CENTRAL FILES
884080

Contract No. 57019

SKUNK CREEK AND BUCHANAN WASH HYDRAULIC EVALUATION OF FLOOD FLOWS

INDEX NO. SA-884080

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Prepared for:
The City of Phoenix

Prepared by:
Parsons Brinckerhoff Quade & Douglas, Inc.

February 1991

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1.0 INTRODUCTION

1.1 Purpose

The purpose of this study was to perform a hydraulic evaluation of flood flows on Skunk Creek and relocated Buchanan Wash and provide recommendations regarding the necessary modifications to the height of the soil cement bank protection shown on the "Skunk Creek Channel Improvements" contract documents, Index No. SA-884080, March, 1989.

2.0 EVALUATION APPROACH

2.1 Skunk Creek

The hydraulic evaluation of Skunk Creek assumed existing channel invert conditions based on topographic mapping north of Happy Valley Road, and utilized the proposed channel improvements as shown on contract documents "Skunk Creek Channel Improvements" Index No. SA-884080, March, 1989, south of Happy Valley Road.

The top of bank horizontal location was held according to that shown on contract documents (Index No. SA-884080) to mitigate encroachment on the landfill with the increased height of the channel banks.

The Mannings "n" values were adjusted for the reaches modified in the HEC-2 models to reflect existing invert conditions north of Happy Valley Road.

2.1.1 Approach

The cross section locations established for previous hydraulic evaluation using the Corps of Engineers, HEC-2 computer backwater model were maintained for this study and are indicated on Figure 1.

The cross sections north of Happy Valley Road were plotted using the topographic information from the contract documents (Index No. SA-884080). The top of bank horizontal location was held and the intersection of the toe of slope 4 horizontal to 1 vertical with the existing ground was determined. The HEC-2 model was modified and preliminary top of banks were established assuming 3 feet of freeboard. The HEC-2 model was adjusted based on the preliminary top of bank elevations and the newly determined intersection of the toe of slope with existing ground. The assumptions, cross sections, and preliminary HEC-2 input and output for Skunk Creek are provided in Appendix 1. Final HEC-2 input and output for Skunk Creek are provided in Appendix 2.

2.2 Relocated Buchanan Wash

The hydraulic evaluation of relocated Buchanan Wash assumed the property between the proposed south soil cement dike (along relocated Buchanan Wash alignment) and the north property line, is excavated to elevation 1443 with 4:1 side slopes. A low flow channel assuming 3:1 side slopes follows the previously proposed relocated Buchanan Wash alignment. A plan layout of this area is shown on sheets 9 of 23 and 11 of 23 in Appendix 7.

The Mannings "n" values were adjusted for the reaches in the HEC-2 models to reflect planted vegetation for a wildlife habitat.

The starting water surface elevations to model relocated Buchanan Wash were established using the energy grade line from the Skunk Creek hydraulic model at the confluence of relocated Buchanan Wash for each flood frequency modeled.

2.2.1 Approach

The cross section location established for previous hydraulic evaluation using the Corps of Engineers, HEC-2 computer backwater model were maintained for this study and are indicated on Figures 2 and 3.

The HEC-2 models were modified according to the proposed layout discussed in Section 2.2. Plots of each cross section, initial starting water surface elevations and HEC-2 input and output are provided in Appendix 3. Final starting water surface elevations and HEC-2 input and output for relocated Buchanan Wash are provided in Appendix 4.

3.0 REVIEW BY MARICOPA COUNTY FLOOD CONTROL DISTRICT

3.1 Review

The Maricopa County Flood Control District (MCFCD) provided hydraulic review for relocated Buchanan Wash and its confluence with Skunk Creek. A letter describing a brief history of the project, the proposed modifications, and a request for review was delivered to MCFCD on December 27, 1990. The letter was accompanied by back-up data, cross sections, plans, Skunk Creek and relocated Buchanan Wash HEC-2 input and output, original floodplain HEC-2 output by AGK Engineers, Inc. and a 5 1/4" floppy diskette containing the HEC-2 input files for Skunk Creek and relocated Buchanan Wash. A copy of the letter and letter of transmittal is provided as back-up information and can be found in Appendix 5.

3.2 Summary of Review by MCFCD

A meeting was held February 15, 1991 at MCFCD to discuss the County's comments. A summary of that meeting is provided in Appendix 6 which describes their requirements.

4.0 RESULTS

4.1 General

The study indicated the soil cement dikes along Skunk Creek and relocated Buchanan Wash would need to be raised from approximately 750 feet downstream of Happy Valley road to the existing Corps of Engineers dikes.

The water surface elevation at Happy Valley Road will require raising the roadway geometry.

The proposed use of existing channel invert conditions along Skunk Creek and the newly proposed geometry of relocated Buchanan Wash resulted in a 100-year water surface elevation of 1458.54 compared to 1460.42 at the downstream section (0.71) of the original FEMA floodplain analysis by AGK Engineers, Inc., September, 1987. These results indicated there will be no adverse backwater effects on Buchanan Wash using the proposed layout and channel geometry.

5.0 RECOMMENDATIONS

5.1 Top of Soil Cement Dikes

The top of the soil cement dike elevations for Skunk Creek have been established using the 100-year water surface elevation at the modeled cross sections plus 3 feet of freeboard. The top of dike elevation along relocated Buchanan Wash was established based on the top of dike elevation required at the confluence of relocated Buchanan Wash and Skunk Creek. The top of dike elevation 1460.5, will provide 2 feet of freeboard for the worst case scenario where peak discharges from Buchanan Wash and Skunk Creek occur simultaneously.

The recommended top of dike elevation and locations are shown on sheets 5 of 23 through 11 of 23 in Appendix 7.

5.2 Happy Valley Road

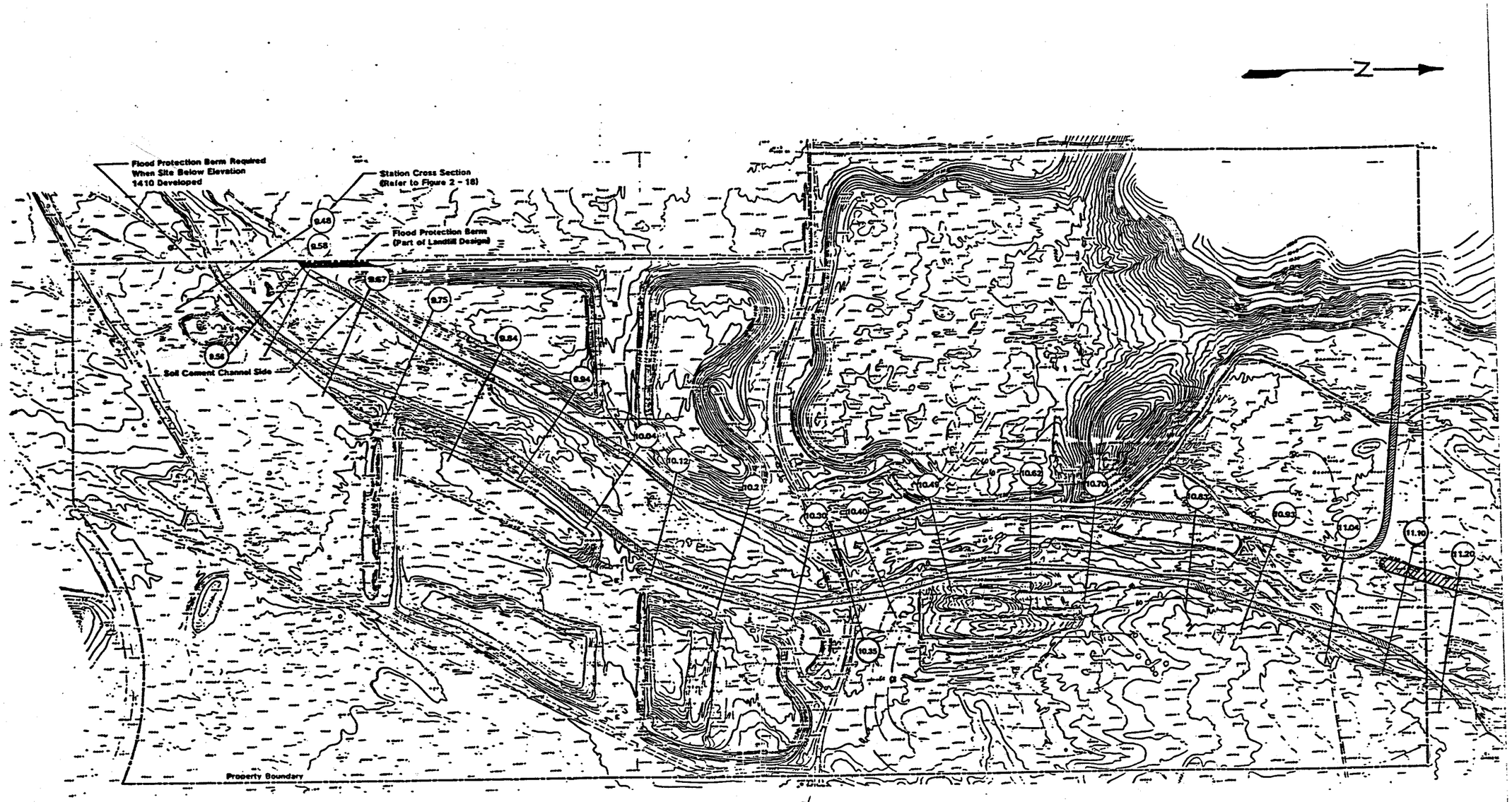
Due to the channel geometry modifications the water surface elevation/energy grade line has risen at Happy Valley Road. This increase will require raising the dikes along Happy Valley Road and modifying the roadway geometry to prevent flooding and erosion of the roadway embankment. The roadway geometry will need to be revised to provide a minimum ditch elevation of 1435.5. The recommended top of dike elevations along Happy Valley Road is shown on sheets 12 of 23 and 13 of 23 in Appendix 7.

5.3 Relocated Buchanan Wash

The Buchanan Wash drain will need to be extended to the confluence of existing Buchanan Wash and Skunk Creek. The proposed alignment, invert and typical section are shown on sheets 7 of 23 and 8 of 23 in Appendix 7.

Relocated Buchanan Wash and the Buchanan Wash drain will require regular maintenance to keep the channel clear of sediments from frequent storm events.

Figure 1



Happy valley

Figure 2

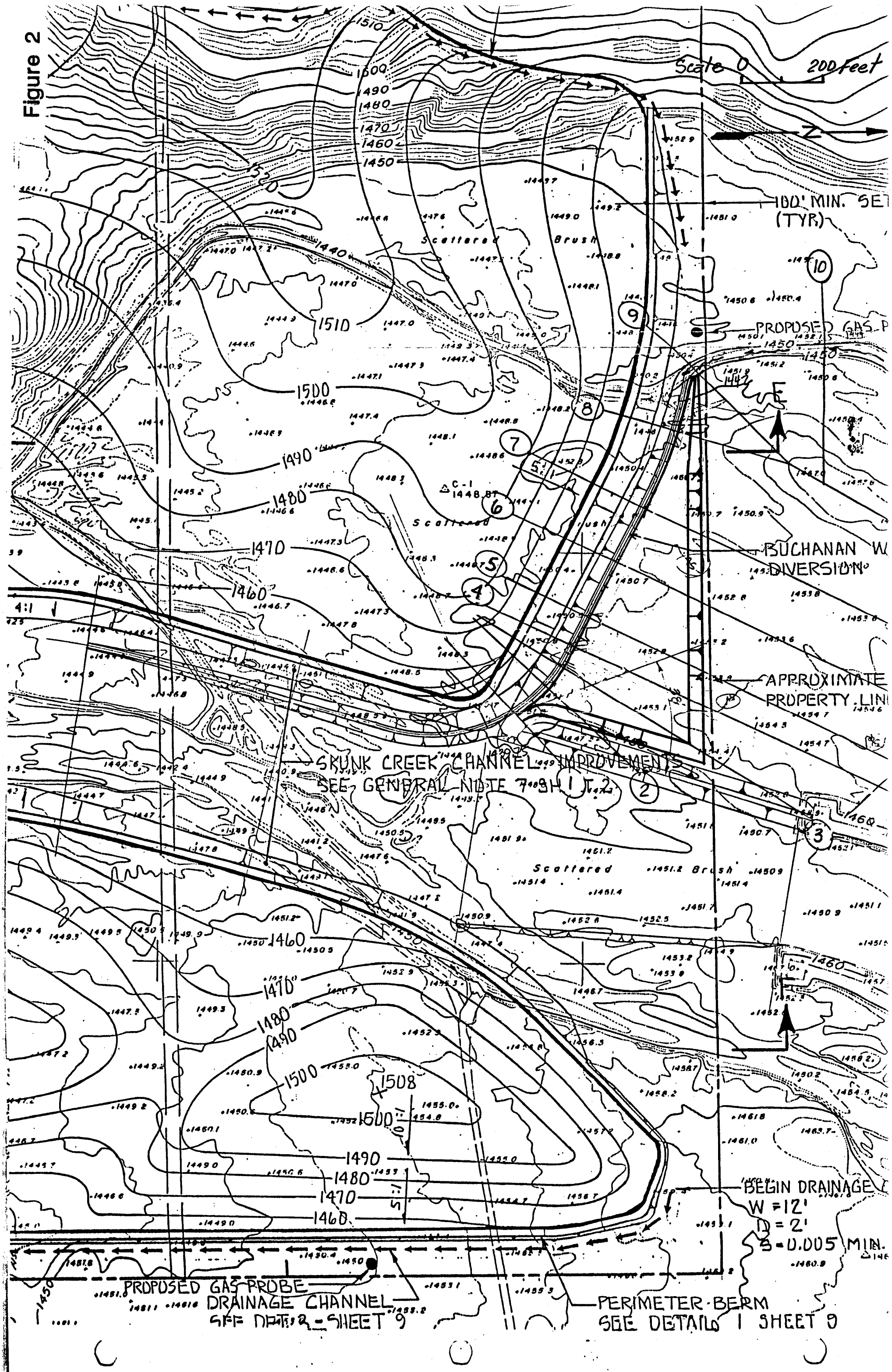
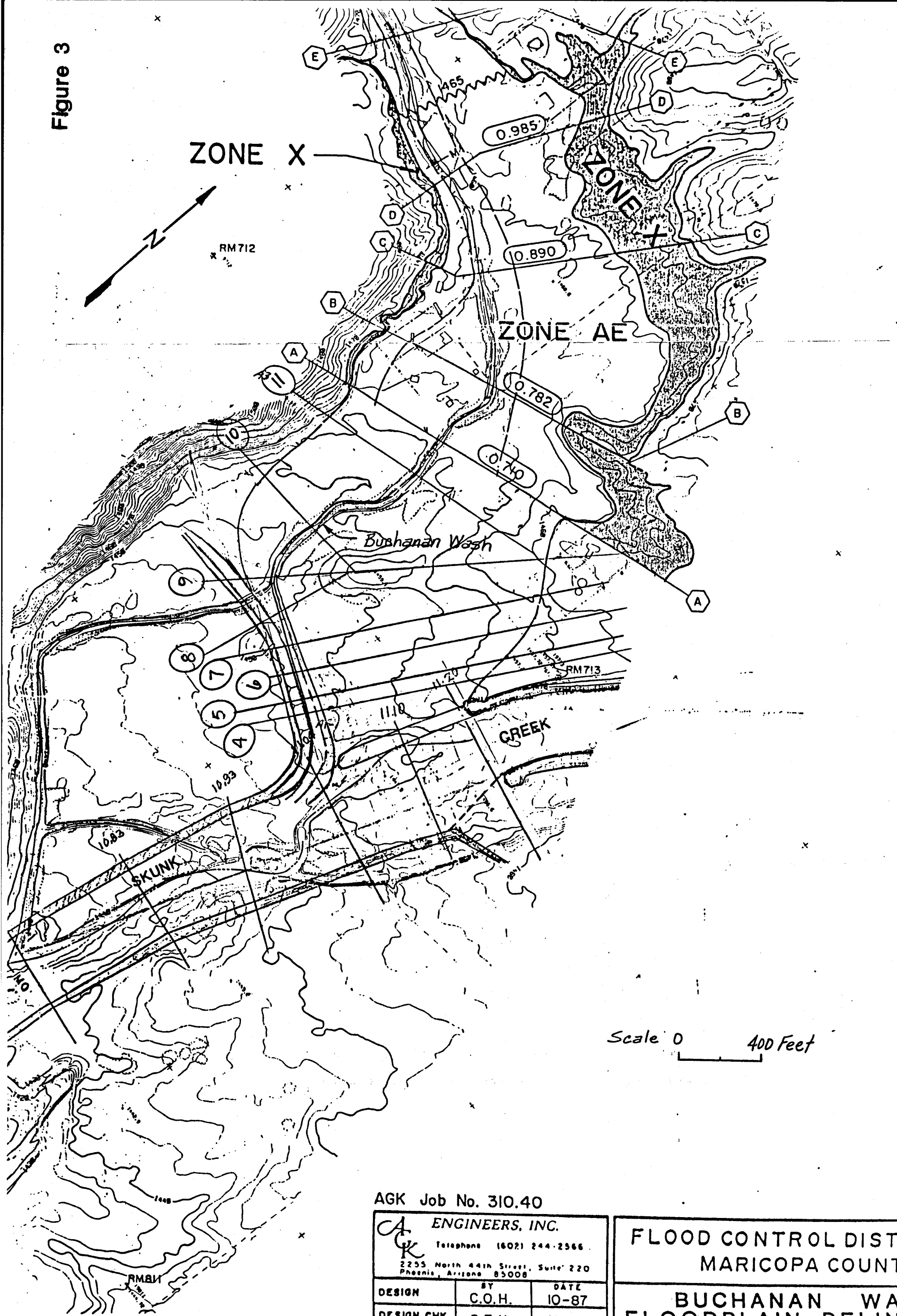

Scale 0 200 Feet
N
1510
1500
1490
1480
1470
1460
1450
100' MIN. SET
(TYP.)
Scattered Brush
1440
1510
1500
1490
1480
1470
1460
PROPOSED GAS P
BUCHANAN W
DIVERSION
APPROXIMATE
PROPERTY LIN
SKUNK CREEK CHANNEL IMPROVEMENTS
SEE GENERAL NOTE 7 SH 1 & 2
Scattered Brush
1460
1470
1480
1490
1500
1508
1500
1490
1480
1470
1460
BEGIN DRAINAGE
W = 12'
D = 2'
S = 0.005 MIN.
PROPOSED GAS PROBE
DRAINAGE CHANNEL
SEE DETAIL 2 - SHEET 9
PERIMETER BERM
SEE DETAIL 1 SHEET 9

Figure 3



AGK Job No. 310.40

AGK ENGINEERS, INC. Telephone (602) 244-2566 2255 North 44th Street, Suite 220 Phoenix, Arizona 85008		
	BY	DATE
DESIGN	C.O.H.	10-87
DESIGN CHK.	S.E.K.	11-87
PLANS	G.L.T.	10-87
PLANS CHK.	S.E.K.	11-87

FLOOD CONTROL DISTI
MARICOPA COUNT

BUCHANAN WA
FLOODPLAIN DELIN

SKUNK CREEK C.A.P

RECOMMENDED BY:

DATE

APPENDIX 1

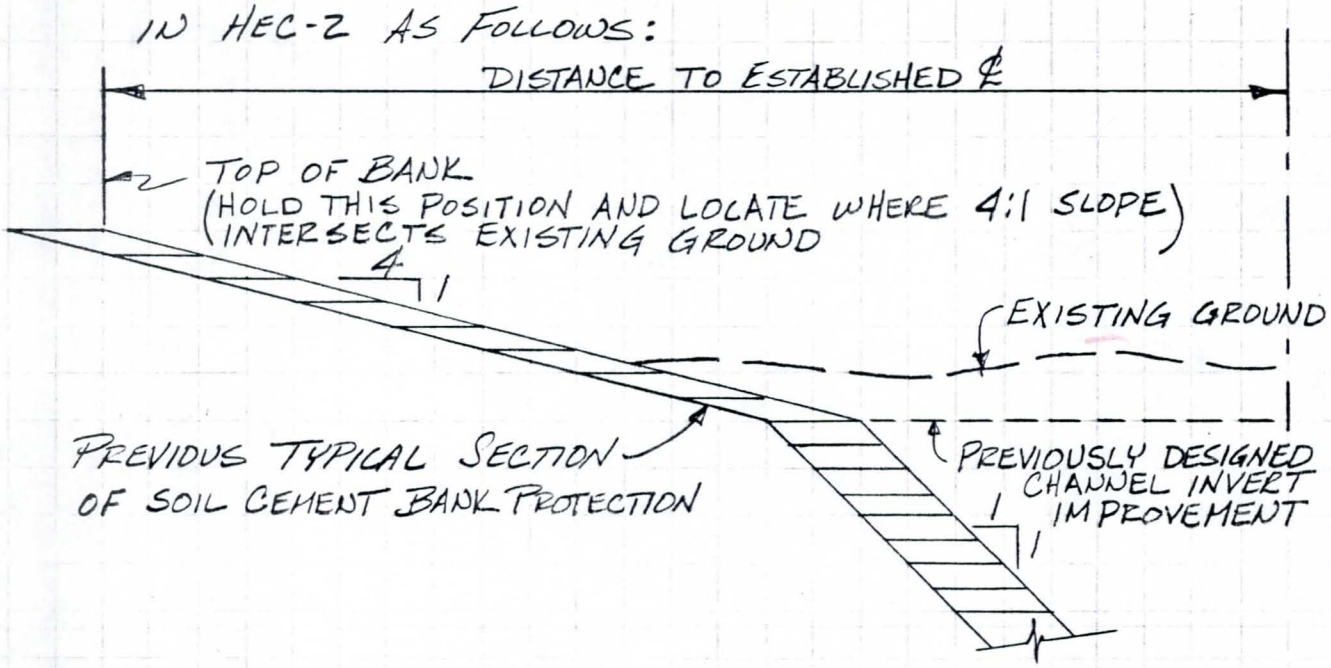
Subject SKUNK CREEK EVAL.
CROSS SECTIONS

THE CROSS SECTIONS TABULATED BELOW ARE TAKEN AT THE SAME LOCATIONS AS THOSE ESTABLISHED BY PREVIOUS CONSULTANT (HARZA).

ASSUMPTIONS AND CRITERIA

1. NO INVERT IMPROVEMENTS
   i.e. TOP OF BANK POSITION SHALL BE MAINTAINED, WHILE USING TOPOGRAPHIC INFORMATION PROVIDED FOR CHANNEL INVERT GEOMETRY

2. CHANNEL BANK IMPROVEMENTS WILL BE MODELLED IN HEC-2 AS FOLLOWS:



TYPICAL HALF SECTION LOOKING DOWNSTREAM

3. MANNING'S "n" VALUE WILL BE MODIFIED ACCORDINGLY

4. NO MODIFICATIONS TO DESIGN OR HEC-2 MODEL DOWNSTREAM OF HAPPY VALLEY ROAD.

Subject SKUNK CREEK EVAL.
CROSS SECTIONS

REFERENCE MATERIAL:

SKUNK CREEK CHANNEL IMPROVEMENTS (CONSTRUCTION DWGS)
INDEX NO. SA-884080
DRAWINGS INCLUDE SHEETS 1 THROUGH 23 OF 23
DATED: MARCH 1989

REPORT: SKUNK CREEK CHANNEL
HYDRAULIC ANALYSIS OF PROPOSED CHANNEL IMPROVEMENT
PHOENIX, ARIZONA
HARZA ENGINEERING COMPANY
JULY 1986

REPORT: FINAL DESIGN
SKUNK CREEK CHANNEL
AND
RELOCATED BUCHANAN WASH
HEC-2 HYDRAULIC ANALYSIS OF
PROPOSED CHANNEL IMPROVEMENTS
MARCH 1989
HARZA ENGINEERING COMPANY

MISCELLANEOUS MEMOS, COMPUTATIONS AND
COMPUTER INPUT FILES (HEC-2) FROM
PREVIOUS CONSULTANT

Parsons Brinckerhoff **Computation Sheet**

Page 3 of 6 | 3588C
Made by ED STEWART
Date 5 DEC., 90
Checked by Lann F.
Date Feb 28, 91

Subject SKUNK CREEK EVAL.
CROSS SECTIONS LOOKING D/S
FROM PLANS

SECTION NO. 10.40

	STA.	ELEV.
	1700	1432
TOB (LT)	1753	1436.9
	1828	1432
	1840	1432
	1860	1430
	1866	1428
	1875	1426
	1880	1424
	1900	1422
	1928	1424
	2007	1424
	2069	1426
	2080	1428
	2118	1430
	2180	1430
TOB (RT)	2234	1436.9
	2267	1428

SECTION NO. 10.49

	STA.	ELEV.
	1700	1413
	1731	1414
TOB (LT)	1745	1438.5
	1752	1418
	1760	1420
	1773	1430
	1779	1432
	1785	1434
	1810	1434
	1835	1432
	1853	1430
	1895	1428
	2060	1428
	2110	1430
	2125	1432
	2220	1432
	2235	1434
TOB (RT)	2245	1438.5

Parsons Brinckerhoff **Computation Sheet**

Page 4 of 6 | 3588C

Made by ED STEWART

Date 5 DEC., 90

Checked by Laura Fritch

Date Feb. 28, 91

Subject SKUNK CREEK EVAL.
CROSS SECTIONS LOOKING D/S
FROM PLANS

SECTION No. 10.62

	STA.	ELEV
	1748	1430
	1752	1436
TOB(LT)	1774	1442
	1820	1437
	1873	1436
	1887	1434
	1905	1432
	1920	1430
	2128	1430
	2145	1432
	2155	1434
	2185	1436
	2218	1438
TOB(RT)	2227	1442

SECTION No. 10.70

	STA.	ELEV
TOB(LT)	1780	1445.3
	1800	1440
	1875	1440
	1925	1438
	1958	1436
	1977	1434
	1987	1432
RT →	2015	1432
	2100	1433
	2142	1434
	2153	1436
	2160	1438
	2200	1438
	2210	1440
TOB(RT)	2220	1445.3

Parsons Brinckerhoff **Computation Sheet**

Page 5 of 6 | 3588C

Made by ED STEWART

Date 5 DEC., 90

Checked by Lana F.

Date Feb 28, 91

Subject SKUNK CREEK EVAL.
CROSS SECTIONS LOOKING D/S
FROM PLANS

SECTION No. 10.83

	STA.	ELEV
	1732	1444
TOB (LT)	1740	1448.5
	1793	1444
	1810	1442
	1819	1440
	1840	1440
	1860	1442
	1900	1440
	1933	1438
	1945	1438
	1977	1436
	1990	1436
	1997	1438
	2005	1440
	2008	1442
	2015	1444
	2230	1444
TOB (RT)	2263	1448.5

SECTION No. 10.93

	STA.	ELEV
	1700	1448
TOB (LT)	1752	1450.3
	1830	1448
	1850	1446
	1860	1444
	1870	1442
	1945	1442
	1957	1444
	1970	1444
	1973	1442
	1995	1442
	2000	1444
	2005	1446
	2020	1448
	2073	1448
	2143	1446
	2156	1446
	2210	1448
	2232	1448
TOB (RT)	2255	1450.3

Parsons Brinckerhoff **Computation Sheet**

Page 6 of 6 | 3588C

Made by ED STEWART

Date 5 DEC., 90

Checked by L. F.

Date Feb 28, 91

Subject SKUNK CREEK EVAL.
CROSS SECTIONS LOOKING D/S
FROM PLANS

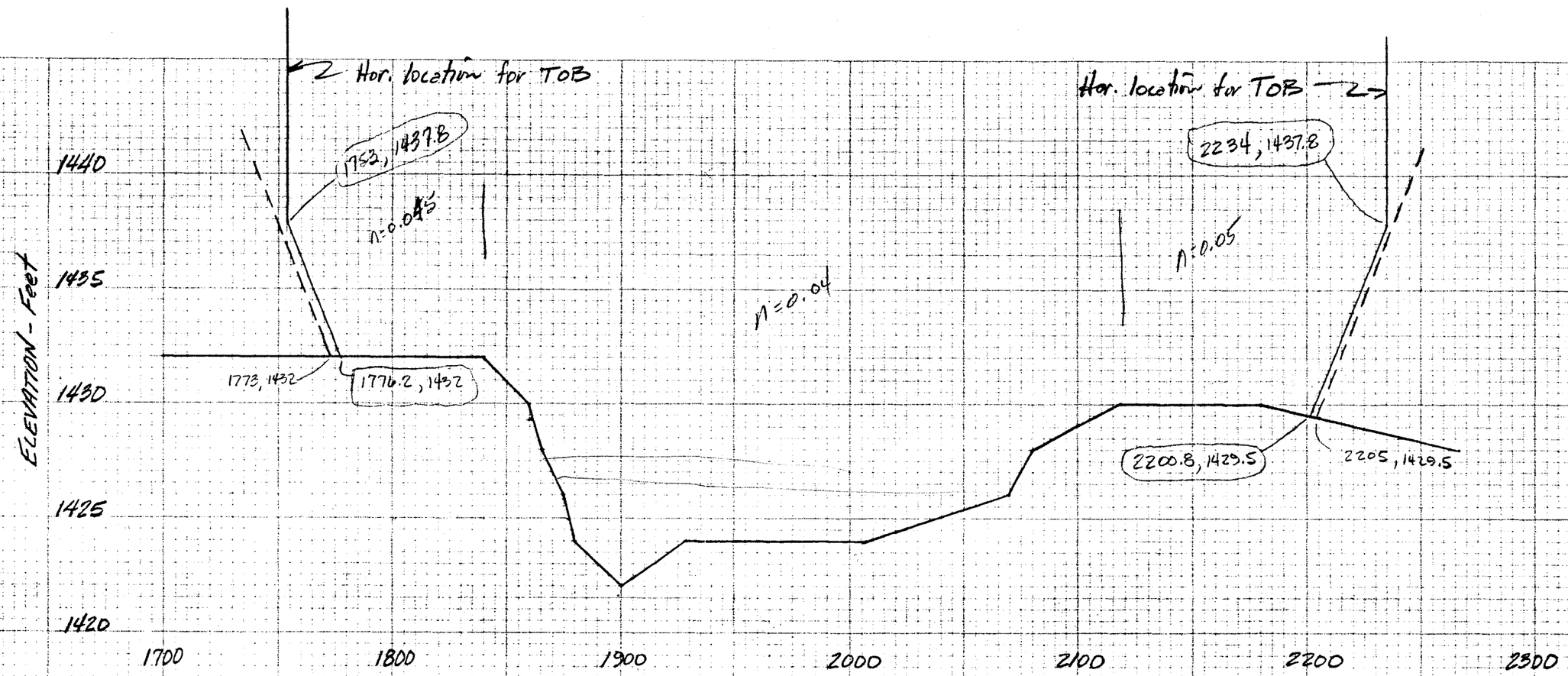
SECTION No. 11.04

	STA.	ELEV.
	1705	1446
TOB (Lt)	1705	1454.9
	1733	1448
	1740	1450
	1760	1450
	1770	1448
	1827	1448
	1900	1450
	1980	1450
	2085	1448
	2095	1448
	2185	1450
	2200	1450

BEGIN 4:1 SLOPE FROM EL 1450
@ STA. 2200 FOR Rt BANK

SECTION No. 11.10

	STA.	ELEV
TOB (Lt)	1545	1458.2
	1555	1456
	1568	1454
	1573	1452
	1580	1450
	1585	1448
	1590	1446
	1615	1446
	1660	1448
	1688	1450
	1775	1452
	1845	1452
	2020	1450
	2200	1450
TOB (Rt)	2200	1463.5



SECTION 10.40
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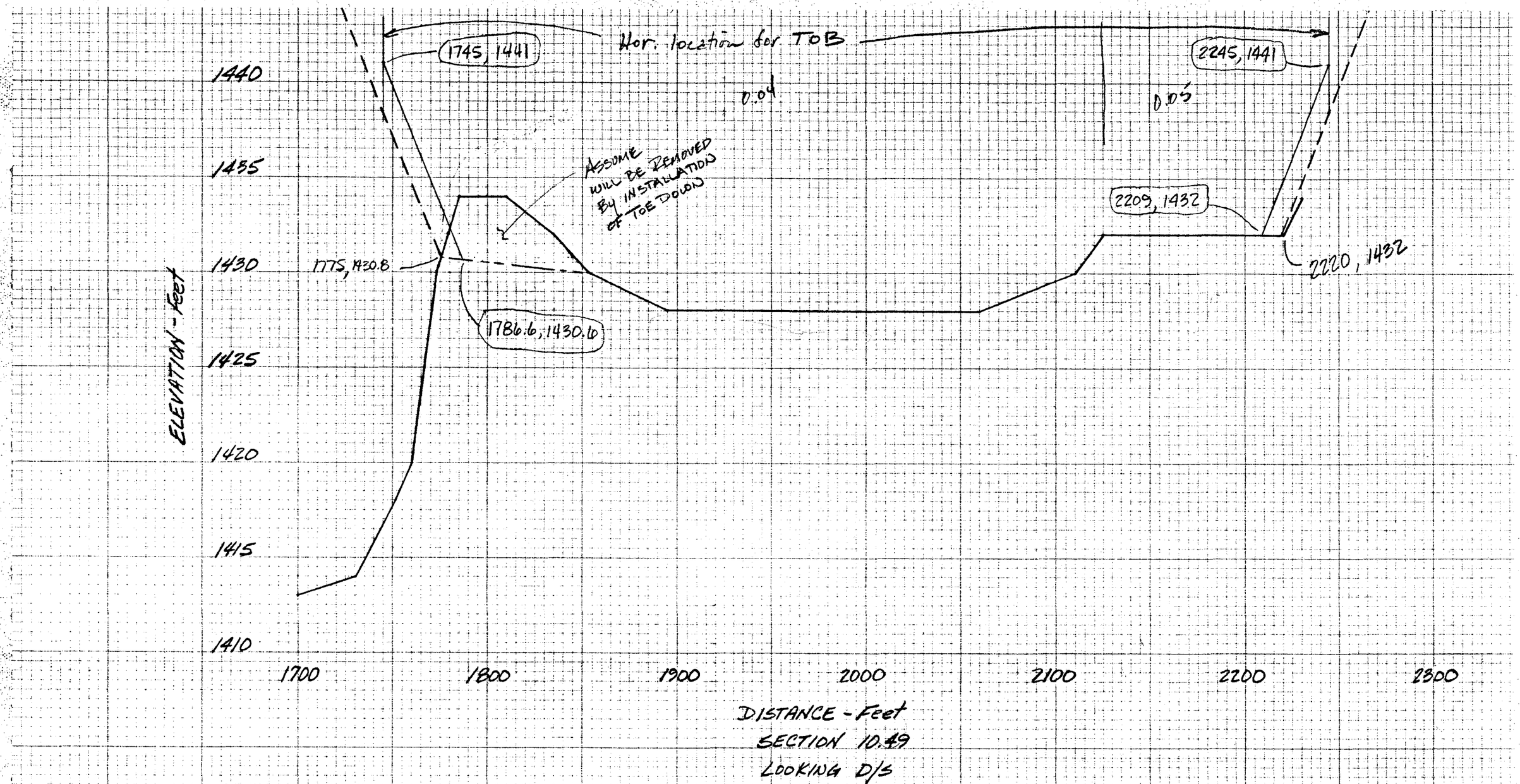
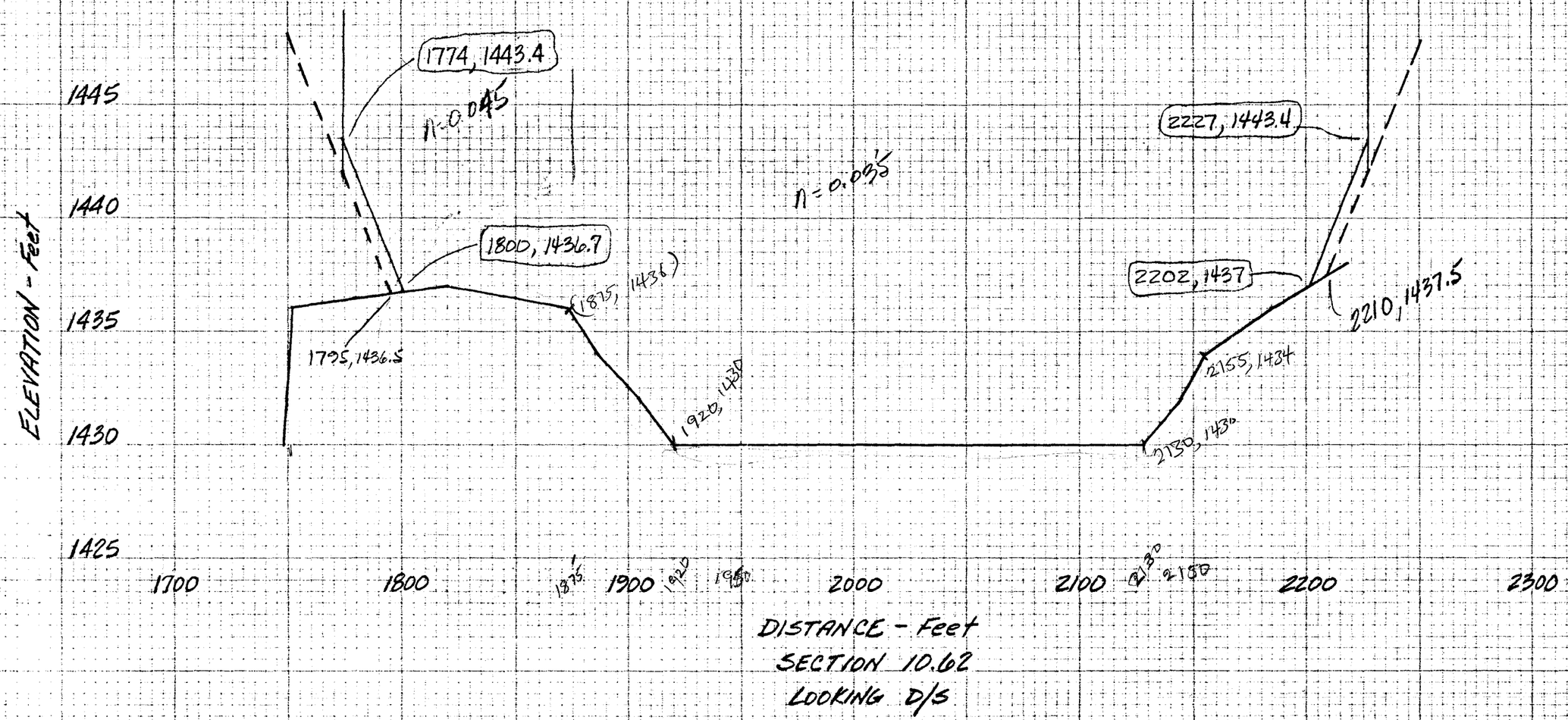


SKUNK CREEK
35BRC101



SECTION 10.62
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SKUNK CREEK
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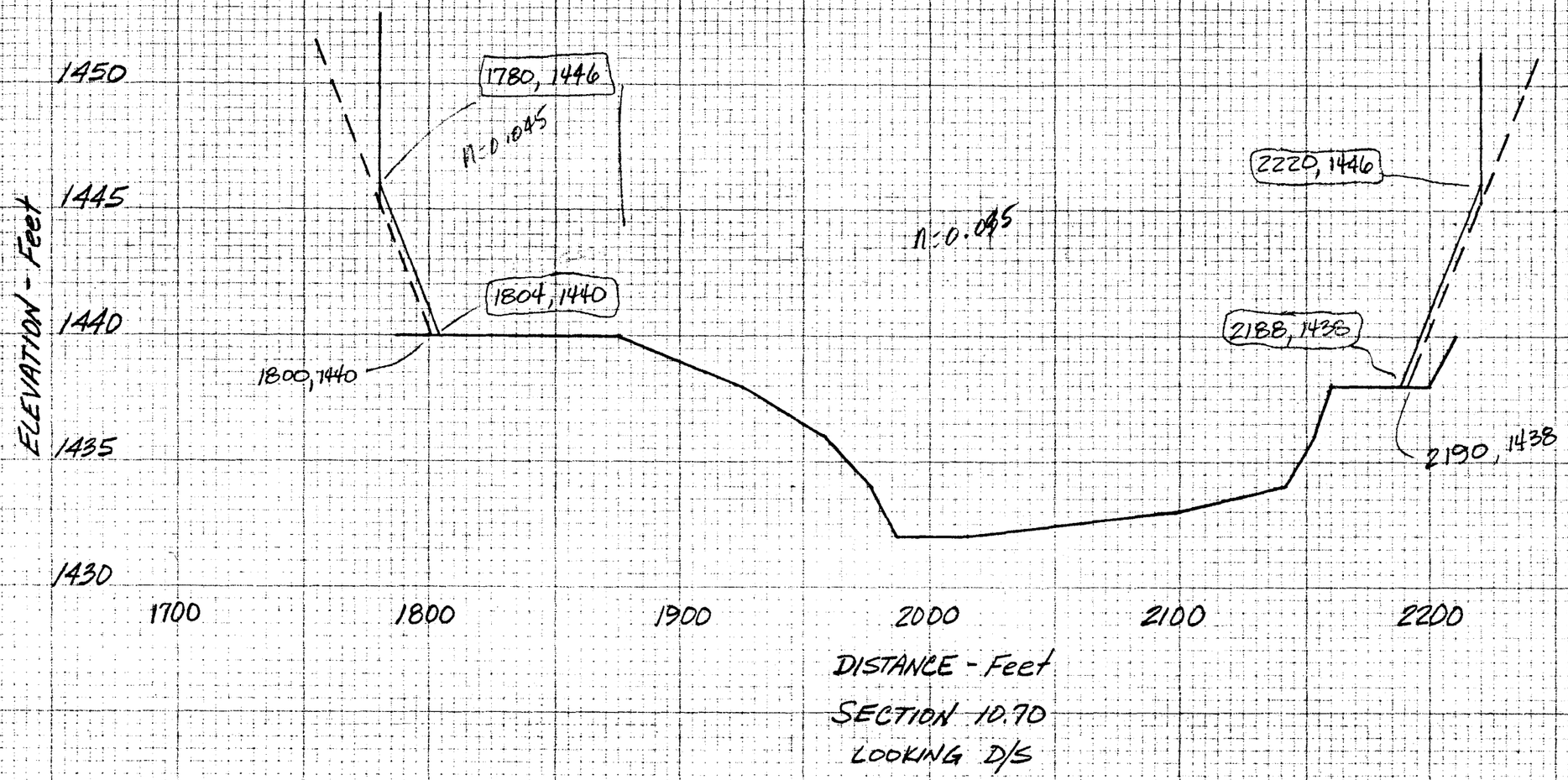

SECTION 10.70
LOOKING D/S

SKUNK CREEK
3588C101

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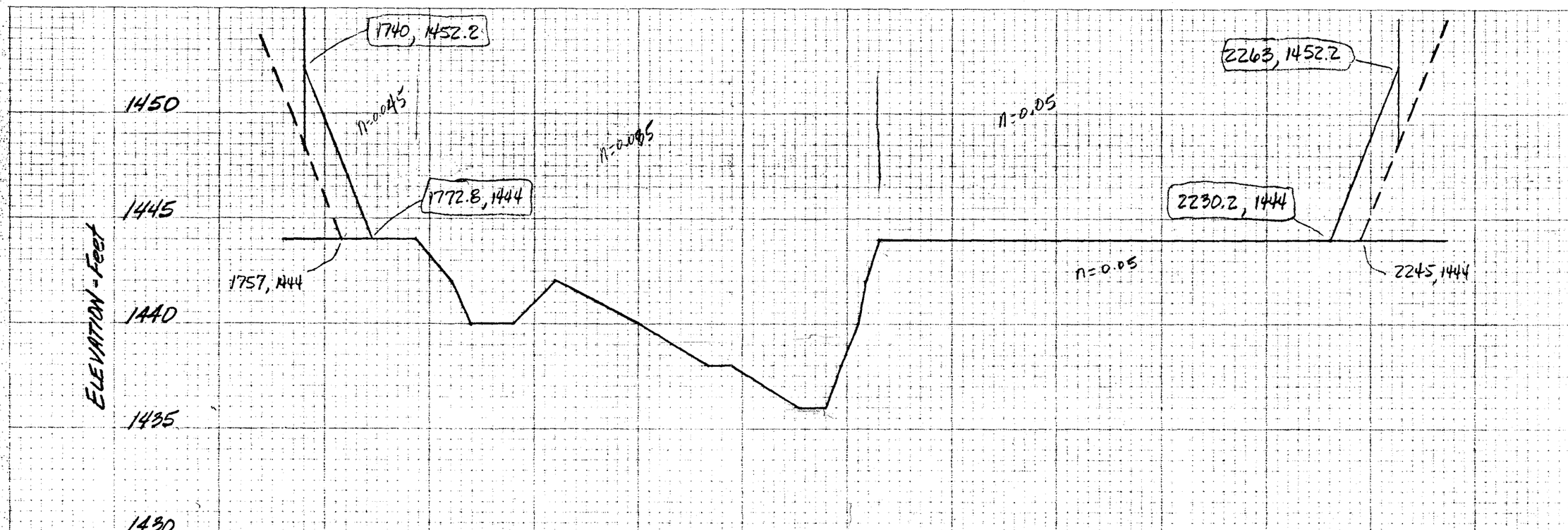
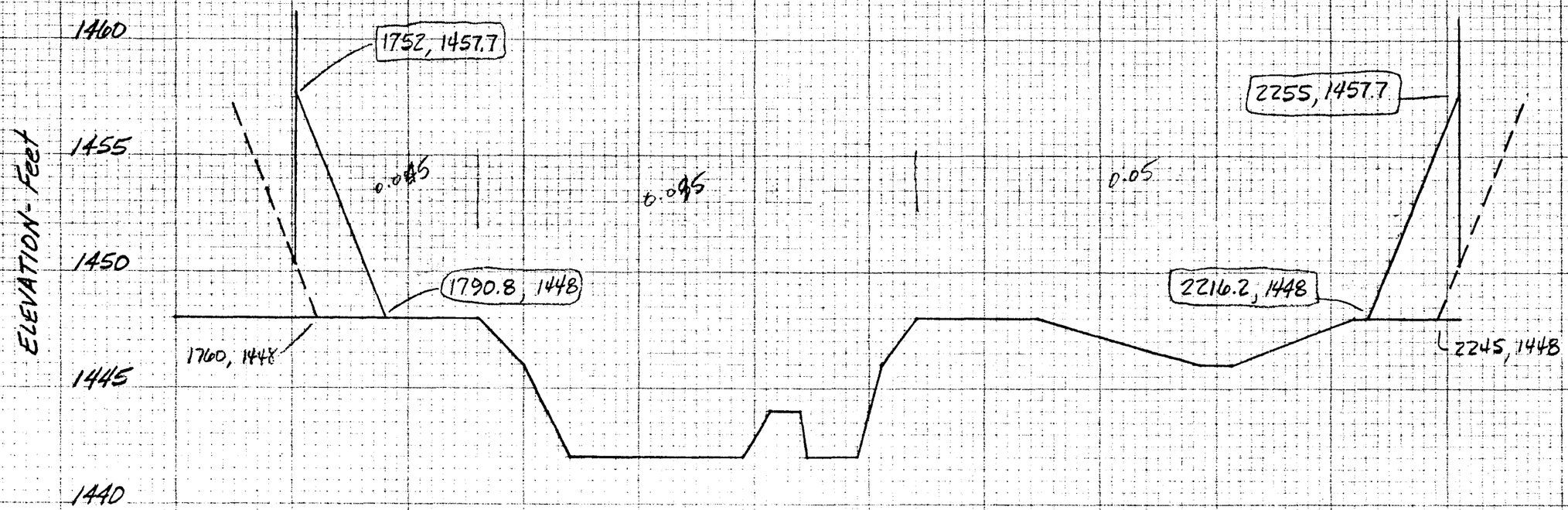
MADE IN U.S.A.



SECTION 10.83
LOOKING D/S

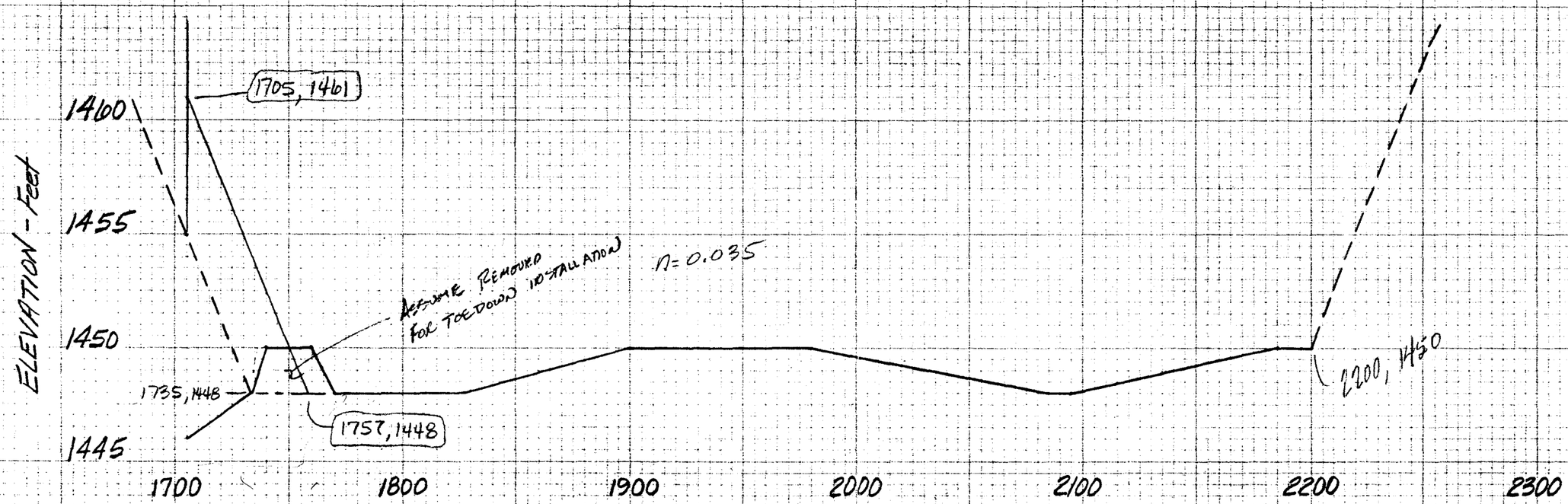
SKUNK CREEK
3588C101



SECTION 10.93
LOOKING D/S

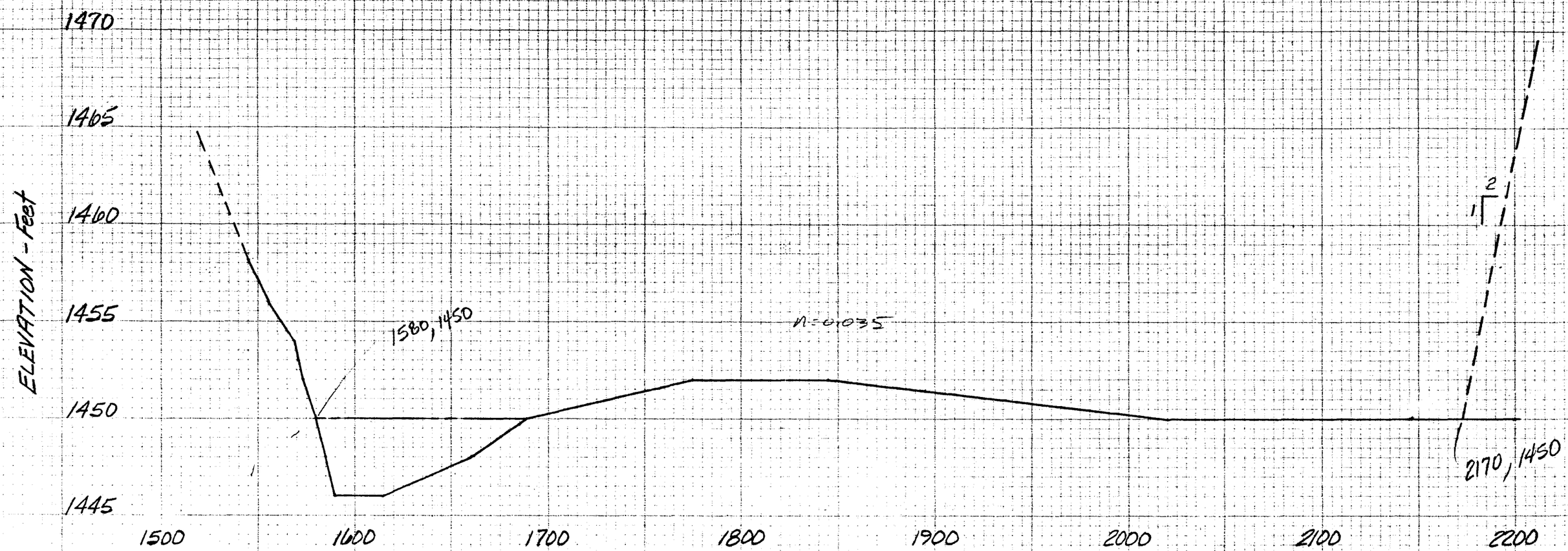
SKUNK CREEK
3588C101

"CLEARPRINT PAPER CO."
NO. 1584—CROSS SECTION 10 × 10
MADE IN U.S.A.



SECTION 11.04
LOOKING D/S

SKUNK CREEK
3588C101



SECTION 11.10
LOOKING D/S

SKUNK CREEK
3588C101

10.620	15000.00	1436.69	1.94	2.54	.00	369.66	610.00
10.620	29000.00	1439.04	2.35	2.37	.00	431.35	610.00
10.620	39000.00	1440.37	1.33	2.28	.00	442.01	610.00
10.620	85000.00	1445.09	4.72	1.95	.00	479.75	610.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	10.700	6800.00	1436.43	.00	1.68	.00	203.59	380.00
*	10.700	15000.00	1438.91	2.49	2.22	.00	291.53	380.00
*	10.700	29000.00	1441.45	2.54	2.41	.00	409.60	380.00
*	10.700	39000.00	1442.66	1.21	2.29	.00	419.28	380.00
*	10.700	85000.00	1447.19	4.53	2.10	.00	455.51	380.00
	10.830	6800.00	1443.38	.00	6.95	.00	214.54	650.00
	10.830	15000.00	1445.65	2.27	6.74	.00	501.21	650.00
	10.830	29000.00	1447.83	2.17	6.38	.00	518.60	650.00
	10.830	39000.00	1449.18	1.36	6.52	.00	529.47	650.00
	10.830	85000.00	1454.14	4.96	6.95	.00	569.13	650.00
	10.930	6800.00	1447.39	.00	4.02	.00	278.38	500.00
	10.930	15000.00	1449.35	1.96	3.70	.00	495.81	500.00
	10.930	29000.00	1451.47	2.12	3.65	.00	512.74	500.00
	10.930	39000.00	1452.66	1.19	3.48	.00	522.30	500.00
	10.930	85000.00	1457.03	4.37	2.89	.00	557.31	500.00
	11.040	6800.00	1451.42	.00	4.02	.00	484.38	500.00
	11.040	15000.00	1453.01	1.60	3.66	.00	497.15	500.00
	11.040	29000.00	1454.95	1.94	3.48	.00	512.60	500.00
	11.040	39000.00	1456.10	1.15	3.44	.00	521.79	500.00
	11.040	85000.00	1460.21	4.11	3.17	.00	554.68	500.00
	11.100	6800.00	1453.21	.00	1.79	.00	609.25	365.00
	11.100	15000.00	1454.83	1.62	1.82	.00	618.98	365.00
	11.100	29000.00	1457.01	2.18	2.06	.00	632.06	365.00
	11.100	39000.00	1458.32	1.31	2.23	.00	639.95	365.00
	11.100	85000.00	1463.20	4.87	2.99	.00	669.22	365.00
*	11.200	6800.00	1454.68	.00	1.47	.00	281.71	410.00
*	11.200	15000.00	1456.50	1.82	1.67	.00	288.99	410.00
*	11.200	29000.00	1458.93	2.43	1.92	.00	298.71	410.00
*	11.200	39000.00	1460.44	1.52	2.12	.00	304.78	410.00
*	11.200	85000.00	1465.95	5.51	2.75	.00	326.81	410.00
	11.300	6800.00	1456.51	.00	1.83	.00	287.03	528.00
	11.300	15000.00	1458.72	2.21	2.23	.00	295.91	528.00
	11.300	29000.00	1461.54	2.82	2.61	.00	307.15	528.00
	11.300	39000.00	1463.20	1.65	2.75	.00	313.75	528.00
	11.300	85000.00	1469.31	6.11	3.35	.00	337.60	528.00
	11.400	6800.00	1457.09	.00	.58	.00	283.35	528.00
	11.400	15000.00	1459.23	2.14	.51	.00	291.92	528.00
	11.400	29000.00	1461.98	2.75	.44	.00	302.92	528.00
	11.400	39000.00	1463.60	1.62	.41	.00	309.42	528.00
	11.400	85000.00	1469.59	5.99	.28	.00	333.36	528.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
1*****************************************************
 *  WATER SURFACE PROFILES                           *
 *  VERSION OF NOVEMBER 1976                         *
 *  UPDATED MAY 1984                                 *
 *  IBM-PC-XT VERSION AUGUST 1985                    *
 *  RUN DATE  12-08-90   TIME  16:18:36              *
 *****************************************************
```

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

PRELIMINARY

```
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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12-08-90 16:18:37 PAGE 1

THIS RUN EXECUTED 12-08-90

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  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION AUGUST 1985
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C
T1        SKUNK CREEK HYDRAULIC ANALYSIS, ESTIMATE T.O.B. W/O CHANNEL INVERT
T2        IMPROVEMENTS NORTH OF HAPPY VALLEY RD              **Q=6800 CFS**
T3        RM 9.48 TO 10.35 W/INV. IMPROVEMENTS     FILE NAME: SKUNK.HYD

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       2.       0.       0.   .000000     .00       .0       0.  1377.800    .000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH     FN      ALLDC    IBW     CHNIM    ITRACE

    1.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   150.000  201.000     .000     .000     .000     .000     .000     .000     .000     .000

NC      .045      .045      .035      .100      .300      .000      .000      .000      .000      .000
QT     5.000  6800.000 15000.000 29000.000 39000.000 85000.000      .000      .000      .000      .000

        DURING MAJOR FLOODS, SKUNK CREEK IS EXPECTED TO FLOW OVER THE OVER-
        SHOOT OF THE CAP AT THE UPSTREAM END OF THE COE'S LEVEES
        ALL CROSSECTIONS WERE RECODED BY JIM HARRIS, HYDRAULICS SECTION
        (APRIL 1983).  THE PREVIOUS ONES WERE FOUND TO BE UNSATISFACTORY.
        CHANNEL CENTERLINE CORRESPONDS TO 2000 FEET.
        ALL MANNINGS "N" VALUES USED WERE OBTAINED FROM THE PREVIOUS
        MODEL AS ASSIGNED BY CASKIE AND MASHBURN BASED ON FIELD
        OBSERVATION (FEB. 1983)
        THE VALUES FOR THE 10, 50, 100, AND 500 YEAR FLOODS ARE 15,000,29000,
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39,000, AND 85,000 CFS RESPECTIVELY (PER GRIGORIAN 5/23/83)

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X1      8.690     19.000   1979.000   2118.000       .000       .000       .000       .000       .000       .000
GR   1380.000    452.000   1378.000    815.000   1378.000    877.000   1378.000    990.000   1378.000   1448.000
GR   1376.000   1481.000   1372.000   1542.000   1374.000   1675.000   1376.000   1727.000   1376.000   1979.000
GR   1369.800   2000.000   1370.000   2038.000   1372.000   2100.000   1376.000   2118.000   1376.200   2181.000
GR   1376.000   2278.000   1376.000   3560.000   1378.000   3560.000   1380.000   3890.000       .000       .000

X1      8.750     26.000   1800.000   2040.000    835.000    733.000    739.000       .000       .000       .000
GR   1390.000    170.000   1388.000    235.000   1386.000    420.000   1384.000    510.000   1383.000    820.000
GR   1382.000   1190.000   1382.000   1435.000   1384.000   1470.000   1384.000   1490.000   1382.000   1500.000
GR   1380.000   1560.000   1378.000   1573.000   1378.000   1600.000   1380.000   1625.000   1378.000   1740.000
GR   1378.000   1790.000   1376.000   1800.000   1376.000   1958.000   1372.000   1975.000   1371.000   2000.000
GR   1380.000   2040.000   1381.000   2290.000   1382.000   2650.000   1382.000   3790.000   1384.000   4050.000
GR   1386.000   4190.000       .000       .000       .000       .000       .000       .000       .000       .000
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X1      8.890     21.000   1900.000   2240.000    565.000    650.000    840.000       .000       .000       .000
X3       .000       .000       .000    870.000       .000   3730.000       .000       .000       .000       .000
GR   1392.000    675.000   1386.000    780.000   1386.000   1765.000   1384.000   1775.000   1384.000   1805.000
GR   1386.000   1815.000   1384.000   1865.000   1384.000   1900.000   1382.000   1950.000   1382.000   1970.000
GR   1378.000   2000.000   1380.000   2030.000   1382.000   2090.000   1382.000   2230.000   1384.000   2240.000
GR   1386.000   2260.000   1387.000   3440.000   1386.500   3770.000   1387.000   4080.000   1388.000   4230.000
GR   1390.000   4440.000       .000       .000       .000       .000       .000       .000       .000       .000

X1      8.965     17.000   1955.000   2330.000    275.000    410.000    400.000       .000       .000       .000
X3       .000       .000       .000   1085.000       .000   3575.000       .000       .000       .000       .000
GR   1392.000    780.000   1390.000    830.000   1388.000    880.000   1388.000   1580.000   1390.000   1915.000
GR   1390.000   1945.000   1388.000   1955.000   1386.000   1975.000   1381.000   2000.000   1382.000   2025.000
GR   1384.000   2105.000   1386.000   2240.000   1388.000   2330.000   1388.000   2560.000   1390.000   2920.000
GR   1390.000   4120.000   1392.000   4570.000       .000       .000       .000       .000       .000       .000

X1      9.050     21.000   1905.000   2140.000    410.000    370.000    550.000       .000       .000       .000
X3       .000       .000       .000   1370.000       .000   3415.000       .000       .000       .000       .000
GR   1398.000    700.000   1396.000    720.000   1394.000    780.000   1392.000    840.000   1390.000   1250.000
GR   1389.000   1645.000   1388.000   1905.000   1386.000   1910.000   1386.000   1925.000   1388.000   1935.000
GR   1386.000   1940.000   1384.000   1970.000   1382.000   2000.000   1382.000   2040.000   1384.000   2050.000
GR   1386.000   2095.000   1388.000   2100.000   1390.000   2140.000   1390.000   2950.000   1392.000   4220.000
GR   1394.000   4570.000       .000       .000       .000       .000       .000       .000       .000       .000

X1      9.115     15.000   1790.000   2300.000    350.000    300.000    370.000       .000       .000       .000
X3       .000       .000       .000       .000       .000   3465.000       .000       .000       .000       .000
GR   1400.000    110.000   1398.000    385.000   1396.000    660.000   1394.000   1600.000   1392.000   1790.000
GR   1390.000   1880.000   1388.000   1970.000   1386.500   2000.000   1388.000   2110.000   1390.000   2185.000
GR   1392.000   2300.000   1392.000   3650.000   1394.000   4025.000   1396.000   4480.000   1398.000   4720.000

NC       .000       .040       .000       .000       .000       .000       .000       .000       .000       .000
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LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
X3 USED TO DEFINE EFFECTIVE FLOW.

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X1      9.210     37.000   1865.000   2190.000    460.000    500.000    600.000       .000       .000       .000
X3       .000       .000       .000   1385.000       .000   2950.000       .000       .000       .000       .000
GR   1402.000    140.000   1402.000    300.000   1400.000    350.000   1398.000    510.000   1396.000    565.000
GR   1394.000    650.000   1394.000    670.000   1396.000    695.000   1396.000    720.000   1394.000    720.000
GR   1394.000    880.000   1396.000   1050.000   1396.000   1130.000   1394.000   1145.000   1394.000   1225.000
GR   1396.000   1290.000   1396.000   1510.000   1394.000   1720.000   1394.000   1735.000   1394.000   1765.000
GR   1394.000   1865.000   1392.000   1920.000   1392.000   1930.000   1390.000   1950.000   1388.500   2000.000
GR   1390.000   2085.000   1392.000   2180.000   1394.000   2190.000   1394.000   2200.000   1392.000   2210.000
GR   1392.000   2225.000   1394.000   2230.000   1394.700   2450.000   1395.000   3250.000   1396.000   4050.000
GR   1398.000   4430.000   1399.500   4600.000       .000       .000       .000       .000       .000       .000

NH      4.000       .045   1930.000       .035   2115.000       .050   3030.000       .040   3660.000       .000
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LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.

X3 USED TO DEFINE EFFECTIVE FLOW.

X1	9.310	29.000	1930.000	2115.000	400.000	480.000	650.000	.000	.000	.000
X3	.000	.000	.000	1110.000	.000	2560.000	.000	.000	.000	.000
GR	1406.000	20.000	1404.000	90.000	1402.000	310.000	1400.000	410.000	1398.000	425.000
GR	1398.000	820.000	1396.000	900.000	1398.000	940.000	1398.000	1130.000	1398.000	1225.000
GR	1398.000	1250.000	1399.000	1300.000	1398.000	1330.000	1399.000	1350.000	1399.000	1845.000
GR	1398.000	1930.000	1394.000	1940.000	1392.000	1980.000	1392.000	2000.000	1392.000	2010.000
GR	1392.000	2040.000	1392.000	2090.000	1394.000	2105.000	1396.000	2115.000	1398.000	2160.000
GR	1398.000	2280.000	1394.000	3030.000	1400.000	3530.000	1402.000	3660.000	.000	.000
NH	4.000	.040	1940.000	.035	2200.000	.050	2300.000	.040	4100.000	.000

LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
X3 USED TO DEFINE EFFECTIVE FLOW.

