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HYDROLOGIC AND HYDRAULIC REPORT FOR UNIT 21 AT NEW TUCSON

PREPARED FOR
MR. JEFF KAY

MAY 23, 1986
DJA JOB NO. 84-077.01

Rep. A1

JUN 3 1994

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LIST OF FIGURES

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FIGURES

INTRODUCTION

This parcel is Unit 21 of New Tucson (Book 17, Page 42, 43 and 44), located in Section 4, Township 17 South, Range 16 East, Gila and Salt River Base and Meridian. The Location Map is given in Figure 1. The property is owned by Mr. Jeff Kay and is currently zoned TR. There are some houses already constructed on the parcel. Most of the area is left undeveloped. The whole area can be classified as desert foothills.

New Tucson was recorded in 1964. This report is being prepared to map existing 100-year floodprone areas on the site.

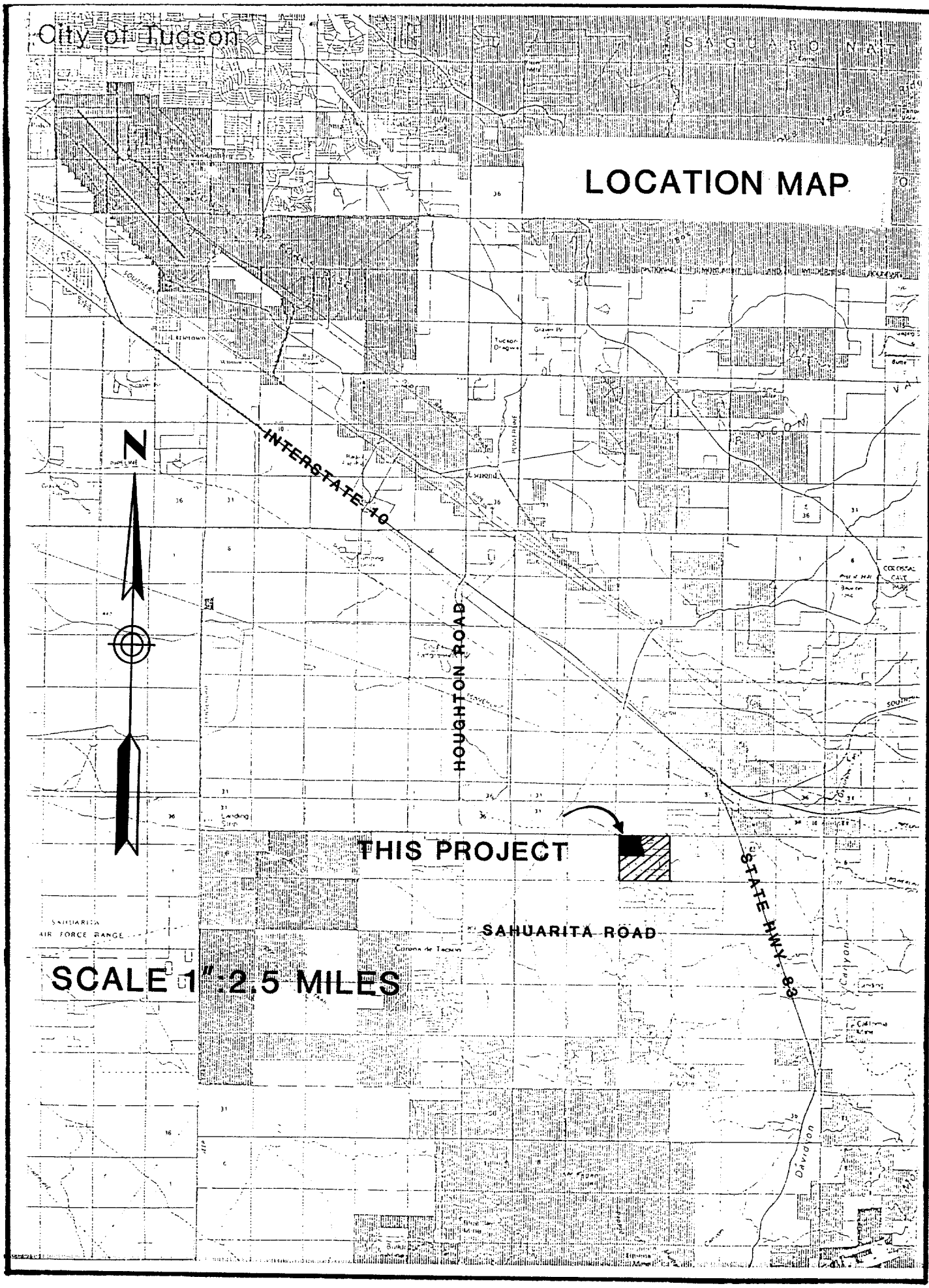

City of Tucson
LOCATION MAP
N
INTERSTATE 10
HOUGHTON ROAD
THIS PROJECT
SAHUARITA ROAD
STATE HWY. 83
SCALE 1" = 2.5 MILES

FIGURE 1

005

OBJECTIVE

The objective of this report is to determine all of the flows generated by a 100-year storm in excess of 100 cfs and them map the floodprone boundaries for the associated channels.

METHODOLOGY AND PROCEDURE

Hydrology

(1) Offsite and Onsite Drainage:

The method outlined in the Pima County Hydrology Manual for Engineering Design and Flood Control Management (Reference 1) was used to determine peak runoff magnitudes for all drainage areas affecting this parcel.

Under future developed conditions, offsite watershed types will be foothills and suburban foothills. Basin factor and impervious cover for the watersheds are 0.032 and 15% as suggested by Pima County. Cover density for all watersheds is 30%. Cover type is desert brush. Soil groups for the watersheds are 35% B, 15% C and 50% D. Precipitation values are derived from the hydrology manual and are listed in the Hydrology Appendix.

The drainage areas and the corresponding discharges are given in Table 1. The watershed delineations are given in Figure 5. The onsite watershed delineations are given in Figure 6. Detailed calculations are included in Appendix 2.

Hydraulics

(1) Backwater Calculation:

The water surface elevations were computed using HEC-2 computer program (Reference 2). The discharges were obtained from the hydrology analysis. The parcel can be divided into six watersheds. Four of them have a discharge over 100 cfs. Therefore, four models were set up to cover the study area. The computer outputs are included in Appendix 3.

(2) Model Flow Regimes:

Because of the steepness in slope, the flow regimes are transitional between subcritical and critical. HEC-2 results show that the flow changes from subcritical to critical and back to subcritical. The same problem existed when the models were set up to run for critical conditions, i.e., from upstream to downstream. There is little difference in water surface elevations between the subcritical and critical models. For mapping purposes, the water surfaces from the subcritical models were used since the water surface elevations were slightly higher. Therefore, a more conservative representation of 100-year floodprone areas has been developed.

(3) Floodprone Boundaries Delineation:

By locating the water surface elevations computed by HEC-2 on the topographic map on which every cross-section location is drawn, the boundaries of the flood can be determined. By connecting the points of the flood boundaries of every cross-section, floodprone areas are delineated. The floodprone boundary delineations are shown in Figure 7.

A "mock" plat has been prepared showing the delineations of floodprone areas overlaying the preliminary parcel layout (Figure 8).

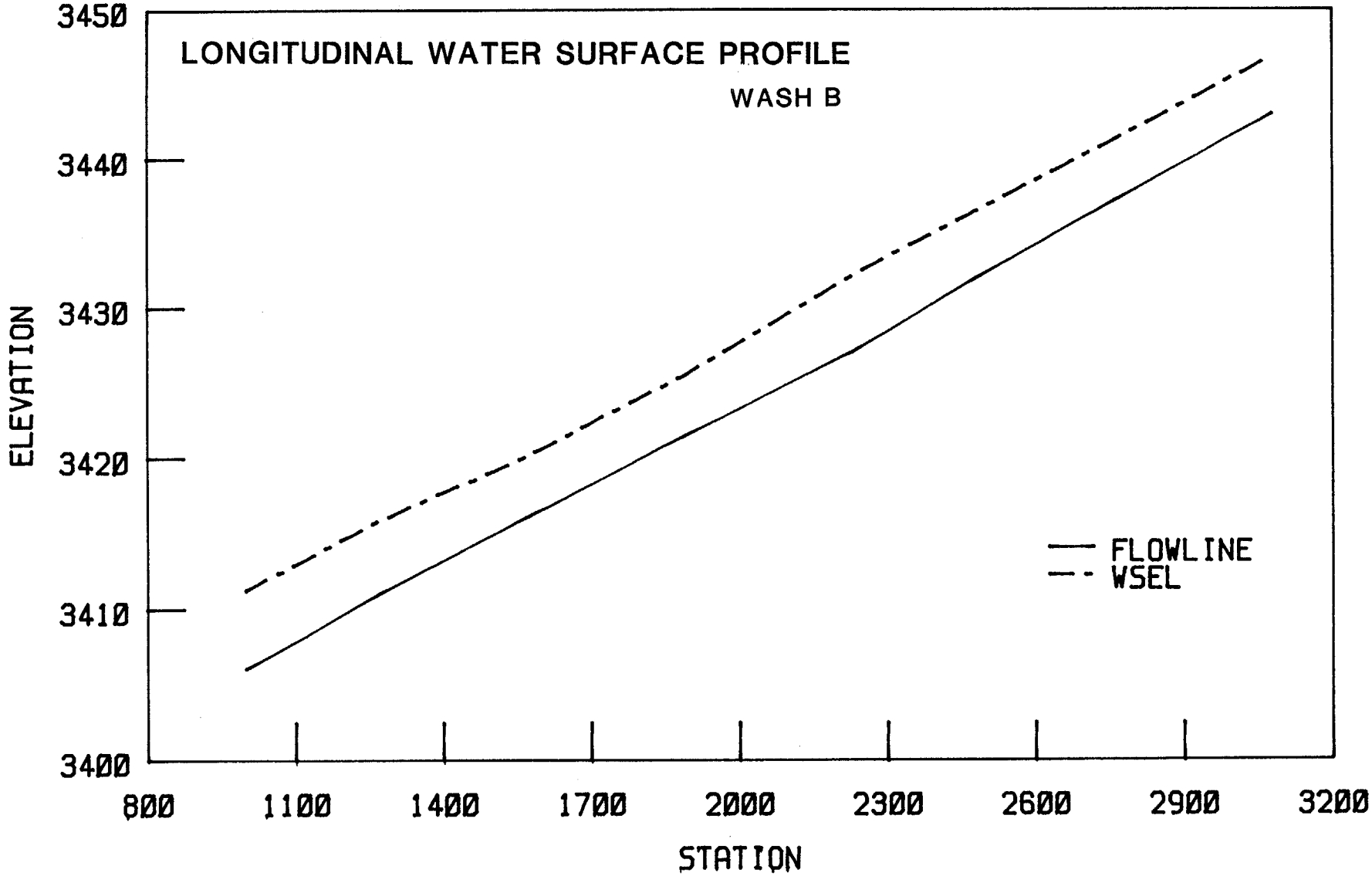
RESULTS AND DISCUSSION

The results from a study of this nature are best explained by a series of maps and figures. The drainage areas and the corresponding discharges are given in Table 1. The watershed delinations are given in Figures 5 and 6. The floodprone boundaries are shown in Figure 7 as well as Figure 8. In Figure 8 the floodprone areas are incorpoated with a preliminary or "mock" layout of roads and lots. Longitudinal water surface profiles are shown in Figures 1 through 4.

TABLE 1
ACREAGE AND PEAK DISCHARGES FOR
NEW TUCSON UNIT WATERSHEDS - UNIT 21

WATERSHED	ACREAGE	DISCHARGE (CFS)
A4	92.7	313
A5	50.4	200
A6	20.0	96
B	1783	3,196
B3	11.6	58
C1	44.8	189

JOB NO. 84-077.01
18-MAR-86



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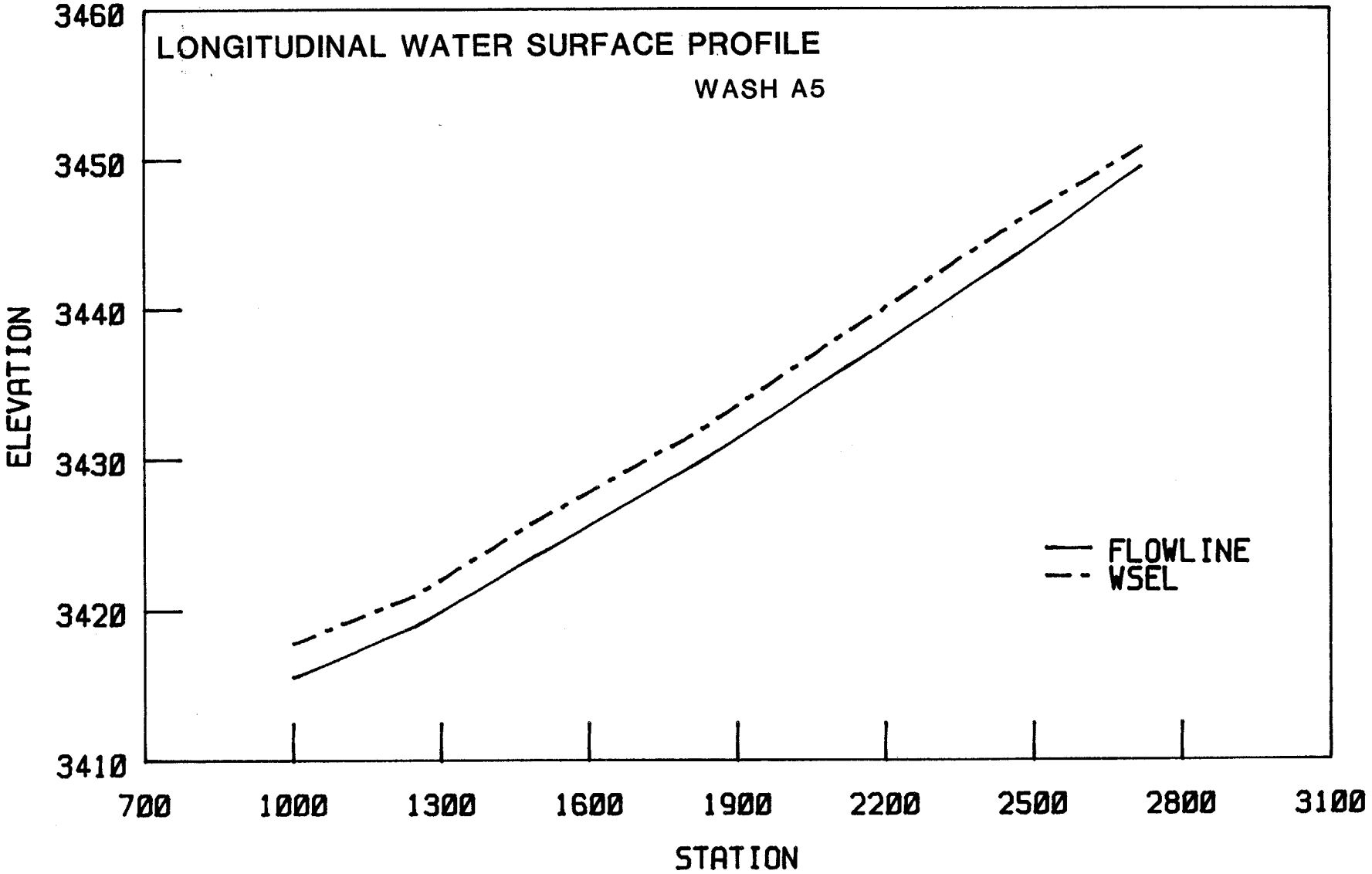

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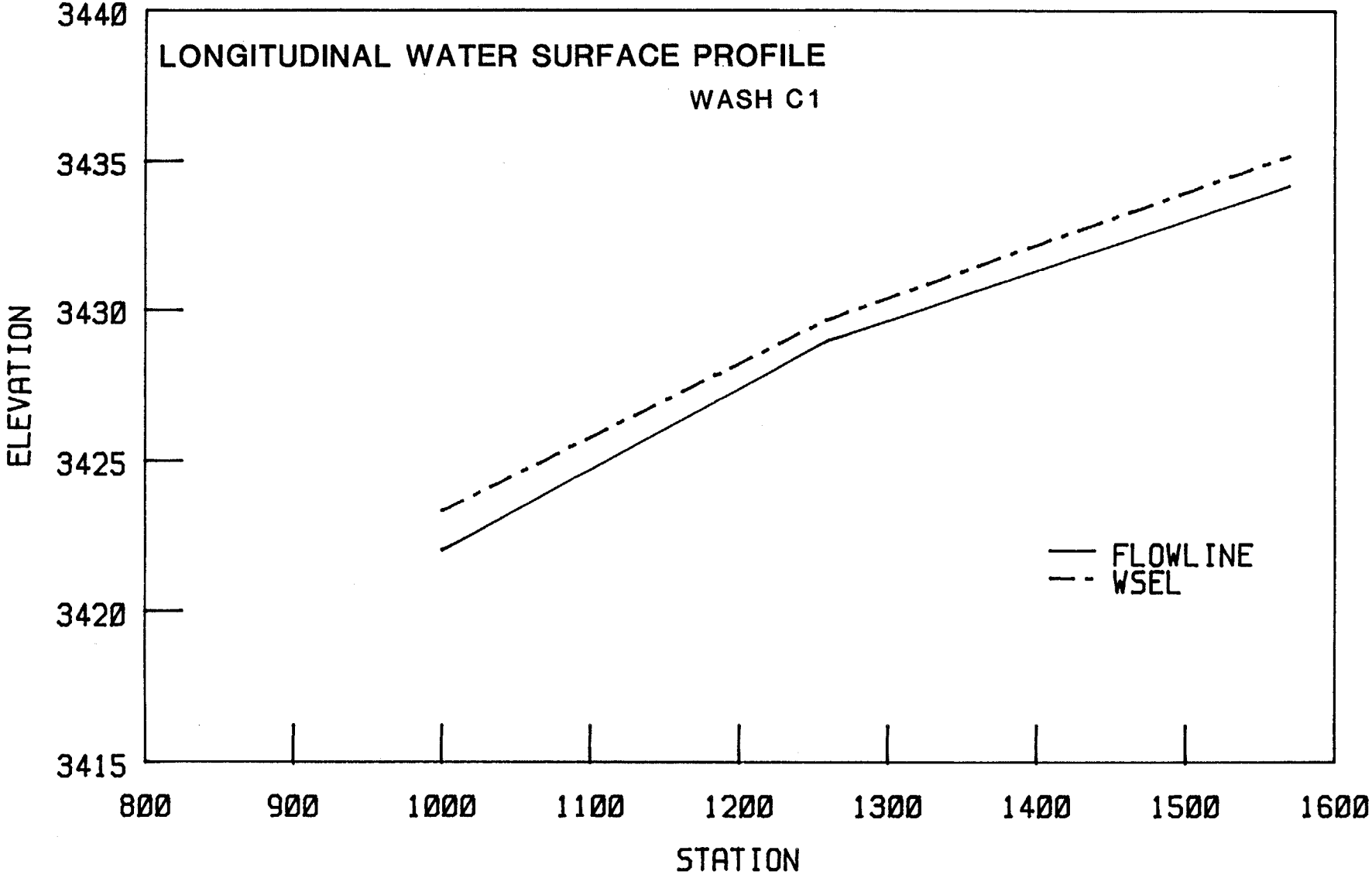

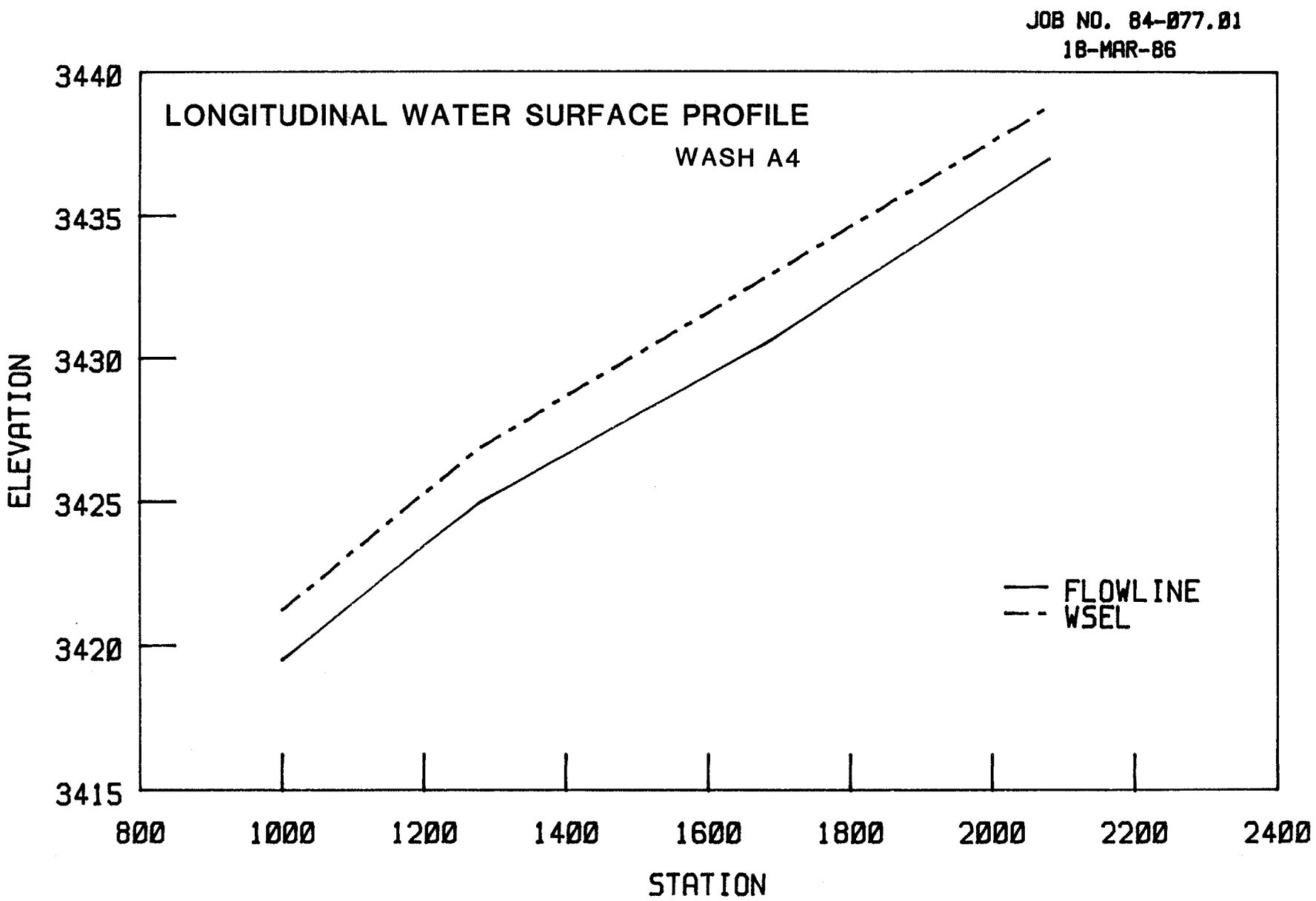
JOB NO. 84-077.01
18-MAR-86
LONGITUDINAL WATER SURFACE PROFILE
WASH A4
3440
3435
3430
3425
3420
3415
ELEVATION
800
1000
1200
1400
1600
1800
2000
2200
2400
STATION
FLOWLINE
WSEL

BASIS OF ELEVATION

The basis of elevation is a bench mark: U.S.G.S. Datum, located at the northeast corner of Section 4, Mount Fagan Quadrangle, elevation is 3451.0.

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REFERENCES

1. Hydrology Manual for Engineering Design and Floodplain Management within Pima County, Arizona, Pima County Department of Transportation and Flood Control District, September, 1979.

2. HEC-2 Water Surface Profiles, the Hydrologic Engineering Center, Water Resources Support Center, Corps of Engineering, 1982.

3. U.S.G.S. Quadrangle Map, Mount Fagan, Arizona, N3152.5-W11037.5/7.5, 1981.

This report was prepared and written by Pat Gresham.

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APPENDICES

APPENDIX 1

Watershed Delineations
Onsite Watershed Delineations
Floodprone Areas Map
Floodprone Areas Associated with Parcel Layout

APPENDIX 2

Hydrology

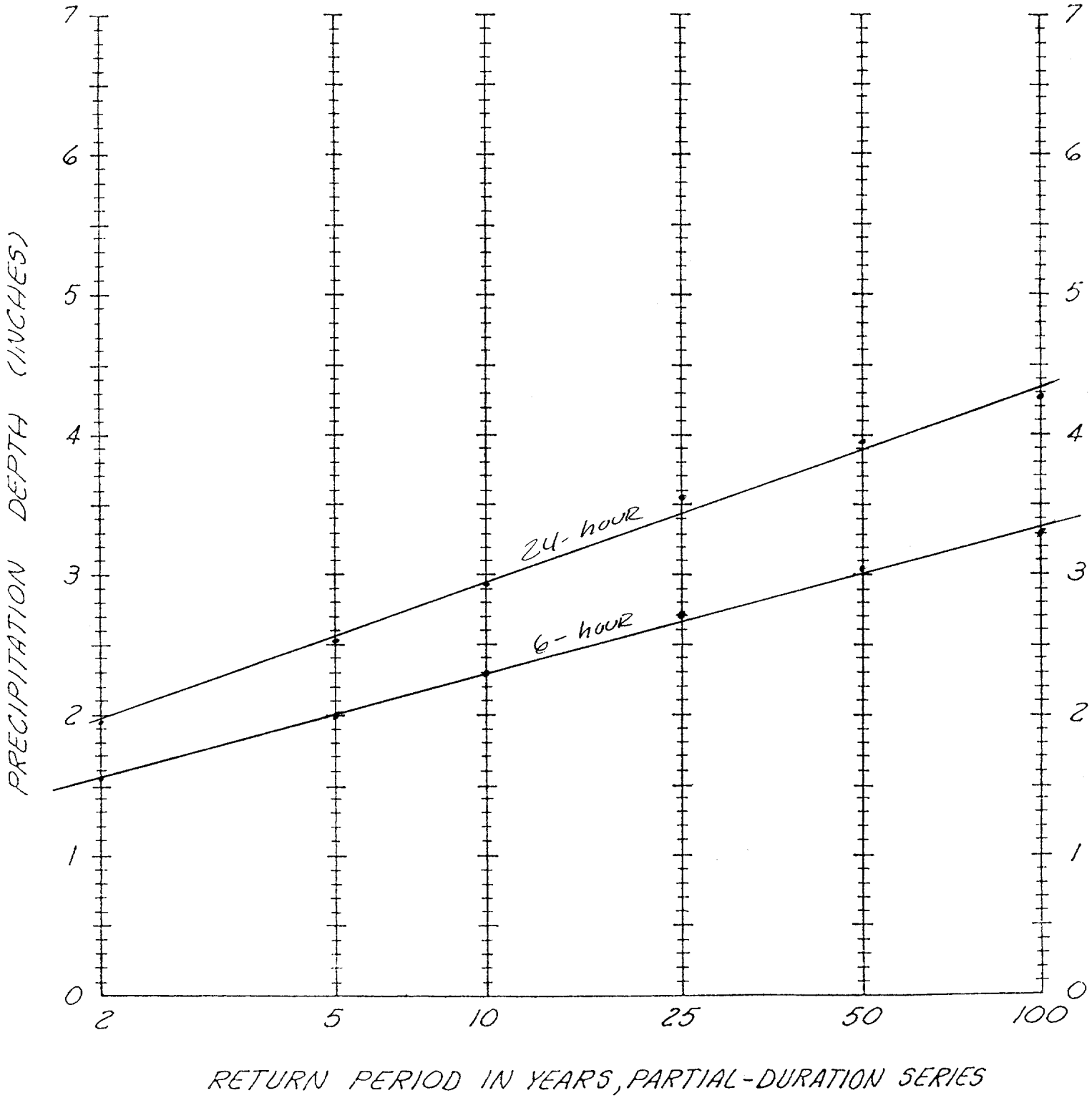
PRECIPITATION VALUES

RETURN PERIOD (YEARS)	PRECIPITATION VALUES (INCHES)			
	6 HOUR DURATION		24 HOUR DURATION	
	MAP VALUE	CORRECTED VALUE	MAP VALUE	CORRECTED VALUE
2	1.56	1.56	1.94	1.98
5	2.00	2.00	2.52	2.56
10	2.30	2.29	2.93	2.94
25	2.70	2.66	3.55	3.43
50	3.04	3.00	3.95	3.89
100	3.30	3.34	4.28	4.33

LATITUDE 31° 57'

NEW TUCSON

LONGITUDE 110° 42'



HYDROLOGIC DATA SHEET

DOOLEY-JONES & ASSOC.

Project Name and Location: NEW TUCSON-UNIT 21 85-077.01

Drainage Concentration Point: A4

Watershed Area (A): 92.70 Acres

Length of Watercourse(Lc): 6500. ft Length to Center of Gravity(Lca): 3250. ft

Incremental Change in Length(Li) -ft.	Incremental Change in Elevation(Hi) -ft.
6500.0	135.0

Mean Slope (Sc): 0.0208 ft/ft Watershed Type(s): SUB. FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr):	4.43	in.	Areal Value:	in.
P6 (6 hr):	3.34	in.	Areal Value:	in.
P1 (1 hr):	2.44	in.	Areal Value:	in.
P2 (2 hr):	2.75	in.	Areal Value:	in.
P3 (3 hr):	2.95	in.	Areal Value:	in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BRUSH (future)

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future)

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 85.8 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas)

Runoff Supply Rate(q): 0.65 X i in/hr (function of i)

Time of Concentration (TC): 0.5645 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 17.6 mins. (K= 23.7)

Rainfall Intensity (i) at TC: 5.16 in./hr.

Runoff Supply Rate (q) at TC: 3.35 in./hr.

Peak Discharge:
1.008qA(acres): 313. cfs

Discharge Location:

WG 3-MAR-86

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HYDROLOGIC DATA SHEET

DOOLEY-JONES & ASSOC.

Project Name and Location: NEW TUCSON-UNIT 21 84-077.01

Drainage Concentration Point: A5

Watershed Area (A): 50.40 Acres

Length of Watercourse(Lc): 3930. ft Length to Center of Gravity(Lca): 1965. ft

Incremental Change in Length(Li) -ft.	Incremental Change in Elevation(Hi) -ft.
3930.0	80.0

Mean Slope (Sc): 0.0204 ft/ft Watershed Type(s): SUB. FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr):	4.43	in.	Areal Value:	in.
P6 (6 hr):	3.34	in.	Areal Value:	in.
P1 (1 hr):	2.44	in.	Areal Value:	in.
P2 (2 hr):	2.75	in.	Areal Value:	in.
P3 (3 hr):	2.95	in.	Areal Value:	in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BRUSH (future)

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future)

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 85.8 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas)

Runoff Supply Rate(a): 0.65 X i in/hr (function of i)

Time of Concentration (TC): 0.4208 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 12.3 mins. (K= 17.7)

Rainfall Intensity (i) at TC: 6.08 in./hr.

Runoff Supply Rate (a) at TC: 3.95 in./hr.

Peak Discharge:
1.008aA(acres): 200. cfs

Discharge Location:

WG 3-MAR-86

HYDROLOGIC DATA SHEET

DOOLEY-JONES & ASSOC.

