]	[illegible]				0615	72	0.	*	1	1240	[illegible]	335.	*	1	1855	228	[illegible]
1	[illegible]	[illegible]				0620	73	0.	*	1	1245	154	371.	*	1	1900	229	124.
1	[illegible]	[illegible]				[illegible]	[illegible]	0.	*	1	[illegible]	[illegible]	390.	*	1	1905	230	112.
1	[illegible]	[illegible]				[illegible]	[illegible]	0.	*	1	[illegible]	[illegible]	[illegible]	*	1	1910	231	115.
1	[illegible]	[illegible]				0645	[illegible]	[illegible]	*	1	[illegible]	157	455.	*	1	[illegible]	232	107.
1	[illegible]	[illegible]				0650	[illegible]	0.	*	1	1305	[illegible]	475.	*	1	[illegible]	233	102.
1	[illegible]	[illegible]				[illegible]	[illegible]		*	1	[illegible]	[illegible]	526.	*	1	1925	234	95.
1	0045	10				0700	[illegible]	0.	*	1	1315	[illegible]	560.	*	1	1930	235	95.
1	[illegible]	11				0705	[illegible]	0.	*	1	[illegible]	[illegible]	511.	*	1	1935	236	93.
1	0055	12				0710	[illegible]	0.	*	1	1325	[illegible]	510.	*	1	1940	237	91.
1	[illegible]	13				0715	[illegible]	0.	*	1	1330	[illegible]	503.	*	1	1945	238	89.
1	[illegible]	14				0720	[illegible]	0.	*	1	1335	[illegible]	771.	*	1	1950	239	88.
1	[illegible]	15				[illegible]	[illegible]	0.	*	1	[illegible]	[illegible]	855.	*	1	1955	240	85.
1	0115	16				0730	[illegible]	0.	*	1	[illegible]	[illegible]	704.	*	1	2000	241	84.
1	0120	17				0735	[illegible]	0.	*	1	1350	167	950.	*	1	2005	242	82.
1	0125	18				0740	[illegible]	0.	*	1	1355	[illegible]	1212.	*	1	2010	243	80.
1	0130	19				0745	[illegible]	0.	*	1	1400	[illegible]	1381.	*	1	2015	244	77.
1	0135	20				0750	[illegible]	0.	*	1	1405	[illegible]	1476.	*	1	2020	245	75.
1	0140	21				0755	[illegible]	0.	*	1	1410	171	1527.	*	1	2025	246	72.
1	0145	22				0800	[illegible]	0.	*	1	1415	172	1540.	*	1	2030	247	70.
1	0150	23				0805	98	0.	*	1	1420	173	1514.	*	1	2035	248	67.
1	0155	24			1	0810	99	0.	*	1	1425	174	[illegible]	*	1	2040	249	64.
1	0200	25		*	1	0815	100	0.	*	1	1430	175	1373.	*	1	2045	250	62.
1	0205	26			1	0820	101	0.	*	1	1435	176	1320.	*	1	2050	251	59.
1	0210	27	0.	*	1	0825	102	0.	*	1	1440	177	1254.	*	1	2055	252	57.
1	0215	28			1	0830	103	0.	*	1	1445	178	1185.	*	1	2100	253	55.
1	0220	29			1	0835	104	0.	*	1	1450	179	1153.	*	1	2105	254	52.
1	0225	30		*	1	0840	105	0.	*	1	1455	180	1052.	*	1	2110	255	50.
1	0230	31	0.		1	0845	106	0.	*	1	1500	181	1089.	*	1	2115	256	48.
1	0235	32		*	1	0850	107	0.	*	1	1505	182	1036.	*	1	2120	257	46.
	0240	33				0855	[illegible]		*		1510	[illegible]	1014.	*		2125	258	44.
1	0245	34				0900	[illegible]	0.	*	1	1515	184	970.	*	1	2130	259	43.
1	0250	35	0.	*	1	0905	110	0.	*	1	1520	185	906.	*	1	2135	260	41.
1	0255	36		*	1	0910	111	0.	*	1	1525	186	839.	*	1	2140	261	39.
1	0300	37	0.	*	1	0915	112	0.	*	1	1530	187	776.	*	1	2145	262	38.
1	0305	38	0.	*	1	0920	113	0.	*	1	1535	188	728.	*	1	2150	263	36.
1	0310	39	0.	*	1	0925	114	0.	*	1	1540	189	688.	*	1	2155	264	35.
1	0315	40	0.	*	1	0930	115	0.	*	1	1545	190	654.	*	1	2200	265	33.
1	0320	41	0.	*	1	0935	116	0.	*	1	1550	191	625.	*	1	2205	266	32.
1	0325	42	0.	*	1	0940	117	0.	*	1	1555	192	602.	*	1	2210	267	31.
1	0330	43	0.	*	1	0945	118	0.	*	1	1600	193	588.	*	1	2215	268	29.
1	0335	44	0.	*	1	0950	119	0.	*	1	1605	194	580.	*	1	2220	269	28.
1	0340	45	0.	*	1	0955	120	0.	*	1	1610	195	575.	*	1	2225	270	27.
1	0345	46	0.	*	1	1000	121	0.	*	1	1615	196	569.	*	1	2230	271	26.
1	0350	47	0.	*	1	1005	122	0.	*	1	1620	197	559.	*	1	2235	272	25.
1	0355	48	0.	*	1	1010	123	0.	*	1	1625	198	545.	*	1	2240	273	25.
1	0400	49	0.	*	1	1015	124	0.	*	1	1630	199	523.	*	1	2245	274	24.
1	0405	50	0.	*	1	1020	125	0.	*	1	1635	200	497.	*	1	2250	275	23.
1	0410	51	0.	*	1	1025	126	0.	*	1	1640	201	469.	*	1	2255	276	23.
1	0415	52	0.	*	1	1030	127	0.	*	1	1645	202	445.	*	1	2300	277	23.
1	0420	53	0.	*	1	1035	128	0.	*	1	1650	203	422.	*	1	2305	278	22.