X1	9.400	33.000	1940.000	2200.000	370.000	420.000	510.000	.000	.000	.000
X3	.000	.000	.000	980.000	.000	2400.000	.000	.000	.000	.000
GR	1410.000	110.000	1408.000	140.000	1406.000	180.000	1404.000	330.000	1402.000	510.000
GR	1400.000	635.000	1400.000	965.000	1400.000	995.000	1400.000	1030.000	1400.000	1150.000
GR	1402.000	1250.000	1402.000	1550.000	1400.000	1620.000	1400.000	1650.000	1402.000	1770.000
GR	1402.000	1940.000	1400.000	1975.000	1396.000	1990.000	1394.400	2000.000	1396.000	2040.000
GR	1396.000	2085.000	1394.000	2100.000	1394.000	2180.000	1400.000	2200.000	1402.000	2300.000
GR	1400.000	2390.000	1400.000	2400.000	1402.000	2450.000	1404.000	2680.000	1404.000	2870.000
GR	1404.000	3300.000	1406.000	3790.000	1408.000	4100.000	.000	.000	.000	.000
NH	3.000	.020	1740.000	.035	2200.000	.045	2480.000	.000	.000	.000

RM 9.48 TO 11.2 MODIFIED
X3 CARD USED FOR RIGHT BANK,EFFECTIVE FLOW AREA ASSUMED
TO EXPAND AT 1.5 TO 1 FROM END OF RIGHT BANK LEVEE

X1	9.480	8.000	1700.000	2200.000	370.000	420.000	490.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	2260.000	.000	.000	.000	.000
GR	1409.000	1700.000	1399.000	1740.000	1399.000	2000.000	1400.000	2020.000	1400.000	2135.000
GR	1402.000	2200.000	1404.000	2260.000	1406.000	2480.000	.000	.000	.000	.000
NH	3.000	.020	1804.000	.035	2196.000	.020	2236.000	.000	.000	.000

ADDITIONAL SECTION ADDED TO REFINE AND REPRESENT THE
PROPOSED HYDRAULIC CONDITIONS

X1	9.560	4.000	1764.000	2236.000	445.000	160.000	300.000	.000	.000	.000
GR	1410.500	1764.000	1400.500	1804.000	1400.500	2196.000	1410.500	2236.000	.000	.000
NH	3.000	.020	1792.000	.035	2202.000	.020	2242.000	.000	.000	.000
X1	9.580	4.000	1750.000	2245.000	145.000	75.000	110.000	.000	.000	.000
GR	1411.000	1752.000	1401.000	1792.000	1401.000	2202.000	1411.000	2242.000	.000	.000

NH	3.000	.020	1780.000	.035	2215.000	.020	2255.000	.000	.000	.000
X1	9.670	4.000	1740.000	2250.000	430.000	395.000	410.000	.000	.000	.000
GR	1413.000	1740.000	1403.000	1780.000	1403.000	2215.000	1413.000	2255.000	.000	.000
NH	3.000	.020	1830.000	.035	2170.000	.020	2210.000	.000	.000	.000
X1	9.750	4.000	1790.000	2205.000	390.000	360.000	370.000	.000	.000	.000
GR	1414.500	1790.000	1404.500	1830.000	1404.500	2170.000	1414.500	2210.000	.000	.000

NH	3.000	.020	1852.000	.035	2147.000	.020	2203.000	.000	.000	.000
X1	9.840	4.000	1796.000	2203.000	475.000	485.000	480.000	.000	.000	.000
GR	1420.000	1796.000	1406.000	1852.000	1406.000	2147.000	1420.000	2203.000	.000	.000
NH	3.000	.020	1835.000	.035	2170.000	.020	2234.000	.000	.000	.000
X1	9.940	4.000	1771.000	2234.000	495.000	545.000	520.000	.000	.000	.000
GR	1425.000	1771.000	1409.000	1835.000	1409.000	2170.000	1425.000	2234.000	.000	.000
NH	3.000	.020	1830.000	.035	2170.000	.020	2230.000	.000	.000	.000
X1	10.040	4.000	1770.000	2230.000	540.000	540.000	540.000	.000	.000	.000
GR	1428.000	1770.000	1413.000	1830.000	1413.000	2170.000	1428.000	2230.000	.000	.000
NH	3.000	.020	1800.000	.035	2200.000	.020	2260.000	.000	.000	.000
X1	10.120	4.000	1740.000	2260.000	415.000	350.000	380.000	.000	.000	.000
GR	1429.500	1740.000	1414.500	1800.000	1414.500	2200.000	1429.500	2260.000	.000	.000
NH	3.000	.020	1785.000	.035	2215.000	.020	2275.000	.000	.000	.000
X1	10.210	4.000	1725.000	2275.000	475.000	430.000	450.000	.000	.000	.000
GR	1435.000	1725.000	1420.000	1785.000	1420.000	2215.000	1435.000	2275.000	.000	.000
NH	3.000	.020	1807.000	.035	2192.000	.020	2252.000	.000	.000	.000
X1	10.300	4.000	1747.000	2252.000	490.000	395.000	440.000	.000	.000	.000
GR	1438.000	1747.000	1423.000	1807.000	1423.000	2192.000	1438.000	2252.000	.000	.000
NC	.035	.035	.035	.100	.300	.000	.000	.000	.000	.000

HAPPY VALLEY ROAD

X1	10.350	9.000	1328.000	1823.000	305.000	155.000	250.000	.000	.000	.000
GR	1440.900	1328.000	1425.900	1388.000	1425.380	1450.000	1424.890	1500.000	1424.770	1600.000
GR	1425.000	1650.000	1425.410	1700.000	1426.480	1763.000	1441.480	1823.000	.000	.000
NH	5.000	.020	1773.000	.045	1840.000	.040	2118.000	.050	2205.000	.020
NH	2285.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

NO CHANNEL INVERT IMPROVEMENTS

X1	10.400	16.000	1713.000	2285.000	195.000	235.000	200.000	.000	.000	.000
GR	1447.000	1713.000	1432.000	1773.000	1432.000	1840.000	1430.000	1860.000	1428.000	1866.000
GR	1426.000	1875.000	1424.000	1880.000	1422.000	1900.000	1424.000	1928.000	1424.000	2007.000
GR	1426.000	2069.000	1428.000	2080.000	1430.000	2118.000	1430.000	2180.000	1429.500	2205.000
GR	1449.500	2285.000	.000	.000	.000	.000	.000	.000	.000	.000

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NH	4.000	.020	1775.000	.040	2125.000	.050	2220.000	.020	2280.000	.000

NO CHANNEL INVERT IMPROVEMENTS

X1	10.490	9.000	1715.000	2280.000	460.000	460.000	460.000	.000	.000	.000
GR	1445.800	1715.000	1430.800	1775.000	1430.000	1853.000	1428.000	1895.000	1428.000	2060.000
GR	1430.000	2110.000	1432.000	2125.000	1432.000	2220.000	1447.000	2280.000	.000	.000
NH	4.000	.020	1795.000	.045	1873.000	.035	2210.000	.020	2270.000	.000

NO CHANNEL INVERT IMPROVEMENTS

X1	10.620	13.000	1735.000	2270.000	575.000	645.000	610.000	.000	.000	.000
GR	1451.500	1735.000	1436.500	1795.000	1437.000	1820.000	1436.000	1873.000	1434.000	1887.000
GR	1432.000	1905.000	1430.000	1920.000	1430.000	2128.000	1432.000	2145.000	1434.000	2155.000
GR	1436.000	2185.000	1437.500	2210.000	1452.500	2270.000	.000	.000	.000	.000
NH	4.000	.020	1800.000	.045	1875.000	.035	2190.000	.020	2250.000	.000

NO CHANNEL INVERT IMPROVEMENTS

X1	10.700	14.000	1740.000	2250.000	365.000	405.000	380.000	.000	.000	.000
GR	1455.000	1740.000	1440.000	1800.000	1440.000	1875.000	1438.000	1925.000	1436.000	1958.000
GR	1434.000	1977.000	1432.000	1987.000	1432.000	2015.000	1433.000	2100.000	1434.000	2142.000
GR	1436.000	2153.000	1438.000	2160.000	1438.000	2190.000	1453.000	2250.000	.000	.000
NH	5.000	.020	1757.000	.050	1793.000	.040	2015.000	.050	2245.000	.020
NH	2305.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

NO CHANNEL INVERT IMPROVEMENTS

X1	10.830	18.000	1697.000	2305.000	640.000	680.000	650.000	.000	.000	.000
GR	1459.000	1697.000	1444.000	1757.000	1444.000	1793.000	1442.000	1810.000	1440.000	1819.000
GR	1440.000	1840.000	1442.000	1860.000	1440.000	1900.000	1438.000	1933.000	1438.000	1945.000
GR	1436.000	1977.000	1436.000	1990.000	1438.000	1997.000	1440.000	2005.000	1442.000	2008.000
GR	1444.000	2015.000	1444.000	2245.000	1459.000	2305.000	.000	.000	.000	.000
NH	5.000	.020	1760.000	.050	1830.000	.040	2020.000	.050	2245.000	.020
NH	2305.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

NO CHANNEL INVERT IMPROVEMENTS

X1	10.930	20.000	1700.000	2305.000	490.000	535.000	500.000	.000	.000	.000
GR	1463.000	1700.000	1448.000	1760.000	1448.000	1830.000	1446.000	1850.000	1444.000	1860.000
GR	1442.000	1870.000	1442.000	1945.000	1444.000	1957.000	1444.000	1970.000	1442.000	1973.000
GR	1442.000	1995.000	1444.000	2000.000	1446.000	2005.000	1448.000	2020.000	1448.000	2073.000
GR	1446.000	2143.000	1446.000	2156.000	1448.000	2210.000	1448.000	2245.000	1463.000	2305.000
NH	3.000	.020	1735.000	.035	2200.000	.020	2260.000	.000	.000	.000

1

END OF DIKE EXTENSION FROM CORPS DIKE ON THE RIGHT BANK ONLY
CONFLUENCE OF BUCHANAN WASH AND SKUNK CREEK
NO CHANNEL INVERT IMPROVEMENTS

X1	11.040	10.000	1675.000	2260.000	530.000	510.000	500.000	.000	.000	.000
GR	1463.000	1675.000	1448.000	1735.000	1448.000	1827.000	1450.000	1900.000	1450.000	1980.000
GR	1448.000	2085.000	1448.000	2095.000	1450.000	2185.000	1450.000	2200.000	1465.000	2260.000
NH	3.000	.020	1580.000	.035	2170.000	.020	2200.000	.000	.000	.000

CROSS SECTION LOCATED BASED ON 1.5 TO 1 FLOW EXPANSION
FROM CORPS DIKE ON THE LEFT BANK
NO CHANNEL INVERT IMPROVEMENTS

X1	11.100	8.000	1520.000	2200.000	395.000	365.000	365.000	.000	.000	.000
GR	1465.000	1520.000	1450.000	1580.000	1450.000	1688.000	1452.000	1775.000	1452.000	1845.000
GR	1450.000	2020.000	1450.000	2170.000	1465.000	2200.000	.000	.000	.000	.000
NC	.000	.000	.020	.000	.000	.000	.000	.000	.000	.000

EFFECTIVE FLOW ASSUMED TO EXPAND AT 1.5 TO 1 FROM COE LEVEES.
(ON LEFT BANK ONLY)
INVERT AND SLOPE DETAILS FOR CORPS LEVEES TAKEN FROM AS BUILT PLANS

X1	11.200	4.000	1834.500	2165.500	520.000	470.000	410.000	.000	.000	.000
GR	1467.000	1834.500	1452.000	1864.500	1452.000	2135.500	1467.000	2165.500	.000	.000
X1	11.300	4.000	1831.500	2169.500	528.000	528.000	528.000	.000	.000	.000
GR	1469.000	1831.500	1452.500	1864.500	1452.500	2135.500	1469.500	2169.500	.000	.000

```
X1     11.400      4.000   1829.500   2171.500    528.000    528.000    528.000       .000       .000       .000
GR   1471.500   1829.500   1454.000   1864.500   1454.000   2135.500   1472.000   2171.500       .000       .000
EJ      .000       .000       .000       .000       .000       .000       .000       .000       .000       .000
1
 12-08-90     16:18:37                                                                                    PAGE    7

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


*PROF 1

CCHV=    .100 CEHV=    .300
*SECNO 8.690

         DURING MAJOR FLOODS, SKUNK CREEK IS EXPECTED TO FLOW OVER THE OVER-
         SHOOT OF THE CAP AT THE UPSTREAM END OF THE COE'S LEVEES
         ALL CROSSECTIONS WERE RECODED BY JIM HARRIS, HYDRAULICS SECTION
         (APRIL 1983).  THE PREVIOUS ONES WERE FOUND TO BE UNSATISFACTORY.
         CHANNEL CENTERLINE CORRESPONDS TO 2000 FEET.
         ALL MANNINGS "N" VALUES USED WERE OBTAINED FROM THE PREVIOUS
         MODEL AS ASSIGNED BY CASKIE AND MASHBURN BASED ON FIELD
         OBSERVATION (FEB. 1983)
         THE VALUES FOR THE 10, 50, 100, AND 500 YEAR FLOODS ARE 15,000,29000,
         39,000, AND 85,000 CFS RESPECTIVELY (PER GRIGORIAN 5/23/83)

    8.69     8.00  1377.80      .00  1377.80  1377.85      .05      .00      .00  1376.00
   6800.    2060.    2414.    2326.    1496.     893.    2580.       0.       0.   1376.00
     .00     1.38     2.70      .90     .045     .035     .045     .000  1369.80  1451.30
 .000344       0.       0.       0.        0        0        0      .00  2108.70  3560.00
0
*SECNO 8.750

3265 DIVIDED FLOW


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
    8.75     7.24  1378.24  1378.24      .00  1379.61     1.38      .75      .40  1376.00
   6800.      76.    6724.       0.      33.     710.       0.      50.      21.   1380.00
     .02     2.31     9.46      .00     .045     .035     .045     .000  1371.00  1571.45
 .011265     835.     739.     733.       20       15        0      .00   337.37  2032.17
0
*SECNO 8.890

3265 DIVIDED FLOW

1
 12-08-90     16:18:37                                                                                    PAGE    8

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


3301 HV CHANGED MORE THAN HVINS
```

```
3470 ENCROACHMENT STATIONS=     870.0 .  3730.0  TYPE=     1  TARGET=    2860.000
     8.89      6.75  1384.75      .00       .00  1385.34      .58      5.64      .08  1384.00
    6800.      101.    6695.       3.       59.    1086.       3.       68.      28.   1384.00
      .06      1.72     6.16     1.15      .045     .035     .045      .000  1378.00  1771.23
  .004487      565.     840.     650.         5        0        0       .00   438.94  2247.54

*SECNO 8.965

3470 ENCROACHMENT STATIONS=    1085.0    3575.0  TYPE=     1  TARGET=    2490.000
     8.97      6.01  1387.01      .00       .00  1388.01     1.00      2.55      .13  1388.00
    6800.        0.    6800.       0.        0.     847.       0.       77.      32.   1388.00
      .07       .00     8.03      .00      .045     .035     .045      .000  1381.00  1964.87
  .009832      275.     400.     410.         2        0        0       .00   320.72  2285.59

*SECNO 9.050

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=    1370.0    3415.0  TYPE=     1  TARGET=    2045.000
     9.05      7.79  1389.79      .00       .00  1390.22      .43      2.15      .06  1388.00
    6800.      716.    6084.       0.      459.    1102.       0.       91.      38.   1390.00
      .10      1.56     5.52      .00      .045     .035     .045      .000  1382.00  1370.00
  .002127      410.     550.     370.         2        0        0       .00   765.86  2135.86

*SECNO 9.115

3470 ENCROACHMENT STATIONS=        .0    3465.0  TYPE=     1  TARGET=    3464.999
     9.11      4.48  1390.98      .00       .00  1391.87      .88      1.51      .14  1392.00
    6800.        0.    6800.       0.        0.     901.       0.      102.      42.   1392.00
      .12       .00     7.55      .00      .045     .035     .045      .000  1386.50  1835.60
  .010933      350.     370.     300.         3        0        0       .00   406.12  2241.73

*SECNO 9.210
```



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

3470 ENCROACHMENT STATIONS=    1385.0    2950.0  TYPE=     1  TARGET=    1565.000

         LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
         X3 USED TO DEFINE EFFECTIVE FLOW.

     9.21      5.93  1394.43      .00       .00  1394.86      .44      2.95      .04  1394.00
    6800.       68.    6526.     206.       72.    1210.      91.      117.      49.   1394.00
      .15       .94     5.39     2.27      .045     .035     .040      .000  1388.50  1675.04
  .002797      460.     600.     500.         2        0        0       .00   689.56  2364.59

1490 NH CARD USED
*SECNO 9.310

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS
```

3470 ENCROACHMENT STATIONS= 1110.0 2560.0 TYPE= 1 TARGET= 1450.000

LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
X3 USED TO DEFINE EFFECTIVE FLOW.

9.31	4.59	1396.59	.00	.00	1397.94	1.35	2.80	.27	1398.00
6800.	0.	6795.	5.	0.	728.	5.	133.	55.	1396.00
.17	.00	9.33	1.02	.045	.035	.050	.000	1392.00	1933.50
.007628	400.	650.	480.	2	0	0	.00	212.10	2560.00

0
1490 NH CARD USED
*SECNO 9.400

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 980.0 2400.0 TYPE= 1 TARGET= 1420.000

LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
X3 USED TO DEFINE EFFECTIVE FLOW.

1
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
9.40	5.78	1399.78	.00	.00	1400.47	.70	2.47	.07	1402.00
6800.	0.	6800.	0.	0.	1015.	0.	143.	58.	1400.00
.19	.00	6.70	.00	.045	.035	.050	.000	1394.00	1975.83
.003338	370.	510.	420.	3	0	0	.00	223.43	2199.26

0
1490 NH CARD USED
*SECNO 9.480

3470 ENCROACHMENT STATIONS= .0 2260.0 TYPE= 1 TARGET= 2259.999

RM 9.48 TO 11.2 MODIFIED
X3 CARD USED FOR RIGHT BANK,EFFECTIVE FLOW AREA ASSUMED
TO EXPAND AT 1.5 TO 1 FROM END OF RIGHT BANK LEVEE

9.48	3.04	1402.04	.00	.00	1402.57	.53	2.08	.02	1409.00
6800.	0.	6800.	0.	0.	1163.	0.	155.	62.	1402.00
.21	.00	5.85	.02	.045	.035	.045	.000	1399.00	1727.83
.005588	370.	490.	420.	2	0	0	.00	473.42	2201.26

1490 NH CARD USED
*SECNO 9.560

ADDITIONAL SECTION ADDED TO REFINE AND REPRESENT THE
PROPOSED HYDRAULIC CONDITIONS

9.56	3.02	1403.52	.00	.00	1404.00	.48	1.42	.00	1410.50
6800.	0.	6800.	0.	0.	1219.	0.	163.	65.	1410.50
.23	.00	5.58	.00	.045	.035	.045	.000	1400.50	1791.93
.004073	445.	300.	160.	2	0	0	.00	416.13	2208.07

1490 NH CARD USED
*SECNO 9.580

9.58	2.90	1403.90	.00	.00	1404.38	.48	.38	.00	1461.00
6800.	0.	0.	6800.	0.	0.	1223.	166.	66.	1461.00
.23	.00	.00	5.56	.045	.035	.035	.000	1401.00	1780.40

```
 .004127    145.    110.     75.      2      0      0    .00   433.21  2213.60

1490 NH CARD USED

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

*SECNO 9.670
    9.67     2.66  1405.66      .00      .00  1406.17      .51     1.78      .01  1413.00
   6800.       0.       0.    6800.       0.       0.    1185.     177.      70.  1463.00
     .25      .00      .00     5.74     .045     .035     .035     .000  1403.00  1769.37
 .004945     430.     410.     395.        2        0        0      .00   456.27  2225.63

1490 NH CARD USED
*SECNO 9.750
    9.75     2.95  1407.45      .00      .00  1408.11      .67     1.90      .05  1414.50
   6800.       0.       0.    6800.       0.       0.    1036.     186.      73.  1464.50
     .27      .00      .00     6.56     .045     .035     .034     .000  1404.50  1818.22
 .005629     390.     370.     360.        2        0        0      .00   363.56  2181.78

1490 NH CARD USED
*SECNO 9.840
    9.84     3.71  1409.71      .00      .00  1410.25      .54     2.13      .01  1420.00
   6800.       0.    6800.       0.       0.    1149.       0.     198.      77.  1420.00
     .29      .00     5.92      .00     .045     .035     .034     .000  1406.00  1837.17
 .003544     475.     480.     485.        2        0        0      .00   324.66  2161.83

1490 NH CARD USED
*SECNO 9.940
    9.94     2.96  1411.96      .00      .00  1412.64      .68     2.35      .04  1425.00
   6800.       0.    6800.       0.       0.    1025.       0.     211.      81.  1425.00
     .31      .00     6.63      .00     .045     .035     .034     .000  1409.00  1823.17
 .005933     495.     520.     545.        2        0        0      .00   358.65  2181.83

1490 NH CARD USED
*SECNO 10.040
   10.04     2.64  1415.64      .00      .00  1416.48      .84     3.79      .05  1428.00
   6800.       0.    6800.       0.       0.     925.       0.     223.      85.  1428.00
     .33      .00     7.35      .00     .045     .035     .034     .000  1413.00  1819.44
 .008449     540.     540.     540.        3        0        0      .00   361.11  2180.56

1490 NH CARD USED
*SECNO 10.120
   10.12     3.35  1417.85      .00      .00  1418.22      .37     1.70      .05  1429.50
   6800.       0.    6800.       0.       0.    1384.       0.     233.      89.  1429.50
     .35      .00     4.91      .00     .045     .035     .034     .000  1414.50  1786.61
 .002755     415.     380.     350.        3        0        0      .00   426.79  2213.39

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

490 NH CARD USED
*SECNO 10.210
```

3301 HV CHANGED MORE THAN HVINS

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

10.21	1.97	1421.97	1421.97	.00	1422.93	.97	2.39	.18	1435.00
6800.	0.	6800.	0.	0.	862.	0.	245.	93.	1435.00
.37	.00	7.89	.00	.045	.035	.034	.000	1420.00	1777.13
.014231	475.	450.	430.	20	11	0	.00	445.75	2222.87

0

1490 NH CARD USED
*SECNO 10.300

10.30	2.87	1425.87	.00	.00	1426.43	.55	3.45	.04	1438.00
6800.	0.	6800.	0.	0.	1140.	0.	255.	98.	1438.00
.39	.00	5.96	.00	.045	.035	.034	.000	1423.00	1795.50
.004955	490.	440.	395.	3	0	0	.00	408.01	2203.50

0

CCHV= .100 CEHV= .300
*SECNO 10.350

HAPPY VALLEY ROAD

10.35	2.67	1427.44	1427.41	.00	1428.49	1.04	1.91	.15	1440.90
6800.	0.	6800.	0.	0.	831.	0.	261.	100.	1441.48
.40	.00	8.19	.00	.035	.035	.035	.000	1424.77	1381.81
.013346	305.	250.	155.	4	11	0	.00	385.06	1766.87

0

1490 NH CARD USED
*SECNO 10.400

NO CHANNEL INVERT IMPROVEMENTS

10.40	7.26	1429.26	.00	.00	1429.89	.64	1.37	.04	1447.00
6800.	0.	6800.	0.	0.	1063.	0.	265.	101.	1449.50
.41	.00	6.40	.00	.035	.040	.035	.000	1422.00	1862.23
.004138	195.	200.	235.	2	0	0	.00	241.64	2103.87

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

1490 NH CARD USED
*SECNO 10.490

NO CHANNEL INVERT IMPROVEMENTS

10.49	3.79	1431.79	.00	.00	1432.50	.71	2.59	.02	1445.80
6800.	0.	6800.	0.	0.	1007.	0.	276.	105.	1447.00
.43	.00	6.76	.00	.035	.040	.035	.000	1428.00	1771.02
.008078	460.	460.	460.	3	0	0	.00	352.46	2123.47

0

1490 NH CARD USED
*SECNO 10.620

NO CHANNEL INVERT IMPROVEMENTS

10.62	4.75	1434.75	.00	.00	1435.28	.53	2.77	.02	1451.50
6800.	0.	6800.	0.	0.	1165.	0.	291.	109.	1452.50
.45	.00	5.84	.00	.035	.035	.035	.000	1430.00	1881.72

.002899	575.	610.	645.	3	0	0	.00	284.60	2166.32

1490 NH CARD USED
*SECNO 10.700

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

NO CHANNEL INVERT IMPROVEMENTS

10.70	4.43	1436.43	1436.43	.00	1438.08	1.65	2.00	.34	1455.00
6800.	0.	6800.	0.	0.	660.	0.	299.	111.	1453.00
.46	.00	10.30	.00	.035	.035	.035	.000	1432.00	1950.91
.012311	365.	380.	405.	4	11	0	.00	203.59	2154.50

1490 NH CARD USED
*SECNO 10.830

3301 HV CHANGED MORE THAN HVINS

NO CHANNEL INVERT IMPROVEMENTS

10.83	7.38	1443.38	.00	.00	1444.39	1.01	6.25	.06	1459.00
6800.	0.	6800.	0.	0.	842.	0.	310.	114.	1459.00
.49	.00	8.07	.00	.035	.040	.035	.000	1436.00	1798.29
.007715	640.	650.	680.	4	0	0	.00	214.54	2012.82

1490 NH CARD USED
*SECNO 10.930

3265 DIVIDED FLOW

NO CHANNEL INVERT IMPROVEMENTS

10.93	5.39	1447.39	.00	.00	1448.44	1.05	4.04	.01	1463.00
6800.	0.	6800.	0.	0.	829.	0.	320.	117.	1463.00
.50	.00	8.20	.00	.035	.034	.035	.000	1442.00	1836.12
.008463	490.	500.	535.	2	0	0	.00	278.38	2193.49

1490 NH CARD USED
*SECNO 11.040

3301 HV CHANGED MORE THAN HVINS

END OF DIKE EXTENSION FROM CORPS DIKE ON THE RIGHT BANK ONLY
CONFLUENCE OF BUCHANAN WASH AND SKUNK CREEK
NO CHANNEL INVERT IMPROVEMENTS

11.04	3.42	1451.42	.00	.00	1451.95	.53	3.46	.05	1463.00
6800.	0.	6800.	0.	0.	1161.	0.	331.	121.	1465.00
.53	.00	5.86	.00	.035	.034	.035	.000	1448.00	1721.31
.005762	530.	500.	510.	2	0	0	.00	484.38	2205.69

1490 NH CARD USED
*SECNO 11.100

CROSS SECTION LOCATED BASED ON 1.5 TO 1 FLOW EXPANSION

FROM CORPS DIKE ON THE LEFT BANK
NO CHANNEL INVERT IMPROVEMENTS

```
   11.10     3.21  1453.21      .00      .00  1453.52      .31     1.55      .02  1465.00
   6800.       0.    6800.       0.       0.    1521.       0.     342.     126.   1465.00
     .55      .00     4.47      .00     .035     .035     .035     .000  1450.00  1567.17
  .003242     395.     365.     365.        3        0        0      .00   609.25  2176.42
0
1
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 11.200

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
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EFFECTIVE FLOW ASSUMED TO EXPAND AT 1.5 TO 1 FROM COE LEVEES.
(ON LEFT BANK ONLY)
INVERT AND SLOPE DETAILS FOR CORPS LEVEES TAKEN FROM AS BUILT PLANS

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   11.20     2.68  1454.68  1454.68      .00  1455.99     1.31     1.51      .30  1467.00
   6800.       0.    6800.       0.       0.     740.       0.     353.     130.   1467.00
     .56      .00     9.19      .00     .035     .020     .035     .000  1452.00  1859.15
  .004246     520.     410.     470.        4       11        0      .00   281.71  2140.85
0
*SECNO 11.300

3301 HV CHANGED MORE THAN HVINS

   11.30     4.01  1456.51      .00      .00  1457.09      .57     1.02      .07  1469.00
   6800.       0.    6800.       0.       0.    1118.       0.     364.     134.   1469.50
     .59      .00     6.08      .00     .035     .020     .035     .000  1452.50  1856.49
  .001104     528.     528.     528.        2        0        0      .00   287.03  2143.51
0
*SECNO 11.400
   11.40     3.09  1457.09      .00      .00  1458.07      .98      .86      .12  1471.50
   6800.       0.    6800.       0.       0.     856.       0.     376.     137.   1472.00
     .61      .00     7.95      .00     .035     .020     .035     .000  1454.00  1858.33
  .002640     528.     528.     528.        3        0        0      .00   283.35  2141.67
1
 12-08-90     16:18:37                                                                    PAGE   16
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THIS RUN EXECUTED 12-08-90

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

T1      SKUNK CREEK HYDRAULIS ANALYSIS, ESTIMATE T.O.B. W/O CHANNEL INVERT
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T2      IMPROVEMENTS NORTH OF HAPPY VALLEY RD              **Q=15000 CFS**
T3      RM 9.48 TO 10.35 W/INV. IMPROVEMENTS     NAME: SKUNK.HYD

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.       3.        0.        0.   .000000       .00       .0        0.  1377.800      .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     2.000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000


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


 *PROF 2

 CCHV=    .100 CEHV=    .300
 *SECNO 8.690

          DURING MAJOR FLOODS, SKUNK CREEK IS EXPECTED TO FLOW OVER THE OVER-
          SHOOT OF THE CAP AT THE UPSTREAM END OF THE COE'S LEVEES
          ALL CROSSECTIONS WERE RECODED BY JIM HARRIS, HYDRAULICS SECTION
          (APRIL 1983).  THE PREVIOUS ONES WERE FOUND TO BE UNSATISFACTORY.
          CHANNEL CENTERLINE CORRESPONDS TO 2000 FEET.
          ALL MANNINGS "N" VALUES USED WERE OBTAINED FROM THE PREVIOUS
          MODEL AS ASSIGNED BY CASKIE AND MASHBURN BASED ON FIELD
          OBSERVATION (FEB. 1983)
          THE VALUES FOR THE 10, 50, 100, AND 500 YEAR FLOODS ARE 15,000,29000,
          39,000, AND 85,000 CFS RESPECTIVELY (PER GRIGORIAN 5/23/83)

     8.69      8.00  1377.80       .00  1377.80  1378.06       .26       .00       .00  1376.00
    15000.     4545.    5325.     5130.    1496.     893.     2580.        0.        0.  1376.00
      .00      3.04     5.96      1.99     .045     .035      .045      .000   1369.80  1451.30
  .001672        0.       0.        0.        0        0         0       .00   2108.70  3560.00

 *SECNO 8.750

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
     8.75      9.24  1380.24  1380.24       .00  1381.99      1.74      2.41       .44  1376.00
    15000.     1764.   13230.       6.      397.    1185.        7.        58.       23.  1380.00
      .02      4.45     11.16      .74      .045     .035      .045      .000   1371.00  1552.65
  .008285      835.     739.     733.        20       11         0       .00    548.56  2101.22

 *SECNO 8.890

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=     870.0    3730.0  TYPE=     1  TARGET=    2860.000
     8.89      8.27  1386.27  1385.44       .00  1387.34      1.07      5.28       .07  1384.00
    15000.     1097.   13805.      98.      478.    1602.       68.        91.       40.  1384.00
      .05      2.30     8.62      1.43     .045     .035      .045      .000   1378.00   870.00
  .005231      565.     840.     650.        6       11         0       .00   1708.19  2578.19

 1
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


*SECNO 8.965

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=    1085.0    3575.0  TYPE=     1  TARGET=    2490.000
     8.97     7.99  1388.99  1388.99      .00  1389.92      .94     2.14      .01  1388.00
   15000.    1338.   12964.    698.     571.    1559.     314.     110.      52.   1388.00
      .06     2.34     8.31     2.22     .045     .035     .045     .000  1381.00  1085.00
  .005747     275.     400.     410.        2       10        0      .00  1447.25  2737.32
0
*SECNO 9.050

3470 ENCROACHMENT STATIONS=    1370.0    3415.0  TYPE=     1  TARGET=    2045.000
     9.05     9.22  1391.22      .00      .00  1391.67      .45     1.70      .05  1388.00
   15000.    3303.    9430.    2267.    1220.    1436.    1380.     145.      69.   1390.00
      .09     2.71     6.57     1.64     .045     .035     .045     .000  1382.00  1370.00
  .002164     410.     550.     370.        2        0        0      .00  2045.00  3415.00
0
*SECNO 9.115
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=        .0    3465.0  TYPE=     1  TARGET=    3464.999
     9.11     6.16  1392.66  1392.66      .00  1393.52      .86     1.27      .12  1392.00
   15000.      27.   13377.    1596.      21.    1702.     769.     171.      83.   1392.00
      .10     1.31     7.86     2.08     .045     .035     .045     .000  1386.50  1727.29
  .006877     350.     370.     300.        3       18        0      .00  1737.71  3465.00
0
*SECNO 9.210

3470 ENCROACHMENT STATIONS=    1385.0    2950.0  TYPE=     1  TARGET=    1565.000

         LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
         X3 USED TO DEFINE EFFECTIVE FLOW.

     9.21     7.16  1395.66      .00      .00  1396.35      .69     2.81      .02  1394.00
   15000.     928.   11899.    2173.     389.    1614.     840.     205.     102.   1394.00
      .13     2.39     7.37     2.59     .045     .035     .040     .000  1388.50  1544.66
  .003564     460.     600.     500.        1        0        0      .00  1405.34  2950.00
0
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


1490 NH CARD USED
*SECNO 9.310
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
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3470 ENCROACHMENT STATIONS=    1110.0    2560.0  TYPE=     1  TARGET=    1450.000

          LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
          X3 USED TO DEFINE EFFECTIVE FLOW.

     9.31      7.34  1399.34  1399.34      .00  1400.43      1.09      2.28       .12  1398.00
    15000.      922.   11601.    2477.     509.    1232.      849.      239.      117.   1396.00
      .15      1.81     9.41     2.92     .045     .035      .050      .000   1392.00  1110.00
  .003955      400.     650.     480.        3        5         0       .00   1450.00  2560.00

1490 NH CARD USED
*SECNO 9.400

3265 DIVIDED FLOW


3470 ENCROACHMENT STATIONS=     980.0    2400.0  TYPE=     1  TARGET=    1420.000

          LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
          X3 USED TO DEFINE EFFECTIVE FLOW.

     9.40      7.41  1401.41  1401.17      .00  1402.72      1.32      2.23       .07  1402.00
    15000.     1256.   13521.     223.     426.    1399.      108.      263.      128.   1400.00
      .17      2.95     9.66     2.06     .040     .035      .044      .000   1394.00   980.00
  .005249      370.     510.     420.        4        5         0       .00    797.80  2400.00

1490 NH CARD USED
*SECNO 9.480

3301 HV CHANGED MORE THAN HVINS


3470 ENCROACHMENT STATIONS=        .0    2260.0  TYPE=     1  TARGET=    2259.999

          RM 9.48 TO 11.2 MODIFIED
          X3 CARD USED FOR RIGHT BANK,EFFECTIVE FLOW AREA ASSUMED
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          TO EXPAND AT 1.5 TO 1 FROM END OF RIGHT BANK LEVEE

     9.48      5.10  1404.10      .00      .00  1404.84       .74      2.06       .06  1409.00
    15000.        0.   14863.     137.       0.    2141.       66.      286.      135.   1402.00
      .19       .00     6.94     2.08     .040     .034      .045      .000   1399.00  1719.62
  .003526      370.     490.     420.        2        0         0       .00    540.38  2260.00

1490 NH CARD USED
*SECNO 9.560

          ADDITIONAL SECTION ADDED TO REFINE AND REPRESENT THE
          PROPOSED HYDRAULIC CONDITIONS

     9.56      4.65  1405.15      .00      .00  1406.11       .96      1.20       .06  1410.50
    15000.        0.   15000.       0.       0.    1910.        0.      300.      138.   1410.50
      .20       .00     7.85      .00     .040     .035      .045      .000   1400.50  1785.39
  .004594      445.     300.     160.        2        0         0       .00    429.22  2214.61

1490 NH CARD USED
*SECNO 9.580
     9.58      4.63  1405.63      .00      .00  1406.52       .89       .40       .01  1461.00
    15000.        0.       0.   15000.       0.       0.     1983.      304.      139.   1461.00
      .20       .00       .00     7.56     .040     .035      .034      .000   1401.00  1773.49
  .004087      145.     110.      75.        2        0         0       .00    447.02  2220.51
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1490 NH CARD USED
*SECNO 9.670
     9.67     4.32  1407.32      .00      .00  1408.24      .92     1.71      .01  1413.00
    15000.      0.       0.   15000.       0.       0.    1954.     322.     143.   1463.00
      .21      .00      .00     7.68     .040     .035     .034     .000  1403.00  1762.72
   .004617     430.     410.     395.        2        0        0      .00   469.56  2232.28
0
1490 NH CARD USED
*SECNO 9.750
     9.75     4.47  1408.97      .00      .00  1410.34     1.36     1.96      .13  1414.50
    15000.      0.       0.   15000.       0.       0.    1602.     337.     147.   1464.50
      .23      .00      .00     9.37     .040     .035     .034     .000  1404.50  1812.10
   .006547     390.     370.     360.        2        0        0      .00   375.80  2187.90
0
1490 NH CARD USED
*SECNO 9.840
     9.84     5.72  1411.72      .00      .00  1412.78     1.06     2.41      .03  1420.00
    15000.      0.   15000.       0.       0.    1819.       0.     356.     151.   1420.00
      .24      .00     8.24      .00     .040     .034     .034     .000  1406.00  1829.11
   .003939     475.     480.     485.        2        0        0      .00   340.79  2169.89
0
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST

1490 NH CARD USED
*SECNO 9.940
     9.94     4.97  1413.97      .00      .00  1415.09     1.12     2.29      .02  1425.00
    15000.      0.   15000.       0.       0.    1764.       0.     377.     155.   1425.00
      .26      .00     8.50      .00     .040     .035     .034     .000  1409.00  1815.11
   .004977     495.     520.     545.        3        0        0      .00   374.78  2189.89
0
1490 NH CARD USED
*SECNO 10.040
    10.04     4.16  1417.16      .00      .00  1418.74     1.59     3.51      .14  1428.00
    15000.      0.   15000.       0.       0.    1484.       0.     397.     159.   1428.00
      .27      .00    10.11      .00     .040     .035     .034     .000  1413.00  1813.35
   .008838     540.     540.     540.        2        0        0      .00   373.29  2186.65
0
1490 NH CARD USED
*SECNO 10.120

3301 HV CHANGED MORE THAN HVINS

    10.12     5.36  1419.86      .00      .00  1420.55      .68     1.71      .09  1429.50
    15000.      0.   15000.       0.       0.    2260.       0.     413.     163.   1429.50
      .29      .00     6.64      .00     .040     .035     .034     .000  1414.50  1778.55
   .002731     415.     380.     350.        2        0        0      .00   442.89  2221.45
0
1490 NH CARD USED
*SECNO 10.210

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
    10.21     3.31  1423.31  1423.31      .00  1424.93     1.63     2.26      .28  1435.00
    15000.      0.   15000.       0.       0.    1466.       0.     433.     168.   1435.00
      .30      .00    10.23      .00     .040     .035     .034     .000  1420.00  1771.77
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 .012112    475.    450.    430.     20     14      0    .00   456.46  2228.23
0
1490 NH CARD USED
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  SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
  TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN       SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID      ENDST

*SECNO 10.300

3301 HV CHANGED MORE THAN HVINS

   10.30     4.41  1427.41      .00      .00  1428.52     1.11     3.53      .05  1438.00
  15000.       0.  15000.       0.       0.    1775.       0.     449.     172.   1438.00
     .32      .00     8.45      .00     .040     .035     .034     .000  1423.00  1789.37
 .005708     490.     440.     395.        3        0        0      .00   420.27  2209.63
0
CCHV=    .100 CEHV=    .300
*SECNO 10.350

3301 HV CHANGED MORE THAN HVINS


              HAPPY VALLEY ROAD

   10.35     4.16  1428.93  1428.90      .00  1430.69     1.76     1.97      .20  1440.90
  15000.       0.  15000.       0.       0.    1409.       0.     458.     174.   1441.48
     .32      .00    10.64      .00     .035     .035     .035     .000  1424.77  1375.89
 .011627     305.     250.     155.        6       11        0      .00   396.89  1772.79
0
1490 NH CARD USED
*SECNO 10.400

            NO CHANNEL INVERT IMPROVEMENTS

   10.40     9.15  1431.15      .00      .00  1432.41     1.26     1.68      .05  1447.00
  15000.       0.  15000.       0.       0.    1665.       0.     465.     176.   1449.50
     .33      .00     9.01      .00     .035     .036     .035     .000  1422.00  1848.47
 .006338     195.     200.     235.        3        0        0      .00   363.14  2211.61
0
1490 NH CARD USED
*SECNO 10.490

            NO CHANNEL INVERT IMPROVEMENTS

   10.49     6.16  1434.16      .00      .00  1434.97      .82     2.52      .04  1445.80
  15000.       0.  15000.       0.       0.    2067.       0.     485.     181.   1447.00
     .35      .00     7.26      .00     .035     .038     .035     .000  1428.00  1761.58
 .004767     460.     460.     460.        3        0        0      .00   467.04  2228.62
0
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  SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
  TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN       SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID      ENDST

1490 NH CARD USED
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*SECNO 10.620

3265 DIVIDED FLOW


            NO CHANNEL INVERT IMPROVEMENTS

    10.62     6.69  1436.69      .00      .00  1437.81     1.12     2.75      .09  1451.50
   15000.       0.   15000.       0.       0.    1767.       0.     512.     186.   1452.50
      .37      .00     8.49      .00     .035     .032     .035     .000  1430.00  1794.26
  .004268     575.     610.     645.        2        0        0      .00   369.66  2196.41

1490 NH CARD USED
*SECNO 10.700

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

            NO CHANNEL INVERT IMPROVEMENTS

    10.70     6.91  1438.91  1438.91      .00  1441.12     2.20     2.47      .33  1455.00
   15000.       0.   15000.       0.       0.    1259.       0.     525.     189.   1453.00
      .38      .00    11.91      .00     .035     .035     .035     .000  1432.00  1902.13
  .011099     365.     380.     405.        2        8        0      .00   291.53  2193.66

1490 NH CARD USED
*SECNO 10.830

3301 HV CHANGED MORE THAN HVINS


            NO CHANNEL INVERT IMPROVEMENTS

    10.83     9.65  1445.65      .00      .00  1446.74     1.08     5.51      .11  1459.00
   15000.       0.   15000.       0.       0.    1795.       0.     548.     195.   1459.00
      .40      .00     8.36      .00     .035     .034     .035     .000  1436.00  1750.39
  .006675     640.     650.     680.        3        0        0      .00   501.21  2251.61
0
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


1490 NH CARD USED
*SECNO 10.930

            NO CHANNEL INVERT IMPROVEMENTS
    10.93     7.35  1449.35      .00      .00  1450.59     1.24     3.81      .05  1463.00
   15000.       0.   15000.       0.       0.    1676.       0.     568.     201.   1463.00
      .41      .00     8.95      .00     .035     .035     .035     .000  1442.00  1754.60
  .008782     490.     500.     535.        3        0        0      .00   495.81  2250.40
0
1490 NH CARD USED
*SECNO 11.040

          END OF DIKE EXTENSION FROM CORPS DIKE ON THE RIGHT BANK ONLY
           CONFLUENCE OF BUCHANAN WASH AND SKUNK CREEK
             NO CHANNEL INVERT IMPROVEMENTS
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   11.04     5.01  1453.01      .00      .00  1453.94      .92     3.31      .03  1463.00
  15000.       0.   15000.       0.       0.    1945.       0.     589.     207.   1465.00
     .43      .00     7.71      .00     .035     .034     .035     .000  1448.00  1714.92
 .005170     530.     500.     510.        1        0        0      .00   497.15  2212.08
0
1490 NH CARD USED
*SECNO 11.100

         CROSS SECTION LOCATED BASED ON 1.5 TO 1 FLOW EXPANSION
         FROM CORPS DIKE ON THE LEFT BANK
            NO CHANNEL INVERT IMPROVEMENTS


   11.10     4.83  1454.83      .00      .00  1455.38      .55     1.41      .04  1465.00
  15000.       0.   15000.       0.       0.    2518.       0.     607.     211.   1465.00
     .45      .00     5.96      .00     .035     .035     .035     .000  1450.00  1560.68
 .002986     395.     365.     365.        3        0        0      .00   618.98  2179.66

*SECNO 11.200

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
1
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN       SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID      ENDST


3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

         EFFECTIVE FLOW ASSUMED TO EXPAND AT 1.5 TO 1 FROM COE LEVEES.
              (ON LEFT BANK ONLY)
         INVERT AND SLOPE DETAILS FOR CORPS LEVEES TAKEN FROM AS BUILT PLANS

   11.20     4.50  1456.50  1456.50      .00  1458.70     2.20     1.35      .50  1467.00
  15000.       0.   15000.       0.       0.    1259.       0.     625.     216.   1467.00
     .46      .00    11.91      .00     .035     .020     .035     .000  1452.00  1855.51
 .003649     520.     410.     470.       20       11        0      .00   288.99  2144.49

*SECNO 11.300

3301 HV CHANGED MORE THAN HVINS

   11.30     6.22  1458.72      .00      .00  1459.85     1.12     1.04      .11  1469.00
  15000.       0.   15000.       0.       0.    1765.       0.     643.     219.   1469.50
     .47      .00     8.50      .00     .035     .020     .035     .000  1452.50  1852.05
 .001225     528.     528.     528.        2        0        0      .00   295.91  2147.95
0
*SECNO 11.400
   11.40     5.23  1459.23      .00      .00  1460.84     1.61      .85      .15  1471.50
  15000.       0.   15000.       0.       0.    1472.       0.     663.     223.   1472.00
     .49      .00    10.19      .00     .035     .020     .035     .000  1454.00  1854.04
 .002198     528.     528.     528.        3        0        0      .00   291.92  2145.96

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


T1      SKUNK CREEK HYDRAULIC ANALYSIS, ESTIMATE T.O.B. W/O CHANNEL INVERT
T2      IMPROVEMENTS NORTH OF HAPPY VALLEY RD              **Q=29000 CFS**
T3      RM 9.48 TO 10.35 W/INV. IMPROVEMENTS    NAME: SKUNK.HYD

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.        4.        0.        0.   .000000       .00        .0        0.  1377.800      .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     3.000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000


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


*PROF 3

CCHV=    .100 CEHV=    .300
*SECNO 8.690

          DURING MAJOR FLOODS, SKUNK CREEK IS EXPECTED TO FLOW OVER THE OVER-
          SHOOT OF THE CAP AT THE UPSTREAM END OF THE COE'S LEVEES
          ALL CROSSECTIONS WERE RECODED BY JIM HARRIS, HYDRAULICS SECTION
          (APRIL 1983).  THE PREVIOUS ONES WERE FOUND TO BE UNSATISFACTORY.
          CHANNEL CENTERLINE CORRESPONDS TO 2000 FEET.
          ALL MANNINGS "N" VALUES USED WERE OBTAINED FROM THE PREVIOUS
          MODEL AS ASSIGNED BY CASKIE AND MASHBURN BASED ON FIELD
          OBSERVATION (FEB. 1983)
          THE VALUES FOR THE 10, 50, 100, AND 500 YEAR FLOODS ARE 15,000,29000,
          39,000, AND 85,000 CFS RESPECTIVELY (PER GRIGORIAN 5/23/83)

    8.69     8.00  1377.80      .00  1377.80  1378.77      .97      .00      .00  1376.00
   29000.    8787.   10295.    9919.    1496.     893.    2580.       0.       0.   1376.00
     .00     5.87    11.53     3.84     .045     .035     .045     .000  1369.80  1451.30
  .006251      0.       0.       0.        0        0        0      .00  2108.70  3560.00

*SECNO 8.750

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
    8.75    11.82  1382.82  1382.82      .00  1383.84     1.02     3.62      .01  1376.00
   29000.    6221.   17875.    4904.    1455.    1803.    2033.      90.      44.   1380.00
     .03     4.27     9.91     2.41     .045     .035     .045     .000  1371.00   886.76
  .003735     835.     739.     733.        2       15        0      .00  2963.23  3896.55

*SECNO 8.890
7185 MINIMUM SPECIFIC ENERGY
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3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     870.0    3730.0  TYPE=     1  TARGET=    2860.000
     8.89      9.61  1387.61  1387.61      .00  1388.53      .92      3.02      .01  1384.00
   29000.     6239.   19038.    3723.    1859.    2058.    1604.      176.      87.   1384.00
      .06      3.36     9.25     2.32     .045     .035     .045      .000  1378.00   870.00
  .004316      565.     840.     650.        7       14        0       .00  2860.00  3730.00


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


*SECNO 8.965
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=    1085.0    3575.0  TYPE=     1  TARGET=    2490.000
     8.97      9.28  1390.28  1390.28      .00  1391.28     1.00      1.77      .02  1388.00
   29000.     5917.   19417.    3666.    1583.    2047.    1174.      219.     109.   1388.00
      .07      3.74     9.49     3.12     .045     .035     .045      .000  1381.00  1085.00
  .005208      275.     400.     410.       20       10        0       .00  2490.00  3575.00
0
*SECNO 9.050

3470 ENCROACHMENT STATIONS=    1370.0    3415.0  TYPE=     1  TARGET=    2045.000
     9.05     10.44  1392.44      .00      .00  1392.98      .54      1.65      .05  1388.00
   29000.     7078.   13542.    8380.    1875.    1724.    2943.      276.     131.   1390.00
      .10      3.77     7.86     2.85     .045     .035     .045      .000  1382.00  1370.00
  .002426      410.     550.     370.        2        0        0       .00  2045.00  3415.00
0
*SECNO 9.115

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=        .0    3465.0  TYPE=     1  TARGET=    3464.999
     9.11      7.20  1393.70  1393.70      .00  1394.75     1.06      1.33      .16  1392.00
   29000.      336.   20974.    7690.     137.    2231.    1978.      318.     145.   1392.00
      .11      2.45     9.40     3.89     .045     .035     .045      .000  1386.50  1628.69
  .006855      350.     370.     300.        3       18        0       .00  1836.31  3465.00

*SECNO 9.210

3470 ENCROACHMENT STATIONS=    1385.0    2950.0  TYPE=     1  TARGET=    1565.000

          LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
          X3 USED TO DEFINE EFFECTIVE FLOW.

     9.21      8.33  1396.83      .00      .00  1397.77      .94      3.01      .01  1394.00
   29000.     3206.   18441.    7353.     900.    1992.    1724.      374.     165.   1394.00
      .13      3.56     9.26     4.27     .045     .035     .040      .000  1388.50  1385.00
  .004246      460.     600.     500.        2        0        0       .00  1565.00  2950.00
0
1
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


1490 NH CARD USED
*SECNO 9.310
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=    1110.0    2560.0  TYPE=     1  TARGET=    1450.000

         LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
         X3 USED TO DEFINE EFFECTIVE FLOW.

     9.31     8.55  1400.55  1400.55      .00  1401.97     1.42     2.65      .14  1398.00
   29000.    5402.   17326.    6272.    1505.    1457.    1390.     428.     181.   1396.00
      .15     3.59    11.89     4.51     .045     .035     .050     .000  1392.00  1110.00
  .005046     400.     650.     480.       20        8        0      .00  1450.00  2560.00
0
1490 NH CARD USED
*SECNO 9.400
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     980.0    2400.0  TYPE=     1  TARGET=    1420.000

         LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
         X3 USED TO DEFINE EFFECTIVE FLOW.

     9.40     9.03  1403.03  1403.03      .00  1404.45     1.42     2.39      .00  1402.00
   29000.    7191.   20191.    1618.    1678.    1817.     416.     469.     195.   1400.00
      .16     4.29    11.11     3.89     .040     .035     .044     .000  1394.00   980.00
  .005168     370.     510.     420.        2        8        0      .00  1420.00  2400.00
0
1490 NH CARD USED
*SECNO 9.480

3470 ENCROACHMENT STATIONS=        .0    2260.0  TYPE=     1  TARGET=    2259.999

         RM 9.48 TO 11.2 MODIFIED
         X3 CARD USED FOR RIGHT BANK,EFFECTIVE FLOW AREA ASSUMED
         TO EXPAND AT 1.5 TO 1 FROM END OF RIGHT BANK LEVEE

     9.48     6.41  1405.41      .00       .00  1407.00     1.59     2.51      .05  1409.00
   29000.       0.   28376.     624.        0.    2776.     145.     505.     204.   1402.00
      .18      .00    10.22     4.31     .040     .034     .045     .000  1399.00  1714.36
  .005443     370.     490.     420.        2        0        0      .00   545.64  2260.00
0
1
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


1490 NH CARD USED
*SECNO 9.560

         ADDITIONAL SECTION ADDED TO REFINE AND REPRESENT THE
         PROPOSED HYDRAULIC CONDITIONS
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    9.56     6.43  1406.93      .00      .00  1408.74     1.81     1.67      .07  1410.50
   29000.       0.   29000.       0.       0.    2684.       0.     524.     208.   1410.50
     .18      .00    10.80      .00     .040     .035     .045     .000  1400.50  1778.30
  .005740     445.     300.     160.        2        0        0      .00   443.41  2221.70
0
1490 NH CARD USED
*SECNO 9.580
    9.58     6.70  1407.70      .00      .00  1409.22     1.52      .46      .03  1461.00
   29000.       0.       0.   29000.       0.       0.    2927.     530.     209.   1461.00
     .19      .00      .00     9.91     .040     .035     .034     .000  1401.00  1765.20
  .004269     145.     110.      75.        2        0        0      .00   463.60  2228.80
0
1490 NH CARD USED
*SECNO 9.670
    9.67     6.45  1409.45      .00      .00  1410.93     1.48     1.70      .00  1413.00
   29000.       0.       0.   29000.       0.       0.    2975.     557.     213.   1463.00
     .20      .00      .00     9.75     .040     .035     .034     .000  1403.00  1754.18
  .004345     430.     410.     395.        2        0        0      .00   486.65  2240.82
0
1490 NH CARD USED
*SECNO 9.750

3301 HV CHANGED MORE THAN HVINS

    9.75     6.27  1410.77      .00      .00  1413.26     2.49     2.03      .30  1414.50
   29000.       0.       0.   29000.       0.       0.    2292.     578.     216.   1464.50
     .21      .00      .00    12.66     .040     .035     .034     .000  1404.50  1804.89
  .007589     390.     370.     360.        2        0        0      .00   390.21  2195.11
0
1490 NH CARD USED
*SECNO 9.840
1
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

3301 HV CHANGED MORE THAN HVINS

    9.84     8.22  1414.22      .00      .00  1416.01     1.80     2.69      .07  1420.00
   29000.       0.   29000.       0.       0.    2695.       0.     606.     221.   1420.00
     .22      .00    10.76      .00     .040     .034     .034     .000  1406.00  1819.12
  .004255     475.     480.     485.        2        0        0      .00   360.76  2179.88
0
1490 NH CARD USED
*SECNO 9.940
    9.94     7.57  1416.57      .00      .00  1418.28     1.70     2.25      .01  1425.00
   29000.       0.   29000.       0.       0.    2770.       0.     638.     225.   1425.00
     .23      .00    10.47      .00     .040     .034     .034     .000  1409.00  1804.67
  .004410     495.     520.     545.        2        0        0      .00   395.66  2200.33
0
1490 NH CARD USED
*SECNO 10.040

3301 HV CHANGED MORE THAN HVINS

   10.04     6.20  1419.20      .00      .00  1421.75     2.55     3.22      .25  1428.00
   29000.       0.   29000.       0.       0.    2264.       0.     670.     230.   1428.00
     .24      .00    12.81      .00     .040     .034     .034     .000  1413.00  1805.18
  .008508     540.     540.     540.        2        0        0      .00   389.64  2194.82
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0
1490 NH CARD USED
*SECNO 10.120

3301 HV CHANGED MORE THAN HVINS

    10.12     7.95  1422.45      .00      .00  1423.56     1.11     1.67      .14  1429.50
   29000.       0.   29000.       0.       0.    3434.       0.     695.     234.   1429.50
      .26      .00     8.45      .00     .040     .034     .034     .000  1414.50  1768.19
  .002670     415.     380.     350.        2        0        0      .00   463.62  2231.81
0
1490 NH CARD USED
*SECNO 10.210
1
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
    10.21     5.11  1425.11  1425.11      .00  1427.57     2.47     2.12      .41  1435.00
   29000.       0.   29000.       0.       0.    2300.       0.     724.     239.   1435.00
      .27      .00    12.61      .00     .040     .035     .034     .000  1420.00  1764.58
  .010467     475.     450.     430.       20       14        0      .00   470.84  2235.42
0
1490 NH CARD USED
*SECNO 10.300
    10.30     6.23  1429.23      .00      .00  1431.23     2.00     3.61      .05  1438.00
   29000.       0.   29000.       0.       0.    2553.       0.     749.     243.   1438.00
      .28      .00    11.36      .00     .040     .035     .034     .000  1423.00  1782.09
  .006608     490.     440.     395.        2        0        0      .00   434.83  2216.91
0
CCHV=    .100 CEHV=    .300
*SECNO 10.350

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

              HAPPY VALLEY ROAD

    10.35     6.08  1430.85  1430.85      .00  1433.58     2.73     2.06      .22  1440.90
   29000.       0.   29000.       0.       0.    2189.       0.     762.     246.   1441.48
      .28      .00    13.25      .00     .035     .035     .035     .000  1424.77  1368.19
  .010557     305.     250.     155.        3        5        0      .00   412.30  1780.49
0
1490 NH CARD USED
*SECNO 10.400

3301 HV CHANGED MORE THAN HVINS


            NO CHANNEL INVERT IMPROVEMENTS
1
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   10.40    11.48  1433.48      .00      .00  1435.35     1.87     1.69      .09  1447.00
  29000.       0.   29000.       0.       0.    2642.       0.     773.     248.   1449.50
     .29      .00    10.98      .00     .035     .036     .035     .000  1422.00  1767.07
 .006916     195.     200.     235.        3        0        0      .00   453.86  2220.93

1490 NH CARD USED
*SECNO 10.490

3301 HV CHANGED MORE THAN HVINS


            NO CHANNEL INVERT IMPROVEMENTS

   10.49     8.68  1436.68      .00      .00  1437.90     1.22     2.48      .06  1445.80
  29000.       0.   29000.       0.       0.    3268.       0.     805.     253.   1447.00
     .30      .00     8.88      .00     .035     .039     .035     .000  1428.00  1751.51
 .004318     460.     460.     460.        2        0        0      .00   487.18  2238.69

1490 NH CARD USED
*SECNO 10.620

3301 HV CHANGED MORE THAN HVINS


            NO CHANNEL INVERT IMPROVEMENTS

   10.62     9.04  1439.04      .00      .00  1440.77     1.72     2.72      .15  1451.50
  29000.       0.   29000.       0.       0.    2753.       0.     847.     259.   1452.50
     .32      .00    10.53      .00     .035     .033     .035     .000  1430.00  1784.83
 .004604     575.     610.     645.        2        0        0      .00   431.35  2216.17

1490 NH CARD USED
*SECNO 10.700

3301 HV CHANGED MORE THAN HVINS

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

            NO CHANNEL INVERT IMPROVEMENTS

   10.70     9.45  1441.45  1441.45      .00  1444.20     2.75     2.38      .31  1455.00
  29000.       0.   29000.       0.       0.    2178.       0.     868.     263.   1453.00
     .33      .00    13.31      .00     .035     .032     .035     .000  1432.00  1794.20
 .009006     365.     380.     405.       20        8        0      .00   409.60  2203.80
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  SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
  TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST

1490 NH CARD USED
*SECNO 10.830

3301 HV CHANGED MORE THAN HVINS


            NO CHANNEL INVERT IMPROVEMENTS
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   10.83    11.83  1447.83      .00      .00  1449.38     1.55     5.05      .12  1459.00
  29000.       0.   29000.       0.       0.    2903.       0.     906.     270.   1459.00
     .34      .00     9.99      .00     .035     .038     .035     .000  1436.00  1741.70
 .006776     640.     650.     680.        2        0        0      .00   518.60  2260.30
0
1490 NH CARD USED
*SECNO 10.930

            NO CHANNEL INVERT IMPROVEMENTS
   10.93     9.47  1451.47      .00      .00  1453.21     1.73     3.78      .06  1463.00
  29000.       0.   29000.       0.       0.    2744.       0.     939.     275.   1463.00
     .36      .00    10.57      .00     .035     .039     .035     .000  1442.00  1746.13
 .008471     490.     500.     535.        2        0        0      .00   512.74  2258.87
0
1490 NH CARD USED
*SECNO 11.040

         END OF DIKE EXTENSION FROM CORPS DIKE ON THE RIGHT BANK ONLY
          CONFLUENCE OF BUCHANAN WASH AND SKUNK CREEK
            NO CHANNEL INVERT IMPROVEMENTS

   11.04     6.95  1454.95      .00      .00  1456.48     1.53     3.26      .02  1463.00
  29000.       0.   29000.       0.       0.    2920.       0.     971.     281.   1465.00
     .37      .00     9.93      .00     .035     .034     .035     .000  1448.00  1707.20
 .005165     530.     500.     510.        2        0        0      .00   512.60  2219.80
0
1490 NH CARD USED
*SECNO 11.100

3301 HV CHANGED MORE THAN HVINS

1
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         CROSS SECTION LOCATED BASED ON 1.5 TO 1 FLOW EXPANSION
         FROM CORPS DIKE ON THE LEFT BANK
            NO CHANNEL INVERT IMPROVEMENTS

   11.10     7.01  1457.01      .00      .00  1457.88      .87     1.33      .07  1465.00
  29000.       0.   29000.       0.       0.    3881.       0.    1000.     286.   1465.00
     .38      .00     7.47      .00     .035     .035     .035     .000  1450.00  1551.96
 .002693     395.     365.     365.        2        0        0      .00   632.06  2184.02
0
*SECNO 11.200

3301 HV CHANGED MORE THAN HVINS

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

         EFFECTIVE FLOW ASSUMED TO EXPAND AT 1.5 TO 1 FROM COE LEVEES.
              (ON LEFT BANK ONLY)
         INVERT AND SLOPE DETAILS FOR CORPS LEVEES TAKEN FROM AS BUILT PLANS

   11.20     6.93  1458.93  1458.93      .00  1462.28     3.35     1.20      .75  1467.00
  29000.       0.   29000.       0.       0.    1973.       0.    1027.     291.   1467.00
     .39      .00    14.70      .00     .035     .020     .035     .000  1452.00  1850.64
 .003202     520.     410.     470.       20        5        0      .00   298.71  2149.36
0
*SECNO 11.300
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3301 HV CHANGED MORE THAN HVINS

   11.30     9.04  1461.54      .00      .00  1463.45     1.91     1.03      .14  1469.00
  29000.       0.   29000.       0.       0.    2613.       0.    1055.     294.   1469.50
     .40      .00    11.10      .00     .035     .020     .035     .000  1452.50  1846.42
 .001309     528.     528.     528.        3        0        0      .00   307.15  2153.58

*SECNO 11.400

3301 HV CHANGED MORE THAN HVINS

   11.40     7.98  1461.98      .00      .00  1464.47     2.49      .84      .17  1471.50
  29000.       0.   29000.       0.       0.    2290.       0.    1085.     298.   1472.00
     .42      .00    12.66      .00     .035     .020     .035     .000  1454.00  1848.54
 .001990     528.     528.     528.        3        0        0      .00   302.92  2151.46
0
1
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                                                                        THIS RUN EXECUTED 12-08-90
 ***************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION AUGUST 1985
 ***************************************************


 T1      SKUNK CREEK HYDRAULIC ANALYSIS, ESTIMATE T.O.B. W/O CHANNEL INVERT
 T2      IMPROVEMENTS NORTH OF HAPPY VALLEY RD              **Q=39000 CFS**
 T3      RM 9.48 TO 10.35 W/INV. IMPROVEMENTS    NAME: SKUNK.HYD

 J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

       0.       5.       0.       0.  .000000      .00       .0       0.  1377.800    .000

 J2  NPROF    IPLOT    PRFVS    XSECV    XSECH     FN      ALLDC    IBW      CHNIM    ITRACE

     4.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000


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


 *PROF 4

 CCHV=    .100 CEHV=    .300
 *SECNO 8.690
 3720 CRITICAL DEPTH ASSUMED

          DURING MAJOR FLOODS, SKUNK CREEK IS EXPECTED TO FLOW OVER THE OVER-
          SHOOT OF THE CAP AT THE UPSTREAM END OF THE COE'S LEVEES
          ALL CROSSECTIONS WERE RECODED BY JIM HARRIS, HYDRAULICS SECTION
          (APRIL 1983).  THE PREVIOUS ONES WERE FOUND TO BE UNSATISFACTORY.
          CHANNEL CENTERLINE CORRESPONDS TO 2000 FEET.
          ALL MANNINGS "N" VALUES USED WERE OBTAINED FROM THE PREVIOUS
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        MODEL AS ASSIGNED BY CASKIE AND MASHBURN BASED ON FIELD
        OBSERVATION (FEB. 1983)
        THE VALUES FOR THE 10, 50, 100, AND 500 YEAR FLOODS ARE 15,000,29000,
        39,000, AND 85,000 CFS RESPECTIVELY (PER GRIGORIAN 5/23/83)

     8.69     8.44  1378.24  1378.24  1377.80  1379.34     1.10      .00      .00  1376.00
   39000.   11672.   12168.   15160.    1889.     955.    3222.       0.       0.   1376.00
      .00     6.18    12.75     4.71     .045     .035     .045     .000  1369.80   771.11
  .006997       0.       0.       0.        0        7        0      .00  2828.79  3599.90
0
*SECNO 8.750

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
     8.75    12.33  1383.33  1383.33      .00  1384.43     1.10     4.03      .00  1376.00
   39000.    8827.   20988.    9185.    1947.    1926.    2999.     114.      53.   1380.00
      .03     4.53    10.90     3.06     .045     .035     .045     .000  1371.00   717.45
  .004134     835.     739.     733.        2       11        0      .00  3210.50  3963.01
0
*SECNO 8.890
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     870.0    3730.0  TYPE=     1  TARGET=    2860.000
     8.89    10.06  1388.06  1388.06      .00  1389.09     1.04     3.29      .01  1384.00
   39000.    9384.   22673.    6943.    2317.    2209.    2266.     220.      98.   1384.00
      .06     4.05    10.27     3.06     .045     .035     .045     .000  1378.00   870.00
  .004833     565.     840.     650.        3       14        0      .00  2860.00  3730.00
0
1
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


*SECNO 8.965
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=    1085.0    3575.0  TYPE=     1  TARGET=    2490.000
     8.97     9.85  1390.85  1390.85      .00  1391.91     1.06     1.88      .01  1388.00
   39000.    9151.   23074.    6775.    2074.    2259.    1878.     274.     120.   1388.00
      .07     4.41    10.22     3.61     .045     .035     .045     .000  1381.00  1085.00
  .005296     275.     400.     410.        2        6        0      .00  2490.00  3575.00
0
*SECNO 9.050

3470 ENCROACHMENT STATIONS=    1370.0    3415.0  TYPE=     1  TARGET=    2045.000
     9.05    11.05  1393.05      .00      .00  1393.68      .63     1.72      .04  1388.00
   39000.    9703.   16281.   13016.    2202.    1867.    3720.     344.     141.   1390.00
      .09     4.41     8.72     3.50     .045     .035     .045     .000  1382.00  1370.00
  .002688     410.     550.     370.        2        0        0      .00  2045.00  3415.00
0
*SECNO 9.115

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
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3470 ENCROACHMENT STATIONS=        .0    3465.0  TYPE=     1  TARGET=    3464.999
     9.11      7.80  1394.30  1394.30      .00  1395.45     1.15     1.38      .16  1392.00
   39000.      808.   25631.   12561.     268.    2537.    2678.     395.     156.   1392.00
      .10      3.02    10.10     4.69     .045     .035     .045     .000  1386.50  1459.55
  .006666      350.     370.     300.        3       14        0      .00  2005.45  3465.00
0
*SECNO 9.210

3470 ENCROACHMENT STATIONS=    1385.0    2950.0  TYPE=     1  TARGET=    1565.000

          LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
          X3 USED TO DEFINE EFFECTIVE FLOW.