Project Name and Location: NEW TUCSON - UNIT 21 84-077.01

Drainage Concentration Point: B

Watershed Area (A): 1783.00 Acres

Length of Watercourse(Lc): 26700. ft Length to Center of Gravity(Lca): 14850. ft

Incremental Change in Length(Li) -ft.	Incremental Change in Elevation(Hi) -ft.
26700.0	675.0

Mean Slope (Sc): 0.0253 ft/ft Watershed Type(s): SUB. FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr):	4.43	in.	Areal Value:	in.
P6 (6 hr):	3.34	in.	Areal Value:	in.
P1 (1 hr):	2.44	in.	Areal Value:	in.
P2 (2 hr):	2.75	in.	Areal Value:	in.
P3 (3 hr):	2.95	in.	Areal Value:	in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BRUSH (future)

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future)

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 85.8 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas)

Runoff Supply Rate(a): 0.65 X i in/hr (function of i)

Time of Concentration (TC): 1.2577 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 50.4 mins. (K= 52.8)

Rainfall Intensity (i) at TC: 2.74 in./hr.

Runoff Supply Rate (a) at TC: 1.78 in./hr.

Peak Discharge:
1.008aA(acres): 3196. cfs

Discharge Location:

WG 3-MAR-86

HYDROLOGIC DATA SHEET

DOOLEY-JONES & ASSOC.

Project Name and Location: NEW TUCSON - UNIT 21 84-077.01

Drainage Concentration Point: A6

Watershed Area (A): 20.00 Acres

Length of Watercourse(Lc): 2100. ft Length to Center of Gravity(Lca): 1050. ft

Incremental Change in Length(Li) -ft.	Incremental Change in Elevation(Hi) -ft.
2100.0	42.0

Mean Slope (Sc): 0.0200 ft/ft Watershed Type(s): SUB. FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr):	4.43	in.	Areal Value:		in.
P6 (6 hr):	3.34	in.	Areal Value:		in.
P1 (1 hr):	2.44	in.	Areal Value:		in.
P2 (2 hr):	2.75	in.	Areal Value:		in.
P3 (3 hr):	2.95	in.	Areal Value:		in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BRUSH (future)

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future)

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 85.8 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas)

Runoff Supply Rate(a): 0.65 X i in/hr (function of i)

Time of Concentration (TC): 0.2910 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 7.9 mins. (K= 12.2)

Rainfall Intensity (i) at TC: 7.31 in./hr.

Runoff Supply Rate (a) at TC: 4.75 in./hr.

Peak Discharge:
1.008aA(acres): 96. cfs

Discharge Location: ,

WG 3-MAR-86

HYDROLOGIC DATA SHEET

DOOLEY-JONES & ASSOC.

Project Name and Location: NEW TUCSON - UNIT 21 84-077.01

Drainage Concentration Point: B3

Watershed Area (A): 11.60 Acres

Length of Watercourse(Lc): 1700. ft Length to Center of Gravity(Lca): 850. ft

Incremental Change in Length(Li) -ft.	Incremental Change in Elevation(Hi) -ft.
1700.0	30.0

Mean Slope (Sc): 0.0176 ft/ft Watershed Type(s): SUB. FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr):	4.43	in.	Areal Value:	in.
P6 (6 hr):	3.34	in.	Areal Value:	in.
P1 (1 hr):	2.44	in.	Areal Value:	in.
P2 (2 hr):	2.75	in.	Areal Value:	in.
P3 (3 hr):	2.95	in.	Areal Value:	in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BRUSH (future)

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future)

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 85.8 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas)

Runoff Supply Rate(a): 0.65 X i in/hr (function of i)

Time of Concentration (TC):0.2695 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 7.2 mins. (K= 11.3)

Rainfall Intensity (i) at TC: 7.58 in./hr.

Runoff Supply Rate (a) at TC: 4.92 in./hr.

Peak Discharge:
1.008aA(acres): 58. cfs

Discharge Location:

WG 3-MAR-86

HYDROLOGIC DATA SHEET

DOOLEY-JONES & ASSOC.

Project Name and Location: NEW TUCSON - UNIT 21 84-077.01

Drainage Concentration Point: C1

Watershed Area (A): 44.80 Acres

Length of Watercourse(Lc): 3400. ft Length to Center of Gravity(Lca): 1700. ft

Incremental Change in Length(Li) -ft. Incremental Change in Elevation(Hi) -ft.

3400.0 76.0

Mean Slope (Sc): 0.0224 ft/ft Watershed Type(s): SUB. FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr): 4.43 in. Areal Value: in.

P6 (6 hr): 3.34 in. Areal Value: in.

P1 (1 hr): 2.44 in. Areal Value: in.

P2 (2 hr): 2.75 in. Areal Value: in.

P3 (3 hr): 2.95 in. Areal Value: in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BRUSH (future)

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future)

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 85.8 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas)

Runoff Supply Rate(q): 0.65 X i in/hr (function of i)

Time of Concentration (TC): 0.3716 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 10.6 mins. (K= 15.6)

Rainfall Intensity (i) at TC: 6.46 in./hr.

Runoff Supply Rate (q) at TC: 4.19 in./hr.

Peak Discharge:
1.008qA(acres): 189. cfs

Discharge Location:

WG 3-MAR-86

APPENDIX 3

Hydraulics
HEC-2 Models

```
**********************************************************
*  WATER SURFACE PROFILES                                *
*  VERSION OF NOVEMBER 1976                              *
*  UPDATED MARCH 1982                                    *
*                                                        *
*  RUN DATE 15-MAY-86  TIME 09:29:22                     *
**********************************************************
```


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


```
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
```

WASH A4

THIS RUN EXECUTED 15-MAY-86 09:29:33

```
**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
  ERROR CORR -  01,02,03,04,05
  MODIFICATION -  50,51,52,53,54,55
**************************************************
```

T1 NEW TUCSON-UNIT 21
T2 DJA JOB NO 84-077.01
T3 FILE WASHA4.DAT

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	0.	0.	0.	-1.000000	0.00	0.0	313.	3421.180	0.000
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	-1.000	0.000	-1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
J3	VARIABLE CODES FOR SUMMARY PRINTOUT									
	150.000	38.000	42.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.060	0.060	0.035	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	1000.000	8.000	4810.000	5100.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	3424.000	4810.000	3424.000	4900.000	3422.000	4955.000	3420.000	4990.000	3419.500	5000.000
GR	3420.000	5015.000	3424.000	5060.000	3426.000	5100.000	0.000	0.000	0.000	0.000
X1	1280.000	7.000	4900.000	5220.000	350.000	180.000	280.000	0.000	0.000	0.000
GR	3430.000	4900.000	3428.000	4970.000	3426.000	4985.000	3425.000	5000.000	3426.000	5015.000
GR	3428.000	5220.000	3430.000	5280.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	1680.000	8.000	4920.000	5110.000	380.000	420.000	400.000	0.000	0.000	0.000
GR	3436.000	4920.000	3434.000	4960.000	3432.000	4990.000	3430.500	5000.000	3432.000	5030.000
GR	3434.000	5055.000	3436.000	5070.000	3438.000	5110.000	0.000	0.000	0.000	0.000
X1	2080.000	9.000	4700.000	5070.000	400.000	400.000	400.000	0.000	0.000	0.000
GR	3444.000	4700.000	3442.000	4920.000	3440.000	4960.000	3438.000	4975.000	3437.000	5000.000
GR	3438.000	5010.000	3440.000	5040.000	3442.000	5050.000	3444.000	5070.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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= 0.100 CEHV= 0.300
*SECNO 1000.000
3720 CRITICAL DEPTH ASSUMED

1000.00	1.69	3421.19	3421.19	3421.18	3421.67	0.48	0.00	0.00	3424.00
313.	0.	313.	0.	0.	56.	0.	0.	0.	3426.00
0.00	0.00	5.57	0.00	0.060	0.035	0.060	0.000	3419.50	4969.21
0.018428	0.	0.	0.	0	4	0	0.00	59.15	5028.36

*SECNO 1280.000

1280.00	1.78	3426.78	3426.75	0.00	3427.08	0.30	5.39	0.02	3430.00
313.	0.	313.	0.	0.	72.	0.	0.	1.	3428.00
0.02	0.00	4.37	0.00	0.060	0.035	0.060	0.000	3425.00	4979.17
0.020117	350.	280.	180.	5	8	0	0.00	115.52	5094.69

*SECNO 1680.000

1680.00	2.20	3432.70	0.00	0.00	3433.06	0.36	5.97	0.02	3436.00
313.	0.	313.	0.	0.	65.	0.	1.	1.	3438.00
0.04	0.00	4.82	0.00	0.060	0.035	0.060	0.000	3430.50	4979.46
0.011505	380.	400.	420.	5	0	0	0.00	59.32	5038.78

*SECNO 2080.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2080.00	1.83	3438.83	3438.83	0.00	3439.35	0.52	5.73	0.05	3444.00
313.	0.	313.	0.	0.	54.	0.	2.	2.	3444.00
0.06	0.00	5.78	0.00	0.060	0.035	0.060	0.000	3437.00	4968.79
0.018352	400.	400.	400.	3	15	0	0.00	53.62	5022.41

THIS RUN EXECUTED 15-MAY-86 09:29:43

```
**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
  ERROR CORR -  01,02,03,04,05
  MODIFICATION -  50,51,52,53,54,55
**************************************************
```

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

WASHA4.DAT

SUMMARY PRINTOUT

	SECNO	ELMIN	CWSEL
*	1000.000	3419.50	3421.19
	1280.000	3425.00	3426.78
	1680.000	3430.50	3432.70
*	2080.000	3437.00	3438.83

WASHA4.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	1000.000	0.00	0.00	0.00	3419.50	313.00	3421.19	3421.19	3421.67	184.28	5.57	56.24	23.0
	1280.000	280.00	0.00	0.00	3425.00	313.00	3426.78	3426.75	3427.08	201.17	4.37	71.57	22.0
	1680.000	400.00	0.00	0.00	3430.50	313.00	3432.70	0.00	3433.06	115.05	4.82	64.89	29.18
*	2080.000	400.00	0.00	0.00	3437.00	313.00	3438.83	3438.83	3439.35	183.52	5.78	54.16	23.1

15-MAY-86 09:29:26 PAGE 5

WASHA4.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	1000.000	313.00	3421.19	0.00	0.00	0.01	59.15	0.00
	1280.000	313.00	3426.78	0.00	5.59	0.00	115.52	280.00
	1680.000	313.00	3432.70	0.00	5.92	0.00	59.32	400.00
*	2080.000	313.00	3438.83	0.00	6.13	0.00	53.62	400.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1000.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 2080.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2080.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

```
**********************************************
*  WATER SURFACE PROFILES                    *
*  VERSION OF NOVEMBER 1976                  *
*  UPDATED MARCH 1982                        *
*                                            *
*  RUN DATE 12-MAR-86  TIME 16:57:02         *
**********************************************
```


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


```
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
```

WASH A5

THIS RUN EXECUTED 12-MAR-86 16:57:04

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
  ERROR CORR -  01,02,03,04,05
  MODIFICATION -  50,51,52,53,54,55
**************************************************

T1 NEW TUCSON-UNIT 21
T2 DJA JOB NO 84-077.01
T3 FILE WASHA5.DAT

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.        0.        0.        0. -1.000000      0.00      0.0     200.  3416.900     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    -1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   150.000    38.000    42.000     1.000     0.000     0.000     0.000     0.000     0.000     0.000


NC     0.060     0.060     0.035     0.100     0.300     0.000     0.000     0.000     0.000     0.000
X1  1000.000     7.000  4930.000  5065.000     0.000     0.000     0.000     0.000     0.000     0.000
GR  3420.000  4930.000  3418.000  4960.000  3416.000  4980.000  3415.500  5000.000  3416.000  5010.000
GR  3418.000  5030.000  3420.000  5065.000     0.000     0.000     0.000     0.000     0.000     0.000

X1  1250.000     9.000  4860.000  5100.000   240.000   260.000   250.000     0.000     0.000     0.000
GR  3426.000  4860.000  3424.000  4930.000  3422.000  4960.000  3420.000  4990.000  3419.000  5000.000
GR  3420.000  5010.000  3422.000  5025.000  3424.000  5040.000  3426.000  5100.000     0.000     0.000

X1  1490.000     9.000  4810.000  5080.000   220.000   250.000   240.000     0.000     0.000     0.000
GR  3431.000  4810.000  3430.000  4930.000  3428.000  4960.000  3426.000  4980.000  3423.500  5000.000
GR  3426.000  5010.000  3428.000  5020.000  3430.000  5050.000  3431.000  5080.000     0.000     0.000

X1  1820.000    11.000  4830.000  5080.000   280.000   350.000   330.000     0.000     0.000     0.000
GR  3437.000  4830.000  3436.000  4910.000  3434.000  4960.000  3432.000  4985.000  3430.000  4995.000
GR  3429.700  5000.000  3430.000  5005.000  3432.000  5010.000  3434.000  5020.000  3436.000  5040.000
GR  3437.000  5080.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

X1  2120.000     9.000  4850.000  5150.000   290.000   310.000   300.000     0.000     0.000     0.000
GR  3443.000  4850.000  3442.000  4925.000  3440.000  4965.000  3438.000  4985.000  3436.000  5000.000
GR  3438.000  5010.000  3440.000  5025.000  3442.000  5090.000  3443.000  5150.000     0.000     0.000

X1  2440.000     9.000  4765.000  5170.000   320.000   320.000   320.000     0.000     0.000     0.000
GR  3449.000  4765.000  3448.000  4860.000  3446.000  4970.000  3444.000  4995.000  3443.000  5000.000
GR  3444.000  5005.000  3446.000  5040.000  3448.000  5085.000  3449.000  5170.000     0.000     0.000
```

X1	2720.000	7.000	4815.000	5150.000	260.000	300.000	280.000	0.000	0.000	0.000
GR	3454.000	4815.000	3452.000	4930.000	3450.000	4980.000	3449.500	5000.000	3450.000	5005.000
3R	3452.000	5040.000	3454.000	5150.000	0.000	0.000	0.000	0.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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= 0.100 CEHV= 0.300

*SECNO 1000.000

3720 CRITICAL DEPTH ASSUMED

1000.00	1.31	3416.81	3416.81	3416.90	3417.23	0.42	0.00	0.00	3420.00
200.	0.	200.	0.	0.	38.	0.	0.	0.	3420.00
0.00	0.00	5.23	0.00	0.060	0.035	0.060	0.000	3415.50	4971.93
0.019557	0.	0.	0.	0	10	0	0.00	46.15	5018.07

*SECNO 1250.000

1250.00	1.99	3420.99	0.00	0.00	3421.36	0.37	4.13	0.01	3426.00
200.	0.	200.	0.	0.	41.	0.	0.	0.	3426.00
0.01	0.00	4.91	0.00	0.060	0.035	0.060	0.000	3419.00	4975.18
0.014113	240.	250.	260.	4	0	0	0.00	42.23	5017.41

*SECNO 1490.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1490.00	2.32	3425.82	3425.82	0.00	3426.42	0.60	3.80	0.07	3431.00
200.	0.	200.	0.	0.	32.	0.	0.	0.	3431.00
0.02	0.00	6.21	0.00	0.060	0.035	0.060	0.000	3423.50	4981.46
0.017921	220.	240.	250.	3	11	0	0.00	27.81	5009.27

*SECNO 1820.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1820.00	2.05	3431.75	3431.75	0.00	3432.42	0.67	5.78	0.02	3437.00
200.	0.	200.	0.	0.	30.	0.	1.	1.	3437.00
0.04	0.00	6.57	0.00	0.060	0.035	0.060	0.000	3429.70	4986.26
0.017126	280.	330.	350.	4	15	0	0.00	23.10	5009.37

*SECNO 2120.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

2120.00	2.30	3438.30	3438.30	0.00	3438.86	0.56	5.22	0.01	3443.00
200.	0.	200.	0.	0.	33.	0.	1.	1.	3443.00
0.05	0.00	5.98	0.00	0.060	0.035	0.060	0.000	3436.00	4981.95
0.017715	290.	300.	310.	9	8	0	0.00	30.34	5012.29

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 2440.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2440.00	2.18	3445.18	3445.18	0.00	3445.62	0.44	6.04	0.01	3449.00
200.	0.	200.	0.	0.	38.	0.	1.	1.	3449.00
0.07	0.00	5.30	0.00	0.060	0.035	0.060	0.000	3443.00	4980.24
0.020142	320.	320.	320.	9	11	0	0.00	45.43	5025.67

*SECNO 2720.000

2720.00	1.34	3450.84	3450.83	0.00	3451.18	0.34	5.55	0.01	3454.00
200.	0.	200.	0.	0.	43.	0.	1.	1.	3454.00
0.09	0.00	4.68	0.00	0.060	0.035	0.060	0.000	3449.50	4958.78
0.019537	260.	280.	300.	5	14	0	0.00	61.07	5019.85

THIS RUN EXECUTED 12-MAR-86 16:57:12

****
HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
ERROR CORR - 01,02,03,04,05
MODIFICATION - 50,51,52,53,54,55
****

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

WASHA5.DAT

SUMMARY PRINTOUT

	SECNO	ELMIN	CWSEL
*	1000.000	3415.50	3416.81
	1250.000	3419.00	3420.99
*	1490.000	3423.50	3425.82
*	1820.000	3429.70	3431.75
*	2120.000	3436.00	3438.30
*	2440.000	3443.00	3445.18
	2720.000	3449.50	3450.84

WASHA5.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	1000.000	200.00	3416.81	0.00	0.00	-0.09	46.15	0.00
	1250.000	200.00	3420.99	0.00	4.18	0.00	42.23	250.00
*	1490.000	200.00	3425.82	0.00	4.83	0.00	27.81	240.00
*	1820.000	200.00	3431.75	0.00	5.93	0.00	23.10	330.00
*	2120.000	200.00	3438.30	0.00	6.56	0.00	30.34	300.00
*	2440.000	200.00	3445.18	0.00	6.88	0.00	45.43	320.00
	2720.000	200.00	3450.84	0.00	5.66	0.00	61.07	280.00

WASHA5.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	1000.000	0.00	0.00	0.00	3415.50	200.00	3416.81	3416.81	3417.23	195.57	5.23	38.24	14.30
	1250.000	250.00	0.00	0.00	3419.00	200.00	3420.99	0.00	3421.36	141.13	4.91	40.74	16.84
*	1490.000	240.00	0.00	0.00	3423.50	200.00	3425.82	3425.82	3426.42	179.21	6.21	32.22	14.94
*	1820.000	330.00	0.00	0.00	3429.70	200.00	3431.75	3431.75	3432.42	171.26	6.57	30.42	15.28
*	2120.000	300.00	0.00	0.00	3436.00	200.00	3438.30	3438.30	3438.86	177.15	5.98	33.44	15.03
*	2440.000	320.00	0.00	0.00	3443.00	200.00	3445.18	3445.18	3445.62	201.42	5.30	37.72	14.09
	2720.000	280.00	0.00	0.00	3449.50	200.00	3450.84	3450.83	3451.18	195.37	4.68	42.77	14.31

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**********************************************************
*  WATER SURFACE PROFILES                                *
*  VERSION OF NOVEMBER 1976                              *
*  UPDATED MARCH 1982                                    *
*                                                        *
*  RUN DATE 17-MAR-86  TIME 09:14:14                     *
**********************************************************
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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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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
```

WASH B

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1000.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 1490.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1490.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1820.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1820.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2120.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2120.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2440.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2440.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

17-MAR-86 09:14:15 PAGE 1

THIS RUN EXECUTED 17-MAR-86 09:14:15

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**************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
 ERROR CORR - 01,02,03,04,05
 MODIFICATION - 50,51,52,53,54,55
**************************************************

T1 NEW TUCSON-UNIT 21
T2 DJA JOB NO 84-077.01
T3 FILE WASHB.DAT

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        0.        0.        0. -1.000000      0.00      0.0    3196.  3410.900     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     -1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150.000    38.000    42.000     1.000     0.000     0.000     0.000     0.000     0.000     0.000


NC      0.060     0.060     0.035     0.100     0.300     0.000     0.000     0.000     0.000     0.000
X1   1000.000     9.000  4730.000  5070.000     0.000     0.000     0.000     0.000     0.000     0.000
GR   3411.700  4730.000  3410.000  4850.000  3411.000  4920.000  3410.000  4950.000  3408.000  4960.000
GR   3406.000  5000.000  3408.000  5025.000  3410.000  5030.000  3412.000  5070.000     0.000     0.000

X1   1270.000    10.000  4730.000  5030.000   270.000   270.000   270.000     0.000     0.000     0.000
GR   3418.000  4730.000  3416.000  4780.000  3414.000  4820.000  3415.000  4910.000  3414.000  4960.000
GR   3412.000  4970.000  3411.000  5000.000  3414.000  5015.000  3416.000  5025.000  3418.000  5030.000

X1   1570.000     8.000  4720.000  5220.000   180.000   400.000   300.000     0.000     0.000     0.000
GR   3420.500  4720.000  3418.000  4875.000  3419.000  4950.000  3418.000  4975.000  3416.000  5000.000
GR   3418.000  5025.000  3420.000  5065.000  3422.000  5220.000     0.000     0.000     0.000     0.000

X1   1890.000     9.000  4890.000  5270.000   360.000   230.000   320.000     0.000     0.000     0.000
GR   3428.000  4890.000  3426.000  4955.000  3424.000  4970.000  3422.000  4980.000  3421.500  5000.000
GR   3422.000  5020.000  3424.000  5085.000  3426.000  5220.000  3428.000  5270.000     0.000     0.000

X1   2230.000     9.000  4840.000  5120.000   350.000   310.000   330.000     0.000     0.000     0.000
GR   3434.000  4840.000  3432.000  4925.000  3430.000  4950.000  3428.000  4975.000  3427.000  5000.000
GR   3428.000  5015.000  3430.000  5020.000  3432.000  5065.000  3434.000  5120.000     0.000     0.000