1353.6 — 1140

57.3 min

1140

storage volume Req.

1448.7 — 1140

[illegible]	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	*	[illegible]	1725	[illegible]	[illegible]					[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	*	[illegible]	[illegible]	[illegible]	[illegible]	*	1	1730	[illegible]	[illegible]		[illegible]		[illegible]	[illegible]
1	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	*	1	1735	212	[illegible]	*			[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	*		[illegible]	[illegible]	[illegible]	*	1	1740	213	[illegible]	[illegible]			[illegible]	[illegible]
1	[illegible]	[illegible]	[illegible]	*	[illegible]	[illegible]	[illegible]	[illegible]	*	1	1745	214	[illegible]	*			[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	0.	*	[illegible]	[illegible]	[illegible]	[illegible]	*	1	1750	215	[illegible]	*	[illegible]		[illegible]	[illegible]
1	[illegible]	[illegible]	[illegible]	*	1	[illegible]	[illegible]	[illegible]	*	1	1755	[illegible]	[illegible]	*	2		[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	0.	*	1	[illegible]	[illegible]	[illegible]	*	1	1800	217	[illegible]	*	2	[illegible]	[illegible]	[illegible]
1	[illegible]	[illegible]	[illegible]	*	1	[illegible]	142	25.	*	1	1805	[illegible]	[illegible]	*	2	[illegible]	[illegible]	[illegible]
	[illegible]	69	0.	*	1	1155	[illegible]	[illegible]	*	1	1810	219	205.	*	2	[illegible]	[illegible]	[illegible]
1	[illegible]	70	0.	*	[illegible]	[illegible]	145	55.	*	1	1815	220	[illegible]	*	2		[illegible]	[illegible]
[illegible]	[illegible]	71	0.	*	1	[illegible]	146	77.	*	1	1820	221	[illegible]	*	2	[illegible]	[illegible]	[illegible]
1	[illegible]	72	0.	*	1	[illegible]	147	105.	*	1	1825	222	[illegible]	*	2	[illegible]	137	[illegible]
1	[illegible]	73	0.	*	1	[illegible]	148	143.	*	1	1830	223	172.	*	2	[illegible]	138	[illegible]
[illegible]	[illegible]	74	0.	*	1	[illegible]	149	185.	*	1	1835	224	163.	*	2	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	75	0.	*	1	[illegible]	150	217.	*	1	1840	225	155.	*	2	[illegible]	[illegible]	[illegible]

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1840.	14.25		652.	181.	174.	174.
		(INCHES)	1.019	1.131	1.131	1.131
		(AC-FT)	323.	359.	359.	359.

CUMULATIVE AREA = 5.95 SQ MI

APPENDIX J

BULLARD WASH CHANNEL

- Cost Estimate
- Concept Design Plan and Profile Figures
- Hydraulic Calculation Sheets