     9.21      8.93  1397.43      .00      .00  1398.55     1.12     3.09      .00  1394.00
   39000.     5142.   22573.   11285.    1187.    2186.    2179.     463.     177.   1394.00
      .12      4.33    10.32     5.18     .045     .035     .040     .000  1388.50  1385.00
  .004664      460.     600.     500.        2        0        0      .00  1565.00  2950.00
0
```



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

1490 NH CARD USED
*SECNO 9.310

3301 HV CHANGED MORE THAN HVINS

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

3470 ENCROACHMENT STATIONS=    1110.0    2560.0  TYPE=     1  TARGET=    1450.000

          LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
          X3 USED TO DEFINE EFFECTIVE FLOW.

     9.31      9.18  1401.18  1401.18      .00  1402.81     1.63     2.87      .15  1398.00
   39000.     9212.   20822.    8965.    2017.    1573.    1667.     527.     194.   1396.00
      .14      4.57    13.24     5.38     .045     .035     .050     .000  1392.00  1110.00
  .005653      400.     650.     480.       20        8        0      .00  1450.00  2560.00
0
1490 NH CARD USED
*SECNO 9.400

3470 ENCROACHMENT STATIONS=     980.0    2400.0  TYPE=     1  TARGET=    1420.000

          LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
          X3 USED TO DEFINE EFFECTIVE FLOW.

     9.40      9.79  1403.79      .00      .00  1405.29     1.50     2.47      .01  1402.00
   39000.    12395.   23910.    2694.    2403.    2014.     567.     577.     207.   1400.00
      .15      5.16    11.87     4.75     .040     .035     .044     .000  1394.00   980.00
  .005148      370.     510.     420.        2        0        0      .00  1420.00  2400.00

1490 NH CARD USED
*SECNO 9.480
3280 CROSS SECTION      9.48 EXTENDED       .00 FEET


3301 HV CHANGED MORE THAN HVINS
```

3470 ENCROACHMENT STATIONS= .0 2260.0 TYPE= 1 TARGET= 2259.999

RM 9.48 TO 11.2 MODIFIED
X3 CARD USED FOR RIGHT BANK,EFFECTIVE FLOW AREA ASSUMED
TO EXPAND AT 1.5 TO 1 FROM END OF RIGHT BANK LEVEE

9.48	7.00	1406.00	.00	.00	1408.34	2.34	2.80	.25	1409.00
39000.	0.	37984.	1016.	0.	3065.	180.	620.	217.	1402.00
.16	.00	12.39	5.64	.040	.034	.045	.000	1399.00	1711.99
.007036	370.	490.	420.	2	0	0	.00	548.01	2260.00

1490 NH CARD USED
*SECNO 9.560

ADDITIONAL SECTION ADDED TO REFINE AND REPRESENT THE
PROPOSED HYDRAULIC CONDITIONS

9.56	7.44	1407.94	.00	.00	1410.34	2.40	1.98	.02	1410.50
39000.	0.	39000.	0.	0.	3140.	0.	641.	220.	1410.50
.17	.00	12.42	.00	.040	.034	.045	.000	1400.50	1774.23
.006291	445.	300.	160.	2	0	0	.00	451.55	2225.77

1490 NH CARD USED
*SECNO 9.580

9.58	7.95	1408.95	.00	.00	1410.86	1.91	.47	.05	1461.00
39000.	0.	0.	39000.	0.	0.	3515.	648.	221.	1461.00
.17	.00	.00	11.09	.040	.034	.034	.000	1401.00	1760.17
.004248	145.	110.	75.	2	0	0	.00	473.65	2233.83

1490 NH CARD USED
*SECNO 9.670

9.67	7.72	1410.72	.00	.00	1412.54	1.82	1.67	.01	1413.00
39000.	0.	0.	39000.	0.	0.	3599.	681.	225.	1463.00
.18	.00	.00	10.84	.040	.034	.034	.000	1403.00	1749.10
.004221	430.	410.	395.	2	0	0	.00	496.80	2245.90

1490 NH CARD USED
*SECNO 9.750

3301 HV CHANGED MORE THAN HVINS

9.75	7.26	1411.76	1411.68	.00	1415.05	3.29	2.07	.44	1414.50
39000.	0.	0.	39000.	0.	0.	2679.	707.	229.	1464.50
.19	.00	.00	14.56	.040	.034	.034	.000	1404.50	1800.96
.008256	390.	370.	360.	6	11	0	.00	398.08	2199.04

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

1490 NH CARD USED
*SECNO 9.840

3301 HV CHANGED MORE THAN HVINS

```
    9.84     9.72  1415.72      .00      .00  1417.96     2.24     2.81      .10  1420.00
   39000.       0.   39000.       0.       0.    3244.       0.     739.     233.   1420.00
     .20      .00    12.02      .00     .040     .034     .034     .000  1406.00  1813.14
  .004318     475.     480.     485.        3        0        0      .00   372.72  2185.86
0
1490 NH CARD USED
*SECNO 9.940
    9.94     9.15  1418.15      .00      .00  1420.19     2.04     2.21      .02  1425.00
   39000.       0.   39000.       0.       0.    3399.       0.     779.     238.   1425.00
     .21      .00    11.47      .00     .040     .034     .034     .000  1409.00  1798.41
  .004187     495.     520.     545.        3        0        0      .00   408.18  2206.59
0
1490 NH CARD USED
*SECNO 10.040

3301 HV CHANGED MORE THAN HVINS

   10.04     7.48  1420.48      .00      .00  1423.57     3.08     3.06      .31  1428.00
   39000.       0.   39000.       0.       0.    2769.       0.     817.     243.   1428.00
     .22      .00    14.09      .00     .040     .034     .034     .000  1413.00  1800.06
  .008111     540.     540.     540.        2        0        0      .00   399.87  2199.94
0
1490 NH CARD USED
*SECNO 10.120

3301 HV CHANGED MORE THAN HVINS

   10.12     9.49  1423.99      .00      .00  1425.36     1.36     1.62      .17  1429.50
   39000.       0.   39000.       0.       0.    4163.       0.     848.     247.   1429.50
     .23      .00     9.37      .00     .040     .034     .034     .000  1414.50  1761.98
  .002624     415.     380.     350.        2        0        0      .00   476.03  2238.02
0
1490 NH CARD USED
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN       SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID      ENDST

*SECNO 10.210

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   10.21     6.20  1426.20  1426.20      .00  1429.17     2.97     2.05      .48  1435.00
   39000.       0.   39000.       0.       0.    2819.       0.     884.     252.   1435.00
     .24      .00    13.84      .00     .040     .035     .034     .000  1420.00  1760.21
  .009812     475.     450.     430.       20       14        0      .00   479.58  2239.79
0
1490 NH CARD USED
*SECNO 10.300
   10.30     7.24  1430.24      .00      .00  1432.87     2.63     3.66      .03  1438.00
   39000.       0.   39000.       0.       0.    2998.       0.     913.     256.   1438.00
     .25      .00    13.01      .00     .040     .034     .034     .000  1423.00  1778.03
  .007153     490.     440.     395.        2        0        0      .00   442.93  2220.97
0
CCHV=    .100 CEHV=    .300
*SECNO 10.350
```

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

HAPPY VALLEY ROAD

10.35	7.33	1432.10	1432.10	.00	1435.32	3.22	2.07	.18	1440.90
39000.	0.	39000.	0.	0.	2709.	0.	929.	259.	1441.48
.26	.00	14.40	.00	.035	.035	.035	.000	1424.77	1363.20
.009691	305.	250.	155.	3	5	0	.00	422.28	1785.48

0
1490 NH CARD USED
*SECNO 10.400

3301 HV CHANGED MORE THAN HVINS

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NO CHANNEL INVERT IMPROVEMENTS

10.40	12.81	1434.81	.00	.00	1437.05	2.24	1.63	.10	1447.00
39000.	0.	39000.	0.	0.	3249.	0.	943.	261.	1449.50
.26	.00	12.00	.00	.035	.038	.035	.000	1422.00	1761.78
.006955	195.	200.	235.	3	0	0	.00	464.43	2226.22

0
1490 NH CARD USED
*SECNO 10.490

3301 HV CHANGED MORE THAN HVINS

NO CHANNEL INVERT IMPROVEMENTS

10.49	10.09	1438.09	.00	.00	1439.59	1.50	2.47	.07	1445.80
39000.	0.	39000.	0.	0.	3965.	0.	981.	266.	1447.00
.28	.00	9.84	.00	.035	.039	.035	.000	1428.00	1745.85
.004268	460.	460.	460.	2	0	0	.00	498.50	2244.35

0
1490 NH CARD USED
*SECNO 10.620

3301 HV CHANGED MORE THAN HVINS

NO CHANNEL INVERT IMPROVEMENTS

10.62	10.37	1440.37	.00	.00	1442.50	2.12	2.72	.19	1451.50
39000.	0.	39000.	0.	0.	3335.	0.	1032.	273.	1452.50
.29	.00	11.69	.00	.035	.033	.035	.000	1430.00	1779.49
.004663	575.	610.	645.	2	0	0	.00	442.01	2221.51

0
1490 NH CARD USED
*SECNO 10.700

3301 HV CHANGED MORE THAN HVINS

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

NO CHANNEL INVERT IMPROVEMENTS

```
  10.70    10.66  1442.66  1442.66      .00  1445.95     3.29     2.38      .35  1455.00
 39000.       0.  39000.       0.       0.    2680.       0.    1058.     276.   1453.00
    .30      .00    14.55      .00     .035     .033     .035     .000  1432.00  1789.36
.008877     365.     380.     405.       20        8        0      .00   419.28  2208.64
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 SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
 Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
 TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
 SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST

1490 NH CARD USED
*SECNO 10.830

3301 HV CHANGED MORE THAN HVINS


            NO CHANNEL INVERT IMPROVEMENTS

  10.83    13.18  1449.18      .00      .00  1450.99     1.81     4.89      .15  1459.00
 39000.       0.  39000.       0.       0.    3615.       0.    1105.     283.   1459.00
    .31      .00    10.79      .00     .035     .040     .035     .000  1436.00  1736.26
.006466     640.     650.     680.        2        0        0      .00   529.47  2265.74

1490 NH CARD USED
*SECNO 10.930

            NO CHANNEL INVERT IMPROVEMENTS
  10.93    10.66  1452.66      .00      .00  1454.75     2.09     3.67      .08  1463.00
 39000.       0.  39000.       0.       0.    3362.       0.    1145.     290.   1463.00
    .33      .00    11.60      .00     .035     .041     .035     .000  1442.00  1741.35
.008428     490.     500.     535.        2        0        0      .00   522.30  2263.65

1490 NH CARD USED
*SECNO 11.040

         END OF DIKE EXTENSION FROM CORPS DIKE ON THE RIGHT BANK ONLY
          CONFLUENCE OF BUCHANAN WASH AND SKUNK CREEK
            NO CHANNEL INVERT IMPROVEMENTS


  11.04     8.10  1456.10      .00      .00  1458.01     1.91     3.24      .02  1463.00
 39000.       0.  39000.       0.       0.    3513.       0.    1185.     296.   1465.00
    .34      .00    11.10      .00     .035     .034     .035     .000  1448.00  1702.61
.005146     530.     500.     510.        2        0        0      .00   521.79  2224.39

1490 NH CARD USED
*SECNO 11.100

3301 HV CHANGED MORE THAN HVINS
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         CROSS SECTION LOCATED BASED ON 1.5 TO 1 FLOW EXPANSION
         FROM CORPS DIKE ON THE LEFT BANK
            NO CHANNEL INVERT IMPROVEMENTS


  11.10     8.32  1458.32      .00      .00  1459.39     1.06     1.29      .09  1465.00
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  39000.      0.   39000.      0.      0.   4718.      0.   1219.    300.   1465.00
     .35     .00     8.27     .00    .035    .034    .035    .000  1450.00  1546.70
 .002572    395.    365.    365.       2       0       0     .00   639.95  2186.65
0
*SECNO 11.200

3301 HV CHANGED MORE THAN HVINS

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

        EFFECTIVE FLOW ASSUMED TO EXPAND AT 1.5 TO 1 FROM COE LEVEES.
            (ON LEFT BANK ONLY)
        INVERT AND SLOPE DETAILS FOR CORPS LEVEES TAKEN FROM AS BUILT PLANS

   11.20     8.44  1460.44  1460.44     .00  1464.44    4.00    1.13     .88  1467.00
  39000.      0.   39000.      0.      0.    2431.      0.   1253.    305.   1467.00
     .36     .00    16.04     .00    .035    .020    .035    .000  1452.00  1847.61
 .002977    520.    410.    470.      20       5       0     .00   304.78  2152.39
0
*SECNO 11.300

3301 HV CHANGED MORE THAN HVINS

   11.30    10.70  1463.20     .00     .00  1465.61    2.42    1.02     .16  1469.00
  39000.      0.   39000.      0.      0.    3125.      0.   1287.    309.   1469.50
     .37     .00    12.48     .00    .035    .020    .035    .000  1452.50  1843.13
 .001345    528.    528.    528.       3       0       0     .00   313.75  2156.87
0
*SECNO 11.400

3301 HV CHANGED MORE THAN HVINS

   11.40     9.60  1463.60     .00     .00  1466.64    3.04     .84     .19  1471.50
  39000.      0.   39000.      0.      0.    2788.      0.   1323.    312.   1472.00
     .38     .00    13.99     .00    .035    .020    .035    .000  1454.00  1845.29
 .001928    528.    528.    528.       3       0       0     .00   309.42  2154.71
0
1
 12-08-90     16:18:37                                                          PAGE   46


                                                                THIS RUN EXECUTED 12-08-90
*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION AUGUST 1985
*************************************************


T1      SKUNK CREEK HYDRAULIC ANALYSIS, ESTIMATE T.O.B. W/O CHANNEL INVERT
T2      IMPROVEMENTS NORTH OF HAPPY VALLEY RD              **Q=85000 CFS**
T3      RM 9.48 TO 10.35 W/INV. IMPROVEMENTS    NAME: SKUNK.HYD

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       6.       0.       0.   .000000     .00      .0       0.  1377.800    .000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    15.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000
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  SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
  TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN       SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID      ENDST


*PROF 5

CCHV=    .100 CEHV=    .300
*SECNO 8.690
3720 CRITICAL DEPTH ASSUMED

         DURING MAJOR FLOODS, SKUNK CREEK IS EXPECTED TO FLOW OVER THE OVER-
         SHOOT OF THE CAP AT THE UPSTREAM END OF THE COE'S LEVEES
         ALL CROSSECTIONS WERE RECODED BY JIM HARRIS, HYDRAULICS SECTION
         (APRIL 1983).  THE PREVIOUS ONES WERE FOUND TO BE UNSATISFACTORY.
         CHANNEL CENTERLINE CORRESPONDS TO 2000 FEET.
         ALL MANNINGS "N" VALUES USED WERE OBTAINED FROM THE PREVIOUS
         MODEL AS ASSIGNED BY CASKIE AND MASHBURN BASED ON FIELD
         OBSERVATION (FEB. 1983)
         THE VALUES FOR THE 10, 50, 100, AND 500 YEAR FLOODS ARE 15,000,29000,
         39,000, AND 85,000 CFS RESPECTIVELY (PER GRIGORIAN 5/23/83)

    8.69     9.89  1379.69  1379.69  1377.80  1381.16     1.47      .00      .00  1376.00
   85000.   27600.   18400.   39000.    3829.    1156.    5542.       0.       0.   1376.00
     .00     7.21    15.92     7.04     .045     .035     .045     .000  1369.80   508.14
  .008452       0.       0.       0.        0       10        0      .00  3330.82  3838.96
0
*SECNO 8.750
    8.75    13.83  1384.83      .00      .00  1386.25     1.42     5.09      .00  1376.00
   85000.   22286.   31851.   30863.    3812.    2286.    6013.     200.      62.   1380.00
     .02     5.85    13.93     5.13     .045     .035     .045     .000  1371.00   472.53
  .005374     835.     739.     733.        2        0        0      .00  3635.77  4108.29
0
*SECNO 8.890
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     870.0    3730.0  TYPE=     1  TARGET=    2860.000
    8.89    11.55  1389.55  1389.55      .00  1391.04     1.48     4.04      .02  1384.00
   85000.   24369.   36209.   24422.    3861.    2719.    4500.     376.     109.   1384.00
     .05     6.31    13.32     5.43     .045     .035     .045     .000  1378.00   870.00
  .006169     565.     840.     650.        2       10        0      .00  2860.00  3730.00
0
*SECNO 8.965
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  SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
  TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN       SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID      ENDST


3280 CROSS SECTION      8.97 EXTENDED       .41 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=    1085.0    3575.0  TYPE=     1  TARGET=    2490.000
    8.97    11.41  1392.41  1392.41      .00  1394.06     1.65     2.39      .05  1388.00
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   85000.   23610.   38582.   22808.    3429.    2843.    3817.     464.     131.   1388.00
     .06     6.88    13.57     5.97     .045     .035     .045     .000  1381.00  1085.00
  .006877    275.     400.     410.        2        6        0      .00  2490.00  3575.00
0
*SECNO 9.050
3280 CROSS SECTION      9.05 EXTENDED      1.19 FEET


3301 HV CHANGED MORE THAN HVINS


3470 ENCROACHMENT STATIONS=    1370.0    3415.0  TYPE=     1  TARGET=    2045.000
    9.05    13.19  1395.19      .00      .00  1396.21     1.02     2.09      .06  1388.00
   85000.   21653.   27055.   36292.    3349.    2371.    6453.     572.     153.   1390.00
     .07     6.47    11.41     5.62     .045     .035     .045     .000  1382.00  1370.00
  .003347    410.     550.     370.        2        0        0      .00  2045.00  3415.00
0
*SECNO 9.115

3470 ENCROACHMENT STATIONS=       .0    3465.0  TYPE=     1  TARGET=    3464.999
    9.11     9.87  1396.37      .00      .00  1397.80     1.43     1.46      .12  1392.00
   85000.    7690.   42951.   34360.    1943.    3596.    5097.     659.     171.   1392.00
     .08     3.96    11.94     6.74     .045     .035     .045     .000  1386.50   608.47
  .005854    350.     370.     300.        3        0        0      .00  2856.53  3465.00
0
*SECNO 9.210

3301 HV CHANGED MORE THAN HVINS


3470 ENCROACHMENT STATIONS=    1385.0    2950.0  TYPE=     1  TARGET=    1565.000

         LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
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         X3 USED TO DEFINE EFFECTIVE FLOW.

    9.21    10.79  1399.29      .00      .00  1401.30     2.01     3.33      .18  1394.00
   85000.   14883.   39856.   30261.    2085.    2794.    3601.     774.     197.   1394.00
     .10     7.14    14.26     8.40     .045     .035     .040     .000  1388.50  1385.00
  .006416    460.     600.     500.        2        0        0      .00  1565.00  2950.00
0
1490 NH CARD USED
*SECNO 9.310
3280 CROSS SECTION      9.31 EXTENDED      1.29 FEET


3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=    1110.0    2560.0  TYPE=     1  TARGET=    1450.000

         LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
         X3 USED TO DEFINE EFFECTIVE FLOW.

    9.31    11.29  1403.29  1403.29      .00  1405.80     2.51     3.66      .15  1398.00
   85000.   29213.   34379.   21409.    3748.    1963.    2607.     870.     213.   1396.00
     .11     7.80    17.51     8.21     .045     .035     .050     .000  1392.00  1110.00
  .007357    400.     650.     480.        3        8        0      .00  1450.00  2560.00

1490 NH CARD USED
*SECNO 9.400
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3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=     980.0    2400.0  TYPE=     1  TARGET=    1420.000

         LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
         X3 USED TO DEFINE EFFECTIVE FLOW.

     9.40    12.57  1406.57      .00      .00  1408.39     1.82     2.52      .07  1402.00
    85000.   39246.   37819.    7936.    5081.    2739.    1125.     953.     226.   1400.00
      .12     7.72    13.81     7.06     .040     .035     .044     .000  1394.00   980.00
   .004619    370.     510.     420.        2        0        0      .00  1420.00  2400.00
0
1490 NH CARD USED
*SECNO 9.480
1
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST

3280 CROSS SECTION      9.48 EXTENDED      3.26 FEET

3301 HV CHANGED MORE THAN HVINS

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

3470 ENCROACHMENT STATIONS=         .0    2260.0  TYPE=     1  TARGET=    2259.999

         RM 9.48 TO 11.2 MODIFIED
         X3 CARD USED FOR RIGHT BANK,EFFECTIVE FLOW AREA ASSUMED
         TO EXPAND AT 1.5 TO 1 FROM END OF RIGHT BANK LEVEE

     9.48    10.26  1409.26  1409.26      .00  1413.83     4.57     2.73      .83  1409.00
    85000.       0.   81429.    3571.       0.    4676.     376.    1024.     236.   1402.00
      .13      .00    17.41     9.50     .040     .034     .045     .000  1399.00  1700.00
   .008030    370.     490.     420.       20       15        0      .00   560.00  2260.00

1490 NH CARD USED
*SECNO 9.560
3280 CROSS SECTION      9.56 EXTENDED       .83 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

         ADDITIONAL SECTION ADDED TO REFINE AND REPRESENT THE
         PROPOSED HYDRAULIC CONDITIONS

     9.56    10.83  1411.33  1411.33      .00  1416.38     5.06     2.28      .15  1410.50
    85000.       0.   85000.       0.       0.    4711.       0.    1057.     239.   1410.50
      .13      .00    18.04      .00     .040     .033     .045     .000  1400.50  1764.00
   .007364    445.     300.     160.        3        8        0      .00   472.00  2236.00

1490 NH CARD USED
*SECNO 9.580
3280 CROSS SECTION      9.58 EXTENDED      2.76 FEET

1
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  SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
  TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


3301 HV CHANGED MORE THAN HVINS

    9.58    12.76  1413.76      .00      .00  1417.04     3.27      .47      .18  1461.00
   85000.       0.       0.   85000.       0.       0.   5853.    1068.     240.   1461.00
     .14      .00      .00    14.52     .040     .033     .033     .000  1401.00  1752.00
  .003777     145.     110.      75.        5        0        0      .00   490.00  2242.00
0
1490 NH CARD USED
*SECNO 9.670
3280 CROSS SECTION      9.67 EXTENDED      2.42 FEET

    9.67    12.42  1415.42      .00      .00  1418.54     3.12     1.49      .02  1413.00
   85000.       0.       0.   85000.       0.       0.   5994.    1122.     245.   1463.00
     .14      .00      .00    14.18     .040     .033     .033     .000  1403.00  1740.00
  .003751     430.     410.     395.        3        0        0      .00   515.00  2255.00
0
1490 NH CARD USED
*SECNO 9.750
3280 CROSS SECTION      9.75 EXTENDED      1.79 FEET


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
    9.75    11.79  1416.29  1416.29      .00  1421.70     5.41     1.79      .69  1414.50
   85000.       0.       0.   85000.       0.       0.   4553.    1165.     249.   1464.50
     .15      .00      .00    18.67     .040     .033     .033     .000  1404.50  1790.00
  .006944     390.     370.     360.       20        8        0      .00   420.00  2210.00
0
1490 NH CARD USED
*SECNO 9.840
3280 CROSS SECTION      9.84 EXTENDED       .00 FEET


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
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  SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
  TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


3710 WSEL ASSUMED BASED ON MIN DIFF
    9.84    14.00  1420.00  1418.86      .00  1424.65     4.65     2.76      .84  1420.00
   85000.       0.   85000.       0.       0.   4914.       0.    1218.     253.   1420.00
     .16      .00    17.30      .00     .040     .031     .033     .000  1406.00  1796.00
  .004793     475.     480.     485.       20        8        0      .00   407.00  2203.00
0
1490 NH CARD USED
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*SECNO 9.940

3301 HV CHANGED MORE THAN HVINS

    9.94    14.63  1423.63      .00      .00  1427.01     3.39     2.24      .13  1425.00
   85000.       0.   85000.       0.       0.    5754.       0.    1281.     259.   1425.00
     .17      .00    14.77      .00     .040     .034     .033     .000  1409.00  1776.51
  .003900     495.     520.     545.        3        0        0      .00   451.98  2228.49

1490 NH CARD USED
*SECNO 10.040

3301 HV CHANGED MORE THAN HVINS

   10.04    12.33  1425.33      .00      .00  1430.20     4.87     2.74      .44  1428.00
   85000.       0.   85000.       0.       0.    4802.       0.    1347.     264.   1428.00
     .17      .00    17.70      .00     .040     .034     .033     .000  1413.00  1780.67
  .006877     540.     540.     540.        3        0        0      .00   438.67  2219.33

1490 NH CARD USED
*SECNO 10.120
3280 CROSS SECTION     10.12 EXTENDED       .00 FEET


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF
   10.12    15.00  1429.50  1425.25      .00  1431.86     2.35     1.37     1.49  1429.50
   85000.       0.   85000.       0.       0.    6902.       0.    1398.     268.   1429.50
     .18      .00    12.32      .00     .040     .032     .033     .000  1414.50  1740.00
  .002226     415.     380.     350.       20       11        0      .00   520.00  2260.00
0
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


1490 NH CARD USED
*SECNO 10.210

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   10.21    10.29  1430.29  1430.29      .00  1435.06     4.77     1.74      .73  1435.00
   85000.       0.   85000.       0.       0.    4849.       0.    1458.     274.   1435.00
     .19      .00    17.53      .00     .040     .034     .033     .000  1420.00  1743.84
  .008266     475.     450.     430.       20       14        0      .00   512.33  2256.16

1490 NH CARD USED
*SECNO 10.300
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   10.30    10.99  1433.99  1433.99      .00  1439.04     5.04     3.60      .08  1438.00
   85000.       0.   85000.       0.       0.    4717.       0.    1507.     279.   1438.00
     .20      .00    18.02      .00     .040     .034     .033     .000  1423.00  1763.02
  .008115     490.     440.     395.        2        8        0      .00   472.96  2235.98

CCHV=    .100 CEHV=    .300
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*SECNO 10.350
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

HAPPY VALLEY ROAD

10.35	11.77	1436.54	1436.54	.00	1441.70	5.15	2.06	.03	1440.90
85000.	0.	85000.	0.	0.	4665.	0.	1534.	281.	1441.48
.20	.00	18.22	.00	.035	.035	.035	.000	1424.77	1345.42
.008398	305.	250.	155.	3	8	0	.00	457.84	1803.26

0
1490 NH CARD USED
*SECNO 10.400

3301 HV CHANGED MORE THAN HVINS

1
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NO CHANNEL INVERT IMPROVEMENTS

10.40	17.85	1439.85	.00	.00	1443.31	3.46	1.44	.17	1447.00
85000.	0.	85000.	0.	0.	5691.	0.	1557.	283.	1449.50
.20	.00	14.94	.00	.035	.039	.035	.000	1422.00	1741.62
.006277	195.	200.	235.	4	0	0	.00	504.76	2246.38

0
1490 NH CARD USED
*SECNO 10.490

3301 HV CHANGED MORE THAN HVINS

NO CHANNEL INVERT IMPROVEMENTS

10.49	15.15	1443.15	.00	.00	1445.73	2.58	2.33	.09	1445.80
85000.	0.	85000.	0.	0.	6589.	0.	1622.	289.	1447.00
.21	.00	12.90	.00	.035	.039	.035	.000	1428.00	1725.62
.004168	460.	460.	460.	2	0	0	.00	538.97	2264.58

0
1490 NH CARD USED
*SECNO 10.620

3301 HV CHANGED MORE THAN HVINS

NO CHANNEL INVERT IMPROVEMENTS

10.62	15.09	1445.09	.00	.00	1448.79	3.70	2.73	.33	1451.50
85000.	0.	85000.	0.	0.	5509.	0.	1707.	296.	1452.50
.23	.00	15.43	.00	.035	.034	.035	.000	1430.00	1760.62
.004804	575.	610.	645.	3	0	0	.00	479.75	2240.38

0
1490 NH CARD USED
*SECNO 10.700

3301 HV CHANGED MORE THAN HVINS

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

NO CHANNEL INVERT IMPROVEMENTS

10.70	15.19	1447.19	1447.19	.00	1452.35	5.17	2.32	.44	1455.00

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  85000.       0.   85000.       0.       0.    4660.       0.    1751.     300.   1453.00
     .23      .00    18.24      .00     .035     .034     .035     .000  1432.00  1771.25
 .008017     365.     380.     405.       20        5        0      .00   455.51  2226.75
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  SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
  TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN       SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID      ENDST

1490 NH CARD USED
*SECNO 10.830

3301 HV CHANGED MORE THAN HVINS


            NO CHANNEL INVERT IMPROVEMENTS

   10.83    18.14  1454.14      .00      .00  1456.93     2.79     4.34      .24  1459.00
  85000.       0.   85000.       0.       0.    6338.       0.    1833.     308.   1459.00
     .24      .00    13.41      .00     .035     .041     .035     .000  1436.00  1716.44
 .005654     640.     650.     680.        3        0        0      .00   569.13  2285.56

1490 NH CARD USED
*SECNO 10.930

3301 HV CHANGED MORE THAN HVINS


            NO CHANNEL INVERT IMPROVEMENTS
   10.93    15.03  1457.03      .00      .00  1460.46     3.42     3.33      .19  1463.00
  85000.       0.   85000.       0.       0.    5725.       0.    1903.     314.   1463.00
     .25      .00    14.85      .00     .035     .042     .035     .000  1442.00  1723.84
 .007982     490.     500.     535.        2        0        0      .00   557.31  2281.16

1490 NH CARD USED
*SECNO 11.040

         END OF DIKE EXTENSION FROM CORPS DIKE ON THE RIGHT BANK ONLY
          CONFLUENCE OF BUCHANAN WASH AND SKUNK CREEK
            NO CHANNEL INVERT IMPROVEMENTS


   11.04    12.21  1460.21      .00      .00  1463.63     3.42     3.17      .00  1463.00
  85000.       0.   85000.       0.       0.    5726.       0.    1968.     321.   1465.00
     .26      .00    14.84      .00     .035     .034     .035     .000  1448.00  1686.16
 .005159     530.     500.     510.        2        0        0      .00   554.68  2240.84

1490 NH CARD USED
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  SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
  TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN       SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID      ENDST


*SECNO 11.100

3301 HV CHANGED MORE THAN HVINS
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          CROSS SECTION LOCATED BASED ON 1.5 TO 1 FLOW EXPANSION
          FROM CORPS DIKE ON THE LEFT BANK
             NO CHANNEL INVERT IMPROVEMENTS

    11.10    13.20  1463.20      .00      .00  1464.99     1.79     1.20      .16  1465.00
   85000.       0.   85000.       0.       0.    7911.       0.    2025.     326.   1465.00
      .27      .00    10.74      .00     .035     .034     .035     .000  1450.00  1527.19
  .002278     395.     365.     365.        2        0        0      .00   669.22  2196.41
0
 *SECNO 11.200

 3301 HV CHANGED MORE THAN HVINS

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

          EFFECTIVE FLOW ASSUMED TO EXPAND AT 1.5 TO 1 FROM COE LEVEES.
               (ON LEFT BANK ONLY)
          INVERT AND SLOPE DETAILS FOR CORPS LEVEES TAKEN FROM AS BUILT PLANS

    11.20    13.95  1465.95  1465.95      .00  1472.40     6.45     1.00     1.40  1467.00
   85000.       0.   85000.       0.       0.    4170.       0.    2082.     331.   1467.00
      .28      .00    20.38      .00     .035     .020     .035     .000  1452.00  1836.60
  .002591     520.     410.     470.       20        8        0      .00   326.81  2163.40
0
 *SECNO 11.300
 3280 CROSS SECTION     11.30 EXTENDED       .30 FEET


 3301 HV CHANGED MORE THAN HVINS

    11.30    16.81  1469.31      .00      .00  1473.59     4.28      .97      .22  1469.00
   85000.       0.   85000.       0.       0.    5117.       0.    2139.     335.   1469.50
      .29      .00    16.61      .00     .035     .020     .035     .000  1452.50  1831.50
  .001376     528.     528.     528.        4        0        0      .00   337.60  2169.10
0
1
 12-08-90     16:18:37                                                                    PAGE   57


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


 *SECNO 11.400

 3301 HV CHANGED MORE THAN HVINS

    11.40    15.59  1469.59      .00      .00  1474.64     5.06      .82      .23  1471.50
   85000.       0.   85000.       0.       0.    4711.       0.    2198.     339.   1472.00
      .30      .00    18.04      .00     .035     .020     .035     .000  1454.00  1833.32
  .001777     528.     528.     528.        3        0        0      .00   333.36  2166.68
0
1
 12-08-90     16:18:37                                                                    PAGE   58


                                                                    THIS RUN EXECUTED 12-08-90
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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION AUGUST 1985
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

RM 9.48 TO 10.35 W/INV

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	8.690	.00	.00	.00	1369.80	6800.00	1377.80	.00	1377.85	3.44	2.70	4968.94	3668.00
	8.690	.00	.00	.00	1369.80	15000.00	1377.80	.00	1378.06	16.72	5.96	4968.94	3668.00
	8.690	.00	.00	.00	1369.80	29000.00	1377.80	.00	1378.77	62.51	11.53	4968.94	3668.00
*	8.690	.00	.00	.00	1369.80	39000.00	1378.24	1378.24	1379.34	69.97	12.75	6064.83	4662.50
*	8.690	.00	.00	.00	1369.80	85000.00	1379.69	1379.69	1381.16	84.52	15.92	10527.02	9245.72
*	8.750	739.00	.00	.00	1371.00	6800.00	1378.24	1378.24	1379.61	112.65	9.46	743.36	640.68
*	8.750	739.00	.00	.00	1371.00	15000.00	1380.24	1380.24	1381.99	82.85	11.16	1589.43	1647.92
*	8.750	739.00	.00	.00	1371.00	29000.00	1382.82	1382.82	1383.84	37.35	9.91	5291.62	4745.36
*	8.750	739.00	.00	.00	1371.00	39000.00	1383.33	1383.33	1384.43	41.34	10.90	6871.51	6065.57
	8.750	739.00	.00	.00	1371.00	85000.00	1384.83	.00	1386.25	53.74	13.93	12111.36	11594.65
	8.890	840.00	.00	.00	1378.00	6800.00	1384.75	.00	1385.34	44.87	6.16	1148.28	1015.20
	8.890	840.00	.00	.00	1378.00	15000.00	1386.27	1385.44	1387.34	52.31	8.62	2147.72	2074.02
*	8.890	840.00	.00	.00	1378.00	29000.00	1387.61	1387.61	1388.53	43.16	9.25	5520.02	4414.26
*	8.890	840.00	.00	.00	1378.00	39000.00	1388.06	1388.06	1389.09	48.33	10.27	6791.17	5609.63
*	8.890	840.00	.00	.00	1378.00	85000.00	1389.55	1389.55	1391.04	61.69	13.32	11080.12	10822.38
	8.965	400.00	.00	.00	1381.00	6800.00	1387.01	.00	1388.01	98.32	8.03	846.68	685.80
*	8.965	400.00	.00	.00	1381.00	15000.00	1388.99	1388.99	1389.92	57.47	8.31	2444.66	1978.64
*	8.965	400.00	.00	.00	1381.00	29000.00	1390.28	1390.28	1391.28	52.08	9.49	4803.52	4018.58
*	8.965	400.00	.00	.00	1381.00	39000.00	1390.85	1390.85	1391.91	52.96	10.22	6210.22	5359.17
*	8.965	400.00	.00	.00	1381.00	85000.00	1392.41	1392.41	1394.06	68.77	13.57	10089.60	10249.73
	9.050	550.00	.00	.00	1382.00	6800.00	1389.79	.00	1390.22	21.27	5.52	1560.29	1474.60
	9.050	550.00	.00	.00	1382.00	15000.00	1391.22	.00	1391.67	21.64	6.57	4034.87	3224.22
	9.050	550.00	.00	.00	1382.00	29000.00	1392.44	.00	1392.98	24.26	7.86	6541.94	5887.57
	9.050	550.00	.00	.00	1382.00	39000.00	1393.05	.00	1393.68	26.88	8.72	7788.61	7522.88
	9.050	550.00	.00	.00	1382.00	85000.00	1395.19	.00	1396.21	33.47	11.41	12172.43	14691.89

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	9.115	370.00	.00	.00	1386.50	6800.00	1390.98	.00	1391.87	109.33	7.55	900.79	650.35
*	9.115	370.00	.00	.00	1386.50	15000.00	1392.66	1392.66	1393.52	68.77	7.86	2491.46	1808.76
*	9.115	370.00	.00	.00	1386.50	29000.00	1393.70	1393.70	1394.75	68.55	9.40	4346.10	3502.62
*	9.115	370.00	.00	.00	1386.50	39000.00	1394.30	1394.30	1395.45	66.66	10.10	5483.30	4776.70
	9.115	370.00	.00	.00	1386.50	85000.00	1396.37	.00	1397.80	58.54	11.94	10635.84	11109.52
	9.210	600.00	.00	.00	1388.50	6800.00	1394.43	.00	1394.86	27.97	5.39	1373.09	1285.66
	9.210	600.00	.00	.00	1388.50	15000.00	1395.66	.00	1396.35	35.64	7.37	2842.81	2512.53
	9.210	600.00	.00	.00	1388.50	29000.00	1396.83	.00	1397.77	42.46	9.26	4615.10	4450.31
	9.210	600.00	.00	.00	1388.50	39000.00	1397.43	.00	1398.55	46.64	10.32	5551.77	5710.88
	9.210	600.00	.00	.00	1388.50	85000.00	1399.29	.00	1401.30	64.16	14.26	8479.84	10611.45

9.310	650.00	.00	.00	1392.00	6800.00	1396.59	.00	1397.94	76.28	9.33	732.92	778.58
* 9.310	650.00	.00	.00	1392.00	15000.00	1399.34	1399.34	1400.43	39.55	9.41	2590.08	2385.23
* 9.310	650.00	.00	.00	1392.00	29000.00	1400.55	1400.55	1401.97	50.46	11.89	4352.14	4082.67
* 9.310	650.00	.00	.00	1392.00	39000.00	1401.18	1401.18	1402.81	56.53	13.24	5256.62	5187.29
* 9.310	650.00	.00	.00	1392.00	85000.00	1403.29	1403.29	1405.80	73.57	17.51	8317.15	9910.19
9.400	510.00	.00	.00	1394.00	6800.00	1399.78	.00	1400.47	33.38	6.70	1015.30	1176.94
9.400	510.00	.00	.00	1394.00	15000.00	1401.41	1401.17	1402.72	52.49	9.66	1933.47	2070.38
* 9.400	510.00	.00	.00	1394.00	29000.00	1403.03	1403.03	1404.45	51.68	11.11	3910.73	4033.89
9.400	510.00	.00	.00	1394.00	39000.00	1403.79	.00	1405.29	51.48	11.87	4983.70	5435.82
9.400	510.00	.00	.00	1394.00	85000.00	1406.57	.00	1408.39	46.19	13.81	8944.52	12506.24
9.480	490.00	.00	.00	1399.00	6800.00	1402.04	.00	1402.57	55.88	5.85	1162.79	909.68
9.480	490.00	.00	.00	1399.00	15000.00	1404.10	.00	1404.84	35.26	6.94	2206.83	2526.05
9.480	490.00	.00	.00	1399.00	29000.00	1405.41	.00	1407.00	54.43	10.22	2920.86	3930.88
9.480	490.00	.00	.00	1399.00	39000.00	1406.00	.00	1408.34	70.36	12.39	3244.74	4649.33
* 9.480	490.00	.00	.00	1399.00	85000.00	1409.26	1409.26	1413.83	80.30	17.41	5052.24	9485.63
9.560	300.00	.00	.00	1400.50	6800.00	1403.52	.00	1404.00	40.73	5.58	1218.81	1065.50
9.560	300.00	.00	.00	1400.50	15000.00	1405.15	.00	1406.11	45.94	7.85	1910.14	2213.01
9.560	300.00	.00	.00	1400.50	29000.00	1406.93	.00	1408.74	57.40	10.80	2684.12	3827.69
9.560	300.00	.00	.00	1400.50	39000.00	1407.94	.00	1410.34	62.91	12.42	3139.52	4917.01
* 9.560	300.00	.00	.00	1400.50	85000.00	1411.33	1411.33	1416.38	73.64	18.04	4710.64	9905.43
9.580	110.00	.00	.00	1401.00	6800.00	1403.90	.00	1404.38	41.27	.00	1223.02	1058.55
9.580	110.00	.00	.00	1401.00	15000.00	1405.63	.00	1406.52	40.87	.00	1983.01	2346.28
9.580	110.00	.00	.00	1401.00	29000.00	1407.70	.00	1409.22	42.69	.00	2926.76	4438.51
9.580	110.00	.00	.00	1401.00	39000.00	1408.95	.00	1410.86	42.48	.00	3515.47	5983.53
9.580	110.00	.00	.00	1401.00	85000.00	1413.76	.00	1417.04	37.77	.00	5853.48	13831.08
9.670	410.00	.00	.00	1403.00	6800.00	1405.66	.00	1406.17	49.45	.00	1184.58	966.99
9.670	410.00	.00	.00	1403.00	15000.00	1407.32	.00	1408.24	46.17	.00	1954.00	2207.52
9.670	410.00	.00	.00	1403.00	29000.00	1409.45	.00	1410.93	43.45	.00	2975.05	4399.42
9.670	410.00	.00	.00	1403.00	39000.00	1410.72	.00	1412.54	42.21	.00	3598.82	6002.91
9.670	410.00	.00	.00	1403.00	85000.00	1415.42	.00	1418.54	37.51	.00	5994.31	13878.42

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
9.750	370.00	.00	.00	1404.50	6800.00	1407.45	.00	1408.11	56.29	.00	1036.11	906.34
9.750	370.00	.00	.00	1404.50	15000.00	1408.97	.00	1410.34	65.47	.00	1601.50	1853.90
9.750	370.00	.00	.00	1404.50	29000.00	1410.77	.00	1413.26	75.89	.00	2291.58	3329.03
9.750	370.00	.00	.00	1404.50	39000.00	1411.76	1411.68	1415.05	82.56	.00	2679.19	4292.13
* 9.750	370.00	.00	.00	1404.50	85000.00	1416.29	1416.29	1421.70	69.44	.00	4552.94	10199.99
9.840	480.00	.00	.00	1406.00	6800.00	1409.71	.00	1410.25	35.44	5.92	1148.50	1142.30
9.840	480.00	.00	.00	1406.00	15000.00	1411.72	.00	1412.78	39.39	8.24	1819.39	2389.86
9.840	480.00	.00	.00	1406.00	29000.00	1414.22	.00	1416.01	42.55	10.76	2694.99	4445.63
9.840	480.00	.00	.00	1406.00	39000.00	1415.72	.00	1417.96	43.18	12.02	3243.62	5935.15
* 9.840	480.00	.00	.00	1406.00	85000.00	1420.00	1418.86	1424.65	47.93	17.30	4914.50	12277.62
9.940	520.00	.00	.00	1409.00	6800.00	1411.96	.00	1412.64	59.33	6.63	1025.45	882.85
9.940	520.00	.00	.00	1409.00	15000.00	1413.97	.00	1415.09	49.77	8.50	1764.47	2126.19
9.940	520.00	.00	.00	1409.00	29000.00	1416.57	.00	1418.28	44.10	10.47	2770.32	4366.82
9.940	520.00	.00	.00	1409.00	39000.00	1418.15	.00	1420.19	41.87	11.47	3399.20	6027.14
9.940	520.00	.00	.00	1409.00	85000.00	1423.63	.00	1427.01	39.00	14.77	5753.72	13610.34
10.040	540.00	.00	.00	1413.00	6800.00	1415.64	.00	1416.48	84.49	7.35	925.18	739.79
10.040	540.00	.00	.00	1413.00	15000.00	1417.16	.00	1418.74	88.38	10.11	1484.27	1595.56
10.040	540.00	.00	.00	1413.00	29000.00	1419.20	.00	1421.75	85.08	12.81	2263.69	3144.01
10.040	540.00	.00	.00	1413.00	39000.00	1420.48	.00	1423.57	81.11	14.09	2768.65	4330.53
10.040	540.00	.00	.00	1413.00	85000.00	1425.33	.00	1430.20	68.77	17.70	4801.80	10249.61

10.120	380.00	.00	.00	1414.50	6800.00	1417.85	.00	1418.22	27.55	4.91	1384.10	1295.65
10.120	380.00	.00	.00	1414.50	15000.00	1419.86	.00	1420.55	27.31	6.64	2259.72	2870.48
10.120	380.00	.00	.00	1414.50	29000.00	1422.45	.00	1423.56	26.70	8.45	3433.98	5612.39
10.120	380.00	.00	.00	1414.50	39000.00	1423.99	.00	1425.36	26.24	9.37	4162.86	7614.17
* 10.120	380.00	.00	.00	1414.50	85000.00	1429.50	1425.25	1431.86	22.26	12.32	6902.09	18015.51
* 10.210	450.00	.00	.00	1420.00	6800.00	1421.97	1421.97	1422.93	142.31	7.89	861.90	570.02
* 10.210	450.00	.00	.00	1420.00	15000.00	1423.31	1423.31	1424.93	121.12	10.23	1466.09	1362.95
* 10.210	450.00	.00	.00	1420.00	29000.00	1425.11	1425.11	1427.57	104.67	12.61	2299.56	2834.56
* 10.210	450.00	.00	.00	1420.00	39000.00	1426.20	1426.20	1429.17	98.12	13.84	2818.80	3937.17
* 10.210	450.00	.00	.00	1420.00	85000.00	1430.29	1430.29	1435.06	82.66	17.53	4848.63	9348.93
10.300	440.00	.00	.00	1423.00	6800.00	1425.87	.00	1426.43	49.55	5.96	1140.29	966.03
10.300	440.00	.00	.00	1423.00	15000.00	1427.41	.00	1428.52	57.08	8.45	1774.99	1985.44
10.300	440.00	.00	.00	1423.00	29000.00	1429.23	.00	1431.23	66.08	11.36	2553.21	3567.37
10.300	440.00	.00	.00	1423.00	39000.00	1430.24	.00	1432.87	71.53	13.01	2997.82	4611.15
* 10.300	440.00	.00	.00	1423.00	85000.00	1433.99	1433.99	1439.04	81.15	18.02	4716.58	9435.55
10.350	250.00	.00	.00	1424.77	6800.00	1427.44	1427.41	1428.49	133.46	8.19	830.77	588.63
10.350	250.00	.00	.00	1424.77	15000.00	1428.93	1428.90	1430.69	116.27	10.64	1409.31	1391.11
* 10.350	250.00	.00	.00	1424.77	29000.00	1430.85	1430.85	1433.58	105.57	13.25	2188.58	2822.40
* 10.350	250.00	.00	.00	1424.77	39000.00	1432.10	1432.10	1435.32	96.91	14.40	2708.86	3961.73
* 10.350	250.00	.00	.00	1424.77	85000.00	1436.54	1436.54	1441.70	83.98	18.22	4665.11	9275.29

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
10.400	200.00	.00	.00	1422.00	6800.00	1429.26	.00	1429.89	41.38	6.40	1063.19	1057.04
10.400	200.00	.00	.00	1422.00	15000.00	1431.15	.00	1432.41	63.38	9.01	1665.04	1884.22
10.400	200.00	.00	.00	1422.00	29000.00	1433.48	.00	1435.35	69.16	10.98	2641.99	3487.14
10.400	200.00	.00	.00	1422.00	39000.00	1434.81	.00	1437.05	69.55	12.00	3248.66	4676.60
10.400	200.00	.00	.00	1422.00	85000.00	1439.85	.00	1443.31	62.77	14.94	5691.28	10728.21
10.490	460.00	.00	.00	1428.00	6800.00	1431.79	.00	1432.50	80.78	6.76	1006.59	756.60
10.490	460.00	.00	.00	1428.00	15000.00	1434.16	.00	1434.97	47.67	7.26	2066.87	2172.47
10.490	460.00	.00	.00	1428.00	29000.00	1436.68	.00	1437.90	43.18	8.88	3267.51	4413.05
10.490	460.00	.00	.00	1428.00	39000.00	1438.09	.00	1439.59	42.68	9.84	3965.20	5969.99
10.490	460.00	.00	.00	1428.00	85000.00	1443.15	.00	1445.73	41.68	12.90	6589.14	13165.93
10.620	610.00	.00	.00	1430.00	6800.00	1434.75	.00	1435.28	28.99	5.84	1164.54	1263.05
10.620	610.00	.00	.00	1430.00	15000.00	1436.69	.00	1437.81	42.68	8.49	1766.83	2296.01
10.620	610.00	.00	.00	1430.00	29000.00	1439.04	.00	1440.77	46.04	10.53	2752.74	4273.87
10.620	610.00	.00	.00	1430.00	39000.00	1440.37	.00	1442.50	46.63	11.69	3335.00	5711.10
10.620	610.00	.00	.00	1430.00	85000.00	1445.09	.00	1448.79	48.04	15.43	5509.00	12263.40
* 10.700	380.00	.00	.00	1432.00	6800.00	1436.43	1436.43	1438.08	123.11	10.30	660.14	612.86
* 10.700	380.00	.00	.00	1432.00	15000.00	1438.91	1438.91	1441.12	110.99	11.91	1259.09	1423.77
* 10.700	380.00	.00	.00	1432.00	29000.00	1441.45	1441.45	1444.20	90.06	13.31	2178.24	3055.86
* 10.700	380.00	.00	.00	1432.00	39000.00	1442.66	1442.66	1445.95	88.77	14.55	2679.70	4139.26
* 10.700	380.00	.00	.00	1432.00	85000.00	1447.19	1447.19	1452.35	80.17	18.24	4660.27	9493.44
10.830	650.00	.00	.00	1436.00	6800.00	1443.38	.00	1444.39	77.15	8.07	842.25	774.15
10.830	650.00	.00	.00	1436.00	15000.00	1445.65	.00	1446.74	66.75	8.36	1794.96	1835.99
10.830	650.00	.00	.00	1436.00	29000.00	1447.83	.00	1449.38	67.76	9.99	2903.16	3523.06
10.830	650.00	.00	.00	1436.00	39000.00	1449.18	.00	1450.99	64.66	10.79	3615.40	4850.14
10.830	650.00	.00	.00	1436.00	85000.00	1454.14	.00	1456.93	56.54	13.41	6338.02	11304.43
10.930	500.00	.00	.00	1442.00	6800.00	1447.39	.00	1448.44	84.63	8.20	828.88	739.18
10.930	500.00	.00	.00	1442.00	15000.00	1449.35	.00	1450.59	87.82	8.95	1676.45	1600.66
10.930	500.00	.00	.00	1442.00	29000.00	1451.47	.00	1453.21	84.71	10.57	2743.60	3150.94
10.930	500.00	.00	.00	1442.00	39000.00	1452.66	.00	1454.75	84.28	11.60	3362.13	4248.18
10.930	500.00	.00	.00	1442.00	85000.00	1457.03	.00	1460.46	79.82	14.85	5724.83	9513.89

11.040	500.00	.00	.00	1448.00	6800.00	1451.42	.00	1451.95	57.62	5.86	1160.81	895.81
11.040	500.00	.00	.00	1448.00	15000.00	1453.01	.00	1453.94	51.70	7.71	1944.59	2086.13
11.040	500.00	.00	.00	1448.00	29000.00	1454.95	.00	1456.48	51.65	9.93	2919.52	4035.02
11.040	500.00	.00	.00	1448.00	39000.00	1456.10	.00	1458.01	51.46	11.10	3513.24	5436.73
11.040	500.00	.00	.00	1448.00	85000.00	1460.21	.00	1463.63	51.59	14.84	5726.08	11834.42
11.100	365.00	.00	.00	1450.00	6800.00	1453.21	.00	1453.52	32.42	4.47	1521.30	1194.26
11.100	365.00	.00	.00	1450.00	15000.00	1454.83	.00	1455.38	29.86	5.96	2517.96	2744.83
11.100	365.00	.00	.00	1450.00	29000.00	1457.01	.00	1457.88	26.93	7.47	3880.94	5588.37
11.100	365.00	.00	.00	1450.00	39000.00	1458.32	.00	1459.39	25.72	8.27	4717.56	7690.78
11.100	365.00	.00	.00	1450.00	85000.00	1463.20	.00	1464.99	22.78	10.74	7910.81	17808.15

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	11.200	410.00	.00	.00	1452.00	6800.00	1454.68	1454.68	1455.99	42.46	9.19	739.94	1043.51
*	11.200	410.00	.00	.00	1452.00	15000.00	1456.50	1456.50	1458.70	36.49	11.91	1258.98	2483.15
*	11.200	410.00	.00	.00	1452.00	29000.00	1458.93	1458.93	1462.28	32.02	14.70	1973.37	5125.18
*	11.200	410.00	.00	.00	1452.00	39000.00	1460.44	1460.44	1464.44	29.77	16.04	2430.88	7148.40
*	11.200	410.00	.00	.00	1452.00	85000.00	1465.95	1465.95	1472.40	25.91	20.38	4170.44	16698.86
	11.300	528.00	.00	.00	1452.50	6800.00	1456.51	.00	1457.09	11.04	6.08	1117.82	2046.98
	11.300	528.00	.00	.00	1452.50	15000.00	1458.72	.00	1459.85	12.25	8.50	1765.01	4285.10
	11.300	528.00	.00	.00	1452.50	29000.00	1461.54	.00	1463.45	13.09	11.10	2612.85	8016.35
	11.300	528.00	.00	.00	1452.50	39000.00	1463.20	.00	1465.61	13.45	12.48	3124.60	10633.44
	11.300	528.00	.00	.00	1452.50	85000.00	1469.31	.00	1473.59	13.76	16.61	5116.84	22918.30
	11.400	528.00	.00	.00	1454.00	6800.00	1457.09	.00	1458.07	26.40	7.95	855.58	1323.55
	11.400	528.00	.00	.00	1454.00	15000.00	1459.23	.00	1460.84	21.98	10.19	1472.28	3199.22
	11.400	528.00	.00	.00	1454.00	29000.00	1461.98	.00	1464.47	19.90	12.66	2290.08	6500.85
	11.400	528.00	.00	.00	1454.00	39000.00	1463.60	.00	1466.64	19.28	13.99	2787.54	8881.28
	11.400	528.00	.00	.00	1454.00	85000.00	1469.59	.00	1474.64	17.77	18.04	4711.02	20165.94

RM 9.48 TO 10.35 W/INV

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	8.690	6800.00	1377.80	.00	.00	.00	2108.70	.00
	8.690	15000.00	1377.80	.00	.00	.00	2108.70	.00
	8.690	29000.00	1377.80	.00	.00	.00	2108.70	.00
*	8.690	39000.00	1378.24	.44	.00	.44	2828.79	.00
*	8.690	85000.00	1379.69	1.45	.00	1.89	3330.82	.00
*	8.750	6800.00	1378.24	.00	.44	.00	337.37	739.00
*	8.750	15000.00	1380.24	2.01	2.44	.00	548.56	739.00
*	8.750	29000.00	1382.82	2.57	5.02	.00	2963.23	739.00
*	8.750	39000.00	1383.33	.51	5.09	.00	3210.50	739.00
	8.750	85000.00	1384.83	1.50	5.14	.00	3635.77	739.00
	8.890	6800.00	1384.75	.00	6.52	.00	438.94	840.00
	8.890	15000.00	1386.27	1.52	6.02	.00	1708.19	840.00
*	8.890	29000.00	1387.61	1.34	4.79	.00	2860.00	840.00
*	8.890	39000.00	1388.06	.44	4.72	.00	2860.00	840.00
*	8.890	85000.00	1389.55	1.50	4.72	.00	2860.00	840.00
	8.965	6800.00	1387.01	.00	2.26	.00	320.72	400.00

*	8.965	15000.00	1388.99	1.97	2.72	.00	1447.25	400.00
*	8.965	29000.00	1390.28	1.30	2.67	.00	2490.00	400.00
*	8.965	39000.00	1390.85	.56	2.79	.00	2490.00	400.00
*	8.965	85000.00	1392.41	1.56	2.85	.00	2490.00	400.00
	9.050	6800.00	1389.79	.00	2.78	.00	765.86	550.00
	9.050	15000.00	1391.22	1.42	2.23	.00	2045.00	550.00
	9.050	29000.00	1392.44	1.22	2.16	.00	2045.00	550.00
	9.050	39000.00	1393.05	.61	2.20	.00	2045.00	550.00
	9.050	85000.00	1395.19	2.14	2.79	.00	2045.00	550.00
	9.115	6800.00	1390.98	.00	1.19	.00	406.12	370.00
*	9.115	15000.00	1392.66	1.68	1.44	.00	1737.71	370.00
*	9.115	29000.00	1393.70	1.04	1.26	.00	1836.31	370.00
*	9.115	39000.00	1394.30	.60	1.25	.00	2005.45	370.00
	9.115	85000.00	1396.37	2.08	1.18	.00	2856.53	370.00
	9.210	6800.00	1394.43	.00	3.44	.00	689.56	600.00
	9.210	15000.00	1395.66	1.23	3.00	.00	1405.34	600.00
	9.210	29000.00	1396.83	1.17	3.14	.00	1565.00	600.00
	9.210	39000.00	1397.43	.60	3.13	.00	1565.00	600.00
	9.210	85000.00	1399.29	1.86	2.92	.00	1565.00	600.00
	9.310	6800.00	1396.59	.00	2.16	.00	212.10	650.00
*	9.310	15000.00	1399.34	2.75	3.68	.00	1450.00	650.00
*	9.310	29000.00	1400.55	1.22	3.72	.00	1450.00	650.00
*	9.310	39000.00	1401.18	.62	3.75	.00	1450.00	650.00
*	9.310	85000.00	1403.29	2.11	3.99	.00	1450.00	650.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	9.400	6800.00	1399.78	.00	3.19	.00	223.43	510.00
	9.400	15000.00	1401.41	1.63	2.07	.00	797.80	510.00
*	9.400	29000.00	1403.03	1.62	2.48	.00	1420.00	510.00
	9.400	39000.00	1403.79	.76	2.62	.00	1420.00	510.00
	9.400	85000.00	1406.57	2.78	3.29	.00	1420.00	510.00
	9.480	6800.00	1402.04	.00	2.26	.00	473.42	490.00
	9.480	15000.00	1404.10	2.06	2.70	.00	540.38	490.00
	9.480	29000.00	1405.41	1.31	2.38	.00	545.64	490.00
	9.480	39000.00	1406.00	.59	2.21	.00	548.01	490.00
*	9.480	85000.00	1409.26	3.26	2.69	.00	560.00	490.00
	9.560	6800.00	1403.52	.00	1.47	.00	416.13	300.00
	9.560	15000.00	1405.15	1.63	1.05	.00	429.22	300.00
	9.560	29000.00	1406.93	1.77	1.51	.00	443.41	300.00
	9.560	39000.00	1407.94	1.02	1.94	.00	451.55	300.00
*	9.560	85000.00	1411.33	3.38	2.06	.00	472.00	300.00
	9.580	6800.00	1403.90	.00	.38	.00	433.21	110.00
	9.580	15000.00	1405.63	1.73	.48	.00	447.02	110.00
	9.580	29000.00	1407.70	2.07	.77	.00	463.60	110.00
	9.580	39000.00	1408.95	1.25	1.01	.00	473.65	110.00
	9.580	85000.00	1413.76	4.81	2.43	.00	490.00	110.00
	9.670	6800.00	1405.66	.00	1.76	.00	456.27	410.00
	9.670	15000.00	1407.32	1.67	1.70	.00	469.56	410.00
	9.670	29000.00	1409.45	2.13	1.76	.00	486.65	410.00
	9.670	39000.00	1410.72	1.27	1.77	.00	496.80	410.00
	9.670	85000.00	1415.42	4.70	1.65	.00	515.00	410.00
	9.750	6800.00	1407.45	.00	1.79	.00	363.56	370.00

	9.750	15000.00	1408.97	1.53	1.65	.00	375.80	370.00
	9.750	29000.00	1410.77	1.80	1.32	.00	390.21	370.00
	9.750	39000.00	1411.76	.99	1.04	.00	398.08	370.00
*	9.750	85000.00	1416.29	4.53	.88	.00	420.00	370.00
	9.840	6800.00	1409.71	.00	2.26	.00	324.66	480.00
	9.840	15000.00	1411.72	2.01	2.75	.00	340.79	480.00
	9.840	29000.00	1414.22	2.49	3.44	.00	360.76	480.00
	9.840	39000.00	1415.72	1.50	3.96	.00	372.72	480.00
*	9.840	85000.00	1420.00	4.29	3.71	.00	407.00	480.00
	9.940	6800.00	1411.96	.00	2.25	.00	358.65	520.00
	9.940	15000.00	1413.97	2.01	2.25	.00	374.78	520.00
	9.940	29000.00	1416.57	2.60	2.36	.00	395.66	520.00
	9.940	39000.00	1418.15	1.57	2.43	.00	408.18	520.00
	9.940	85000.00	1423.63	5.48	3.62	.00	451.98	520.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	10.040	6800.00	1415.64	.00	3.68	.00	361.11	540.00
	10.040	15000.00	1417.16	1.51	3.18	.00	373.29	540.00
	10.040	29000.00	1419.20	2.05	2.63	.00	389.64	540.00
	10.040	39000.00	1420.48	1.28	2.34	.00	399.87	540.00
	10.040	85000.00	1425.33	4.85	1.71	.00	438.67	540.00
	10.120	6800.00	1417.85	.00	2.21	.00	426.79	380.00
	10.120	15000.00	1419.86	2.01	2.71	.00	442.89	380.00
	10.120	29000.00	1422.45	2.59	3.25	.00	463.62	380.00
	10.120	39000.00	1423.99	1.54	3.51	.00	476.03	380.00
*	10.120	85000.00	1429.50	5.51	4.17	.00	520.00	380.00
*	10.210	6800.00	1421.97	.00	4.12	.00	445.75	450.00
*	10.210	15000.00	1423.31	1.34	3.45	.00	456.46	450.00
*	10.210	29000.00	1425.11	1.80	2.65	.00	470.84	450.00
*	10.210	39000.00	1426.20	1.09	2.20	.00	479.58	450.00
*	10.210	85000.00	1430.29	4.09	.79	.00	512.33	450.00
	10.300	6800.00	1425.87	.00	3.90	.00	408.01	440.00
	10.300	15000.00	1427.41	1.53	4.10	.00	420.27	440.00
	10.300	29000.00	1429.23	1.82	4.12	.00	434.83	440.00
	10.300	39000.00	1430.24	1.01	4.04	.00	442.93	440.00
*	10.300	85000.00	1433.99	3.75	3.70	.00	472.96	440.00
	10.350	6800.00	1427.44	.00	1.57	.00	385.06	250.00
	10.350	15000.00	1428.93	1.48	1.52	.00	396.89	250.00
*	10.350	29000.00	1430.85	1.93	1.62	.00	412.30	250.00
*	10.350	39000.00	1432.10	1.25	1.86	.00	422.28	250.00
*	10.350	85000.00	1436.54	4.45	2.55	.00	457.84	250.00
	10.400	6800.00	1429.26	.00	1.81	.00	241.64	200.00
	10.400	15000.00	1431.15	1.90	2.23	.00	363.14	200.00
	10.400	29000.00	1433.48	2.33	2.63	.00	453.86	200.00
	10.400	39000.00	1434.81	1.33	2.71	.00	464.43	200.00
	10.400	85000.00	1439.85	5.04	3.31	.00	504.76	200.00
	10.490	6800.00	1431.79	.00	2.54	.00	352.46	460.00
	10.490	15000.00	1434.16	2.36	3.00	.00	467.04	460.00
	10.490	29000.00	1436.68	2.52	3.19	.00	487.18	460.00
	10.490	39000.00	1438.09	1.41	3.28	.00	498.50	460.00
	10.490	85000.00	1443.15	5.06	3.30	.00	538.97	460.00
	10.620	6800.00	1434.75	.00	2.96	.00	284.60	610.00

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CAUTION  SECNO=     8.690  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     8.690  PROFILE= 5  CRITICAL DEPTH ASSUMED

CAUTION  SECNO=     8.750  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     8.750  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     8.750  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=     8.750  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     8.750  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     8.750  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=     8.750  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     8.750  PROFILE= 3  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     8.750  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     8.750  PROFILE= 4  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=     8.890  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     8.890  PROFILE= 3  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     8.890  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     8.890  PROFILE= 4  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     8.890  PROFILE= 5  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     8.890  PROFILE= 5  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=     8.965  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     8.965  PROFILE= 2  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     8.965  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     8.965  PROFILE= 3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     8.965  PROFILE= 3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=     8.965  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     8.965  PROFILE= 4  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     8.965  PROFILE= 5  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     8.965  PROFILE= 5  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=     9.115  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     9.115  PROFILE= 2  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     9.115  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     9.115  PROFILE= 3  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     9.115  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     9.115  PROFILE= 4  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=     9.310  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     9.310  PROFILE= 2  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     9.310  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     9.310  PROFILE= 3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     9.310  PROFILE= 3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=     9.310  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     9.310  PROFILE= 4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     9.310  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=     9.310  PROFILE= 5  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     9.310  PROFILE= 5  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=     9.400  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     9.400  PROFILE= 3  MINIMUM SPECIFIC ENERGY
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CAUTION  SECNO=     9.480  PROFILE= 5  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     9.480  PROFILE= 5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     9.480  PROFILE= 5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=     9.560  PROFILE= 5  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     9.560  PROFILE= 5  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=     9.750  PROFILE= 5  CRITICAL DEPTH ASSUMED
```

```
CAUTION  SECNO=     9.750  PROFILE= 5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     9.750  PROFILE= 5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=     9.840  PROFILE= 5  WSEL ASSUMED BASED ON MIN DIFF
CAUTION  SECNO=     9.840  PROFILE= 5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=    10.120  PROFILE= 5  WSEL ASSUMED BASED ON MIN DIFF
CAUTION  SECNO=    10.120  PROFILE= 5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=    10.210  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    10.210  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    10.210  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=    10.210  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    10.210  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    10.210  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=    10.210  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    10.210  PROFILE= 3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    10.210  PROFILE= 3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=    10.210  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    10.210  PROFILE= 4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    10.210  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=    10.210  PROFILE= 5  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    10.210  PROFILE= 5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    10.210  PROFILE= 5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=    10.300  PROFILE= 5  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    10.300  PROFILE= 5  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=    10.350  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    10.350  PROFILE= 3  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    10.350  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    10.350  PROFILE= 4  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    10.350  PROFILE= 5  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    10.350  PROFILE= 5  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=    10.700  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    10.700  PROFILE= 1  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    10.700  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    10.700  PROFILE= 2  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    10.700  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    10.700  PROFILE= 3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    10.700  PROFILE= 3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=    10.700  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    10.700  PROFILE= 4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    10.700  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE WSEL
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CAUTION  SECNO=    10.700  PROFILE= 5  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    10.700  PROFILE= 5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    10.700  PROFILE= 5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=    11.200  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    11.200  PROFILE= 1  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    11.200  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    11.200  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    11.200  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=    11.200  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    11.200  PROFILE= 3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    11.200  PROFILE= 3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=    11.200  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    11.200  PROFILE= 4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    11.200  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=    11.200  PROFILE= 5  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    11.200  PROFILE= 5  PROBABLE MINIMUM SPECIFIC ENERGY
```

CAUTION SECNO= 11.200 PROFILE= 5 20 TRIALS ATTEMPTED TO BALANCE WSEL

1

FLOOD INSURANCE ZONE DATA FOR RM 9.48 TO 10.35 W/INV

FLOOD HAZARD FACTOR FOR ENTIRE REACH USING SECTIONS

SECTION NUMBER	CUMULATIVE DISTANCE	ELEVATION DIFFERENCE BETWEEN BASE FLOOD AND 10	2	0.2
8.690	0.	.00	.00	.44
8.750	739.	-4.58	-2.57	.51
8.890	1579.	-2.86	-1.34	.44
8.965	1979.	-3.27	-1.30	.56
9.050	2529.	-2.65	-1.22	.61
9.115	2899.	-2.71	-1.04	.60
9.210	3499.	-2.41	-1.17	.60
9.310	4149.	-3.96	-1.22	.62
9.400	4659.	-3.25	-1.62	.76
9.480	5149.	-3.37	-1.31	.59
9.560	5449.	-3.41	-1.77	1.02
9.580	5559.	-3.80	-2.07	1.25
9.670	5969.	-3.80	-2.13	1.27
9.750	6339.	-3.33	-1.80	.99
9.840	6819.	-4.51	-2.49	1.50
9.940	7339.	-4.62	-2.60	1.57
10.040	7879.	-3.56	-2.05	1.28
10.120	8259.	-4.61	-2.59	1.54
10.210	8709.	-3.14	-1.80	1.09
10.300	9149.	-3.36	-1.82	1.01
10.350	9399.	-3.41	-1.93	1.25
10.400	9599.	-4.23	-2.33	1.33
10.490	10059.	-4.88	-2.52	1.41
10.620	10669.	-4.29	-2.35	1.33
10.700	11049.	-5.02	-2.54	1.21
10.830	11699.	-4.45	-2.17	1.36
10.930	12199.	-4.08	-2.12	1.19
11.040	12699.	-3.54	-1.94	1.15
11.100	13064.	-3.80	-2.18	1.31
11.200	13474.	-4.25	-2.43	1.52
11.300	14002.	-5.03	-2.82	1.65
11.400	14530.	-4.89	-2.75	1.62
WEIGHTED AVG FOR REACH		-3.76	-1.94	1.05

FHF FOR THE REACH = 040 WITH 84.6 PERCENT OF THE REACH WITHIN 1.0 FEET
ZONE FOR THE REACH = A 8

THIS RUN EXECUTED 12-08-90

****

HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984

ERROR CORR - 01,02,03,04,05,06
MODIFICATION - 50,51,52,53,54,55,56
IBM-PC-XT VERSION AUGUST 1985
****

APPENDIX 2

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED MAY 1984                                 *
*  IBM-PC-XT VERSION AUGUST 1985                    *
*  RUN DATE  12-22-90   TIME  14:06:45              *
*****************************************************
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****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  THE HYDROLOGIC ENGINEERING CENTER   *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616             *
*  (916) 440-2105 (FTS) 448-2105       *
****************************************
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FINAL

```
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
```

12-22-90 14:06:46 PAGE 1

THIS RUN EXECUTED 12-22-90

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**************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985
**************************************************
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```
C
T1        SKUNK CREEK HYDRAULIC ANALYSIS, ESTIMATE T.O.B. W/O CHANNEL INVERT
T2        IMPROVEMENTS NORTH OF HAPPY VALLEY RD              **Q=6800 CFS**
T3        RM 9.48 TO 10.35 W/INV. IMPROVEMENTS     FILE NAME: SKUNK.HYD

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     0.        2.        0.        0.   .000000       .00        .0        0.  1377.800      .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    1.000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   150.000      .000      .000      .000      .000      .000      .000      .000      .000      .000


NC      .045      .045      .035      .100      .300      .000      .000      .000      .000      .000
QT     5.000   6800.000  15000.000  29000.000  39000.000  85000.000      .000      .000      .000      .000

         DURING MAJOR FLOODS, SKUNK CREEK IS EXPECTED TO FLOW OVER THE OVER-
         SHOOT OF THE CAP AT THE UPSTREAM END OF THE COE'S LEVEES
         ALL CROSSECTIONS WERE RECODED BY JIM HARRIS, HYDRAULICS SECTION
         (APRIL 1983).  THE PREVIOUS ONES WERE FOUND TO BE UNSATISFACTORY.
         CHANNEL CENTERLINE CORRESPONDS TO 2000 FEET.
         ALL MANNINGS "N" VALUES USED WERE OBTAINED FROM THE PREVIOUS
         MODEL AS ASSIGNED BY CASKIE AND MASHBURN BASED ON FIELD
         OBSERVATION (FEB. 1983)
         THE VALUES FOR THE 10, 50, 100, AND 500 YEAR FLOODS ARE 15,000,29000,
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39,000, AND 85,000 CFS RESPECTIVELY (PER GRIGORIAN 5/23/83)

X1	8.690	19.000	1979.000	2118.000	.000	.000	.000	.000	.000	.000
GR	1380.000	452.000	1378.000	815.000	1378.000	877.000	1378.000	990.000	1378.000	1448.000
GR	1376.000	1481.000	1372.000	1542.000	1374.000	1675.000	1376.000	1727.000	1376.000	1979.000
GR	1369.800	2000.000	1370.000	2038.000	1372.000	2100.000	1376.000	2118.000	1376.200	2181.000
GR	1376.000	2278.000	1376.000	3560.000	1378.000	3560.000	1380.000	3890.000	.000	.000
X1	8.750	26.000	1800.000	2040.000	835.000	733.000	739.000	.000	.000	.000
GR	1390.000	170.000	1388.000	235.000	1386.000	420.000	1384.000	510.000	1383.000	820.000
GR	1382.000	1190.000	1382.000	1435.000	1384.000	1470.000	1384.000	1490.000	1382.000	1500.000
GR	1380.000	1560.000	1378.000	1573.000	1378.000	1600.000	1380.000	1625.000	1378.000	1740.000
GR	1378.000	1790.000	1376.000	1800.000	1376.000	1958.000	1372.000	1975.000	1371.000	2000.000
GR	1380.000	2040.000	1381.000	2290.000	1382.000	2650.000	1382.000	3790.000	1384.000	4050.000
GR	1386.000	4190.000	.000	.000	.000	.000	.000	.000	.000	.000

X1	8.890	21.000	1900.000	2240.000	565.000	650.000	840.000	.000	.000	.000
X3	.000	.000	.000	870.000	.000	3730.000	.000	.000	.000	.000
GR	1392.000	675.000	1386.000	780.000	1386.000	1765.000	1384.000	1775.000	1384.000	1805.000
GR	1386.000	1815.000	1384.000	1865.000	1384.000	1900.000	1382.000	1950.000	1382.000	1970.000
GR	1378.000	2000.000	1380.000	2030.000	1382.000	2090.000	1382.000	2230.000	1384.000	2240.000
GR	1386.000	2260.000	1387.000	3440.000	1386.500	3770.000	1387.000	4080.000	1388.000	4230.000
GR	1390.000	4440.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	8.965	17.000	1955.000	2330.000	275.000	410.000	400.000	.000	.000	.000
X3	.000	.000	.000	1085.000	.000	3575.000	.000	.000	.000	.000
GR	1392.000	780.000	1390.000	830.000	1388.000	880.000	1388.000	1580.000	1390.000	1915.000
GR	1390.000	1945.000	1388.000	1955.000	1386.000	1975.000	1381.000	2000.000	1382.000	2025.000
GR	1384.000	2105.000	1386.000	2240.000	1388.000	2330.000	1388.000	2560.000	1390.000	2920.000
GR	1390.000	4120.000	1392.000	4570.000	.000	.000	.000	.000	.000	.000
X1	9.050	21.000	1905.000	2140.000	410.000	370.000	550.000	.000	.000	.000
X3	.000	.000	.000	1370.000	.000	3415.000	.000	.000	.000	.000
GR	1398.000	700.000	1396.000	720.000	1394.000	780.000	1392.000	840.000	1390.000	1250.000
GR	1389.000	1645.000	1388.000	1905.000	1386.000	1910.000	1386.000	1925.000	1388.000	1935.000
GR	1386.000	1940.000	1384.000	1970.000	1382.000	2000.000	1382.000	2040.000	1384.000	2050.000
GR	1386.000	2095.000	1388.000	2100.000	1390.000	2140.000	1390.000	2950.000	1392.000	4220.000
GR	1394.000	4570.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	9.115	15.000	1790.000	2300.000	350.000	300.000	370.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	3465.000	.000	.000	.000	.000
GR	1400.000	110.000	1398.000	385.000	1396.000	660.000	1394.000	1600.000	1392.000	1790.000
GR	1390.000	1880.000	1388.000	1970.000	1386.500	2000.000	1388.000	2110.000	1390.000	2185.000
GR	1392.000	2300.000	1392.000	3650.000	1394.000	4025.000	1396.000	4480.000	1398.000	4720.000
NC	.000	.040	.000	.000	.000	.000	.000	.000	.000	.000

LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
X3 USED TO DEFINE EFFECTIVE FLOW.