X1   2480.000    10.000  4785.000  5075.000   150.000   350.000   250.000     0.000     0.000     0.000
GR   3437.000  4785.000  3436.000  4840.000  3436.000  4920.000  3434.000  4970.000  3432.000  4980.000
GR   3432.000  5000.000  3432.000  5020.000  3434.000  5040.000  3436.000  5055.000  3438.000  5075.000
```

X1	2760.000	11.000	4925.000	5130.000	350.000	220.000	280.000	0.000	0.000	0.000
GR	3442.000	4925.000	3440.000	4945.000	3439.000	4960.000	3440.000	4980.000	3438.000	4995.000
GR	3437.200	5000.000	3438.000	5015.000	3440.000	5035.000	3439.000	5080.000	3440.000	5120.000
GR	3442.000	5130.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	3080.000	7.000	4780.000	5080.000	320.000	400.000	360.000	0.000	0.000	0.000
GR	3447.000	4780.000	3446.000	4860.000	3444.000	4985.000	3443.000	5000.000	3444.000	5025.000
GR	3446.000	5050.000	3448.000	5080.000	0.000	0.000	0.000	0.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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= 0.100 CEHV= 0.300

*SECNO 1000.000

3720 CRITICAL DEPTH ASSUMED

1000.00	5.19	3411.19	3411.19	3410.90	3412.02	0.83	0.00	0.00	3411.70
3196.	0.	3196.	0.	0.	437.	0.	0.	0.	3412.00
0.00	0.00	7.31	0.00	0.060	0.035	0.060	0.000	3406.00	4766.31
0.017023	0.	0.	0.	0	7	0	0.00	287.40	5053.71

*SECNO 1270.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1270.00	4.82	3415.82	3415.82	0.00	3416.66	0.84	4.11	0.00	3418.00
3196.	0.	3196.	0.	0.	434.	0.	3.	2.	3418.00
0.01	0.00	7.36	0.00	0.060	0.035	0.060	0.000	3411.00	4783.55
0.013712	270.	270.	270.	3	10	0	0.00	240.56	5024.11

*SECNO 1570.000

1570.00	4.10	3420.10	0.00	0.00	3420.75	0.65	4.06	0.02	3420.50
3196.	0.	3196.	0.	0.	494.	0.	6.	4.	3422.00
0.02	0.00	6.46	0.00	0.060	0.035	0.060	0.000	3416.00	4745.10
0.013380	180.	300.	400.	3	0	0	0.00	327.27	5072.37

*SECNO 1890.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1890.00	3.97	3425.47	3425.47	0.00	3426.39	0.92	4.47	0.08	3428.00
3196.	0.	3196.	0.	0.	415.	0.	9.	6.	3428.00
0.03	0.00	7.70	0.00	0.060	0.035	0.060	0.000	3421.50	4958.98
0.014612	360.	320.	230.	3	8	0	0.00	225.16	5184.14

*SECNO 2230.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

2230.00	5.15	3432.15	3432.15	0.00	3433.36	1.21	4.64	0.09	3434.00
3196.	0.	3196.	0.	0.	362.	0.	12.	7.	3434.00
0.04	0.00	8.84	0.00	0.060	0.035	0.060	0.000	3427.00	4918.69
0.013536	350.	330.	310.	4	11	0	0.00	150.39	5069.08

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 2480.000

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2480.00	4.45	3436.45	3436.45	0.00	3437.36	0.90	3.65	0.03	3437.00
3196.	0.	3196.	0.	0.	419.	0.	14.	8.	3438.00
0.05	0.00	7.63	0.00	0.060	0.035	0.060	0.000	3432.00	4815.09
0.015772	150.	250.	350.	2	15	0	0.00	244.44	5059.53

*SECNO 2760.000

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2760.00	4.14	3441.34	3441.34	0.00	3442.38	1.04	4.28	0.04	3442.00
3196.	0.	3196.	0.	0.	390.	0.	17.	10.	3442.00
0.06	0.00	8.19	0.00	0.060	0.035	0.060	0.000	3437.20	4931.65
0.014838	350.	280.	220.	3	15	0	0.00	195.03	5126.68

*SECNO 3080.000

3080.00	3.87	3446.87	3446.83	0.00	3447.65	0.78	5.24	0.03	3447.00
3196.	0.	3196.	0.	0.	450.	0.	20.	12.	3448.00
0.08	0.00	7.10	0.00	0.060	0.035	0.060	0.000	3443.00	4790.68
0.014304	320.	360.	400.	4	12	0	0.00	272.32	5063.00

17-MAR-86 09:14:15 PAGE 5

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HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
ERROR CORR - 01,02,03,04,05
MODIFICATION - 50,51,52,53,54,55
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

WASHB.DAT

SUMMARY PRINTOUT

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*	1270.000	3411.00	3415.82
	1570.000	3416.00	3420.10
*	1890.000	3421.50	3425.47
*	2230.000	3427.00	3432.15
*	2480.000	3432.00	3436.45
*	2760.000	3437.20	3441.34
	3080.000	3443.00	3446.87

17-MAR-86 09:14:15 PAGE 6

WASHB.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	1000.000	0.00	0.00	0.00	3406.00	3196.00	3411.19	3411.19	3412.02	170.23	7.31	437.06	244.96
*	1270.000	270.00	0.00	0.00	3411.00	3196.00	3415.82	3415.82	3416.66	137.12	7.36	434.40	272.93
	1570.000	300.00	0.00	0.00	3416.00	3196.00	3420.10	0.00	3420.75	133.80	6.46	494.48	276.30
*	1890.000	320.00	0.00	0.00	3421.50	3196.00	3425.47	3425.47	3426.39	146.12	7.70	414.80	264.40
*	2230.000	330.00	0.00	0.00	3427.00	3196.00	3432.15	3432.15	3433.36	135.36	8.84	361.55	274.70
*	2480.000	250.00	0.00	0.00	3432.00	3196.00	3436.45	3436.45	3437.36	157.72	7.63	419.03	254.49
*	2760.000	280.00	0.00	0.00	3437.20	3196.00	3441.34	3441.34	3442.38	148.38	8.19	390.08	262.37
	3080.000	360.00	0.00	0.00	3443.00	3196.00	3446.87	3446.83	3447.65	143.04	7.10	450.30	267.23

17-MAR-86 09:14:15 PAGE 7

WASHB.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	1000.000	3196.00	3411.19	0.00	0.00	0.29	287.40	0.00
*	1270.000	3196.00	3415.82	0.00	4.64	0.00	240.56	270.00
	1570.000	3196.00	3420.10	0.00	4.27	0.00	327.27	300.00
*	1890.000	3196.00	3425.47	0.00	5.37	0.00	225.16	320.00
*	2230.000	3196.00	3432.15	0.00	6.68	0.00	150.39	330.00
*	2480.000	3196.00	3436.45	0.00	4.30	0.00	244.44	250.00
*	2760.000	3196.00	3441.34	0.00	4.88	0.00	195.03	280.00
	3080.000	3196.00	3446.87	0.00	5.53	0.00	272.32	360.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1000.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 1270.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1270.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1890.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1890.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2230.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2230.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2480.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2480.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2760.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2760.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

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*  VERSION OF NOVEMBER 1976                              *
*  UPDATED MARCH 1982                                    *
*                                                        *
*  RUN DATE 12-MAR-86  TIME 17:00:29                     *
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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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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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WASH C1

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T1 NEW TUCSON-UNIT 21
T2 DJA JOB NO 84-077.01
T3 FILE WASHC1.DAT

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        0.        0.        0. -1.000000      0.00      0.0     189.  3423.300     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     -1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

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NC      0.060     0.060     0.035     0.100     0.300     0.000     0.000     0.000     0.000     0.000
X1   1000.000     5.000  4890.000  5140.000     0.000     0.000     0.000     0.000     0.000     0.000
GR   3426.000  4890.000  3424.000  4935.000  3422.000  5000.000  3424.000  5035.000  3426.000  5140.000

X1   1260.000     7.000  4830.000  5290.000   260.000   260.000   260.000     0.000     0.000     0.000
GR   3433.000  4830.000  3432.000  4875.000  3430.000  4910.000  3429.000  5000.000  3430.000  5125.000
GR   3432.000  5205.000  3433.000  5290.000     0.000     0.000     0.000     0.000     0.000     0.000

X1   1570.000     7.000  4775.000  5230.000   340.000   270.000   310.000     0.000     0.000     0.000
GR   3439.500  4775.000  3438.000  4840.000  3436.000  4885.000  3434.200  5000.000  3436.000  5100.000
GR   3438.000  5160.000  3439.000  5230.000     0.000     0.000     0.000     0.000     0.000     0.000
EJ      0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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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= 0.100 CEHV= 0.300

*SECNO 1000.000

3720 CRITICAL DEPTH ASSUMED

1000.00	1.28	3423.28	3423.28	3423.30	3423.61	0.33	0.00	0.00	3426.00
189.	0.	189.	0.	0.	41.	0.	0.	0.	3426.00
0.00	0.00	4.62	0.00	0.060	0.035	0.060	0.000	3422.00	4958.42
0.021496	0.	0.	0.	0	4	0	0.00	63.98	5022.39

*SECNO 1260.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1260.00	0.72	3429.72	3429.72	0.00	3429.90	0.18	6.07	0.02	3433.00
189.	0.	189.	0.	0.	55.	0.	0.	1.	3433.00
0.02	0.00	3.42	0.00	0.060	0.035	0.060	0.000	3429.00	4935.42
0.025408	260.	260.	260.	5	11	0	0.00	154.27	5089.69

*SECNO 1570.000

1570.00	1.01	3435.21	0.00	0.00	3435.36	0.15	5.46	0.00	3439.50
189.	0.	189.	0.	0.	62.	0.	1.	2.	3439.00
0.05	0.00	3.07	0.00	0.060	0.035	0.060	0.000	3434.20	4935.14
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HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
ERROR CORR - 01,02,03,04,05
MODIFICATION - 50,51,52,53,54,55
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

WASHC1.DAT

SUMMARY PRINTOUT

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*	1260.000	3429.00	3429.72
	1570.000	3434.20	3435.21

WASHC1.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	1000.000	0.00	0.00	0.00	3422.00	189.00	3423.28	3423.28	3423.61	214.96	4.62	40.92	12.89
*	1260.000	260.00	0.00	0.00	3429.00	189.00	3429.72	3429.72	3429.90	254.08	3.42	55.33	11.86
	1570.000	310.00	0.00	0.00	3434.20	189.00	3435.21	0.00	3435.36	129.12	3.07	61.56	16.63

WASHC1.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	1000.000	189.00	3423.28	0.00	0.00	-0.02	63.98	0.00
*	1260.000	189.00	3429.72	0.00	6.44	0.00	154.27	260.00
	1570.000	189.00	3435.21	0.00	5.50	0.00	121.26	310.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1000.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 1260.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1260.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

EROSION-HAZARD SETBACK ANALYSIS

for

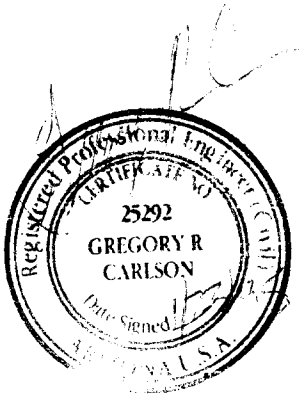
UNIT 23
NEW TUCSON
LOTS 212 & 219 through 227

(Job Number: 94-517)

JANUARY, 1995

Prepared for:

Canyon State Equity, Inc.
5832 East Mabel
Tucson, Arizona 85712



Prepared by:

Martin-McIntosh, L.L.C.
LAND SURVEYING • PHOTOGRAMMETRY
CIVIL ENGINEERING • GIS • GPS • PLANNING
LANDSCAPE ARCHITECTURE

SITE REVIEW REQUEST
PIMA COUNTY FLOOD CONTROL DISTRICT
201 NORTH STONE AVENUE
TUCSON, ARIZONA 85701

TO BE FILLED OUT BY REQUESTOR (PLEASE PRINT CLEARLY):

DATE	TOWNSHIP	RANGE	SECTION	TAX CODE
11-18-94	17	16	4	

	LAST NAME	FIRST NAME	PHONE
SITE OWNER:	CANYON STATE EQUITY		
REQUESTOR:	MARTIN McINTOSH		624-4403

	ADDRESS	CITY	ST	ZIP
SITE:				
REQUESTOR:	450 W. Paseo Redondo Suite 201	Tucson	AZ	85701

SUBDIVISION & LOT # (OR OTHER LEGAL DESCRIPTION) -->	UNIT 23 NEW TUCSON LOTS 212 & 219 THRU 227
DESCRIPTION OF PROPOSED USE OF PROPERTY -->	SINGLE FAMILY RESIDENCES
DESCRIPTION OF ANY SUPPORTING INFORMATION BEING SUBMITTED->	EROSION HAZARD SETBACK ANALYSIS JOB # 94-517

The undersigned requests information regarding the requirements of the PIMA COUNTY FLOODPLAIN AND EROSION HAZARD MANAGEMENT ORDINANCE, NO. 1988-FC2, FOR PIMA COUNTY, ARIZONA (the Ordinance) for new construction or substantial improvement of the referenced property based on the proposed use of the property indicated above.

REQUESTOR SIGNATURE-> [signature]

THIS PORTION AND REVERSE TO BE COMPLETED BY FLOOD CONTROL DISTRICT:

RECD BY	DATE RECD	NUMBER	CODES	ZONES	PANEL / DATE	PREPARED BY / DATE
SS	11/18/94	94-226	SFR's	C	3475B 2/15/83	[signature] 1/31/95

THIS IS NOT A FLOODPLAIN USE PERMIT The information on the reverse is provided regarding requirements of the Ordinance for new construction or substantial improvement of the referenced property. The information on the reverse is provided to assist interested parties in understanding the general and most common conditions associated with the floodplain use permitting process which might affect the usability and/or value of the property. This information is provided based on the planned site use indicated above (if any) but without the benefit of an application for a permit for a specific use (e.g., house, fence, mobile home etc.) and is for that reason only for general information purposes. Other conditions may apply depending on the specific use. This information is subject to change without notice as property, technical or regulatory conditions change. A floodplain use permit is required for any specific uses within the floodplain and such permit can and most likely will contain specific conditions for specific uses. This information is not valid unless signed below by a representative of the Pima County Flood Control District.