COST ESTIMATE

BULLARD WASH CHANNEL
COST ESTIMATE SHEET

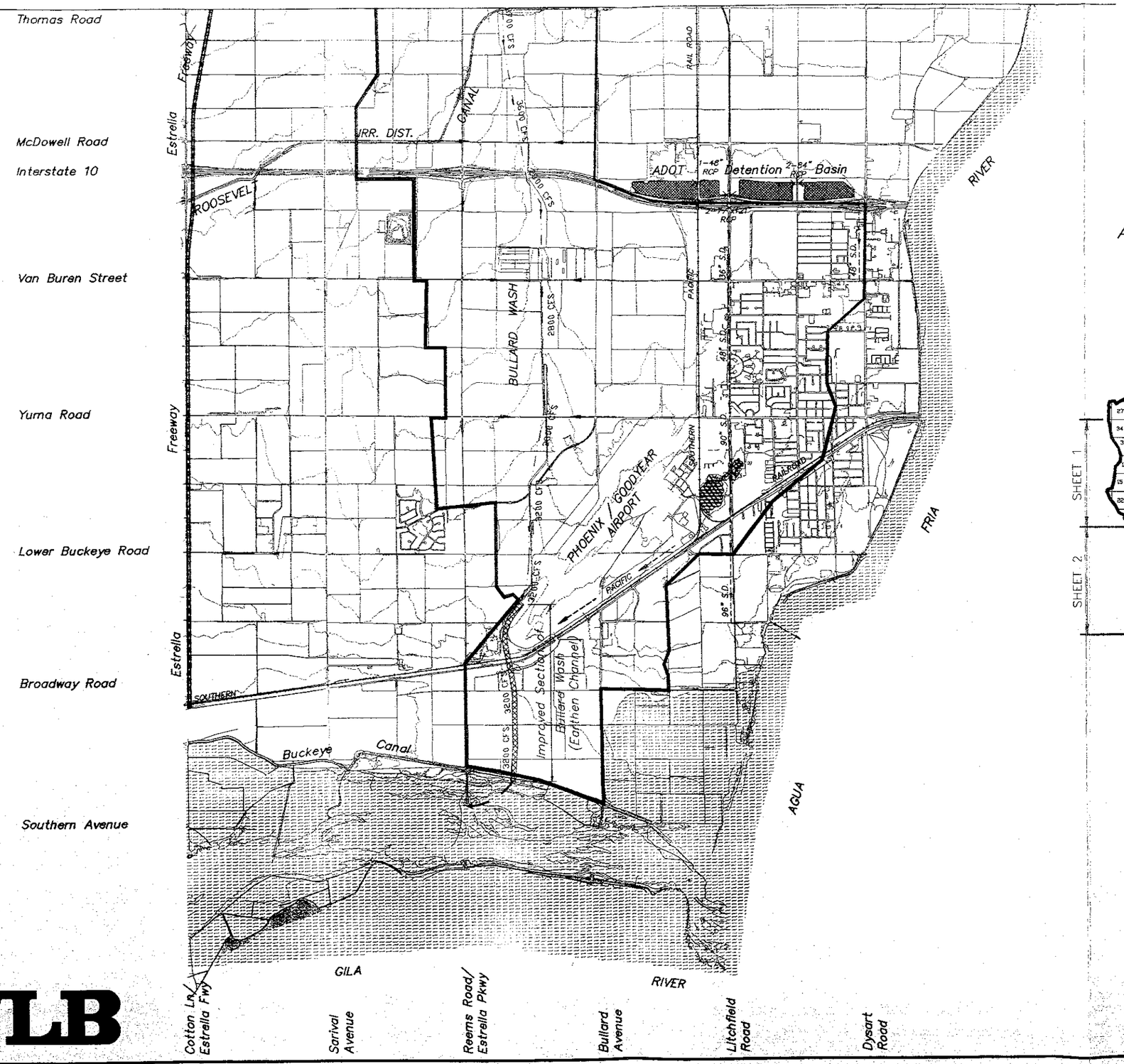
	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	COST
1.	Channel Excavation	470,600	C.Y.	$ 3	$ 1,411,800
2.	3' drop structure at sta. 14 + 50	1	EA.	$ 48,700	$ 48,700
3.	3' drop structure at sta. 19 + 20	1	EA.	$ 48,700	$ 48,700
4.	2 - 12' x 8' Box Culvert at Buckeye Canal	300	L.F.	$ 975	$ 292,500
5.	12 - 10' x 4' Box Culvert at SR 85	60	L.F.	$ 3,635	$ 218,100
6.	12 - 10' x 4' Box Culvert at S.P.R.R.	20	L.F.	$ 3,635	$ 72,700
7.	3' Drop structure at sta. 67 + 60	1	EA.	$ 48,700	$ 48,700
8.	5' Drop structure at sta. 71 + 35	1	EA.	$ 61,600	$ 61,600
9.	5' Drop structure at sta. 76 + 50	1	EA.	$ 61,600	$ 61,600
				Estimated Construction Cost	$ 2,264,400
				Contingencies (25%)	$ 566,100
				Total Construction Cost	$ 2,830,500
8.	R.O.W.	2,449,300	S.F.	$.15	$ 367,400
				GRAND TOTAL	**$ 3,197,900**