X1	9.210	37.000	1865.000	2190.000	460.000	500.000	600.000	.000	.000	.000
X3	.000	.000	.000	1385.000	.000	2950.000	.000	.000	.000	.000
GR	1402.000	140.000	1402.000	300.000	1400.000	350.000	1398.000	510.000	1396.000	565.000
GR	1394.000	650.000	1394.000	670.000	1396.000	695.000	1396.000	720.000	1394.000	720.000
GR	1394.000	880.000	1396.000	1050.000	1396.000	1130.000	1394.000	1145.000	1394.000	1225.000
GR	1396.000	1290.000	1396.000	1510.000	1394.000	1720.000	1394.000	1735.000	1394.000	1765.000
GR	1394.000	1865.000	1392.000	1920.000	1392.000	1930.000	1390.000	1950.000	1388.500	2000.000
GR	1390.000	2085.000	1392.000	2180.000	1394.000	2190.000	1394.000	2200.000	1392.000	2210.000
GR	1392.000	2225.000	1394.000	2230.000	1394.700	2450.000	1395.000	3250.000	1396.000	4050.000
GR	1398.000	4430.000	1399.500	4600.000	.000	.000	.000	.000	.000	.000
NH	4.000	.045	1930.000	.035	2115.000	.050	3030.000	.040	3660.000	.000

LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.

X3 USED TO DEFINE EFFECTIVE FLOW.

X1	9.310	29.000	1930.000	2115.000	400.000	480.000	650.000	.000	.000	.000
X3	.000	.000	.000	1110.000	.000	2560.000	.000	.000	.000	.000
GR	1406.000	20.000	1404.000	90.000	1402.000	310.000	1400.000	410.000	1398.000	425.000
GR	1398.000	820.000	1396.000	900.000	1398.000	940.000	1398.000	1130.000	1398.000	1225.000
GR	1398.000	1250.000	1399.000	1300.000	1398.000	1330.000	1399.000	1350.000	1399.000	1845.000
GR	1398.000	1930.000	1394.000	1940.000	1392.000	1980.000	1392.000	2000.000	1392.000	2010.000
GR	1392.000	2040.000	1392.000	2090.000	1394.000	2105.000	1396.000	2115.000	1398.000	2160.000
GR	1398.000	2280.000	1394.000	3030.000	1400.000	3530.000	1402.000	3660.000	.000	.000
NH	4.000	.040	1940.000	.035	2200.000	.050	2300.000	.040	4100.000	.000

LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
X3 USED TO DEFINE EFFECTIVE FLOW.

X1	9.400	33.000	1940.000	2200.000	370.000	420.000	510.000	.000	.000	.000
X3	.000	.000	.000	980.000	.000	2400.000	.000	.000	.000	.000
GR	1410.000	110.000	1408.000	140.000	1406.000	180.000	1404.000	330.000	1402.000	510.000
GR	1400.000	635.000	1400.000	965.000	1400.000	995.000	1400.000	1030.000	1400.000	1150.000
GR	1402.000	1250.000	1402.000	1550.000	1400.000	1620.000	1400.000	1650.000	1402.000	1770.000
GR	1402.000	1940.000	1400.000	1975.000	1396.000	1990.000	1394.400	2000.000	1396.000	2040.000
GR	1396.000	2085.000	1394.000	2100.000	1394.000	2180.000	1400.000	2200.000	1402.000	2300.000
GR	1400.000	2390.000	1400.000	2400.000	1402.000	2450.000	1404.000	2680.000	1404.000	2870.000
GR	1404.000	3300.000	1406.000	3790.000	1408.000	4100.000	.000	.000	.000	.000
NH	3.000	.020	1740.000	.035	2200.000	.045	2480.000	.000	.000	.000

RM 9.48 TO 11.2 MODIFIED
X3 CARD USED FOR RIGHT BANK,EFFECTIVE FLOW AREA ASSUMED
TO EXPAND AT 1.5 TO 1 FROM END OF RIGHT BANK LEVEE

X1	9.480	8.000	1700.000	2200.000	370.000	420.000	490.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	2260.000	.000	.000	.000	.000
GR	1409.000	1700.000	1399.000	1740.000	1399.000	2000.000	1400.000	2020.000	1400.000	2135.000
GR	1402.000	2200.000	1404.000	2260.000	1406.000	2480.000	.000	.000	.000	.000
NH	3.000	.020	1804.000	.035	2196.000	.020	2236.000	.000	.000	.000

ADDITIONAL SECTION ADDED TO REFINE AND REPRESENT THE
PROPOSED HYDRAULIC CONDITIONS

X1	9.560	4.000	1764.000	2236.000	445.000	160.000	300.000	.000	.000	.000
GR	1410.500	1764.000	1400.500	1804.000	1400.500	2196.000	1410.500	2236.000	.000	.000
NH	3.000	.020	1792.000	.035	2202.000	.020	2242.000	.000	.000	.000
X1	9.580	4.000	1750.000	2245.000	145.000	75.000	110.000	.000	.000	.000
GR	1411.000	1752.000	1401.000	1792.000	1401.000	2202.000	1411.000	2242.000	.000	.000

NH	3.000	.020	1780.000	.035	2215.000	.020	2255.000	.000	.000	.000
X1	9.670	4.000	1740.000	2250.000	430.000	395.000	410.000	.000	.000	.000
GR	1413.000	1740.000	1403.000	1780.000	1403.000	2215.000	1413.000	2255.000	.000	.000
NH	3.000	.020	1830.000	.035	2170.000	.020	2210.000	.000	.000	.000
X1	9.750	4.000	1790.000	2205.000	390.000	360.000	370.000	.000	.000	.000
GR	1414.500	1790.000	1404.500	1830.000	1404.500	2170.000	1414.500	2210.000	.000	.000

NH	3.000	.020	1852.000	.035	2147.000	.020	2203.000	.000	.000	.000
X1	9.840	4.000	1796.000	2203.000	475.000	485.000	480.000	.000	.000	.000
GR	1420.000	1796.000	1406.000	1852.000	1406.000	2147.000	1420.000	2203.000	.000	.000
NH	3.000	.020	1835.000	.035	2170.000	.020	2234.000	.000	.000	.000
X1	9.940	4.000	1771.000	2234.000	495.000	545.000	520.000	.000	.000	.000
GR	1425.000	1771.000	1409.000	1835.000	1409.000	2170.000	1425.000	2234.000	.000	.000
NH	3.000	.020	1830.000	.035	2170.000	.020	2230.000	.000	.000	.000
X1	10.040	4.000	1770.000	2230.000	540.000	540.000	540.000	.000	.000	.000
GR	1428.000	1770.000	1413.000	1830.000	1413.000	2170.000	1428.000	2230.000	.000	.000
NH	3.000	.020	1800.000	.035	2200.000	.020	2260.000	.000	.000	.000
X1	10.120	4.000	1740.000	2260.000	415.000	350.000	380.000	.000	.000	.000
GR	1429.500	1740.000	1414.500	1800.000	1414.500	2200.000	1429.500	2260.000	.000	.000
NH	3.000	.020	1785.000	.035	2215.000	.020	2275.000	.000	.000	.000
X1	10.210	4.000	1725.000	2275.000	475.000	430.000	450.000	.000	.000	.000
GR	1435.000	1725.000	1420.000	1785.000	1420.000	2215.000	1435.000	2275.000	.000	.000
NH	3.000	.020	1807.000	.035	2192.000	.020	2252.000	.000	.000	.000
X1	10.300	4.000	1747.000	2252.000	490.000	395.000	440.000	.000	.000	.000
GR	1438.000	1747.000	1423.000	1807.000	1423.000	2192.000	1438.000	2252.000	.000	.000
NC	.035	.035	.035	.100	.300	.000	.000	.000	.000	.000

HAPPY VALLEY ROAD

X1	10.350	9.000	1328.000	1823.000	305.000	155.000	250.000	.000	.000	.000
GR	1440.900	1328.000	1425.900	1388.000	1425.380	1450.000	1424.890	1500.000	1424.770	1600.000
GR	1425.000	1650.000	1425.410	1700.000	1426.480	1763.000	1441.480	1823.000	.000	.000
NH	5.000	.020	1776.200	.045	1840.000	.040	2118.000	.050	2200.800	.020
NH	2234.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

NO CHANNEL INVERT IMPROVEMENTS

X1	10.400	16.000	1753.000	2234.000	195.000	235.000	200.000	.000	.000	.000
GR	1437.800	1753.000	1432.000	1776.200	1432.000	1840.000	1430.000	1860.000	1428.000	1866.000
GR	1426.000	1875.000	1424.000	1880.000	1422.000	1900.000	1424.000	1928.000	1424.000	2007.000
GR	1426.000	2069.000	1428.000	2080.000	1430.000	2118.000	1430.000	2180.000	1429.500	2200.800
GR	1437.800	2234.000	.000	.000	.000	.000	.000	.000	.000	.000

NH	4.000	.020	1786.600	.040	2125.000	.050	2209.000	.020	2245.000	.000

NO CHANNEL INVERT IMPROVEMENTS

X1	10.490	9.000	1745.000	2245.000	460.000	460.000	460.000	.000	.000	.000
GR	1441.000	1745.000	1430.600	1786.600	1430.000	1853.000	1428.000	1895.000	1428.000	2060.000
GR	1430.000	2110.000	1432.000	2125.000	1432.000	2209.000	1441.000	2245.000	.000	.000
NH	4.000	.020	1800.000	.045	1873.000	.035	2202.000	.020	2227.000	.000

NO CHANNEL INVERT IMPROVEMENTS

X1	10.620	13.000	1774.000	2227.000	575.000	645.000	610.000	.000	.000	.000
GR	1443.400	1774.000	1436.700	1800.000	1437.000	1820.000	1436.000	1873.000	1434.000	1887.000
GR	1432.000	1905.000	1430.000	1920.000	1430.000	2128.000	1432.000	2145.000	1434.000	2155.000
GR	1436.000	2185.000	1437.000	2202.000	1443.400	2227.000	.000	.000	.000	.000
NH	4.000	.020	1804.000	.045	1875.000	.035	2188.000	.020	2220.000	.000

NO CHANNEL INVERT IMPROVEMENTS

X1	10.700	14.000	1780.000	2220.000	365.000	405.000	380.000	.000	.000	.000
GR	1446.000	1780.000	1440.000	1804.000	1440.000	1875.000	1438.000	1925.000	1436.000	1958.000
GR	1434.000	1977.000	1432.000	1987.000	1432.000	2015.000	1433.000	2100.000	1434.000	2142.000
GR	1436.000	2153.000	1438.000	2160.000	1438.000	2188.000	1446.000	2220.000	.000	.000
NH	5.000	.020	1772.800	.050	1793.000	.040	2015.000	.050	2230.200	.020
NH	2263.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

NO CHANNEL INVERT IMPROVEMENTS

X1	10.830	18.000	1740.000	2263.000	640.000	680.000	650.000	.000	.000	.000
GR	1452.200	1740.000	1444.000	1772.800	1444.000	1793.000	1442.000	1810.000	1440.000	1819.000
GR	1440.000	1840.000	1442.000	1860.000	1440.000	1900.000	1438.000	1933.000	1438.000	1945.000
GR	1436.000	1977.000	1436.000	1990.000	1438.000	1997.000	1440.000	2005.000	1442.000	2008.000
GR	1444.000	2015.000	1444.000	2230.200	1452.200	2263.000	.000	.000	.000	.000
NH	5.000	.020	1790.800	.050	1830.000	.040	2020.000	.050	2216.200	.020
NH	2255.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

NO CHANNEL INVERT IMPROVEMENTS

X1	10.930	20.000	1752.000	2255.000	490.000	535.000	500.000	.000	.000	.000
GR	1457.700	1752.000	1448.000	1790.800	1448.000	1830.000	1446.000	1850.000	1444.000	1860.000
GR	1442.000	1870.000	1442.000	1945.000	1444.000	1957.000	1444.000	1970.000	1442.000	1973.000
GR	1442.000	1995.000	1444.000	2000.000	1446.000	2005.000	1448.000	2020.000	1448.000	2073.000
GR	1446.000	2143.000	1446.000	2156.000	1448.000	2210.000	1448.000	2216.200	1457.700	2255.000
NH	3.000	.020	1757.000	.035	2200.000	.020	2260.000	.000	.000	.000

END OF DIKE EXTENSION FROM CORPS DIKE ON THE RIGHT BANK ONLY
CONFLUENCE OF BUCHANAN WASH AND SKUNK CREEK
NO CHANNEL INVERT IMPROVEMENTS

X1	11.040	10.000	1705.000	2260.000	530.000	510.000	500.000	.000	.000	.000
GR	1461.000	1705.000	1448.000	1757.000	1448.000	1827.000	1450.000	1900.000	1450.000	1980.000
GR	1448.000	2085.000	1448.000	2095.000	1450.000	2185.000	1450.000	2200.000	1465.000	2260.000
NH	3.000	.020	1580.000	.035	2170.000	.020	2200.000	.000	.000	.000

CROSS SECTION LOCATED BASED ON 1.5 TO 1 FLOW EXPANSION
FROM CORPS DIKE ON THE LEFT BANK
NO CHANNEL INVERT IMPROVEMENTS

X1	11.100	8.000	1520.000	2200.000	395.000	365.000	365.000	.000	.000	.000
GR	1465.000	1520.000	1450.000	1580.000	1450.000	1688.000	1452.000	1775.000	1452.000	1845.000
GR	1450.000	2020.000	1450.000	2170.000	1465.000	2200.000	.000	.000	.000	.000
NC	.000	.000	.020	.000	.000	.000	.000	.000	.000	.000

EFFECTIVE FLOW ASSUMED TO EXPAND AT 1.5 TO 1 FROM COE LEVEES.
(ON LEFT BANK ONLY)
INVERT AND SLOPE DETAILS FOR CORPS LEVEES TAKEN FROM AS BUILT PLANS

X1	11.200	4.000	1834.500	2165.500	520.000	470.000	410.000	.000	.000	.000
GR	1467.000	1834.500	1452.000	1864.500	1452.000	2135.500	1467.000	2165.500	.000	.000
X1	11.300	4.000	1831.500	2169.500	528.000	528.000	528.000	.000	.000	.000
GR	1469.000	1831.500	1452.500	1864.500	1452.500	2135.500	1469.500	2169.500	.000	.000

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X1     11.400      4.000   1829.500   2171.500    528.000    528.000    528.000       .000       .000       .000
GR   1471.500   1829.500   1454.000   1864.500   1454.000   2135.500   1472.000   2171.500       .000       .000
EJ       .000       .000       .000       .000       .000       .000       .000       .000       .000       .000
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  SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
  TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


*PROF 1

CCHV=    .100 CEHV=    .300
*SECNO 8.690

        DURING MAJOR FLOODS, SKUNK CREEK IS EXPECTED TO FLOW OVER THE OVER-
        SHOOT OF THE CAP AT THE UPSTREAM END OF THE COE'S LEVEES
        ALL CROSSECTIONS WERE RECODED BY JIM HARRIS, HYDRAULICS SECTION
        (APRIL 1983).  THE PREVIOUS ONES WERE FOUND TO BE UNSATISFACTORY.
        CHANNEL CENTERLINE CORRESPONDS TO 2000 FEET.
        ALL MANNINGS "N" VALUES USED WERE OBTAINED FROM THE PREVIOUS
        MODEL AS ASSIGNED BY CASKIE AND MASHBURN BASED ON FIELD
        OBSERVATION (FEB. 1983)
        THE VALUES FOR THE 10, 50, 100, AND 500 YEAR FLOODS ARE 15,000,29000,
        39,000, AND 85,000 CFS RESPECTIVELY (PER GRIGORIAN 5/23/83)

    8.69     8.00  1377.80      .00  1377.80  1377.85      .05      .00      .00  1376.00
   6800.    2060.    2414.    2326.    1496.     893.    2580.       0.       0.  1376.00
     .00     1.38     2.70      .90     .045     .035     .045     .000  1369.80  1451.30
 .000344       0.       0.       0.        0        0        0      .00  2108.70  3560.00
0
*SECNO 8.750

3265 DIVIDED FLOW


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
    8.75     7.24  1378.24  1378.24      .00  1379.61     1.38      .75      .40  1376.00
   6800.      76.    6724.       0.      33.     710.       0.      50.      21.  1380.00
     .02     2.31     9.46      .00     .045     .035     .045     .000  1371.00  1571.45
 .011265     835.     739.     733.       20       15        0      .00   337.37  2032.17
0
*SECNO 8.890

3265 DIVIDED FLOW
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  SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
  TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


3301 HV CHANGED MORE THAN HVINS
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```
3470 ENCROACHMENT STATIONS=     870.0    3730.0  TYPE=     1  TARGET=    2860.000
    8.89      6.75  1384.75      .00       .00  1385.34      .58      5.64       .08  1384.00
   6800.      101.    6695.       3.       59.    1086.       3.       68.       28.   1384.00
     .06      1.72     6.16     1.15      .045     .035     .045      .000   1378.00  1771.23
 .004487      565.     840.     650.         5        0        0       .00    438.94  2247.54

*SECNO 8.965

3470 ENCROACHMENT STATIONS=    1085.0    3575.0  TYPE=     1  TARGET=    2490.000
    8.97      6.01  1387.01      .00       .00  1388.01     1.00      2.55       .13  1388.00
   6800.        0.    6800.       0.        0.     847.       0.       77.       32.   1388.00
     .07       .00     8.03      .00      .045     .035     .045      .000   1381.00  1964.87
 .009832      275.     400.     410.         2        0        0       .00    320.72  2285.59
0
*SECNO 9.050

3301 HV CHANGED MORE THAN HVINS


3470 ENCROACHMENT STATIONS=    1370.0    3415.0  TYPE=     1  TARGET=    2045.000
    9.05      7.79  1389.79      .00       .00  1390.22      .43      2.15       .06  1388.00
   6800.      716.    6084.       0.      459.    1102.       0.       91.       38.   1390.00
     .10      1.56     5.52      .00      .045     .035     .045      .000   1382.00  1370.00
 .002127      410.     550.     370.         2        0        0       .00    765.86  2135.86
0
*SECNO 9.115

3470 ENCROACHMENT STATIONS=        .0    3465.0  TYPE=     1  TARGET=    3464.999
    9.11      4.48  1390.98      .00       .00  1391.87      .88      1.51       .14  1392.00
   6800.        0.    6800.       0.        0.     901.       0.      102.       42.   1392.00
     .12       .00     7.55      .00      .045     .035     .045      .000   1386.50  1835.60
 .010933      350.     370.     300.         3        0        0       .00    406.12  2241.73
0
*SECNO 9.210

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


3470 ENCROACHMENT STATIONS=    1385.0    2950.0  TYPE=     1  TARGET=    1565.000

        LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
        X3 USED TO DEFINE EFFECTIVE FLOW.

    9.21      5.93  1394.43      .00       .00  1394.86      .44      2.95       .04  1394.00
   6800.       68.    6526.     206.       72.    1210.      91.      117.       49.   1394.00
     .15       .94     5.39     2.27      .045     .035     .040      .000   1388.50  1675.04
 .002797      460.     600.     500.         2        0        0       .00    689.56  2364.59
0
1490 NH CARD USED
*SECNO 9.310

3265 DIVIDED FLOW


3301 HV CHANGED MORE THAN HVINS
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3470 ENCROACHMENT STATIONS=    1110.0    2560.0  TYPE=     1  TARGET=    1450.000

        LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
        X3 USED TO DEFINE EFFECTIVE FLOW.

    9.31     4.59  1396.59      .00      .00  1397.94     1.35     2.80      .27  1398.00
   6800.       0.    6795.       5.       0.     728.       5.     133.      55.   1396.00
     .17      .00     9.33     1.02     .045     .035     .050     .000  1392.00  1933.50
  .007628     400.     650.     480.        2        0        0      .00   212.10  2560.00
0
1490 NH CARD USED
*SECNO 9.400

3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=     980.0    2400.0  TYPE=     1  TARGET=    1420.000

        LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
        X3 USED TO DEFINE EFFECTIVE FLOW.


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


    9.40     5.78  1399.78      .00      .00  1400.47      .70     2.47      .07  1402.00
   6800.       0.    6800.       0.       0.    1015.       0.     143.      58.   1400.00
     .19      .00     6.70      .00     .045     .035     .050     .000  1394.00  1975.83
  .003338     370.     510.     420.        3        0        0      .00   223.43  2199.26
0
1490 NH CARD USED
*SECNO 9.480

3470 ENCROACHMENT STATIONS=        .0    2260.0  TYPE=     1  TARGET=    2259.999

        RM 9.48 TO 11.2 MODIFIED
        X3 CARD USED FOR RIGHT BANK,EFFECTIVE FLOW AREA ASSUMED
        TO EXPAND AT 1.5 TO 1 FROM END OF RIGHT BANK LEVEE

    9.48     3.04  1402.04      .00      .00  1402.57      .53     2.08      .02  1409.00
   6800.       0.    6800.       0.       0.    1163.       0.     155.      62.   1402.00
     .21      .00     5.85      .02     .045     .035     .045     .000  1399.00  1727.83
  .005588     370.     490.     420.        2        0        0      .00   473.42  2201.26
0
1490 NH CARD USED
*SECNO 9.560

        ADDITIONAL SECTION ADDED TO REFINE AND REPRESENT THE
        PROPOSED HYDRAULIC CONDITIONS

    9.56     3.02  1403.52      .00      .00  1404.00      .48     1.42      .00  1410.50
   6800.       0.    6800.       0.       0.    1219.       0.     163.      65.   1410.50
     .23      .00     5.58      .00     .045     .035     .045     .000  1400.50  1791.93
  .004073     445.     300.     160.        2        0        0      .00   416.13  2208.07
0
1490 NH CARD USED
*SECNO 9.580
    9.58     2.90  1403.90      .00      .00  1404.38      .48      .38      .00  1461.00
   6800.       0.       0.    6800.       0.       0.    1223.     166.      66.   1461.00
     .23      .00      .00     5.56     .045     .035     .035     .000  1401.00  1780.40
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 .004127     145.     110.      75.       2       0       0     .00   433.21  2213.60
0
1490 NH CARD USED
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  SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
  TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST

*SECNO 9.670
    9.67     2.66  1405.66      .00      .00  1406.17      .51     1.78      .01  1413.00
   6800.       0.       0.    6800.       0.       0.    1185.     177.      70.   1463.00
     .25      .00      .00     5.74     .045     .035     .035     .000  1403.00  1769.37
 .004945     430.     410.     395.       2        0        0      .00   456.27  2225.63

1490 NH CARD USED
*SECNO 9.750
    9.75     2.95  1407.45      .00      .00  1408.11      .67     1.90      .05  1414.50
   6800.       0.       0.    6800.       0.       0.    1036.     186.      73.   1464.50
     .27      .00      .00     6.56     .045     .035     .034     .000  1404.50  1818.22
 .005629     390.     370.     360.       2        0        0      .00   363.56  2181.78

1490 NH CARD USED
*SECNO 9.840
    9.84     3.71  1409.71      .00      .00  1410.25      .54     2.13      .01  1420.00
   6800.       0.    6800.       0.       0.    1149.       0.     198.      77.   1420.00
     .29      .00     5.92      .00     .045     .035     .034     .000  1406.00  1837.17
 .003544     475.     480.     485.       2        0        0      .00   324.66  2161.83

1490 NH CARD USED
*SECNO 9.940
    9.94     2.96  1411.96      .00      .00  1412.64      .68     2.35      .04  1425.00
   6800.       0.    6800.       0.       0.    1025.       0.     211.      81.   1425.00
     .31      .00     6.63      .00     .045     .035     .034     .000  1409.00  1823.17
 .005933     495.     520.     545.       2        0        0      .00   358.65  2181.83
0
1490 NH CARD USED
*SECNO 10.040
   10.04     2.64  1415.64      .00      .00  1416.48      .84     3.79      .05  1428.00
   6800.       0.    6800.       0.       0.     925.       0.     223.      85.   1428.00
     .33      .00     7.35      .00     .045     .035     .034     .000  1413.00  1819.44
 .008449     540.     540.     540.       3        0        0      .00   361.11  2180.56
0
1490 NH CARD USED
*SECNO 10.120
   10.12     3.35  1417.85      .00      .00  1418.22      .37     1.70      .05  1429.50
   6800.       0.    6800.       0.       0.    1384.       0.     233.      89.   1429.50
     .35      .00     4.91      .00     .045     .035     .034     .000  1414.50  1786.61
 .002755     415.     380.     350.       3        0        0      .00   426.79  2213.39
0
12-22-90     14:06:46                                                                                PAGE   12

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

1490 NH CARD USED
*SECNO 10.210
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3301 HV CHANGED MORE THAN HVINS

5685 20 TRIALS ATTEMPTED WSEL,CWSEL
5693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

10.21	1.97	1421.97	1421.97	.00	1422.93	.97	2.39	.18	1435.00
6800.	0.	6800.	0.	0.	862.	0.	245.	93.	1435.00
.37	.00	7.89	.00	.045	.035	.034	.000	1420.00	1777.13
.014231	475.	450.	430.	20	11	0	.00	445.75	2222.87

1490 NH CARD USED
*SECNO 10.300

10.30	2.87	1425.87	.00	.00	1426.43	.55	3.45	.04	1438.00
6800.	0.	6800.	0.	0.	1140.	0.	255.	98.	1438.00
.39	.00	5.96	.00	.045	.035	.034	.000	1423.00	1795.50
.004955	490.	440.	395.	3	0	0	.00	408.01	2203.50

CCHV= .100 CEHV= .300
*SECNO 10.350

HAPPY VALLEY ROAD

10.35	2.67	1427.44	1427.41	.00	1428.49	1.04	1.91	.15	1440.90
6800.	0.	6800.	0.	0.	831.	0.	261.	100.	1441.48
.40	.00	8.19	.00	.035	.035	.035	.000	1424.77	1381.81
.013346	305.	250.	155.	4	11	0	.00	385.06	1766.87

0
1490 NH CARD USED
*SECNO 10.400

NO CHANNEL INVERT IMPROVEMENTS

10.40	7.26	1429.26	.00	.00	1429.89	.64	1.37	.04	1437.80
6800.	0.	6800.	0.	0.	1063.	0.	265.	101.	1437.80
.41	.00	6.40	.00	.035	.040	.035	.000	1422.00	1862.23
.004138	195.	200.	235.	2	0	0	.00	241.64	2103.87

1

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

1490 NH CARD USED
*SECNO 10.490

NO CHANNEL INVERT IMPROVEMENTS

10.49	3.78	1431.78	.00	.00	1432.51	.73	2.59	.03	1441.00
6800.	0.	6800.	0.	0.	993.	0.	276.	104.	1441.00
.42	.00	6.85	.00	.035	.040	.035	.000	1428.00	1781.87
.008080	460.	460.	460.	3	0	0	.00	341.50	2123.37

0
1490 NH CARD USED
*SECNO 10.620

NO CHANNEL INVERT IMPROVEMENTS

10.62	4.76	1434.76	.00	.00	1435.29	.53	2.76	.02	1443.40
6800.	0.	6800.	0.	0.	1166.	0.	291.	109.	1443.40
.45	.00	5.83	.00	.035	.035	.035	.000	1430.00	1881.69

```
 .002890     575.     610.     645.       3       0       0     .00   284.70  2166.38
0
1490 NH CARD USED
*SECNO 10.700

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

            NO CHANNEL INVERT IMPROVEMENTS

   10.70     4.43  1436.43  1436.43     .00  1438.08     1.65     1.99      .34  1446.00
   6800.       0.    6800.       0.      0.     660.       0.     299.     111.   1446.00
     .46      .00    10.30      .00    .035     .035     .035     .000  1432.00  1950.93
 .012322     365.     380.     405.       4      11       0      .00   203.57  2154.50
0
1490 NH CARD USED
*SECNO 10.830

3301 HV CHANGED MORE THAN HVINS

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            NO CHANNEL INVERT IMPROVEMENTS

   10.83     7.38  1443.38      .00     .00  1444.39     1.01     6.25      .06  1452.20
   6800.       0.    6800.       0.      0.     842.       0.     310.     114.   1452.20
     .49      .00     8.07      .00    .035     .040     .035     .000  1436.00  1798.28
 .007711     640.     650.     680.       4       0       0      .00   214.55  2012.83

1490 NH CARD USED
*SECNO 10.930

6265 DIVIDED FLOW

            NO CHANNEL INVERT IMPROVEMENTS
   10.93     5.39  1447.39      .00     .00  1448.44     1.04     4.04      .01  1457.70
   6800.       0.    6800.       0.      0.     829.       0.     320.     117.   1457.70
     .50      .00     8.20      .00    .035     .034     .035     .000  1442.00  1836.11
 .008459     490.     500.     535.       2       0       0      .00   278.43  2193.50
0
1490 NH CARD USED
*SECNO 11.040

         END OF DIKE EXTENSION FROM CORPS DIKE ON THE RIGHT BANK ONLY
          CONFLUENCE OF BUCHANAN WASH AND SKUNK CREEK
            NO CHANNEL INVERT IMPROVEMENTS


   11.04     3.49  1451.49      .00     .00  1452.07      .57     3.58      .05  1461.00
   6800.       0.    6800.       0.      0.    1118.       0.     331.     121.   1465.00
     .53      .00     6.08      .00    .035     .034     .035     .000  1448.00  1743.03
 .006144     530.     500.     510.       2       0       0      .00   462.93  2205.97

1490 NH CARD USED
*SECNO 11.100

         CROSS SECTION LOCATED BASED ON 1.5 TO 1 FLOW EXPANSION
         FROM CORPS DIKE ON THE LEFT BANK
            NO CHANNEL INVERT IMPROVEMENTS
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   11.10     3.29  1453.29      .00      .00  1453.58      .29     1.49      .03  1465.00
   6800.       0.    6800.       0.       0.    1573.       0.     342.     126.   1465.00
     .55      .00     4.32      .00     .035     .035     .035     .000  1450.00  1566.83
 .002900     395.     365.     365.        3        0        0      .00   609.76  2176.59
```



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

*SECNO 11.200

3301 HV CHANGED MORE THAN HVINS

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

         EFFECTIVE FLOW ASSUMED TO EXPAND AT 1.5 TO 1 FROM COE LEVEES.
              (ON LEFT BANK ONLY)
         INVERT AND SLOPE DETAILS FOR CORPS LEVEES TAKEN FROM AS BUILT PLANS

   11.20     2.67  1454.67  1454.67      .00  1455.99     1.32     1.44      .31  1467.00
   6800.       0.    6800.       0.       0.     737.       0.     353.     130.   1467.00
     .56      .00     9.23      .00     .035     .020     .035     .000  1452.00  1859.17
 .004308     520.     410.     470.       20       15        0      .00   281.66  2140.83

*SECNO 11.300

3301 HV CHANGED MORE THAN HVINS

   11.30     4.02  1456.52      .00      .00  1457.09      .57     1.02      .07  1469.00
   6800.       0.    6800.       0.       0.    1119.       0.     364.     133.   1469.50
     .59      .00     6.08      .00     .035     .020     .035     .000  1452.50  1856.48
 .001099     528.     528.     528.        2        0        0      .00   287.04  2143.52

*SECNO 11.400
   11.40     3.09  1457.09      .00      .00  1458.07      .98      .86      .12  1471.50
   6800.       0.    6800.       0.       0.     856.       0.     376.     137.   1472.00
     .60      .00     7.94      .00     .035     .020     .035     .000  1454.00  1858.32
 .002632     528.     528.     528.        3        0        0      .00   283.36  2141.68
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                                                                    THIS RUN EXECUTED 12-22-90

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

T1      SKUNK CREEK HYDRAULIS ANALYSIS, ESTIMATE T.O.B. W/O CHANNEL INVERT
T2      IMPROVEMENTS NORTH OF HAPPY VALLEY RD              **Q=15000 CFS**
T3      RM 9.48 TO 10.35 W/INV. IMPROVEMENTS     NAME: SKUNK.HYD
```

```
J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     0.        3.        0.        0.   .000000       .00       .0        0.  1377.800      .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    2.000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA     LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*PROF 2

CCHV=    .100 CEHV=    .300
*SECNO 8.690

          DURING MAJOR FLOODS, SKUNK CREEK IS EXPECTED TO FLOW OVER THE OVER-
          SHOOT OF THE CAP AT THE UPSTREAM END OF THE COE'S LEVEES
          ALL CROSSECTIONS WERE RECODED BY JIM HARRIS, HYDRAULICS SECTION
          (APRIL 1983).  THE PREVIOUS ONES WERE FOUND TO BE UNSATISFACTORY.
          CHANNEL CENTERLINE CORRESPONDS TO 2000 FEET.
          ALL MANNINGS "N" VALUES USED WERE OBTAINED FROM THE PREVIOUS
          MODEL AS ASSIGNED BY CASKIE AND MASHBURN BASED ON FIELD
          OBSERVATION (FEB. 1983)
          THE VALUES FOR THE 10, 50, 100, AND 500 YEAR FLOODS ARE 15,000,29000,
          39,000, AND 85,000 CFS RESPECTIVELY (PER GRIGORIAN 5/23/83)

    8.69      8.00  1377.80       .00  1377.80  1378.06       .26       .00       .00  1376.00
   15000.     4545.     5325.     5130.     1496.      893.     2580.        0.        0.  1376.00
     .00      3.04      5.96      1.99      .045      .035      .045      .000  1369.80  1451.30
  .001672       0.        0.        0         0         0         0       .00  2108.70  3560.00

*SECNO 8.750

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
    8.75      9.24  1380.24  1380.24       .00  1381.99      1.74      2.41       .44  1376.00
   15000.     1764.    13230.       6.      397.     1185.        7.        58.       23.  1380.00
     .02      4.45     11.16       .74      .045      .035      .045      .000  1371.00  1552.65
  .008285      835.      739.      733.        20        11         0       .00   548.56  2101.22

*SECNO 8.890

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=     870.0    3730.0  TYPE=     1  TARGET=    2860.000
    8.89      8.27  1386.27  1385.44       .00  1387.34      1.07      5.28       .07  1384.00
   15000.     1097.    13805.       98.     478.     1602.       68.       91.       40.  1384.00
     .05      2.30      8.62      1.43      .045      .035      .045      .000  1378.00   870.00
  .005231      565.      840.      650.         6        11         0       .00  1708.19  2578.19
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


*SECNO 8.965

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=    1085.0    3575.0  TYPE=     1  TARGET=    2490.000
     8.97      7.99  1388.99  1388.99      .00  1389.92      .94      2.14      .01  1388.00
   15000.     1338.   12964.    698.     571.    1559.     314.      110.      52.   1388.00
     .06      2.34     8.31     2.22     .045     .035     .045      .000  1381.00  1085.00
  .005747     275.     400.     410.        2       10        0       .00  1447.25  2737.32
0
*SECNO 9.050

3470 ENCROACHMENT STATIONS=    1370.0    3415.0  TYPE=     1  TARGET=    2045.000
     9.05      9.22  1391.22      .00      .00  1391.67      .45      1.70      .05  1388.00
   15000.     3303.    9430.   2267.    1220.    1436.    1380.      145.      69.   1390.00
     .09      2.71     6.57     1.64     .045     .035     .045      .000  1382.00  1370.00
  .002164     410.     550.     370.        2        0        0       .00  2045.00  3415.00
0
*SECNO 9.115
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=        .0    3465.0  TYPE=     1  TARGET=    3464.999
     9.11      6.16  1392.66  1392.66      .00  1393.52      .86      1.27      .12  1392.00
   15000.       27.   13377.    1596.      21.    1702.     769.      171.      83.   1392.00
     .10      1.31     7.86     2.08     .045     .035     .045      .000  1386.50  1727.29
  .006877     350.     370.     300.        3       18        0       .00  1737.71  3465.00
0
*SECNO 9.210

3470 ENCROACHMENT STATIONS=    1385.0    2950.0  TYPE=     1  TARGET=    1565.000

          LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
          X3 USED TO DEFINE EFFECTIVE FLOW.

     9.21      7.16  1395.66      .00      .00  1396.35      .69      2.81      .02  1394.00
   15000.     928.   11899.   2173.     389.    1614.     840.      205.     102.   1394.00
     .13      2.39     7.37     2.59     .045     .035     .040      .000  1388.50  1544.66
  .003564     460.     600.     500.        1        0        0       .00  1405.34  2950.00
0
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


1490 NH CARD USED
*SECNO 9.310
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=    1110.0    2560.0  TYPE=     1  TARGET=    1450.000
```

LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
X3 USED TO DEFINE EFFECTIVE FLOW.

9.31	7.34	1399.34	1399.34	.00	1400.43	1.09	2.28	.12	1398.00
15000.	922.	11601.	2477.	509.	1232.	849.	239.	117.	1396.00
.15	1.81	9.41	2.92	.045	.035	.050	.000	1392.00	1110.00
.003955	400.	650.	480.	3	5	0	.00	1450.00	2560.00

0
1490 NH CARD USED
*SECNO 9.400

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 980.0 2400.0 TYPE= 1 TARGET= 1420.000

LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
X3 USED TO DEFINE EFFECTIVE FLOW.

9.40	7.41	1401.41	1401.17	.00	1402.72	1.32	2.23	.07	1402.00
15000.	1256.	13521.	223.	426.	1399.	108.	263.	128.	1400.00
.17	2.95	9.66	2.06	.040	.035	.044	.000	1394.00	980.00
.005249	370.	510.	420.	4	5	0	.00	797.80	2400.00

1490 NH CARD USED
*SECNO 9.480

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= .0 2260.0 TYPE= 1 TARGET= 2259.999

RM 9.48 TO 11.2 MODIFIED
X3 CARD USED FOR RIGHT BANK,EFFECTIVE FLOW AREA ASSUMED

TO EXPAND AT 1.5 TO 1 FROM END OF RIGHT BANK LEVEE

9.48	5.10	1404.10	.00	.00	1404.84	.74	2.06	.06	1409.00
15000.	0.	14863.	137.	0.	2141.	66.	286.	135.	1402.00
.19	.00	6.94	2.08	.040	.034	.045	.000	1399.00	1719.62
.003526	370.	490.	420.	2	0	0	.00	540.38	2260.00

0
1490 NH CARD USED
*SECNO 9.560

ADDITIONAL SECTION ADDED TO REFINE AND REPRESENT THE
PROPOSED HYDRAULIC CONDITIONS

9.56	4.65	1405.15	.00	.00	1406.11	.96	1.20	.06	1410.50
15000.	0.	15000.	0.	0.	1910.	0.	300.	138.	1410.50
.20	.00	7.85	.00	.040	.035	.045	.000	1400.50	1785.39
.004594	445.	300.	160.	2	0	0	.00	429.22	2214.61

0
1490 NH CARD USED
*SECNO 9.580

9.58	4.63	1405.63	.00	.00	1406.52	.89	.40	.01	1461.00
15000.	0.	0.	15000.	0.	0.	1983.	304.	139.	1461.00
.20	.00	.00	7.56	.040	.035	.034	.000	1401.00	1773.49
.004087	145.	110.	75.	2	0	0	.00	447.02	2220.51

0
1490 NH CARD USED
*SECNO 9.670

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   9.67     4.32  1407.32      .00      .00  1408.24      .92     1.71      .01  1413.00
  15000.      0.       0.   15000.       0.       0.    1954.     322.     143.   1463.00
    .21      .00      .00     7.68     .040     .035     .034     .000  1403.00  1762.72
 .004617     430.     410.     395.        2        0        0      .00   469.56  2232.28
0
 1490 NH CARD USED
 *SECNO 9.750
   9.75     4.47  1408.97      .00      .00  1410.34     1.36     1.96      .13  1414.50
  15000.      0.       0.   15000.       0.       0.    1602.     337.     147.   1464.50
    .23      .00      .00     9.37     .040     .035     .034     .000  1404.50  1812.10
 .006547     390.     370.     360.        2        0        0      .00   375.80  2187.90
0
 1490 NH CARD USED
 *SECNO 9.840
   9.84     5.72  1411.72      .00      .00  1412.78     1.06     2.41      .03  1420.00
  15000.      0.   15000.       0.       0.    1819.       0.     356.     151.   1420.00
    .24      .00     8.24      .00     .040     .034     .034     .000  1406.00  1829.11
 .003939     475.     480.     485.        2        0        0      .00   340.79  2169.89

1
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

 1490 NH CARD USED
 *SECNO 9.940
   9.94     4.97  1413.97      .00      .00  1415.09     1.12     2.29      .02  1425.00
  15000.      0.   15000.       0.       0.    1764.       0.     377.     155.   1425.00
    .26      .00     8.50      .00     .040     .035     .034     .000  1409.00  1815.11
 .004977     495.     520.     545.        3        0        0      .00   374.78  2189.89
0
 1490 NH CARD USED
 *SECNO 10.040
  10.04     4.16  1417.16      .00      .00  1418.74     1.59     3.51      .14  1428.00
  15000.      0.   15000.       0.       0.    1484.       0.     397.     159.   1428.00
    .27      .00    10.11      .00     .040     .035     .034     .000  1413.00  1813.35
 .008838     540.     540.     540.        2        0        0      .00   373.29  2186.65
0
 1490 NH CARD USED
 *SECNO 10.120

 3301 HV CHANGED MORE THAN HVINS

  10.12     5.36  1419.86      .00      .00  1420.55      .68     1.71      .09  1429.50
  15000.      0.   15000.       0.       0.    2260.       0.     413.     163.   1429.50
    .29      .00     6.64      .00     .040     .035     .034     .000  1414.50  1778.55
 .002731     415.     380.     350.        2        0        0      .00   442.89  2221.45
0
 1490 NH CARD USED
 *SECNO 10.210

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
  10.21     3.31  1423.31  1423.31      .00  1424.93     1.63     2.26      .28  1435.00
  15000.      0.   15000.       0.       0.    1466.       0.     433.     168.   1435.00
    .30      .00    10.23      .00     .040     .035     .034     .000  1420.00  1771.77
 .012112     475.     450.     430.       20       14        0      .00   456.46  2228.23
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1490 NH CARD USED

1

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

*SECNO 10.300

3301 HV CHANGED MORE THAN HVINS

10.30	4.41	1427.41	.00	.00	1428.52	1.11	3.53	.05	1438.00
15000.	0.	15000.	0.	0.	1775.	0.	449.	172.	1438.00
.32	.00	8.45	.00	.040	.035	.034	.000	1423.00	1789.37
.005708	490.	440.	395.	3	0	0	.00	420.27	2209.63

0

CCHV= .100 CEHV= .300

*SECNO 10.350

3301 HV CHANGED MORE THAN HVINS

HAPPY VALLEY ROAD

10.35	4.16	1428.93	1428.90	.00	1430.69	1.76	1.97	.20	1440.90
15000.	0.	15000.	0.	0.	1409.	0.	458.	174.	1441.48
.32	.00	10.64	.00	.035	.035	.035	.000	1424.77	1375.89
.011627	305.	250.	155.	6	11	0	.00	396.89	1772.79

1490 NH CARD USED

*SECNO 10.400

NO CHANNEL INVERT IMPROVEMENTS

10.40	9.14	1431.14	.00	.00	1432.42	1.27	1.68	.05	1437.80
15000.	0.	15000.	0.	0.	1656.	0.	465.	176.	1437.80
.33	.00	9.06	.00	.035	.036	.035	.000	1422.00	1848.55
.006381	195.	200.	235.	3	0	0	.00	358.83	2207.38

0

1490 NH CARD USED

*SECNO 10.490

NO CHANNEL INVERT IMPROVEMENTS

10.49	6.16	1434.16	.00	.00	1435.02	.87	2.56	.04	1441.00
15000.	0.	15000.	0.	0.	2009.	0.	485.	180.	1441.00
.35	.00	7.46	.00	.035	.038	.035	.000	1428.00	1772.37
.004905	460.	460.	460.	3	0	0	.00	445.25	2217.63

0

1

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

1490 NH CARD USED

*SECNO 10.620

3265 DIVIDED FLOW

NO CHANNEL INVERT IMPROVEMENTS

10.62	6.74	1436.74	.00	.00	1437.84	1.10	2.75	.07	1443.40
15000.	0.	15000.	0.	0.	1786.	0.	511.	186.	1443.40
.37	.00	8.40	.00	.035	.033	.035	.000	1430.00	1799.85
.004146	575.	610.	645.	2	0	0	.00	366.49	2197.56

0

1490 NH CARD USED
*SECNO 10.700

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

NO CHANNEL INVERT IMPROVEMENTS

10.70	6.91	1438.91	1438.91	.00	1441.13	2.21	2.42	.33	1446.00
15000.	0.	15000.	0.	0.	1257.	0.	524.	189.	1446.00
.37	.00	11.94	.00	.035	.035	.035	.000	1432.00	1902.18
.011064	365.	380.	405.	3	8	0	.00	289.48	2191.65

1490 NH CARD USED
*SECNO 10.830

3301 HV CHANGED MORE THAN HVINS

NO CHANNEL INVERT IMPROVEMENTS

10.83	9.65	1445.65	.00	.00	1446.79	1.15	5.56	.11	1452.20
15000.	0.	15000.	0.	0.	1746.	0.	547.	195.	1452.20
.40	.00	8.59	.00	.035	.034	.035	.000	1436.00	1766.18
.006812	640.	650.	680.	2	0	0	.00	470.64	2236.82

0
1

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

1490 NH CARD USED
*SECNO 10.930

NO CHANNEL INVERT IMPROVEMENTS

10.93	7.38	1449.38	.00	.00	1450.73	1.35	3.88	.06	1457.70
15000.	0.	15000.	0.	0.	1609.	0.	566.	200.	1457.70
.41	.00	9.32	.00	.035	.036	.035	.000	1442.00	1785.28
.008899	490.	500.	535.	3	0	0	.00	436.44	2221.72

0
1490 NH CARD USED
*SECNO 11.040

END OF DIKE EXTENSION FROM CORPS DIKE ON THE RIGHT BANK ONLY
CONFLUENCE OF BUCHANAN WASH AND SKUNK CREEK
NO CHANNEL INVERT IMPROVEMENTS

11.04	5.16	1453.16	.00	.00	1454.12	.96	3.35	.04	1461.00

```
 15000.      0.   15000.      0.      0.    1904.      0.     586.     205.   1465.00
    .43     .00     7.88     .00    .035     .034    .035     .000  1448.00  1736.34
 .005231    530.    500.    510.       1        0       0      .00   476.32  2212.66

1490 NH CARD USED
*SECNO 11.100

        CROSS SECTION LOCATED BASED ON 1.5 TO 1 FLOW EXPANSION
        FROM CORPS DIKE ON THE LEFT BANK
           NO CHANNEL INVERT IMPROVEMENTS


  11.10     4.98  1454.98     .00     .00  1455.49     .51    1.32     .05  1465.00
 15000.      0.   15000.      0.      0.    2608.      0.     605.     210.   1465.00
    .45     .00     5.75     .00    .035     .035    .035     .000  1450.00  1560.10
 .002660    395.    365.    365.       3        0       0      .00   619.85  2179.95
0
*SECNO 11.200

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

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


3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

        EFFECTIVE FLOW ASSUMED TO EXPAND AT 1.5 TO 1 FROM COE LEVEES.
             (ON LEFT BANK ONLY)
        INVERT AND SLOPE DETAILS FOR CORPS LEVEES TAKEN FROM AS BUILT PLANS

  11.20     4.50  1456.50  1456.50     .00  1458.70    2.20    1.27     .51  1467.00
 15000.      0.   15000.      0.      0.    1259.      0.     623.     214.   1467.00
    .46     .00    11.92     .00    .035     .020    .035     .000  1452.00  1855.51
 .003650    520.    410.    470.      20       11       0      .00   288.98  2144.49

*SECNO 11.300

3301 HV CHANGED MORE THAN HVINS

  11.30     6.22  1458.72     .00     .00  1459.85    1.12    1.04     .11  1469.00
 15000.      0.   15000.      0.      0.    1765.      0.     642.     218.   1469.50
    .47     .00     8.50     .00    .035     .020    .035     .000  1452.50  1852.05
 .001225    528.    528.    528.       2        0       0      .00   295.91  2147.95
0
*SECNO 11.400
  11.40     5.23  1459.23     .00     .00  1460.84    1.61     .85     .15  1471.50
 15000.      0.   15000.      0.      0.    1472.      0.     661.     221.   1472.00
    .49     .00    10.19     .00    .035     .020    .035     .000  1454.00  1854.04
 .002198    528.    528.    528.       3        0       0      .00   291.92  2145.96


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                                                                THIS RUN EXECUTED 12-22-90
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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION AUGUST 1985
*****************************************************


T1      SKUNK CREEK HYDRAULIC ANALYSIS, ESTIMATE T.O.B. W/O CHANNEL INVERT
T2      IMPROVEMENTS NORTH OF HAPPY VALLEY RD              **Q=29000 CFS**
T3      RM 9.48 TO 10.35 W/INV. IMPROVEMENTS    NAME: SKUNK.HYD

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     0.        4.        0.        0.   .000000       .00        .0        0.  1377.800      .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    3.000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000

1
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST


*PROF 3

CCHV=    .100 CEHV=    .300
*SECNO 8.690

         DURING MAJOR FLOODS, SKUNK CREEK IS EXPECTED TO FLOW OVER THE OVER-
         SHOOT OF THE CAP AT THE UPSTREAM END OF THE COE'S LEVEES
         ALL CROSSECTIONS WERE RECODED BY JIM HARRIS, HYDRAULICS SECTION
         (APRIL 1983).  THE PREVIOUS ONES WERE FOUND TO BE UNSATISFACTORY.
         CHANNEL CENTERLINE CORRESPONDS TO 2000 FEET.
         ALL MANNINGS "N" VALUES USED WERE OBTAINED FROM THE PREVIOUS
         MODEL AS ASSIGNED BY CASKIE AND MASHBURN BASED ON FIELD
         OBSERVATION (FEB. 1983)
         THE VALUES FOR THE 10, 50, 100, AND 500 YEAR FLOODS ARE 15,000,29000,
         39,000, AND 85,000 CFS RESPECTIVELY (PER GRIGORIAN 5/23/83)

    8.69      8.00  1377.80       .00  1377.80  1378.77       .97       .00       .00  1376.00
   29000.     8787.   10295.     9919.    1496.     893.     2580.        0.        0.  1376.00
     .00      5.87     11.53      3.84     .045     .035      .045      .000  1369.80  1451.30
  .006251       0.        0.        0.        0        0         0       .00  2108.70  3560.00

*SECNO 8.750

 3265 DIVIDED FLOW

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
    8.75     11.82  1382.82  1382.82       .00  1383.84      1.02      3.62       .01  1376.00
   29000.     6221.   17875.     4904.    1455.     1803.     2033.       90.       44.  1380.00
     .03      4.27      9.91      2.41     .045     .035      .045      .000  1371.00   886.76
  .003735     835.      739.      733.        2        15         0       .00  2963.23  3896.55

*SECNO 8.890
 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
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3470 ENCROACHMENT STATIONS=     870.0    3730.0  TYPE=     1  TARGET=    2860.000
    8.89     9.61  1387.61  1387.61      .00  1388.53      .92     3.02      .01  1384.00
   29000.    6239.   19038.    3723.    1859.    2058.    1604.     176.     87.   1384.00
     .06     3.36     9.25     2.32     .045     .035     .045     .000  1378.00   870.00
  .004316     565.     840.     650.        7       14        0      .00  2860.00  3730.00
0
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN       SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID      ENDST

 *SECNO 8.965
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=    1085.0    3575.0  TYPE=     1  TARGET=    2490.000
    8.97     9.28  1390.28  1390.28      .00  1391.28     1.00     1.77      .02  1388.00
   29000.    5917.   19417.    3666.    1583.    2047.    1174.     219.    109.   1388.00
     .07     3.74     9.49     3.12     .045     .035     .045     .000  1381.00  1085.00
  .005208     275.     400.     410.       20       10        0      .00  2490.00  3575.00
0
 *SECNO 9.050

3470 ENCROACHMENT STATIONS=    1370.0    3415.0  TYPE=     1  TARGET=    2045.000
    9.05    10.44  1392.44      .00      .00  1392.98      .54     1.65      .05  1388.00
   29000.    7078.   13542.    8380.    1875.    1724.    2943.     276.    131.   1390.00
     .10     3.77     7.86     2.85     .045     .035     .045     .000  1382.00  1370.00
  .002426     410.     550.     370.        2        0        0      .00  2045.00  3415.00
0
*SECNO 9.115

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=       .0    3465.0  TYPE=     1  TARGET=    3464.999
    9.11     7.20  1393.70  1393.70      .00  1394.75     1.06     1.33      .16  1392.00
   29000.     336.   20974.    7690.     137.    2231.    1978.     318.    145.   1392.00
     .11     2.45     9.40     3.89     .045     .035     .045     .000  1386.50  1628.69
  .006855     350.     370.     300.        3       18        0      .00  1836.31  3465.00

 *SECNO 9.210

3470 ENCROACHMENT STATIONS=    1385.0    2950.0  TYPE=     1  TARGET=    1565.000

         LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
         X3 USED TO DEFINE EFFECTIVE FLOW.

    9.21     8.33  1396.83      .00      .00  1397.77      .94     3.01      .01  1394.00
   29000.    3206.   18441.    7353.     900.    1992.    1724.     374.    165.   1394.00
     .13     3.56     9.26     4.27     .045     .035     .040     .000  1388.50  1385.00
  .004246     460.     600.     500.        2        0        0      .00  1565.00  2950.00
0
1
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```
   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
```

```
  TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


1490 NH CARD USED
*SECNO 9.310
685 20 TRIALS ATTEMPTED WSEL,CWSEL
693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

470 ENCROACHMENT STATIONS=    1110.0    2560.0  TYPE=     1  TARGET=    1450.000

        LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
        X3 USED TO DEFINE EFFECTIVE FLOW.

    9.31      8.55  1400.55  1400.55      .00  1401.97      1.42      2.65       .14  1398.00
   29000.     5402.   17326.    6272.    1505.     1457.     1390.      428.      181.   1396.00
     .15      3.59     11.89     4.51     .045      .035      .050      .000   1392.00  1110.00
  .005046     400.      650.     480.       20         8         0       .00   1450.00  2560.00
0
1490 NH CARD USED
*SECNO 9.400
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     980.0    2400.0  TYPE=     1  TARGET=    1420.000

        LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
        X3 USED TO DEFINE EFFECTIVE FLOW.

    9.40      9.03  1403.03  1403.03      .00  1404.45      1.42      2.39       .00  1402.00
   29000.     7191.   20191.    1618.    1678.     1817.      416.      469.      195.   1400.00
     .16      4.29     11.11     3.89     .040      .035      .044      .000   1394.00   980.00
  .005168     370.      510.     420.        2         8         0       .00   1420.00  2400.00
0
1490 NH CARD USED
*SECNO 9.480

3470 ENCROACHMENT STATIONS=        .0    2260.0  TYPE=     1  TARGET=    2259.999

        RM 9.48 TO 11.2 MODIFIED
        X3 CARD USED FOR RIGHT BANK,EFFECTIVE FLOW AREA ASSUMED
        TO EXPAND AT 1.5 TO 1 FROM END OF RIGHT BANK LEVEE

    9.48      6.41  1405.41       .00       .00  1407.00      1.59      2.51       .05  1409.00
   29000.        0.   28376.     624.        0.     2776.      145.      505.      204.   1402.00
     .18       .00     10.22     4.31     .040      .034      .045      .000   1399.00  1714.36
  .005443     370.      490.     420.        2         0         0       .00    545.64  2260.00
0
1
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  SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
  Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
  TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


1490 NH CARD USED
*SECNO 9.560

        ADDITIONAL SECTION ADDED TO REFINE AND REPRESENT THE
        PROPOSED HYDRAULIC CONDITIONS

    9.56      6.43  1406.93       .00       .00  1408.74      1.81      1.67       .07  1410.50
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```
  29000.      0.   29000.      0.      0.   2684.      0.    524.    208.  1410.50
    .18     .00    10.80     .00    .040    .035    .045    .000 1400.50  1778.30
 .005740    445.    300.    160.      2       0       0     .00  443.41  2221.70

1490 NH CARD USED
*SECNO 9.580
   9.58    6.70  1407.70     .00     .00 1409.22    1.52    .46     .03  1461.00
  29000.      0.      0.  29000.      0.      0.   2927.   530.    209.  1461.00
    .19     .00     .00    9.91    .040    .035    .034    .000 1401.00  1765.20
 .004269    145.    110.     75.      2       0       0     .00  463.60  2228.80

1490 NH CARD USED
*SECNO 9.670
   9.67    6.45  1409.45     .00     .00 1410.93    1.48    1.70     .00  1413.00
  29000.      0.      0.  29000.      0.      0.   2975.   557.    213.  1463.00
    .20     .00     .00    9.75    .040    .035    .034    .000 1403.00  1754.18
 .004345    430.    410.    395.      2       0       0     .00  486.65  2240.82

1490 NH CARD USED
*SECNO 9.750

3301 HV CHANGED MORE THAN HVINS

   9.75    6.27  1410.77     .00     .00 1413.26    2.49    2.03     .30  1414.50
  29000.      0.      0.  29000.      0.      0.   2292.   578.    216.  1464.50
    .21     .00     .00   12.66    .040    .035    .034    .000 1404.50  1804.89
 .007589    390.    370.    360.      2       0       0     .00  390.21  2195.11
0
1490 NH CARD USED
*SECNO 9.840
1
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK     EG       HV       HL     OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB      ACH      AROB     VOL     TWA   LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL       XNCH     XNR      WTN     ELMIN     SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL    IDC      ICONT    CORAR   TOPWID    ENDST

3301 HV CHANGED MORE THAN HVINS

   9.84    8.22  1414.22     .00     .00 1416.01    1.80    2.69     .07  1420.00
  29000.      0.  29000.      0.      0.   2695.      0.   606.    221.  1420.00
    .22     .00    10.76     .00    .040    .034    .034    .000 1406.00  1819.12
 .004255    475.    480.    485.      2       0       0     .00  360.76  2179.88

1490 NH CARD USED
*SECNO 9.940
   9.94    7.57  1416.57     .00     .00 1418.28    1.70    2.25     .01  1425.00
  29000.      0.  29000.      0.      0.   2770.      0.   638.    225.  1425.00
    .23     .00    10.47     .00    .040    .034    .034    .000 1409.00  1804.67
 .004410    495.    520.    545.      2       0       0     .00  395.66  2200.33

1490 NH CARD USED
*SECNO 10.040

3301 HV CHANGED MORE THAN HVINS

  10.04    6.20  1419.20     .00     .00 1421.75    2.55    3.22     .25  1428.00
  29000.      0.  29000.      0.      0.   2264.      0.   670.    230.  1428.00
    .24     .00    12.81     .00    .040    .034    .034    .000 1413.00  1805.18
 .008508    540.    540.    540.      2       0       0     .00  389.64  2194.82
0
1490 NH CARD USED
```

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*SECNO 10.120

3301 HV CHANGED MORE THAN HVINS

    10.12      7.95  1422.45       .00       .00  1423.56      1.11      1.67       .14  1429.50
    29000.       0.   29000.        0.        0.    3434.        0.      695.      234.   1429.50
      .26       .00     8.45       .00      .040     .034      .034      .000   1414.50  1768.19
   .002670      415.     380.      350.         2        0         0       .00    463.62  2231.81
0
1490 NH CARD USED
*SECNO 10.210
```



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


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
    10.21      5.11  1425.11  1425.11       .00  1427.57      2.47      2.12       .41  1435.00
    29000.       0.   29000.        0.        0.    2300.        0.      724.      239.   1435.00
      .27       .00    12.61       .00      .040     .035      .034      .000   1420.00  1764.58
   .010467      475.     450.      430.        20       14         0       .00    470.84  2235.42
0
1490 NH CARD USED
*SECNO 10.300
    10.30      6.23  1429.23       .00       .00  1431.23      2.00      3.61       .05  1438.00
    29000.       0.   29000.        0.        0.    2553.        0.      749.      243.   1438.00
      .28       .00    11.36       .00      .040     .035      .034      .000   1423.00  1782.09
   .006608      490.     440.      395.         2        0         0       .00    434.83  2216.91
0
CCHV=    .100 CEHV=    .300
*SECNO 10.350

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

                HAPPY VALLEY ROAD

    10.35      6.08  1430.85  1430.85       .00  1433.58      2.73      2.06       .22  1440.90
    29000.       0.   29000.        0.        0.    2189.        0.      762.      246.   1441.48
      .28       .00    13.25       .00      .035     .035      .035      .000   1424.77  1368.19
   .010557      305.     250.      155.         3        5         0       .00    412.30  1780.49
0
1490 NH CARD USED
*SECNO 10.400

3301 HV CHANGED MORE THAN HVINS


            NO CHANNEL INVERT IMPROVEMENTS
```

```
  10.40    11.45  1433.45      .00      .00  1435.37     1.92     1.71      .08  1437.80
 29000.       0.   29000.       0.       0.    2606.       0.     773.     248.   1437.80
    .29      .00    11.13      .00     .035     .036     .035     .000  1422.00  1770.41
 .007083     195.     200.     235.        3        0        0      .00   446.19  2216.59
0
1490 NH CARD USED
*SECNO 10.490

3301 HV CHANGED MORE THAN HVINS


            NO CHANNEL INVERT IMPROVEMENTS

  10.49     8.69  1436.69      .00      .00  1438.00     1.31     2.56      .06  1441.00
 29000.       0.   29000.       0.       0.    3163.       0.     804.     252.   1441.00
    .30      .00     9.17      .00     .035     .039     .035     .000  1428.00  1762.24
 .004499     460.     460.     460.        2        0        0      .00   465.51  2227.76

1490 NH CARD USED
*SECNO 10.620

            NO CHANNEL INVERT IMPROVEMENTS

  10.62     9.12  1439.12      .00      .00  1440.84     1.72     2.72      .12  1443.40
 29000.       0.   29000.       0.       0.    2759.       0.     845.     259.   1443.40
    .32      .00    10.51      .00     .035     .033     .035     .000  1430.00  1790.61
 .004408     575.     610.     645.        3        0        0      .00   419.68  2210.28
0
1490 NH CARD USED
*SECNO 10.700

3301 HV CHANGED MORE THAN HVINS

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

            NO CHANNEL INVERT IMPROVEMENTS

  10.70     9.46  1441.46  1441.46      .00  1444.23     2.78     2.32      .32  1446.00
 29000.       0.   29000.       0.       0.    2168.       0.     867.     262.   1446.00
    .32      .00    13.38      .00     .035     .032     .035     .000  1432.00  1798.17
 .009014     365.     380.     405.       20        8        0      .00   403.66  2201.83


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


1490 NH CARD USED
*SECNO 10.830

3301 HV CHANGED MORE THAN HVINS


            NO CHANNEL INVERT IMPROVEMENTS

  10.83    11.84  1447.84      .00      .00  1449.51     1.67     5.17      .11  1452.20
 29000.       0.   29000.       0.       0.    2793.       0.     904.     269.   1452.20
    .34      .00    10.38      .00     .035     .038     .035     .000  1436.00  1757.44
 .007065     640.     650.     680.        2        0        0      .00   488.11  2245.56
```

1490 NH CARD USED
*SECNO 10.930

NO CHANNEL INVERT IMPROVEMENTS

10.93	9.57	1451.57	.00	.00	1453.53	1.96	3.93	.08	1457.70
29000.	0.	29000.	0.	0.	2584.	0.	935.	274.	1457.70
.35	.00	11.22	.00	.035	.039	.035	.000	1442.00	1776.52
.008789	490.	500.	535.	2	0	0	.00	453.96	2230.48

1490 NH CARD USED
*SECNO 11.040

END OF DIKE EXTENSION FROM CORPS DIKE ON THE RIGHT BANK ONLY
CONFLUENCE OF BUCHANAN WASH AND SKUNK CREEK
NO CHANNEL INVERT IMPROVEMENTS

11.04	7.25	1455.25	.00	.00	1456.79	1.54	3.22	.04	1461.00
29000.	0.	29000.	0.	0.	2914.	0.	966.	280.	1465.00
.37	.00	9.95	.00	.035	.034	.035	.000	1448.00	1728.00
.004924	530.	500.	510.	2	0	0	.00	493.00	2221.00

1490 NH CARD USED
*SECNO 11.100

3301 HV CHANGED MORE THAN HVINS

CROSS SECTION LOCATED BASED ON 1.5 TO 1 FLOW EXPANSION
FROM CORPS DIKE ON THE LEFT BANK
NO CHANNEL INVERT IMPROVEMENTS

11.10	7.27	1457.27	.00	.00	1458.07	.80	1.20	.07	1465.00
29000.	0.	29000.	0.	0.	4043.	0.	995.	284.	1465.00
.38	.00	7.17	.00	.035	.034	.035	.000	1450.00	1550.94
.002355	395.	365.	365.	2	0	0	.00	633.60	2184.53

*SECNO 11.200

3301 HV CHANGED MORE THAN HVINS

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

EFFECTIVE FLOW ASSUMED TO EXPAND AT 1.5 TO 1 FROM COE LEVEES.
(ON LEFT BANK ONLY)
INVERT AND SLOPE DETAILS FOR CORPS LEVEES TAKEN FROM AS BUILT PLANS

11.20	6.96	1458.96	1458.96	.00	1462.28	3.32	1.11	.76	1467.00
29000.	0.	29000.	0.	0.	1983.	0.	1024.	289.	1467.00
.39	.00	14.63	.00	.035	.020	.035	.000	1452.00	1850.58
.003153	520.	410.	470.	20	8	0	.00	298.84	2149.42

*SECNO 11.300

3301 HV CHANGED MORE THAN HVINS

11.30	9.03	1461.53	.00	.00	1463.45	1.92	1.03	.14	1469.00
29000.	0.	29000.	0.	0.	2609.	0.	1051.	292.	1469.50

```
    .40      .00    11.12      .00     .035     .020     .035     .000  1452.50  1846.45
  .001315    528.     528.     528.        3        0        0      .00   307.10  2153.55

SECNO 11.400

3301 HV CHANGED MORE THAN HVINS

   11.40     7.97  1461.97      .00      .00  1464.47     2.50      .85      .17  1471.50
   29000.      0.   29000.       0.       0.    2287.       0.    1081.     296.  1472.00
     .41      .00    12.68      .00     .035     .020     .035     .000  1454.00  1848.56
  .001998    528.     528.     528.        3        0        0      .00   302.88  2151.44
0
1
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                                                                        THIS RUN EXECUTED 12-22-90
 ***************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION AUGUST 1985
 ***************************************************


 T1      SKUNK CREEK HYDRAULIC ANALYSIS, ESTIMATE T.O.B. W/O CHANNEL INVERT
 T2      IMPROVEMENTS NORTH OF HAPPY VALLEY RD              **Q=39000 CFS**
 T3      RM 9.48 TO 10.35 W/INV. IMPROVEMENTS    NAME: SKUNK.HYD

 J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.       5.        0.        0.   .000000       .00        .0        0.  1377.800      .000

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      4.000     .000    -1.000      .000      .000      .000      .000      .000      .000      .000

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


 *PROF 4

CCHV=    .100 CEHV=    .300
 *SECNO 8.690
3720 CRITICAL DEPTH ASSUMED

          DURING MAJOR FLOODS, SKUNK CREEK IS EXPECTED TO FLOW OVER THE OVER-
          SHOOT OF THE CAP AT THE UPSTREAM END OF THE COE'S LEVEES
          ALL CROSSECTIONS WERE RECODED BY JIM HARRIS, HYDRAULICS SECTION
          (APRIL 1983).  THE PREVIOUS ONES WERE FOUND TO BE UNSATISFACTORY.
          CHANNEL CENTERLINE CORRESPONDS TO 2000 FEET.
          ALL MANNINGS "N" VALUES USED WERE OBTAINED FROM THE PREVIOUS
          MODEL AS ASSIGNED BY CASKIE AND MASHBURN BASED ON FIELD
          OBSERVATION (FEB. 1983)
          THE VALUES FOR THE 10, 50, 100, AND 500 YEAR FLOODS ARE 15,000,29000,
          39,000, AND 85,000 CFS RESPECTIVELY (PER GRIGORIAN 5/23/83)
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    8.69      8.44  1378.24  1378.24  1377.80  1379.34     1.10      .00      .00  1376.00
   39000.    11672.   12168.   15160.    1889.     955.    3222.       0.       0.  1376.00
     .00      6.18    12.75     4.71     .045     .035     .045     .000  1369.80   771.11
  .006997       0.       0.       0.        0        7        0      .00  2828.79  3599.90
0
 *SECNO 8.750

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
    8.75     12.33  1383.33  1383.33      .00  1384.43     1.10     4.03      .00  1376.00
   39000.    8827.   20988.    9185.    1947.    1926.    2999.     114.      53.  1380.00
     .03      4.53    10.90     3.06     .045     .035     .045     .000  1371.00   717.45
  .004134     835.     739.     733.        2       11        0      .00  3210.50  3963.01
0
 *SECNO 8.890
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     870.0    3730.0  TYPE=     1  TARGET=    2860.000
    8.89     10.06  1388.06  1388.06      .00  1389.09     1.04     3.29      .01  1384.00
   39000.    9384.   22673.    6943.    2317.    2209.    2266.     220.      98.  1384.00
     .06      4.05    10.27     3.06     .045     .035     .045     .000  1378.00   870.00
  .004833     565.     840.     650.        3       14        0      .00  2860.00  3730.00

1
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

 *SECNO 8.965
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=    1085.0    3575.0  TYPE=     1  TARGET=    2490.000
    8.97      9.85  1390.85  1390.85      .00  1391.91     1.06     1.88      .01  1388.00
   39000.    9151.   23074.    6775.    2074.    2259.    1878.     274.     120.  1388.00
     .07      4.41    10.22     3.61     .045     .035     .045     .000  1381.00  1085.00
  .005296     275.     400.     410.        2        6        0      .00  2490.00  3575.00
0
 *SECNO 9.050

3470 ENCROACHMENT STATIONS=    1370.0    3415.0  TYPE=     1  TARGET=    2045.000
    9.05     11.05  1393.05      .00      .00  1393.68      .63     1.72      .04  1388.00
   39000.    9703.   16281.   13016.    2202.    1867.    3720.     344.     141.  1390.00
     .09      4.41     8.72     3.50     .045     .035     .045     .000  1382.00  1370.00
  .002688     410.     550.     370.        2        0        0      .00  2045.00  3415.00
0
 *SECNO 9.115

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=        .0    3465.0  TYPE=     1  TARGET=    3464.999
    9.11      7.80  1394.30  1394.30      .00  1395.45     1.15     1.38      .16  1392.00
   39000.     808.   25631.   12561.     268.    2537.    2678.     395.     156.  1392.00
     .10      3.02    10.10     4.69     .045     .035     .045     .000  1386.50  1459.55
  .006666     350.     370.     300.        3       14        0      .00  2005.45  3465.00
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0
*SECNO 9.210

3470 ENCROACHMENT STATIONS=    1385.0    2950.0  TYPE=     1  TARGET=    1565.000

         LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
         X3 USED TO DEFINE EFFECTIVE FLOW.