SIGNED	[signature]	DATE	1/31/95

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THIS IS NOT A FLOODPLAIN USE PERMIT

The following information is provided in response to the SITE REVIEW REQUEST on the reverse and provides information regarding requirements of the PIMA COUNTY FLOODPLAIN AND EROSION HAZARD MANAGEMENT ORDINANCE, NO. 1988-FC2, FOR PIMA COUNTY ARIZONA for new construction or substantial improvement of the referenced property:

GENERAL INFORMATION AND REQUIREMENTS (applicable to all floodplain uses)

Any activity will have to meet the requirements of the floodplain and erosion HAZARD MANAGEMENT ORDINANCE NO.1988-FC2 FOR PIMA COUNTY, ARIZONA. When a permit is issued for a use it is valid for a period of one (1) year from the date of approval unless otherwise indicated. Permits can be revoked subject to the provisions of Article VII, Part G of the Ordinance.

When a permit is issued for a use the applicant assumes responsibility for all aspects of the work to be performed and certifies that any and all federal, state and other local permits required for the activity. Natural drainage cannot be altered, disturbed or obstructed, other than as allowed on an issued permit.

SPECIFIC INFORMATION AND REQUIREMENTS (applicable to the property described on reverse)

Specific information and requirements for Site Review No. 94-226 :

Floodplain Use Permits will be issued for Lots: 212, 219, 220, 221, 222, 223, 224, 225, 226, 227, of Unit 23, New Tucson provided improvements are constructed according to the specifications outlined in the Erosion Hazard Setback Analysis (Job Number: 94-517) prepared by; Gregory R. Carlson, P.E. dated January 23, 1995 , of Martin McIntosh L.L.C. Applicants for Floodplain Use Permits must reference this report

Building envelopes, building pads, finished floor elevations and bank protection is to be as shown on the respective Finished Pad Plan/Profile, drawn for each lot.

The recording of certain Covenants and Restrictions which run with the land and are to be considered as conditions upon which these Floodplain Use Permits will be issued.

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EROSION-HAZARD SETBACK ANALYSIS

for

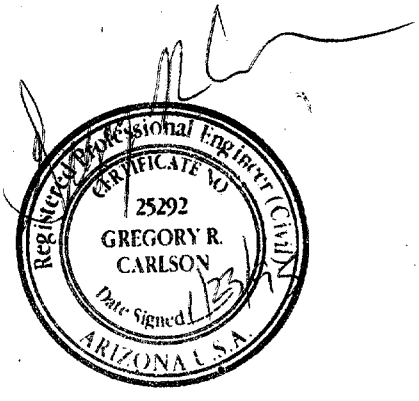
UNIT 23
NEW TUCSON
LOTS 212 & 219 through 227

(Job Number: 94-517)

JANUARY, 1995

Prepared for:

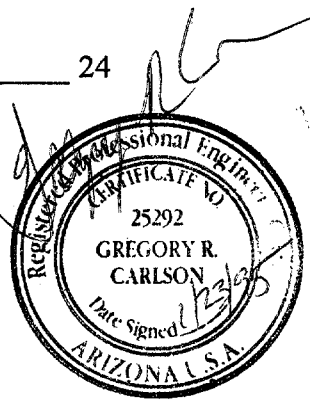
Canyon State Equity, Inc.
5832 East Mabel
Tucson, Arizona 85712



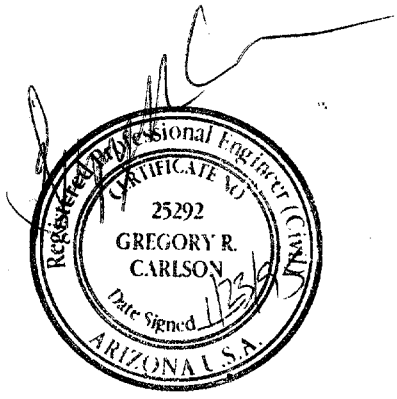
Prepared by:

Martin-McIntosh, L.L.C.
LAND SURVEYING • PHOTOGRAMMETRY
CIVIL ENGINEERING • GIS • GPS • PLANNING
LANDSCAPE ARCHITECTURE

TABLE OF CONTENTS



LIST OF FIGURES



1.0 INTRODUCTION

1.1 General

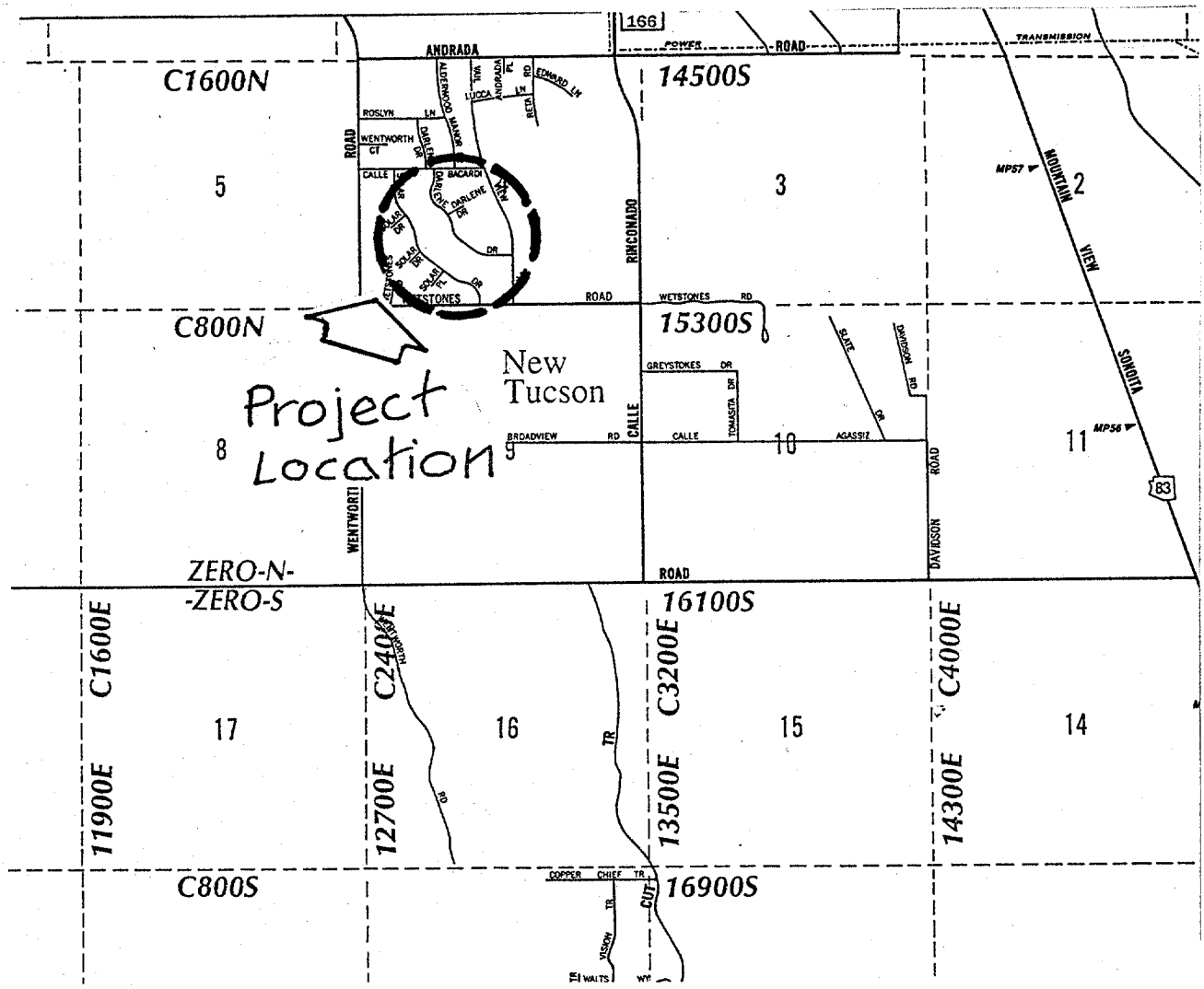
This report was prepared for the exclusive use of Canyon State Equity, Inc. and the Pima County Department of Transportation and Flood Control District for specific application to erosion hazard setback analysis for lots 212 and 219 through 227 located in Unit 23 at New Tucson. The report was prepared in accordance with generally accepted engineering practices. No other warranty, expressed or implied, is made.

1.2 Background of Project

This report has been performed utilizing information obtained from topographic maps, site inspections, previous studies (see section 3), and applicable Pima County publications.

1.3 Purpose of Report

This report is intended to support the development and the placement of houses on Lots 212 and 219 through 227 of New Tucson, Unit 23.



A portion of Section 4, Township 17 South, Range 16 East, Gila and Salt River Basin and Meridian, Pima County, Arizona.

FIGURE 1
Location Map

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2.0 PROJECT LOCATION & DESCRIPTION

2.1 Project Location

This report is intended for the specific application to lots 212, and 219 through 227 (see Figure 1) in Unit 23 of New Tucson (Book 17, page 43), being a portion of the south 1/2 of Section 4, Township 17 South, Range 16 East, Gila and Salt River Base and Meridian, Pima County, Arizona.

2.2 Project Description

2.2.1 Type of Present Use

The area is presently zoned CR-1 with one-acre single family residences intermingled with undeveloped lots. The West Section Line Road (Wentworth Road)and the South Section Line Road (Wetstones Road) are paved and the internal collector and local streets are unpaved.

2.2.2 General Description of Property

The whole area can be classified as desert foothills. Soils are from the Whitehouse-Bernadino-Caralampi association, which is composed of hydrologic soil groups 27% B, and 73% C.

2.2.3 Proposed Land Use

The proposed land use for lots 212 and 219 through 227 are single family residences on one acre (±) lots.

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3.0 PREVIOUS STUDIES

This report utilized information provided in the report entitled "Hydrologic and Hydraulic Report for Units 22, 23, and 24 at New Tucson" prepared by Dooley Jones and Associates in August 1985, revised December 1985 (see Appendix). The hydrologic and hydraulic (HEC-2) models generated in the DJA report were used as a basis for design for the erosion-hazard setback and floodplain encroachment analysis.

Figure 2 is the recorded plat for New Tucson Unit 23 (Book 17, page 43).

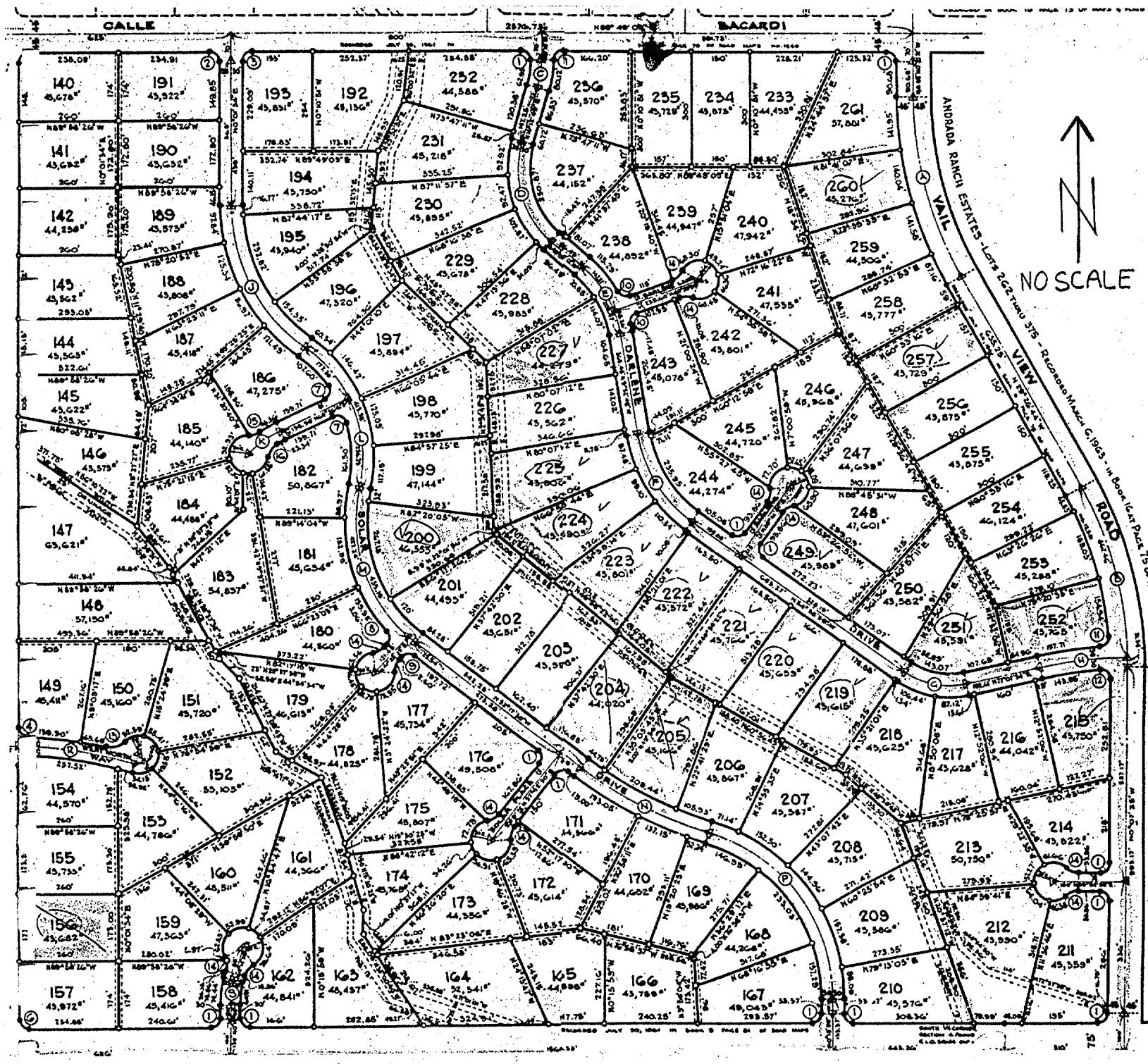


Figure 2
Plat Map for New Tucson
Unit 23
Book 17, Page 43

4.0 OFF-SITE HYDROLOGY

4.1 Previous Studies

The offsite hydrology is addressed in the "Hydrologic and Hydraulic Report for Units 22, 23, and 24 at New Tucson" prepared by Dooley Jones and Associates in August 1985, revised December 1985 (see Appendix). 100-year peak discharges and locations based on DJA results are shown on Figure 3.

5.0 LEVEL I ANALYSIS

The 100-year discharge floodplain limits (see Figure 3), were determined from information provided in the "Hydrologic and Hydraulic Report for Units 22, 23, and 24 at New Tucson" prepared by Dooley Jones and Associates in August 1985, revised December 1985 (see Appendix).

5.1 Geomorphic Relationships

The watercourse which flows through Lots 212 and 219 through 227 is a straight channel (sinuosity < 1.5) with a sinuosity of 1.1. The channel contains areas of local braiding where overbank breakout occurs and a bar braided channel pattern is more apparent. The channel bed is well defined and composed of sands and sandy gravels with the intermittent presence of small cobbles. The channel banks are generally low (less than 5 ft) with well established vegetation. Island and bar formations are evident throughout the study reach.

The Q_{100} discharge for the channel is 3228 cfs as determined by the DJA Study and the average bed slope is 0.02 ft/ft. Applying this data to both Leopold/Wolman's criteria (1957) as well as Lane's (1957), the channel is considered braided. It should be remembered that the Leopold/Wolman and Lane relationships were derived from data on perennial channels, rather than ephemeral washes which are common in Arizona, so classification based on those criteria should be performed based on the knowledge of their derivation.

5.2 Past Lateral Channel Movement

Aerial photographs were used to determine if the wash shown on Figure 3 is susceptible to lateral movement resulting from flooding. As can be seen upon comparison of Figures 4 and 5, the wash has shown little to no lateral movement in the past 15 years.

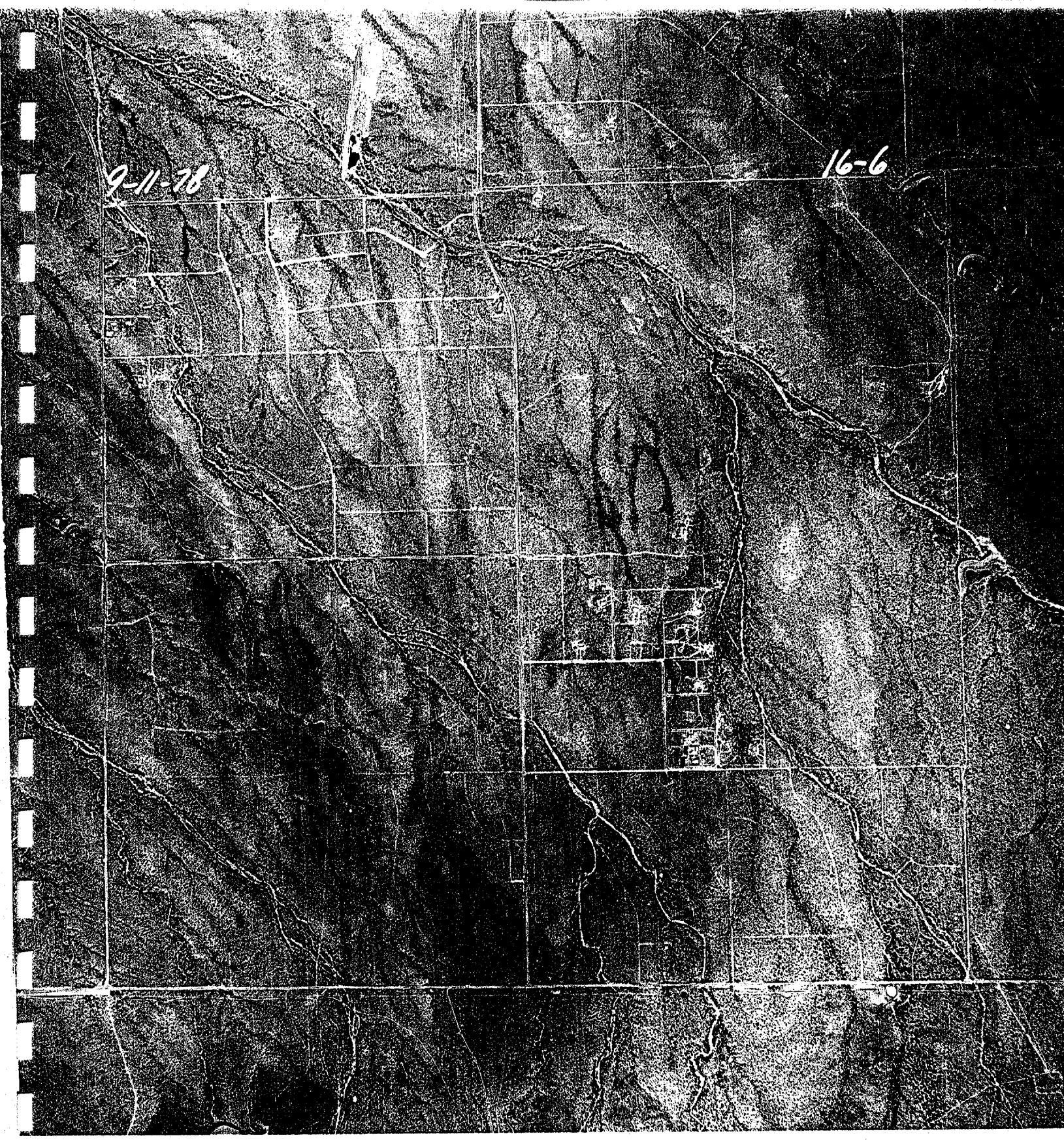


Figure 4
1978 Aerial Photo (Cooper Aerial)
of Section 4, T 17 S, R 16 E,
Gila & Salt River Basin & Meridian,
Pima County, Arizona

Figure 5
1993 Aerial Photo (Cooper Aerial)
of Section 4, T 17 S, R 16 E,
Gila & Salt River Basin & Meridian,
Pima County, Arizona

5.3 Field Assessment of the Existing Channel and Overbank

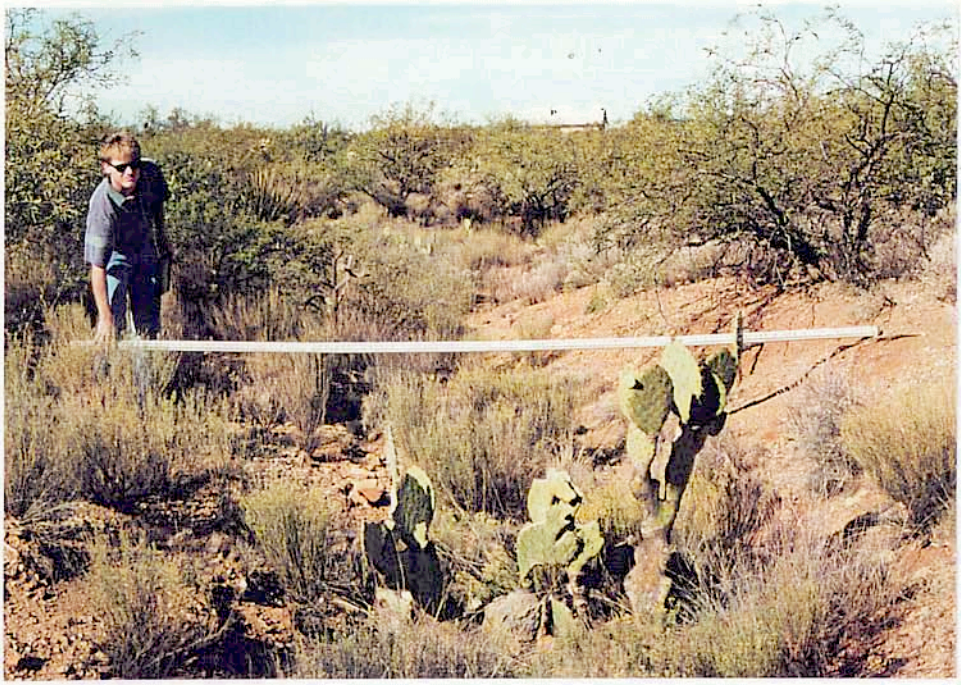
A field visit was made to the project site in order to identify any geologic formations that might control either horizontal or vertical channel movement. The following photographs (1 through 24) represent field conditions during a November 10, 1994 field visit. No natural or artificial bed controls were located within the study reach which could be used for pivot points in an equilibrium slope analysis.

In general the channel bed is well defined and composed of sands and sandy gravels, with intermittent occurrences of small cobbles. The shape of the sand and aggregate is slightly angular to slightly rounded. The channel banks possess mature vegetation with large trees.

Along some locations of the west bank behind Lots 226 and 227 caliche deposits were evidenced in the bank. There is no evidence of manmade disturbance to the watershed.

5.4 Level I Analysis Conclusions

All aspects of this Level 1 Analysis confirm the existence of a braided channel pattern. Braided channels are generally wide, have poorly defined banks, and consist of two or more main channels that cross one another giving the riverbed a braided appearance at low flow. These channels have sinuosity ratios less than 1.5 and exhibit steeper slopes than meandering channels. Braiding is generally believed to result primarily from random deposition of sediment transported during high flows in quantities or sizes too great for continued transport during low flows.



Photograph 1 - View from Lot 223 looking downstream showing the small arroyo near front of lot. Notice stable vegetation in thalwag and on banks.

Photograph 2 - Close up of Photo 1. Exhibitor is holding 18 ft.

Photograph 3 - Looking upstream at primary channel behind Lot 223. Marks on rod indicate 1 ft. Notice large trees on channel banks.

Photograph 4 - Looking upstream behind Lot 221 at confluence of channel braid.

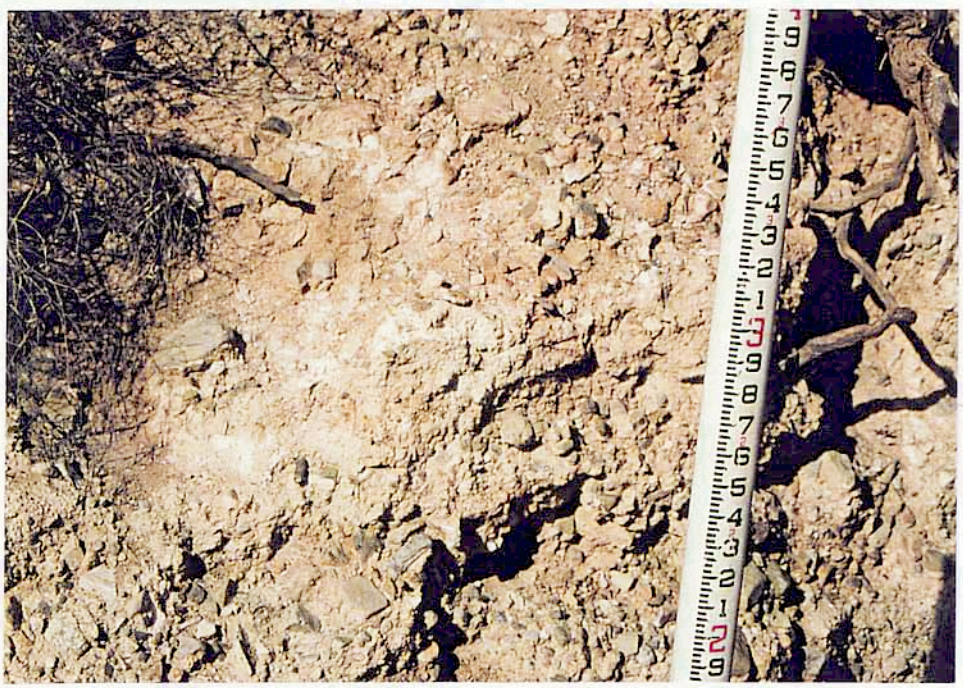
Photograph 5 - Looking upstream along western channel braid behind Lot 223.

Photograph 6 - Looking downstream from photo 5 position. Notice stable vegetation on left bank.

Photograph 7 - Looking downstream. Example of channel braiding near Lot 223.

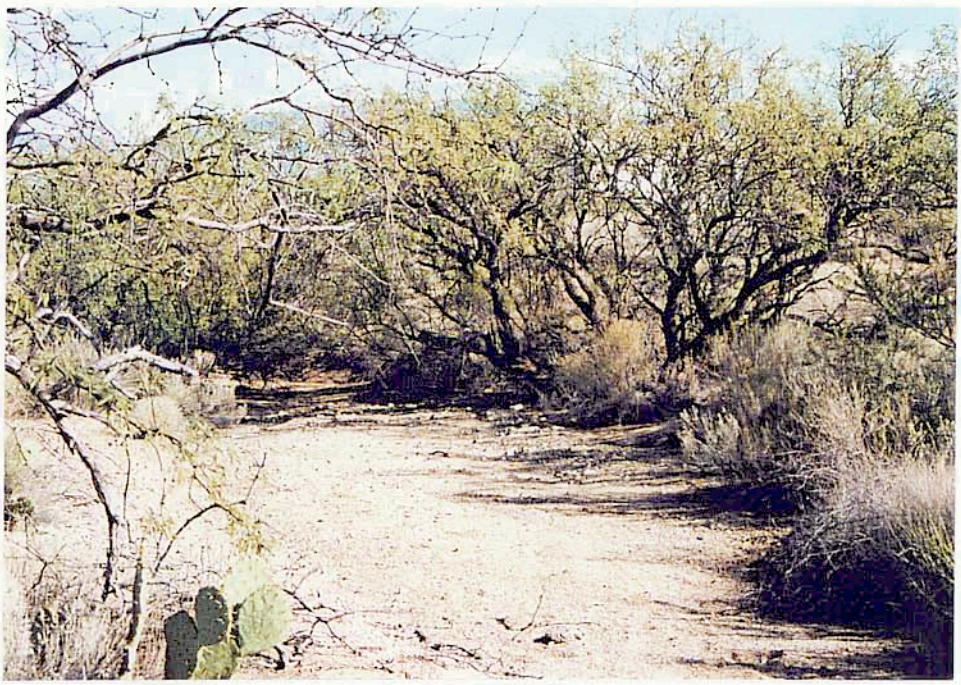
Photograph 8 - Same location as photo 7. Notice house elevation in background.

Photograph 9 - West Bank of primary channel behind Lot 226.



Photograph 10 - Close up of west bank located slightly downstream of photo 9, behind Lots 226 & 227. Notice calcification (white) of bank material.

Photograph 11 - View towards west side from channel bottom behind Lot 227.



Photograph 12 - View towards east side (road) at Lot 227 looking down channel braid.

Photograph 13 - Standing on Darlene, facing west looking into Lot 227.

Photograph 14 - Standing on Darlene facing west into Lot 223.

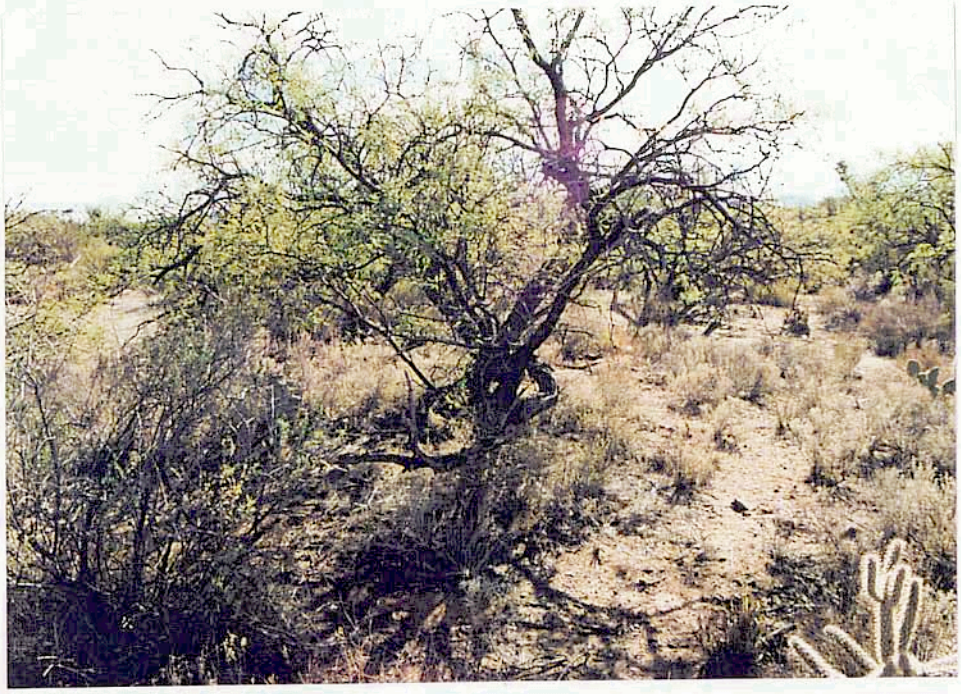
Photograph 15 - Thalwag of small arroyo near front of Lot 223. Looking upstream.

Photograph 16 - Standing in Lot 223 looking downstream into Lot 224.

Photograph 17 - Overbank soil on Lot 223.

Photograph 18 - Same as photo 17 with scale.

Photograph 19 - Primary channel soils - Lots 223 & 224



Photograph 20 - Channel braiding example. Standing on highspot at Lot 224 looking upstream.

Photograph 21 - Looking upstream of primary channel - Lot 219

Photograph 22 - Same location as photo 21 - looking downstream

Photograph 23 - Looking downstream at northeast bank of northeast braid behind Lot 212

Photograph 24 - Looking downstream at southwest bank of southwest braid at Lot 212

6.0 FLOODPLAIN ENCROACHMENTS

6.1 Introduction

As shown on Figure 3, the 100-year flood limits occupy a significant portion of the lots. Therefore, in order to accommodate a house site, some filling of the lots will be required. The intent of the house pad fills are to increase the pad area using fill material and provide erosion protection along the slopes in areas which could be affected by erosion. The proposed house pad fill envelopes range from 4,640 to 8,640 square feet in area so as to allow for flexibility in the selection of house models. The limits of the 100-year floodplain originated from the HEC-2 analysis used for the Dooley Jones Hydrologic and Hydraulic report. The Dooley Jones report and the HEC-2 run are located in the Appendix. Further analysis of the changes to the floodplain limits and hydraulics caused by the proposed encroachments was determined by the use of a Mannings Computer Model. Worksheets are located in Section 10.