CONCEPT DESIGN

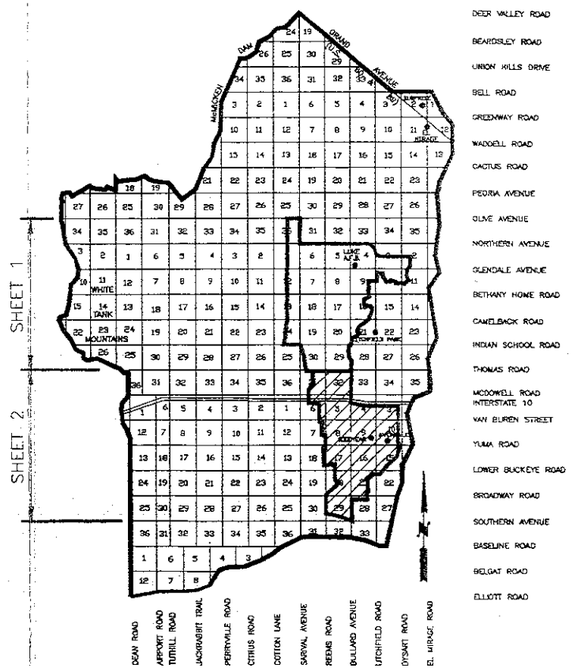
PLAN AND PROFILE FIGURES

Figure 12.2-2

Area Drainage Master Plan for Bullard Wash Watershed Sheet 2 of 2



WHITE TANKS/AGUA FRIA
AREA DRAINAGE MASTER STUDY

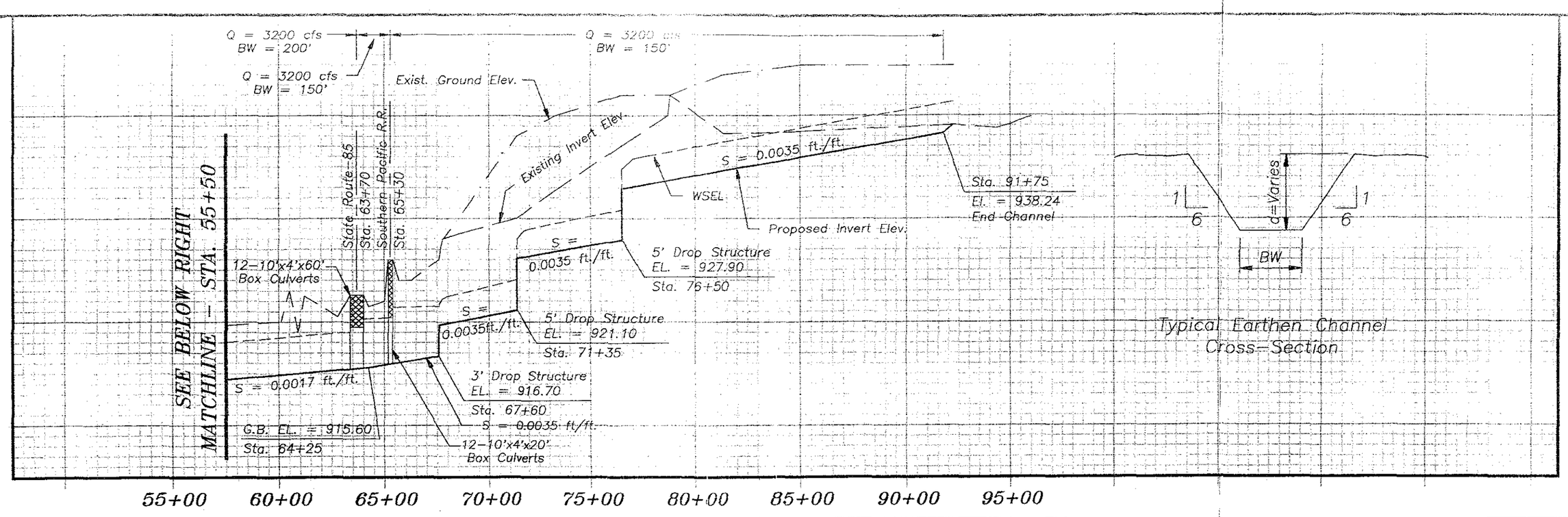


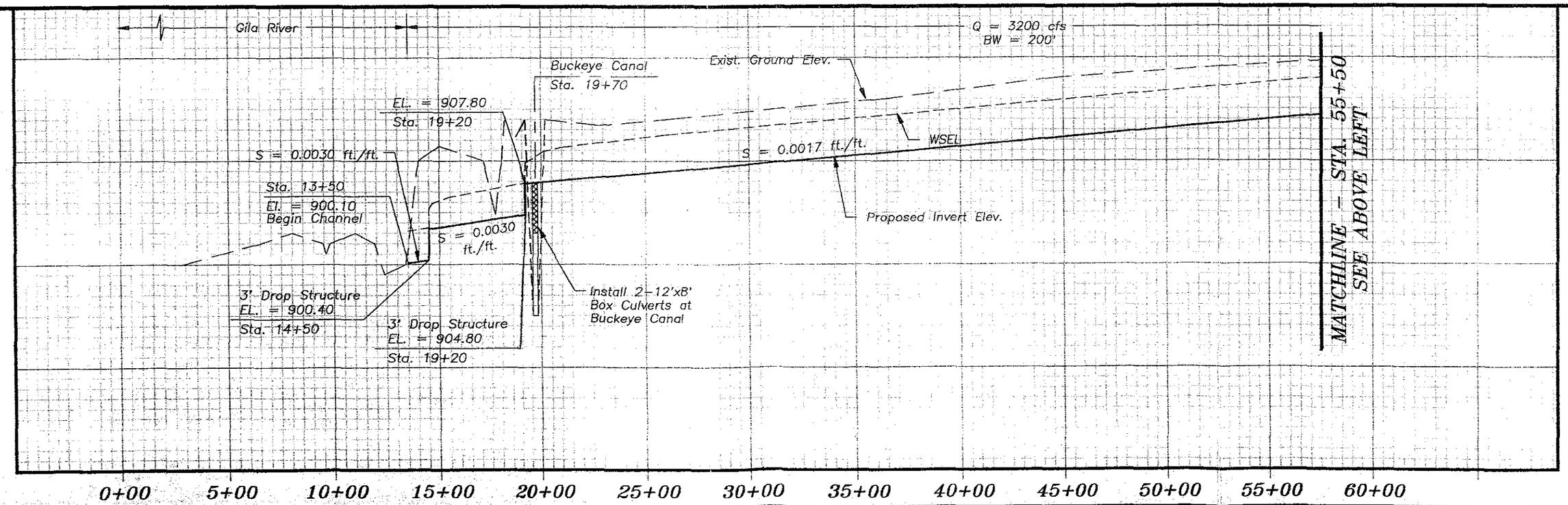
Location Map

Legend

- 1800 CFS — Proposed Condition Peak Flow
- 100 – Year Floodplain
- Detention Basins
- Watershed Boundary
- Railroads
- Existing Channels
- Future Local Drainage System

The WLB Group INC. **WLB**





The WLB Group Inc. WLB	White Tanks / Agua Fria ADMS Flood Control District of Maricopa County	Concept Design Bullard Wash Channel	Scale: Horiz.: 1"=500' Vert.: 1"=10' Checked By: G.M.A. Job No.: 289036 Date: Dec. 1994 Sheet: 1 of 1

HYDRAULIC CALCULATION SHEETS

Includes Trapezoidal Channel Analysis
and Culvert Analysis

Ballard main channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 18, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	3200.0
Channel Bottom Slope (feet per foot).....	0.0030
Manning's Roughness Coefficient (n-value).....	0.0350
Channel Side Slope - Left Side (horizontal/vertical)....	6.00
Channel Side Slope - Right Side (horizontal/vertical)...	6.00
Channel Bottom Width (feet).....	200.0
Channel Flow-Line Elevation at Starting Station (feet)..	900.10
Water Surface Elevation at Starting Station (feet).....	903.22
Starting Channel Station (feet).....	1350.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	3.12
Critical Depth (feet).....	1.96

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
start Improv. —	1350.0	900.10	903.22	3.12	682.41	4.69	0.341	0.002994
	1450.0	900.40	903.52	3.12	682.27	4.69	0.342	0.002996

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Bullard Wash Cu...

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 18, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	3200.0