    9.21     8.93  1397.43      .00      .00  1398.55     1.12     3.09      .00  1394.00
   39000.    5142.   22573.   11285.    1187.    2186.    2179.     463.     177.   1394.00
     .12     4.33    10.32     5.18     .045     .035     .040     .000  1388.50  1385.00
  .004664     460.     600.     500.        2        0        0      .00  1565.00  2950.00
0
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN       SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID      ENDST

1490 NH CARD USED
*SECNO 9.310

3301 HV CHANGED MORE THAN HVINS

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

3470 ENCROACHMENT STATIONS=    1110.0    2560.0  TYPE=     1  TARGET=    1450.000

         LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
         X3 USED TO DEFINE EFFECTIVE FLOW.

    9.31     9.18  1401.18  1401.18      .00  1402.81     1.63     2.87      .15  1398.00
   39000.    9212.   20822.    8965.    2017.    1573.    1667.     527.     194.   1396.00
     .14     4.57    13.24     5.38     .045     .035     .050     .000  1392.00  1110.00
  .005653     400.     650.     480.       20        8        0      .00  1450.00  2560.00
0
1490 NH CARD USED
*SECNO 9.400

3470 ENCROACHMENT STATIONS=     980.0    2400.0  TYPE=     1  TARGET=    1420.000

         LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
         X3 USED TO DEFINE EFFECTIVE FLOW.

    9.40     9.79  1403.79      .00      .00  1405.29     1.50     2.47      .01  1402.00
   39000.   12395.   23910.    2694.    2403.    2014.     567.     577.     207.   1400.00
     .15     5.16    11.87     4.75     .040     .035     .044     .000  1394.00   980.00
  .005148     370.     510.     420.        2        0        0      .00  1420.00  2400.00
0
1490 NH CARD USED
*SECNO 9.480
3280 CROSS SECTION      9.48 EXTENDED       .00 FEET

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=        .0    2260.0  TYPE=     1  TARGET=    2259.999
1
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        RM 9.48 TO 11.2 MODIFIED
        X3 CARD USED FOR RIGHT BANK,EFFECTIVE FLOW AREA ASSUMED
        TO EXPAND AT 1.5 TO 1 FROM END OF RIGHT BANK LEVEE

   9.48      7.00  1406.00      .00      .00  1408.34     2.34     2.80      .25  1409.00
  39000.       0.   37984.    1016.       0.    3065.      180.     620.     217.   1402.00
    .16       .00    12.39     5.64     .040     .034     .045     .000  1399.00  1711.99
 .007036     370.     490.     420.        2        0        0      .00   548.01  2260.00

1490 NH CARD USED
*SECNO 9.560

        ADDITIONAL SECTION ADDED TO REFINE AND REPRESENT THE
        PROPOSED HYDRAULIC CONDITIONS

   9.56      7.44  1407.94      .00      .00  1410.34     2.40     1.98      .02  1410.50
  39000.       0.   39000.       0.       0.    3140.       0.     641.     220.   1410.50
    .17       .00    12.42      .00     .040     .034     .045     .000  1400.50  1774.23
 .006291     445.     300.     160.        2        0        0      .00   451.55  2225.77

1490 NH CARD USED
*SECNO 9.580
   9.58      7.95  1408.95      .00      .00  1410.86     1.91      .47      .05  1461.00
  39000.       0.       0.   39000.       0.       0.    3515.     648.     221.   1461.00
    .17       .00      .00    11.09     .040     .034     .034     .000  1401.00  1760.17
 .004248     145.     110.      75.        2        0        0      .00   473.65  2233.83

1490 NH CARD USED
*SECNO 9.670
   9.67      7.72  1410.72      .00      .00  1412.54     1.82     1.67      .01  1413.00
  39000.       0.       0.   39000.       0.       0.    3599.     681.     225.   1463.00
    .18       .00      .00    10.84     .040     .034     .034     .000  1403.00  1749.10
 .004221     430.     410.     395.        2        0        0      .00   496.80  2245.90

1490 NH CARD USED
*SECNO 9.750

3301 HV CHANGED MORE THAN HVINS

   9.75      7.26  1411.76  1411.68      .00  1415.05     3.29     2.07      .44  1414.50
  39000.       0.       0.   39000.       0.       0.    2679.     707.     229.   1464.50
    .19       .00      .00    14.56     .040     .034     .034     .000  1404.50  1800.96
 .008256     390.     370.     360.        6       11        0      .00   398.08  2199.04
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA     LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

1490 NH CARD USED
*SECNO 9.840

3301 HV CHANGED MORE THAN HVINS

   9.84      9.72  1415.72      .00      .00  1417.96     2.24     2.81      .10  1420.00
  39000.       0.   39000.       0.       0.    3244.       0.     739.     233.   1420.00
    .20       .00    12.02      .00     .040     .034     .034     .000  1406.00  1813.14
 .004318     475.     480.     485.        3        0        0      .00   372.72  2185.86
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1490 NH CARD USED
*SECNO 9.940
    9.94      9.15  1418.15      .00      .00  1420.19     2.04     2.21      .02  1425.00
   39000.       0.   39000.       0.       0.    3399.       0.     779.     238.   1425.00
     .21       .00    11.47      .00     .040     .034     .034     .000  1409.00  1798.41
  .004187     495.     520.     545.        3        0        0      .00   408.18  2206.59

1490 NH CARD USED
*SECNO 10.040

3301 HV CHANGED MORE THAN HVINS

   10.04      7.48  1420.48      .00      .00  1423.57     3.08     3.06      .31  1428.00
   39000.       0.   39000.       0.       0.    2769.       0.     817.     243.   1428.00
     .22       .00    14.09      .00     .040     .034     .034     .000  1413.00  1800.06
  .008111     540.     540.     540.        2        0        0      .00   399.87  2199.94

1490 NH CARD USED
*SECNO 10.120

3301 HV CHANGED MORE THAN HVINS

   10.12      9.49  1423.99      .00      .00  1425.36     1.36     1.62      .17  1429.50
   39000.       0.   39000.       0.       0.    4163.       0.     848.     247.   1429.50
     .23       .00     9.37      .00     .040     .034     .034     .000  1414.50  1761.98
  .002624     415.     380.     350.        2        0        0      .00   476.03  2238.02

1490 NH CARD USED
```



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

*SECNO 10.210

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   10.21      6.20  1426.20  1426.20      .00  1429.17     2.97     2.05      .48  1435.00
   39000.       0.   39000.       0.       0.    2819.       0.     884.     252.   1435.00
     .24       .00    13.84      .00     .040     .035     .034     .000  1420.00  1760.21
  .009812     475.     450.     430.       20       14        0      .00   479.58  2239.79

1490 NH CARD USED
*SECNO 10.300
   10.30      7.24  1430.24      .00      .00  1432.87     2.63     3.66      .03  1438.00
   39000.       0.   39000.       0.       0.    2998.       0.     913.     256.   1438.00
     .25       .00    13.01      .00     .040     .034     .034     .000  1423.00  1778.03
  .007153     490.     440.     395.        2        0        0      .00   442.93  2220.97

CHV=    .100 CEHV=    .300
*SECNO 10.350

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
```

HAPPY VALLEY ROAD

10.35	7.33	1432.10	1432.10	.00	1435.32	3.22	2.07	.18	1440.90
39000.	0.	39000.	0.	0.	2709.	0.	929.	259.	1441.48
.26	.00	14.40	.00	.035	.035	.035	.000	1424.77	1363.20
.009691	305.	250.	155.	3	5	0	.00	422.28	1785.48

1490 NH CARD USED
*SECNO 10.400

3301 HV CHANGED MORE THAN HVINS

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NO CHANNEL INVERT IMPROVEMENTS

10.40	12.75	1434.75	.00	.00	1437.07	2.32	1.66	.09	1437.80
39000.	0.	39000.	0.	0.	3193.	0.	943.	261.	1437.80
.26	.00	12.22	.00	.035	.038	.035	.000	1422.00	1765.21
.007194	195.	200.	235.	3	0	0	.00	456.58	2221.79

0
1490 NH CARD USED
*SECNO 10.490

3301 HV CHANGED MORE THAN HVINS

NO CHANNEL INVERT IMPROVEMENTS

10.49	10.10	1438.10	.00	.00	1439.71	1.61	2.57	.07	1441.00
39000.	0.	39000.	0.	0.	3830.	0.	980.	266.	1441.00
.27	.00	10.18	.00	.035	.039	.035	.000	1428.00	1756.58
.004478	460.	460.	460.	2	0	0	.00	476.84	2233.42

1490 NH CARD USED
*SECNO 10.620

3301 HV CHANGED MORE THAN HVINS

NO CHANNEL INVERT IMPROVEMENTS

10.62	10.48	1440.48	.00	.00	1442.60	2.12	2.74	.15	1443.40
39000.	0.	39000.	0.	0.	3336.	0.	1030.	272.	1443.40
.29	.00	11.69	.00	.035	.033	.035	.000	1430.00	1785.33
.004494	575.	610.	645.	2	0	0	.00	430.27	2215.59

0
1490 NH CARD USED
*SECNO 10.700

3301 HV CHANGED MORE THAN HVINS

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

NO CHANNEL INVERT IMPROVEMENTS

10.70	10.75	1442.75	1442.75	.00	1446.00	3.25	2.30	.34	1446.00
39000.	0.	39000.	0.	0.	2697.	0.	1056.	276.	1446.00
.30	.00	14.46	.00	.035	.033	.035	.000	1432.00	1793.00
.008581	365.	380.	405.	20	5	0	.00	414.01	2207.00

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

1490 NH CARD USED
*SECNO 10.830

3301 HV CHANGED MORE THAN HVINS


            NO CHANNEL INVERT IMPROVEMENTS

   10.83    13.14  1449.14      .00      .00  1451.14     2.00     5.02      .12  1452.20
  39000.       0.   39000.       0.       0.    3436.       0.    1102.     283.   1452.20
     .31      .00    11.35      .00     .035     .039     .035     .000  1436.00  1752.23
 .006983     640.     650.     680.        2        0        0      .00   498.54  2250.77

1490 NH CARD USED
*SECNO 10.930

            NO CHANNEL INVERT IMPROVEMENTS
   10.93    10.79  1452.79      .00      .00  1455.18     2.39     3.92      .12  1457.70
  39000.       0.   39000.       0.       0.    3145.       0.    1140.     288.   1457.70
     .32      .00    12.40      .00     .035     .040     .035     .000  1442.00  1771.63
 .008885     490.     500.     535.        2        0        0      .00   463.74  2235.37

1490 NH CARD USED
*SECNO 11.040

3301 HV CHANGED MORE THAN HVINS


         END OF DIKE EXTENSION FROM CORPS DIKE ON THE RIGHT BANK ONLY
          CONFLUENCE OF BUCHANAN WASH AND SKUNK CREEK
            NO CHANNEL INVERT IMPROVEMENTS


   11.04     8.52  1456.52      .00      .00  1458.40     1.88     3.17      .05  1461.00
  39000.       0.   39000.       0.       0.    3546.       0.    1178.     294.   1465.00
     .34      .00    11.00      .00     .035     .034     .035     .000  1448.00  1722.92
 .004740     530.     500.     510.        2        0        0      .00   503.15  2226.08

1490 NH CARD USED
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  SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
  TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


*SECNO 11.100

3301 HV CHANGED MORE THAN HVINS


         CROSS SECTION LOCATED BASED ON 1.5 TO 1 FLOW EXPANSION
         FROM CORPS DIKE ON THE LEFT BANK
```

NO CHANNEL INVERT IMPROVEMENTS

11.10	8.66	1458.66	.00	.00	1459.63	.97	1.14	.09	1465.00
39000.	0.	39000.	0.	0.	4934.	0.	1214.	299.	1465.00
.35	.00	7.91	.00	.035	.034	.035	.000	1450.00	1545.35
.002222	395.	365.	365.	2	0	0	.00	641.97	2187.32

*SECNO 11.200

3301 HV CHANGED MORE THAN HVINS

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

EFFECTIVE FLOW ASSUMED TO EXPAND AT 1.5 TO 1 FROM COE LEVEES.
(ON LEFT BANK ONLY)
INVERT AND SLOPE DETAILS FOR CORPS LEVEES TAKEN FROM AS BUILT PLANS

11.20	8.44	1460.44	1460.44	.00	1464.44	4.00	1.05	.91	1467.00
39000.	0.	39000.	0.	0.	2429.	0.	1249.	303.	1467.00
.36	.00	16.06	.00	.035	.020	.035	.000	1452.00	1847.62
.002983	520.	410.	470.	20	8	0	.00	304.75	2152.38

*SECNO 11.300

3301 HV CHANGED MORE THAN HVINS

11.30	10.70	1463.20	.00	.00	1465.62	2.42	1.02	.16	1469.00
39000.	0.	39000.	0.	0.	3125.	0.	1282.	307.	1469.50
.37	.00	12.48	.00	.035	.020	.035	.000	1452.50	1843.12
.001344	528.	528.	528.	3	0	0	.00	313.76	2156.88

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

*SECNO 11.400

3301 HV CHANGED MORE THAN HVINS

11.40	9.61	1463.61	.00	.00	1466.64	3.04	.84	.19	1471.50
39000.	0.	39000.	0.	0.	2788.	0.	1318.	311.	1472.00
.38	.00	13.99	.00	.035	.020	.035	.000	1454.00	1845.29
.001927	528.	528.	528.	3	0	0	.00	309.43	2154.71

THIS RUN EXECUTED 12-22-90

****
HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
ERROR CORR - 01,02,03,04,05,06
MODIFICATION - 50,51,52,53,54,55,56
IBM-PC-XT VERSION AUGUST 1985
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1      SKUNK CREEK HYDRAULIC ANALYSIS, ESTIMATE T.O.B. W/O CHANNEL INVERT
2      IMPROVEMENTS NORTH OF HAPPY VALLEY RD              **Q=85000 CFS**
T3     RM 9.48 TO 10.35 W/INV. IMPROVEMENTS    NAME: SKUNK.HYD

1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     0.        6.        0.        0.   .000000       .00        .0        0.  1377.800      .000

2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

   15.000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000
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  SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
  TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


*PROF 5

CCHV=    .100 CEHV=    .300
*SECNO 8.690
6720 CRITICAL DEPTH ASSUMED

         DURING MAJOR FLOODS, SKUNK CREEK IS EXPECTED TO FLOW OVER THE OVER-
         SHOOT OF THE CAP AT THE UPSTREAM END OF THE COE'S LEVEES
         ALL CROSSECTIONS WERE RECODED BY JIM HARRIS, HYDRAULICS SECTION
         (APRIL 1983).  THE PREVIOUS ONES WERE FOUND TO BE UNSATISFACTORY.
         CHANNEL CENTERLINE CORRESPONDS TO 2000 FEET.
         ALL MANNINGS "N" VALUES USED WERE OBTAINED FROM THE PREVIOUS
         MODEL AS ASSIGNED BY CASKIE AND MASHBURN BASED ON FIELD
         OBSERVATION (FEB. 1983)
         THE VALUES FOR THE 10, 50, 100, AND 500 YEAR FLOODS ARE 15,000,29000,
         39,000, AND 85,000 CFS RESPECTIVELY (PER GRIGORIAN 5/23/83)

    8.69     9.89  1379.69  1379.69  1377.80  1381.16     1.47      .00      .00  1376.00
   85000.   27600.   18400.   39000.    3829.    1156.    5542.       0.       0.  1376.00
     .00     7.21    15.92     7.04     .045     .035     .045     .000  1369.80   508.14
  .008452      0.       0.       0.        0       10        0      .00  3330.82  3838.96
0
*SECNO 8.750
    8.75    13.83  1384.83      .00      .00  1386.25     1.42     5.09      .00  1376.00
   85000.   22286.   31851.   30863.    3812.    2286.    6013.     200.      62.  1380.00
     .02     5.85    13.93     5.13     .045     .035     .045     .000  1371.00   472.53
  .005374     835.     739.     733.        2        0        0      .00  3635.77  4108.29

*SECNO 8.890
7185 MINIMUM SPECIFIC ENERGY
6720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     870.0    3730.0  TYPE=     1  TARGET=    2860.000
    8.89    11.55  1389.55  1389.55      .00  1391.04     1.48     4.04      .02  1384.00
   85000.   24369.   36209.   24422.    3861.    2719.    4500.     376.     109.  1384.00
     .05     6.31    13.32     5.43     .045     .035     .045     .000  1378.00   870.00
  .006169     565.     840.     650.        2       10        0      .00  2860.00  3730.00

*SECNO 8.965
1
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  SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
  Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
  TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

3280 CROSS SECTION      8.97 EXTENDED       .41 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=    1085.0    3575.0  TYPE=     1  TARGET=    2490.000
     8.97     11.41  1392.41  1392.41      .00  1394.06     1.65      2.39      .05  1388.00
   85000.    23610.   38582.   22808.    3429.    2843.    3817.      464.     131.   1388.00
      .06      6.88    13.57     5.97     .045     .035     .045      .000  1381.00  1085.00
  .006877      275.     400.     410.        2        6        0       .00  2490.00  3575.00

*SECNO 9.050
3280 CROSS SECTION      9.05 EXTENDED      1.19 FEET

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=    1370.0    3415.0  TYPE=     1  TARGET=    2045.000
     9.05     13.19  1395.19      .00      .00  1396.21     1.02      2.09      .06  1388.00
   85000.    21653.   27055.   36292.    3349.    2371.    6453.      572.     153.   1390.00
      .07      6.47    11.41     5.62     .045     .035     .045      .000  1382.00  1370.00
  .003347      410.     550.     370.        2        0        0       .00  2045.00  3415.00
0
*SECNO 9.115

3470 ENCROACHMENT STATIONS=        .0    3465.0  TYPE=     1  TARGET=    3464.999
     9.11      9.87  1396.37      .00      .00  1397.80     1.43      1.46      .12  1392.00
   85000.     7690.   42951.   34360.    1943.    3596.    5097.      659.     171.   1392.00
      .08      3.96    11.94     6.74     .045     .035     .045      .000  1386.50   608.47
  .005854      350.     370.     300.        3        0        0       .00  2856.53  3465.00
0
*SECNO 9.210

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=    1385.0    2950.0  TYPE=     1  TARGET=    1565.000

         LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
```



```
         X3 USED TO DEFINE EFFECTIVE FLOW.

     9.21     10.79  1399.29      .00      .00  1401.30     2.01      3.33      .18  1394.00
   85000.    14883.   39856.   30261.    2085.    2794.    3601.      774.     197.   1394.00
      .10      7.14    14.26     8.40     .045     .035     .040      .000  1388.50  1385.00
  .006416      460.     600.     500.        2        0        0       .00  1565.00  2950.00

1490 NH CARD USED
*SECNO 9.310
3280 CROSS SECTION      9.31 EXTENDED      1.29 FEET

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
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3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=    1110.0    2560.0  TYPE=     1  TARGET=    1450.000

         LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
         X3 USED TO DEFINE EFFECTIVE FLOW.

    9.31    11.29  1403.29  1403.29      .00  1405.80     2.51     3.66      .15  1398.00
   85000.   29213.   34379.   21409.    3748.    1963.    2607.     870.     213.   1396.00
     .11     7.80    17.51     8.21     .045     .035     .050     .000  1392.00  1110.00
  .007357    400.     650.     480.        3        8        0      .00  1450.00  2560.00
0
 1490 NH CARD USED
*SECNO 9.400

 3301 HV CHANGED MORE THAN HVINS


3470 ENCROACHMENT STATIONS=     980.0    2400.0  TYPE=     1  TARGET=    1420.000

         LEVEE, COMPOSED OF UNCOMPACTED SANDS, ASSUMED TO WASHOUT.
         X3 USED TO DEFINE EFFECTIVE FLOW.

    9.40    12.57  1406.57      .00      .00  1408.39     1.82     2.52      .07  1402.00
   85000.   39246.   37819.    7936.    5081.    2739.    1125.     953.     226.   1400.00
     .12     7.72    13.81     7.06     .040     .035     .044     .000  1394.00   980.00
  .004619    370.     510.     420.        2        0        0      .00  1420.00  2400.00
0
1490 NH CARD USED
*SECNO 9.480
1
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3280 CROSS SECTION      9.48 EXTENDED      3.26 FEET


3301 HV CHANGED MORE THAN HVINS

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

 3470 ENCROACHMENT STATIONS=        .0    2260.0  TYPE=     1  TARGET=    2259.999

         RM 9.48 TO 11.2 MODIFIED
         X3 CARD USED FOR RIGHT BANK,EFFECTIVE FLOW AREA ASSUMED
         TO EXPAND AT 1.5 TO 1 FROM END OF RIGHT BANK LEVEE

    9.48    10.26  1409.26  1409.26      .00  1413.83     4.57     2.73      .83  1409.00
   85000.       0.   81429.    3571.       0.    4676.     376.    1024.     236.   1402.00
     .13      .00    17.41     9.50     .040     .034     .045     .000  1399.00  1700.00
  .008030    370.     490.     420.       20       15        0      .00   560.00  2260.00
0
 1490 NH CARD USED
*SECNO 9.560
3280 CROSS SECTION      9.56 EXTENDED       .83 FEET

 7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
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ADDITIONAL SECTION ADDED TO REFINE AND REPRESENT THE
PROPOSED HYDRAULIC CONDITIONS

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    9.56    10.83  1411.33  1411.33      .00  1416.38     5.06     2.28      .15  1410.50
   85000.       0.   85000.       0.       0.    4711.       0.    1057.     239.   1410.50
     .13      .00    18.04      .00     .040     .033     .045     .000  1400.50  1764.00
 .007364     445.     300.     160.        3        8        0      .00   472.00  2236.00
0
1490 NH CARD USED
*SECNO 9.580
3280 CROSS SECTION      9.58 EXTENDED      2.76 FEET
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN       SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID      ENDST


3301 HV CHANGED MORE THAN HVINS

    9.58    12.76  1413.76      .00      .00  1417.04     3.27      .47      .18  1461.00
   85000.       0.       0.   85000.       0.       0.    5853.    1068.     240.   1461.00
     .14      .00      .00    14.52     .040     .033     .033     .000  1401.00  1752.00
 .003777     145.     110.      75.        5        0        0      .00   490.00  2242.00
0
1490 NH CARD USED
*SECNO 9.670
3280 CROSS SECTION      9.67 EXTENDED      2.42 FEET

    9.67    12.42  1415.42      .00      .00  1418.54     3.12     1.49      .02  1413.00
   85000.       0.       0.   85000.       0.       0.    5994.    1122.     245.   1463.00
     .14      .00      .00    14.18     .040     .033     .033     .000  1403.00  1740.00
 .003751     430.     410.     395.        3        0        0      .00   515.00  2255.00

1490 NH CARD USED
*SECNO 9.750
3280 CROSS SECTION      9.75 EXTENDED      1.79 FEET


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
    9.75    11.79  1416.29  1416.29      .00  1421.70     5.41     1.79      .69  1414.50
   85000.       0.       0.   85000.       0.       0.    4553.    1165.     249.   1464.50
     .15      .00      .00    18.67     .040     .033     .033     .000  1404.50  1790.00
 .006944     390.     370.     360.       20        8        0      .00   420.00  2210.00

1490 NH CARD USED
*SECNO 9.840
3280 CROSS SECTION      9.84 EXTENDED       .00 FEET


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
1
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```
  SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
  Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
  TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3710 WSEL ASSUMED BASED ON MIN DIFF
    9.84     14.00   1420.00   1418.86       .00   1424.65      4.65      2.76       .84   1420.00
   85000.       0.    85000.        0.        0.     4914.        0.     1218.      253.    1420.00
     .16       .00     17.30       .00      .040      .031      .033      .000   1406.00   1796.00
  .004793     475.      480.      485.        20         8         0       .00    407.00   2203.00
0
1490 NH CARD USED
*SECNO 9.940

3301 HV CHANGED MORE THAN HVINS

    9.94     14.63   1423.63       .00       .00   1427.01      3.39      2.24       .13   1425.00
   85000.       0.    85000.        0.        0.     5754.        0.     1281.      259.    1425.00
     .17       .00     14.77       .00      .040      .034      .033      .000   1409.00   1776.51
  .003900     495.      520.      545.         3         0         0       .00    451.98   2228.49
0
1490 NH CARD USED
*SECNO 10.040

3301 HV CHANGED MORE THAN HVINS

   10.04     12.33   1425.33       .00       .00   1430.20      4.87      2.74       .44   1428.00
   85000.       0.    85000.        0.        0.     4802.        0.     1347.      264.    1428.00
     .17       .00     17.70       .00      .040      .034      .033      .000   1413.00   1780.67
  .006877     540.      540.      540.         3         0         0       .00    438.67   2219.33

1490 NH CARD USED
*SECNO 10.120
3280 CROSS SECTION      10.12 EXTENDED        .00 FEET


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF
   10.12     15.00   1429.50   1425.25       .00   1431.86      2.35      1.37      1.49   1429.50
   85000.       0.    85000.        0.        0.     6902.        0.     1398.      268.    1429.50
     .18       .00     12.32       .00      .040      .032      .033      .000   1414.50   1740.00
  .002226     415.      380.      350.        20        11         0       .00    520.00   2260.00


  12-22-90      14:06:46                                                                          PAGE    54


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


1490 NH CARD USED
*SECNO 10.210

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   10.21     10.29   1430.29   1430.29       .00   1435.06      4.77      1.74       .73   1435.00
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  85000.      0.   85000.      0.      0.   4849.      0.   1458.    274.   1435.00
    .19     .00    17.53     .00    .040    .034    .033    .000  1420.00  1743.84
 .008266    475.     450.    430.     20      14       0     .00   512.33  2256.16

1490 NH CARD USED
*SECNO 10.300
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   10.30   10.99  1433.99  1433.99     .00  1439.04    5.04    3.60     .08  1438.00
  85000.      0.   85000.      0.      0.    4717.      0.   1507.    279.   1438.00
    .20     .00    18.02     .00    .040    .034    .033    .000  1423.00  1763.02
 .008115    490.     440.    395.      2       8       0     .00   472.96  2235.98
0
CCHV=    .100 CEHV=    .300
*SECNO 10.350
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

              HAPPY VALLEY ROAD

   10.35   11.77  1436.54  1436.54     .00  1441.70    5.15    2.06     .03  1440.90
  85000.      0.   85000.      0.      0.    4665.      0.   1534.    281.   1441.48
    .20     .00    18.22     .00    .035    .035    .035    .000  1424.77  1345.42
 .008398    305.     250.    155.      3       8       0     .00   457.84  1803.26

1490 NH CARD USED
*SECNO 10.400
3280 CROSS SECTION     10.40 EXTENDED      1.71 FEET
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  SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
  TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST

3301 HV CHANGED MORE THAN HVINS

            NO CHANNEL INVERT IMPROVEMENTS

   10.40   17.52  1439.52     .00     .00  1443.30    3.78    1.46     .14  1437.80
  85000.      0.   85000.      0.      0.    5448.      0.   1557.    283.   1437.80
    .20     .00    15.60     .00    .035    .038    .035    .000  1422.00  1753.00
 .006398    195.     200.    235.      4       0       0     .00   481.00  2234.00
0
1490 NH CARD USED
*SECNO 10.490
3280 CROSS SECTION     10.49 EXTENDED      1.84 FEET

3301 HV CHANGED MORE THAN HVINS

            NO CHANNEL INVERT IMPROVEMENTS

   10.49   14.84  1442.84     .00     .00  1445.79    2.95    2.41     .08  1441.00
  85000.      0.   85000.      0.      0.    6164.      0.   1618.    289.   1441.00
    .21     .00    13.79     .00    .035    .038    .035    .000  1428.00  1745.00
 .004382    460.     460.    460.      2       0       0     .00   500.00  2245.00
0
1490 NH CARD USED
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*SECNO 10.620
3280 CROSS SECTION     10.62 EXTENDED      1.57 FEET


3301 HV CHANGED MORE THAN HVINS


            NO CHANNEL INVERT IMPROVEMENTS

   10.62    14.97  1444.97      .00      .00  1448.91     3.94     2.82      .30  1443.40
  85000.       0.   85000.       0.       0.    5339.       0.    1699.     295.   1443.40
     .22      .00    15.92      .00     .035     .034     .035     .000  1430.00  1774.00
 .004888     575.     610.     645.        3        0        0      .00   453.00  2227.00
```



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


1490 NH CARD USED
*SECNO 10.700
3280 CROSS SECTION     10.70 EXTENDED      1.21 FEET


3301 HV CHANGED MORE THAN HVINS

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

            NO CHANNEL INVERT IMPROVEMENTS

   10.70    15.21  1447.21  1447.21      .00  1452.47     5.26     2.27      .40  1446.00
  85000.       0.   85000.       0.       0.    4617.       0.    1742.     299.   1446.00
     .23      .00    18.41      .00     .035     .033     .035     .000  1432.00  1780.00
 .007492     365.     380.     405.       20        5        0      .00   440.00  2220.00
0
1490 NH CARD USED
*SECNO 10.830
3280 CROSS SECTION     10.83 EXTENDED      1.59 FEET


3301 HV CHANGED MORE THAN HVINS


            NO CHANNEL INVERT IMPROVEMENTS

   10.83    17.79  1453.79      .00      .00  1457.09     3.30     4.42      .20  1452.20
  85000.       0.   85000.       0.       0.    5829.       0.    1820.     306.   1452.20
     .24      .00    14.58      .00     .035     .040     .035     .000  1436.00  1740.00
 .006199     640.     650.     680.        3        0        0      .00   523.00  2263.00
0
1490 NH CARD USED
*SECNO 10.930

3301 HV CHANGED MORE THAN HVINS


            NO CHANNEL INVERT IMPROVEMENTS
   10.93    14.93  1456.93      .00      .00  1461.19     4.26     3.81      .29  1457.70
  85000.       0.   85000.       0.       0.    5131.       0.    1883.     312.   1457.70
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    .25      .00    16.57      .00     .035     .041     .035     .000  1442.00  1755.09
 .009595     490.     500.     535.        2        0        0      .00   496.83  2251.91
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  SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
  TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST

1490 NH CARD USED
*SECNO 11.040
3280 CROSS SECTION     11.04 EXTENDED       .25 FEET

3301 HV CHANGED MORE THAN HVINS

        END OF DIKE EXTENSION FROM CORPS DIKE ON THE RIGHT BANK ONLY
         CONFLUENCE OF BUCHANAN WASH AND SKUNK CREEK
           NO CHANNEL INVERT IMPROVEMENTS

   11.04    13.25  1461.25      .00      .00  1464.35     3.10     3.05      .12  1461.00
  85000.       0.   85000.       0.       0.    6017.       0.    1947.     318.   1465.00
     .26      .00    14.13      .00     .035     .034     .035     .000  1448.00  1705.00
 .004209     530.     500.     510.        2        0        0      .00   540.01  2245.01
0
1490 NH CARD USED
*SECNO 11.100

3301 HV CHANGED MORE THAN HVINS

        CROSS SECTION LOCATED BASED ON 1.5 TO 1 FLOW EXPANSION
        FROM CORPS DIKE ON THE LEFT BANK
           NO CHANNEL INVERT IMPROVEMENTS

   11.10    13.89  1463.89      .00      .00  1465.49     1.60      .99      .15  1465.00
  85000.       0.   85000.       0.       0.    8372.       0.    2007.     323.   1465.00
     .27      .00    10.15      .00     .035     .034     .035     .000  1450.00  1524.44
 .001897     395.     365.     365.        2        0        0      .00   673.34  2197.78

*SECNO 11.200

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
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        EFFECTIVE FLOW ASSUMED TO EXPAND AT 1.5 TO 1 FROM COE LEVEES.
            (ON LEFT BANK ONLY)
        INVERT AND SLOPE DETAILS FOR CORPS LEVEES TAKEN FROM AS BUILT PLANS