6.2 Description of Parameters

6.2.1 Encroachment Requirements

Some of the pad fills encroach into the 100-year flood limits of the wash. Encroachments into the floodplain of the wash are designed as to not adversely affect the river's stability or adversely alter flooding conditions on other properties. The pad fills are designed to allow for a maximum allowable rise in water-surface elevation for the 100-year discharge of one-tenth of a foot.

Erosion protection for the building pads is designed using the post-development hydraulic conditions of the overbank floodwaters in the immediate vicinity of the building site.

6.2.2 Encroachment Description

For all lots where encroachment into the floodplain was necessary, the encroachment length was kept to a minimum, and no building pads extend into the primary channel. The side slope design for all the constructed earthen pads is 3:1. Figures 6-15 (pages 25 through 34) show the individual proposed building pads, 100-year flood limits, and cross-section profiles demonstrating water surface elevations, and encroachments of pads on Lots 212, 219-221, 225, and 226. Lot pads for Lots 222 through 224 and 227 do not encroach into the 100-year floodplain.

100-YR FLOODPLAIN

N

SCALE: 1"=40'

25' SIDEYARD SETBACK

LOT 212

8640 ft²

40' BACKYARD SETBACK

50' DRAINAGE

TOE DOWN LOCATION

50' FRONTYARD SETBACK

Q_{100}=3228 cfs

25' SIDEYARD SETBACK

WETSTONES ROAD

LEGEND

FILL SLOPE WITH BANK PROTECTION

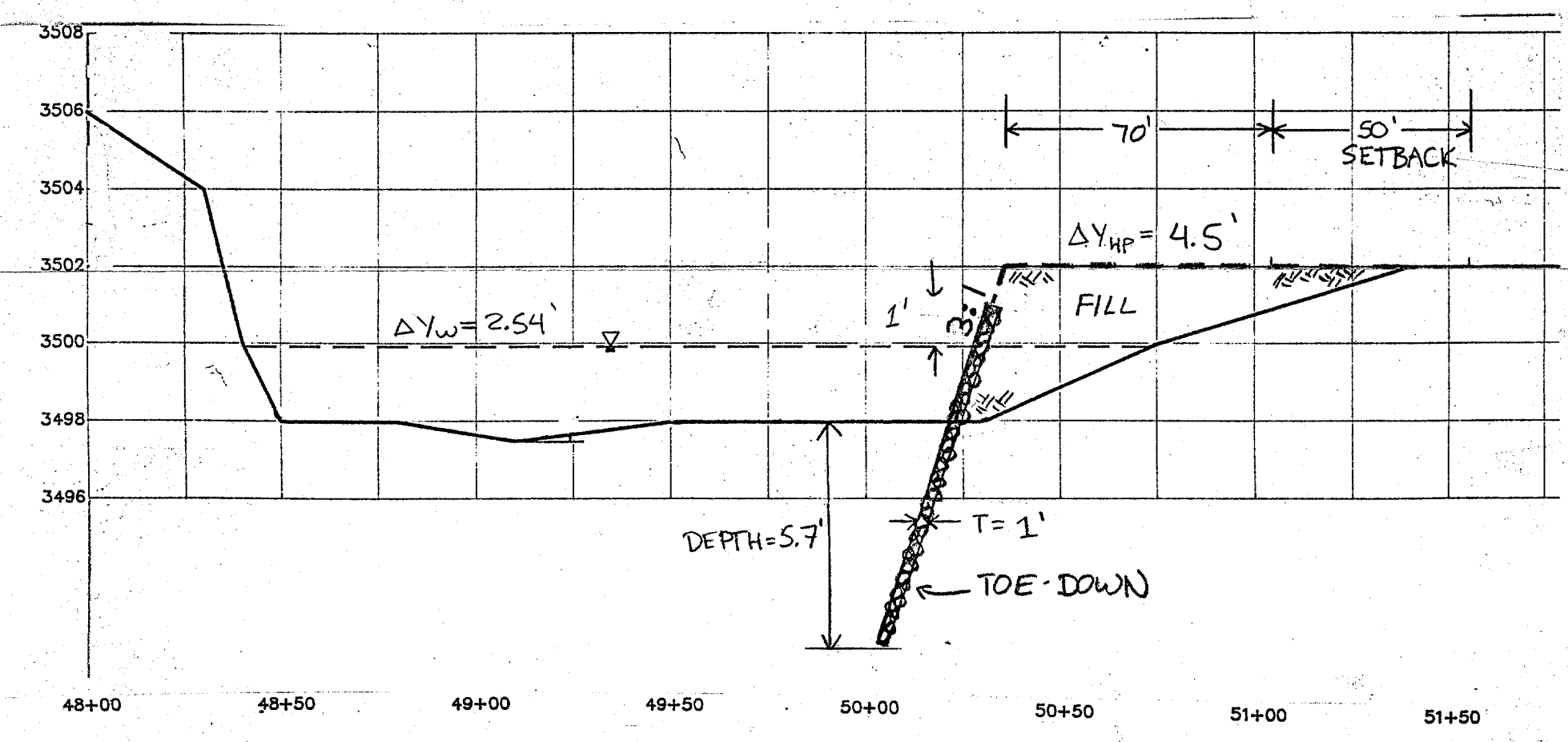
PROPOSED DRIVEWAY

ΔY_W = HEIGHT OF WATER ABOVE BOTTOM OF WASH

ΔY_{HP} = HEIGHT OF FINISHED HOUSE PAD ABOVE BOTTOM OF WASH

HAND PLACED RIP-RAP

GROUTED RIP-RAP

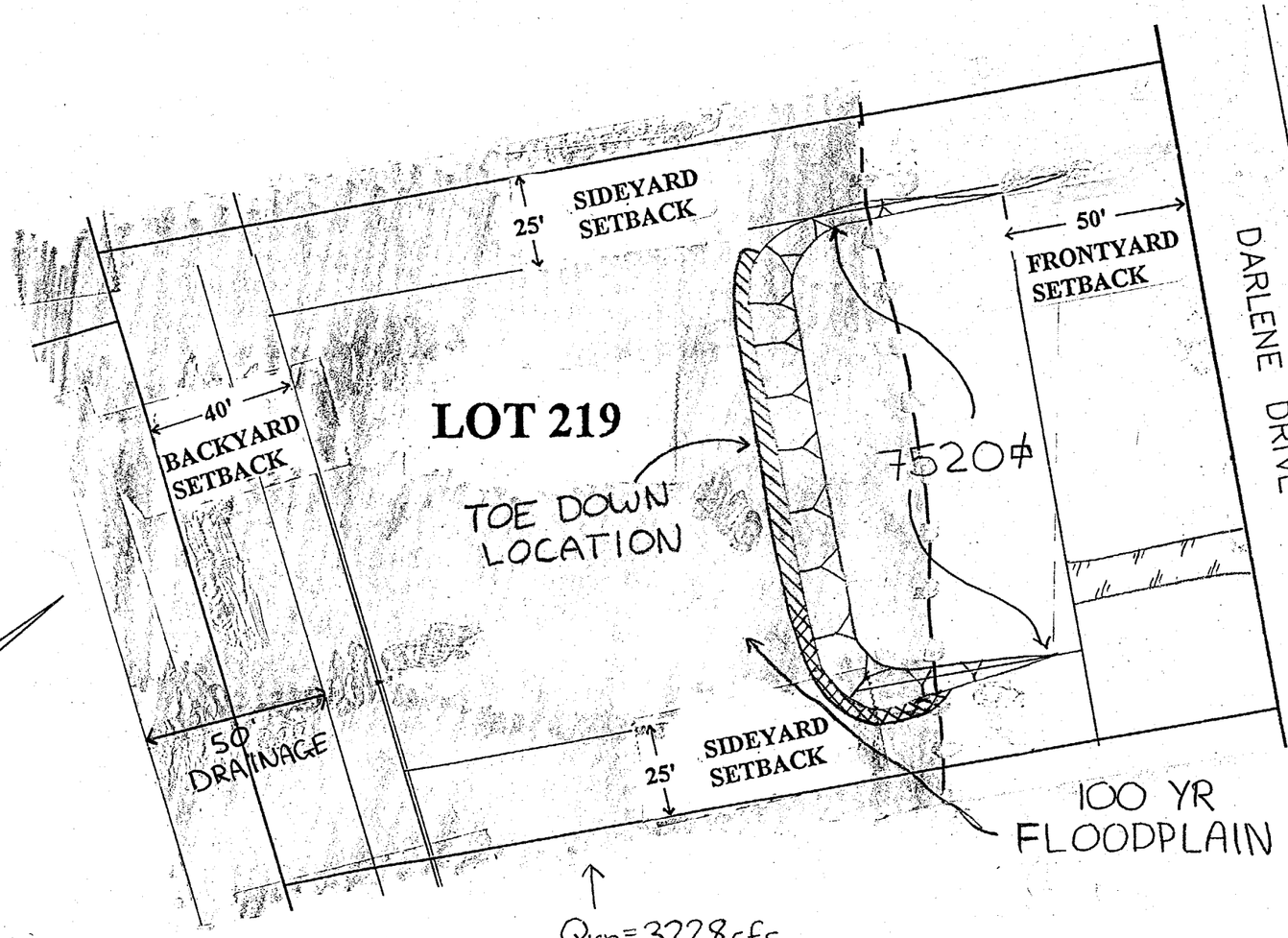


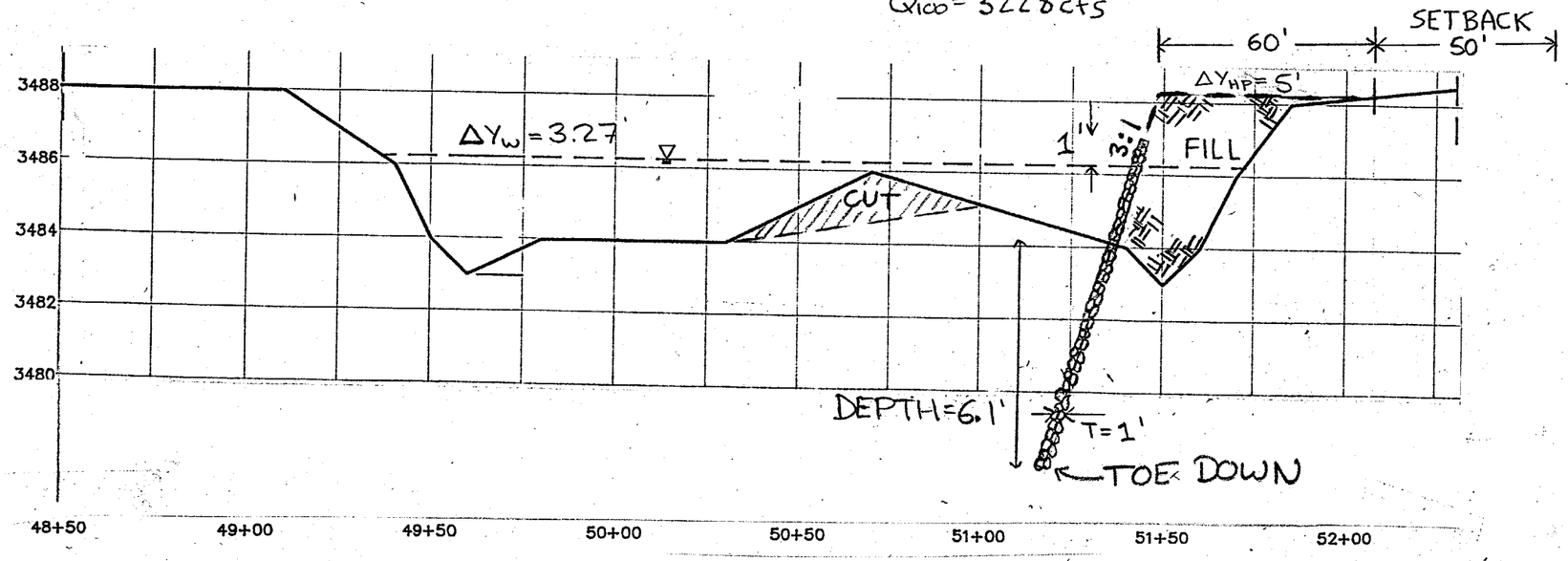
TYPICAL CROSS SECTION

FINISHED PAD PLAN/PROFILE LOT 212

Figure 6

090





TYPICAL CROSS SECTION

LEGEND

FILL SLOPE WITH BANK PROTECTION

PROPOSED DRIVEWAY

ΔY_W = HEIGHT OF WATER ABOVE BOTTOM OF WASH

ΔY_{HP} = HEIGHT OF FINISHED HOUSE PAD ABOVE BOTTOM OF WASH

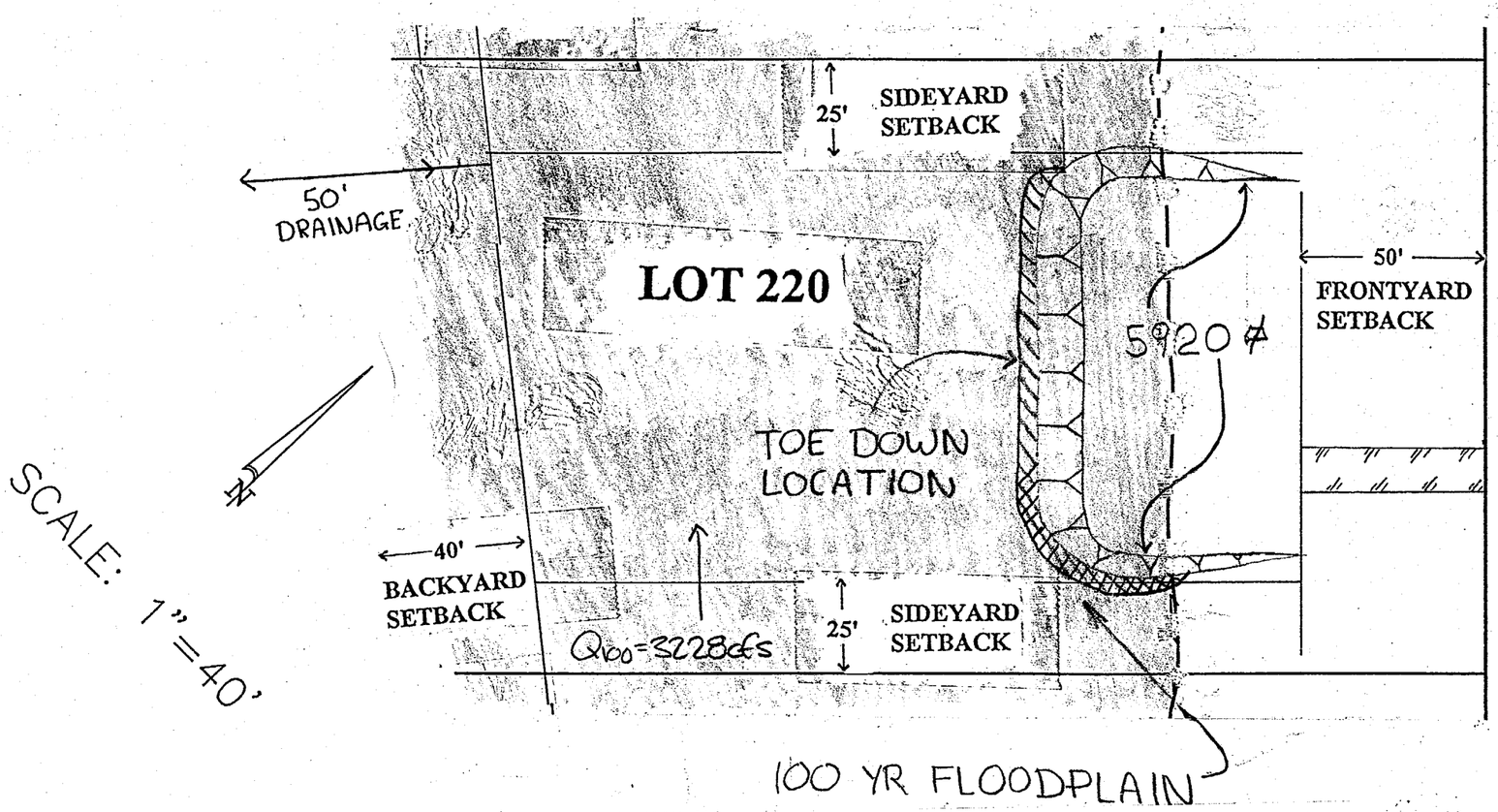
HAND PLACED RIP-RAP

GROUTED RIP-RAP

FINISHED PAD PLAN/PROFILE

LOT 219

Figure 7



DARLENE DRIVE

LEGEND

FILL SLOPE WITH BANK PROTECTION

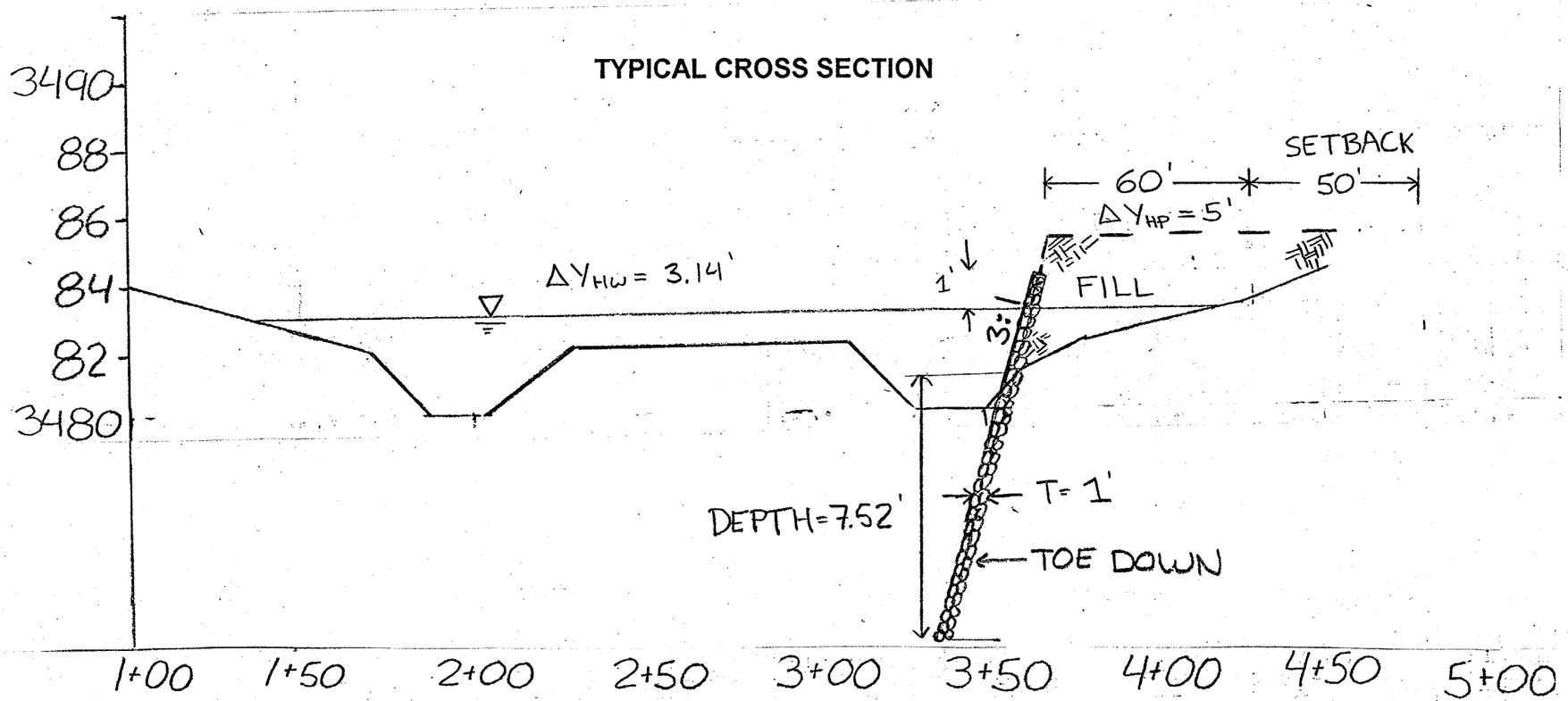
PROPOSED DRIVEWAY

ΔY_W = HEIGHT OF WATER ABOVE BOTTOM OF WASH

ΔY_{HP} = HEIGHT OF FINISHED HOUSE PAD ABOVE BOTTOM OF WASH

HAND PLACED RIP-RAP

GROUTED RIP-RAP

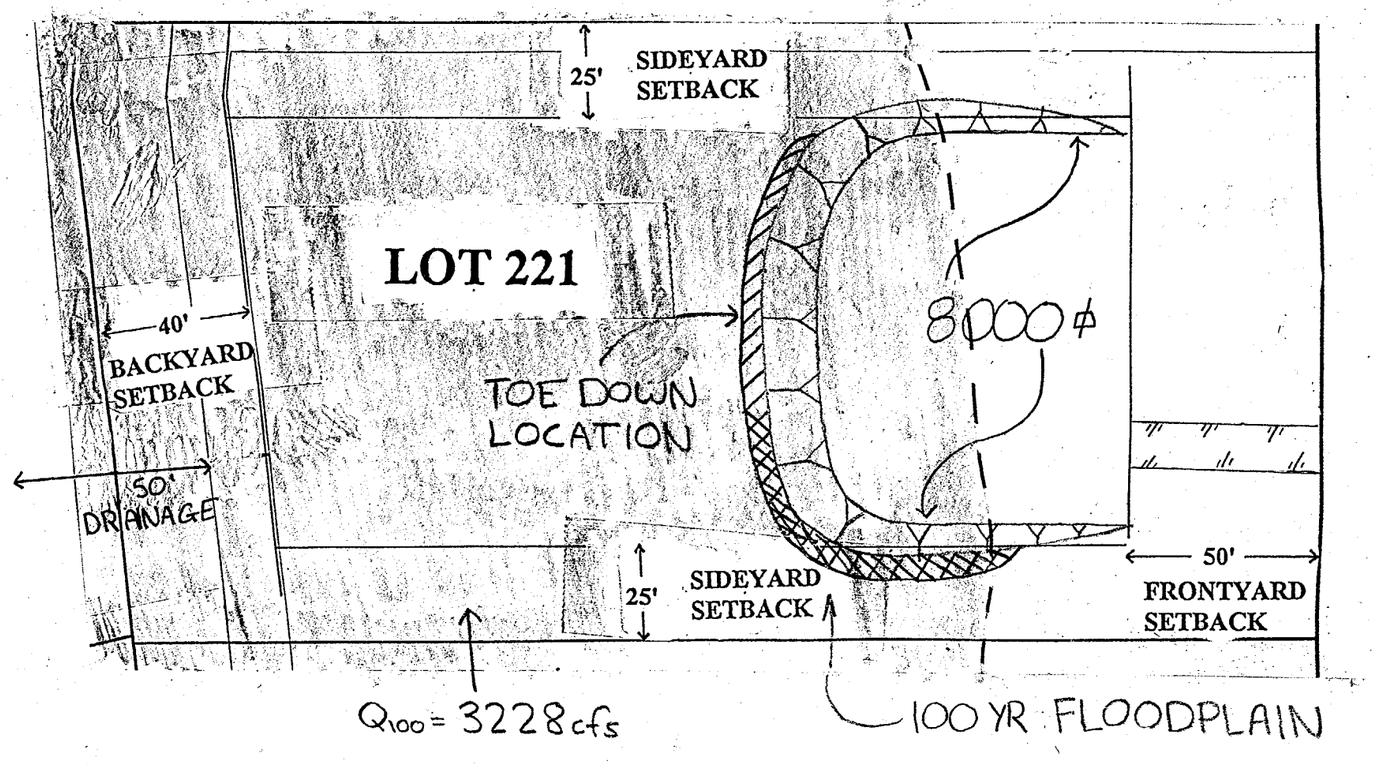


FINISHED PAD PLAN/PROFILE

LOT 220

Figure 8

092



DARLENE DRIVE

SCALE: 1" = 40'

LEGEND

FILL SLOPE WITH BANK PROTECTION

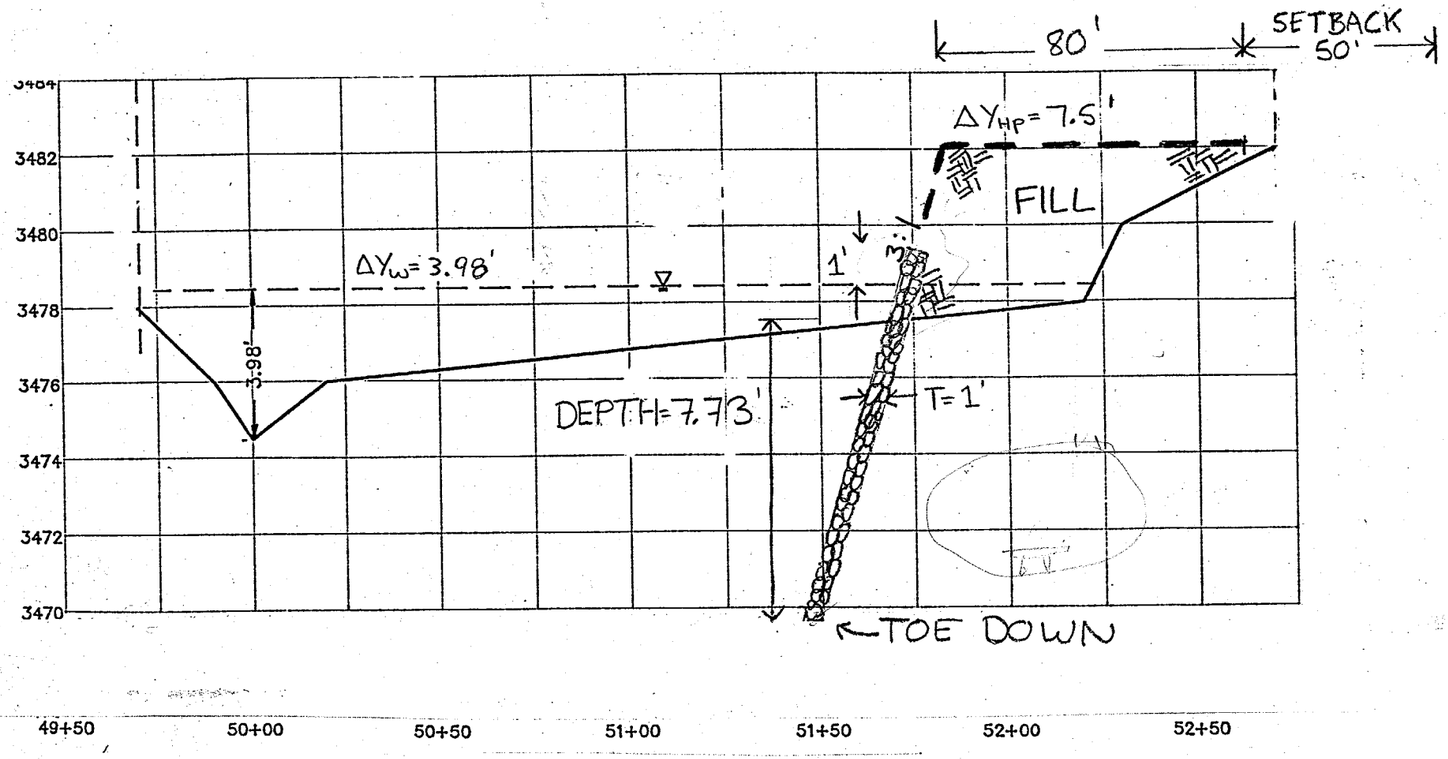
PROPOSED DRIVEWAY

ΔY_W = HEIGHT OF WATER ABOVE BOTTOM OF WASH

ΔY_{HP} = HEIGHT OF FINISHED HOUSE PAD ABOVE BOTTOM OF WASH

HAND PLACED RIP-RAP

GROUTED RIP-RAP



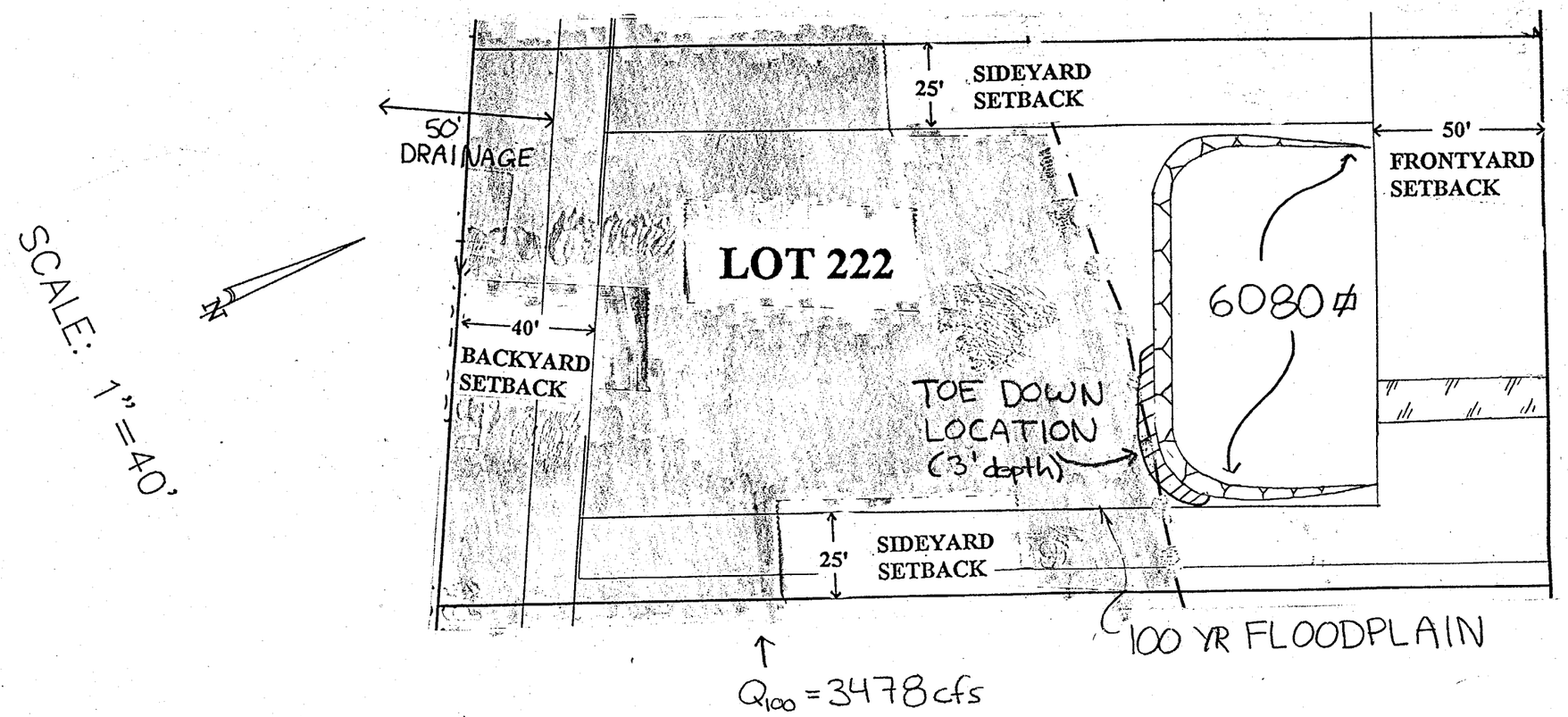
TYPICAL CROSS SECTION

FINISHED PAD PLAN/PROFILE

LOT 221

Figure 9

093



LEGEND

FILL SLOPE WITH BANK PROTECTION

PROPOSED DRIVEWAY

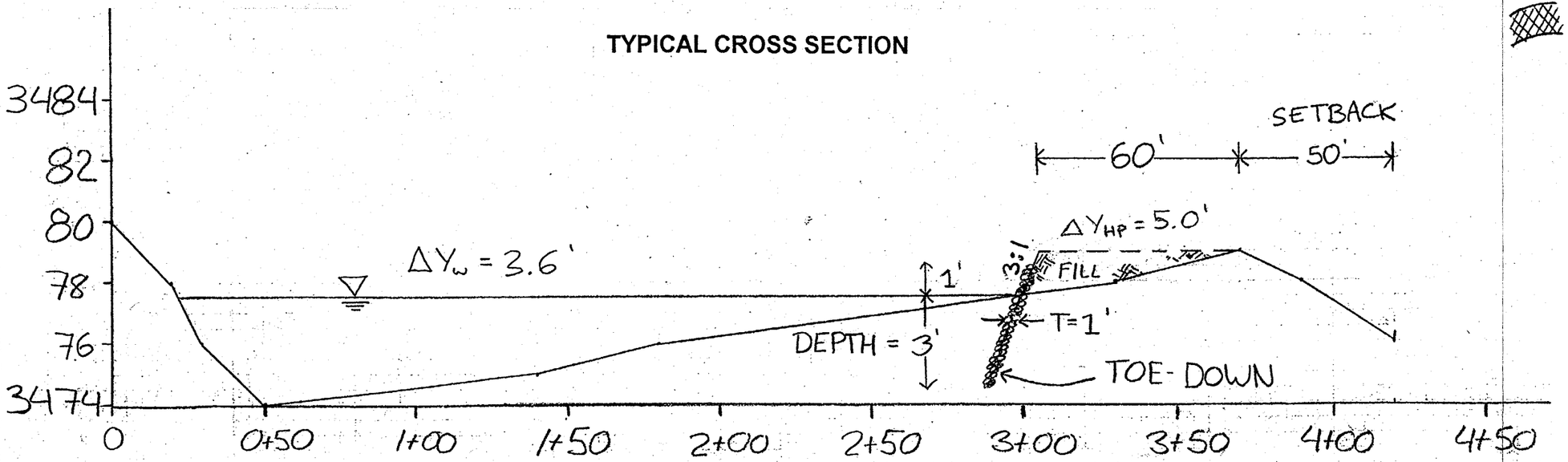
ΔY_W = HEIGHT OF WATER ABOVE BOTTOM OF WASH

ΔY_{HP} = HEIGHT OF FINISHED HOUSE PAD ABOVE BOTTOM OF WASH

HAND PLACED RIP-RAP

GROUTED RIP-RAP

TYPICAL CROSS SECTION

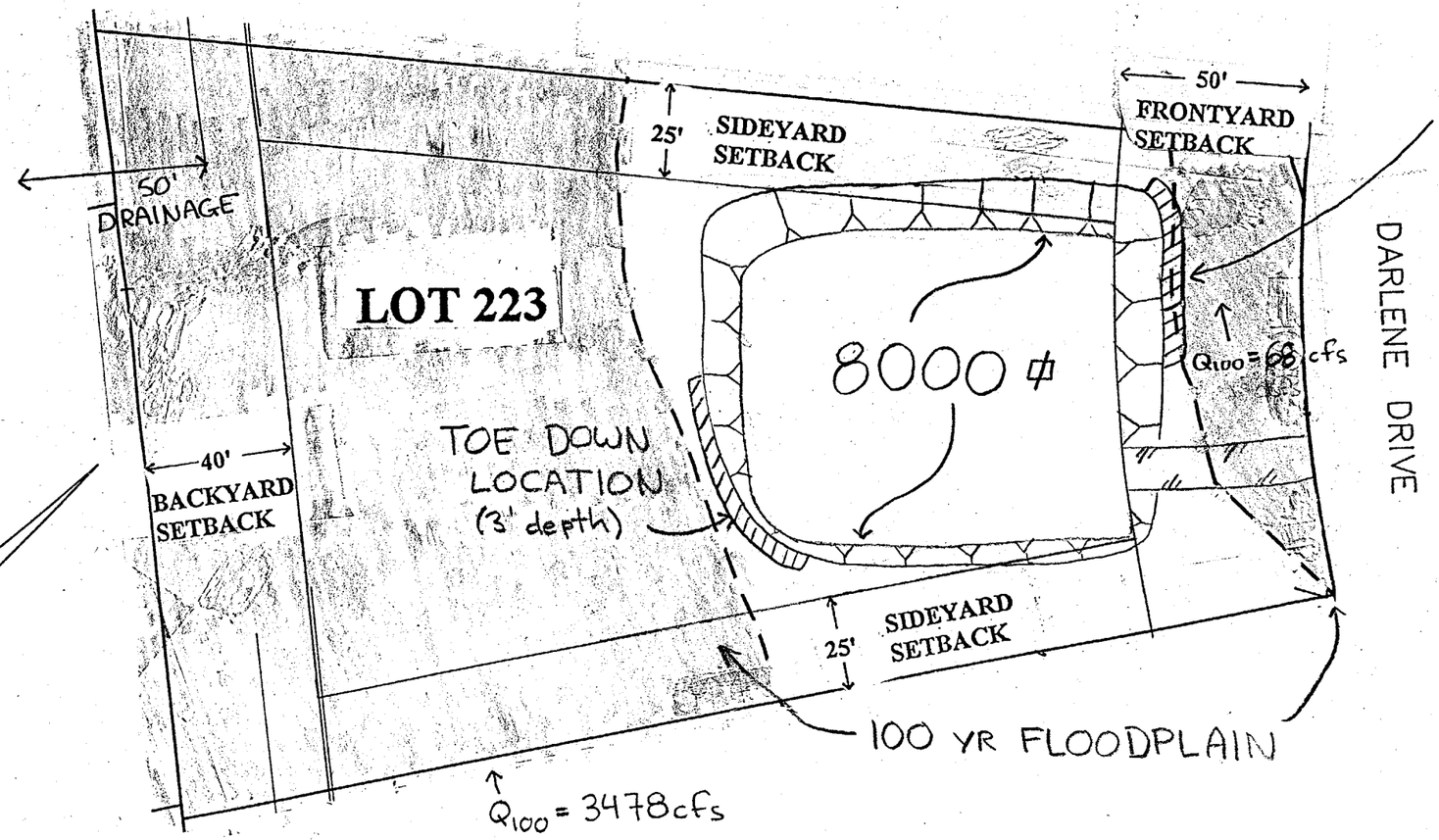


FINISHED PAD PLAN/PROFILE

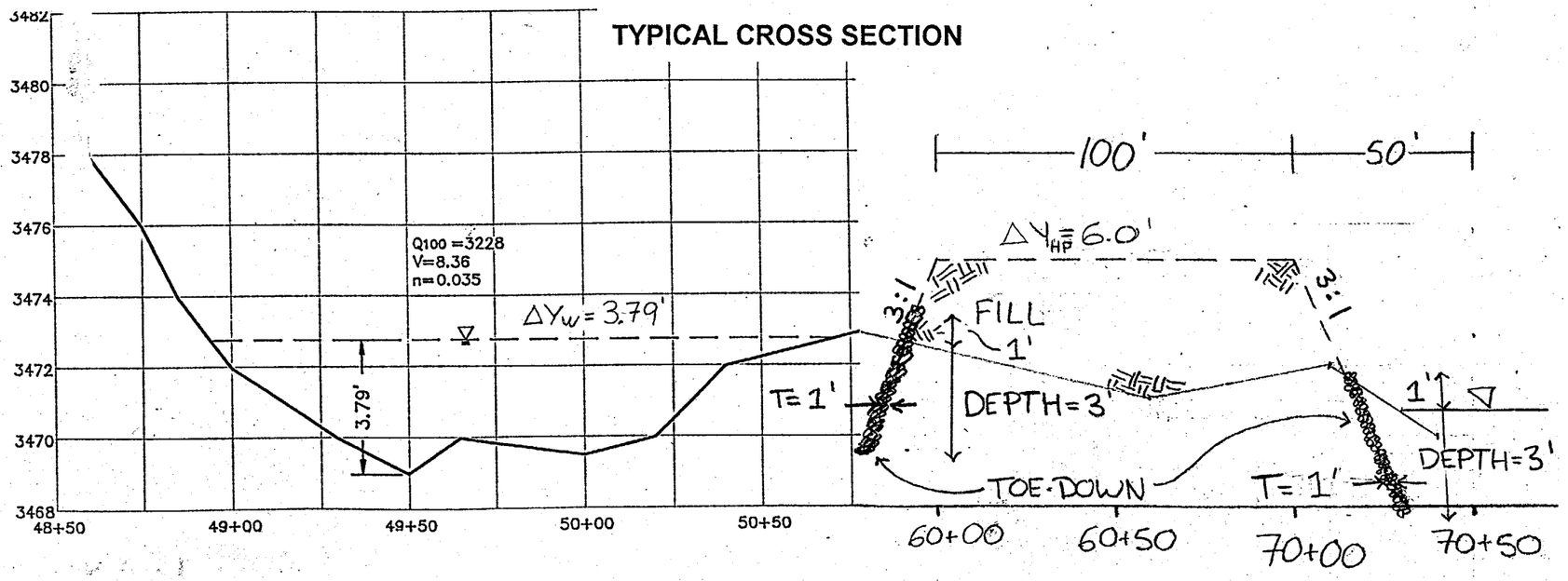
LOT 222

Figure 10

094



SCALE: 1" = 40'



LEGEND

FILL SLOPE WITH BANK PROTECTION

PROPOSED DRIVEWAY

ΔY_W = HEIGHT OF WATER ABOVE BOTTOM OF WASH

ΔY_{HP} = HEIGHT OF FINISHED HOUSE PAD ABOVE BOTTOM OF WASH

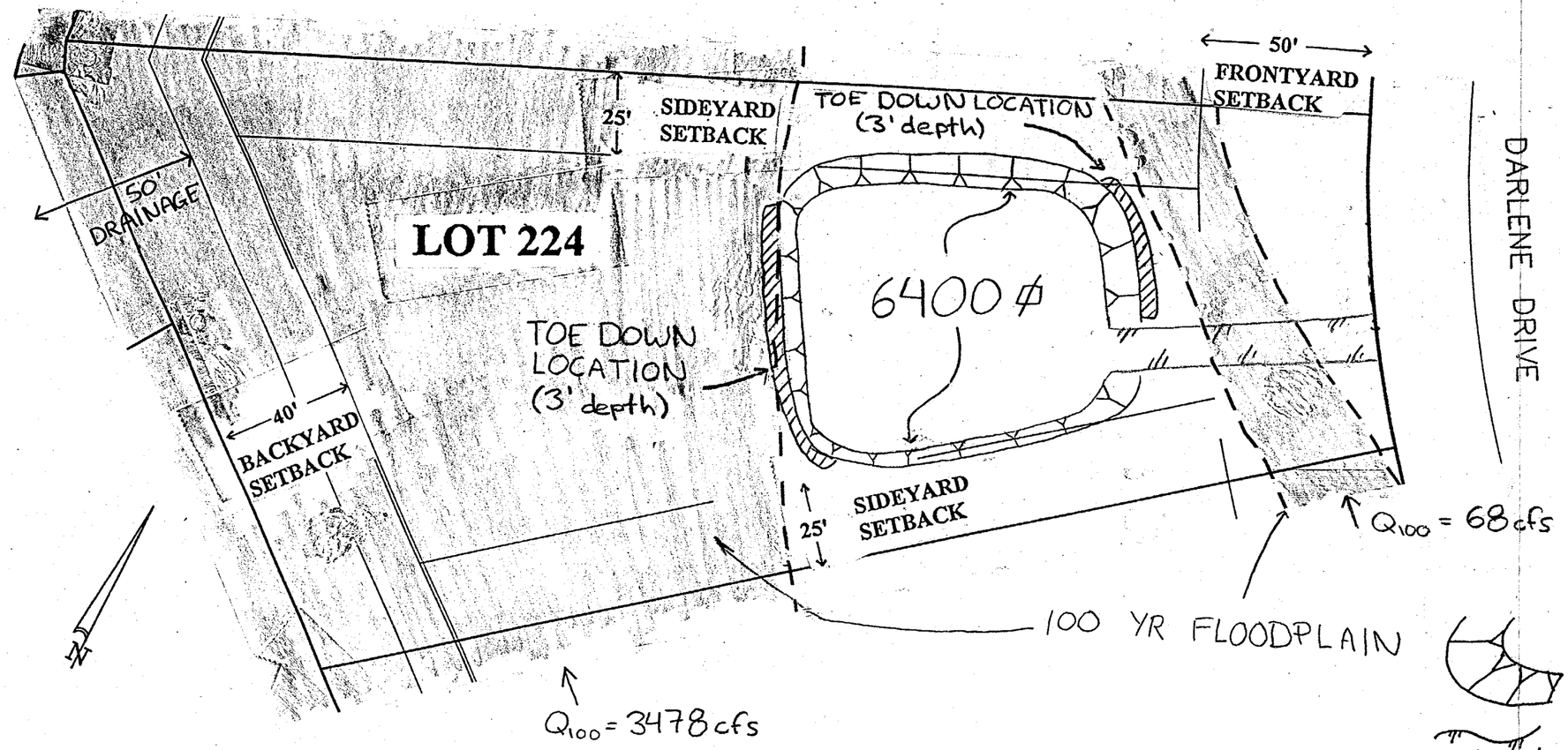
HAND PLACED RIP-RAP

GROUTED RIP-RAP

FINISHED PAD PLAN/PROFILE

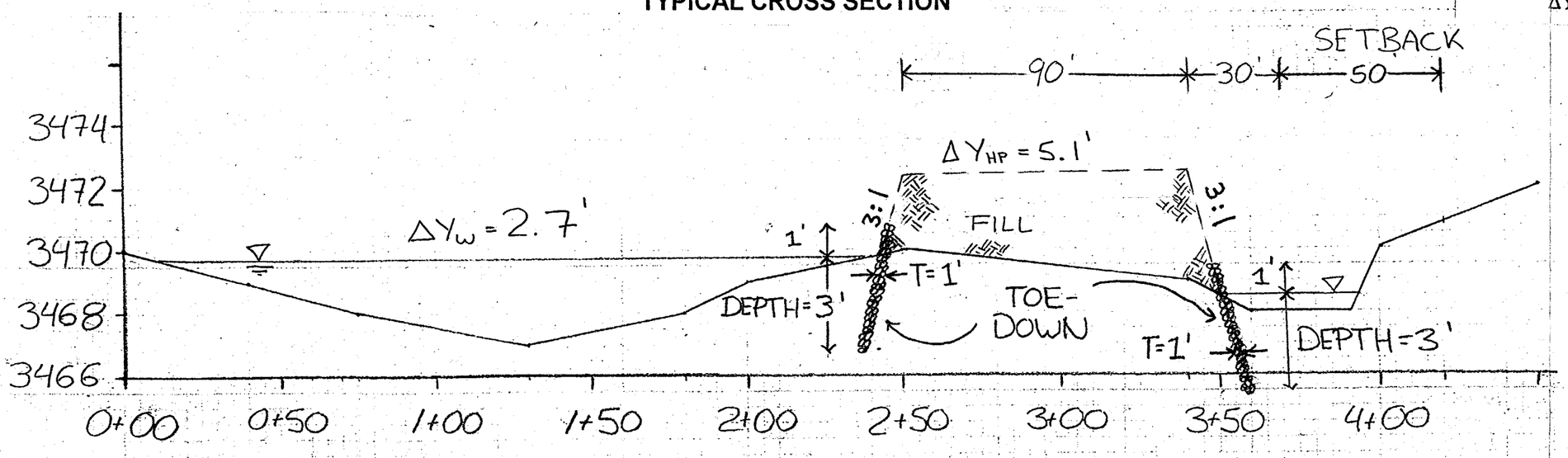
LOT 223

Figure 11



SCALE: 1" = 40'

TYPICAL CROSS SECTION



LEGEND

FILL SLOPE WITH BANK PROTECTION

PROPOSED DRIVEWAY

ΔY_W = HEIGHT OF WATER ABOVE BOTTOM OF WASH

ΔY_{HP} = HEIGHT OF FINISHED HOUSE PAD ABOVE BOTTOM OF WASH

HAND PLACED RIP-RAP

GROUTED RIP-RAP

FINISHED PAD PLAN/PROFILE

LOT 224

Figure 12

096

SCALE: 1"=40'

N

LOT 225

25' SIDEYARD SETBACK

40' BACKYARD SETBACK

50' DRAINAGE

TOE DOWN LOCATION (3' depth)

TOE DOWN LOCATION

4800ft²

50' FRONTYARD SETBACK

Q_{100} = 68cfs

25' SIDEYARD SETBACK

DARLENE DRIVE

Q_{100} = 3478cfs

100-YR FLOODPLAIN

LEGEND

FILL SLOPE WITH BANK PROTECTION

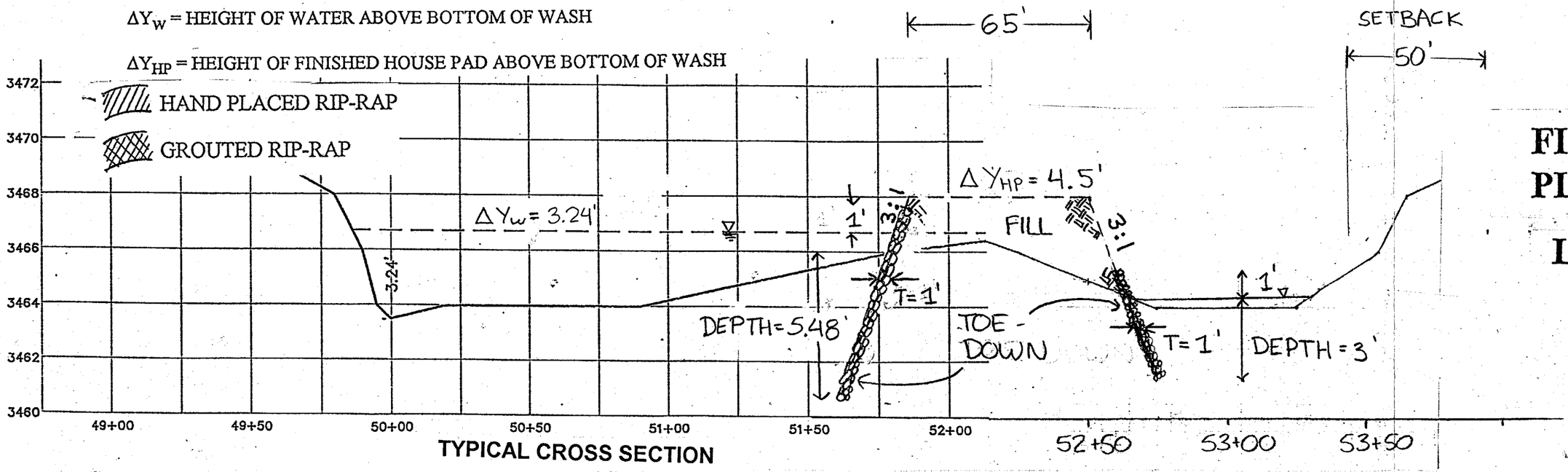
PROPOSED DRIVEWAY

ΔY_W = HEIGHT OF WATER ABOVE BOTTOM OF WASH

ΔY_{HP} = HEIGHT OF FINISHED HOUSE PAD ABOVE BOTTOM OF WASH

HAND PLACED RIP-RAP

GROUTED RIP-RAP



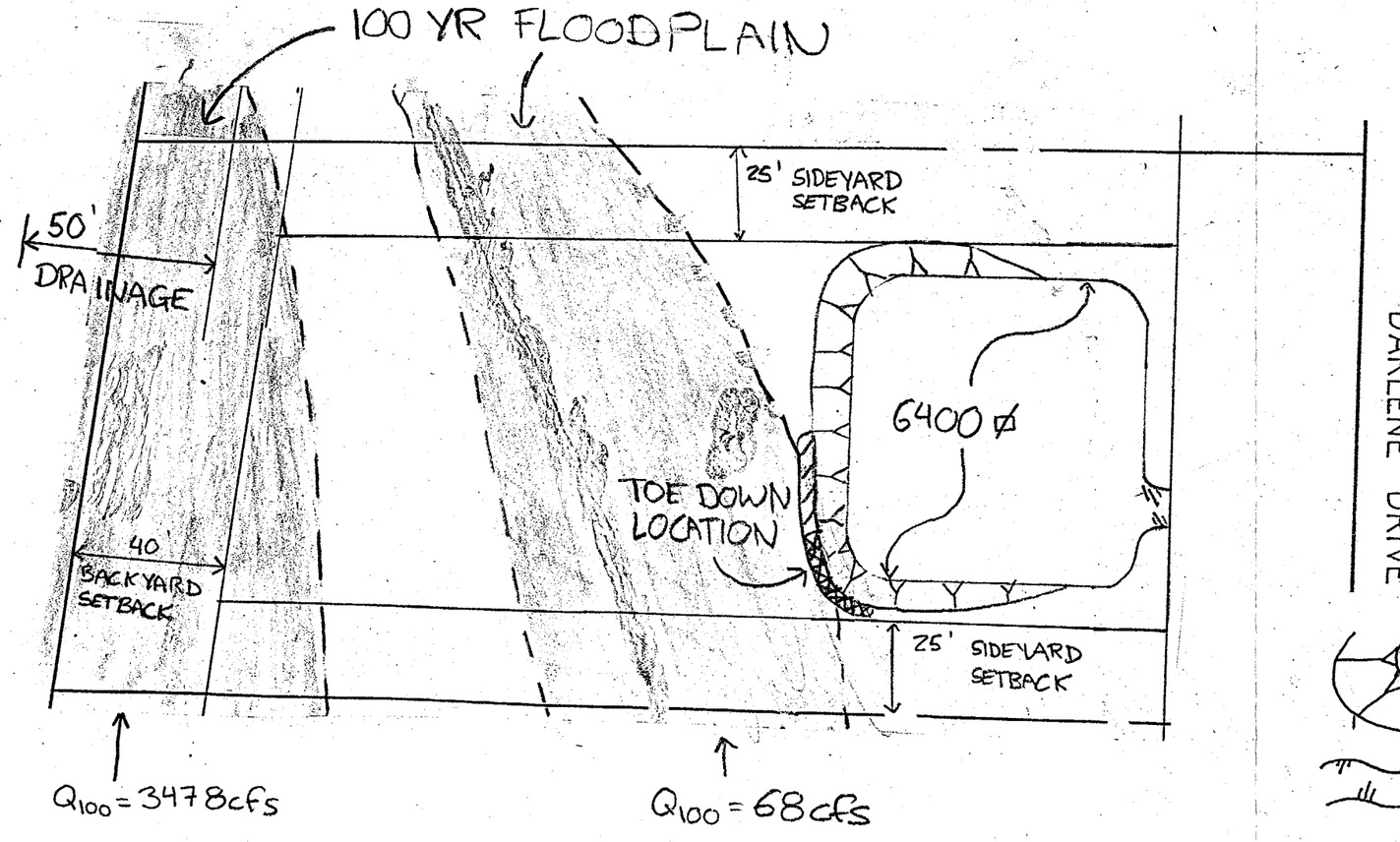
TYPICAL CROSS SECTION

FINISHED PAD PLAN/PROFILE

LOT 225

Figure 13

097



N

SCALE: 1"=40'

LEGEND

FILL SLOPE WITH BANK PROTECTION

PROPOSED DRIVEWAY

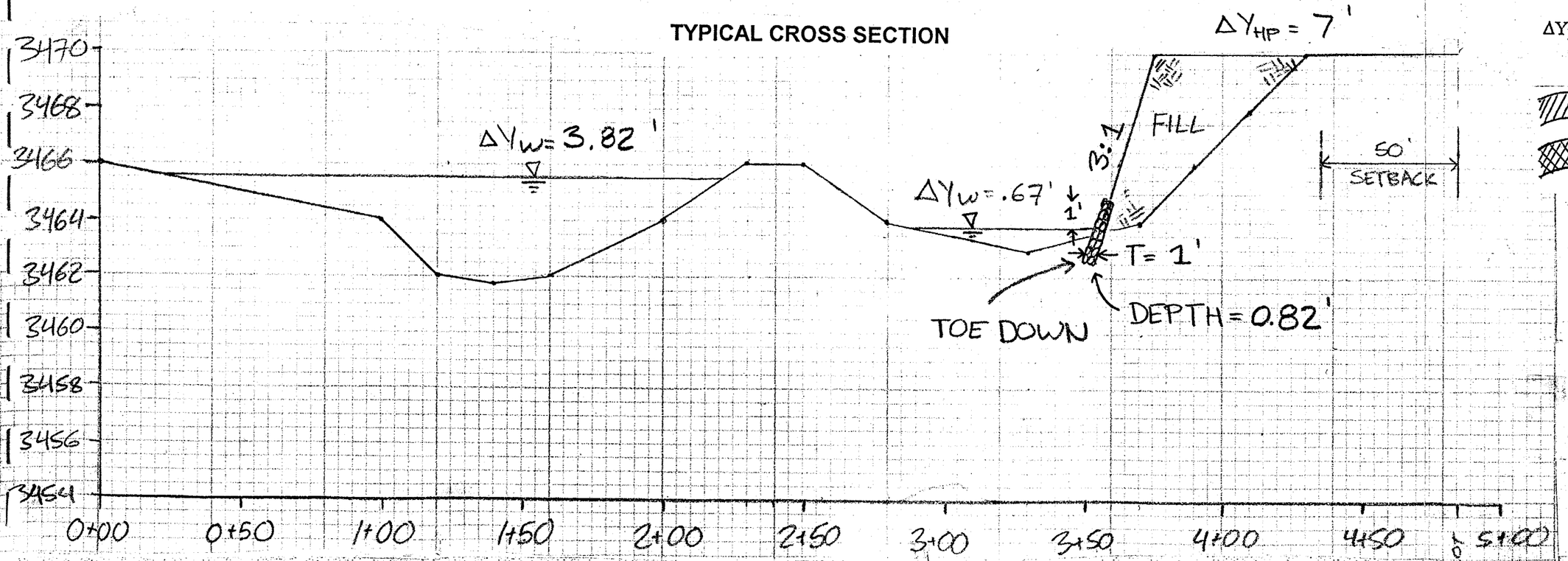
ΔY_W = HEIGHT OF WATER ABOVE BOTTOM OF WASH

ΔY_{HP} = HEIGHT OF FINISHED HOUSE PAD ABOVE BOTTOM OF WASH

HAND PLACED RIP-RAP

GROUTED RIP-RAP

TYPICAL CROSS SECTION

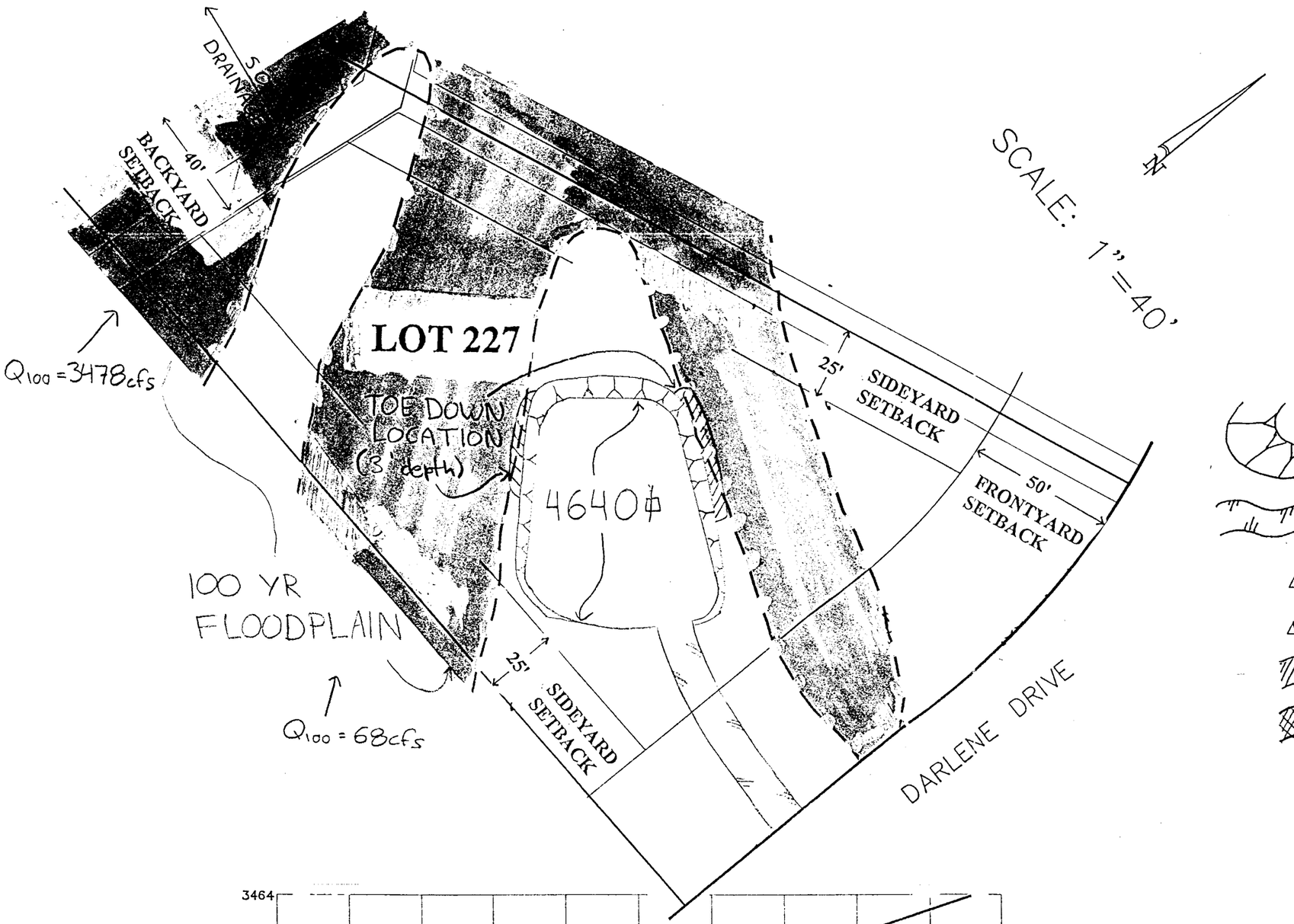


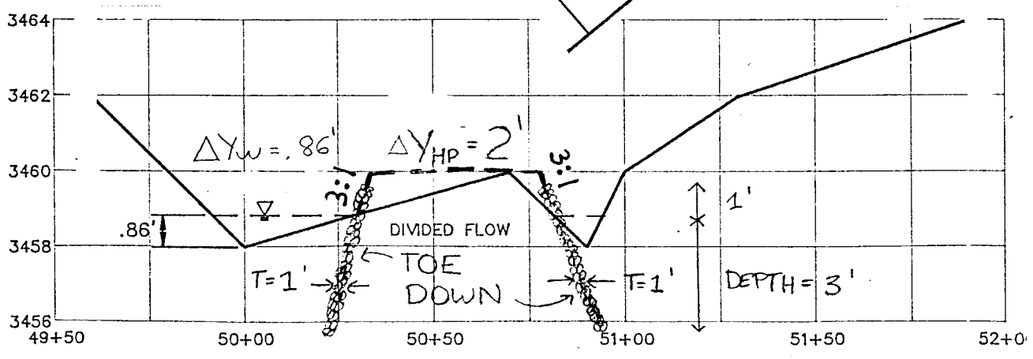
FINISHED PAD PLAN/PROFILE

LOT 226

Figure 14

098





TYPICAL CROSS SECTION

LEGEND

FILL SLOPE WITH BANK PROTECTION

PROPOSED DRIVEWAY

ΔY_W = HEIGHT OF WATER ABOVE BOTTOM OF WASH

ΔY_{HP} = HEIGHT OF FINISHED HOUSE PAD ABOVE BOTTOM OF WASH

HAND PLACED RIP-RAP

GROUTED RIP-RAP

FINISHED PAD PLAN/PROFILE

LOT 227

* NOTE: PAD 227 IS LOCATED UPSTREAM OF CROSS-SECTION LOCATION

Figure 15

6.3 Encroachment Results

As mentioned in Section 6.2.1, the maximum allowable rise in water surface elevation due to encroachment is one-tenth of a foot. Table 1 demonstrates the results of the water surface elevation for the individual lots with constructed 3:1 bank protected pads encroaching into the floodplain. Calculations are located in Section 10.0.

TABLE 1
FLOODPLAIN ENCROACHMENT RESULTS

LOT	WSE (natural)	WSE (developed)	RISE (ft)
212	3499.95	3500.04	.09
219	3486.29	3486.27	-.02
220	3483.04	3483.14	.10
221	3478.48	3478.49	.01
225	3466.65	3466.68	.03
226	3463.71	3463.67	-.04

As mentioned earlier, Lots 222 through 224 and 227 do not encroach into the floodplain.

6.4 Scour

Local scour caused by encroachments projecting into the flow, were calculated using the following equation:

$$Z_{lse} = 2.15 \sin(\theta_a) Y (a_e/Y)^{0.4} F_u^{0.33}$$

Where:

Z_{lse} = Local scour due to embankment, in feet;
θ_a = Slope angle of abutment face, measured from the horizontal, in degrees;
Y = Upstream normal flow depth, in feet;
A_e = Embankment or encroachment length, measured normal to the edge of the Floodplain or channel bank, in feet (see Figure 6.5); and,
F_u = Upstream Froude number.

Table 2 demonstrates the scour (Z_{lse}) for individual lots encroaching into the floodplain. The calculated scour depth (Z_{lse}) is equal to the toe down depth required for erosion protection.

TABLE 2
LOCAL SCOUR RESULTING FROM ENCROACHMENT

LOT	θa	Y	A_e	F_u	Z_{lse}
212	18.4	2.54	50	1.0	5.67
219	18.4	3.27	41	1.0	6.10
220	18.4	3.14	65	1.15	7.52
221	18.4	4.0	52	1.1	7.73
225	18.4	3.18	35	.92	5.48
226	18.4	.67	3.4	.90	.84

6.5 Erosion Protection

As mentioned in Section 6.2.1, erosion protection for the building pads is designed using post-development hydraulic conditions. Erosion protection should be provided around all sides of the proposed encroachment, and should be placed at a toe down depth equal to the depth of scour (see Table 2).

Rip-rap will be used as bank protection for the proposed floodplain encroachments. Figure 16 was used to size the rip-rap necessary for adequate protection. Table 3 demonstrates the size of rip-rap or gabion baskets required for the individual lots. The face of the encroachments looking directly upstream were considered to be under severe bend conditions (≥60 degrees). The sides parallel to the channel flow and backface of the encroachments were considered to be straight channel conditions (≤18 degrees).

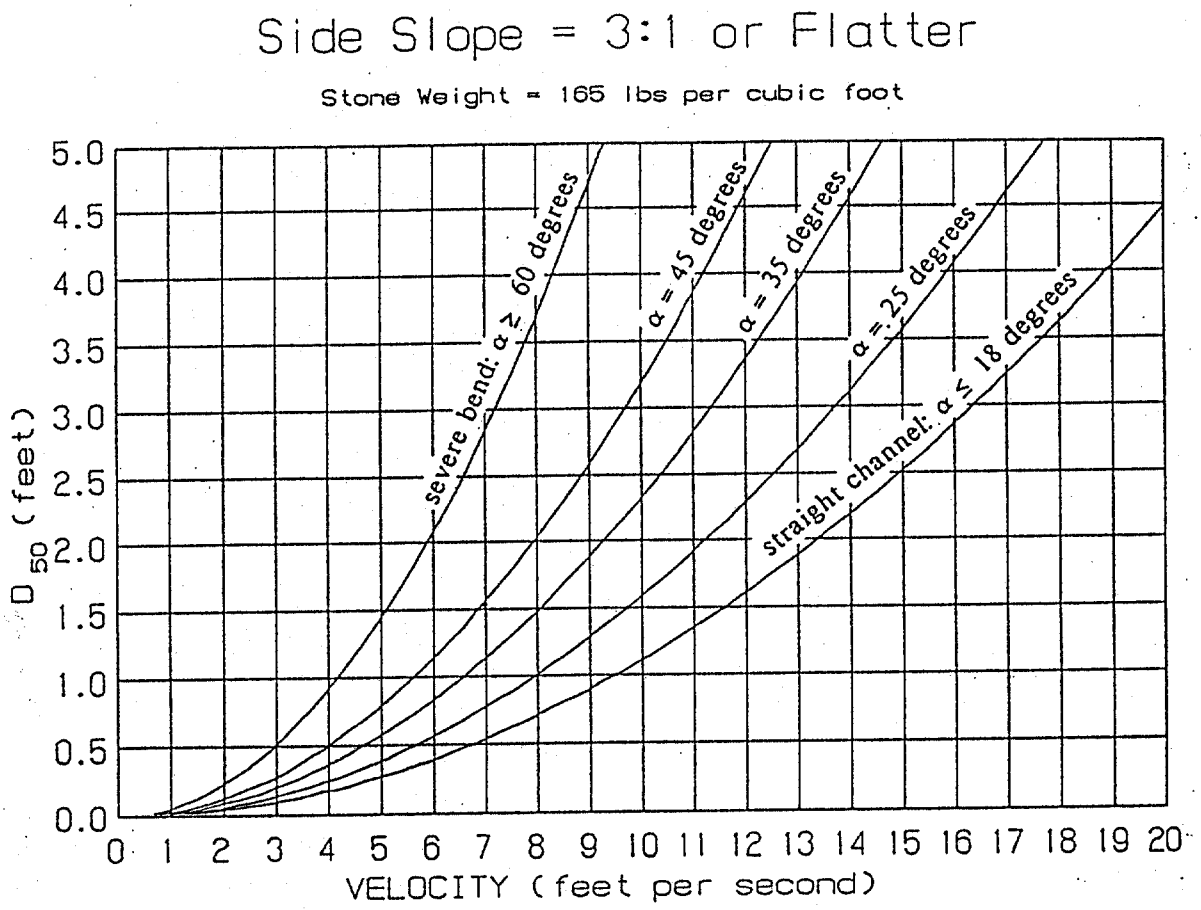


Figure 16
Rip Rap Design Chart
(from Reference 2)

102

TABLE 3
RIP-RAP & GABION BASKET SIZING FOR ENCROACHMENTS

		$\alpha \geq 60$		$\alpha \leq 18$	
LOT	V (fps)	Rip-Rap D_{50} (ft)	Gabion .67 D_{50} (ft)	Rip-Rap D_{50} (ft)	Gabion .67D_{50} (ft)
212	8.36	4.0	2.7	.75	.50
219	8.1	3.75	2.5	.75	.50
220	8.36	4.0	2.7	.75	.50
221	8.28	4.0	2.7	.75	.50
225	7.66	3.3	2.2	.6	.40
226	3.10	.6	.40	.2	--

6.5.1 Alternative Bank Protection

The size rip-rap or gabion basket required for the upstream face of the encroachments ($\alpha \geq 60$) shown on Table 3 are too large to be considered feasible for the intent of this project. The recommended alternative to the large diameter rip-rap is grouted rip-rap with a $d_{50} = 1$ ft. The profile of the encroachments (typical cross sections) depicted on Figures 6 through 15 show the depth and thickness of the grouted rip-rap for the individual lots. The cross sections are considered to be taken at the upstream edge (worst case) of the encroachments. Bank protection for the sides of the encroachments parallel to the channel flow and facing downstream ($\alpha \leq 18$) will be provided by 1 layer of $d_{50} = 1$ ft hand placed rip-rap, which is a larger diameter than required as shown on Table 3. As mentioned earlier, the cross sections shown on Figures 6-15 show the depth and thickness for the grouted rip-rap located at the upstream edge of the encroachments. The depth and thickness of the handplaced rip-rap located along the sides and downstream edges ($\alpha \leq 18$) of the encroachments is the same as shown for the grouted rip-rap. Also, the erosion protection provided for the encroachments will extend to 1' above the developed conditions water depth.

Additionally, as a precaution, erosion protection in the form of $d_{50} = 1$ ft hand placed rip-rap is recommended for portions of fill pads which do not encroach into the floodplain, but border along the floodplain limits. The rip-rap will be placed to a toe down depth of 3' and extend to 1' above the depth of flow. Locations of the recommended rip-rap are shown on Figures 6 through 15.

7.0 RESULTS

The results of the encroachment analysis indicate that the proposed home site pads depicted in Figure 6 through 15 will not increase the 100-year water surface elevation by more than a tenth of a foot. Additionally, bank protection is recommended to protect the fill slopes from lateral migration, and toe downs are also proposed to account local scour and stream degradation.

Recommended finished pad heights are shown on Figures 6 through 15 as a height above the flowline of the primary channel. The pad height should be measured from the flowline of the channel reach which is adjacent to the upstream corner of the pad. The recommended finished pad height is one foot minimum above the depth of flow for the 100-year storm.

8.0 RECOMMENDATIONS

Filling and grading Lots 212 and 219 through 227 in accordance with Figures 6 through 15 is recommended in order to protect the homesites from flooding and channel migration. The finished pad heights above the flowline of the primary channel, should be certified by a registered engineer or land surveyor prior to the release of occupancy permits, and should be measured from the upstream most reach of the channel adjacent to the building envelope. As mentioned in Section 6.5.1, bank protection in the form of d_{50} = 1 ft hand placed rip rap along fill slopes parallel to the channel and perpendicular to the channel on the downstream slope, and grouted rip rap (d_{50} = 1 ft) for fill slopes perpendicular to the channel on the upstream slopes is recommended. Toe downs to the depths shown on Table 2 and Figures 6 through 15 should also be constructed in the locations shown on the site plans (see Figures 6 through 15) prior to the placement of bank protection. An engineer's certification indicating substantial conformance to the recommendations of this report, should be required prior to the issuance of occupancy permits. Further, a deed restriction requiring a revision to this report to support any alteration to the lot other than what is shown on Figure 6 through 15 should be placed on the property. The calculations and analysis contained in this report are intended to support the building pad envelopes shown on Figures 6 through 15. In the event that any changes in the nature, design or location of the project are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing by this firm.