Channel Bottom Slope (feet per foot).....	0.0030
Manning's Roughness Coefficient (n-value).....	0.0350
Channel Side Slope - Left Side (horizontal/vertical)....	6.00
Channel Side Slope - Right Side (horizontal/vertical)...	6.00
Channel Bottom Width (feet).....	200.0
Channel Flow-Line Elevation at Starting Station (feet)..	903.40
Water Surface Elevation at Starting Station (feet).....	904.00
Starting Channel Station (feet).....	1450.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	3.12
Critical Depth (feet).....	1.96

Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
1450.0	903.40	905.36	1.96	414.21	7.73	0.927	0.014570
1470.0	903.46	905.93	2.47	530.64	6.03	0.565	0.006620
1500.0	903.55	906.18	2.63	567.71	5.64	0.493	0.005346
1550.0	903.70	906.48	2.78	602.50	5.31	0.438	0.004430
1600.0	903.85	906.72	2.87	623.31	5.13	0.409	0.003981
1700.0	904.15	907.13	2.98	648.16	4.94	0.378	0.003520
1800.0	904.45	907.48	3.03	661.40	4.84	0.363	0.003303
1900.0	904.75	907.81	3.06	669.12	4.78	0.355	0.003185
1920.0	904.81	907.88	3.07	670.22	4.77	0.354	0.003168

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Bullard Wash Channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
December 19, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	3200.0
Channel Bottom Slope (feet per foot).....	0.0017
Manning's Roughness Coefficient (n-value).....	0.0350
Channel Side Slope - Left Side (horizontal/vertical)....	6.00
Channel Side Slope - Right Side (horizontal/vertical)...	6.00
Channel Bottom Width (feet).....	200.0
Channel Flow-Line Elevation at Starting Station (feet)..	907.83
Water Surface Elevation at Starting Station (feet).....	908.00
Starting Channel Station (feet).....	1920.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	3.68
Critical Depth (feet).....	1.96

Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
Buckeye— 1920.0	907.83	909.79	1.96	414.21	7.73	0.927	0.014570
Canal 1970.0	907.91	910.76	2.85	618.36	5.17	0.416	0.004082
2020.0	908.00	910.99	2.99	652.58	4.90	0.373	0.003445
2100.0	908.14	911.29	3.15	689.69	4.64	0.334	0.002896
2200.0	908.31	911.59	3.28	720.46	4.44	0.306	0.002526
2280.0	908.44	911.79	3.35	737.98	4.34	0.292	0.002343
2600.0	908.99	912.52	3.53	780.55	4.10	0.261	0.001967
3000.0	909.67	913.28	3.62	802.04	3.99	0.247	0.001807
3645.0	910.76	914.43	3.67	814.15	3.93	0.240	0.001725
4000.0	911.37	915.04	3.67	816.01	3.92	0.239	0.001712
4450.0	912.13	915.81	3.68	817.13	3.92	0.238	0.001705
5000.0	913.07	916.75	3.68	817.66	3.91	0.238	0.001702
5280.0	913.54	917.22	3.68	817.75	3.91	0.238	0.001701
6010.0	914.78	918.47	3.68	817.88	3.91	0.238	0.001700
6050.0	914.85	918.53	3.68	817.88	3.91	0.238	0.001700
6090.0	914.92	918.60	3.68	817.88	3.91	0.238	0.001700
6120.0	914.97	918.65	3.68	817.88	3.91	0.238	0.001700
6280.0	915.24	918.92	3.68	817.89	3.91	0.238	0.001700
6340.0	915.34	919.03	3.68	817.89	3.91	0.238	0.001700

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Bullard [illegible]
At SR-35

1/3

CURRENT DATE: 04-26-1994
CURRENT TIME: 17:03:13

FILE DATE: 02-16-1993
FILE NAME: BULSR85

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	915.48	915.38	60.00	12 RCB	10.00	4.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: BULSR85 CULVERT HEADWATER ELEVATION (FT) DATE: 02-16-1993

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	919.06	0.00	0.00	0.00	0.00	0.00	922.60
320	919.17	0.00	0.00	0.00	0.00	0.00	923.39
640	919.21	0.00	0.00	0.00	0.00	0.00	923.86
960	919.26	0.00	0.00	0.00	0.00	0.00	924.24
1280	919.27	0.00	0.00	0.00	0.00	0.00	924.59
1600	919.38	0.00	0.00	0.00	0.00	0.00	924.91
1920	919.51	0.00	0.00	0.00	0.00	0.00	925.21
2240	919.67	0.00	0.00	0.00	0.00	0.00	925.49
2560	919.85	0.00	0.00	0.00	0.00	0.00	925.76
2880	920.06	0.00	0.00	0.00	0.00	0.00	926.01
3200	920.29	0.00	0.00	0.00	0.00	0.00	926.26
7040	926.34	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 04-26-1994 FILE DATE: 02-16-1993
CURRENT TIME: 17:03:13 FILE NAME: BULSR85

PERFORMANCE CURVE FOR CULVERT # 1 - 12 (10 BY 4) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (F4)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	919.06	0.00	3.58	0-NF	0.00	0.00	0.00	0.00	0.00	3.68
320	919.17	0.93	3.69	3-M1t	0.71	0.61	0.72	3.68	0.00	3.68
640	919.21	1.47	3.73	3-M1t	1.11	0.96	1.45	3.68	0.00	3.68
960	919.26	1.93	3.78	3-M1t	1.45	1.26	2.17	3.68	0.00	3.68
1280	919.27	2.35	3.79	3-M1t	1.76	1.53	2.90	3.68	0.00	3.68
1600	919.38	2.73	3.90	3-M1t	2.05	1.77	3.62	3.68	0.00	3.68
1920	919.51	3.08	4.02	3-M1t	2.32	2.00	4.35	3.68	0.00	3.68
2240	919.67	3.42	4.19	3-M1t	2.58	2.22	5.07	3.68	0.00	3.68
2560	919.85	3.75	4.37	3-M1t	2.84	2.42	5.80	3.68	0.00	3.68
2880	920.06	4.09	4.58	3-M1t	3.08	2.62	6.52	3.68	0.00	3.68
3200	920.29	4.44	4.81	3-M1t	3.32	2.81	7.25	3.68	0.00	3.68

El. inlet face invert 915.48 ft El. outlet invert 915.38 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00	= 64+00
INLET ELEVATION (FT)	915.48	
OUTLET STATION (FT)	60.00	= 63+40
OUTLET ELEVATION (FT)	915.38	
NUMBER OF BARRELS	12	
SLOPE (V-FT/H-FT)	0.0017	
CULVERT LENGTH ALONG SLOPE (FT)	60.00	

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	4.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

SR-85

CURRENT DATE: 04-26-1994
CURRENT TIME: 17:03:13

FILE DATE: 02-16-1993
FILE NAME: BULSR85

TAILWATER

CONSTANT WATER SURFACE ELEVATION
919.06

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	40.00
CREST LENGTH (FT)	150.00
OVERTOPPING CREST ELEVATION (FT)	922.60

Bullard wash channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
November 20, 1994

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	3200.0
Channel Bottom Slope (feet per foot).....	0.0035
Manning's Roughness Coefficient (n-value).....	0.0350
Channel Side Slope - Left Side (horizontal/vertical)....	6.00
Channel Side Slope - Right Side (horizontal/vertical)...	6.00
Channel Bottom Width (feet).....	150.0
Channel Flow-Line Elevation at Starting Station (feet)..	915.48
Water Surface Elevation at Starting Station (feet).....	920.29
Starting Channel Station (feet).....	6400.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	3.50
Critical Depth (feet).....	2.34

Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
6400.0	915.48	920.29	4.81	860.32	3.72	0.215	0.001160
6425.0	915.57	920.31	4.75	846.92	3.78	0.222	0.001216
6500.0	915.83	920.39	4.56	808.66	3.96	0.243	0.001398
6510.0	915.86	920.40	4.54	803.80	3.98	0.246	0.001424
6520.0	915.90	920.41	4.51	798.99	4.01	0.249	0.001450

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Bullard Wash Channel
At S.P.R.R

CURRENT DATE: 04-26-1994
CURRENT TIME: 18:57:43

FILE DATE: 02-16-1993
FILE NAME: BULSPRR

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.0

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	915.97	915.90	20.00	12 RCB	10.00	4.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: BULSPRR CULVERT HEADWATER ELEVATION (FT) DATE: 02-16-1993

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	920.41	0.00	0.00	0.00	0.00	0.00	926.50
320	920.42	0.00	0.00	0.00	0.00	0.00	927.34
640	920.45	0.00	0.00	0.00	0.00	0.00	927.80
960	920.50	0.00	0.00	0.00	0.00	0.00	928.18
1280	920.57	0.00	0.00	0.00	0.00	0.00	928.52
1600	920.66	0.00	0.00	0.00	0.00	0.00	928.83
1920	920.77	0.00	0.00	0.00	0.00	0.00	929.12
2240	920.90	0.00	0.00	0.00	0.00	0.00	929.40
2560	921.05	0.00	0.00	0.00	0.00	0.00	929.71
2880	921.22	0.00	0.00	0.00	0.00	0.00	929.96
3200	921.41	0.00	0.00	0.00	0.00	0.00	930.21
8320	930.23	0.00	0.00	0.00	0.00	0.00	0.00

The above Q and HW are for a point above the roadway.

CURRENT DATE: 04-26-1994
CURRENT TIME: 19:57:43

FILE DATE: 02-16-1993
FILE NAME: BULSPRR

PERFORMANCE CURVE FOR CULVERT # 1 - 12 (10 BY 4) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE (FA)	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	920.41	0.00	4.44	0-NF	0.00	0.00	0.00	0.00	0.00	4.51
320	920.42	0.93	4.45	4-FFt	0.55	0.61	0.67	4.00	0.00	4.51
640	920.45	1.47	4.48	4-FFt	0.87	0.96	1.33	4.00	0.00	4.51
960	920.50	1.93	4.53	4-FFt	1.14	1.26	2.00	4.00	0.00	4.51
1280	920.57	2.34	4.60	4-FFt	1.37	1.53	2.67	4.00	0.00	4.51
1600	920.66	2.72	4.69	4-FFt	1.60	1.77	3.33	4.00	0.00	4.51
1920	920.77	3.08	4.80	4-FFt	1.80	2.00	4.00	4.00	0.00	4.51
2240	920.90	3.42	4.93	4-FFt	2.00	2.22	4.67	4.00	0.00	4.51
2560	921.05	3.75	5.08	4-FFt	2.19	2.42	5.33	4.00	0.00	4.51
2880	921.22	4.09	5.25	4-FFt	2.38	2.62	6.00	4.00	0.00	4.51
3200	921.41	4.43	5.44	4-FFt	2.56	2.81	6.67	4.00	0.00	4.51

El. inlet face invert 915.97 ft El. outlet invert 915.90 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

```
*** SITE DATA ***** CULVERT INVERT ***************
    INLET STATION (FT)                    0.00  = 65+40
    INLET ELEVATION (FT)                915.97
    OUTLET STATION (FT)                  20.00  = 65+20
    OUTLET ELEVATION (FT)               915.90
    NUMBER OF BARRELS                    12
    SLOPE (V-FT/H-FT)                     0.0035
    CULVERT LENGTH ALONG SLOPE (FT)      20.00

***** CULVERT DATA SUMMARY ************************
    BARREL SHAPE          BOX
    BARREL SPAN            10.00 FT
    BARREL RISE             4.00 FT
    BARREL MATERIAL       CONCRETE
    BARREL MANNING'S N    0.012
    INLET TYPE            CONVENTIONAL
    INLET EDGE AND WALL   SQUARE EDGE (30-75 DEG. FLARE)
    INLET DEPRESSION      NONE
```

CURRENT DATE: 04-26-1994
CURRENT TIME: 10:57:43

FILE DATE: 02-16-1993
FILE NAME: BULSPRR

TAILWATER

CONSTANT WATER SURFACE ELEVATION
920.41

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	GRAVEL
EMBANKMENT TOP WIDTH (FT)	20.00
CREST LENGTH (FT)	150.00
OVERTOPPING CREST ELEVATION (FT)	926.50