   11.20    13.98  1465.98  1465.98      .00  1472.40     6.43      .90     1.45  1467.00
  85000.       0.   85000.       0.       0.    4178.       0.    2066.     328.   1467.00
     .28      .00    20.34      .00     .035     .020     .035     .000  1452.00  1836.55
```

.002576	520.	410.	470.	20	5	0	.00	326.91	2163.45

0

SECNO 11.300
280 CROSS SECTION 11.30 EXTENDED .29 FEET

301 HV CHANGED MORE THAN HVINS

11.30	16.80	1469.30	.00	.00	1473.59	4.29	.97	.21	1469.00
85000.	0.	85000.	0.	0.	5114.	0.	2123.	332.	1469.50
.28	.00	16.62	.00	.035	.020	.035	.000	1452.50	1831.50
.001378	528.	528.	528.	4	0	0	.00	337.58	2169.08

0

SECNO 11.400

3301 HV CHANGED MORE THAN HVINS

11.40	15.58	1469.58	.00	.00	1474.64	5.06	.82	.23	1471.50
85000.	0.	85000.	0.	0.	4708.	0.	2182.	336.	1472.00
.29	.00	18.05	.00	.035	.020	.035	.000	1454.00	1833.34
.001780	528.	528.	528.	3	0	0	.00	333.32	2166.66

1

THIS RUN EXECUTED 12-22-90

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

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

RM 9.48 TO 10.35 W/INV

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	8.690	.00	.00	.00	1369.80	6800.00	1377.80	.00	1377.85	3.44	2.70	4968.94	3668.00
	8.690	.00	.00	.00	1369.80	15000.00	1377.80	.00	1378.06	16.72	5.96	4968.94	3668.00
	8.690	.00	.00	.00	1369.80	29000.00	1377.80	.00	1378.77	62.51	11.53	4968.94	3668.00
*	8.690	.00	.00	.00	1369.80	39000.00	1378.24	1378.24	1379.34	69.97	12.75	6064.83	4662.50
*	8.690	.00	.00	.00	1369.80	85000.00	1379.69	1379.69	1381.16	84.52	15.92	10527.02	9245.72
*	8.750	739.00	.00	.00	1371.00	6800.00	1378.24	1378.24	1379.61	112.65	9.46	743.36	640.68
*	8.750	739.00	.00	.00	1371.00	15000.00	1380.24	1380.24	1381.99	82.85	11.16	1589.43	1647.92
*	8.750	739.00	.00	.00	1371.00	29000.00	1382.82	1382.82	1383.84	37.35	9.91	5291.62	4745.36
*	8.750	739.00	.00	.00	1371.00	39000.00	1383.33	1383.33	1384.43	41.34	10.90	6871.51	6065.57
	8.750	739.00	.00	.00	1371.00	85000.00	1384.83	.00	1386.25	53.74	13.93	12111.36	11594.65
	8.890	840.00	.00	.00	1378.00	6800.00	1384.75	.00	1385.34	44.87	6.16	1148.28	1015.20
	8.890	840.00	.00	.00	1378.00	15000.00	1386.27	1385.44	1387.34	52.31	8.62	2147.72	2074.02
*	8.890	840.00	.00	.00	1378.00	29000.00	1387.61	1387.61	1388.53	43.16	9.25	5520.02	4414.26
*	8.890	840.00	.00	.00	1378.00	39000.00	1388.06	1388.06	1389.09	48.33	10.27	6791.17	5609.63
*	8.890	840.00	.00	.00	1378.00	85000.00	1389.55	1389.55	1391.04	61.69	13.32	11080.12	10822.38
	8.965	400.00	.00	.00	1381.00	6800.00	1387.01	.00	1388.01	98.32	8.03	846.68	685.80

*	8.965	400.00	.00	.00	1381.00	15000.00	1388.99	1388.99	1389.92	57.47	8.31	2444.66	1978.64
*	8.965	400.00	.00	.00	1381.00	29000.00	1390.28	1390.28	1391.28	52.08	9.49	4803.52	4018.58
*	8.965	400.00	.00	.00	1381.00	39000.00	1390.85	1390.85	1391.91	52.96	10.22	6210.22	5359.17
*	8.965	400.00	.00	.00	1381.00	85000.00	1392.41	1392.41	1394.06	68.77	13.57	10089.60	10249.73
	9.050	550.00	.00	.00	1382.00	6800.00	1389.79	.00	1390.22	21.27	5.52	1560.29	1474.60
	9.050	550.00	.00	.00	1382.00	15000.00	1391.22	.00	1391.67	21.64	6.57	4034.87	3224.22
	9.050	550.00	.00	.00	1382.00	29000.00	1392.44	.00	1392.98	24.26	7.86	6541.94	5887.57
	9.050	550.00	.00	.00	1382.00	39000.00	1393.05	.00	1393.68	26.88	8.72	7788.61	7522.88
	9.050	550.00	.00	.00	1382.00	85000.00	1395.19	.00	1396.21	33.47	11.41	12172.43	14691.89

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	9.115	370.00	.00	.00	1386.50	6800.00	1390.98	.00	1391.87	109.33	7.55	900.79	650.35
*	9.115	370.00	.00	.00	1386.50	15000.00	1392.66	1392.66	1393.52	68.77	7.86	2491.46	1808.76
*	9.115	370.00	.00	.00	1386.50	29000.00	1393.70	1393.70	1394.75	68.55	9.40	4346.10	3502.62
*	9.115	370.00	.00	.00	1386.50	39000.00	1394.30	1394.30	1395.45	66.66	10.10	5483.30	4776.70
	9.115	370.00	.00	.00	1386.50	85000.00	1396.37	.00	1397.80	58.54	11.94	10635.84	11109.52
	9.210	600.00	.00	.00	1388.50	6800.00	1394.43	.00	1394.86	27.97	5.39	1373.09	1285.66
	9.210	600.00	.00	.00	1388.50	15000.00	1395.66	.00	1396.35	35.64	7.37	2842.81	2512.53
	9.210	600.00	.00	.00	1388.50	29000.00	1396.83	.00	1397.77	42.46	9.26	4615.10	4450.31
	9.210	600.00	.00	.00	1388.50	39000.00	1397.43	.00	1398.55	46.64	10.32	5551.77	5710.88
	9.210	600.00	.00	.00	1388.50	85000.00	1399.29	.00	1401.30	64.16	14.26	8479.84	10611.45
	9.310	650.00	.00	.00	1392.00	6800.00	1396.59	.00	1397.94	76.28	9.33	732.92	778.58
*	9.310	650.00	.00	.00	1392.00	15000.00	1399.34	1399.34	1400.43	39.55	9.41	2590.08	2385.23
*	9.310	650.00	.00	.00	1392.00	29000.00	1400.55	1400.55	1401.97	50.46	11.89	4352.14	4082.67
*	9.310	650.00	.00	.00	1392.00	39000.00	1401.18	1401.18	1402.81	56.53	13.24	5256.62	5187.29
*	9.310	650.00	.00	.00	1392.00	85000.00	1403.29	1403.29	1405.80	73.57	17.51	8317.15	9910.19
	9.400	510.00	.00	.00	1394.00	6800.00	1399.78	.00	1400.47	33.38	6.70	1015.30	1176.94
	9.400	510.00	.00	.00	1394.00	15000.00	1401.41	1401.17	1402.72	52.49	9.66	1933.47	2070.38
*	9.400	510.00	.00	.00	1394.00	29000.00	1403.03	1403.03	1404.45	51.68	11.11	3910.73	4033.89
	9.400	510.00	.00	.00	1394.00	39000.00	1403.79	.00	1405.29	51.48	11.87	4983.70	5435.82
	9.400	510.00	.00	.00	1394.00	85000.00	1406.57	.00	1408.39	46.19	13.81	8944.52	12506.24
	9.480	490.00	.00	.00	1399.00	6800.00	1402.04	.00	1402.57	55.88	5.85	1162.79	909.68
	9.480	490.00	.00	.00	1399.00	15000.00	1404.10	.00	1404.84	35.26	6.94	2206.83	2526.05
	9.480	490.00	.00	.00	1399.00	29000.00	1405.41	.00	1407.00	54.43	10.22	2920.86	3930.88
	9.480	490.00	.00	.00	1399.00	39000.00	1406.00	.00	1408.34	70.36	12.39	3244.74	4649.33
*	9.480	490.00	.00	.00	1399.00	85000.00	1409.26	1409.26	1413.83	80.30	17.41	5052.24	9485.63
	9.560	300.00	.00	.00	1400.50	6800.00	1403.52	.00	1404.00	40.73	5.58	1218.81	1065.50
	9.560	300.00	.00	.00	1400.50	15000.00	1405.15	.00	1406.11	45.94	7.85	1910.14	2213.01
	9.560	300.00	.00	.00	1400.50	29000.00	1406.93	.00	1408.74	57.40	10.80	2684.12	3827.69
	9.560	300.00	.00	.00	1400.50	39000.00	1407.94	.00	1410.34	62.91	12.42	3139.52	4917.01
*	9.560	300.00	.00	.00	1400.50	85000.00	1411.33	1411.33	1416.38	73.64	18.04	4710.64	9905.43
	9.580	110.00	.00	.00	1401.00	6800.00	1403.90	.00	1404.38	41.27	.00	1223.02	1058.55
	9.580	110.00	.00	.00	1401.00	15000.00	1405.63	.00	1406.52	40.87	.00	1983.01	2346.28
	9.580	110.00	.00	.00	1401.00	29000.00	1407.70	.00	1409.22	42.69	.00	2926.76	4438.51
	9.580	110.00	.00	.00	1401.00	39000.00	1408.95	.00	1410.86	42.48	.00	3515.47	5983.53
	9.580	110.00	.00	.00	1401.00	85000.00	1413.76	.00	1417.04	37.77	.00	5853.48	13831.08
	9.670	410.00	.00	.00	1403.00	6800.00	1405.66	.00	1406.17	49.45	.00	1184.58	966.99
	9.670	410.00	.00	.00	1403.00	15000.00	1407.32	.00	1408.24	46.17	.00	1954.00	2207.52
	9.670	410.00	.00	.00	1403.00	29000.00	1409.45	.00	1410.93	43.45	.00	2975.05	4399.42
	9.670	410.00	.00	.00	1403.00	39000.00	1410.72	.00	1412.54	42.21	.00	3598.82	6002.91
	9.670	410.00	.00	.00	1403.00	85000.00	1415.42	.00	1418.54	37.51	.00	5994.31	13878.42

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	9.750	370.00	.00	.00	1404.50	6800.00	1407.45	.00	1408.11	56.29	.00	1036.11	906.34
	9.750	370.00	.00	.00	1404.50	15000.00	1408.97	.00	1410.34	65.47	.00	1601.50	1853.90
	9.750	370.00	.00	.00	1404.50	29000.00	1410.77	.00	1413.26	75.89	.00	2291.58	3329.03
	9.750	370.00	.00	.00	1404.50	39000.00	1411.76	1411.68	1415.05	82.56	.00	2679.19	4292.13
*	9.750	370.00	.00	.00	1404.50	85000.00	1416.29	1416.29	1421.70	69.44	.00	4552.94	10199.99
	9.840	480.00	.00	.00	1406.00	6800.00	1409.71	.00	1410.25	35.44	5.92	1148.50	1142.30
	9.840	480.00	.00	.00	1406.00	15000.00	1411.72	.00	1412.78	39.39	8.24	1819.39	2389.86
	9.840	480.00	.00	.00	1406.00	29000.00	1414.22	.00	1416.01	42.55	10.76	2694.99	4445.63
	9.840	480.00	.00	.00	1406.00	39000.00	1415.72	.00	1417.96	43.18	12.02	3243.62	5935.15
*	9.840	480.00	.00	.00	1406.00	85000.00	1420.00	1418.86	1424.65	47.93	17.30	4914.50	12277.62
	9.940	520.00	.00	.00	1409.00	6800.00	1411.96	.00	1412.64	59.33	6.63	1025.45	882.85
	9.940	520.00	.00	.00	1409.00	15000.00	1413.97	.00	1415.09	49.77	8.50	1764.47	2126.19
	9.940	520.00	.00	.00	1409.00	29000.00	1416.57	.00	1418.28	44.10	10.47	2770.32	4366.82
	9.940	520.00	.00	.00	1409.00	39000.00	1418.15	.00	1420.19	41.87	11.47	3399.20	6027.14
	9.940	520.00	.00	.00	1409.00	85000.00	1423.63	.00	1427.01	39.00	14.77	5753.72	13610.34
	10.040	540.00	.00	.00	1413.00	6800.00	1415.64	.00	1416.48	84.49	7.35	925.18	739.79
	10.040	540.00	.00	.00	1413.00	15000.00	1417.16	.00	1418.74	88.38	10.11	1484.27	1595.56
	10.040	540.00	.00	.00	1413.00	29000.00	1419.20	.00	1421.75	85.08	12.81	2263.69	3144.01
	10.040	540.00	.00	.00	1413.00	39000.00	1420.48	.00	1423.57	81.11	14.09	2768.65	4330.53
	10.040	540.00	.00	.00	1413.00	85000.00	1425.33	.00	1430.20	68.77	17.70	4801.80	10249.61
	10.120	380.00	.00	.00	1414.50	6800.00	1417.85	.00	1418.22	27.55	4.91	1384.10	1295.65
	10.120	380.00	.00	.00	1414.50	15000.00	1419.86	.00	1420.55	27.31	6.64	2259.72	2870.48
	10.120	380.00	.00	.00	1414.50	29000.00	1422.45	.00	1423.56	26.70	8.45	3433.98	5612.39
	10.120	380.00	.00	.00	1414.50	39000.00	1423.99	.00	1425.36	26.24	9.37	4162.86	7614.17
*	10.120	380.00	.00	.00	1414.50	85000.00	1429.50	1425.25	1431.86	22.26	12.32	6902.09	18015.51
*	10.210	450.00	.00	.00	1420.00	6800.00	1421.97	1421.97	1422.93	142.31	7.89	861.90	570.02
*	10.210	450.00	.00	.00	1420.00	15000.00	1423.31	1423.31	1424.93	121.12	10.23	1466.09	1362.95
*	10.210	450.00	.00	.00	1420.00	29000.00	1425.11	1425.11	1427.57	104.67	12.61	2299.56	2834.56
*	10.210	450.00	.00	.00	1420.00	39000.00	1426.20	1426.20	1429.17	98.12	13.84	2818.80	3937.17
*	10.210	450.00	.00	.00	1420.00	85000.00	1430.29	1430.29	1435.06	82.66	17.53	4848.63	9348.93
	10.300	440.00	.00	.00	1423.00	6800.00	1425.87	.00	1426.43	49.55	5.96	1140.29	966.03
	10.300	440.00	.00	.00	1423.00	15000.00	1427.41	.00	1428.52	57.08	8.45	1774.99	1985.44
	10.300	440.00	.00	.00	1423.00	29000.00	1429.23	.00	1431.23	66.08	11.36	2553.21	3567.37
	10.300	440.00	.00	.00	1423.00	39000.00	1430.24	.00	1432.87	71.53	13.01	2997.82	4611.15
*	10.300	440.00	.00	.00	1423.00	85000.00	1433.99	1433.99	1439.04	81.15	18.02	4716.58	9435.55
	10.350	250.00	.00	.00	1424.77	6800.00	1427.44	1427.41	1428.49	133.46	8.19	830.77	588.63
	10.350	250.00	.00	.00	1424.77	15000.00	1428.93	1428.90	1430.69	116.27	10.64	1409.31	1391.11
*	10.350	250.00	.00	.00	1424.77	29000.00	1430.85	1430.85	1433.58	105.57	13.25	2188.58	2822.40
*	10.350	250.00	.00	.00	1424.77	39000.00	1432.10	1432.10	1435.32	96.91	14.40	2708.86	3961.73
*	10.350	250.00	.00	.00	1424.77	85000.00	1436.54	1436.54	1441.70	83.98	18.22	4665.11	9275.29

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
10.400	200.00	.00	.00	1422.00	6800.00	1429.26	.00	1429.89	41.38	6.40	1063.19	1057.04
10.400	200.00	.00	.00	1422.00	15000.00	1431.14	.00	1432.42	63.81	9.06	1656.26	1877.73
10.400	200.00	.00	.00	1422.00	29000.00	1433.45	.00	1435.37	70.83	11.13	2606.31	3445.72
10.400	200.00	.00	.00	1422.00	39000.00	1434.75	.00	1437.07	71.94	12.22	3192.58	4598.16
10.400	200.00	.00	.00	1422.00	85000.00	1439.52	.00	1443.30	63.98	15.60	5447.58	10626.79
10.490	460.00	.00	.00	1428.00	6800.00	1431.78	.00	1432.51	80.80	6.85	993.28	756.51

10.490	460.00	.00	.00	1428.00	15000.00	1434.16	.00	1435.02	49.05	7.46	2009.44	2141.86
10.490	460.00	.00	.00	1428.00	29000.00	1436.69	.00	1438.00	44.99	9.17	3162.62	4323.70
10.490	460.00	.00	.00	1428.00	39000.00	1438.10	.00	1439.71	44.78	10.18	3829.64	5828.04
10.490	460.00	.00	.00	1428.00	85000.00	1442.84	.00	1445.79	43.82	13.79	6164.27	12840.52
10.620	610.00	.00	.00	1430.00	6800.00	1434.76	.00	1435.29	28.90	5.83	1165.72	1264.91
10.620	610.00	.00	.00	1430.00	15000.00	1436.74	.00	1437.84	41.46	8.40	1785.74	2329.70
10.620	610.00	.00	.00	1430.00	29000.00	1439.12	.00	1440.84	44.08	10.51	2758.74	4367.70
10.620	610.00	.00	.00	1430.00	39000.00	1440.48	.00	1442.60	44.94	11.69	3336.49	5817.72
10.620	610.00	.00	.00	1430.00	85000.00	1444.97	.00	1448.91	48.88	15.92	5338.76	12158.16
* 10.700	380.00	.00	.00	1432.00	6800.00	1436.43	1436.43	1438.08	123.22	10.30	659.94	612.60
* 10.700	380.00	.00	.00	1432.00	15000.00	1438.91	1438.91	1441.13	110.64	11.94	1256.70	1426.02
10.700	380.00	.00	.00	1432.00	29000.00	1441.46	1441.46	1444.23	90.14	13.38	2168.10	3054.41
10.700	380.00	.00	.00	1432.00	39000.00	1442.75	1442.75	1446.00	85.81	14.46	2697.15	4210.14
* 10.700	380.00	.00	.00	1432.00	85000.00	1447.21	1447.21	1452.47	74.92	18.41	4617.15	9820.28
10.830	650.00	.00	.00	1436.00	6800.00	1443.38	.00	1444.39	77.11	8.07	842.41	774.37
10.830	650.00	.00	.00	1436.00	15000.00	1445.65	.00	1446.79	68.12	8.59	1746.20	1817.36
10.830	650.00	.00	.00	1436.00	29000.00	1447.84	.00	1449.51	70.65	10.38	2792.96	3450.12
10.830	650.00	.00	.00	1436.00	39000.00	1449.14	.00	1451.14	69.83	11.35	3435.94	4667.07
10.830	650.00	.00	.00	1436.00	85000.00	1453.79	.00	1457.09	61.99	14.58	5828.59	10795.93
10.930	500.00	.00	.00	1442.00	6800.00	1447.39	.00	1448.44	84.59	8.20	829.05	739.35
10.930	500.00	.00	.00	1442.00	15000.00	1449.38	.00	1450.73	88.99	9.32	1608.67	1590.05
10.930	500.00	.00	.00	1442.00	29000.00	1451.57	.00	1453.53	87.89	11.22	2583.74	3093.35
10.930	500.00	.00	.00	1442.00	39000.00	1452.79	.00	1455.18	88.85	12.40	3144.88	4137.55
10.930	500.00	.00	.00	1442.00	85000.00	1456.93	.00	1461.19	95.95	16.57	5130.92	8677.57
11.040	500.00	.00	.00	1448.00	6800.00	1451.49	.00	1452.07	61.44	6.08	1117.60	867.54
11.040	500.00	.00	.00	1448.00	15000.00	1453.16	.00	1454.12	52.31	7.88	1903.74	2073.96
11.040	500.00	.00	.00	1448.00	29000.00	1455.25	.00	1456.79	49.24	9.95	2913.76	4132.58
11.040	500.00	.00	.00	1448.00	39000.00	1456.52	.00	1458.40	47.40	11.00	3546.08	5664.67
11.040	500.00	.00	.00	1448.00	85000.00	1461.25	.00	1464.35	42.09	14.13	6017.26	13102.03
11.100	365.00	.00	.00	1450.00	6800.00	1453.29	.00	1453.58	29.00	4.32	1573.46	1262.76
11.100	365.00	.00	.00	1450.00	15000.00	1454.98	.00	1455.49	26.60	5.75	2607.94	2908.28
11.100	365.00	.00	.00	1450.00	29000.00	1457.27	.00	1458.07	23.55	7.17	4043.24	5976.24
11.100	365.00	.00	.00	1450.00	39000.00	1458.66	.00	1459.63	22.22	7.91	4933.51	8273.73
11.100	365.00	.00	.00	1450.00	85000.00	1463.89	.00	1465.49	18.97	10.15	8372.32	19513.67

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
* 11.200	410.00	.00	.00	1452.00	6800.00	1454.67	1454.67	1455.99	43.08	9.23	736.71	1036.05
* 11.200	410.00	.00	.00	1452.00	15000.00	1456.50	1456.50	1458.70	36.50	11.92	1258.87	2482.81
* 11.200	410.00	.00	.00	1452.00	29000.00	1458.96	1458.96	1462.28	31.53	14.63	1982.74	5164.22
* 11.200	410.00	.00	.00	1452.00	39000.00	1460.44	1460.44	1464.44	29.83	16.06	2429.13	7140.22
* 11.200	410.00	.00	.00	1452.00	85000.00	1465.98	1465.98	1472.40	25.76	20.34	4178.46	16748.74
11.300	528.00	.00	.00	1452.50	6800.00	1456.52	.00	1457.09	10.99	6.08	1119.12	2050.84
11.300	528.00	.00	.00	1452.50	15000.00	1458.72	.00	1459.85	12.25	8.50	1764.97	4284.96
11.300	528.00	.00	.00	1452.50	29000.00	1461.53	.00	1463.45	13.15	11.12	2608.87	7997.03
11.300	528.00	.00	.00	1452.50	39000.00	1463.20	.00	1465.62	13.44	12.48	3125.29	10637.13
11.300	528.00	.00	.00	1452.50	85000.00	1469.30	.00	1473.59	13.78	16.62	5113.66	22895.96
11.400	528.00	.00	.00	1454.00	6800.00	1457.09	.00	1458.07	26.32	7.94	856.30	1325.38
11.400	528.00	.00	.00	1454.00	15000.00	1459.23	.00	1460.84	21.98	10.19	1472.39	3199.60
11.400	528.00	.00	.00	1454.00	29000.00	1461.97	.00	1464.47	19.98	12.68	2287.20	6487.81
11.400	528.00	.00	.00	1454.00	39000.00	1463.61	.00	1466.64	19.27	13.99	2788.14	8884.33
11.400	528.00	.00	.00	1454.00	85000.00	1469.58	.00	1474.64	17.80	18.05	4708.04	20146.32

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SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	8.690	6800.00	1377.80	.00	.00	.00	2108.70	.00
	8.690	15000.00	1377.80	.00	.00	.00	2108.70	.00
	8.690	29000.00	1377.80	.00	.00	.00	2108.70	.00
*	8.690	39000.00	1378.24	.44	.00	.44	2828.79	.00
*	8.690	85000.00	1379.69	1.45	.00	1.89	3330.82	.00
*	8.750	6800.00	1378.24	.00	.44	.00	337.37	739.00
*	8.750	15000.00	1380.24	2.01	2.44	.00	548.56	739.00
*	8.750	29000.00	1382.82	2.57	5.02	.00	2963.23	739.00
*	8.750	39000.00	1383.33	.51	5.09	.00	3210.50	739.00
	8.750	85000.00	1384.83	1.50	5.14	.00	3635.77	739.00
	8.890	6800.00	1384.75	.00	6.52	.00	438.94	840.00
	8.890	15000.00	1386.27	1.52	6.02	.00	1708.19	840.00
*	8.890	29000.00	1387.61	1.34	4.79	.00	2860.00	840.00
*	8.890	39000.00	1388.06	.44	4.72	.00	2860.00	840.00
*	8.890	85000.00	1389.55	1.50	4.72	.00	2860.00	840.00
	8.965	6800.00	1387.01	.00	2.26	.00	320.72	400.00
*	8.965	15000.00	1388.99	1.97	2.72	.00	1447.25	400.00
*	8.965	29000.00	1390.28	1.30	2.67	.00	2490.00	400.00
*	8.965	39000.00	1390.85	.56	2.79	.00	2490.00	400.00
*	8.965	85000.00	1392.41	1.56	2.85	.00	2490.00	400.00
	9.050	6800.00	1389.79	.00	2.78	.00	765.86	550.00
	9.050	15000.00	1391.22	1.42	2.23	.00	2045.00	550.00
	9.050	29000.00	1392.44	1.22	2.16	.00	2045.00	550.00
	9.050	39000.00	1393.05	.61	2.20	.00	2045.00	550.00
	9.050	85000.00	1395.19	2.14	2.79	.00	2045.00	550.00
	9.115	6800.00	1390.98	.00	1.19	.00	406.12	370.00
*	9.115	15000.00	1392.66	1.68	1.44	.00	1737.71	370.00
*	9.115	29000.00	1393.70	1.04	1.26	.00	1836.31	370.00
*	9.115	39000.00	1394.30	.60	1.25	.00	2005.45	370.00
	9.115	85000.00	1396.37	2.08	1.18	.00	2856.53	370.00
	9.210	6800.00	1394.43	.00	3.44	.00	689.56	600.00
	9.210	15000.00	1395.66	1.23	3.00	.00	1405.34	600.00
	9.210	29000.00	1396.83	1.17	3.14	.00	1565.00	600.00
	9.210	39000.00	1397.43	.60	3.13	.00	1565.00	600.00
	9.210	85000.00	1399.29	1.86	2.92	.00	1565.00	600.00
	9.310	6800.00	1396.59	.00	2.16	.00	212.10	650.00
*	9.310	15000.00	1399.34	2.75	3.68	.00	1450.00	650.00
*	9.310	29000.00	1400.55	1.22	3.72	.00	1450.00	650.00
*	9.310	39000.00	1401.18	.62	3.75	.00	1450.00	650.00
*	9.310	85000.00	1403.29	2.11	3.99	.00	1450.00	650.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
9.400	6800.00	1399.78	.00	3.19	.00	223.43	510.00
9.400	15000.00	1401.41	1.63	2.07	.00	797.80	510.00

*	9.400	29000.00	1403.03	1.62	2.48	.00	1420.00	510.00
	9.400	39000.00	1403.79	.76	2.62	.00	1420.00	510.00
	9.400	85000.00	1406.57	2.78	3.29	.00	1420.00	510.00
	9.480	6800.00	1402.04	.00	2.26	.00	473.42	490.00
	9.480	15000.00	1404.10	2.06	2.70	.00	540.38	490.00
	9.480	29000.00	1405.41	1.31	2.38	.00	545.64	490.00
	9.480	39000.00	1406.00	.59	2.21	.00	548.01	490.00
*	9.480	85000.00	1409.26	3.26	2.69	.00	560.00	490.00
	9.560	6800.00	1403.52	.00	1.47	.00	416.13	300.00
	9.560	15000.00	1405.15	1.63	1.05	.00	429.22	300.00
	9.560	29000.00	1406.93	1.77	1.51	.00	443.41	300.00
	9.560	39000.00	1407.94	1.02	1.94	.00	451.55	300.00
*	9.560	85000.00	1411.33	3.38	2.06	.00	472.00	300.00
	9.580	6800.00	1403.90	.00	.38	.00	433.21	110.00
	9.580	15000.00	1405.63	1.73	.48	.00	447.02	110.00
	9.580	29000.00	1407.70	2.07	.77	.00	463.60	110.00
	9.580	39000.00	1408.95	1.25	1.01	.00	473.65	110.00
	9.580	85000.00	1413.76	4.81	2.43	.00	490.00	110.00
	9.670	6800.00	1405.66	.00	1.76	.00	456.27	410.00
	9.670	15000.00	1407.32	1.67	1.70	.00	469.56	410.00
	9.670	29000.00	1409.45	2.13	1.76	.00	486.65	410.00
	9.670	39000.00	1410.72	1.27	1.77	.00	496.80	410.00
	9.670	85000.00	1415.42	4.70	1.65	.00	515.00	410.00
	9.750	6800.00	1407.45	.00	1.79	.00	363.56	370.00
	9.750	15000.00	1408.97	1.53	1.65	.00	375.80	370.00
	9.750	29000.00	1410.77	1.80	1.32	.00	390.21	370.00
	9.750	39000.00	1411.76	.99	1.04	.00	398.08	370.00
*	9.750	85000.00	1416.29	4.53	.88	.00	420.00	370.00
	9.840	6800.00	1409.71	.00	2.26	.00	324.66	480.00
	9.840	15000.00	1411.72	2.01	2.75	.00	340.79	480.00
	9.840	29000.00	1414.22	2.49	3.44	.00	360.76	480.00
	9.840	39000.00	1415.72	1.50	3.96	.00	372.72	480.00
*	9.840	85000.00	1420.00	4.29	3.71	.00	407.00	480.00
	9.940	6800.00	1411.96	.00	2.25	.00	358.65	520.00
	9.940	15000.00	1413.97	2.01	2.25	.00	374.78	520.00
	9.940	29000.00	1416.57	2.60	2.36	.00	395.66	520.00
	9.940	39000.00	1418.15	1.57	2.43	.00	408.18	520.00
	9.940	85000.00	1423.63	5.48	3.62	.00	451.98	520.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	10.040	6800.00	1415.64	.00	3.68	.00	361.11	540.00
	10.040	15000.00	1417.16	1.51	3.18	.00	373.29	540.00
	10.040	29000.00	1419.20	2.05	2.63	.00	389.64	540.00
	10.040	39000.00	1420.48	1.28	2.34	.00	399.87	540.00
	10.040	85000.00	1425.33	4.85	1.71	.00	438.67	540.00
	10.120	6800.00	1417.85	.00	2.21	.00	426.79	380.00
	10.120	15000.00	1419.86	2.01	2.71	.00	442.89	380.00
	10.120	29000.00	1422.45	2.59	3.25	.00	463.62	380.00
	10.120	39000.00	1423.99	1.54	3.51	.00	476.03	380.00
*	10.120	85000.00	1429.50	5.51	4.17	.00	520.00	380.00
*	10.210	6800.00	1421.97	.00	4.12	.00	445.75	450.00
*	10.210	15000.00	1423.31	1.34	3.45	.00	456.46	450.00

*	10.210	29000.00	1425.11	1.80	2.65	.00	470.84	450.00
*	10.210	39000.00	1426.20	1.09	2.20	.00	479.58	450.00
*	10.210	85000.00	1430.29	4.09	.79	.00	512.33	450.00
	10.300	6800.00	1425.87	.00	3.90	.00	408.01	440.00
	10.300	15000.00	1427.41	1.53	4.10	.00	420.27	440.00
	10.300	29000.00	1429.23	1.82	4.12	.00	434.83	440.00
	10.300	39000.00	1430.24	1.01	4.04	.00	442.93	440.00
*	10.300	85000.00	1433.99	3.75	3.70	.00	472.96	440.00
	10.350	6800.00	1427.44	.00	1.57	.00	385.06	250.00
	10.350	15000.00	1428.93	1.48	1.52	.00	396.89	250.00
*	10.350	29000.00	1430.85	1.93	1.62	.00	412.30	250.00
*	10.350	39000.00	1432.10	1.25	1.86	.00	422.28	250.00
*	10.350	85000.00	1436.54	4.45	2.55	.00	457.84	250.00
	10.400	6800.00	1429.26	.00	1.81	.00	241.64	200.00
	10.400	15000.00	1431.14	1.89	2.22	.00	358.83	200.00
	10.400	29000.00	1433.45	2.30	2.60	.00	446.19	200.00
	10.400	39000.00	1434.75	1.30	2.65	.00	456.58	200.00
	10.400	85000.00	1439.52	4.76	2.97	.00	481.00	200.00
	10.490	6800.00	1431.78	.00	2.52	.00	341.50	460.00
	10.490	15000.00	1434.16	2.38	3.01	.00	445.25	460.00
	10.490	29000.00	1436.69	2.54	3.24	.00	465.51	460.00
	10.490	39000.00	1438.10	1.41	3.35	.00	476.84	460.00
	10.490	85000.00	1442.84	4.74	3.32	.00	500.00	460.00
	10.620	6800.00	1434.76	.00	2.98	.00	284.70	610.00
	10.620	15000.00	1436.74	1.98	2.58	.00	366.49	610.00
	10.620	29000.00	1439.12	2.38	2.43	.00	419.68	610.00
	10.620	39000.00	1440.48	1.36	2.38	.00	430.27	610.00
	10.620	85000.00	1444.97	4.49	2.13	.00	453.00	610.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	10.700	6800.00	1436.43	.00	1.67	.00	203.57	380.00
*	10.700	15000.00	1438.91	2.48	2.17	.00	289.48	380.00
*	10.700	29000.00	1441.46	2.54	2.34	.00	403.66	380.00
*	10.700	39000.00	1442.75	1.29	2.27	.00	414.01	380.00
*	10.700	85000.00	1447.21	4.46	2.24	.00	440.00	380.00
	10.830	6800.00	1443.38	.00	6.95	.00	214.55	650.00
	10.830	15000.00	1445.65	2.27	6.73	.00	470.64	650.00
	10.830	29000.00	1447.84	2.19	6.38	.00	488.11	650.00
	10.830	39000.00	1449.14	1.30	6.39	.00	498.54	650.00
	10.830	85000.00	1453.79	4.65	6.58	.00	523.00	650.00
	10.930	6800.00	1447.39	.00	4.01	.00	278.43	500.00
	10.930	15000.00	1449.38	1.99	3.73	.00	436.44	500.00
	10.930	29000.00	1451.57	2.19	3.73	.00	453.96	500.00
	10.930	39000.00	1452.79	1.22	3.65	.00	463.74	500.00
	10.930	85000.00	1456.93	4.13	3.14	.00	496.83	500.00
	11.040	6800.00	1451.49	.00	4.10	.00	462.93	500.00
	11.040	15000.00	1453.16	1.67	3.78	.00	476.32	500.00
	11.040	29000.00	1455.25	2.09	3.68	.00	493.00	500.00
	11.040	39000.00	1456.52	1.27	3.73	.00	503.15	500.00
	11.040	85000.00	1461.25	4.73	4.33	.00	540.01	500.00
	11.100	6800.00	1453.29	.00	1.80	.00	609.76	365.00
	11.100	15000.00	1454.98	1.68	1.82	.00	619.85	365.00

	11.100	29000.00	1457.27	2.29	2.01	.00	633.60	365.00
	11.100	39000.00	1458.66	1.39	2.14	.00	641.97	365.00
	11.100	85000.00	1463.89	5.23	2.64	.00	673.34	365.00
*	11.200	6800.00	1454.67	.00	1.37	.00	281.66	410.00
*	11.200	15000.00	1456.50	1.83	1.52	.00	288.98	410.00
*	11.200	29000.00	1458.96	2.46	1.69	.00	298.84	410.00
*	11.200	39000.00	1460.44	1.48	1.78	.00	304.75	410.00
*	11.200	85000.00	1465.98	5.54	2.09	.00	326.91	410.00
	11.300	6800.00	1456.52	.00	1.85	.00	287.04	528.00
	11.300	15000.00	1458.72	2.21	2.23	.00	295.91	528.00
	11.300	29000.00	1461.53	2.80	2.57	.00	307.10	528.00
	11.300	39000.00	1463.20	1.67	2.76	.00	313.76	528.00
	11.300	85000.00	1469.30	6.10	3.32	.00	337.58	528.00
	11.400	6800.00	1457.09	.00	.57	.00	283.36	528.00
	11.400	15000.00	1459.23	2.14	.51	.00	291.92	528.00
	11.400	29000.00	1461.97	2.74	.44	.00	302.88	528.00
	11.400	39000.00	1463.61	1.64	.41	.00	309.43	528.00
	11.400	85000.00	1469.58	5.97	.28	.00	333.32	528.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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12-22-90     14:06:46                                                    PAGE   70

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12-22-90     14:09:56                                                    PAGE    1

                                                   THIS RUN EXECUTED 12-22-90
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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985
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APPENDIX 3

Parsons Brinckerhoff **Computation Sheet**

Page 1 of 1 | 3588C

Made by ED STEWART

Date 15 DEC, 1990

Checked by

Date

Subject STARTING WSEL FOR RELOCATED BUCHANAN WASH.

PRELIMINARY

THE STARTING WSEL FOR FILE: BUCWASH.HYD ARE FOR CONDITION WITHOUT CHANNEL INVERT IMPROVEMENTS IN SKUNK CREEK.

DATA TAKEN FROM HEC-2 OUTPUT USING HEC-2

INPUT FILE: SKUNK.HYD (DATED 12-08-90)
"MARKED PRELIMINARY"

TITLE: SKUNK CREEK HYDRAULIC ANALYSIS, ESTIMATE T.O.B. W/O CHANNEL INVERT IMPROVEMENTS NORTH OF HAPPY VALLEY RD.
RM 9.48 TO 10.35 W/INV. IMPROVEMENTS

SKUNK CR.

SECTION No.	FREQUENCY	STARTING WSEL
11.04	10-YR	1453.94
11.04	50-YR	1456.48
11.04	100-YR	1458.01
11.04	500-YR	1463.63

SUMMARY TABLE FROM PRELIMINARY RUN

11.040	500.00	.00	.00	1448.00	6800.00	1451.42	.00	1451.95	57.62	5.86	1160.81	895.81
11.040	500.00	.00	.00	1448.00	15000.00	1453.01	.00	1453.94	51.70	7.71	1944.59	2086.13
11.040	500.00	.00	.00	1448.00	29000.00	1454.95	.00	1456.48	51.65	9.93	2919.52	4035.02
11.040	500.00	.00	.00	1448.00	39000.00	1456.10	.00	1458.01	51.46	11.10	3513.24	5436.73
11.040	500.00	.00	.00	1448.00	85000.00	1460.21	.00	1463.63	51.59	14.84	5726.08	11834.42
11.100	365.00	.00	.00	1450.00	6800.00	1453.21	.00	1453.52	32.42	4.47	1521.30	1194.26
11.100	365.00	.00	.00	1450.00	15000.00	1454.83	.00	1455.38	29.86	5.96	2517.96	2744.83
11.100	365.00	.00	.00	1450.00	29000.00	1457.01	.00	1457.88	26.93	7.47	3880.94	5588.37
11.100	365.00	.00	.00	1450.00	39000.00	1458.32	.00	1459.39	25.72	8.27	4717.56	7690.78
11.100	365.00	.00	.00	1450.00	85000.00	1463.20	.00	1464.99	22.78	10.74	7910.81	17808.15

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	11.200	410.00	.00	.00	1452.00	6800.00	1454.68	1454.68	1455.99	42.46	9.19	739.94	1043.51
*	11.200	410.00	.00	.00	1452.00	15000.00	1456.50	1456.50	1458.70	36.49	11.91	1258.98	2483.15
*	11.200	410.00	.00	.00	1452.00	29000.00	1458.93	1458.93	1462.28	32.02	14.70	1973.37	5125.18
*	11.200	410.00	.00	.00	1452.00	39000.00	1460.44	1460.44	1464.44	29.77	16.04	2430.88	7148.40
*	11.200	410.00	.00	.00	1452.00	85000.00	1465.95	1465.95	1472.40	25.91	20.38	4170.44	16698.86
	11.300	528.00	.00	.00	1452.50	6800.00	1456.51	.00	1457.09	11.04	6.08	1117.82	2046.98
	11.300	528.00	.00	.00	1452.50	15000.00	1458.72	.00	1459.85	12.25	8.50	1765.01	4285.10
	11.300	528.00	.00	.00	1452.50	29000.00	1461.54	.00	1463.45	13.09	11.10	2612.85	8016.35
	11.300	528.00	.00	.00	1452.50	39000.00	1463.20	.00	1465.61	13.45	12.48	3124.60	10633.44
	11.300	528.00	.00	.00	1452.50	85000.00	1469.31	.00	1473.59	13.76	16.61	5116.84	22918.30
	11.400	528.00	.00	.00	1454.00	6800.00	1457.09	.00	1458.07	26.40	7.95	855.58	1323.55
	11.400	528.00	.00	.00	1454.00	15000.00	1459.23	.00	1460.84	21.98	10.19	1472.28	3199.22
	11.400	528.00	.00	.00	1454.00	29000.00	1461.98	.00	1464.47	19.90	12.66	2290.08	6500.85
	11.400	528.00	.00	.00	1454.00	39000.00	1463.60	.00	1466.64	19.28	13.99	2787.54	8881.28
	11.400	528.00	.00	.00	1454.00	85000.00	1469.59	.00	1474.64	17.77	18.04	4711.02	20165.94

RM 9.48 TO 10.35 W/INV

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	8.690	6800.00	1377.80	.00	.00	.00	2108.70	.00
	8.690	15000.00	1377.80	.00	.00	.00	2108.70	.00
	8.690	29000.00	1377.80	.00	.00	.00	2108.70	.00
*	8.690	39000.00	1378.24	.44	.00	.44	2828.79	.00
*	8.690	85000.00	1379.69	1.45	.00	1.89	3330.82	.00
*	8.750	6800.00	1378.24	.00	.44	.00	337.37	739.00
*	8.750	15000.00	1380.24	2.01	2.44	.00	548.56	739.00
*	8.750	29000.00	1382.82	2.57	5.02	.00	2963.23	739.00
*	8.750	39000.00	1383.33	.51	5.09	.00	3210.50	739.00
	8.750	85000.00	1384.83	1.50	5.14	.00	3635.77	739.00
	8.890	6800.00	1384.75	.00	6.52	.00	438.94	840.00
	8.890	15000.00	1386.27	1.52	6.02	.00	1708.19	840.00
*	8.890	29000.00	1387.61	1.34	4.79	.00	2860.00	840.00
*	8.890	39000.00	1388.06	.44	4.72	.00	2860.00	840.00
*	8.890	85000.00	1389.55	1.50	4.72	.00	2860.00	840.00
	8.965	6800.00	1387.01	.00	2.26	.00	320.72	400.00

HARZA ENGINEERING COMPANY **PHOENIX**

SUBJECT	CROSS SECTIONS FOR BUCHANAN WASH	PROJECT	SKUNK CREEK
		FILE NUMBER	1639
COMPUTED	EHS	CHECKED	
		DATE	5 FEB, 89 Page 1 of 5 Pages

SECTION 1

ELEV	STA	
1460	1532	
1451	1550	LB
1439.82 ~~1439.75~~	1595	
1439.82 ~~1439.75~~	1605	
1451	1650	RB
1463.5	1700	

SECTION 2

ELEV	STA	
1463	1340	
1450	1400	
1450	1450	
1452	1475	
1452	1510	
1451.5	1549	LB
1440	1595	
1440	1605	
1451	1650	RB
1463.5	1700	

SECTION 3

ELEV	STA	
1469	920	
1453	1040	
1454	1140	
1454	1170	
1452	1563	LB
1440.16	1595	
1440.16	1605	
1451	1648	RB
1465	1705	

SECTION 4

ELEV	STA.	
1458	440	
1456	800	
1454	1260	
1452	1563	LB
1440.26	1595	
1440.26	1605	
1451	1650	RB
1465	1700	

HARZA ENGINEERING COMPANY **PHOENIX**

SUBJECT	CROSS SECTIONS FOR BUCHANAN WASH	PROJECT	SKUNK CREEK
		FILE NUMBER	1639
COMPUTED	EHS	DATE	5 FEB 89
CHECKED		Page	2 of 5 Pages

SECTION 5

ELEV	STA	
1458	440	
1456	840	
1454	1200	
1452	1560	LB
1440.3	1595	
1440.3	1605	
1451	1632	RB
1451	1650	
1465	1705	

SECTION 6

ELEV	STA	
1458	460	
1456	830	
1454	1200	
1452	1560	LB
1440.51	1595	
1440.51	1605	
1451	1636	RB
1451	1650	
1465	1705	

SECTION 7

ELEV	STA	
1460	120	
1458	370	
1456	690	
1454	1050	
1452	1460	
1451	1565	LB
1440.9	1595	
1440.9	1605	
1451	1635	RB
1451	1650	
1465	1705	

SECTION 8

ELEV	STA	
1460	350	
1458	450	
1456	610	
1454	900	
1452	1300	
1451	1565	LB
1441.3	1595	
1441.3	1605	
1451	1635	RB
1451	1650	
1465	1705	

HARZA ENGINEERING COMPANY **PHOENIX**

SUBJECT	CROSS SECTIONS FOR BUCHANAN WASH	PROJECT	SKUNK CREEK
		FILE NUMBER	1639
COMPUTED	EHS	DATE	5 FEB, 89
CHECKED		Page	3 of 5 Pages

SECTION 9

ELEV	STA	
1460	390	
1458	730	
1456	900	
1456	990	
1459	1070	
1459	1200	
1456	1310	
1454	1365	
1452	1470	
1450	1571	LB
1441.8	1595	
1441.8	1605	
1450	1629	RB
1450	1650	
1464	1705	

SECTION 10

ELEV	STA	
1460	350	
1458	690	
1456	860	
1456	950	
1459	1030	
1459	1160	
1456	1270	
1454	1330	
1452	1410	
1450	1450	
1450	1530	
1450	1580	LB
1442	1595	
1442	1605	
1450	1615	RB
1450	1670	
1465	1730	

HARZA ENGINEERING COMPANY **PHOENIX**

SUBJECT	Cross Sections for Buchanan Wash	PROJECT	Skunk Creek
		FILE NUMBER	1639
COMPUTED	EHS	DATE	5 Feb, 89
CHECKED			Page 4 of 5 Pages

SECTION 11

ELEV	STA	
1460	420	
1458	760	
1456	920	
1456	1020	
1459	1100	
1459	1230	
1457	1300	
1456	1340	
1454	1400	
1452	1430	
1451	1580	LB
1444	1595	
1444	1605	
1451	1620	RB
1452	2000	
1454	2050	
1456	2080	
1458	2100	
1460	2110	

SECTION 12

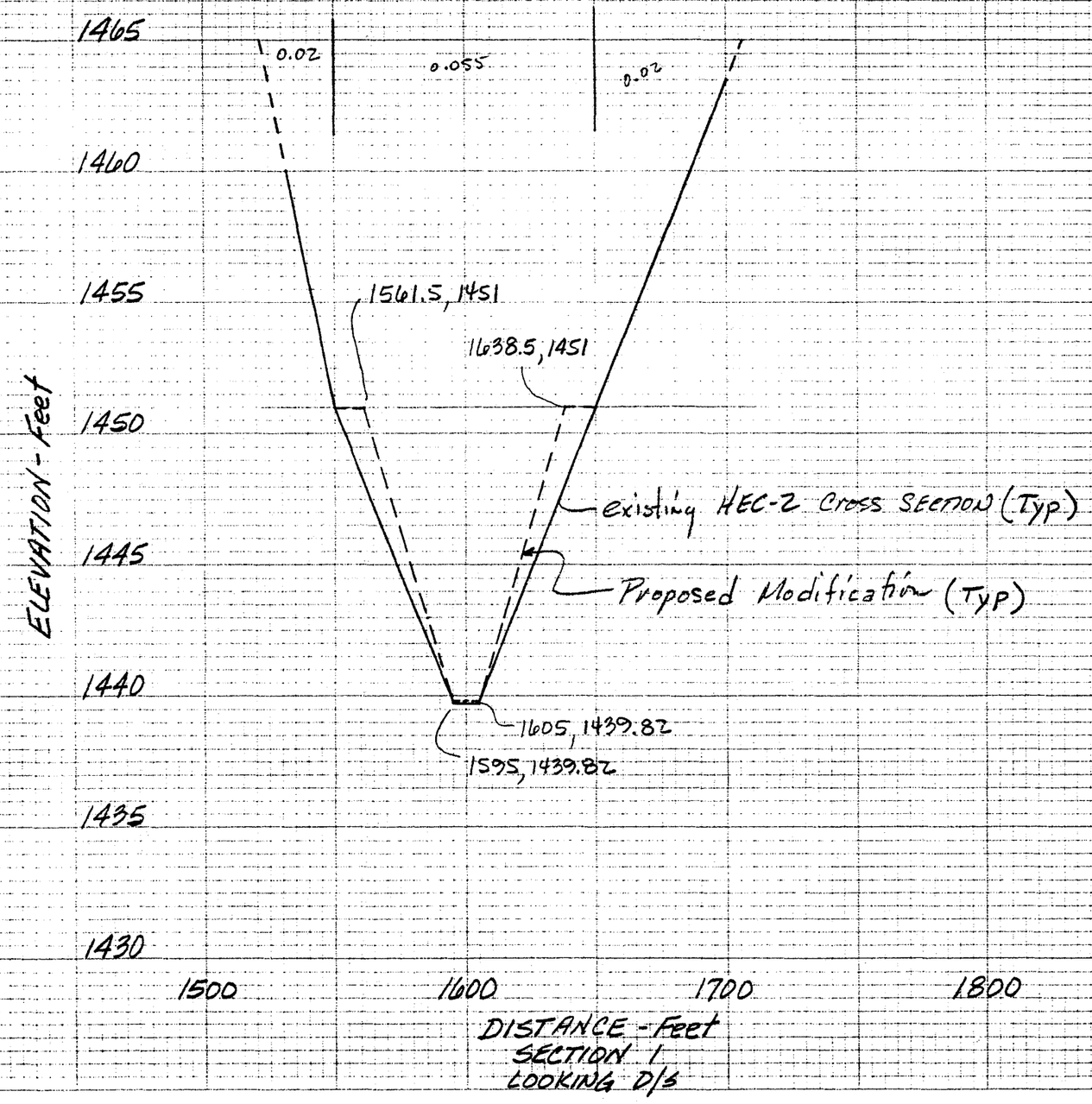
ELEV	STA	
1460	930	
1458	1100	
1456	1210	
1454	1440	
1452	1580	LB
1450	1590	
1448	1595	
1448	1605	
1450	1610	
1452	1630	RB
1454	1960	
1456	2110	
1458	2120	
1460	2140	

HARZA ENGINEERING COMPANY **PHOENIX**

SUBJECT	DATA FOR SECTIONS ON BUCHANAN WASH	PROJECT	SKUNK CREEK
		FILE NUMBER	1639
COMPUTED	EHS	DATE	5 FEB, 89
CHECKED		Page	5 of 5 Pages

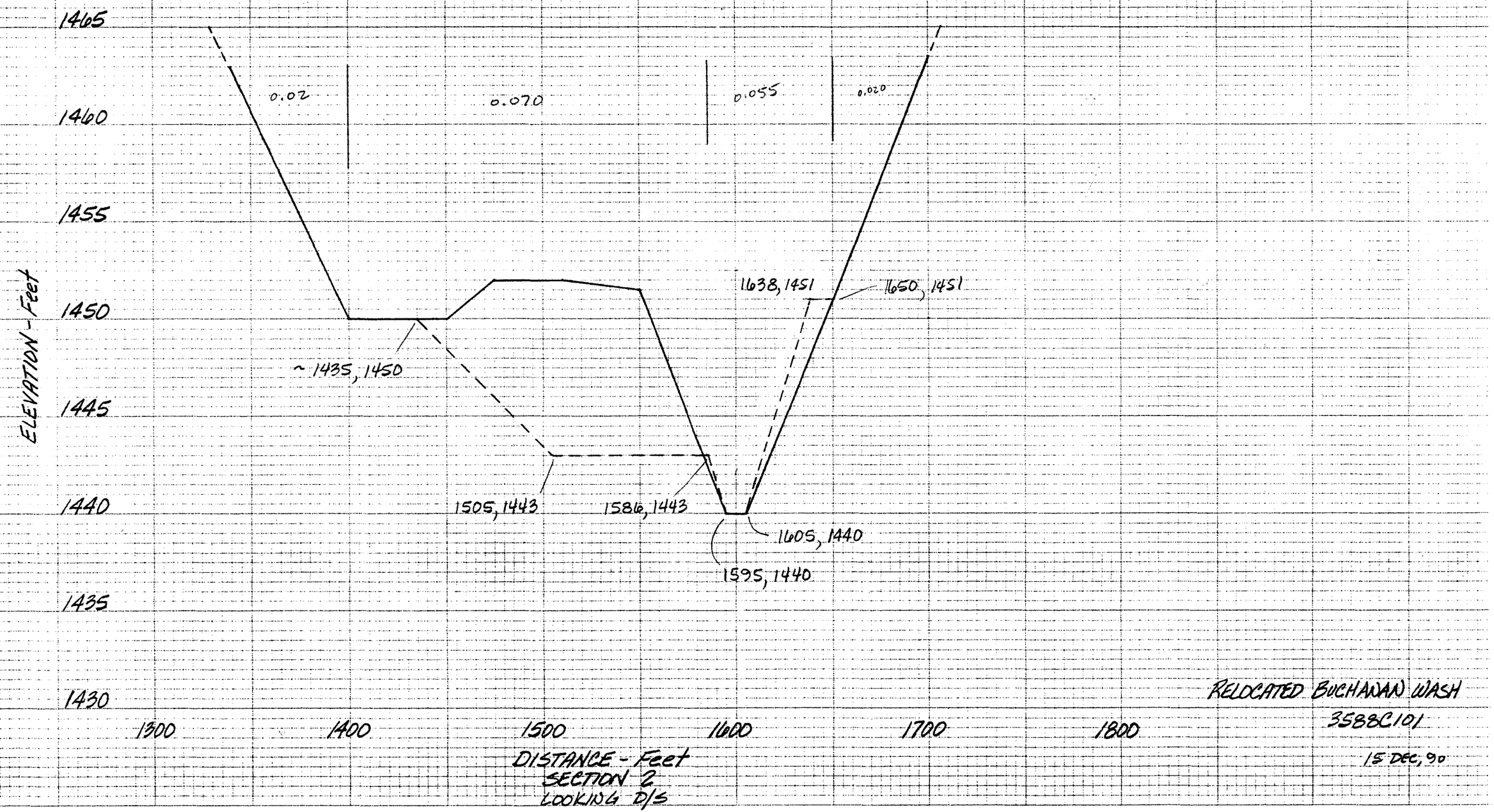
DISTANCE BETWEEN SECTION AND NEXT D/S SECTION

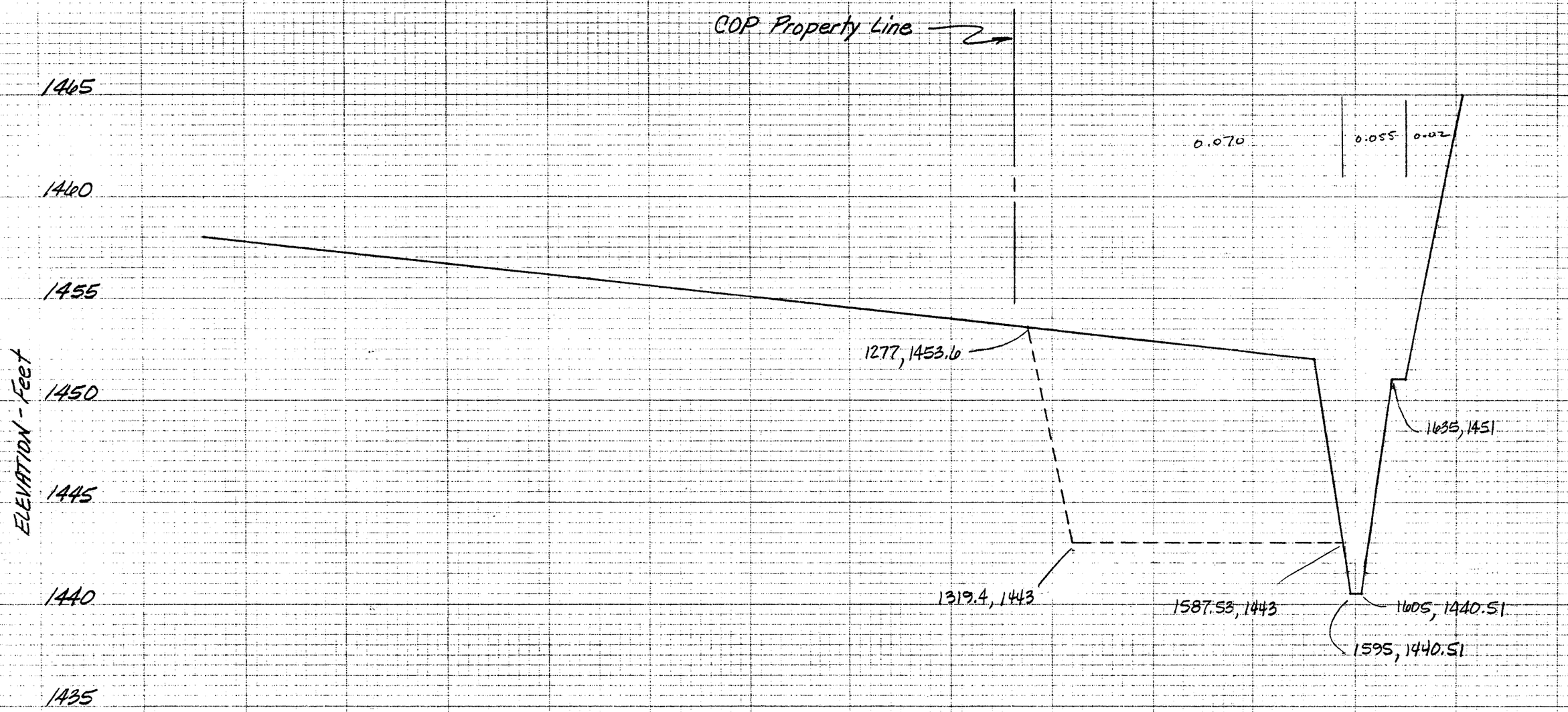
SECTION	LB	RB	CHANNEL
1	0	0	0
2	~~110~~ 80	~~95~~ 60	~~100~~ 70
3	70	50	60
4	40	30	35
5	20	20	20
6	80	80	80
7	150	150	150
8	150	150	150
9	205	195	200
10	150	170	160
11	300	335	320
12	550	550	550
0.710	200	200	200



RELOCATED BUCHANAN WASH
3588C101
15 DEC. 90

NO. 1294—CROSS SECTION 10 x 10
"CLEARPRINT PAPER CO."
MADE IN U.S.A.

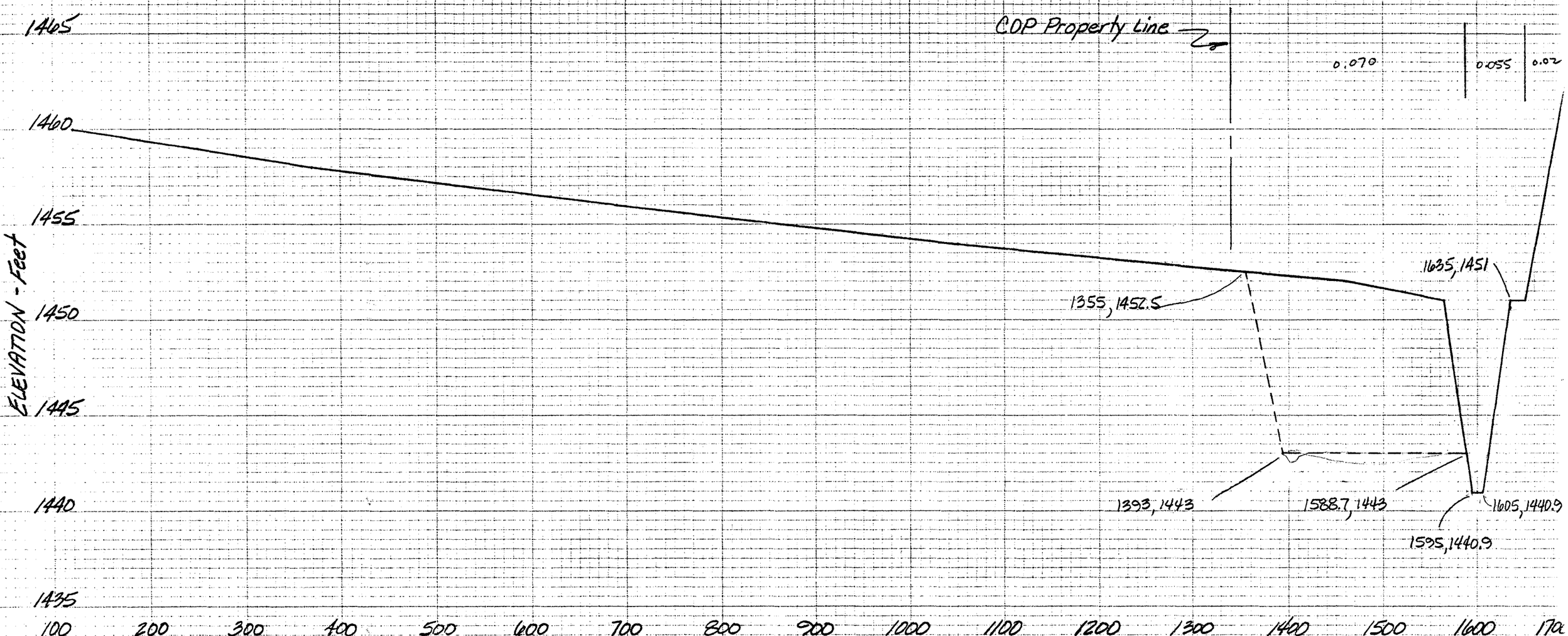

1465
1460
1455
1450
1445
1440
1435
1430
ELEVATION - Feet
0.02
0.070
0.055
0.020
1638, 1451
1650, 1451
~ 1435, 1450
1505, 1443
1586, 1443
1605, 1440
1595, 1440
1300
1400
1500
1600
1700
1800
DISTANCE - Feet
SECTION 2
LOOKING D/S
RELOCATED BUCHANAN WASH
3588C101
15 DEC, 90



SECTION 6
LOOKING D/S

(SECTION 5, BUCHWASH HYD)

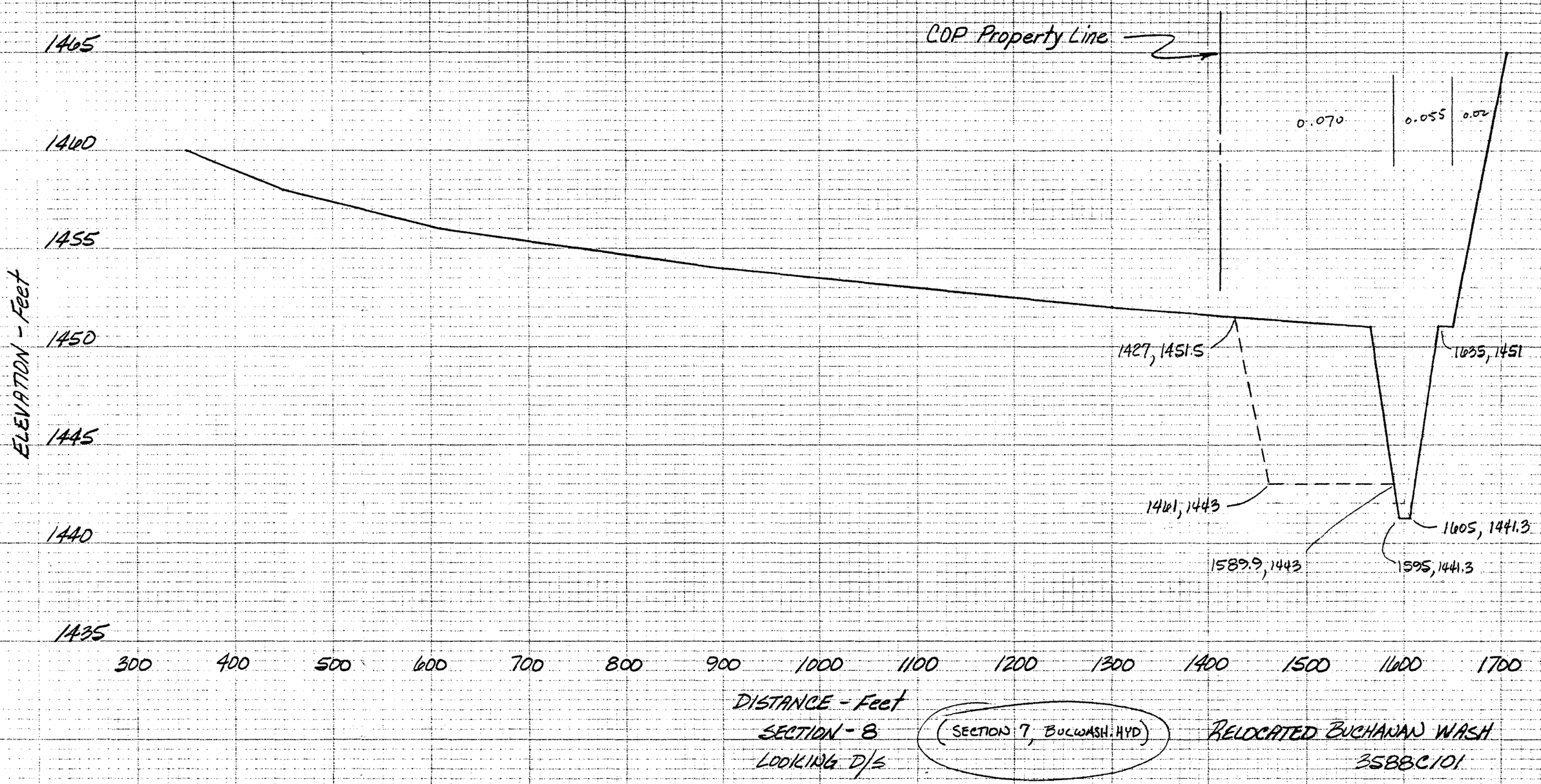
RELOCATED BUCHANAN WASH
3588C101
15 DEC, 90



SECTION 7
LOOKING D/S

(SECTION 6, BUCWASH. HYD)

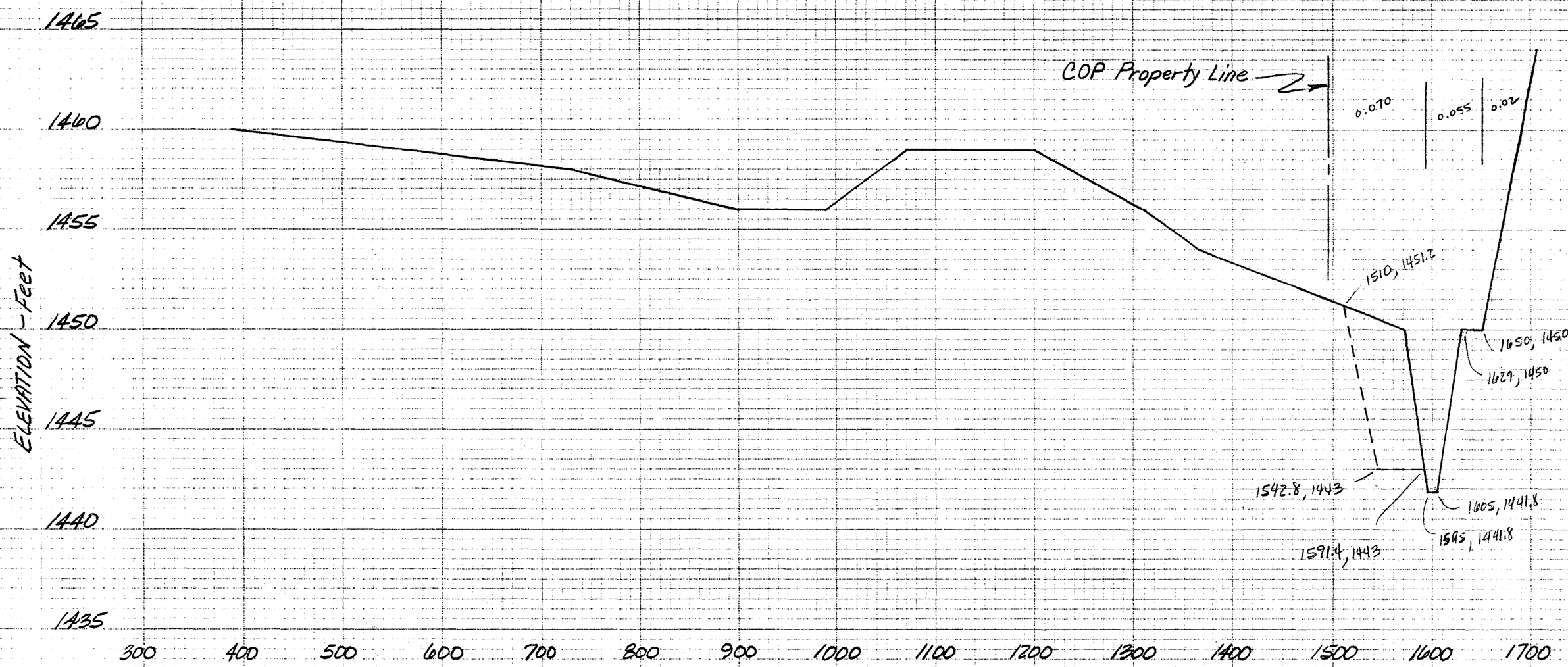
RELOCATED BUCHANAN WASH
3588C101
15 DEC, 90



RELOCATED BUCHANAN WASH

3588C101

15 DEC, 90



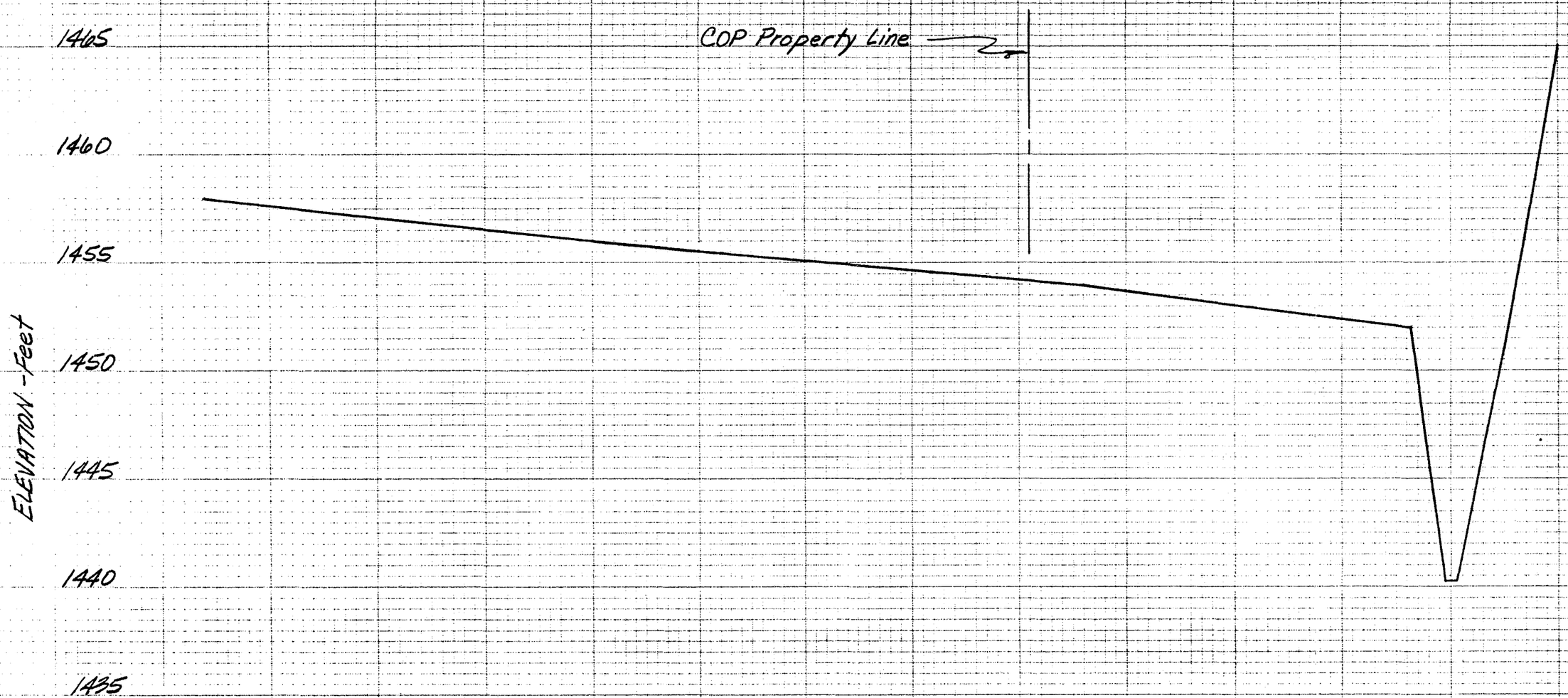
SECTION 9
LOOKING D/S

(SECTION 8, BUCHWASH. HYD)

RELOCATED BUCHANAN WASH

3588C101

15 DEC, 90



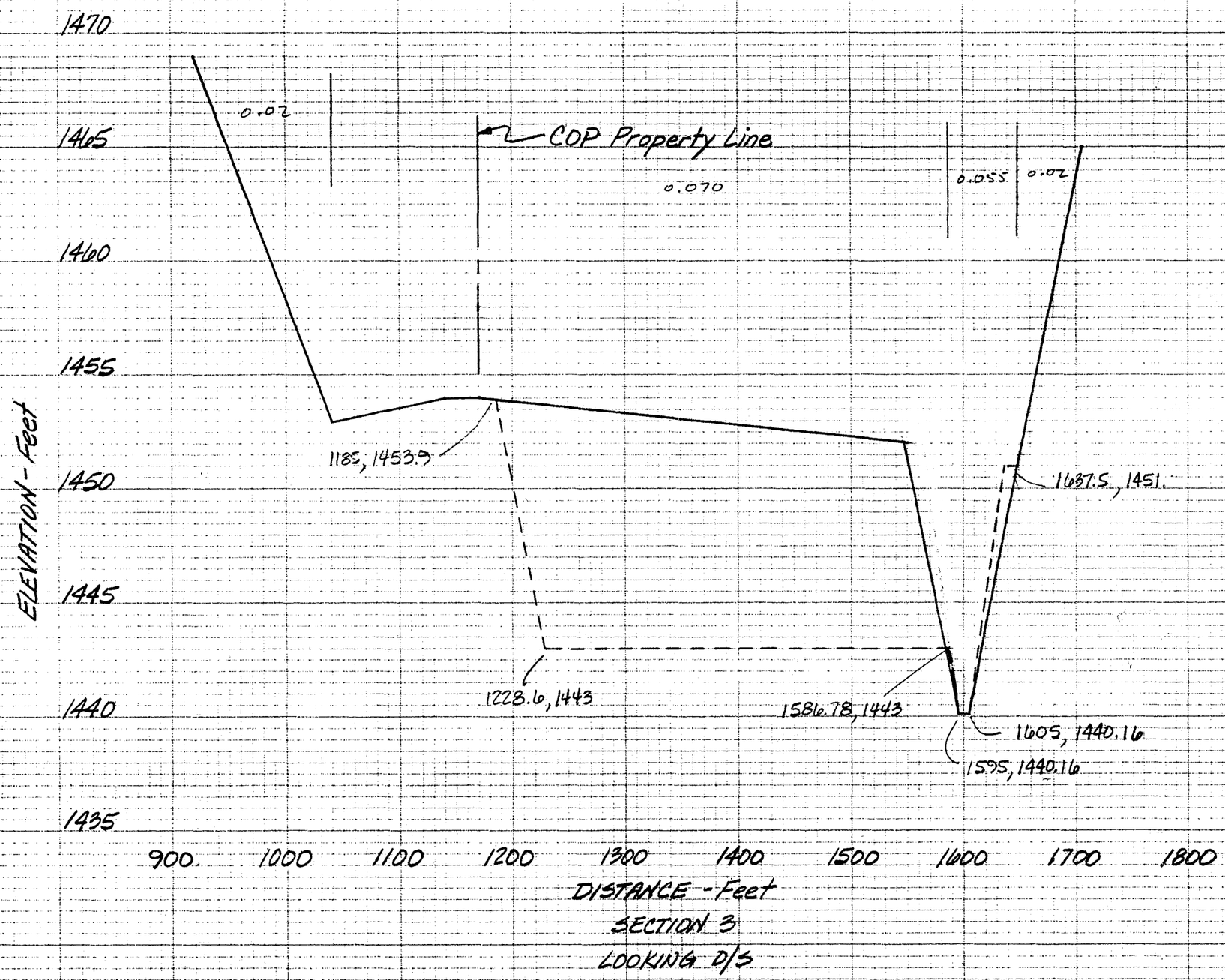
SECTION 4
LOOKING D/S

RELOCATED BUCHADAN WASH
3588C101

NOT USED IN BUCWASH HYD

15 DEC., 90

NO. 1294—CROSS SECTION 10 x
"CLEARPRINT PAPER C
MADE IN U.S.A.



SECTION 3
LOOKING D/S

RELOCATED BUCHANAN WASH

3588C101

15 DEC, 90

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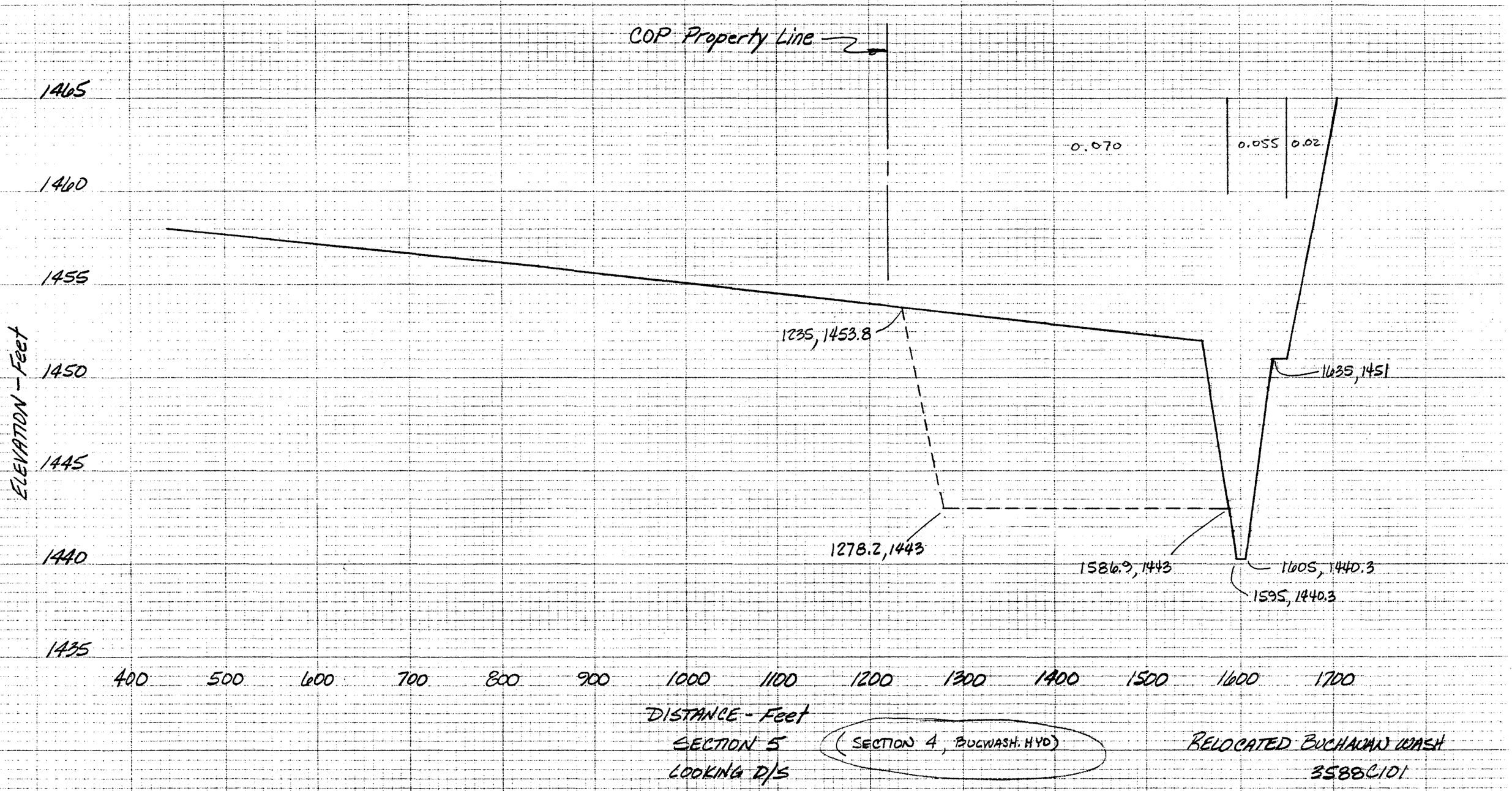
"CLEARPRINT PAPER CO."
MADE IN U.S.A.


COP Property Line
0.070
0.055
0.02
1235, 1453.8
1635, 1451
1278.2, 1443
1586.9, 1443
1605, 1440.3
1595, 1440.3
1465
1460
1455
1450
1445
1440
1435
ELEVATION - Feet
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
DISTANCE - Feet
SECTION 5
LOOKING D/S
(SECTION 4, BUCWASH. HYD)
RELOCATED BUCHANAN WASH
3588C101
15 DEC, 90

```
*******************************************************
*  WATER SURFACE PROFILES                             *
   VERSION OF NOVEMBER 1976                           *
   UPDATED MAY 1984                                   *
   IBM-PC-XT VERSION AUGUST 1985                      *
*  RUN DATE  12-22-90   TIME  11:29:49                *
*******************************************************
```

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

PRELIMINARY

```
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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THIS RUN EXECUTED 12-22-90

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*************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985
*************************************************
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```
T1 FLOODPLAIN ANALYSIS OF RELOCATED BUCHANAN WASH TO DETERMINE EFFECT OF SKUNK
T2 CREEK WITHOUT CHANNEL INVERT IMPROVEMENTS,EXTENSION OF COE DIKE IS INCLUDED
T3      RELOCATED BUCHANAN WASH     10-YR EVENT    FILE NAME : BUCWASH.HYD

T1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.       2.        0.        0.   .000000       .00       .0        0.  1453.940      .000

T2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    1.000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000

T3  VARIABLE CODES FOR SUMMARY PRINTOUT

   150.000      .000      .000      .000      .000      .000      .000      .000      .000      .000

QT     4.000  1422.000  2005.000  2304.000  3067.000      .000      .000      .000      .000      .000
NC      .055      .055      .055      .500      .700      .000      .000      .000      .000      .000
NH     3.000      .030  1550.000      .055  1650.000      .030  1706.000      .000      .000      .000
X1     1.000     8.000  1561.500  1638.500      .000      .000      .000      .000      .000      .000
GR  1465.000  1522.000  1451.000  1550.000  1451.000  1561.500  1439.820  1595.000  1439.820  1605.000
GR  1451.000  1638.500  1451.000  1650.000  1465.000  1706.000      .000      .000      .000      .000

NH     4.000      .030  1400.000      .070  1586.000      .055  1650.000      .030  1706.000      .000
X1     2.000    10.000  1586.000  1638.000    80.000    60.000    70.000      .000      .000      .000
GR  1465.000  1330.000  1450.000  1400.000  1450.000  1435.000  1443.000  1505.000  1443.000  1586.000
GR  1440.000  1595.000  1440.000  1605.000  1451.000  1638.000  1451.000  1650.000  1465.000  1706.000

NH     4.000      .030  1040.000      .070  1586.780      .055  1648.000      .030  1705.000      .000
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X1	3.000	12.000	1586.780	1637.500	70.000	50.000	60.000	.000	.000	.000
GR	1469.000	920.000	1453.000	1040.000	1454.000	1140.000	1454.000	1170.000	1453.900	1185.000
GR	1443.000	1228.600	1443.000	1586.780	1440.160	1595.000	1440.160	1605.000	1451.000	1637.500
GR	1451.000	1648.000	1465.000	1705.000	.000	.000	.000	.000	.000	.000
NC	.000	.000	.000	.100	.300	.000	.000	.000	.000	.000
NH	3.000	.070	1586.900	.055	1650.000	.030	1705.000	.000	.000	.000
X1	4.000	11.000	1586.900	1635.000	60.000	50.000	55.000	.000	.000	.000
GR	1458.000	440.000	1456.000	840.000	1454.000	1200.000	1453.800	1235.000	1443.000	1278.200
GR	1443.000	1586.900	1440.300	1595.000	1440.300	1605.000	1451.000	1635.000	1451.000	1650.000
GR	1465.000	1705.000	.000	.000	.000	.000	.000	.000	.000	.000

NH	3.000	.070	1587.530	.055	1650.000	.030	1705.000	.000	.000	.000
X1	5.000	11.000	1587.530	1635.000	80.000	80.000	80.000	.000	.000	.000
GR	1458.000	460.000	1456.000	830.000	1454.000	1200.000	1453.600	1277.000	1443.000	1319.400
GR	1443.000	1587.530	1440.510	1595.000	1440.510	1605.000	1451.000	1635.000	1451.000	1650.000
GR	1465.000	1705.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	3.000	.070	1588.700	.055	1650.000	.030	1705.000	.000	.000	.000
X1	6.000	12.000	1588.700	1635.000	150.000	150.000	150.000	.000	.000	.000
GR	1460.000	120.000	1458.000	370.000	1456.000	690.000	1454.000	1050.000	1452.500	1355.000
GR	1443.000	1393.000	1443.000	1588.700	1440.900	1595.000	1440.900	1605.000	1451.000	1635.000
GR	1451.000	1650.000	1465.000	1705.000	.000	.000	.000	.000	.000	.000
NH	3.000	.070	1589.900	.055	1650.000	.030	1705.000	.000	.000	.000
X1	7.000	13.000	1589.900	1635.000	150.000	150.000	150.000	.000	.000	.000
GR	1460.000	350.000	1458.000	450.000	1456.000	610.000	1454.000	900.000	1452.000	1300.000
GR	1451.500	1427.000	1443.000	1461.000	1443.000	1589.900	1441.300	1595.000	1441.300	1605.000
GR	1451.000	1635.000	1451.000	1650.000	1465.000	1705.000	.000	.000	.000	.000
NH	3.000	.070	1591.400	.055	1650.000	.030	1705.000	.000	.000	.000
X1	8.000	17.000	1591.400	1629.000	205.000	195.000	200.000	.000	.000	.000
GR	1460.000	390.000	1458.000	730.000	1456.000	900.000	1456.000	990.000	1459.000	1079.000
GR	1459.000	1200.000	1456.000	1310.000	1454.000	1365.000	1452.000	1470.000	1451.200	1510.000
GR	1443.000	1542.800	1443.000	1591.400	1441.800	1595.000	1441.800	1605.000	1450.000	1629.000
GR	1450.000	1650.000	1464.000	1705.000	.000	.000	.000	.000	.000	.000
NH	4.000	.070	1580.000	.055	1615.000	.070	1670.000	.030	1730.000	.000
X1	9.000	17.000	1580.000	1615.000	150.000	170.000	160.000	.000	.000	.000
GR	1460.000	350.000	1458.000	690.000	1456.000	860.000	1456.000	950.000	1459.000	1030.000
GR	1459.000	1160.000	1456.000	1270.000	1454.000	1330.000	1452.000	1410.000	1450.000	1450.000
GR	1450.000	1530.000	1450.000	1580.000	1442.000	1595.000	1442.000	1605.000	1450.000	1615.000
GR	1450.000	1670.000	1465.000	1730.000	.000	.000	.000	.000	.000	.000
NH	3.000	.070	1580.000	.055	1620.000	.070	2110.000	.000	.000	.000
X1	10.000	19.000	1580.000	1620.000	300.000	335.000	320.000	.000	.000	.000
GR	1460.000	420.000	1458.000	760.000	1456.000	920.000	1456.000	1020.000	1459.000	1100.000
GR	1459.000	1230.000	1457.000	1300.000	1456.000	1340.000	1454.000	1400.000	1452.000	1430.000
GR	1451.000	1580.000	1444.000	1595.000	1444.000	1605.000	1451.000	1620.000	1452.000	2000.000
GR	1454.000	2050.000	1456.000	2080.000	1458.000	2100.000	1460.000	2110.000	.000	.000
NH	3.000	.070	1580.000	.055	1630.000	.070	2140.000	.000	.000	.000
X1	11.000	14.000	1580.000	1630.000	550.000	550.000	550.000	.000	.000	.000
GR	1460.000	930.000	1458.000	1100.000	1456.000	1210.000	1454.000	1440.000	1452.000	1580.000
GR	1450.000	1590.000	1448.000	1595.000	1448.000	1605.000	1450.000	1610.000	1452.000	1630.000
GR	1454.000	1960.000	1456.000	2110.000	1458.000	2120.000	1460.000	2140.000	.000	.000
NC	.055	.055	.055	.100	.300	.000	.000	.000	.000	.000
X1	.710	57.000	9985.000	10025.000	200.000	200.000	200.000	.000	.000	.000
GR	1464.300	8805.000	1465.200	8829.000	1465.900	8860.000	1465.600	8890.000	1465.500	8945.000
GR	1464.600	9006.000	1464.200	9072.000	1463.000	9130.000	1462.300	9188.000	1461.100	9257.000
GR	1461.000	9317.000	1461.300	9374.000	1460.800	9426.000	1459.100	9474.000	1457.400	9519.000

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GR   1456.700   9574.000   1457.100   9621.000   1457.300   9668.000   1456.300   9683.000   1455.600   9700.000
GR   1455.500   9710.000   1455.200   9716.000   1456.200   9730.000   1456.600   9748.000   1455.600   9758.000
GR   1457.000   9776.000   1456.900   9798.000   1455.500   9823.000   1456.000   9852.000   1455.400   9887.000
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GR   1455.500   9917.000   1455.100   9932.000   1454.300   9952.000   1455.200   9975.000   1456.300   9985.000
GR   1454.900   9990.000   1449.500  10000.000   1449.900  10016.000   1455.000  10018.000   1456.000  10025.000
GR   1456.100  10035.000   1455.400  10061.000   1454.900  10105.000   1455.200  10165.000   1455.200  10224.000
GR   1455.000  10267.000   1455.400  10316.000   1455.400  10363.000   1455.900  10405.000   1455.900  10458.000
GR   1456.300  10486.000   1460.500  10502.000   1464.400  10525.000   1468.300  10549.000   1469.900  10572.000
GR   1474.200  10608.000   1476.600  10648.000       .000       .000       .000       .000       .000       .000

X1       .782     48.000   9966.000  10032.000    380.000    360.000    380.000       .000       .000       .000
GR   1465.200   9401.000   1466.000   9455.000   1464.800   9494.000   1464.300   9529.000   1464.300   9559.000
GR   1464.100   9606.000   1462.800   9651.000   1460.600   9689.000   1458.800   9738.000   1457.400   9784.000
GR   1456.200   9827.000   1456.900   9865.000   1456.900   9891.000   1456.400   9909.000   1456.400   9934.000
GR   1457.100   9966.000   1454.600   9985.000   1454.500  10000.000   1454.800  10016.000   1459.800  10032.000
GR   1456.200  10044.000   1454.800  10058.000   1456.400  10082.000   1456.300  10116.000   1456.200  10153.000
GR   1457.000  10175.000   1463.500  10188.000   1463.200  10199.000   1458.200  10208.000   1457.200  10219.000
GR   1456.500  10262.000   1456.900  10308.000   1456.600  10356.000   1456.500  10404.000   1456.800  10457.000
GR   1457.400  10510.000   1456.800  10564.000   1458.100  10609.000   1464.200  10632.000   1469.600  10656.000
GR   1470.800  10676.000   1469.300  10687.000   1469.900  10699.000   1470.700  10715.000   1471.300  10737.000
GR   1475.600  10754.000   1478.200  10775.000   1479.300  10792.000       .000       .000       .000       .000
EJ       .000       .000       .000       .000       .000       .000       .000       .000       .000       .000
```



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


*PROF 1

 CCHV=    .500 CEHV=    .700
1490 NH CARD USED
*SECNO 1.000
     1.00    14.12  1453.94      .00  1453.94  1453.99      .05      .00      .00  1451.00
    1422.      39.     1335.     48.      42.     713.      51.       0.       0.   1451.00
      .00      .91     1.87      .94     .050     .055     .046     .000  1439.82  1544.12
  .000263       0.       0.       0.        0        0        0      .00   117.64  1661.76
0
1490 NH CARD USED
*SECNO 2.000
     2.00    14.01  1454.01      .00      .00  1454.02      .01      .01      .02  1443.00
    1422.     966.      435.     21.    1596.     534.      54.       3.       0.   1451.00
      .03      .61      .82      .39     .069     .055     .046     .000  1440.00  1381.27
  .000043      80.      70.      60.        2        0        0      .00   280.79  1662.06
0
1490 NH CARD USED
*SECNO 3.000
     3.00    13.86  1454.02      .00      .00  1454.02      .00      .00      .00  1443.00
    1422.    1232.      181.      9.    4249.     515.      50.       8.       1.   1451.00
      .09      .29      .35      .17     .070     .055     .045     .000  1440.16  1032.33
  .000008      70.      60.      50.        0        0        0      .00   627.98  1660.31
0
 CCHV=    .100 CEHV=    .300
1490 NH CARD USED
*SECNO 4.000
     4.00    13.72  1454.02      .00      .00  1454.03      .00      .00      .00  1443.00
    1422.    1215.      195.     12.    3651.     489.      63.      14.       2.   1451.00
      .14      .33      .40      .19     .070     .055     .047     .000  1440.30  1195.52
```

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 .000011      60.      55.      50.       0       0       0     .00   466.37  1661.88
0
490 NH CARD USED
SECNO 5.000
    5.00    13.51  1454.02      .00     .00  1454.03     .00     .00     .00  1443.00
   1422.    1197.     212.      14.   3216.     475.      63.     22.      3.  1451.00
     .20      .37      .45      .21    .070     .055    .047    .000  1440.51  1195.48
 .000013      80.      80.      80.       0       0       0     .00   466.40  1661.88
0
1
12-22-90     11:29:50                                                                    PAGE    5

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

1490 NH CARD USED
*SECNO 6.000
    6.00    13.13  1454.03      .00     .00  1454.03     .00     .00     .00  1443.00
   1422.    1154.     250.      17.   2633.     450.      63.     33.      5.  1451.00
     .29      .44      .56      .27    .070     .055    .047    .000  1440.90  1045.30
 .000022     150.     150.     150.       0       0       0     .00   616.59  1661.89

1490 NH CARD USED
*SECNO 7.000
    7.00    12.73  1454.03      .00     .00  1454.03     .00     .00     .00  1443.00
   1422.    1105.     295.      22.   2353.     424.      63.     44.      7.  1451.00
     .37      .47      .70      .35    .070     .055    .047    .000  1441.30   895.82
 .000035     150.     150.     150.       0       0       0     .00   766.08  1661.90

1490 NH CARD USED
*SECNO 8.000
    8.00    12.23  1454.03      .00     .00  1454.05     .02     .01     .00  1443.00
   1422.     868.     464.      90.    970.     359.     117.     54.      9.  1450.00
     .43      .90     1.29      .77    .070     .055    .048    .000  1441.80  1364.03
 .000119     205.     200.     195.       0       0       0     .00   301.82  1665.85

1490 NH CARD USED
*SECNO 9.000
    9.00    12.05  1454.05      .00     .00  1454.08     .03     .03     .00  1450.00
   1422.     595.     584.     243.    731.     322.     255.     59.     11.  1450.00
     .46      .81     1.82      .95    .070     .055    .063    .000  1442.00  1328.64
 .000279     150.     160.     170.       0       0       0     .00   357.54  1686.18

1490 NH CARD USED
*SECNO 10.000
   10.00    10.15  1454.15      .00     .00  1454.17     .02     .09     .00  1451.00
   1422.     271.     475.     676.    432.     301.    1064.     70.     14.  1451.00
     .56      .63     1.58      .63    .070     .055    .070    .000  1444.00  1395.52
 .000256     300.     320.     335.       2       0       0     .00   656.71  2052.24
0
1490 NH CARD USED
*SECNO 11.000
   11.00     6.40  1454.40      .00     .00  1454.48     .08     .30     .02  1452.00
   1422.     225.     670.     526.    206.     220.     469.     87.     22.  1452.00
     .63     1.09     3.04     1.12    .070     .055    .070    .000  1448.00  1393.53
 .001808     550.     550.     550.       2       0       0     .00   596.77  1990.30
0

12-22-90     11:29:50                                                                    PAGE    6

  SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
```

```
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
  TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


CCHV=    .100 CEHV=    .300
SECNO  .710

3265 DIVIDED FLOW

685 20 TRIALS ATTEMPTED WSEL,CWSEL
693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
     .71     6.31  1455.81  1455.81      .00  1456.17      .36      .70      .09  1456.30
    1422.     176.     865.     381.      84.     144.     200.      90.      25.   1456.00
     .64     2.09     6.00     1.91     .055     .055     .055     .000  1449.50  9694.96
  .009486     200.     200.     200.       20        6        0      .00   563.16 10397.23

SECNO  .782

3265 DIVIDED FLOW

     .78     3.23  1457.73      .00      .00  1457.78      .05     1.57      .03  1457.10
    1422.     264.     351.     807.     193.     147.     545.      96.      30.   1459.80
     .71     1.37     2.39     1.48     .055     .055     .055     .000  1454.50  9773.08
  .002387     380.     380.     360.        4        0        0      .00   773.00 10596.27
0
1
12-22-90     11:29:50                                                                    PAGE    7


                                                                        THIS RUN EXECUTED 12-22-90
 ***************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION AUGUST 1985
 ***************************************************


T1 FLOODPLAIN ANALYSIS OF RELOCATED BUCHANAN WASH TO DETERMINE EFFECT OF SKUNK
T2 CREEK WITHOUT CHANNEL INVERT IMPROVEMENTS, EXTENSION OF COE DIKE IS INCLUDED
T3      RELOCATED BUCHANAN WASH     50-YR EVENT     FILE NAME : BUCWASH.HYD

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.       3.        0.        0.   .000000       .00        .0       0.  1456.480      .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    2.000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000


12-22-90     11:29:50                                                                    PAGE    8

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


*PROF 2
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```
CCHV=    .500 CEHV=    .700
 1490 NH CARD USED
*SECNO 1.000
    1.00    16.66  1456.48      .00  1456.48  1456.53      .05      .00      .00  1451.00
   2005.     113.    1737.     155.     93.     908.     123.       0.       0.   1451.00
     .00     1.21     1.91     1.26    .047     .055     .042     .000  1439.82  1539.04
 .000198       0.       0.       0.       0        0        0      .00   132.88  1671.92

 1490 NH CARD USED
*SECNO 2.000
    2.00    16.55  1456.55      .00     .00  1456.56      .01      .01      .02  1443.00
   2005.    1367.     569.      69.   2131.     666.     128.       3.       0.   1451.00
     .03      .64      .86      .54    .068     .055     .042     .000  1440.00  1369.42
 .000035      80.      70.      60.       2        0        0      .00   302.78  1672.21

 1490 NH CARD USED
*SECNO 3.000
    3.00    16.40  1456.56      .00     .00  1456.56      .00      .00      .00  1443.00
   2005.    1726.     249.      30.   5679.     644.     121.      11.       1.   1451.00
     .09      .30      .39      .25    .070     .055     .041     .000  1440.16  1013.31
 .000007      70.      60.      50.       0        0        0      .00   657.33  1670.63

CCHV=    .100 CEHV=    .300
 1490 NH CARD USED
*SECNO 4.000
    4.00    16.26  1456.56      .00     .00  1456.56      .00      .00      .00  1443.00
   2005.    1699.     266.      39.   5228.     611.     144.      19.       2.   1451.00
     .14      .33      .44      .27    .070     .055     .044     .000  1440.30   727.30
 .000009      60.      55.      50.       0        0        0      .00   944.55  1671.86

 1490 NH CARD USED
*SECNO 5.000
    5.00    16.05  1456.56      .00     .00  1456.57      .00      .00      .00  1443.00
   2005.    1676.     286.      44.   4808.     595.     144.      30.       4.   1451.00
     .20      .35      .48      .30    .070     .055     .044     .000  1440.51   725.80
 .000011      80.      80.      80.       0        0        0      .00   946.05  1671.86

1
 12-22-90     11:29:50                                                                    PAGE    9

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

 1490 NH CARD USED
*SECNO 6.000
    6.00    15.67  1456.57      .00     .00  1456.57      .00      .00      .00  1443.00
   2005.    1640.     313.      51.   4590.     567.     144.      49.       7.   1451.00
     .31      .36      .55      .35    .070     .055     .044     .000  1440.90   599.61
 .000016     150.     150.     150.       0        0        0      .00  1072.25  1671.86
0
 1490 NH CARD USED
*SECNO 7.000
    7.00    15.27  1456.57      .00     .00  1456.57      .00      .00      .00  1443.00
   2005.    1616.     331.      58.   4572.     539.     144.      67.      11.   1451.00
     .41      .35      .62      .40    .070     .055     .044     .000  1441.30   564.63
 .000020     150.     150.     150.       0        0        0      .00  1107.24  1671.87
0
 1490 NH CARD USED
*SECNO 8.000

 3265 DIVIDED FLOW
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```
    8.00    14.77  1456.57      .00      .00  1456.58      .01      .01      .00  1443.00
   2005.    1256.     554.     195.    1707.     455.     223.     85.      15.   1450.00
     .47      .74     1.22      .87     .070     .055     .045     .000  1441.80   851.45
 .000077     205.     200.     195.        0        0        0      .00   542.25  1675.82
0
 1490 NH CARD USED
*SECNO 9.000

 3265 DIVIDED FLOW

    9.00    14.58  1456.58      .00      .00  1456.60      .01      .01      .00  1450.00
   2005.    1045.     568.     392.    1535.     410.     448.     93.      17.   1450.00
     .52      .68     1.39      .88     .070     .055     .060     .000  1442.00   811.09
 .000117     150.     160.     170.        0        0        0      .00   601.66  1696.30

 1490 NH CARD USED
 *SECNO 10.000

 3265 DIVIDED FLOW

1
 12-22-90     11:29:50                                                                    PAGE   10

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

    10.00    12.62  1456.62      .00      .00  1456.63      .01      .03      .00  1451.00
   2005.     486.     401.    1118.    1061.     399.    2173.     115.      23.   1451.00
     .67      .46     1.00      .51     .070     .055     .070     .000  1444.00   871.04
 .000071     300.     320.     335.        0        0        0      .00   935.89  2086.12
0
1490 NH CARD USED
*SECNO 11.000
    11.00     8.68  1456.68      .00      .00  1456.69      .01      .06      .00  1452.00
   2005.     547.     458.    1000.     910.     334.    1463.     155.      34.   1452.00
     .86      .60     1.37      .68     .070     .055     .070     .000  1448.00  1173.12
 .000212     550.     550.     550.        0        0        0      .00   940.23  2113.35
0
 CCHV=    .100 CEHV=    .300
*SECNO  .710

 3265 DIVIDED FLOW

     .71     7.23  1456.73      .00      .00  1456.81      .07      .10      .02  1456.30
   2005.     455.     580.     969.     304.     181.     609.     164.      38.   1456.00
     .88     1.50     3.21     1.59     .055     .055     .055     .000  1449.50  9571.38
 .002218     200.     200.     200.        2        0        0      .00   789.27 10487.65

 *SECNO  .782

3265 DIVIDED FLOW

     .78     3.30  1457.80      .00      .00  1457.88      .08     1.07      .00  1457.10
   2005.     381.     474.    1150.     207.     151.     582.     172.      45.   1459.80
     .93     1.84     3.14     1.98     .055     .055     .055     .000  1454.50  9770.74
 .003981     380.     380.     360.        2        0        0      .00   779.20 10598.74
0
 12-22-90     11:29:50                                                                    PAGE   11
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THIS RUN EXECUTED 12-22-90

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


T1 FLOODPLAIN ANALYSIS OF RELOCATED BUCHANAN WASH TO DETERMINE EFFECT OF SKUNK
T2 CREEK WITHOUT CHANNEL INVERT IMPROVEMENTS, EXTENSION OF COE DIKE IS INCLUDED
T3      RELOCATED BUCHANAN WASH     100-YR EVENT    FILE NAME : BUCWASH.HYD

T1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.        4.        0.        0.   .000000      .00       .0        0.  1458.010      .000

T2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    3.000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000


 12-22-90     11:29:50                                                                          PAGE   12


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


*PROF 3

 CCHV=    .500 CEHV=    .700
1490 NH CARD USED
*SECNO 1.000
    1.00    18.19  1458.01      .00  1458.01  1458.06      .05      .00      .00  1451.00
   2304.     166.     1900.     239.     130.     1026.     179.      0.       0.   1451.00
     .00     1.28      1.85     1.33     .045      .055     .041     .000  1439.82  1535.98
  .000158      0.        0.       0.        0         0        0      .00   142.06  1678.04
0
 1490 NH CARD USED
*SECNO 2.000
    2.00    18.08  1458.08      .00      .00  1458.08      .01      .00      .02  1443.00
   2304.    1570.      627.     107.    2466.      745.     185.      4.       0.   1451.00
     .03      .64       .84      .58     .067      .055     .041     .000  1440.00  1362.31
  .000030     80.       70.      60.        2         0        0      .00   315.99  1678.30
0
 1490 NH CARD USED
*SECNO 3.000
    3.00    17.93  1458.09      .00      .00  1458.09      .00      .00      .00  1443.00
   2304.    1977.      280.      48.    6561.      721.     176.     13.       1.   1451.00
     .09      .30       .39      .27     .070      .055     .040     .000  1440.16  1001.89
  .000006     70.       60.      50.        0         0        0      .00   674.94  1676.83