It is recommended that the engineer be provided the opportunity for a general review of final design and specifications in order that these recommendations may be properly interpreted and implemented in the design and specifications. If the engineer is not accorded the privilege of making this recommended review, he can assume no responsibility for misinterpretation of his recommendations. This report is issued with the understanding that the owner or representative will ensure that the applicable provisions of this report are called to the attention of the home site designers and incorporated into the plans; and further, that the necessary steps will be taken to ensure that these provisions will be carried out by the construction contractor and subcontractors.

9.0 REFERENCES

1. American Iron and Steel Institute. Handbook of Steel Drainage & Highway Construction Products. ed. 3. 1983.

2. City of Tucson Engineering Division. Standards Manual for Drainage Design and Floodplain Management in Tucson, Arizona. 1989.

3. Chow, V.T. Open-Channel Hydraulics. McGraw-Hill Book Co., New York. 1959.

4. Cochise County Public Works. Flood Control, Flood Plain Management Division. Hydrologic and Hydraulic Design Standards for Flood Control and Drainage. 1985.

5. Dooley Jones and Associates, Hydrologic and Hydraulic Report for Units 22, 23, and 24 at New Tucson, August 1985, revised December 1985

6. Pima County Department of Transportation and City of Tucson Flood Control District. Stormwater Detention/Retention Manual.

7. Pima County Urban Design Commission. The Urban Design of the Tucson Basin. 1986.

8. United States Army Corps of Engineers. The Hydrologic Engineering Center. Hydrologic Engineering Methods for Water Resources Development: Water Surface Profiles. v. 6. July 1975.

9. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, Office of Hydrology. Isopluvials of 24-Hr, 6-Hr Precipitation in Tenths of an Inch. v. VIII.

10. United States Department of Transportation. Federal Highway Administration. Design of Stable Channels with Flexible Linings. Hydraulic Engineering Circular No. 15. October 1975.

10.0 WORKSHEETS & CALCULATIONS

JOB # 95-517
CANYON STATE EQUITY
BY: KD
01-19-1995

NATURAL

CROSS SECTION TYPICAL SECTION LOT 212

STATION 4800.00	ELEVATION 3506.00
STATION 4830.00	ELEVATION 3504.00
STATION 4835.00	ELEVATION 3502.00
STATION 4840.00	ELEVATION 3500.00
STATION 4850.00	ELEVATION 3498.00
STATION 4880.00	ELEVATION 3498.00
STATION 4910.00	ELEVATION 3497.50
STATION 4950.00	ELEVATION 3498.00
STATION 4980.00	ELEVATION 3498.00
STATION 5030.00	ELEVATION 3498.00
STATION 5075.00	ELEVATION 3500.00
STATION 5140.00	ELEVATION 3502.00
STATION 5200.00	ELEVATION 3502.00
STATION 5265.00	ELEVATION 3502.00
STATION 5330.00	ELEVATION 3502.50

RESULTS

Manning's 'n'	0.035	
Channel Slope	0.0150	ft/ft
W.S. Elevation	3499.95	ft
Area	420.26	sq.ft
Perimeter	233.81	ft
Near Bank	4840.26	ft
Far Bank	5073.82	ft
Discharge	3230.64	cfs
Velocity	7.69	fps

JOB # 95-517
CANYON STATE EQUITY
BY: KD
01-19-1995

WITH ENCROACHMENT

CROSS SECTION TYPICAL SECTION LOT 212

STATION 4800.00	ELEVATION 3506.00	
STATION 4830.00	ELEVATION 3504.00	
STATION 4835.00	ELEVATION 3502.00	
STATION 4840.00	ELEVATION 3500.00	
STATION 4850.00	ELEVATION 3498.00	
STATION 4880.00	ELEVATION 3498.00	
STATION 4910.00	ELEVATION 3497.50	
STATION 4950.00	ELEVATION 3498.00	
STATION 5022.00	ELEVATION 3498.00	← BEGIN ENCROACH
STATION 5035.00	ELEVATION 3502.00	

RESULTS

Manning's 'n'	0.035	
Channel Slope	0.0150	ft/ft
W.S. Elevation	3500.04	ft
Area	386.10	sq.ft
Perimeter	189.27	ft
Near Bank	4839.89	ft
Far Bank	5028.64	ft
Discharge	3229.39	cfs
Velocity	8.36	fps

JOB # 95-517
CANYON STATE EQUITY
BY: KD
01-19-1995

NATURAL

CROSS SECTION TYPICAL SECTION LOT 219

STATION 4850.00	ELEVATION 3488.00
STATION 4910.00	ELEVATION 3488.00
STATION 4940.00	ELEVATION 3486.00
STATION 4950.00	ELEVATION 3484.00
STATION 4960.00	ELEVATION 3483.00
STATION 4980.00	ELEVATION 3484.00
STATION 5000.00	ELEVATION 3484.00
STATION 5030.00	ELEVATION 3484.00
STATION 5070.00	ELEVATION 3486.00
STATION 5140.00	ELEVATION 3484.00
STATION 5150.00	ELEVATION 3483.00
STATION 5160.00	ELEVATION 3484.00
STATION 5170.00	ELEVATION 3486.00
STATION 5185.00	ELEVATION 3488.00
STATION 5230.00	ELEVATION 3488.50

RESULTS

Manning's 'n'	0.035	
Channel Slope	0.0150	ft/ft
W.S. Elevation	3486.29	ft
Area	422.66	sq.ft
Perimeter	237.20	ft
Near Bank	4935.65	ft
Far Bank	5172.18	ft
Discharge	3230.17	cfs
Velocity	7.64	fps

JOB # 95-517
CANYON STATE EQUITY
BY: KD
01-19-1995

W/ENCROACH & CUT

CROSS SECTION TYPICAL SECTION LOT 219

STATION 4850.00	ELEVATION 3488.00	
STATION 4910.00	ELEVATION 3488.00	
STATION 4940.00	ELEVATION 3486.00	
STATION 4950.00	ELEVATION 3484.00	
STATION 4960.00	ELEVATION 3483.00	
STATION 4980.00	ELEVATION 3484.00	
STATION 5000.00	ELEVATION 3484.00	
STATION 5030.00	ELEVATION 3484.00	- BEGIN CUT
STATION 5100.00	ELEVATION 3485.00	- END CUT
STATION 5131.00	ELEVATION 3484.00	- BEGIN ENCROACH
STATION 5148.00	ELEVATION 3488.00	

RESULTS

Manning's 'n'	0.035	
Channel Slope	0.0150	ft/ft
W.S. Elevation	3486.27	ft
Area	398.82	sq.ft
Perimeter	205.20	ft
Near Bank	4936.01	ft
Far Bank	5140.63	ft
Discharge	3229.84	cfs
Velocity	8.10	fps

JOB # 95-517
CANYON STATE EQUITY
BY: KD
01-19-1995

NATURAL

CROSS SECTION TYPICAL SECTION LOT 220

STATION	100.00	ELEVATION	84.00
STATION	170.00	ELEVATION	82.00
STATION	180.00	ELEVATION	81.00
STATION	190.00	ELEVATION	80.00
STATION	200.00	ELEVATION	80.00
STATION	215.00	ELEVATION	81.00
STATION	230.00	ELEVATION	82.00
STATION	310.00	ELEVATION	82.00
STATION	320.00	ELEVATION	81.00
STATION	330.00	ELEVATION	80.00
STATION	350.00	ELEVATION	80.00
STATION	365.00	ELEVATION	81.00
STATION	380.00	ELEVATION	82.00
STATION	425.00	ELEVATION	83.00
STATION	450.00	ELEVATION	84.00

RESULTS

Manning's 'n'	0.035	
Channel Slope	0.0200	ft/ft
W.S. Elevation	83.04	ft
Area	421.79	sq.ft
Perimeter	292.79	ft
Near Bank	133.58	ft
Far Bank	426.01	ft
Discharge	3230.39	cfs
Velocity	7.66	fps

DEPTH 3.04 ft

JOB # 95-517
CANYON STATE EQUITY
BY: KD
01-19-1995

WITH ENCROACHMENT

CROSS SECTION TYPICAL SECTIN LOT 220

STATION	100.00	ELEVATION	84.00
STATION	170.00	ELEVATION	82.00
STATION	180.00	ELEVATION	81.00
STATION	190.00	ELEVATION	80.00
STATION	200.00	ELEVATION	80.00
STATION	215.00	ELEVATION	81.00
STATION	230.00	ELEVATION	82.00
STATION	310.00	ELEVATION	82.00
STATION	320.00	ELEVATION	81.00
STATION	330.00	ELEVATION	80.00
STATION	350.00	ELEVATION	80.00
BEGIN ENCROACHMENT → STATION	357.00	ELEVATION	80.70
STATION	370.00	ELEVATION	85.00

RESULTS

Manning's 'n'	0.035	
Channel Slope	0.0200	ft/ft
W.S. Elevation	83.14	ft
Area	386.16	sq.ft
Perimeter	234.94	ft
Near Bank	130.15	ft
Far Bank	364.37	ft
Discharge	3229.36	cfs
Velocity	8.36	fps
DEPTH	3.14	ft

JOB # 95-517
CANYON STATE EQUITY
BY: KD
01-19-1995

NATURAL

CROSS SECTION TYPICAL LOT 221

STATION 4970.00	ELEVATION 3478.00
STATION 4990.00	ELEVATION 3476.00
STATION 5000.00	ELEVATION 3474.50
STATION 5020.00	ELEVATION 3476.00
STATION 5220.00	ELEVATION 3478.00
STATION 5230.00	ELEVATION 3480.00
STATION 5270.00	ELEVATION 3482.00

RESULTS

Manning's 'n'	0.035	
Channel Slope	0.0160	ft/ft
W.S. Elevation	3478.49	ft
Area	424.80	sq.ft
Perimeter	252.76	ft
Near Bank	%10000000000.00	ft
Far Bank	5222.43	ft
Discharge	3224.83	cfs
Velocity	7.59	fps

JOB # 95-517
CANYON STATE EQUITY
BY: KD
01-19-1995

WITH ENCROACHMENT

CROSS SECTION TYPICAL SECTION LOT 221

STATION 4970.00	ELEVATION 3478.00	
STATION 4990.00	ELEVATION 3476.00	
STATION 5000.00	ELEVATION 3474.50	
STATION 5020.00	ELEVATION 3476.00	
STATION 5170.00	ELEVATION 3477.50	← BEGIN ENCROACH
STATION 5183.00	ELEVATION 3482.00	

RESULTS

Manning's 'n'	0.035		
Channel Slope	0.0160	ft/ft	
W.S. Elevation	3478.49	ft	
Area	389.36	sq.ft	
Perimeter	203.30	ft	
Near Bank	%10000000000.00		ft
Far Bank	5172.86	ft	
Discharge	3224.86	cfs	
Velocity	8.28	fps	

JOB # 94-517
CANYON STATE EQUITY
BY: KD
01-20-1995

NATURAL

CROSS SECTION TYPICAL SECTION LOT 225

STATION 4890.00	ELEVATION 3471.00
STATION 4945.00	ELEVATION 3470.00
STATION 4980.00	ELEVATION 3468.00
STATION 4990.00	ELEVATION 3466.00
STATION 4995.00	ELEVATION 3464.00
STATION 5000.00	ELEVATION 3463.50
STATION 5020.00	ELEVATION 3464.00
STATION 5090.00	ELEVATION 3464.00
STATION 5215.00	ELEVATION 3466.40

RESULTS

Manning's 'n'	0.035	
Channel Slope	0.0117	ft/ft
W.S. Elevation	3466.65	ft
Area	448.37	sq.ft
Perimeter	228.75	ft
Near Bank	4986.75	ft
Far Bank	5215.00	ft
Discharge	3225.05	cfs
Velocity	7.19	fps

JOB # 94-517
CANYON STATE EQUITY
BY: KD
01-20-1995

WITH ENCROACHMENT

CROSS SECTION TYPICAL SECTION LOT 225

STATION 4890.00	ELEVATION 3471.00	
STATION 4945.00	ELEVATION 3470.00	
STATION 4980.00	ELEVATION 3468.00	
STATION 4990.00	ELEVATION 3466.00	
STATION 4995.00	ELEVATION 3464.00	
STATION 5000.00	ELEVATION 3463.50	
STATION 5020.00	ELEVATION 3464.00	
STATION 5090.00	ELEVATION 3464.00	
STATION 5180.00	ELEVATION 3466.00	← BEGIN ENCROACH
STATION 5186.00	ELEVATION 3468.00	

RESULTS

Manning's 'n'	0.035	
Channel Slope	0.0117	ft/ft
W.S. Elevation	3466.68	ft
Area	421.95	sq.ft
Perimeter	196.04	ft
Near Bank	4986.61	ft
Far Bank	5182.03	ft
Discharge	3230.36	cfs
Velocity	7.66	fps

JOB # 94-517
CANYON STATE EQUITY
BY: KD
01-20-1995

NATURAL

CROSS SECTION TYPICAL LOT 226 (LARGE WASH)

STATION	0.00	ELEVATION	66.00
STATION	100.00	ELEVATION	64.00
STATION	120.00	ELEVATION	62.00
STATION	140.00	ELEVATION	61.75
STATION	160.00	ELEVATION	62.00
STATION	200.00	ELEVATION	64.00
STATION	230.00	ELEVATION	66.00

RESULTS

Manning's 'n'	0.035	
Channel Slope	0.0170	ft/ft
W.S. Elevation	65.57	ft
Area	381.97	sq.ft
Perimeter	202.23	ft
Near Bank	21.53	ft
Far Bank	223.54	ft
Discharge	3230.97	cfs
Velocity	8.46	fps

JOB # 94-517
CANYON STATE EQUITY
BY: KD
01-20-1995

NATURAL

CROSS SECTION TYPICAL SECTION LOT 226 (SMALL WASH)

STATION	250.00	ELEVATION	66.00
STATION	280.00	ELEVATION	64.00
STATION	330.00	ELEVATION	63.00
STATION	370.00	ELEVATION	64.00
STATION	390.00	ELEVATION	66.00
STATION	410.00	ELEVATION	68.00
STATION	430.00	ELEVATION	70.00

RESULTS

Manning's 'n'	0.035	
Channel Slope	0.0200	ft/ft
W.S. Elevation	63.71	ft
Area	22.69	sq.ft
Perimeter	63.92	ft
Near Bank	294.50	ft
Far Bank	358.40	ft
Discharge	68.30	cfs
Velocity	3.01	fps

JOB # 94-517
CANYON STATE EQUITY
BY: KD
01-20-1995

W/ENCROACHMENT

CROSS SECTION TYPICAL SECTION LOT 226 (SMALL WASH)

STATION	250.00	ELEVATION	66.00	
STATION	280.00	ELEVATION	64.00	
STATION	330.00	ELEVATION	63.00	
STATION	355.00	ELEVATION	63.50	← BEGIN ENCROACH
STATION	375.00	ELEVATION	70.00	

RESULTS

Manning's 'n'	0.035	
Channel Slope	0.0200	ft/ft
W.S. Elevation	63.67	ft
Area	22.03	sq.ft
Perimeter	59.30	ft
Near Bank	296.28	ft
Far Bank	355.54	ft
Discharge	68.37	cfs
Velocity	3.10	fps

11.0 APPENDICES

Appendix A:

HYDROLOGIC AND HYDRAULIC REPORT
FOR UNITS 22,23 AND 24
AT NEW TUCSON

PREPARED FOR
MR. JEFF KAY

AUGUST 26, 1985
REVISED DECEMBER 10, 1985

DJA JOB NO. 84-077.01

(REP-2)

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FIGURES

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INTRODUCTION

This parcel is Unit 22, 23 and 24 of New Tucson (Book 17, page 42, 43 and 44), located in Section 4, Township 17 South, Range 16 East, Gila and Salt River Base and Meridian. The Location Map is given in Figure 1. The property is owned by Mr. Jeff Kay and is currently zoned TR. There are some houses already constructed on the parcel. Most of the area is left undeveloped. The whole area can be classified as desert foothills.

New Tucson was recorded in 1964. This report is being prepared to map existing 100-year floodprone areas on the site.

OBJECTIVE

The objective of this report is to determine all of the flows generated by a 100-year storm in excess of 100 cfs and then map the floodprone boundaries for the flows.