Bullard Wash Channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
November 20, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	3200.0
Channel Bottom Slope (feet per foot).....	0.0035
Manning's Roughness Coefficient (n-value).....	0.0350
Channel Side Slope - Left Side (horizontal/vertical)....	6.00
Channel Side Slope - Right Side (horizontal/vertical)...	6.00
Channel Bottom Width (feet).....	200.0
Channel Flow-Line Elevation at Starting Station (feet)..	915.97
Water Surface Elevation at Starting Station (feet).....	921.41
Starting Channel Station (feet).....	6540.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	2.98
Critical Depth (feet).....	1.96

Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
6540.0	915.97	921.41	5.44	1265.56	2.53	0.099	0.000444
6570.0	916.07	921.42	5.34	1240.33	2.58	0.103	0.000472
6625.0	916.27	921.44	5.17	1194.83	2.68	0.111	0.000529
- 6760.0	916.74	921.50	4.76	1087.83	2.94	0.134	0.000704

3' Drop structure

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Bullard Wash Channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
November 20, 1994

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PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	3200.0
Channel Bottom Slope (feet per foot).....	0.0035
Manning's Roughness Coefficient (n-value).....	0.0350
Channel Side Slope - Left Side (horizontal/vertical)....	6.00
Channel Side Slope - Right Side (horizontal/vertical)...	6.00
Channel Bottom Width (feet).....	200.0
Channel Flow-Line Elevation at Starting Station (feet)..	919.74
Water Surface Elevation at Starting Station (feet).....	920.00
Starting Channel Station (feet).....	6760.00

==========

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	2.98
Critical Depth (feet).....	1.96

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
3' Drop structure	-6760.0	919.74	921.70	1.96	414.21	7.73	0.927	0.014570
	6775.0	919.79	922.18	2.39	511.99	6.25	0.607	0.007416
	6800.0	919.88	922.43	2.55	548.04	5.84	0.529	0.005977
	6850.0	920.05	922.76	2.71	585.30	5.47	0.464	0.004854
5' Drop structure	-7135.0	921.05	924.04	2.99	650.50	4.92	0.376	0.003480

==========

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Bullard wash channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
November 20, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	3200.0
Channel Bottom Slope (feet per foot).....	0.0035
Manning's Roughness Coefficient (n-value).....	0.0350
Channel Side Slope - Left Side (horizontal/vertical)....	6.00
Channel Side Slope - Right Side (horizontal/vertical)...	6.00
Channel Bottom Width (feet).....	200.0
Channel Flow-Line Elevation at Starting Station (feet)..	926.05
Water Surface Elevation at Starting Station (feet).....	927.00
Starting Channel Station (feet).....	7135.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	2.98
Critical Depth (feet).....	1.96

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
5' Drop structure	7135.0	926.05	928.01	1.96	414.21	7.73	0.927	0.014570
	7170.0	926.17	928.78	2.61	562.77	5.69	0.502	0.005496
	7200.0	926.28	928.97	2.69	582.37	5.49	0.469	0.004932
	7330.0	926.73	929.61	2.88	625.27	5.12	0.407	0.003941
	7400.0	926.98	929.89	2.91	633.69	5.05	0.396	0.003779
	7500.0	927.33	930.27	2.94	640.75	4.99	0.387	0.003649
5' Drop - structure	7650.0	927.85	930.82	2.97	645.86	4.95	0.381	0.003559

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.1 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Ballard Wash Channel

TRAPEZOIDAL CHANNEL ANALYSIS
STANDARD STEP WATER SURFACE PROFILE
November 20, 1994

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	3200.0
Channel Bottom Slope (feet per foot).....	0.0035
Manning's Roughness Coefficient (n-value).....	0.0350
Channel Side Slope - Left Side (horizontal/vertical)....	6.00
Channel Side Slope - Right Side (horizontal/vertical)...	6.00
Channel Bottom Width (feet).....	200.0
Channel Flow-Line Elevation at Starting Station (feet)..	932.85
Water Surface Elevation at Starting Station (feet).....	933.00
Starting Channel Station (feet).....	7650.00

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	2.98
Critical Depth (feet).....	1.96

	Station (ft)	Flowline (ft)	WS Elev. (ft)	Depth (ft)	Flow Area (sq ft)	Vel (fps)	Velocity Head(ft)	EGL Slope (ft/ft)
5' Drop structure	7650.0	932.85	934.81	1.96	414.21	7.73	0.927	0.014570
	7700.0	933.02	935.76	2.74	592.02	5.41	0.454	0.004682
	7750.0	933.20	936.01	2.81	609.35	5.25	0.428	0.004275
	7800.0	933.37	936.23	2.86	620.60	5.16	0.413	0.004036
	7865.0	933.60	936.50	2.90	630.22	5.08	0.400	0.003845
	7875.0	933.64	936.54	2.90	631.31	5.07	0.399	0.003824
	8135.0	934.55	937.52	2.97	646.92	4.95	0.380	0.003541
	8505.0	935.84	938.82	2.98	649.34	4.93	0.377	0.003500
	9175.0	938.19	941.17	2.98	649.30	4.93	0.377	0.003500

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