 CCHV=    .100 CEHV=    .300
1490 NH CARD USED
*SECNO 4.000
3280 CROSS SECTION      4.00 EXTENDED       .09 FEET

    4.00    17.79  1458.09      .00      .00  1458.09      .00      .00      .00  1443.00
   2304.    1955.      289.      60.    6768.      684.     205.     23.       2.   1451.00
     .14      .29       .42      .29     .070      .055     .042     .000  1440.30   440.00
  .000008     60.       55.      50.        0         0        0      .00  1237.84  1677.84
```

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1490 NH CARD USED
*SECNO 5.000
1280 CROSS SECTION      5.00 EXTENDED       .09 FEET

    5.00    17.58  1458.09      .00      .00  1458.09      .00      .00      .00  1443.00
   2304.    1932.     307.      65.    6334.     668.     205.      36.       5.  1451.00
     .21      .31      .46      .32     .070     .055     .042     .000  1440.51   460.00
 .000009      80.      80.      80.        0        0        0      .00  1217.84  1677.84
0
1
12-22-90     11:29:50                                                                PAGE   13

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

1490 NH CARD USED
*SECNO 6.000
    6.00    17.19  1458.09      .00      .00  1458.09      .00      .00      .00  1443.00
   2304.    1908.     323.      73.    6281.     638.     205.      61.       9.  1451.00
     .34      .30      .51      .36     .070     .055     .042     .000  1440.90   359.03
 .000011     150.     150.     150.        0        0        0      .00  1318.82  1677.84

1490 NH CARD USED
*SECNO 7.000
    7.00    16.79  1458.09      .00      .00  1458.09      .00      .00      .00  1443.00
   2304.    1895.     330.      79.    6225.     607.     205.      86.      13.  1451.00
     .46      .30      .54      .39     .070     .055     .042     .000  1441.30   445.53
 .000013     150.     150.     150.        0        0        0      .00  1232.33  1677.85

1490 NH CARD USED
*SECNO 8.000

3265 DIVIDED FLOW

    8.00    16.29  1458.09      .00      .00  1458.10      .01      .00      .00  1443.00
   2304.    1498.     557.     249.    2578.     512.     299.     110.      18.  1450.00
     .54      .58     1.09      .83     .070     .055     .043     .000  1441.80   714.33
 .000053     205.     200.     195.        0        0        0      .00   786.24  1681.79
0
1490 NH CARD USED
*SECNO 9.000

3265 DIVIDED FLOW

    9.00    16.10  1458.10      .00      .00  1458.11      .01      .01      .00  1450.00
   2304.    1324.     532.     449.    2444.     463.     576.     122.      21.  1450.00
     .59      .54     1.15      .78     .070     .055     .058     .000  1442.00   673.88
 .000068     150.     160.     170.        0        0        0      .00   841.18  1702.38
0
1490 NH CARD USED
*SECNO 10.000

3265 DIVIDED FLOW

12-22-90     11:29:50                                                                PAGE   14

  SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
  TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST
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```
   10.00    14.12  1458.12      .00      .00  1458.12      .00      .02      .00  1451.00
   2304.     657.     368.    1279.    1872.     460.    2887.     154.      28.   1451.00
     .78      .35      .80      .44     .070     .055     .070     .000  1444.00   739.93
  .000037     300.     320.     335.        0        0        0      .00  1176.27  2100.59

490 NH CARD USED
*SECNO 11.000
   11.00    10.15  1458.15      .00      .00  1458.15      .01      .03      .00  1452.00
   2304.     738.     397.    1169.    1573.     407.    2183.     213.      42.   1452.00
    1.04      .47      .97      .54     .070     .055     .070     .000  1448.00  1087.30
  .000082     550.     550.     550.        0        0        0      .00  1034.19  2121.49

CHV=    .100 CEHV=    .300
*SECNO  .710
     .71     8.67  1458.17      .00      .00  1458.19      .02      .03      .00  1456.30
   2304.     750.     346.    1208.     922.     238.    1273.     228.      47.   1456.00
    1.10      .81     1.46      .95     .055     .055     .055     .000  1449.50  9498.88
  .000316     200.     200.     200.        0        0        0      .00   994.21 10493.09

*SECNO  .782

3265 DIVIDED FLOW

     .78     3.87  1458.37      .00      .00  1458.42      .05      .22      .01  1457.10
   2304.     487.     417.    1400.     323.     185.     888.     244.      55.   1459.80
    1.16     1.51     2.25     1.58     .055     .055     .055     .000  1454.50  9752.01
  .001616     380.     380.     360.        2        0        0      .00   818.77 10610.03
```


THIS RUN EXECUTED 12-22-90

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

T1 FLOODPLAIN ANALYSIS OF RELOCATED BUCHANAN WASH TO DETERMINE EFFECT OF SKUNK
T2 CREEK WITHOUT CHANNEL INVERT IMPROVEMENTS, EXTENSION OF COE DIKE IS INCLUDED
T3      RELOCATED BUCHANAN WASH     500-YR EVENT     FILE MANE : BUCWASH.HYD

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.       5.        0.        0.   .000000       .00        .0        0.  1463.630      .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    15.000     .000    -1.000      .000      .000      .000      .000      .000      .000      .000
```



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

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*PROF 4

CHV=    .500 CEHV=    .700
1490 NH CARD USED
*SECNO 1.000
    1.00    23.81  1463.63     .00  1463.63  1463.66     .03     .00     .00  1451.00
   3067.     362.    2124.    580.     305.    1459.    464.      0.      0.   1451.00
     .00     1.19     1.46    1.25     .041     .055    .037    .000  1439.82  1524.74
  .000061      0.       0.      0.        0        0       0     .00   175.78  1700.52

1490 NH CARD USED
*SECNO 2.000
    2.00    23.67  1463.67     .00     .00  1463.67     .01     .00     .01  1443.00
   3067.    2069.     724.    274.    3790.    1036.    473.      6.      0.   1451.00
     .03      .55      .70     .58     .065     .055    .037    .000  1440.00  1336.21
  .000013     80.      70.     60.        2        0       0     .00   364.46  1700.67

1490 NH CARD USED
*SECNO 3.000
    3.00    23.52  1463.68     .00     .00  1463.68     .00     .00     .00  1443.00
   3067.    2597.     340.    130.    9948.    1005.    460.     19.      1.   1451.00
     .10      .26      .34     .28     .068     .055    .037    .000  1440.16   959.97
  .000003     70.      60.     50.        0        0       0     .00   739.62  1699.59

CHV=    .100 CEHV=    .300
1490 NH CARD USED
*SECNO 4.000
3280 CROSS SECTION      4.00 EXTENDED      5.68 FEET

    4.00    23.38  1463.68     .00     .00  1463.68     .00     .00     .00  1443.00
   3067.    2638.     298.    131.   13178.     953.    506.     37.      3.   1451.00
     .18      .20      .31     .26     .070     .055    .039    .000  1440.30   440.00
  .000003     60.      55.     50.        0        0       0     .00  1259.80  1699.80
0
1490 NH CARD USED
*SECNO 5.000
3280 CROSS SECTION      5.00 EXTENDED      5.68 FEET

    5.00    23.17  1463.68     .00     .00  1463.68     .00     .00     .00  1443.00
   3067.    2620.     308.    139.   12637.     933.    506.     63.      5.   1451.00
     .28      .21      .33     .27     .070     .055    .039    .000  1440.51   460.00
  .000003     80.      80.     80.        0        0       0     .00  1239.80  1699.80

  12-22-90     11:29:50                                                          PAGE   17

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

1490 NH CARD USED
*SECNO 6.000
3280 CROSS SECTION      6.00 EXTENDED      3.68 FEET

    6.00    22.78  1463.68     .00     .00  1463.68     .00     .00     .00  1443.00
   3067.    2643.     288.    136.   14261.     896.    506.    115.     10.   1451.00
     .49      .19      .32     .27     .070     .055    .039    .000  1440.90   120.00
  .000003    150.     150.    150.        0        0       0     .00  1579.80  1699.80

1490 NH CARD USED
*SECNO 7.000
3280 CROSS SECTION      7.00 EXTENDED      3.68 FEET
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   7.00    22.38  1463.68      .00      .00  1463.68      .00      .00      .00  1443.00
  3067.    2627.     294.     146.   13062.     859.     506.     166.      15.   1451.00
    .68      .20      .34      .29     .070     .055     .039     .000  1441.30   350.00
 .000003     150.     150.     150.        0        0        0      .00  1349.80  1699.80
0
490 NH CARD USED
SECNO 8.000
3280 CROSS SECTION      8.00 EXTENDED      3.68 FEET

   8.00    21.88  1463.68      .00      .00  1463.68      .00      .00      .00  1443.00
  3067.    2351.     398.     318.    8842.     722.     655.     224.      21.   1450.00
    .85      .27      .55      .49     .070     .055     .040     .000  1441.80   390.00
 .000009     205.     200.     195.        0        0        0      .00  1313.73  1703.73

1490 NH CARD USED
*SECNO 9.000
280 CROSS SECTION      9.00 EXTENDED      3.68 FEET

   9.00    21.68  1463.68      .00      .00  1463.68      .00      .00      .00  1450.00
  3067.    2262.     342.     463.    8860.     659.    1127.     261.      26.   1450.00
    .99      .26      .52      .41     .070     .055     .053     .000  1442.00   350.00
 .000009     150.     160.     170.        0        0        0      .00  1374.71  1724.71
0
490 NH CARD USED
SECNO 10.000
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  SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
  TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST

280 CROSS SECTION     10.00 EXTENDED      3.68 FEET

  10.00    19.68  1463.68      .00      .00  1463.68      .00      .00      .00  1451.00
  3067.    1441.     260.    1366.    7886.     682.    5604.     349.      37.   1451.00
   1.37      .18      .38      .24     .070     .055     .070     .000  1444.00   420.00
 .000005     300.     320.     335.        0        0        0      .00  1690.00  2110.00
0
490 NH CARD USED
SECNO 11.000
3280 CROSS SECTION     11.00 EXTENDED      3.69 FEET

  11.00    15.69  1463.69      .00      .00  1463.69      .00      .00      .00  1452.00
  3067.    1297.     311.    1460.    5026.     684.    4990.     506.      55.   1452.00
   1.89      .26      .45      .29     .070     .055     .070     .000  1448.00   930.00
 .000009     550.     550.     550.        0        0        0      .00  1210.00  2140.00

CCHV=    .100 CEHV=    .300
*SECNO  .710
    .71    14.19  1463.69      .00      .00  1463.69      .00      .00      .00  1456.30
  3067.    1428.     195.    1444.    4562.     459.    3929.     551.      61.   1456.00
   2.05      .31      .43      .37     .055     .055     .055     .000  1449.50  9096.82
 .000011     200.     200.     200.        0        0        0      .00  1423.98 10520.79

*SECNO  .782
    .78     9.19  1463.69      .00      .00  1463.70      .00      .01      .00  1457.10
  3067.     841.     293.    1933.    1817.     533.    3909.     616.      71.   1459.80
   2.26      .46      .55      .49     .055     .055     .055     .000  1454.50  9620.17
 .000026     380.     380.     360.        0        0        0      .00  1009.91 10630.08
0
```

THIS RUN EXECUTED 12-22-90

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

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

ELOCATED BUCHANAN WASH

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
1.000	.00	.00	.00	1439.82	1422.00	1453.94	.00	1453.99	2.63	1.87	806.26	876.73
1.000	.00	.00	.00	1439.82	2005.00	1456.48	.00	1456.53	1.98	1.91	1124.42	1423.25
1.000	.00	.00	.00	1439.82	2304.00	1458.01	.00	1458.06	1.58	1.85	1334.75	1833.05
1.000	.00	.00	.00	1439.82	3067.00	1463.63	.00	1463.66	.61	1.46	2227.88	3922.12
2.000	70.00	.00	.00	1440.00	1422.00	1454.01	.00	1454.02	.43	.82	2184.24	2163.00
2.000	70.00	.00	.00	1440.00	2005.00	1456.55	.00	1456.56	.35	.86	2924.82	3368.72
2.000	70.00	.00	.00	1440.00	2304.00	1458.08	.00	1458.08	.30	.84	3396.26	4240.76
2.000	70.00	.00	.00	1440.00	3067.00	1463.67	.00	1463.67	.13	.70	5299.11	8471.63
3.000	60.00	.00	.00	1440.16	1422.00	1454.02	.00	1454.02	.08	.35	4814.83	4983.49
3.000	60.00	.00	.00	1440.16	2005.00	1456.56	.00	1456.56	.07	.39	6444.68	7407.18
3.000	60.00	.00	.00	1440.16	2304.00	1458.09	.00	1458.09	.06	.39	7458.77	9153.85
3.000	60.00	.00	.00	1440.16	3067.00	1463.68	.00	1463.68	.03	.34	11412.10	17433.71
4.000	55.00	.00	.00	1440.30	1422.00	1454.02	.00	1454.03	.11	.40	4202.89	4377.03
4.000	55.00	.00	.00	1440.30	2005.00	1456.56	.00	1456.56	.09	.44	5982.62	6555.15
4.000	55.00	.00	.00	1440.30	2304.00	1458.09	.00	1458.09	.08	.42	7657.17	8380.17
4.000	55.00	.00	.00	1440.30	3067.00	1463.68	.00	1463.68	.03	.31	14637.11	18807.72
5.000	80.00	.00	.00	1440.51	1422.00	1454.02	.00	1454.03	.13	.45	3754.24	3886.75
5.000	80.00	.00	.00	1440.51	2005.00	1456.56	.00	1456.57	.11	.48	5547.22	5917.99
5.000	80.00	.00	.00	1440.51	2304.00	1458.09	.00	1458.09	.09	.46	7207.02	7665.11
5.000	80.00	.00	.00	1440.51	3067.00	1463.68	.00	1463.68	.03	.33	14075.63	17752.61
6.000	150.00	.00	.00	1440.90	1422.00	1454.03	.00	1454.03	.22	.56	3146.09	3055.51
6.000	150.00	.00	.00	1440.90	2005.00	1456.57	.00	1456.57	.16	.55	5301.07	5064.75
6.000	150.00	.00	.00	1440.90	2304.00	1458.09	.00	1458.09	.11	.51	7123.87	6869.85
6.000	150.00	.00	.00	1440.90	3067.00	1463.68	.00	1463.68	.03	.32	15663.27	18088.69
7.000	150.00	.00	.00	1441.30	1422.00	1454.03	.00	1454.03	.35	.70	2840.77	2397.40
7.000	150.00	.00	.00	1441.30	2005.00	1456.57	.00	1456.57	.20	.62	5254.65	4483.08
7.000	150.00	.00	.00	1441.30	2304.00	1458.09	.00	1458.09	.13	.54	7037.38	6326.34
7.000	150.00	.00	.00	1441.30	3067.00	1463.68	.00	1463.68	.03	.34	14427.35	16838.28

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
8.000	200.00	.00	.00	1441.80	1422.00	1454.03	.00	1454.05	1.19	1.29	1446.14	1306.21

8.000	200.00	.00	.00	1441.80	2005.00	1456.57	.00	1456.58	.77	1.22	2384.19	2281.58
8.000	200.00	.00	.00	1441.80	2304.00	1458.09	.00	1458.10	.53	1.09	3388.90	3176.58
8.000	200.00	.00	.00	1441.80	3067.00	1463.68	.00	1463.68	.09	.55	10219.17	10490.27
9.000	160.00	.00	.00	1442.00	1422.00	1454.05	.00	1454.08	2.79	1.82	1308.16	851.19
9.000	160.00	.00	.00	1442.00	2005.00	1456.58	.00	1456.60	1.17	1.39	2393.00	1851.71
9.000	160.00	.00	.00	1442.00	2304.00	1458.10	.00	1458.11	.68	1.15	3483.38	2786.35
9.000	160.00	.00	.00	1442.00	3067.00	1463.68	.00	1463.68	.09	.52	10644.78	10377.75
10.000	320.00	.00	.00	1444.00	1422.00	1454.15	.00	1454.17	2.56	1.58	1797.46	889.16
10.000	320.00	.00	.00	1444.00	2005.00	1456.62	.00	1456.63	.71	1.00	3633.48	2381.95
10.000	320.00	.00	.00	1444.00	2304.00	1458.12	.00	1458.12	.37	.80	5218.03	3767.15
10.000	320.00	.00	.00	1444.00	3067.00	1463.68	.00	1463.68	.05	.38	14172.39	13711.14
11.000	550.00	.00	.00	1448.00	1422.00	1454.40	.00	1454.48	18.08	3.04	895.62	334.41
11.000	550.00	.00	.00	1448.00	2005.00	1456.68	.00	1456.69	2.12	1.37	2706.97	1377.42
11.000	550.00	.00	.00	1448.00	2304.00	1458.15	.00	1458.15	.82	.97	4163.46	2549.74
11.000	550.00	.00	.00	1448.00	3067.00	1463.69	.00	1463.69	.09	.45	10699.66	10296.54
* .710	200.00	.00	.00	1449.50	1422.00	1455.81	1455.81	1456.17	94.86	6.00	427.72	146.00
.710	200.00	.00	.00	1449.50	2005.00	1456.73	.00	1456.81	22.18	3.21	1094.42	425.75
.710	200.00	.00	.00	1449.50	2304.00	1458.17	.00	1458.19	3.16	1.46	2432.91	1295.13
.710	200.00	.00	.00	1449.50	3067.00	1463.69	.00	1463.69	.11	.43	8949.63	9131.81
.782	380.00	.00	.00	1454.50	1422.00	1457.73	.00	1457.78	23.87	2.39	883.83	291.08
.782	380.00	.00	.00	1454.50	2005.00	1457.80	.00	1457.88	39.81	3.14	939.16	317.77
.782	380.00	.00	.00	1454.50	2304.00	1458.37	.00	1458.42	16.16	2.25	1396.30	573.14
.782	380.00	.00	.00	1454.50	3067.00	1463.69	.00	1463.70	.26	.55	6259.41	6011.52

RELOCATED BUCHANAN WASH

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
1.000	1422.00	1453.94	.00	.00	.00	117.64	.00
1.000	2005.00	1456.48	2.54	.00	.00	132.88	.00
1.000	2304.00	1458.01	1.53	.00	.00	142.06	.00
1.000	3067.00	1463.63	5.62	.00	.00	175.78	.00
2.000	1422.00	1454.01	.00	.07	.00	280.79	70.00
2.000	2005.00	1456.55	2.54	.07	.00	302.78	70.00
2.000	2304.00	1458.08	1.52	.07	.00	315.99	70.00
2.000	3067.00	1463.67	5.59	.04	.00	364.46	70.00
3.000	1422.00	1454.02	.00	.01	.00	627.98	60.00
3.000	2005.00	1456.56	2.54	.01	.00	657.33	60.00
3.000	2304.00	1458.09	1.52	.01	.00	674.94	60.00
3.000	3067.00	1463.68	5.59	.01	.00	739.62	60.00
4.000	1422.00	1454.02	.00	.00	.00	466.37	55.00
4.000	2005.00	1456.56	2.54	.00	.00	944.55	55.00
4.000	2304.00	1458.09	1.52	.00	.00	1237.84	55.00
4.000	3067.00	1463.68	5.59	.00	.00	1259.80	55.00
5.000	1422.00	1454.02	.00	.00	.00	466.40	80.00
5.000	2005.00	1456.56	2.54	.00	.00	946.05	80.00
5.000	2304.00	1458.09	1.52	.00	.00	1217.84	80.00
5.000	3067.00	1463.68	5.59	.00	.00	1239.80	80.00
6.000	1422.00	1454.03	.00	.00	.00	616.59	150.00

6.000	2005.00	1456.57	2.54	.00	.00	1072.25	150.00
6.000	2304.00	1458.09	1.52	.00	.00	1318.82	150.00
6.000	3067.00	1463.68	5.59	.00	.00	1579.80	150.00
7.000	1422.00	1454.03	.00	.00	.00	766.08	150.00
7.000	2005.00	1456.57	2.54	.00	.00	1107.24	150.00
7.000	2304.00	1458.09	1.52	.00	.00	1232.33	150.00
7.000	3067.00	1463.68	5.59	.00	.00	1349.80	150.00
8.000	1422.00	1454.03	.00	.00	.00	301.82	200.00
8.000	2005.00	1456.57	2.53	.00	.00	542.25	200.00
8.000	2304.00	1458.09	1.52	.00	.00	786.24	200.00
8.000	3067.00	1463.68	5.59	.00	.00	1313.73	200.00
9.000	1422.00	1454.05	.00	.02	.00	357.54	160.00
9.000	2005.00	1456.58	2.53	.01	.00	601.66	160.00
9.000	2304.00	1458.10	1.52	.01	.00	841.18	160.00
9.000	3067.00	1463.68	5.58	.00	.00	1374.71	160.00

1

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
10.000	1422.00	1454.15	.00	.10	.00	656.71	320.00
10.000	2005.00	1456.62	2.47	.04	.00	935.89	320.00
10.000	2304.00	1458.12	1.50	.02	.00	1176.27	320.00
10.000	3067.00	1463.68	5.56	.00	.00	1690.00	320.00
11.000	1422.00	1454.40	.00	.25	.00	596.77	550.00
11.000	2005.00	1456.68	2.27	.06	.00	940.23	550.00
11.000	2304.00	1458.15	1.47	.03	.00	1034.19	550.00
11.000	3067.00	1463.69	5.54	.00	.00	1210.00	550.00
.710	1422.00	1455.81	.00	1.40	.00	563.16	200.00
.710	2005.00	1456.73	.93	.06	.00	789.27	200.00
.710	2304.00	1458.17	1.44	.02	.00	994.21	200.00
.710	3067.00	1463.69	5.52	.00	.00	1423.98	200.00
.782	1422.00	1457.73	.00	1.92	.00	773.00	380.00
.782	2005.00	1457.80	.07	1.07	.00	779.20	380.00
.782	2304.00	1458.37	.57	.20	.00	818.77	380.00
.782	3067.00	1463.69	5.32	.00	.00	1009.91	380.00

1

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION  SECNO=      .710  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=      .710  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=      .710  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
```


THIS RUN EXECUTED 12-22-90

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HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
ERROR CORR -  01,02,03,04,05,06
MODIFICATION -  50,51,52,53,54,55,56
IBM-PC-XT VERSION AUGUST 1985
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APPENDIX 4

Parsons Brinckerhoff **Computation Sheet**

Page 1 of 1 | 3588C

Made by ED STEWART

Date 22 DEC., 90

Checked by

Date

Subject STARTING WSEL FOR RELOCATED BUCHANAN WASH

FINAL

THE STARTING WSEL FOR FILE: BUCWASH.HYD ARE FOR CONDITION WITHOUT CHANNEL INVERT IMPROVEMENTS IN SKUNK CREEK.

DATA TAKEN FROM HEC-2 OUTPUT USING HEC-2 INPUT FILE: SKUNK.HYD (DATED 12-22-90) "MARKED FINAL"

TITLE: SKUNK CREEK HYDRAULIC ANALYSIS, ESTIMATE T.O.B. W/O CHANNEL INVERT IMPROVEMENTS NORTH OF HAPPY VALLEY RD.
RM 9.48 TO 10.35 W/INV. IMPROVEMENTS

SKUNK CR. SECTION No.	FREQUENCY	STARTING WSEL
11.04	10-YR	1454.12
11.04	50-YR	1456.79
11.04	100-YR	1458.40
11.04	500-YR	1464.35

```
1*****************************************************
 * WATER SURFACE PROFILES                            *
 * VERSION OF NOVEMBER 1976                          *
 * UPDATED MAY 1984                                  *
 * IBM-PC-XT VERSION AUGUST 1985                     *
 * RUN DATE  12-22-90   TIME  14:06:45               *
*****************************************************
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****************************************
* U.S. ARMY CORPS OF ENGINEERS         *
* THE HYDROLOGIC ENGINEERING CENTER    *
* 609 SECOND STREET, SUITE D           *
* DAVIS, CALIFORNIA 95616              *
* (916) 440-2105 (FTS) 448-2105        *
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FINAL

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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X       X     X            X     X
X     X  X       X                        X
XXXXXXX  XXXX    X          XXXXX    XXXXX
X     X  X       X                  X
X     X  X       X     X            X
X     X  XXXXXXX   XXXXX            XXXXXXX
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1

12-22-90 14:06:46 PAGE 1

THIS RUN EXECUTED 12-22-90

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**************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985
**************************************************
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```
C
T1        SKUNK CREEK HYDRAULIC ANALYSIS, ESTIMATE T.O.B. W/O CHANNEL INVERT
T2        IMPROVEMENTS NORTH OF HAPPY VALLEY RD              **Q=6800 CFS**
T3        RM 9.48 TO 10.35 W/INV. IMPROVEMENTS     FILE NAME: SKUNK.HYD

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.        2.        0.        0.   .000000       .00        .0        0.  1377.800      .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   150.000      .000      .000      .000      .000      .000      .000      .000      .000      .000

NC      .045      .045      .035      .100      .300      .000      .000      .000      .000      .000
QT     5.000   6800.000  15000.000  29000.000  39000.000  85000.000      .000      .000      .000      .000

         DURING MAJOR FLOODS, SKUNK CREEK IS EXPECTED TO FLOW OVER THE OVER-
         SHOOT OF THE CAP AT THE UPSTREAM END OF THE COE'S LEVEES
         ALL CROSSECTIONS WERE RECODED BY JIM HARRIS, HYDRAULICS SECTION
         (APRIL 1983).  THE PREVIOUS ONES WERE FOUND TO BE UNSATISFACTORY.
         CHANNEL CENTERLINE CORRESPONDS TO 2000 FEET.
         ALL MANNINGS "N" VALUES USED WERE OBTAINED FROM THE PREVIOUS
         MODEL AS ASSIGNED BY CASKIE AND MASHBURN BASED ON FIELD
         OBSERVATION (FEB. 1983)
         THE VALUES FOR THE 10, 50, 100, AND 500 YEAR FLOODS ARE 15,000,29000,
```

SUMMARY TABLE FINAL RUN

10.490	460.00	.00	.00	1428.00	15000.00	1434.16	.00	1435.02	49.05	7.46	2009.44	2141.86
10.490	460.00	.00	.00	1428.00	29000.00	1436.69	.00	1438.00	44.99	9.17	3162.62	4323.70
10.490	460.00	.00	.00	1428.00	39000.00	1438.10	.00	1439.71	44.78	10.18	3829.64	5828.04
10.490	460.00	.00	.00	1428.00	85000.00	1442.84	.00	1445.79	43.82	13.79	6164.27	12840.52
10.620	610.00	.00	.00	1430.00	6800.00	1434.76	.00	1435.29	28.90	5.83	1165.72	1264.91
10.620	610.00	.00	.00	1430.00	15000.00	1436.74	.00	1437.84	41.46	8.40	1785.74	2329.70
10.620	610.00	.00	.00	1430.00	29000.00	1439.12	.00	1440.84	44.08	10.51	2758.74	4367.70
10.620	610.00	.00	.00	1430.00	39000.00	1440.48	.00	1442.60	44.94	11.69	3336.49	5817.72
10.620	610.00	.00	.00	1430.00	85000.00	1444.97	.00	1448.91	48.88	15.92	5338.76	12158.16
* 10.700	380.00	.00	.00	1432.00	6800.00	1436.43	1436.43	1438.08	123.22	10.30	659.94	612.60
* 10.700	380.00	.00	.00	1432.00	15000.00	1438.91	1438.91	1441.13	110.64	11.94	1256.70	1426.02
* 10.700	380.00	.00	.00	1432.00	29000.00	1441.46	1441.46	1444.23	90.14	13.38	2168.10	3054.41
* 10.700	380.00	.00	.00	1432.00	39000.00	1442.75	1442.75	1446.00	85.81	14.46	2697.15	4210.14
* 10.700	380.00	.00	.00	1432.00	85000.00	1447.21	1447.21	1452.47	74.92	18.41	4617.15	9820.28
10.830	650.00	.00	.00	1436.00	6800.00	1443.38	.00	1444.39	77.11	8.07	842.41	774.37
10.830	650.00	.00	.00	1436.00	15000.00	1445.65	.00	1446.79	68.12	8.59	1746.20	1817.36
10.830	650.00	.00	.00	1436.00	29000.00	1447.84	.00	1449.51	70.65	10.38	2792.96	3450.12
10.830	650.00	.00	.00	1436.00	39000.00	1449.14	.00	1451.14	69.83	11.35	3435.94	4667.07
10.830	650.00	.00	.00	1436.00	85000.00	1453.79	.00	1457.09	61.99	14.58	5828.59	10795.93
10.930	500.00	.00	.00	1442.00	6800.00	1447.39	.00	1448.44	84.59	8.20	829.05	739.35
10.930	500.00	.00	.00	1442.00	15000.00	1449.38	.00	1450.73	88.99	9.32	1608.67	1590.05
10.930	500.00	.00	.00	1442.00	29000.00	1451.57	.00	1453.53	87.89	11.22	2583.74	3093.35
10.930	500.00	.00	.00	1442.00	39000.00	1452.79	.00	1455.18	88.85	12.40	3144.88	4137.55
10.930	500.00	.00	.00	1442.00	85000.00	1456.93	.00	1461.19	95.95	16.57	5130.92	8677.57
11.040	500.00	.00	.00	1448.00	6800.00	1451.49	.00	1452.07	61.44	6.08	1117.60	867.54
11.040	500.00	.00	.00	1448.00	15000.00	1453.16	.00	1454.12	52.31	7.88	1903.74	2073.96
11.040	500.00	.00	.00	1448.00	29000.00	1455.25	.00	1456.79	49.24	9.95	2913.76	4132.58
11.040	500.00	.00	.00	1448.00	39000.00	1456.52	.00	1458.40	47.40	11.00	3546.08	5664.67
11.040	500.00	.00	.00	1448.00	85000.00	1461.25	.00	1464.35	42.09	14.13	6017.26	13102.03
11.100	365.00	.00	.00	1450.00	6800.00	1453.29	.00	1453.58	29.00	4.32	1573.46	1262.76
11.100	365.00	.00	.00	1450.00	15000.00	1454.98	.00	1455.49	26.60	5.75	2607.94	2908.28
11.100	365.00	.00	.00	1450.00	29000.00	1457.27	.00	1458.07	23.55	7.17	4043.24	5976.24
11.100	365.00	.00	.00	1450.00	39000.00	1458.66	.00	1459.63	22.22	7.91	4933.51	8273.73
11.100	365.00	.00	.00	1450.00	85000.00	1463.89	.00	1465.49	18.97	10.15	8372.32	19513.67

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
* 11.200	410.00	.00	.00	1452.00	6800.00	1454.67	1454.67	1455.99	43.08	9.23	736.71	1036.05
* 11.200	410.00	.00	.00	1452.00	15000.00	1456.50	1456.50	1458.70	36.50	11.92	1258.87	2482.81
* 11.200	410.00	.00	.00	1452.00	29000.00	1458.96	1458.96	1462.28	31.53	14.63	1982.74	5164.22
* 11.200	410.00	.00	.00	1452.00	39000.00	1460.44	1460.44	1464.44	29.83	16.06	2429.13	7140.22
* 11.200	410.00	.00	.00	1452.00	85000.00	1465.98	1465.98	1472.40	25.76	20.34	4178.46	16748.74
11.300	528.00	.00	.00	1452.50	6800.00	1456.52	.00	1457.09	10.99	6.08	1119.12	2050.84
11.300	528.00	.00	.00	1452.50	15000.00	1458.72	.00	1459.85	12.25	8.50	1764.97	4284.96
11.300	528.00	.00	.00	1452.50	29000.00	1461.53	.00	1463.45	13.15	11.12	2608.87	7997.03
11.300	528.00	.00	.00	1452.50	39000.00	1463.20	.00	1465.62	13.44	12.48	3125.29	10637.13
11.300	528.00	.00	.00	1452.50	85000.00	1469.30	.00	1473.59	13.78	16.62	5113.66	22895.96
11.400	528.00	.00	.00	1454.00	6800.00	1457.09	.00	1458.07	26.32	7.94	856.30	1325.38
11.400	528.00	.00	.00	1454.00	15000.00	1459.23	.00	1460.84	21.98	10.19	1472.39	3199.60
11.400	528.00	.00	.00	1454.00	29000.00	1461.97	.00	1464.47	19.98	12.68	2287.20	6487.81
11.400	528.00	.00	.00	1454.00	39000.00	1463.61	.00	1466.64	19.27	13.99	2788.14	8884.33
11.400	528.00	.00	.00	1454.00	85000.00	1469.58	.00	1474.64	17.80	18.05	4708.04	20146.32

```
*******************************************************
 *  WATER SURFACE PROFILES                            *
 *  VERSION OF NOVEMBER 1976                          *
 *  UPDATED MAY 1984                                  *
 *  IBM-PC-XT VERSION AUGUST 1985                     *
 *  RUN DATE  12-22-90   TIME  14:57:10               *
*******************************************************
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```
****************************************
 *  U.S. ARMY CORPS OF ENGINEERS        *
 *  THE HYDROLOGIC ENGINEERING CENTER   *
 *  609 SECOND STREET, SUITE D          *
 *  DAVIS, CALIFORNIA 95616             *
  *  (916) 440-2105 (FTS) 448-2105
****************************************
```

FINAL

```
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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12-22-90 14:57:11 PAGE 1

THIS RUN EXECUTED 12-22-90

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION AUGUST 1985
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T1 FLOODPLAIN ANALYSIS OF RELOCATED BUCHANAN WASH TO DETERMINE EFFECT OF SKUNK
T2 CREEK WITHOUT CHANNEL INVERT IMPROVEMENTS,EXTENSION OF COE DIKE IS INCLUDED
 T3      RELOCATED BUCHANAN WASH     10-YR EVENT    FILE NAME : BUCWASH.HYD

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.        2.        0.        0.   .000000      .00       .0        0.  1454.120      .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   150.000      .000      .000      .000      .000      .000      .000      .000      .000      .000

 QT      4.000  1422.000  2005.000  2304.000  3067.000      .000      .000      .000      .000      .000
 NC       .055      .055      .055      .500      .700      .000      .000      .000      .000      .000
 NH      3.000      .030  1550.000      .055  1650.000      .030  1706.000      .000      .000      .000
 X1      1.000     8.000  1561.500  1638.500      .000      .000      .000      .000      .000      .000
 GR   1465.000  1522.000  1451.000  1550.000  1451.000  1561.500  1439.820  1595.000  1439.820  1605.000
 GR   1451.000  1638.500  1451.000  1650.000  1465.000  1706.000      .000      .000      .000      .000

 NH      4.000      .030  1400.000      .070  1586.000      .055  1650.000      .030  1706.000      .000
 X1      2.000    10.000  1586.000  1638.000    80.000    60.000    70.000      .000      .000      .000
 GR   1465.000  1330.000  1450.000  1400.000  1450.000  1435.000  1443.000  1505.000  1443.000  1586.000
 GR   1440.000  1595.000  1440.000  1605.000  1451.000  1638.000  1451.000  1650.000  1465.000  1706.000

 NH      4.000      .030  1040.000      .070  1586.780      .055  1648.000      .030  1705.000      .000
```

X1	3.000	12.000	1586.780	1637.500	70.000	50.000	60.000	.000	.000	.000
GR	1469.000	920.000	1453.000	1040.000	1454.000	1140.000	1454.000	1170.000	1453.900	1185.000
GR	1443.000	1228.600	1443.000	1586.780	1440.160	1595.000	1440.160	1605.000	1451.000	1637.500
GR	1451.000	1648.000	1465.000	1705.000	.000	.000	.000	.000	.000	.000
NC	.000	.000	.000	.100	.300	.000	.000	.000	.000	.000
NH	3.000	.070	1586.900	.055	1650.000	.030	1705.000	.000	.000	.000
X1	4.000	11.000	1586.900	1635.000	60.000	50.000	55.000	.000	.000	.000
GR	1458.000	440.000	1456.000	840.000	1454.000	1200.000	1453.800	1235.000	1443.000	1278.200
GR	1443.000	1586.900	1440.300	1595.000	1440.300	1605.000	1451.000	1635.000	1451.000	1650.000
GR	1465.000	1705.000	.000	.000	.000	.000	.000	.000	.000	.000

NH	3.000	.070	1587.530	.055	1650.000	.030	1705.000	.000	.000	.000
X1	5.000	11.000	1587.530	1635.000	80.000	80.000	80.000	.000	.000	.000
GR	1458.000	460.000	1456.000	830.000	1454.000	1200.000	1453.600	1277.000	1443.000	1319.400
GR	1443.000	1587.530	1440.510	1595.000	1440.510	1605.000	1451.000	1635.000	1451.000	1650.000
GR	1465.000	1705.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	3.000	.070	1588.700	.055	1650.000	.030	1705.000	.000	.000	.000
X1	6.000	12.000	1588.700	1635.000	150.000	150.000	150.000	.000	.000	.000
GR	1460.000	120.000	1458.000	370.000	1456.000	690.000	1454.000	1050.000	1452.500	1355.000
GR	1443.000	1393.000	1443.000	1588.700	1440.900	1595.000	1440.900	1605.000	1451.000	1635.000
GR	1451.000	1650.000	1465.000	1705.000	.000	.000	.000	.000	.000	.000
NH	3.000	.070	1589.900	.055	1650.000	.030	1705.000	.000	.000	.000
X1	7.000	13.000	1589.900	1635.000	150.000	150.000	150.000	.000	.000	.000
GR	1460.000	350.000	1458.000	450.000	1456.000	610.000	1454.000	900.000	1452.000	1300.000
GR	1451.500	1427.000	1443.000	1461.000	1443.000	1589.900	1441.300	1595.000	1441.300	1605.000
GR	1451.000	1635.000	1451.000	1650.000	1465.000	1705.000	.000	.000	.000	.000
NH	3.000	.070	1591.400	.055	1650.000	.030	1705.000	.000	.000	.000
X1	8.000	17.000	1591.400	1629.000	205.000	195.000	200.000	.000	.000	.000
GR	1460.000	390.000	1458.000	730.000	1456.000	900.000	1456.000	990.000	1459.000	1079.000
GR	1459.000	1200.000	1456.000	1310.000	1454.000	1365.000	1452.000	1470.000	1451.200	1510.000
GR	1443.000	1542.800	1443.000	1591.400	1441.800	1595.000	1441.800	1605.000	1450.000	1629.000
GR	1450.000	1650.000	1464.000	1705.000	.000	.000	.000	.000	.000	.000
NH	4.000	.070	1580.000	.055	1615.000	.070	1670.000	.030	1730.000	.000
X1	9.000	17.000	1580.000	1615.000	150.000	170.000	160.000	.000	.000	.000
GR	1460.000	350.000	1458.000	690.000	1456.000	860.000	1456.000	950.000	1459.000	1030.000
GR	1459.000	1160.000	1456.000	1270.000	1454.000	1330.000	1452.000	1410.000	1450.000	1450.000
GR	1450.000	1530.000	1450.000	1580.000	1442.000	1595.000	1442.000	1605.000	1450.000	1615.000
GR	1450.000	1670.000	1465.000	1730.000	.000	.000	.000	.000	.000	.000
NH	3.000	.070	1580.000	.055	1620.000	.070	2110.000	.000	.000	.000
X1	10.000	19.000	1580.000	1620.000	300.000	335.000	320.000	.000	.000	.000
GR	1460.000	420.000	1458.000	760.000	1456.000	920.000	1456.000	1020.000	1459.000	1100.000
GR	1459.000	1230.000	1457.000	1300.000	1456.000	1340.000	1454.000	1400.000	1452.000	1430.000
GR	1451.000	1580.000	1444.000	1595.000	1444.000	1605.000	1451.000	1620.000	1452.000	2000.000
GR	1454.000	2050.000	1456.000	2080.000	1458.000	2100.000	1460.000	2110.000	.000	.000
NH	3.000	.070	1580.000	.055	1630.000	.070	2140.000	.000	.000	.000
X1	11.000	14.000	1580.000	1630.000	550.000	550.000	550.000	.000	.000	.000
GR	1460.000	930.000	1458.000	1100.000	1456.000	1210.000	1454.000	1440.000	1452.000	1580.000
GR	1450.000	1590.000	1448.000	1595.000	1448.000	1605.000	1450.000	1610.000	1452.000	1630.000
GR	1454.000	1960.000	1456.000	2110.000	1458.000	2120.000	1460.000	2140.000	.000	.000
NC	.055	.055	.055	.100	.300	.000	.000	.000	.000	.000
X1	.710	57.000	9985.000	10025.000	200.000	200.000	200.000	.000	.000	.000
GR	1464.300	8805.000	1465.200	8829.000	1465.900	8860.000	1465.600	8890.000	1465.500	8945.000
GR	1464.600	9006.000	1464.200	9072.000	1463.000	9130.000	1462.300	9188.000	1461.100	9257.000
GR	1461.000	9317.000	1461.300	9374.000	1460.800	9426.000	1459.100	9474.000	1457.400	9519.000

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GR   1456.700   9574.000   1457.100   9621.000   1457.300   9668.000   1456.300   9683.000   1455.600   9700.000
GR   1455.500   9710.000   1455.200   9716.000   1456.200   9730.000   1456.600   9748.000   1455.600   9758.000
GR   1457.000   9776.000   1456.900   9798.000   1455.500   9823.000   1456.000   9852.000   1455.400   9887.000
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GR   1455.500   9917.000   1455.100   9932.000   1454.300   9952.000   1455.200   9975.000   1456.300   9985.000
GR   1454.900   9990.000   1449.500  10000.000   1449.900  10016.000   1455.000  10018.000   1456.000  10025.000
GR   1456.100  10035.000   1455.400  10061.000   1454.900  10105.000   1455.200  10165.000   1455.200  10224.000
GR   1455.000  10267.000   1455.400  10316.000   1455.400  10363.000   1455.900  10405.000   1455.900  10458.000
GR   1456.300  10486.000   1460.500  10502.000   1464.400  10525.000   1468.300  10549.000   1469.900  10572.000
GR   1474.200  10608.000   1476.600  10648.000       .000       .000       .000       .000       .000       .000

X1       .782     48.000   9966.000  10032.000    380.000    360.000    380.000       .000       .000       .000
GR   1465.200   9401.000   1466.000   9455.000   1464.800   9494.000   1464.300   9529.000   1464.300   9559.000
GR   1464.100   9606.000   1462.800   9651.000   1460.600   9689.000   1458.800   9738.000   1457.400   9784.000
GR   1456.200   9827.000   1456.900   9865.000   1456.900   9891.000   1456.400   9909.000   1456.400   9934.000
GR   1457.100   9966.000   1454.600   9985.000   1454.500  10000.000   1454.800  10016.000   1459.800  10032.000
GR   1456.200  10044.000   1454.800  10058.000   1456.400  10082.000   1456.300  10116.000   1456.200  10153.000
GR   1457.000  10175.000   1463.500  10188.000   1463.200  10199.000   1458.200  10208.000   1457.200  10219.000
GR   1456.500  10262.000   1456.900  10308.000   1456.600  10356.000   1456.500  10404.000   1456.800  10457.000
GR   1457.400  10510.000   1456.800  10564.000   1458.100  10609.000   1464.200  10632.000   1469.600  10656.000
GR   1470.800  10676.000   1469.300  10687.000   1469.900  10699.000   1470.700  10715.000   1471.300  10737.000
GR   1475.600  10754.000   1478.200  10775.000   1479.300  10792.000       .000       .000       .000       .000
EJ       .000       .000       .000       .000       .000       .000       .000       .000       .000       .000
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN       SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID      ENDST


*PROF 1

 CCHV=    .500 CEHV=    .700
 1490 NH CARD USED
 *SECNO 1.000
     1.00    14.30  1454.12      .00  1454.12  1454.17      .05      .00      .00  1451.00
    1422.      42.    1328.      52.      46.     727.      55.       0.       0.   1451.00
      .00      .92     1.83      .94     .049     .055     .045     .000  1439.82  1543.76
  .000244       0.       0.       0.        0        0        0      .00   118.72  1662.48
0
 1490 NH CARD USED
 *SECNO 2.000
     2.00    14.19  1454.19      .00      .00  1454.20      .01      .01      .02  1443.00
    1422.     966.     433.      23.    1632.     543.      59.       3.       0.   1451.00
      .03      .59      .80      .39     .069     .055     .046     .000  1440.00  1380.45
  .000040      80.      70.      60.        2        0        0      .00   282.31  1662.76
0
 1490 NH CARD USED
 *SECNO 3.000
     3.00    14.04  1454.20      .00      .00  1454.20      .00      .00      .00  1443.00
    1422.    1232.     181.       9.    4347.     524.      54.       8.       1.   1451.00
      .10      .28      .35      .17     .070     .055     .045     .000  1440.16  1031.01
  .000008      70.      60.      50.        0        0        0      .00   630.01  1661.02

 CCHV=    .100 CEHV=    .300
 1490 NH CARD USED
 *SECNO 4.000
     4.00    13.90  1454.20      .00      .00  1454.20      .00      .00      .00  1443.00
    1422.    1214.     195.      13.    3722.     497.      68.      15.       2.   1451.00
      .15      .33      .39      .19     .070     .055     .047     .000  1440.30  1163.94
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 .000010      60.      55.      50.       0       0       0     .00   498.63  1662.57
0
1490 NH CARD USED
*SECNO 5.000
    5.00    13.69  1454.20     .00     .00  1454.20     .00     .00     .00  1443.00
   1422.    1196.     211.     15.   3288.     483.     68.     22.      3.   1451.00
     .20      .36      .44     .22    .070     .055    .047    .000  1440.51  1163.01
 .000013      80.      80.     80.       0       0       0     .00   499.56  1662.57
0
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN       SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID      ENDST

1490 NH CARD USED
*SECNO 6.000
    6.00    13.30  1454.20     .00     .00  1454.20     .00     .00     .00  1443.00
   1422.    1154.     249.     19.   2731.     458.     68.     34.      5.   1451.00
     .30      .42      .54     .27    .070     .055    .047    .000  1440.90  1013.75
 .000020     150.     150.    150.       0       0       0     .00   648.83  1662.58

1490 NH CARD USED
*SECNO 7.000
    7.00    12.90  1454.20     .00     .00  1454.21     .00     .00     .00  1443.00
   1422.    1107.     291.     24.   2477.     432.     68.     45.      7.   1451.00
     .38      .45      .67     .35    .070     .055    .047    .000  1441.30   870.42
 .000032     150.     150.    150.       0       0       0     .00   792.16  1662.59

1490 NH CARD USED
*SECNO 8.000
    8.00    12.41  1454.21     .00     .00  1454.22     .02     .01     .00  1443.00
   1422.     869.     459.     94.   1010.     366.    123.     55.     10.   1450.00
     .44      .86     1.25     .76    .070     .055    .047    .000  1441.80  1359.23
 .000109     205.     200.    195.       0       0       0     .00   307.31  1666.54

1490 NH CARD USED
*SECNO 9.000
    9.00    12.23  1454.23     .00     .00  1454.25     .02     .02     .00  1450.00
   1422.     608.     567.    247.    775.     328.    268.     61.     11.   1450.00
     .48      .78     1.73     .92    .070     .055    .063    .000  1442.00  1323.43
 .000247     150.     160.    170.       0       0       0     .00   363.45  1686.88

1490 NH CARD USED
*SECNO 10.000
   10.00    10.31  1454.31     .00     .00  1454.33     .01     .07     .00  1451.00
   1422.     278.     454.    690.    462.     307.   1134.     72.     15.   1451.00
     .58      .60     1.48     .61    .070     .055    .070    .000  1444.00  1390.68
 .000217     300.     320.    335.       2       0       0     .00   663.98  2054.66
0
1490 NH CARD USED
*SECNO 11.000
   11.00     6.53  1454.53     .00     .00  1454.59     .06     .25     .01  1452.00
   1422.     237.     636.    550.    230.     226.    514.     91.     23.   1452.00
     .66     1.03     2.81    1.07    .070     .055    .070    .000  1448.00  1379.47
 .001484     550.     550.    550.       2       0       0     .00   620.01  1999.48
0
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
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      Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
      TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN     SSTA
      SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID    ENDST

   CCHV=    .100 CEHV=    .300
   *SECNO  .710

   3265 DIVIDED FLOW

   3685 20 TRIALS ATTEMPTED WSEL,CWSEL
   3693 PROBABLE MINIMUM SPECIFIC ENERGY
   3720 CRITICAL DEPTH ASSUMED
        .71      6.29  1455.79  1455.79      .00  1456.17      .38      .61      .09  1456.30
      1422.      173.     876.     374.      82.     144.     195.      94.      26.  1456.00
        .67      2.12     6.09     1.92     .055     .055     .055     .000  1449.50  9695.28
    .009781      200.     200.     200.       20        9        0      .00   558.77 10396.13
 0
  *SECNO  .782

  3265 DIVIDED FLOW

        .78      3.23  1457.73      .00      .00  1457.78      .05     1.57      .03  1457.10
      1422.      265.     350.     808.     194.     147.     548.      99.      31.  1459.80
        .73      1.36     2.38     1.47     .055     .055     .055     .000  1454.50  9772.87
    .002349      380.     380.     360.        4        0        0      .00   773.55 10596.49
 0
 1
  12-22-90      14:57:11
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F

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 ***************************************************                    THIS RUN EXECUTED 12-22-90
   HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
   ERROR CORR -  01,02,03,04,05,06
   MODIFICATION -  50,51,52,53,54,55,56
   IBM-PC-XT VERSION AUGUST 1985
 ***************************************************

 T1 FLOODPLAIN ANALYSIS OF RELOCATED BUCHANAN WASH TO DETERMINE EFFECT OF SKUNK
 T2 CREEK WITHOUT CHANNEL INVERT IMPROVEMENTS, EXTENSION OF COE DIKE IS INCLUDED
 T3      RELOCATED BUCHANAN WASH     50-YR EVENT     FILE NAME : BUCWASH.HYD

 J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

       0.       3.       0.       0.   .000000      .00      .0       0.  1456.790    .000

 J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     2.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000
1
  12-22-90      14:57:11
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PAG

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

*PROF 2
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CCHV=    .500 CEHV=    .700
1490 NH CARD USED
*SECNO 1.000
    1.00    16.97  1456.79     .00  1456.79  1456.84     .05     .00     .00  1451.00
   2005.     119.    1720.    166.     100.     932.    134.      0.      0.  1451.00
     .00     1.19     1.85    1.24     .046     .055    .042    .000 1439.82  1538.42
 .000178       0.       0.      0.        0        0       0     .00  134.74  1673.16

1490 NH CARD USED
*SECNO 2.000
    2.00    16.86  1456.86     .00      .00  1456.86     .01     .00     .02  1443.00
   2005.    1367.     564.     74.    2197.     682.    139.      4.      0.  1451.00
     .03      .62      .83     .53     .068     .055    .042    .000 1440.00  1368.00
 .000032      80.      70.     60.        2        0       0     .00  305.42  1673.43

1490 NH CARD USED
*SECNO 3.000
    3.00    16.71  1456.87     .00      .00  1456.87     .00     .00     .00  1443.00
   2005.    1725.     248.     32.    5854.     659.    132.     11.      1.  1451.00
     .09      .29      .38     .24     .070     .055    .041    .000 1440.16  1011.03
 .000007      70.      60.     50.        0        0       0     .00  660.84  1671.87

CCHV=    .100 CEHV=    .300
1490 NH CARD USED
*SECNO 4.000
    4.00    16.57  1456.87     .00      .00  1456.87     .00     .00     .00  1443.00
   2005.    1699.     264.     42.    5498.     625.    156.     20.      2.  1451.00
     .14      .31      .42     .27     .070     .055    .043    .000 1440.30   666.54
 .000008      60.      55.     50.        0        0       0     .00 1006.51  1673.05

1490 NH CARD USED
*SECNO 5.000
    5.00    16.36  1456.87     .00      .00  1456.87     .00     .00     .00  1443.00
   2005.    1676.     282.     47.    5078.     610.    156.     31.      4.  1451.00
     .21      .33      .46     .30     .070     .055    .043    .000 1440.51   669.57
 .000010      80.      80.     80.        0        0       0     .00 1003.48  1673.05
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK     EG       HV       HL     OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB      ACH      AROB     VOL    TWA   LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL       XNCH     XNR      WTN    ELMIN     SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL    IDC      ICONT    CORAR  TOPWID    ENDST

1490 NH CARD USED
*SECNO 6.000
    6.00    15.97  1456.87     .00      .00  1456.87     .00     .00     .00  1443.00
   2005.    1644.     307.     54.    4897.     581.    156.     51.      8.  1451.00
     .32      .34      .53     .35     .070     .055    .043    .000 1440.90   551.04
 .000014     150.     150.    150.        0        0       0     .00 1122.02  1673.05
0
1490 NH CARD USED
*SECNO 7.000
    7.00    15.57  1456.87     .00      .00  1456.87     .00     .00     .00  1443.00
   2005.    1623.     322.     60.    4886.     552.    156.     70.     12.  1451.00
     .43      .33      .58     .39     .070     .055    .043    .000 1441.30   540.36
 .000017     150.     150.    150.        0        0       0     .00 1132.70  1673.06
0
1490 NH CARD USED
*SECNO 8.000

3265 DIVIDED FLOW
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   8.00    15.07  1456.87      .00      .00  1456.88      .01      .01      .00  1443.00
  2005.     1264.     541.     200.    1852.     466.     237.      89.      16.   1450.00
    .50      .68     1.16      .85     .070     .055     .044     .000  1441.80    825.71
 .000068     205.     200.     195.        0        0        0      .00   589.27  1677.01
0
1490 NH CARD USED
*SECNO 9.000

3265 DIVIDED FLOW

   9.00    14.88  1456.88      .00      .00  1456.90      .01      .01      .00  1450.00
  2005.     1066.     545.     394.    1688.     421.     473.      98.      18.   1450.00
    .55      .63     1.30      .83     .070     .055     .059     .000  1442.00    785.41
 .000099     150.     160.     170.        0        0        0      .00   647.68  1697.51
0
1490 NH CARD USED
*SECNO 10.000

3265 DIVIDED FLOW
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1
 12-22-90      14:57:11

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

   10.00    12.91  1456.91      .00      .00  1456.92      .01      .02      .00  1451.00
  2005.     501.     382.    1121.    1195.     411.    2312.     122.      24.   1451.00
    .71      .42      .93      .48     .070     .055     .070     .000  1444.00    847.26
 .000058     300.     320.     335.        0        0        0      .00   982.46  2089.09
0
1490 NH CARD USED
*SECNO 11.000
   11.00     8.96  1456.96      .00      .00  1456.97      .01      .05      .00  1452.00
  2005.     569.     430.    1007.    1030.     348.    1602.     166.      36.   1452.00
    .92      .55     1.23      .63     .070     .055     .070     .000  1448.00   1157.32
 .000162     550.     550.     550.        0        0        0      .00   957.47  2114.79
0
CCHV=     .100 CEHV=     .300
*SECNO  .710

3265 DIVIDED FLOW

     .71     7.51  1457.01      .00      .00  1457.05      .05      .07      .01  1456.30
  2005.     495.     495.    1015.     393.     192.     736.     175.      40.   1456.00
    .95     1.26     2.58     1.38     .055     .055     .055     .000  1449.50   9549.90
 .001329     200.     200.     200.        2        0        0      .00   876.43 10488.69
0
*SECNO  .782

3265 DIVIDED FLOW

     .78     3.28  1457.78      .00      .00  1457.86      .08      .80      .01  1457.10
  2005.     379.     478.    1148.     204.     150.     574.     185.      47.   1459.80
   1.00     1.86     3.19     2.00     .055     .055     .055     .000  1454.50   9771.21
 .004121     380.     380.     380.        2        0        0      .00   777.96 10598.25
0
1
 12-22-90      14:57:11
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THIS RUN EXECUTED 12-22-90

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


T1 FLOODPLAIN ANALYSIS OF RELOCATED BUCHANAN WASH TO DETERMINE EFFECT OF SKUNK
T2 CREEK WITHOUT CHANNEL INVERT IMPROVEMENTS, EXTENSION OF COE DIKE IS INCLUDED
T3      RELOCATED BUCHANAN WASH     100-YR EVENT    FILE NAME : BUCWASH.HYD

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       4.       0.       0.   .000000     .00      .0       0.   1458.400    .000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    3.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000
```



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


*PROF 3

CCHV=    .500 CEHV=    .700
1490 NH CARD USED
*SECNO 1.000
    1.00    18.58  1458.40      .00  1458.40  1458.44      .04      .00      .00  1451.00
   2304.     175.    1876.     254.     140.    1056.     195.       0.       0.  1451.00
     .00     1.25     1.78     1.30     .045     .055     .040     .000  1439.82  1535.20
  .000140      0.       0.       0.        0        0        0      .00   144.40  1679.60
0
1490 NH CARD USED
*SECNO 2.000
    2.00    18.46  1458.46      .00      .00  1458.47      .01      .00      .02  1443.00
   2304.    1569.     620.     114.    2553.     765.     201.       4.       0.  1451.00
     .03      .61      .81      .57     .067     .055     .040     .000  1440.00  1360.52
  .000026     80.      70.      60.        2        0        0      .00   319.32  1679.84
0
1490 NH CARD USED
*SECNO 3.000
    3.00    18.31  1458.47      .00      .00  1458.47      .00      .00      .00  1443.00
   2304.    1975.     278.      51.    6786.     741.     192.      13.       1.  1451.00
     .09      .29      .38      .27     .069     .055     .039     .000  1440.16   999.01
  .000006     70.      60.      50.        0        0        0      .00   679.38  1678.39
0
CCHV=    .100 CEHV=    .300
1490 NH CARD USED
*SECNO 4.000
3280 CROSS SECTION      4.00 EXTENDED       .47 FEET

    4.00    18.17  1458.47      .00      .00  1458.47      .00      .00      .00  1443.00
   2304.    1957.     284.      63.    7208.     703.     222.      24.       2.  1451.00
     .15      .27      .40      .28     .070     .055     .042     .000  1440.30   440.00
  .000007     60.      55.      50.        0        0        0      .00  1239.35  1679.35
0
```

1490 NH CARD USED
*SECNO 5.000
3280 CROSS SECTION 5.00 EXTENDED .47 FEET

5.00	17.96	1458.47	.00	.00	1458.47	.00	.00	.00	1443.00
2304.	1935.	300.	69.	6767.	686.	222.	38.	5.	1451.00
.22	.29	.44	.31	.070	.055	.042	.000	1440.51	460.00
.000008	80.	80.	80.	0	0	0	.00	1219.35	1679.35

0

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

1490 NH CARD USED
*SECNO 6.000

6.00	17.57	1458.47	.00	.00	1458.47	.00	.00	.00	1443.00
2304.	1915.	313.	76.	6762.	655.	222.	65.	9.	1451.00
.36	.28	.48	.34	.070	.055	.042	.000	1440.90	311.09
.000010	150.	150.	150.	0	0	0	.00	1368.27	1679.35

1490 NH CARD USED
*SECNO 7.000

7.00	17.17	1458.47	.00	.00	1458.47	.00	.00	.00	1443.00
2304.	1904.	318.	82.	6667.	625.	222.	91.	14.	1451.00
.49	.29	.51	.37	.070	.055	.042	.000	1441.30	426.36
.000011	150.	150.	150.	0	0	0	.00	1253.00	1679.36

1490 NH CARD USED
*SECNO 8.000

3265 DIVIDED FLOW

8.00	16.67	1458.47	.00	.00	1458.48	.01	.00	.00	1443.00
2304.	1515.	536.	253.	2862.	526.	319.	117.	19.	1450.00
.57	.53	1.02	.79	.070	.055	.043	.000	1441.80	649.25
.000044	205.	200.	195.	0	0	0	.00	878.21	1683.29

0

1490 NH CARD USED
*SECNO 9.000

3265 DIVIDED FLOW

9.00	16.48	1458.48	.00	.00	1458.49	.01	.01	.00	1450.00
2304.	1355.	504.	445.	2736.	477.	610.	130.	22.	1450.00
.64	.50	1.06	.73	.070	.055	.058	.000	1442.00	608.88
.000056	150.	160.	170.	0	0	0	.00	931.92	1703.91

0

1490 NH CARD USED
*SECNO 10.000

3265 DIVIDED FLOW

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

```
      10.00     14.50  1458.50      .00      .00  1458.50      .00      .01      .00  1451.00
      2304.      686.     350.    1269.    2136.     475.    3069.     165.      30.  1451.00
        .84       .32      .74      .41     .070     .055     .070     .000  1444.00   675.60
    .000030      300.     320.     335.        0        0        0      .00  1265.83  2102.48
 0
  1490 NH CARD USED
  *SECNO 11.000
      11.00     10.52  1458.52      .00      .00  1458.53      .00      .02      .00  1452.00
      2304.      760.     376.    1168.    1762.     426.    2367.     229.      44.  1452.00
       1.12       .43      .88      .49     .070     .055     .070     .000  1448.00  1055.64
    .000063      550.     550.     550.        0        0        0      .00  1069.58  2125.22
 0
  CCHV=    .100 CEHV=    .300
  *SECNO  .710
        .71      9.04  1458.54      .00      .00  1458.55      .01      .02      .00  1456.30
      2304.      791.     309.    1203.    1103.     253.    1446.     246.      49.  1456.00
       1.19       .72     1.22      .83     .055     .055     .055     .000  1449.50  9489.10
    .000207      200.     200.     200.        0        0        0      .00  1005.39 10494.49
 0
  *SECNO  .782

  3265 DIVIDED FLOW

        .78      4.17  1458.67      .00      .00  1458.70      .03      .14      .01  1457.10
      2304.      503.     378.    1424.     387.     203.    1047.     265.      57.  1459.80
       1.26      1.30     1.86     1.36     .055     .055     .055     .000  1454.50  9742.42
    .000992      380.     380.     360.        2        0        0      .00   832.47 10611.13
 0
 1
  12-22-90      14:57:11
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                                                                                THIS RUN EXECUTED 12-22-90
 ****************************************************
   HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
   ERROR CORR -  01,02,03,04,05,06
   MODIFICATION -  50,51,52,53,54,55,56
   IBM-PC-XT VERSION AUGUST 1985
 ****************************************************

 T1 FLOODPLAIN ANALYSIS OF RELOCATED BUCHANAN WASH TO DETERMINE EFFECT OF SKUNK
 T2 CREEK WITHOUT CHANNEL INVERT IMPROVEMENTS, EXTENSION OF COE DIKE IS INCLUDED
 T3      RELOCATED BUCHANAN WASH     500-YR EVENT     FILE MANE : BUCWASH.HYD

 J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.       5.        0.        0.    .000000      .00       .0       0.   1464.350     .000

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     15.000     .000    -1.000     .000      .000      .000      .000      .000      .000      .000

1
 12-22-90      14:57:11
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA     LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST
```

```
*PROF 4

CCHV=    .500 CEHV=    .700
1490 NH CARD USED
*SECNO 1.000
    1.00    24.53  1464.35      .00  1464.35  1464.38      .03      .00      .00  1451.00
   3067.     377.    2080.     609.     332.    1514.     510.       0.       0.   1451.00
     .00     1.14     1.37     1.20     .041     .055     .037     .000  1439.82  1523.30
  .000052      0.       0.       0.        0        0        0      .00   180.10  1703.40

1490 NH CARD USED
*SECNO 2.000
    2.00    24.38  1464.38      .00      .00  1464.39      .00      .00      .01  1443.00
   3067.    2066.     712.     289.    3970.    1073.     519.       7.       0.   1451.00
     .04      .52      .66      .56     .064     .055     .037     .000  1440.00  1332.87
  .000011     80.      70.      60.        2        0        0      .00   370.66  1703.54

1490 NH CARD USED
*SECNO 3.000
    3.00    24.23  1464.39      .00      .00  1464.39      .00      .00      .00  1443.00
   3067.    2593.     336.     138.   10398.    1041.     505.      20.       1.   1451.00
     .11      .25      .32      .27     .068     .055     .036     .000  1440.16   954.60
  .000003     70.      60.      50.        0        0        0      .00   747.90  1702.50

CCHV=    .100 CEHV=    .300
1490 NH CARD USED
*SECNO 4.000
3280 CROSS SECTION      4.00 EXTENDED      6.39 FEET

    4.00    24.09  1464.39      .00      .00  1464.39      .00      .00      .00  1443.00
   3067.    2640.     290.     137.   13998.     987.     553.      39.       3.   1451.00
     .19      .19      .29      .25     .070     .055     .038     .000  1440.30   440.00
  .000002     60.      55.      50.        0        0        0      .00  1262.61  1702.61
0
1490 NH CARD USED
*SECNO 5.000
3280 CROSS SECTION      5.00 EXTENDED      6.39 FEET

    5.00    23.88  1464.39      .00      .00  1464.39      .00      .00      .00  1443.00
   3067.    2623.     299.     144.   13443.     967.     553.      67.       5.   1451.00
     .30      .20      .31      .26     .070     .055     .038     .000  1440.51   460.00
  .000003     80.      80.      80.        0        0        0      .00  1242.61  1702.61
```



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

1490 NH CARD USED
*SECNO 6.000
3280 CROSS SECTION      6.00 EXTENDED      4.39 FEET

    6.00    23.49  1464.39      .00      .00  1464.39      .00      .00      .00  1443.00
   3067.    2650.     277.     140.   15311.     930.     553.     122.      10.   1451.00
     .52      .17      .30      .25     .070     .055     .038     .000  1440.90   120.00
  .000002    150.     150.     150.        0        0        0      .00  1582.61  1702.61

1490 NH CARD USED
*SECNO 7.000
3280 CROSS SECTION      7.00 EXTENDED      4.39 FEET
```

```
    7.00    23.09  1464.39      .00      .00  1464.39      .00      .00      .00  1443.00
   3067.    2633.     284.     151.    13948.     892.     553.     177.      15.  1451.00
     .72      .19      .32      .27     .070     .055     .038     .000  1441.30   350.00
  .000003     150.     150.     150.        0        0        0      .00  1352.61  1702.61
0
1490 NH CARD USED
*SECNO 8.000
3280 CROSS SECTION      8.00 EXTENDED      4.39 FEET

    8.00    22.59  1464.39      .00      .00  1464.39      .00      .00      .00  1443.00
   3067.    2376.     374.     317.     9701.     749.     709.     239.      21.  1450.00
     .91      .24      .50      .45     .070     .055     .040     .000  1441.80   390.00
  .000007     205.     200.     195.        0        0        0      .00  1315.00  1705.00

1490 NH CARD USED
*SECNO 9.000
3280 CROSS SECTION      9.00 EXTENDED      4.39 FEET

    9.00    22.39  1464.39      .00      .00  1464.39      .00      .00      .00  1450.00
   3067.    2294.     320.     453.     9738.     684.    1206.     279.      26.  1450.00
    1.06      .24      .47      .38     .070     .055     .053     .000  1442.00   350.00
  .000007     150.     160.     170.        0        0        0      .00  1377.57  1727.57
0
1490 NH CARD USED
*SECNO 10.000
1
 12-22-90     14:57:11                                                                PAGE   18

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

3280 CROSS SECTION     10.00 EXTENDED      4.40 FEET

   10.00    20.40  1464.40      .00      .00  1464.40      .00      .00      .00  1451.00
   3067.    1486.     246.    1335.     8714.     711.    5954.     375.      37.  1451.00
    1.48      .17      .35      .22     .070     .055     .070     .000  1444.00   420.00
  .000004     300.     320.     335.        0        0        0      .00  1690.00  2110.00
0
1490 NH CARD USED
*SECNO 11.000
3280 CROSS SECTION     11.00 EXTENDED      4.40 FEET

   11.00    16.40  1464.40      .00      .00  1464.40      .00      .00      .00  1452.00
   3067.    1319.     299.    1449.     5489.     720.    5353.     545.      55.  1452.00
    2.04      .24      .42      .27     .070     .055     .070     .000  1448.00   930.00
  .000007     550.     550.     550.        0        0        0      .00  1210.00  2140.00

CCHV=    .100 CEHV=    .300
*SECNO  .710

5265 DIVIDED FLOW

3280 CROSS SECTION       .71 EXTENDED       .10 FEET

     .71    14.90  1464.40      .00      .00  1464.40      .00      .00      .00  1456.30
   3067.    1465.     185.    1418.     5210.     487.    4284.     595.      61.  1456.00
    2.22      .28      .38      .33     .055     .055     .055     .000  1449.50  8805.00
  .000008     200.     200.     200.        0        0        0      .00  1488.51 10525.00
0
*SECNO  .782
     .78     9.90  1464.40      .00      .00  1464.41      .00      .00      .00  1457.10
```

3067.	857.	285.	1926.	2084.	580.	4336.	667.	72.	1459.80
2.46	.41	.49	.44	.055	.055	.055	.000	1454.50	9521.85
.000019	380.	380.	360.	0	0	0	.00	1111.05	10632.90

THIS RUN EXECUTED 12-22-90

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION AUGUST 1985
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

RELOCATED BUCHANAN WASH

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
1.000	.00	.00	.00	1439.82	1422.00	1454.12	.00	1454.17	2.44	1.83	827.53	910.25
1.000	.00	.00	.00	1439.82	2005.00	1456.79	.00	1456.84	1.78	1.85	1165.91	1501.22
1.000	.00	.00	.00	1439.82	2304.00	1458.40	.00	1458.44	1.40	1.78	1390.62	1947.75
1.000	.00	.00	.00	1439.82	3067.00	1464.35	.00	1464.38	.52	1.37	2356.00	4261.80
2.000	70.00	.00	.00	1440.00	1422.00	1454.19	.00	1454.20	.40	.80	2233.77	2236.93
2.000	70.00	.00	.00	1440.00	2005.00	1456.86	.00	1456.86	.32	.83	3017.47	3533.99
2.000	70.00	.00	.00	1440.00	2304.00	1458.46	.00	1458.47	.26	.81	3518.33	4478.87
2.000	70.00	.00	.00	1440.00	3067.00	1464.38	.00	1464.39	.11	.66	5562.13	9136.99
3.000	60.00	.00	.00	1440.16	1422.00	1454.20	.00	1454.20	.08	.35	4925.24	5130.58
3.000	60.00	.00	.00	1440.16	2005.00	1456.87	.00	1456.87	.07	.38	6645.02	7738.70
3.000	60.00	.00	.00	1440.16	2304.00	1458.47	.00	1458.47	.06	.38	7718.65	9628.21
3.000	60.00	.00	.00	1440.16	3067.00	1464.39	.00	1464.39	.03	.32	11944.04	18709.64
4.000	55.00	.00	.00	1440.30	1422.00	1454.20	.00	1454.20	.10	.39	4287.52	4503.55
4.000	55.00	.00	.00	1440.30	2005.00	1456.87	.00	1456.87	.08	.42	6279.02	6883.65
4.000	55.00	.00	.00	1440.30	2304.00	1458.47	.00	1458.47	.07	.40	8132.08	8922.92
4.000	55.00	.00	.00	1440.30	3067.00	1464.39	.00	1464.39	.02	.29	15538.52	20491.46
5.000	80.00	.00	.00	1440.51	1422.00	1454.20	.00	1454.20	.13	.44	3839.02	4001.79
5.000	80.00	.00	.00	1440.51	2005.00	1456.87	.00	1456.87	.10	.46	5843.50	6231.17
5.000	80.00	.00	.00	1440.51	2304.00	1458.47	.00	1458.47	.08	.44	7674.40	8186.78
5.000	80.00	.00	.00	1440.51	3067.00	1464.39	.00	1464.39	.03	.31	14963.05	19389.37
6.000	150.00	.00	.00	1440.90	1422.00	1454.20	.00	1454.20	.20	.54	3257.00	3161.87
6.000	150.00	.00	.00	1440.90	2005.00	1456.87	.00	1456.87	.14	.53	5634.15	5386.37
6.000	150.00	.00	.00	1440.90	2304.00	1458.47	.00	1458.47	.10	.48	7639.18	7410.86
6.000	150.00	.00	.00	1440.90	3067.00	1464.39	.00	1464.39	.02	.30	16793.59	19992.42
7.000	150.00	.00	.00	1441.30	1422.00	1454.20	.00	1454.21	.32	.67	2977.25	2505.37
7.000	150.00	.00	.00	1441.30	2005.00	1456.87	.00	1456.87	.17	.58	5594.39	4815.34
7.000	150.00	.00	.00	1441.30	2304.00	1458.47	.00	1458.47	.11	.51	7513.70	6863.79
7.000	150.00	.00	.00	1441.30	3067.00	1464.39	.00	1464.39	.03	.32	15392.93	18563.08

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
8.000	200.00	.00	.00	1441.80	1422.00	1454.21	.00	1454.22	1.09	1.25	1499.34	1360.34
8.000	200.00	.00	.00	1441.80	2005.00	1456.87	.00	1456.88	.68	1.16	2555.53	2436.11
8.000	200.00	.00	.00	1441.80	2304.00	1458.47	.00	1458.48	.44	1.02	3707.49	3457.42
8.000	200.00	.00	.00	1441.80	3067.00	1464.39	.00	1464.39	.07	.50	11158.50	11874.82
9.000	160.00	.00	.00	1442.00	1422.00	1454.23	.00	1454.25	2.47	1.73	1370.78	905.20
9.000	160.00	.00	.00	1442.00	2005.00	1456.88	.00	1456.90	.99	1.30	2581.72	2012.67
9.000	160.00	.00	.00	1442.00	2304.00	1458.48	.00	1458.49	.56	1.06	3822.33	3079.31
9.000	160.00	.00	.00	1442.00	3067.00	1464.39	.00	1464.39	.07	.47	11628.00	11803.55
10.000	320.00	.00	.00	1444.00	1422.00	1454.31	.00	1454.33	2.17	1.48	1904.11	964.37
10.000	320.00	.00	.00	1444.00	2005.00	1456.91	.00	1456.92	.58	.93	3918.58	2622.58
10.000	320.00	.00	.00	1444.00	2304.00	1458.50	.00	1458.50	.30	.74	5680.10	4187.54
10.000	320.00	.00	.00	1444.00	3067.00	1464.40	.00	1464.40	.04	.35	15378.41	15500.68
11.000	550.00	.00	.00	1448.00	1422.00	1454.53	.00	1454.59	14.84	2.81	970.03	369.17
11.000	550.00	.00	.00	1448.00	2005.00	1456.96	.00	1456.97	1.62	1.23	2979.51	1576.56
11.000	550.00	.00	.00	1448.00	2304.00	1458.52	.00	1458.53	.63	.88	4555.22	2904.84
11.000	550.00	.00	.00	1448.00	3067.00	1464.40	.00	1464.40	.07	.42	11562.26	11638.23
.710	200.00	.00	.00	1449.50	1422.00	1455.79	1455.79	1456.17	97.81	6.09	420.39	143.78
.710	200.00	.00	.00	1449.50	2005.00	1457.01	.00	1457.05	13.29	2.58	1320.56	549.95
.710	200.00	.00	.00	1449.50	2304.00	1458.54	.00	1458.55	2.07	1.22	2802.10	1602.45
.710	200.00	.00	.00	1449.50	3067.00	1464.40	.00	1464.40	.08	.38	9980.64	10698.12
.782	380.00	.00	.00	1454.50	1422.00	1457.73	.00	1457.78	23.49	2.38	888.74	293.41
.782	380.00	.00	.00	1454.50	2005.00	1457.78	.00	1457.86	41.21	3.19	928.04	312.33
.782	380.00	.00	.00	1454.50	2304.00	1458.67	.00	1458.70	9.92	1.86	1637.28	731.42
.782	380.00	.00	.00	1454.50	3067.00	1464.40	.00	1464.41	.19	.49	6999.10	7125.95

RELOCATED BUCHANAN WASH

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
1.000	1422.00	1454.12	.00	.00	.00	118.72	.00
1.000	2005.00	1456.79	2.67	.00	.00	134.74	.00
1.000	2304.00	1458.40	1.61	.00	.00	144.40	.00
1.000	3067.00	1464.35	5.95	.00	.00	180.10	.00
2.000	1422.00	1454.19	.00	.07	.00	282.31	70.00
2.000	2005.00	1456.86	2.67	.07	.00	305.42	70.00
2.000	2304.00	1458.46	1.60	.06	.00	319.32	70.00
2.000	3067.00	1464.38	5.92	.03	.00	370.66	70.00
3.000	1422.00	1454.20	.00	.01	.00	630.01	60.00
3.000	2005.00	1456.87	2.67	.01	.00	660.84	60.00
3.000	2304.00	1458.47	1.60	.01	.00	679.38	60.00
3.000	3067.00	1464.39	5.92	.01	.00	747.90	60.00
4.000	1422.00	1454.20	.00	.00	.00	498.63	55.00
4.000	2005.00	1456.87	2.67	.00	.00	1006.51	55.00
4.000	2304.00	1458.47	1.60	.00	.00	1239.35	55.00
4.000	3067.00	1464.39	5.92	.00	.00	1262.61	55.00
5.000	1422.00	1454.20	.00	.00	.00	499.56	80.00

5.000	2005.00	1456.87	2.67	.00	.00	1003.48	80.00
5.000	2304.00	1458.47	1.60	.00	.00	1219.35	80.00
5.000	3067.00	1464.39	5.92	.00	.00	1242.61	80.00
6.000	1422.00	1454.20	.00	.00	.00	648.83	150.00
6.000	2005.00	1456.87	2.67	.00	.00	1122.02	150.00
6.000	2304.00	1458.47	1.60	.00	.00	1368.27	150.00
6.000	3067.00	1464.39	5.92	.00	.00	1582.61	150.00
7.000	1422.00	1454.20	.00	.00	.00	792.16	150.00
7.000	2005.00	1456.87	2.67	.00	.00	1132.70	150.00
7.000	2304.00	1458.47	1.60	.00	.00	1253.00	150.00
7.000	3067.00	1464.39	5.92	.00	.00	1352.61	150.00
8.000	1422.00	1454.21	.00	.00	.00	307.31	200.00
8.000	2005.00	1456.87	2.66	.00	.00	589.27	200.00
8.000	2304.00	1458.47	1.60	.00	.00	878.21	200.00
8.000	3067.00	1464.39	5.92	.00	.00	1315.00	200.00
9.000	1422.00	1454.23	.00	.02	.00	363.45	160.00
9.000	2005.00	1456.88	2.66	.01	.00	647.68	160.00
9.000	2304.00	1458.48	1.60	.01	.00	931.92	160.00
9.000	3067.00	1464.39	5.91	.00	.00	1377.57	160.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
10.000	1422.00	1454.31	.00	.09	.00	663.98	320.00
10.000	2005.00	1456.91	2.60	.03	.00	982.46	320.00
10.000	2304.00	1458.50	1.58	.02	.00	1265.83	320.00
10.000	3067.00	1464.40	5.90	.00	.00	1690.00	320.00
11.000	1422.00	1454.53	.00	.22	.00	620.01	550.00
11.000	2005.00	1456.96	2.44	.05	.00	957.47	550.00
11.000	2304.00	1458.52	1.56	.02	.00	1069.58	550.00
11.000	3067.00	1464.40	5.88	.00	.00	1210.00	550.00
* .710	1422.00	1455.79	.00	1.27	.00	558.77	200.00
.710	2005.00	1457.01	1.21	.05	.00	876.43	200.00
.710	2304.00	1458.54	1.53	.02	.00	1005.39	200.00
.710	3067.00	1464.40	5.86	.00	.00	1488.51	200.00
.782	1422.00	1457.73	.00	1.94	.00	773.55	380.00
.782	2005.00	1457.78	.05	.77	.00	777.96	380.00
.782	2304.00	1458.67	.89	.13	.00	832.47	380.00
.782	3067.00	1464.40	5.74	.00	.00	1111.05	380.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION  SECNO=      .710  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=      .710  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=      .710  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
```

1

THIS RUN EXECUTED 12-22-90

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION AUGUST 1985
*****************************************************
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APPENDIX 5

PARSONS BRINCKERHOFF QUADE & DOUGLAS, INC.
1501 W. Fountainhead Parkway, #400
Tempe, Arizona 85282
(602) 966-8295

LETTER OF TRANSMITTAL

DATE 27 DEC., 1990	JOB NO. 35886101
ATTENTION: JOE TEAM	
RE: SKUNK CREEK & RELOCATED BUCHANAN WASH	

TO MARICOPA COUNTY
FLOOD CONTROL DISTRICT
3335 WEST DURANGO ST.
PHOENIX, AZ. 85009

GENTLEMEN:

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☒ HEC-2 INPUT FILES & BACKUP DATA

COPIES	DATE	NO.	DESCRIPTION
1	12/27/90		5 1/4 FLOPPY: HEC-2 INPUT FILES FOR SKUNK CREEK & BUCHANAN WASH
1	12/1/90	1-6	SKUNK CREEK MODIFICATION PROCEDURE AND PLOTTED CROSS SECTIONS (8 SHEETS)
1	12/22/90	1	INITIAL WSEL CONDITIONS FOR BUCHANAN WASH
1	11/87	1	CROSS SECTION LOCATIONS FOR BUCHANAN WASH (ON AGK MAP)
1	12/15/90	9 SHEETS	PLOTTED CROSS SECTIONS FOR BUCHANAN WASH
1	11/23/87	11 PAGES	ORIGINAL FLOODPLAIN HEC-2 OUTPUT BY AGK
1	3/1989	6 of 23 THRU	FULL SIZE PLANS FOR SKUNK CREEK CHANNEL IMPROVEMENTS
		11 of 23	INDICATING CROSS SECTION LOCATIONS FOR SKUNK CR. & BUCHANAN WASH SHOWING PROPOSED PLAN MODIFICATIONS FOR BUCHANAN WASH

THESE ARE TRANSMITTED as checked below:

☒ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution

☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☒ For review and comment ☐ _____

☐ FOR BIDS DUE _____ 19 _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS SEE LETTER ATTACHED FOR EXPLANATION.

COPY TO CHRIS CORNELL, JOHN FINCEL COP
FILES

SIGNED: [signature]

If enclosures are not as noted, kindly notify us at once.

Parsons Brinckerhoff 100 YEARS

Parsons Brinckerhoff Quade & Douglas, Inc.
Engineers
Architects
Planners

1501 W. Fountainhead Parkway
Suite 400
Tempe, Arizona 85282
602-966-8295
Fax: 602-966-9234

P.O. Box 24158
Tempe, Arizona 85285-4158

December 27, 1990

Mr. Joe Tram, Supervisor
Floodplain Management Branch
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
3335 West Durango Street
Phoenix, Arizona 85009

SUBJECT: Review for Relocation of Buchanan Wash and Confluence with Skunk Creek

Dear Mr. Tram:

Per our conversation on December 26, 1990, Parsons Brinckerhoff is submitting HEC-2 input files for Skunk Creek and relocated Buchanan Wash with appropriate backup data and cross sections for the County's review.

Brief History:

The County previously reviewed and approved the Skunk Creek plans March 3, 1989 with the proposed project indicating channel invert improvements throughout the reach of soil cement diking. Since that time, the Corps of Engineers have deferred approval of a 404 Permit to the EPA, San Francisco. The US Fish and Wildlife Service and the Arizona Fish and Game Department suggested that the City of Phoenix examine the possibility of eliminating the channel invert improvements north of Happy Valley Road, thereby leaving vegetation for a wildlife habitat, enhancing the issuance of a 404 Permit.

The HEC-2 input files provided have been modified to reflect no channel invert improvements north of Happy Valley Road on Skunk Creek. Further, relocated Buchanan Wash has been modified to provide additional wildlife habitat for that lost along Buchanan Wash.

Thank you for your time and efforts in the reviewing process. If you have any questions, please contact me at 966-8295.

Sincerely,

PARSONS BRINCKERHOFF QUADE & DOUGLAS, INC.

Edward H. Stewart, III, P.E.
Project Manager

Enclosures

c: Chris Cornell, P.E., COP
John M. Fincel, P.E., COP
Files

EHS/alm

APPENDIX 6

Parsons Brinckerhoff 100 YEARS

Parsons Brinckerhoff Quade & Douglas, Inc.

Engineers
Architects
Planners

1501 W. Fountainhead Parkway
Suite 400
Tempe, Arizona 85282
602-966-8295
Fax: 602-966-9234

P.O. Box 24158
Tempe, Arizona 85285-4158

February 26, 1991

John M. Fincel, P.E.
Municipal Property
CITY OF PHOENIX
Engineering Department
125 East Washington Street
Phoenix, Arizona 85004

RE: Skunk Creek and Buchanan Wash
Hydraulic Evaluation of Flood Flows
Project No. 3588C101
INDEX NO. SA-884080

SUBJECT: Review Meeting Minutes with Maricopa County Flood Control District (MCFCD)

Dear Mr. Fincel:

The following is our summary of the review meeting held at MCFCD on February 15, 1991. If you feel that this summary is incomplete or inaccurate, please advise us.

Attendees:	John Fincel	City of Phoenix (COP)
	Ed Raleigh	MCFCD
	John Rodriguez	MCFCD
	Joe Tram	MCFCD
	Tim Murphy	MCFCD
	Ed Stewart	Parsons Brinckerhoff (PB)

Items discussed:

1. MCFCD indicated the COP will require a TCE to construct the proposed dike extension of the existing Corps of Engineers dike.

   John Rodriguez indicated the COP already has approval.

   (John excused himself from the meeting.)

   Ed Raleigh asked if it was necessary for him to review the proposed connection to the existing Corps of Engineers dike. Since a previous review was already approved and the proposed design has not changed, further review will not be necessary.

   PB indicated the soil cement protection shown on the Buchanan Wash side of the proposed dike extension would be extended to the limits of excavation in the wildlife habitat as a minimum.

   (Ed Raleigh excused himself from the meeting.)

2. MCFCD indicated the HEC-2 modelling of relocated Buchanan Wash should be performed with ineffective flow areas considered.

   PB indicated the initial study performed by the previous consultant was modelled with ineffective flow areas. During a previous review by MCFCD in February, 1989, the consultant was directed to eliminate ineffective flow areas from the HEC-2 model, and additional cross-sections were to be added as specified.

   PB also indicated the study provided for the present review was modelled in accordance with the previous review (February, 1989) comments by MCFCD.

   The comment was deleted.

3. MCFCD indicated the drawings should have a note stating that the COP will maintain the relocated portion and low flow Buchanan Wash within the COP property limits.

   The COP concurred.

4. MCFCD indicated the Bench Mark reference and data should be provided on the drawings.

   PB indicated the data is already supplied on the typical sections sheet of the Contract Documents.

5. MCFCD will summarize the review comments and forward to PB and the COP as soon as possible.

Other issues:

MCFCD indicated there may be a flooding problem for a subdivision of the south end of the COP proposed soil cement dikes.

MCFCD will forward existing mapping conditions with floodway boundaries and floodplain limits to review the potential problem.

A possible remedy suggested by MCFCD would be to extend the westernmost proposed soil cement dike south to direct flood flows and cut off the floodplain draining to the

subdivision. Further, it was suggested to fill the low area behind the proposed south extension to increase the property value and potential for development.

Very truly yours,

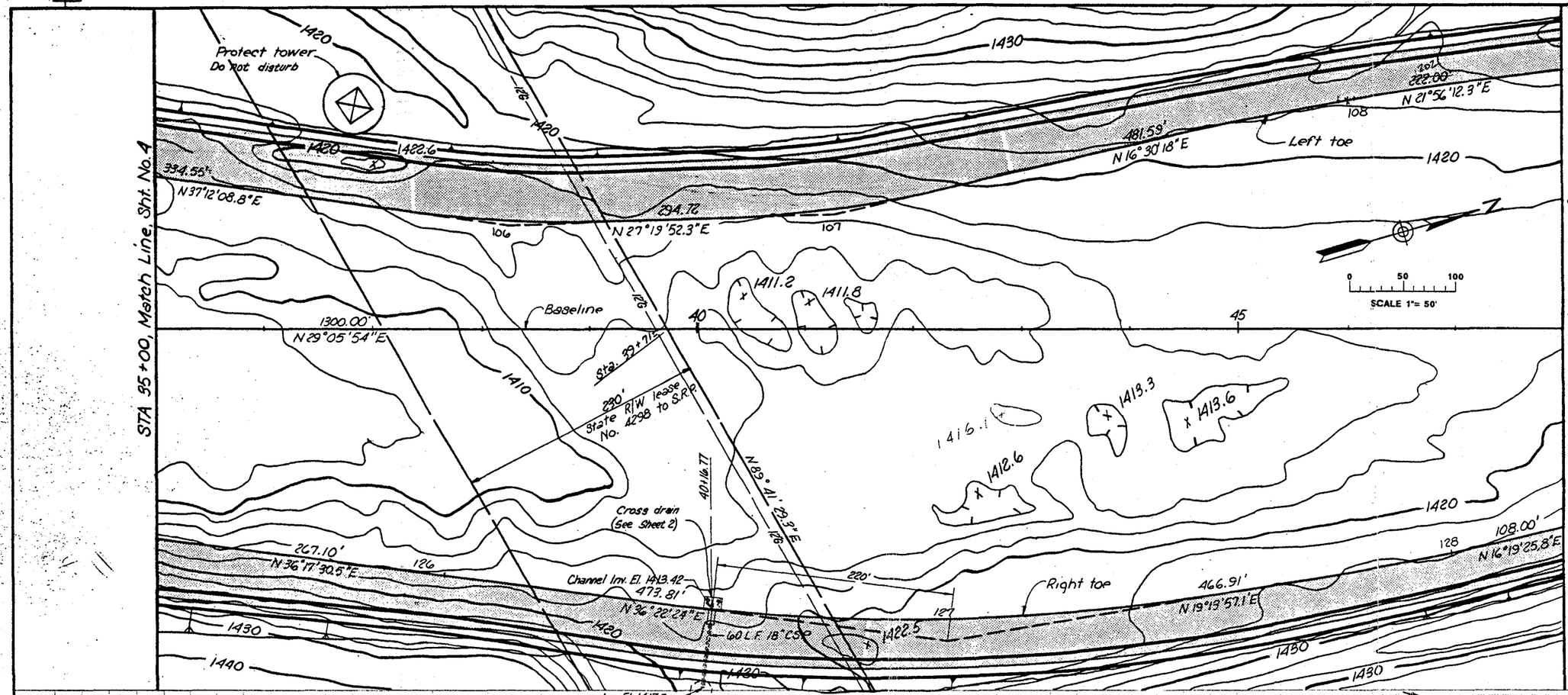
PARSONS BRINCKERHOFF QUADE & DOUGLAS, INC.

Edward H. Stewart, III, P.E.
Project Manager

c: Attendees

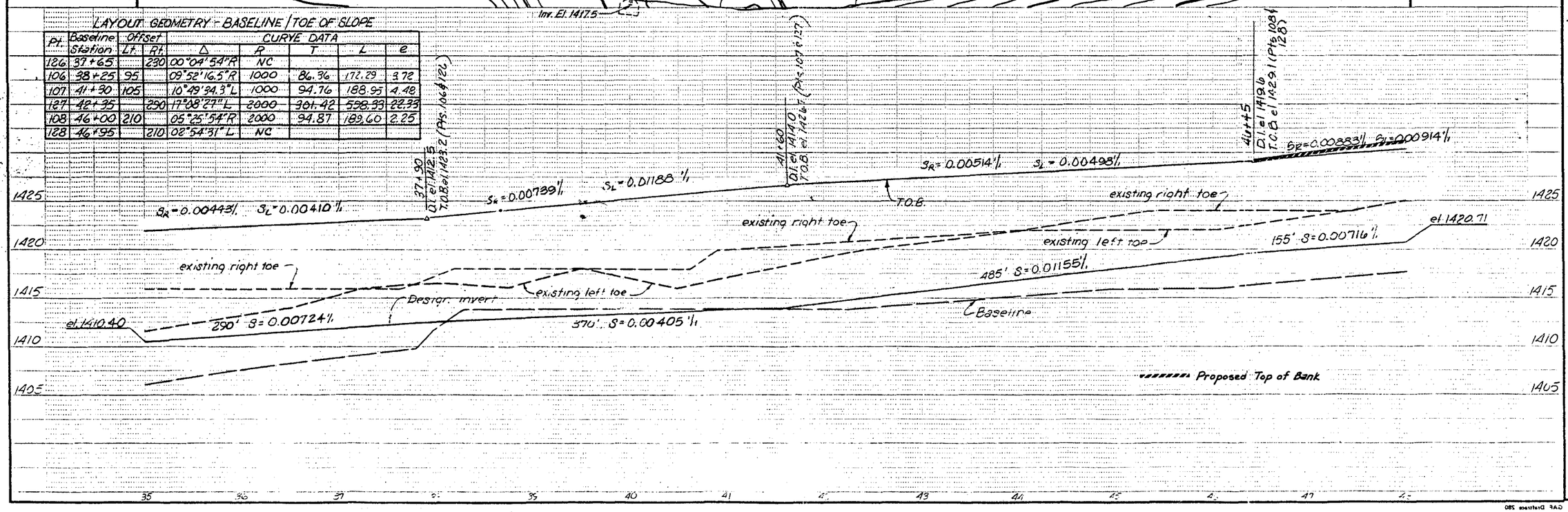
EHS/alm

APPENDIX 7



LAYOUT GEOMETRY - BASELINE / TOE OF SLOPE

Pt.	Baseline Station	Offset Lt.	Offset Rt.	Δ	R	T	L	e
				CURVE DATA				
126	37+65		230	00°04'54"R	NC			
106	38+25	95		09°52'16.5"R	1000	86.36	172.29	3.72
107	41+30	105		10°49'34.3"L	1000	94.76	188.95	4.48
127	42+35		290	17°08'27"L	2000	301.42	598.33	22.33
108	46+00	210		05°25'54"R	2000	94.87	189.60	2.25
128	46+95		210	02°54'31"L	NC			



ENGINEER EJB
ARCHITECT
TECHNICIAN BAF
REVISED

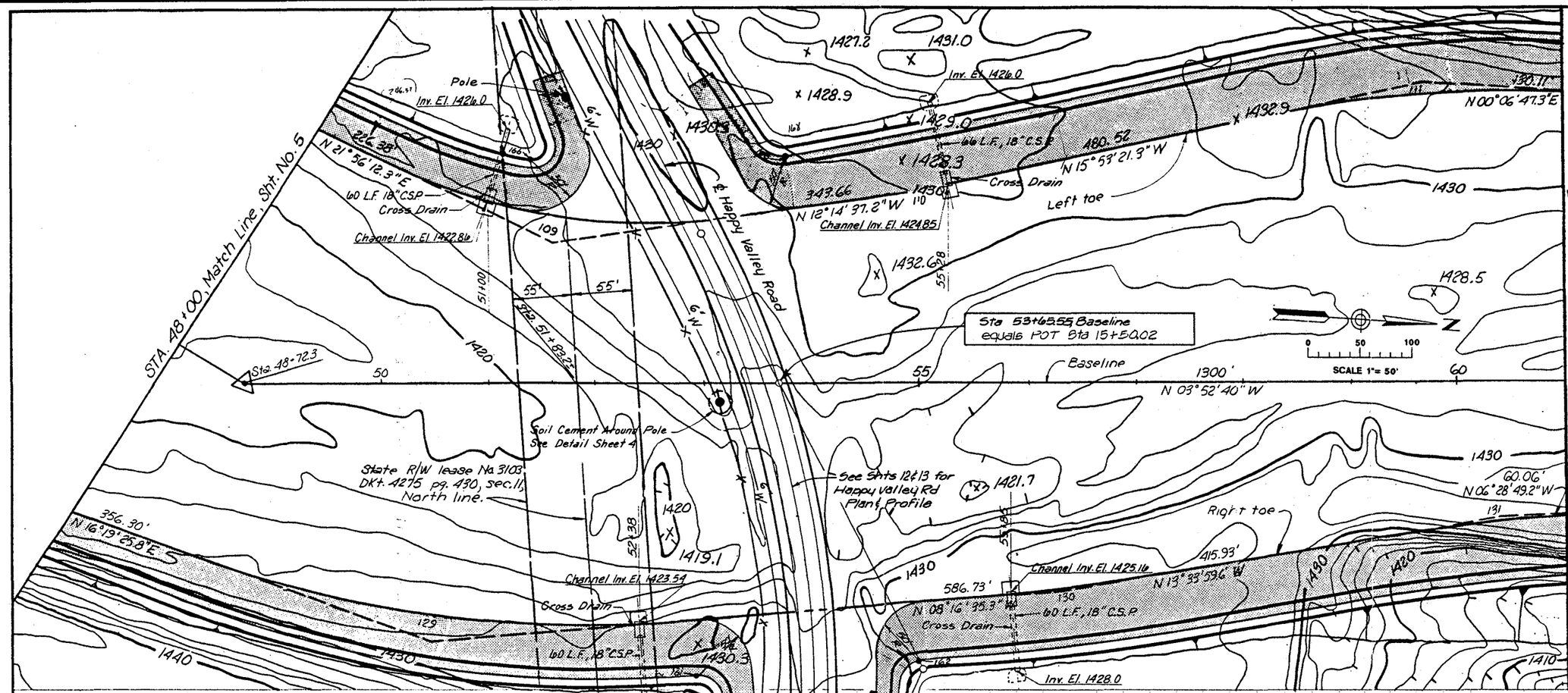
CITY OF PHOENIX
ENGINEERING DEPARTMENT
DIVISION OF DESIGN

HARZA ENGINEERING CO.
CONSULTING ENGINEERS
Phoenix, Arizona
March 1989

SKUNK CREEK CHANNEL IMPROVEMENTS

INDEX NO. SA-[illegible]

SHEET 5 OF 23

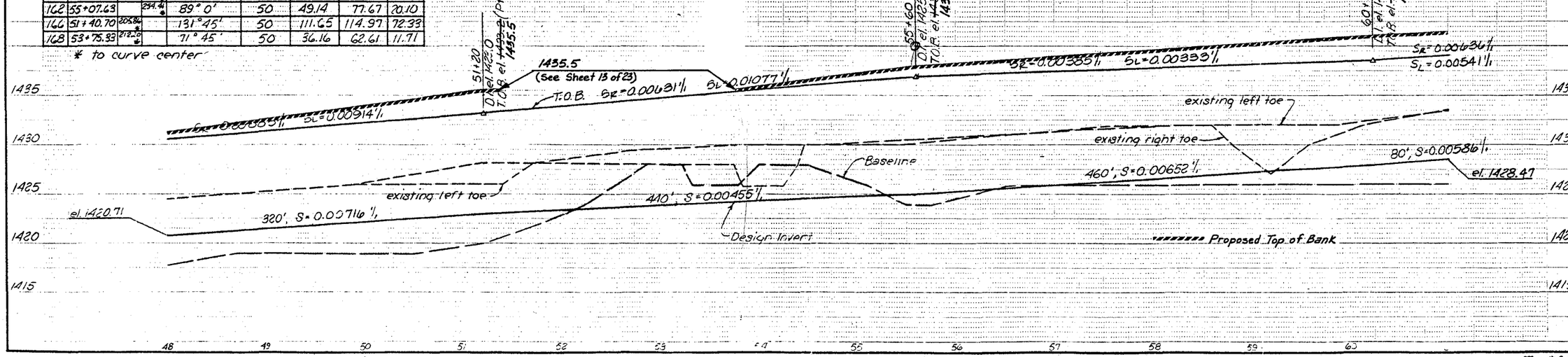


LAYOUT GEOMETRY – BASELINE / TOE OF SLOPE

Pt.	Baseline Station	Offset Lt.	Offset Rt.	CURVE DATA Δ	R	T	L	e
129	50+45		240	24°36'01" L	1000	218.04	429.36	23.49
109	51+60	130		34°10'49" L	500	153.73	298.28	23.10
110	55+00	180		03°38'44" L	NC			
130	56+90		195	05°17'24" L	2000	92.39	184.66	2.13
111	59+70	280		16°00'09" R	1000	140.56	279.29	9.83
131	60+40		125	07°05'10" R	2000	123.83	247.35	3.83
161	53+03.08		270.39	100° 30'	50	60.12	87.70	28.19
162	55+07.63		254.46 *	89° 0'	50	49.14	77.67	20.10
166	51+40.70	205.86		131° 45'	50	111.65	114.97	72.33
168	53+75.33	212.39 *		71° 45'	50	36.16	62.61	11.71

* to curve center

Notes:
1. Vary soil cement side slope from 4:1 in drain to 2:1 parallel to Happy Valley Road.
2. 6" waterline, sta. 12+30 to 16+20± and sta. 17+40± to 20+00 to be lowered. See Sheet 13.
3. For plan and profile of berms along Happy Valley Rd., see sheets 12 and 13.



ENGINEER EAS
ARCHITECT
TECHNICIAN BAF
REVISED

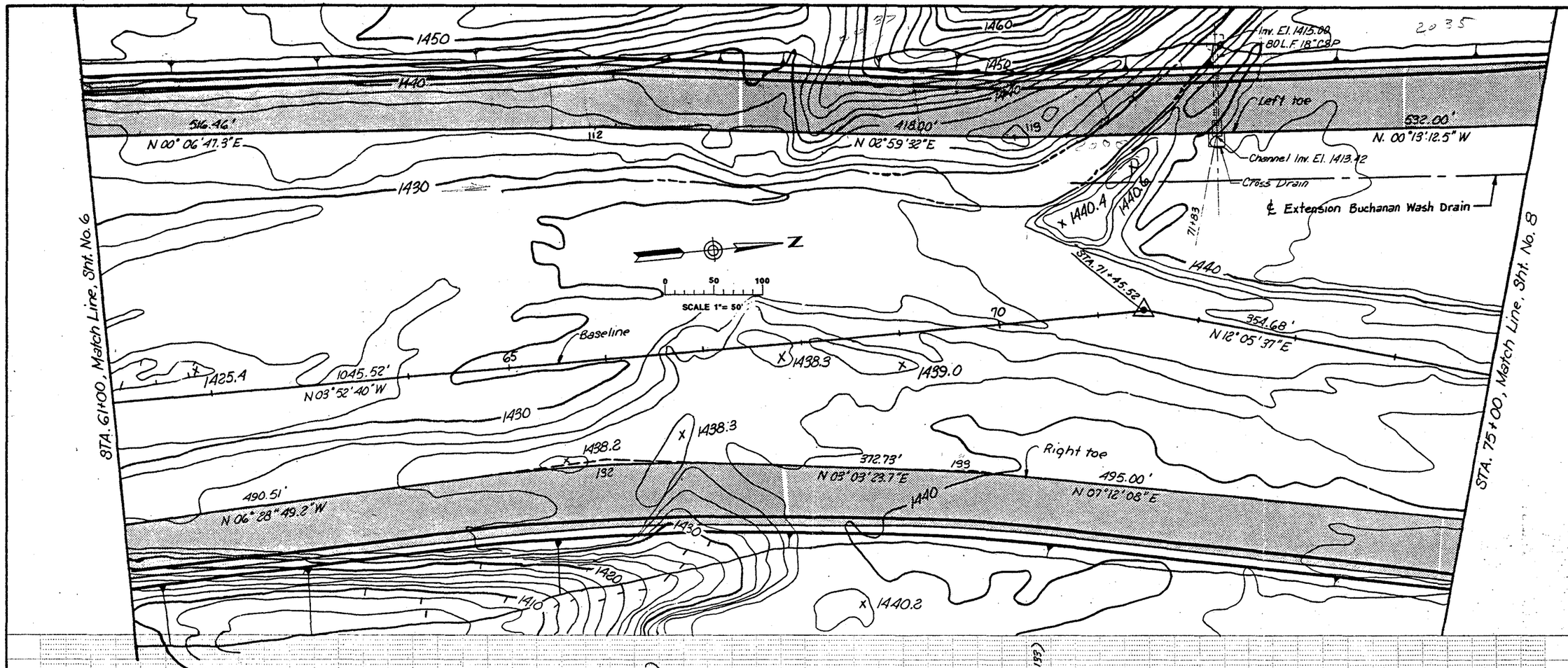
CITY OF PHOENIX
ENGINEERING DEPARTMENT
DIVISION OF DESIGN

HARZA ENGINEERING CO.
CONSULTING ENGINEERS
Phoenix, Arizona
March 1989

SKUNK CREEK CHANNEL IMPROVEMENTS

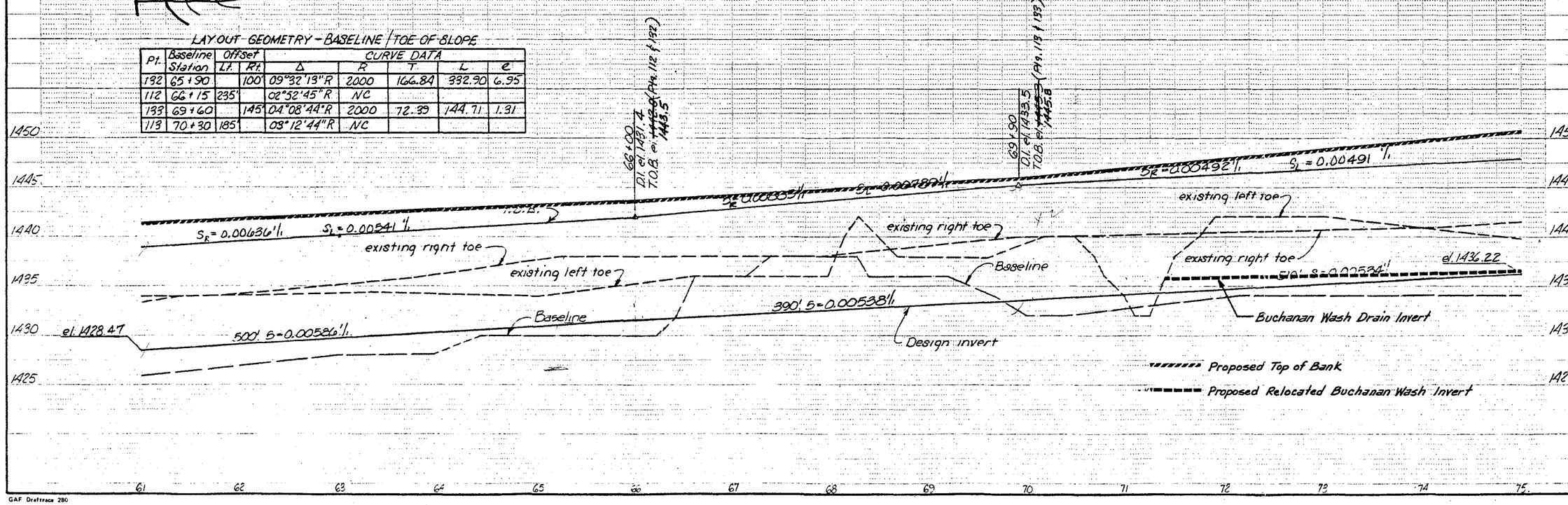
INDEX NO. SA-984080

SHEET 6 OF 23



LAY OUT GEOMETRY – BASELINE / TOE OF SLOPE

Pt.	Baseline Station	Offset Lt.	Offset Rt.	CURVE DATA Δ	R	T	L	e
132	65+90		100'	09°32'13" R	2000	166.84	332.90	6.95
112	66+15	235'		02°32'45" R	NC			
133	69+60		145'	04°08'44" R	2000	72.39	144.71	1.31
113	70+30	185'		03°12'44" R	NC			



ENGINEER
ARCHITECT
TECHNICIAN BAF
REVISED

CITY OF PHOENIX
ENGINEERING DEPARTMENT
DIVISION OF DESIGN

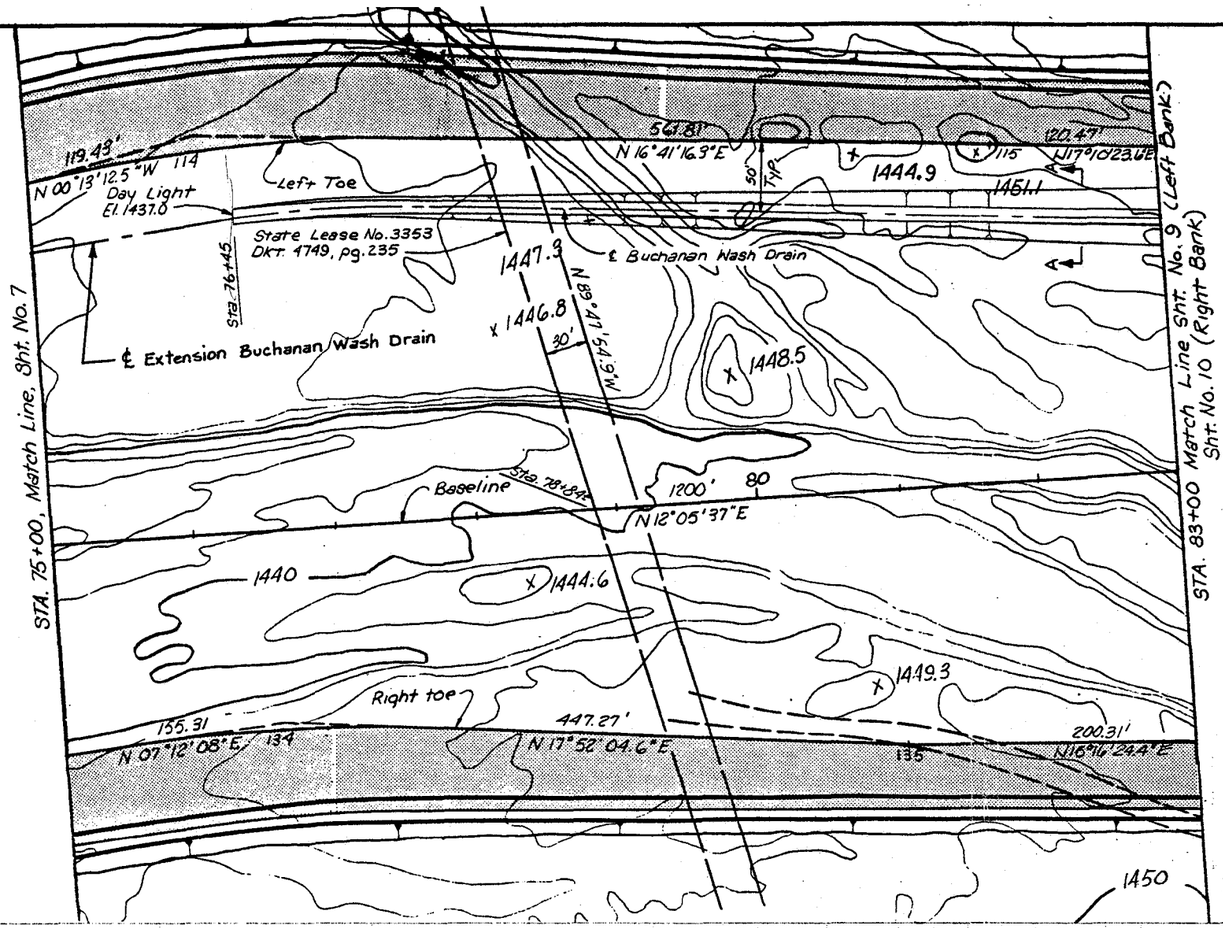
HARZA ENGINEERING CO.
CONSULTING ENGINEERS
Phoenix, Arizona
March 1989

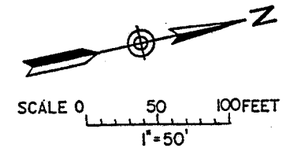
SKUNK CREEK CHANNEL IMPROVEMENTS

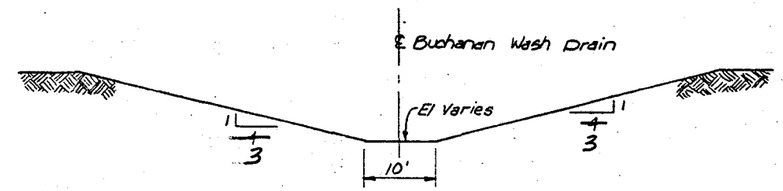
INDEX NO. SA-884080

SHEET 7 OF 23

GAF Draftrace 280



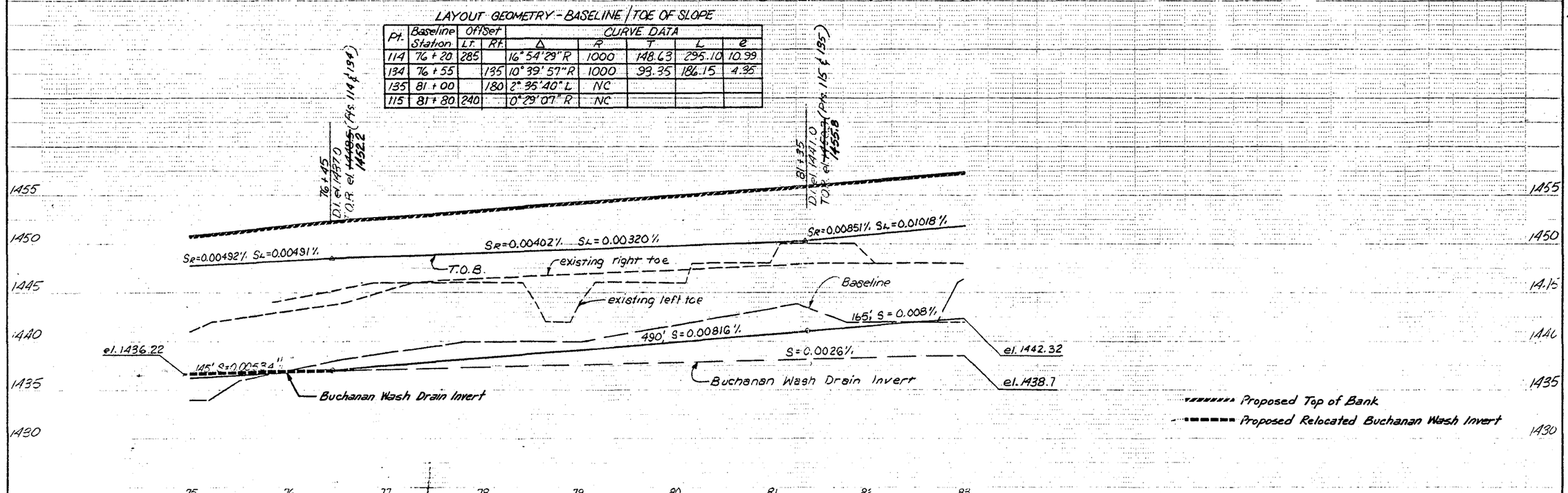




Section A-A

LAYOUT GEOMETRY - BASELINE / TOE OF SLOPE

Pt.	Baseline Station	Offset LT.	Offset RT.	CURVE DATA Δ	R	T	L	e
114	76 + 20	285		16° 54' 29" R	1000	148.63	295.10	10.99
134	76 + 55		135	10° 39' 57" R	1000	93.35	186.15	4.35
135	81 + 00		180	2° 35' 40" L	NC			
115	81 + 80	240		0° 29' 07" R	NC			



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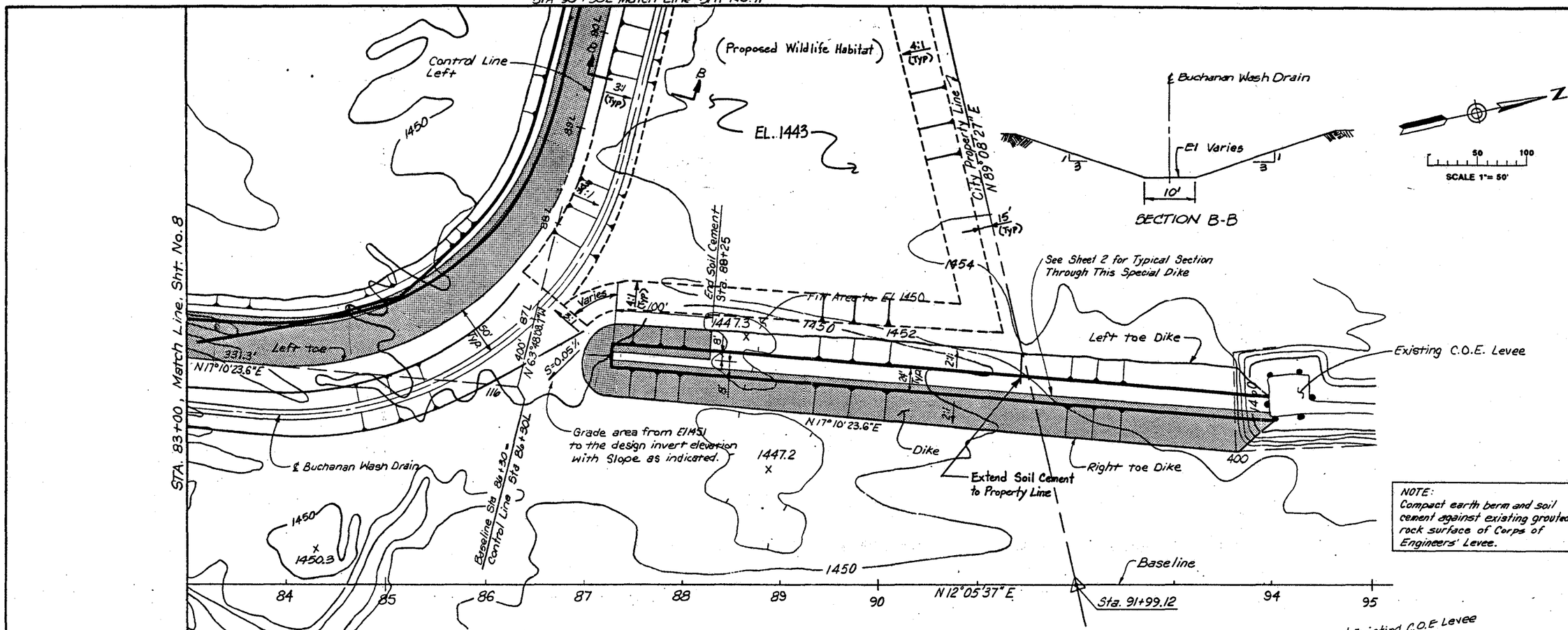
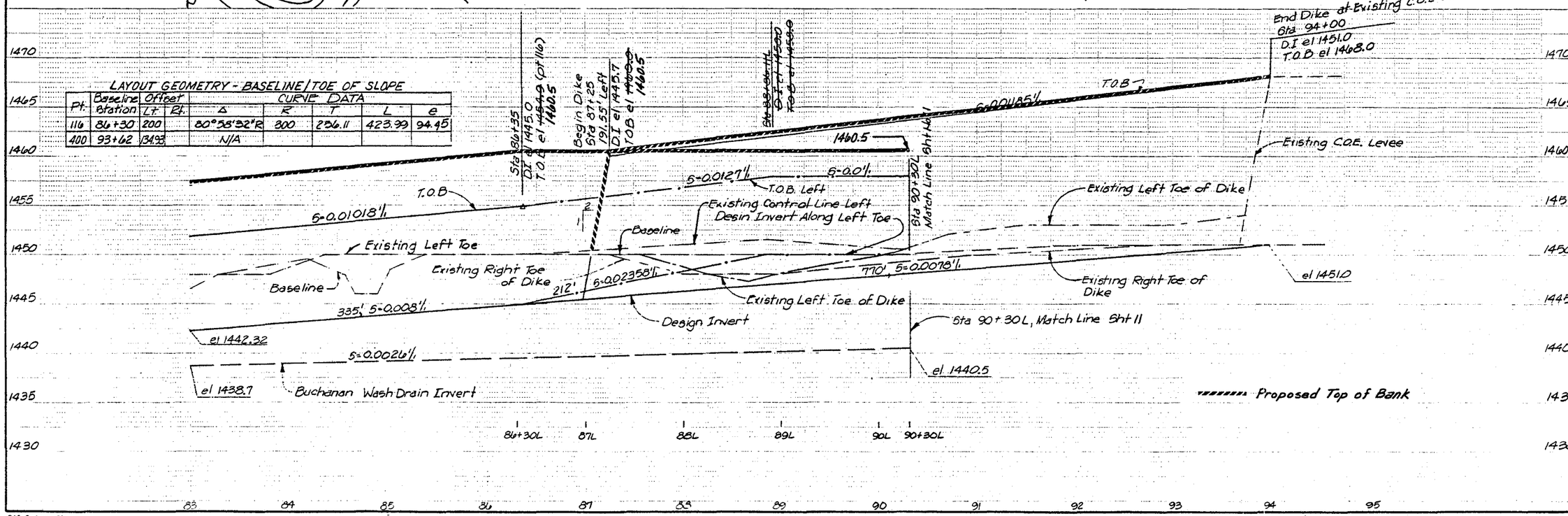
STA 90+30L Match Line Sht No. 11



NOTE:
Compact earth berm and soil cement against existing grouted rock surface of Corps of Engineers' Levee.



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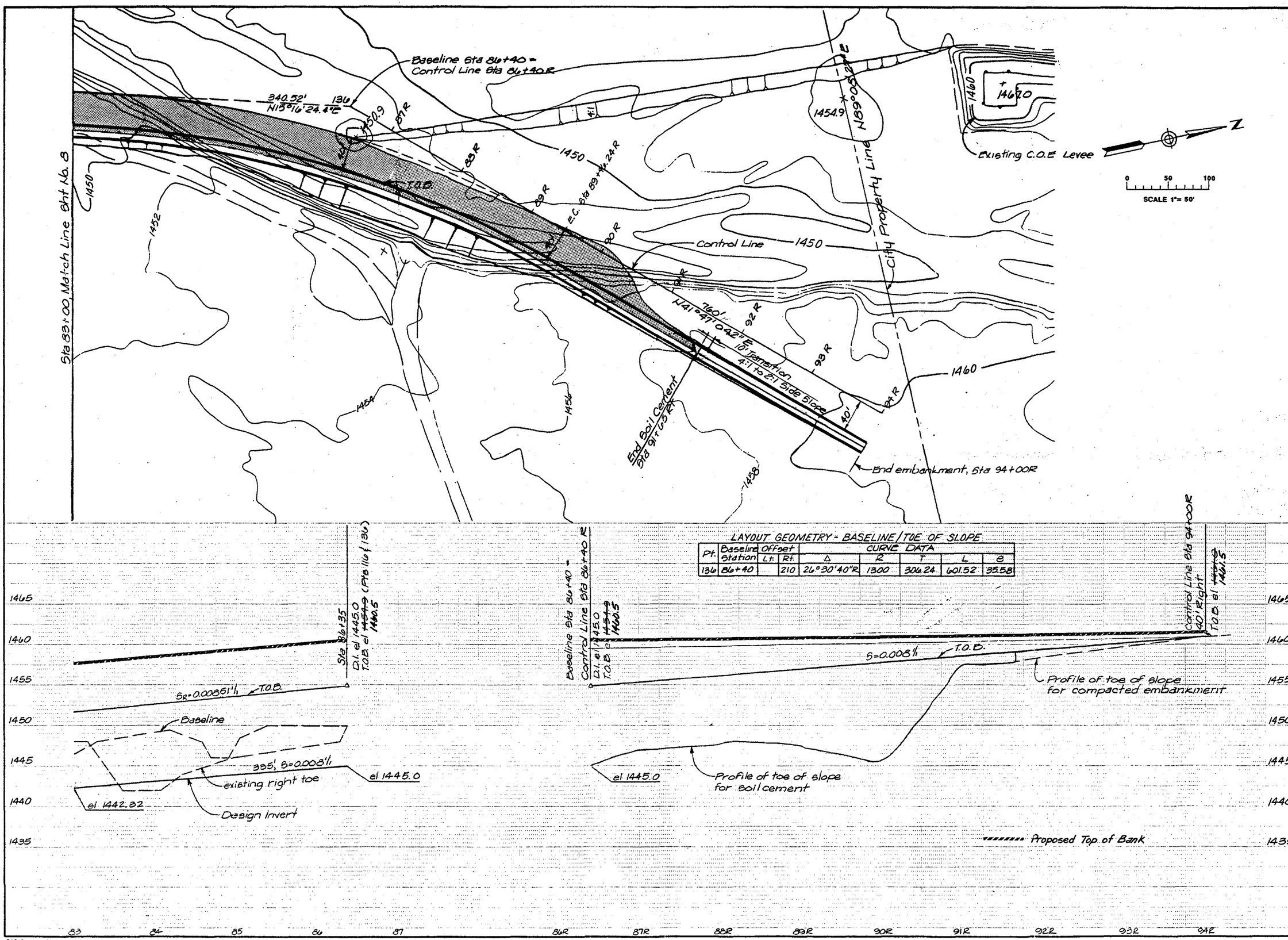

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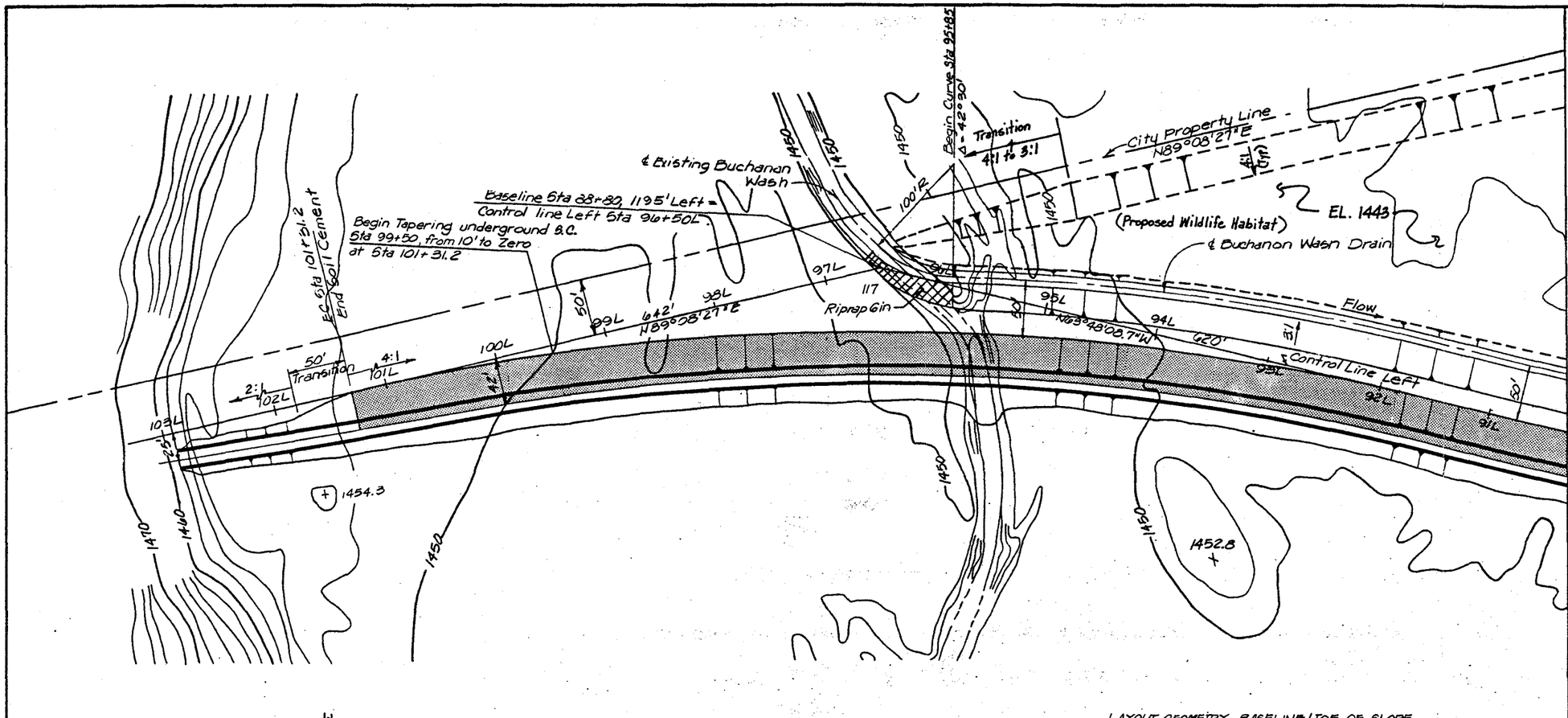
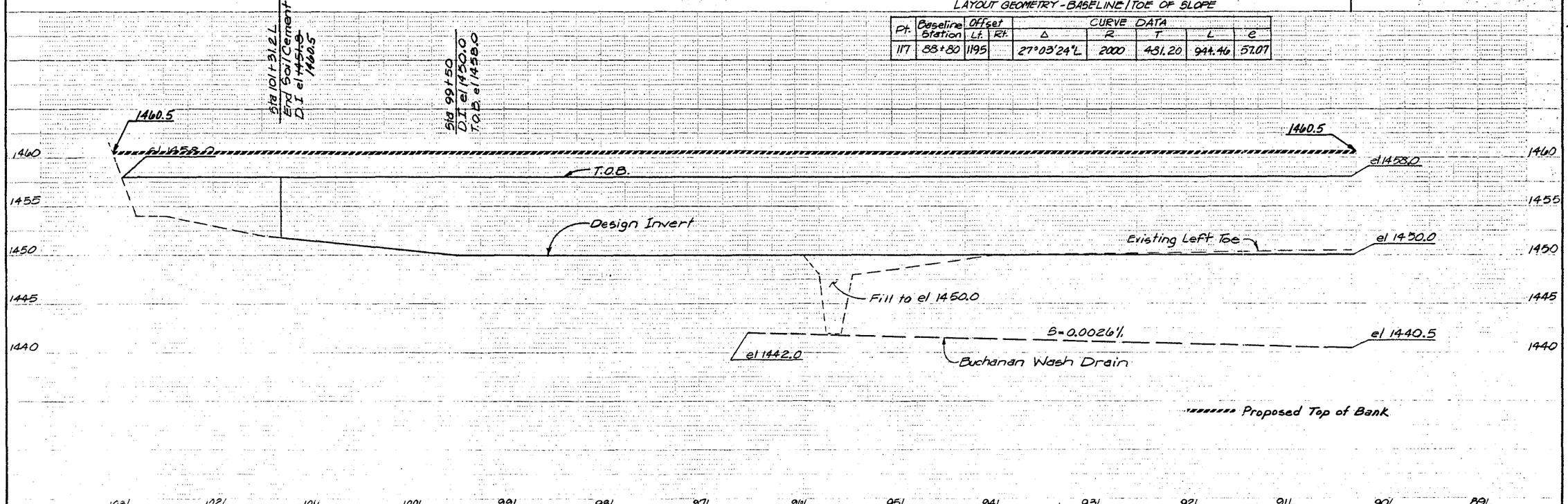


LAYOUT GEOMETRY - BASELINE / TOE OF SLOPE

Pt.	Baseline Station	Offset Lt.	Offset Rt.	CURVE DATA Δ	R	T	L	E
117	88+80	1195		27°03'24"L	2000	481.20	944.46	57.07



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CURVE DATA
PI Sta 6+88.15
Δ = 38°-58'-55.3"
D = 6°-00'
R = 955.37'
T = 338.15
L = 650.00
E = 58.08

For Profile and Typical Section of Entrance Road, See This Sheet Lower Left.

Existing 24" CSP Culvert Remove Headwall and Bury Pipe

Match Line Sta 12+50

Sta 3+50 Match Existing Road (Saw Cut)

4+00.33 Entrance Rd. = 8+35 Happy Valley Rd.

Chain Link Fence

El. 1434.74 Under Wires

El. 1436.2 Under Wires

El. 1435.31 Under Wires

El. 1435.99

El. 1435.82

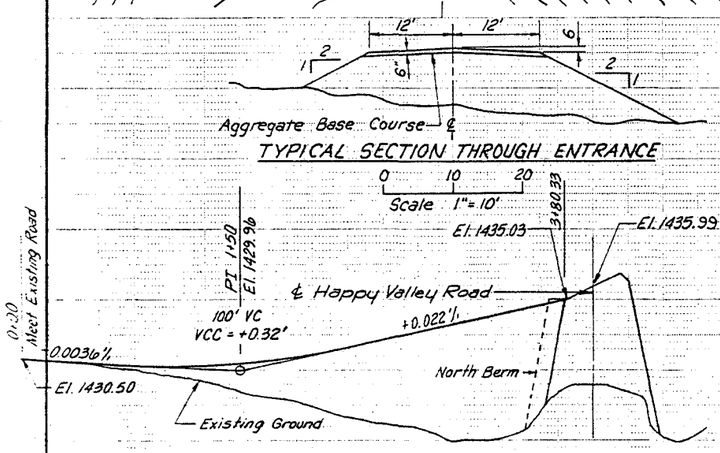
Existing 24" CSP Culvert Remove Headwalls and Bury Pipe

PI Sta 6+88.15

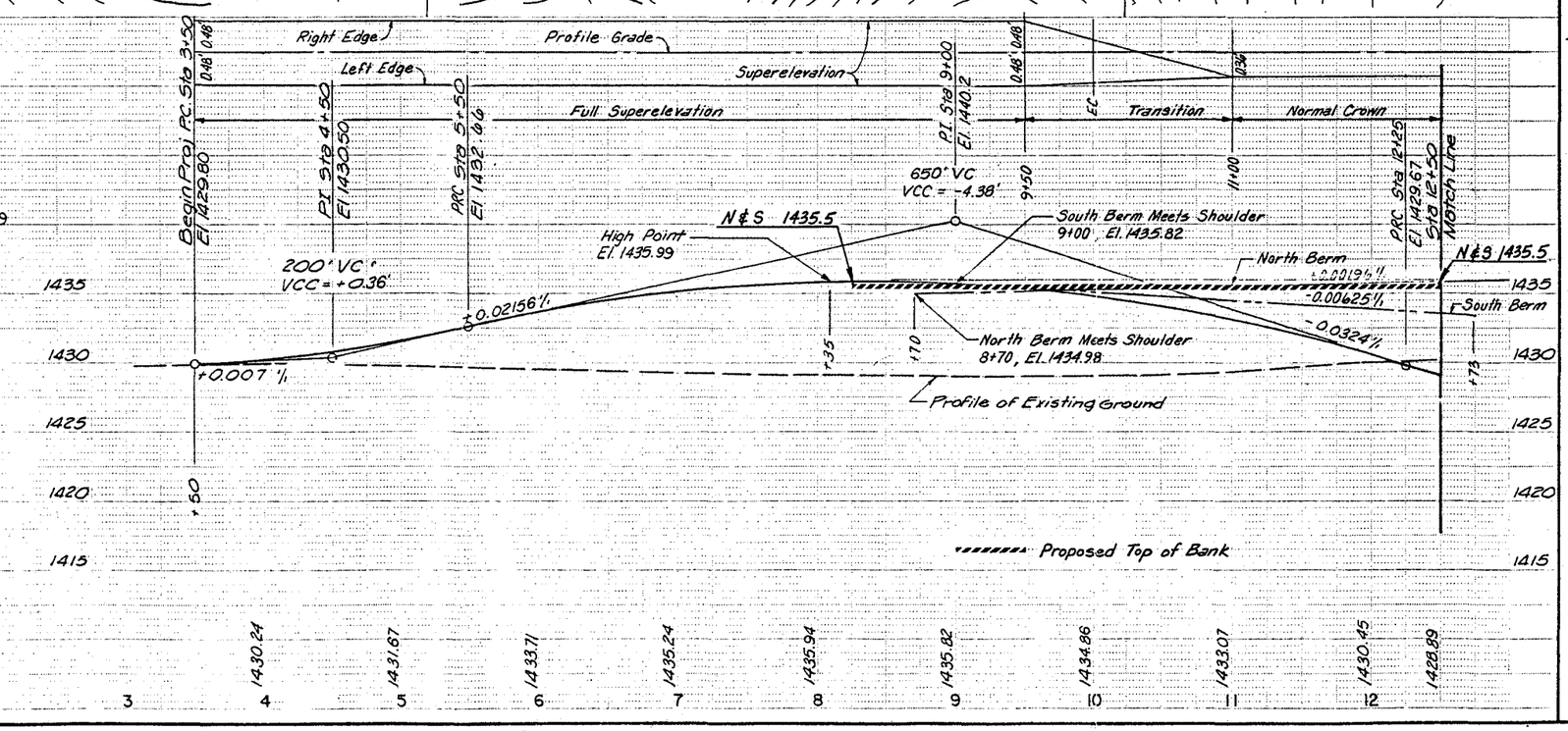
N 15000

E 1200

SCALE 1" = 50'



PROFILE OF ENTRANCE
STA 8 + 35 (Lt.)



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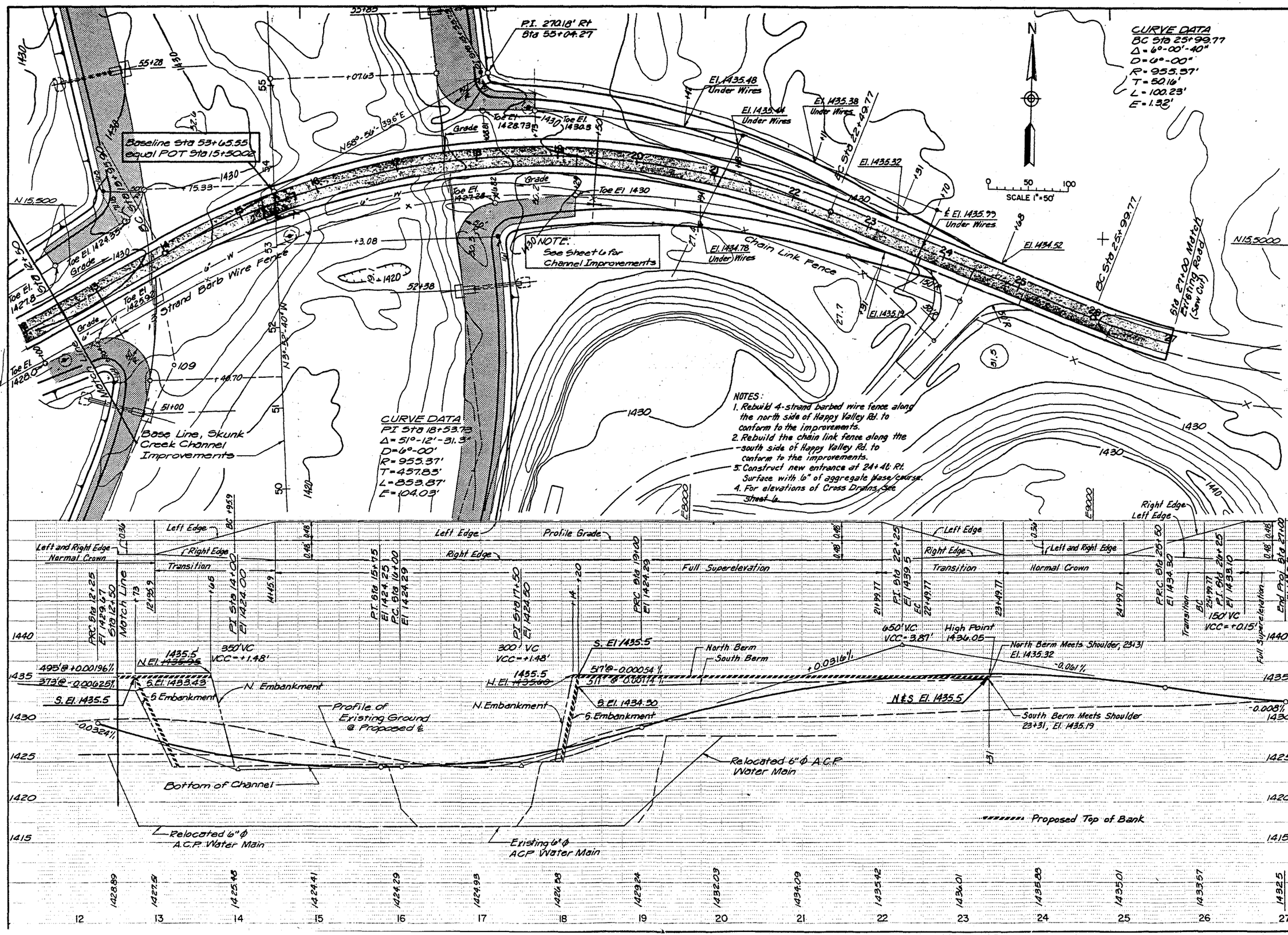

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