METHODOLOGY AND PROCEDURE

Hydrology

(1) Offsite and Onsite Drainage:

The method outlined in the Pima County Hydrology Manual for Engineering Design and Flood Control Management (Reference 1) was used to determine the peak runoff magnitudes for all drainage areas affecting this parcel.

Under future developed conditions, offsite watershed types will be foothills and suburban foothills. Due to the large size of Watershed A, the basin factor and impervious cover have been weighted to obtain values of 0.0327 and 12.5% respectively. Basin factor and impervious cover for the remaining watersheds are 0.032 and 15% as suggested by Pima County. Cover density for all watersheds is 30%. Cover type is desert brush. Soil groups for the watersheds are 35% B, 15% C and 50% D. Precipitation values are derived from the hydrology manual.

The drainage areas and the corresponding discharges are given in Table 1. The watershed delineations are given in Figure 2. The on-site watershed delineations are given in Figure 3. Detailed calculations are included in Appendix 1.

071

THIS PROJECT

A5 130cfs

A4 468 ac 359 cfs

A3 177ac 177cfs

A1 26.7ac 104cfs

A2 171ac 515cfs

C1 356ac 156cfs

D 153ac 493cfs

C 104.5ac 302cfs

B1 67.9ac 250cfs

A 5243 ac 7245 cfs

B 1745 ac 3228 cfs

WATERSHED BOUNDARY DELINEATION

SCALE 1"=2000'

FIGURE 2

Hydraulics

(1) Backwater Calculation:

The water surface elevations were computed using HEC-2 computer program (Reference 2). The discharges were obtained from the hydrology analysis. The parcel can be divided into eight watersheds. All of them have a discharge over 100 cfs. Therefore, eight models were setup to cover the whole study area. The computer outputs are included in Appendix 2.

(2) Starting Water Surface Elevation:

Because of the steepness of the slope, the flow regimes are very close to critical. The models are setup for subcritical flow. For watersheds B, C and D, the critical messages are shown in every cross-section. This indicates that the flow regimes for these two watersheds are supercritical. Since HEC-2 does not have the option of changing to supercritical flow calculations for a tributary stream system during a subcritical run. Also, in the supercritical flow case the critical depth is higher than normal depth. Therefore, to be conservative, subcritical models are used in these three cases for mapping purposes. The critical water surface elevations are used as the starting water surface elevations.

For the rest of the watersheds, the flow regimes are subcritical, but the Froude numbers are very close to 1. A small change of the starting water surface elevation can change the regime at an upstream station. It is very difficult to obtain the starting water surface elevation by the convergence of the backwater profiles calculated by a multiple profile run. So, normal depth water surface elevations are used as the starting water surface elevations.

(3) Floodprone Boundaries Delineation:

By locating the water surface elevations computed by HEC-2 on the topographic map on which every cross-section location is drawn, the boundaries of the flood can be determined. Connecting the points of the flood boundaries of every cross-section are the floodprone boundaries. The floodprone boundaries delineations are shown in Figure 4.

A "mock" plat has bee prepared showing the delineations of floodprone areas overlaying the preliminary parcel layout. The reason that the layout of roads and lots are not final is that until this study is complete, a more feasible layout cannot be developed.

RESULTS AND DISCUSSION

The results from a study of this nature are best explained by a series of maps and figures. The drainage areas and the corresponding discharges are given in Table 1. The watershed delineations are given in Figures 2 and 3. The floodprone boundaries are shown in Figure 4 as well as Figure 17. In Figure 17 the floodprone areas are incorporated with a preliminary or "mock" layout of roads and lots. As previously mentioned, the actual layout for the parcel will be determined once actual development is ready to proceed. Longitudinal water surface profiles are shown in Figures 5 through 16.

The parcel is affected by 7 major watersheds and an eighth which has a floodprone area associated with Watershed D and will not affect future development of this parcel. Some of the major watersheds have been subdivided to show the effect of contributing onsite tributaries that convey a Q100 flow in excess of 100 cfs.

As per comments from submittal dated November 12, 1985, Watershed areas A3 and B/A5 have been redelineated and corrections made to corresponding HEC-2 analysis. A 100-year floodprone area has been developed for Watershed D, located at

the southwestern margin of the parcel. The 100-year floodprone areas are shown with corresponding drainage areas and discharges. The tributary backwater for Wash B begins at Sections 1100 and 2600 for the two contributing tributary sub-basins. The floodprone area associated with B1 has been extended to parcel boundary.

TABLE 1

ACREAGE AND PEAK DISCHARGE FOR
NEW TUCSON WATERSHEDS

Watershed	Acreage (Acre)	Discharge (cfs)
A	5243.0	7245
A1	26.7	106
A2	171.7	515
A3	45.8	177
A3 (East)	21.2	96
A4 (West)	52.7	178
A4 (West-Tributary)	17.1	81
A4 (East)	22.9	100
A4 (Combined)	92.7	359
A5	26.1	130
B1	67.9	250
B2	14.7	68
B (Combined)	1754.0	3228
C1	35.5	156
C	106.5	302
D	153.0	493

BASIS OF ELEVATION

The basis of elevation is a bench mark: U.S.G.S. Datum, located at the northeast corner of Section 4, Mount Fagan Quadrangle, Elevation is 3451.0.

REFERENCE

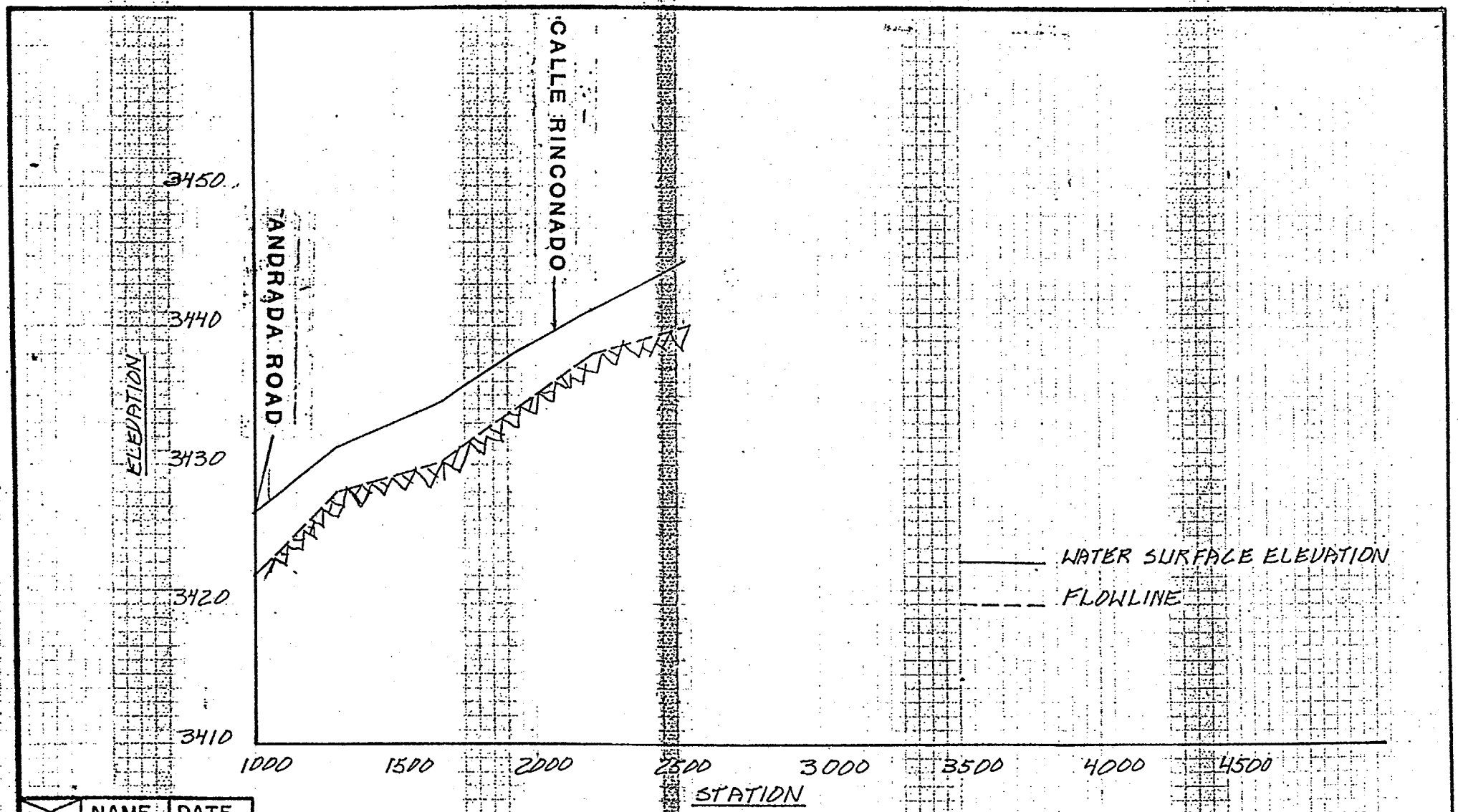
1. Hydrology Manual for Engineering Design and Floodplain Management within Pima County, Arizona, Pima County Department of Transportation and Flood Control District, September, 1979.

2. HEC-2 Water Surface Profiles, the Hydrologic Engineering Center, Water Resources Support Center, Corps of Engineering, 1982.

3. USGS Quadrangle Map, Mount Fagan, Arizona, N3152.5-W11037.5/7.5, 1981.

This report prepared and written by H.Y. Lee and W.C. Gresham.

This report revised by W.C. Gresham.



	NAME	DATE
DSN	HYL	9/9/85
DRN	LAH	8/29/85
CKD	HYL	9/9/85

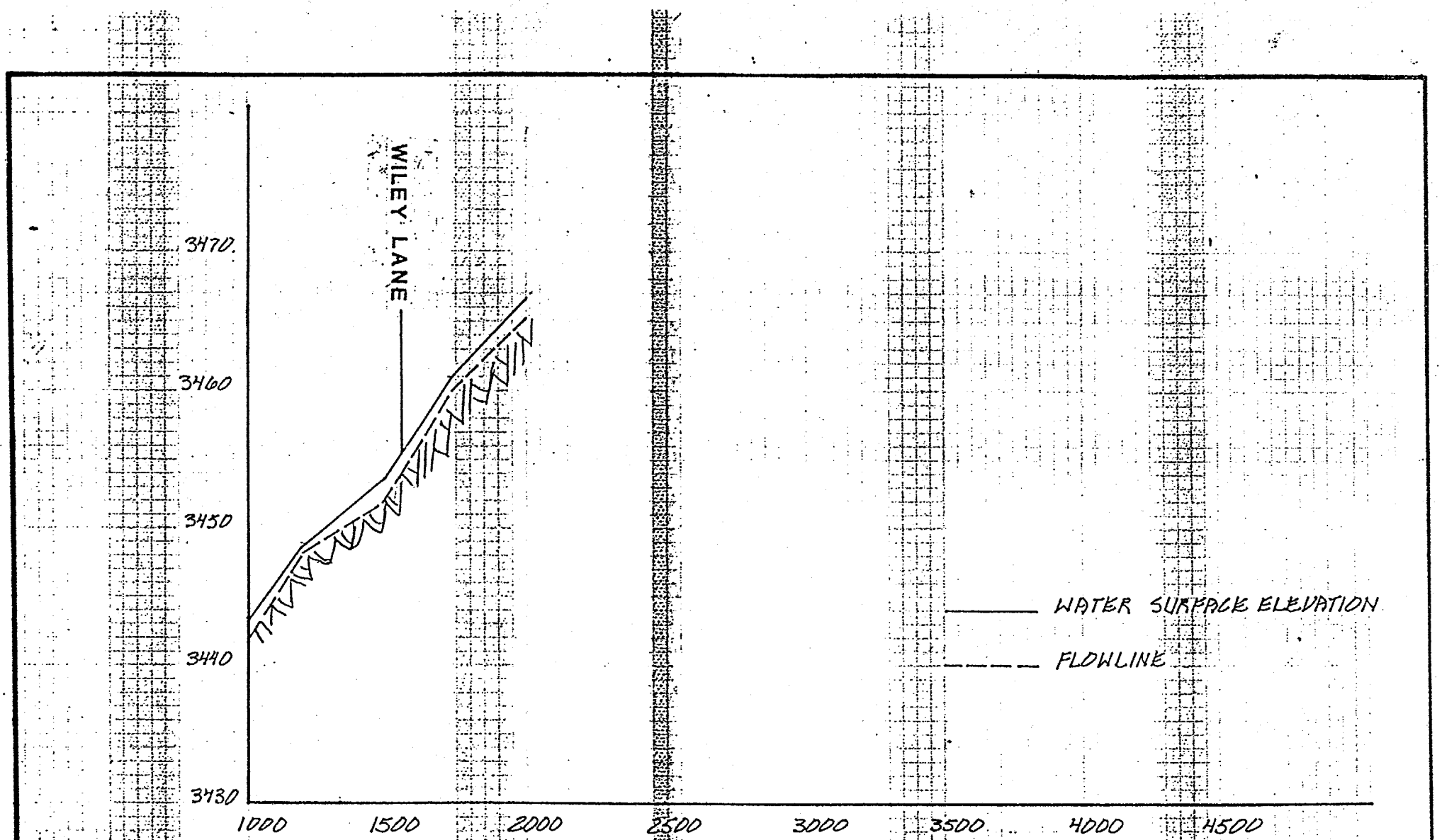
NO.	NAME	DATE	REVISION

LONGITUDINAL WATER SURFACE PROFILE

WASHA

FIGURE 5

SCALE:



LONGITUDINAL WATER SURFACE PROFILE

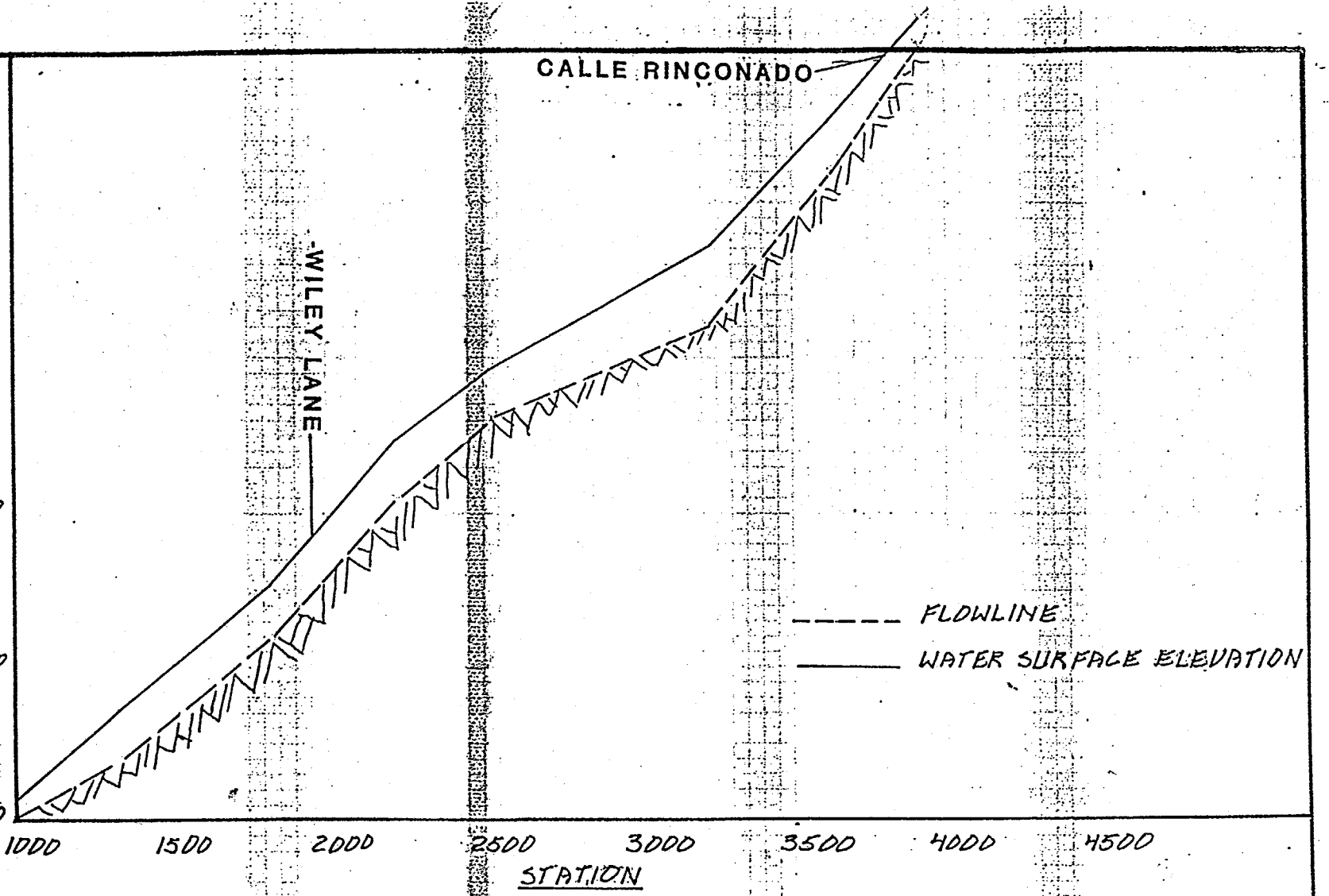
WASH A1

	NAME	DATE
DSN	H Y L	9/9/85
DRN	LAH	8/29/86
CKD	H Y L	9/9/85

NO.	NAME	DATE	REVISION

FIGURE 6

SCALE



LONGITUDINAL WATER SURFACE PROFILE

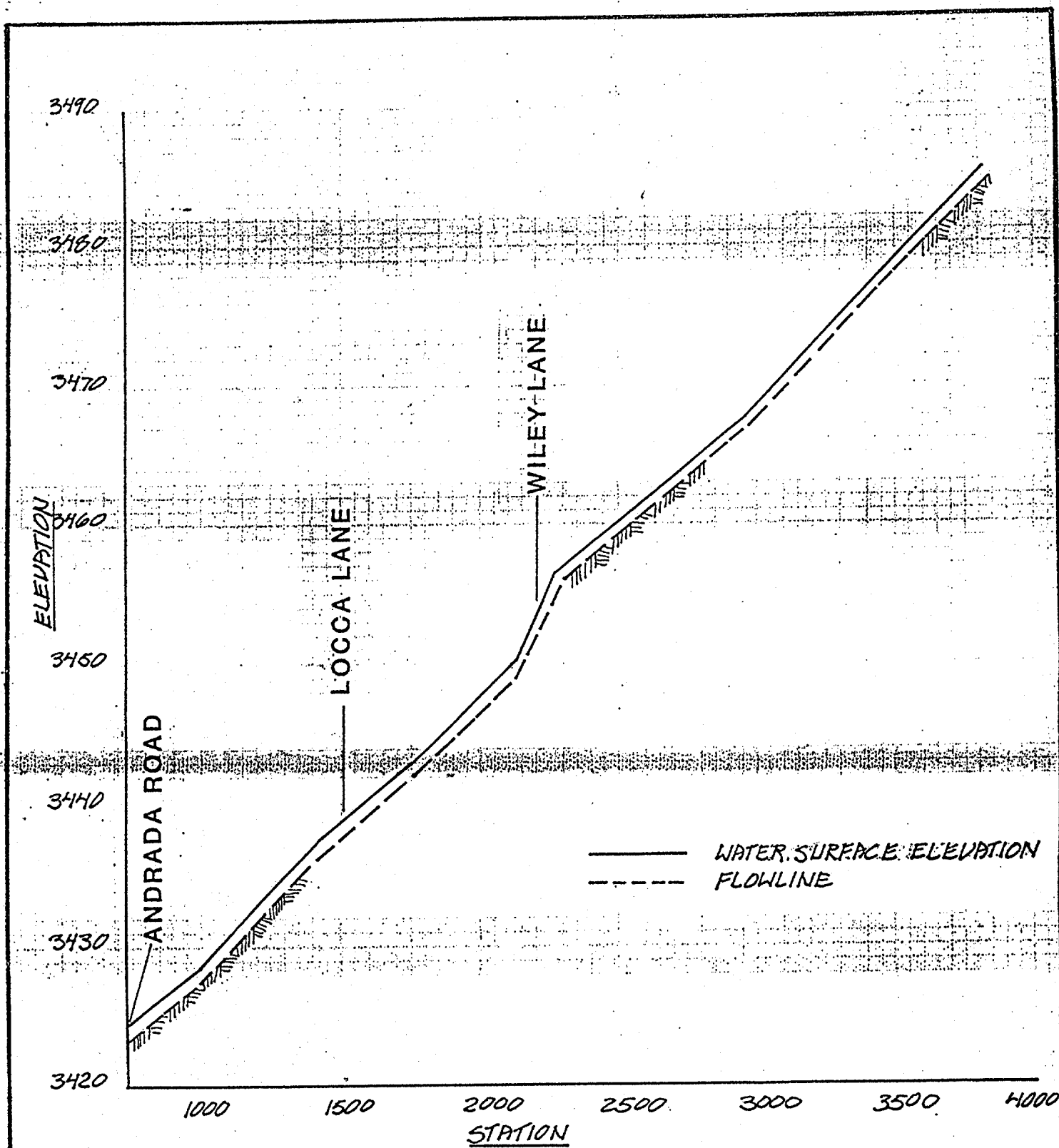
WASH A2

	NAME	DATE
DSN	HYL	9/9/85
DRN	LAH	8/29/85
CKD	HYL	9/9/85

NO.	NAME	DATE	REVISION

FIGURE 7

84-077.01



	NAME	DATE
DSN	HYL	9/10/85
DRN	LAH	9/10/85
CKD	HYL	9/10/85

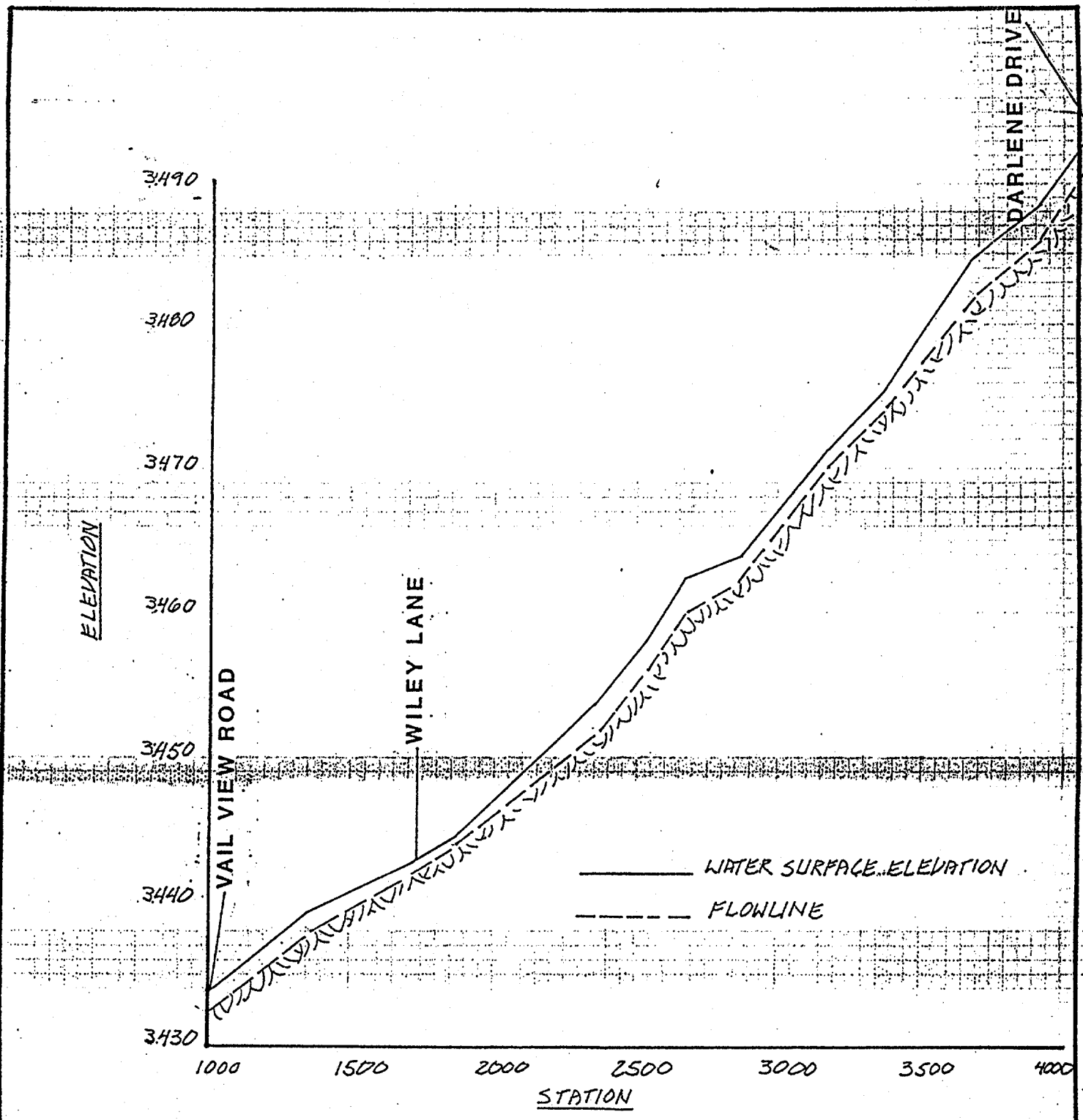
NO.	NAME	DATE	REVISION

LONGITUDINAL WATER SURFACE PROFILE

UASH P3

FIGURE 8

DJA JOB NO. 84-077.01



	NAME	DATE
DSN	H Y L	9/9/85
DRN	LAH	8/27/85
CKD	H Y L	9/9/85

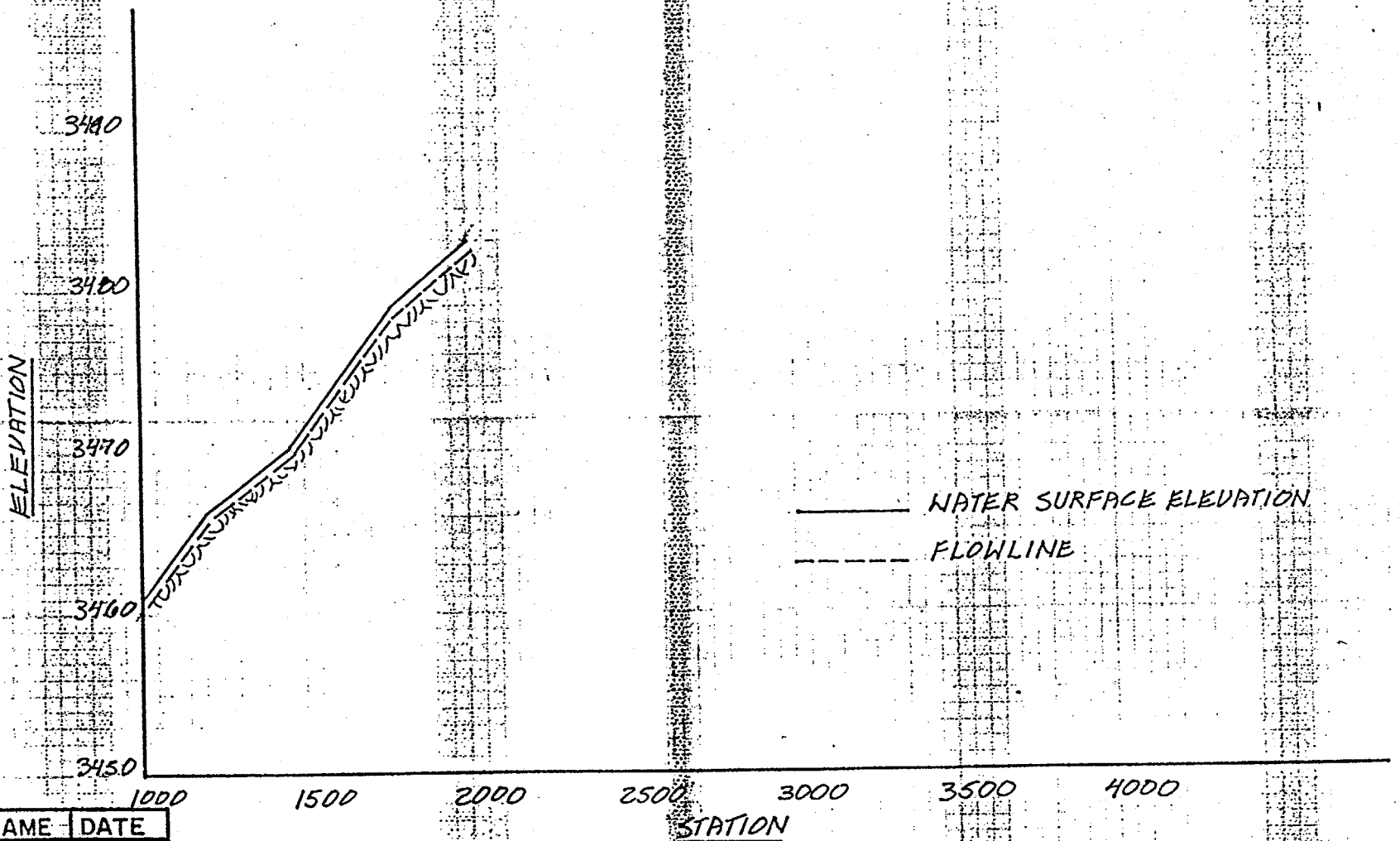
NO.	NAME	DATE	REVISION

LONGITUDINAL WATER SURFACE PROFILE

WASH A4

FIGURE 9

DJA JOB_NO_84,077.01



	NAME	DATE
DSN	HYL	9/9/85
DRN	LAH	8/27/85
CKD	HYL	9/9/85

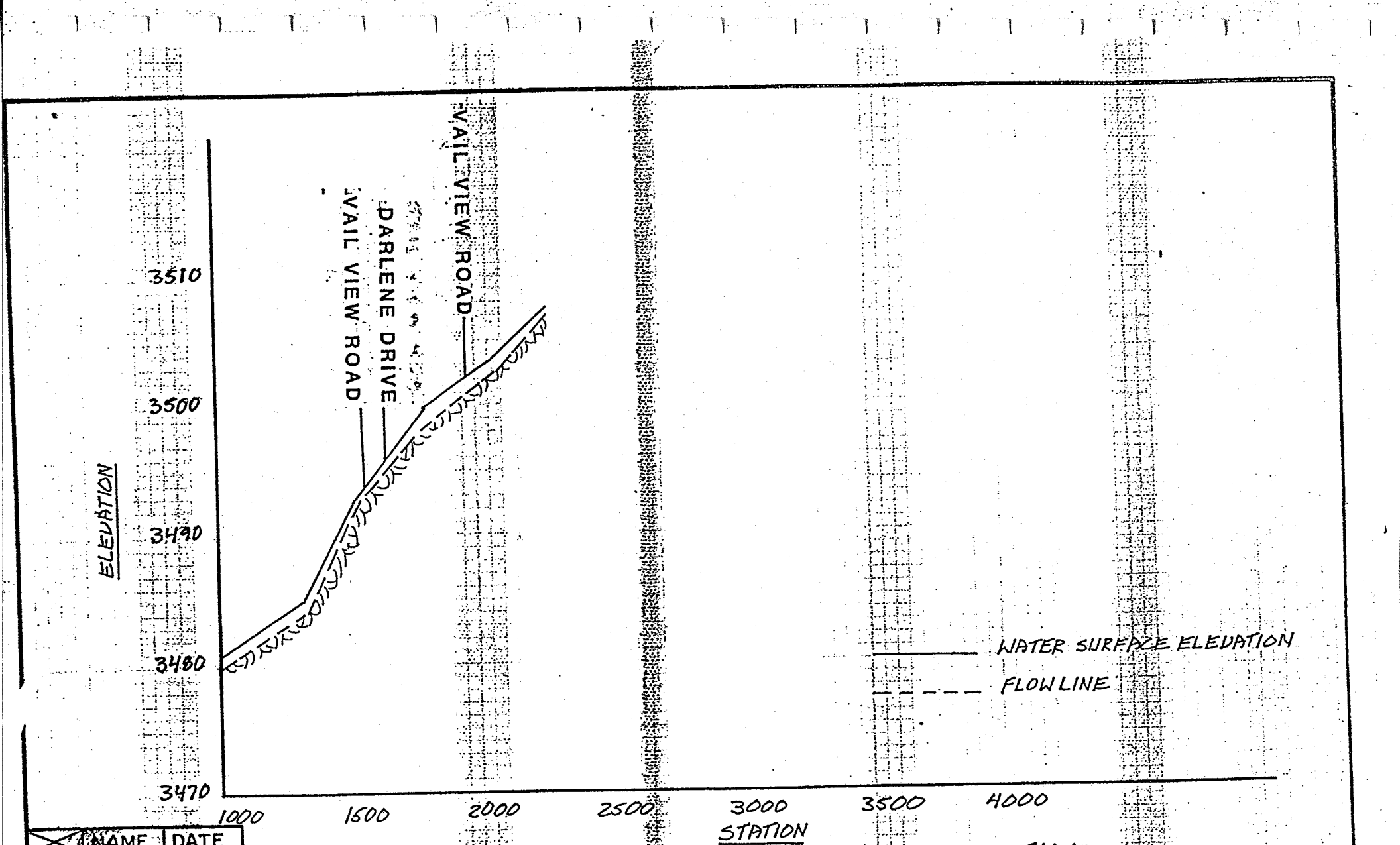
NO.	NAME	DATE	REVISION

LONGITUDINAL WATER SURFACE PROFILE

WASH AY EAST

FIGURE 10

84077.01



	NAME	DATE
DSN	HYL	9/9/85
DRN	LAH	8/27/85
CKD	HYL	9/9/85

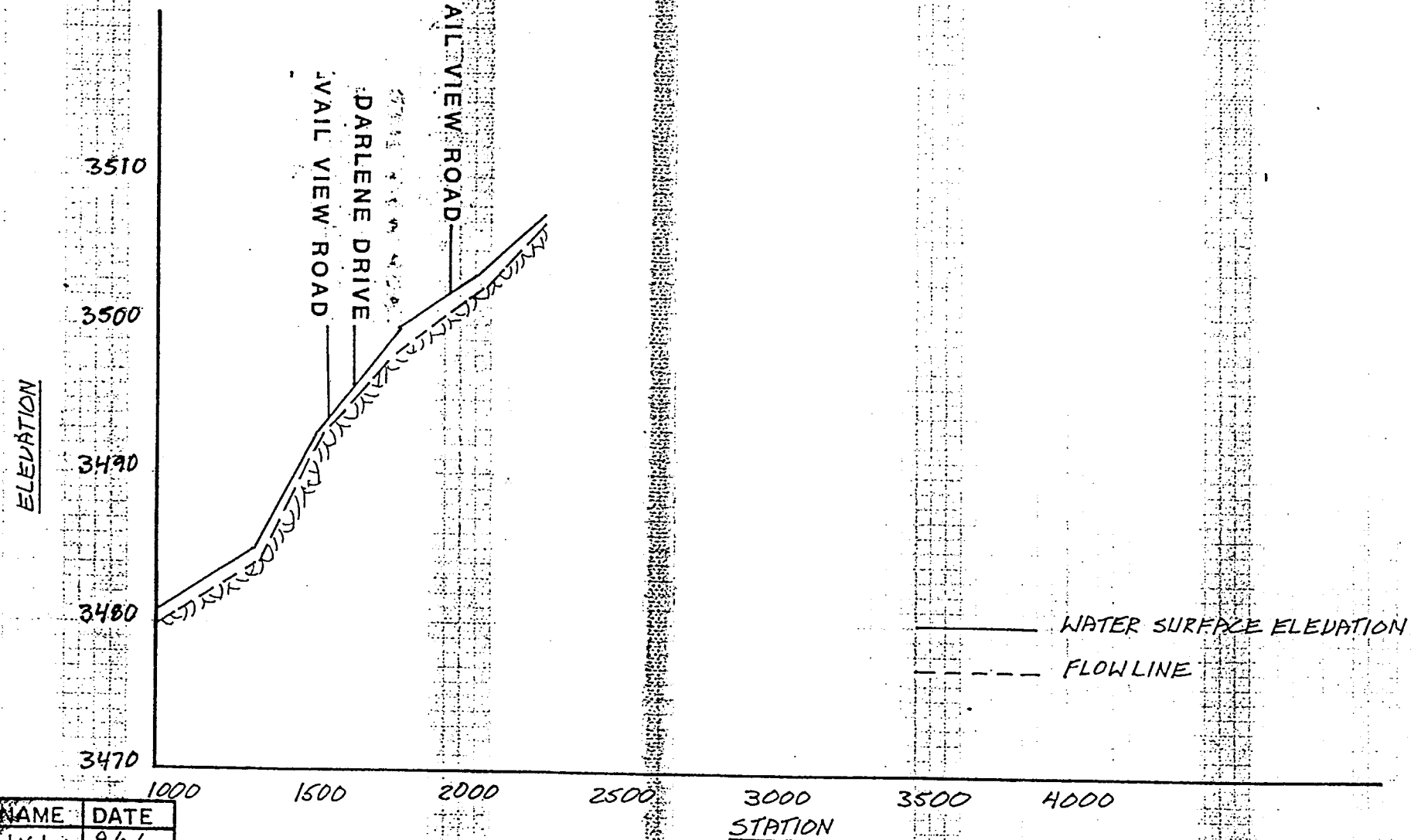
NO.	NAME	DATE	REVISION

LONGITUDINAL WATER SURFACE PROFILE

WASH A4 WEST

FIGURE 11

84077.01



	NAME	DATE
DSN	HYL	9/9/85
DRN	LAH	8/27/85
CKD	HYL	9/9/85

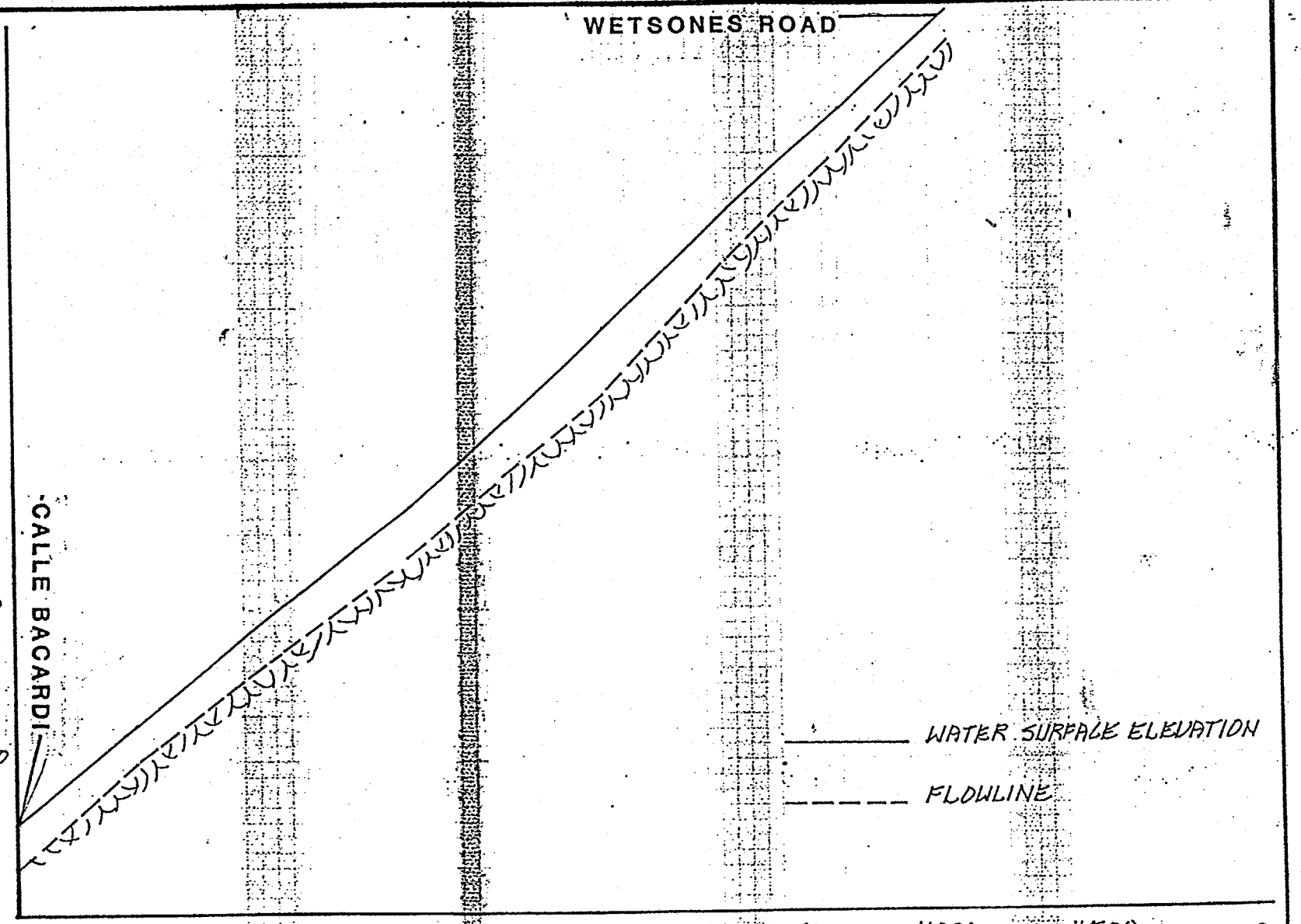
NO.	NAME	DATE	REVISION

LONGITUDINAL WATER SURFACE PROFILE

WASH A4 WEST

FIGURE 11

84077.01



	NAME	DATE
DSN	HYL	9/9/85
DRN	LAH	8/29/85
CKD	HYL	9/9/85

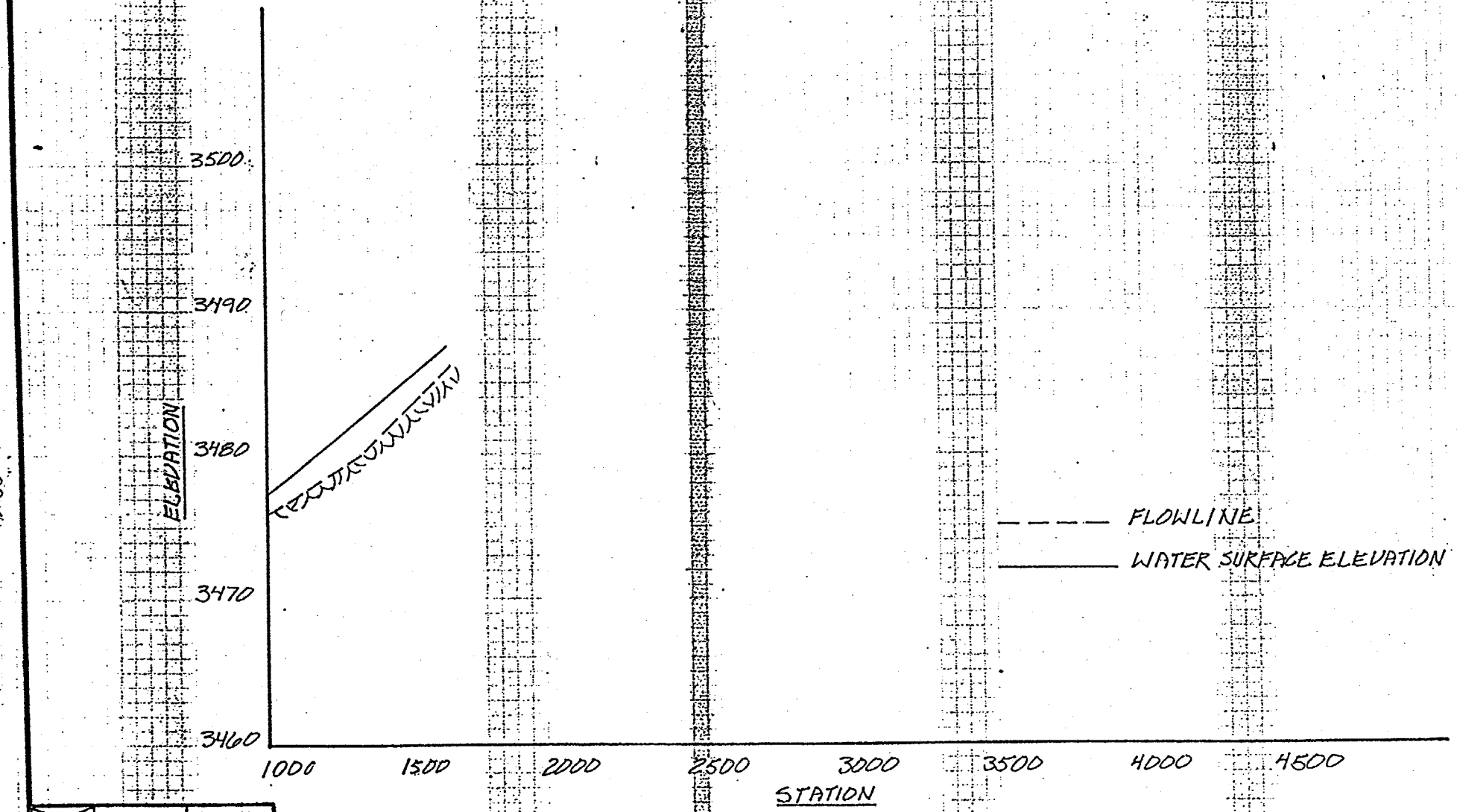
NO.	NAME	DATE	REVISION

LONGITUDINAL WATER SURFACE PROFILE

WASHB

FIGURE 13

84-077.01



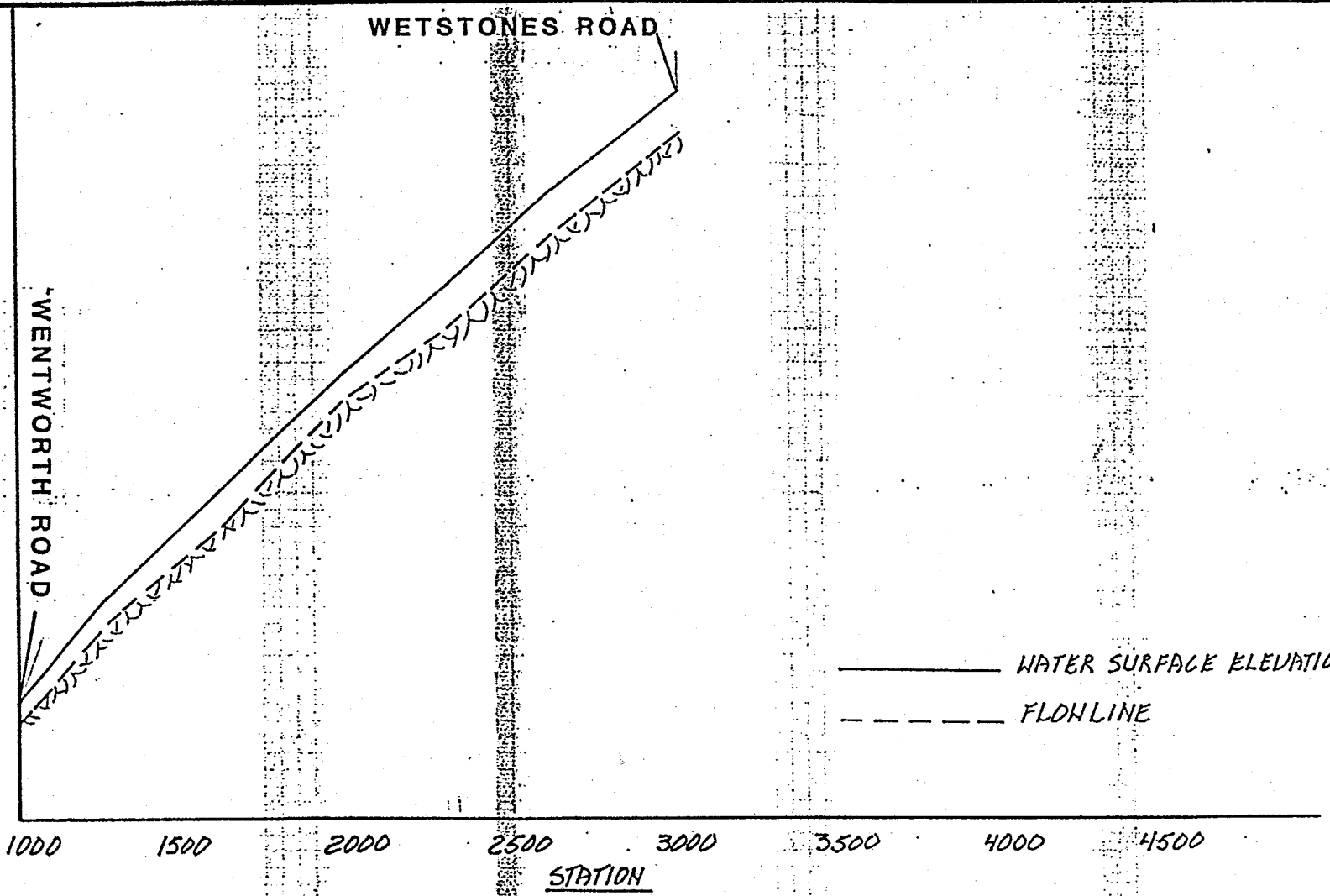
	NAME	DATE
DSN	HYL	9/9/85
DRN	LAH	8/29/85
CKD	HYL	9/9/85

NO.	NAME	DATE	REVISION

LONGITUDINAL WATER SURFACE PROFILE

WASH B1

FIGURE 14



LONGITUDINAL WATER SURFACE PROFILE

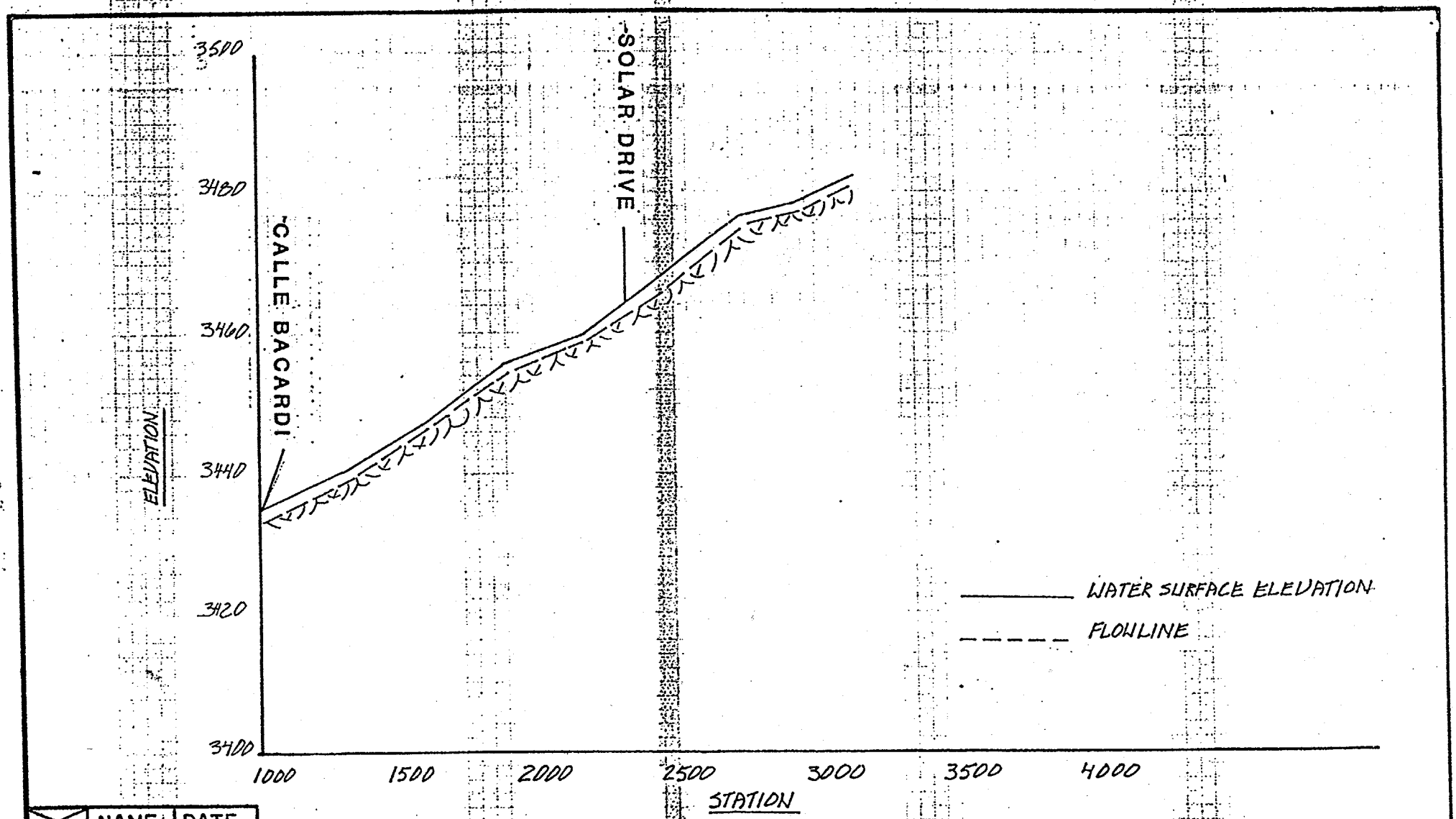
WASHC

	NAME	DATE
DSN	HYL	9/9/85
DRN	LAH	8/27/85
CKD	HYL	9/9/85

NO.	NAME	DATE	REVISION

FIGURE 15

84-077.01



	NAME	DATE
DSN	HYL	9/9/85
DRN	LAH	8/27/85
CKD	HYL	9/9/85

NO.	NAME	DATE	REVISION

LONGITUDINAL WATER SURFACE PROFILE

WASH C1

FIGURE 16

SCALE:

APPENDIX 1

Hydrology Calculation

HYDROLOGIC DATA SHEET

Project Name and Location: NEW TUCSON, B, 84-077.01

Drainage Concentration Point: CALLE BACARDI

Watershed Area (A): 1754.00 Acres

Length of Watercourse(Lc): 24500. ft Length to Center of Gravity(Lca): 13750. ft

Incremental Change in Length(Li) -ft. Incremental Change in Elevation(Hi) -ft

Mean Slope (Sc): 0.0260 ft/ft Watershed Type(s): FT.HILLS & SUB.FT.HI(future)

Basin Factor(nb): 0.0325 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr):	4.43	in.	Areal Value:	in.
P6 (6 hr):	3.34	in.	Areal Value:	in.
P1 (1 hr):	2.44	in.	Areal Value:	in.
P2 (2 hr):	2.75	in.	Areal Value:	in.
P3 (3 hr):	2.95	in.	Areal Value:	in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BR

Cover Density (pervious areas): 30.0% Impervious Cover: 13.3% (future)

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 0.0 0.0 0.0 0.0 85.8

Adjusted Curve Number(s) - CN*(s): 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas)

Runoff Supply Rate(q): 0.64 X i in/hr (function of i)

Time of Concentration (TC):1.2073 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 47.7 mins. (K= 50.7)

Rainfall Intensity (i) at TC: 2.84 in./hr.

Runoff Supply Rate (q) at TC: 1.83 in./hr.

Peak Discharge:
1.008qA(acres): 3228. cfs

Discharge Location:

HYDROLOGIC DATA SHEET

Project Name and Location: NEW TUCSON B1

Drainage Concentration Point: PT B1

Watershed Area (A): 67.87 Acres

Length of Watercourse(Lc): 6000. ft Length to Center of Gravity(Lca): 3000. ft

Incremental Change in Length(Li) -ft. Incremental Change in Elevation(Hi) -ft

6000.0 160.0

Mean Slope (Sc): 0.0267 ft/ft Watershed Type(s): SUBURBAN FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr):	4.43	in.	Areal Value:	in.
P6 (6 hr):	3.34	in.	Areal Value:	in.
P1 (1 hr):	2.44	in.	Areal Value:	in.
P2 (2 hr):	2.75	in.	Areal Value:	in.
P3 (3 hr):	2.95	in.	Areal Value:	in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BR

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future)

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 0.0 0.0 0.0 0.0 85.8

Adjusted Curve Number(s) - CN*(s): 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas)

Runoff Supply Rate(q): 0.65 X i in/hr (function of i)

Time of Concentration (TC):0.4869 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 14.6 mins. (K= 20.4)

Rainfall Intensity (i) at TC: 5.63 in./hr.

Runoff Supply Rate (q) at TC: 3.65 in./hr.

Peak Discharge:
1.008qA(acres): 250. cfs

Discharge Location:

HYDROLOGIC DATA SHEET

Project Name and Location: NEW TUCSON B2

Drainage Concentration Point: 150 FT. SOUTH OF CALLE BACARDI

Watershed Area (A): 14.70 Acres

Length of Watercourse(Lc): 2400. ft Length to Center of Gravity(Lca): 1200. ft

Incremental Change in Length(Li) -ft. Incremental Change in Elevation(Hi) -ft

2400.0 50.0

Mean Slope (Sc): 0.0208 ft/ft Watershed Type(s): SUBURBAUN FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr): 4.43 in. Areal Value: in.

P6 (6 hr): 3.34 in. Areal Value: in.

P1 (1 hr): 2.44 in. Areal Value: in.

P2 (2 hr): 2.75 in. Areal Value: in.

P3 (3 hr): 2.95 in. Areal Value: in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BR

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future)

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 0.0 0.0 0.0 0.0 85.8

Adjusted Curve Number(s) - CN*(s): 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas)

Runoff Supply Rate(q): 0.65 X i in/hr (function of i)

Time of Concentration (TC):0.3101 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 8.5 mins. (K= 13.0)

Rainfall Intensity (i) at TC: /.08 in./hr.

Runoff Supply Rate (q) at TC: 4.60 in./hr.

Peak Discharge:
1.008qA(acres): 68. cfs

Discharge Location:

Appendix B:

```
*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED MARCH 1982                               *
*                                                   *
*  RUN DATE 27-AUG-85  TIME 09:51:34                *
*****************************************************
```

WASH B


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


```
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
```

THIS RUN EXECUTED 5-DEC-85 10:51:25

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**************************************************
  HEC2 RELEASE DATED NOV 76-UPDATED MAR. 1982
  ERROR CORR -  01,02,03,04,05
  MODIFICATION -  50,51,52,53,54,55
**************************************************

T1 NEW TUCSON DJA JOB NO 84-077.01
T2 FILE WASHB.DAT
T3

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.        2.        0.        0. -1.000000      0.00      0.0       0.  3447.000     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    -1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000


NC     0.060     0.060     0.035     0.100     0.300     0.000     0.000     0.000     0.000     0.000
QT     0.000  3228.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
X1  1000.000    15.000  4805.000  5570.000     0.000     0.000     0.000     0.000     0.000     0.000
GR  3446.500  4805.000  3446.000  4835.000  3444.000  4860.000  3444.000  4950.000  3443.000  4990.000
GR  3443.000  5015.000  3444.000  5030.000  3446.000  5040.000  3447.000  5100.000  3448.000  5125.000
GR  3450.000  5145.000  3452.000  5210.000  3454.000  5290.000  3456.000  5420.000  3458.000  5570.000

X1  1100.000     8.000  4865.000  5240.000    90.000   110.000   100.000     0.000     0.000     0.000
GR  3448.000  4865.000  3446.000  4920.000  3446.000  4970.000  3444.000  5000.000  3446.000  5045.000
GR  3448.000  5065.000  3450.000  5110.000  3452.000  5240.000     0.000     0.000     0.000     0.000

X1  1400.000     9.000  4960.000  5190.000   310.000   200.000   300.000     0.000     0.000     0.000
GR  3453.000  4960.000  3452.000  4975.000  3450.000  4990.000  3450.000  5005.000  3451.000  5025.000
GR  3450.000  5065.000  3451.000  5100.000  3450.000  5125.000  3452.000  5190.000     0.000     0.000

X1  1880.000     7.000  4750.000  5020.000   520.000   180.000   480.000     0.000     0.000     0.000
GR  3465.000  4750.000  3464.000  4810.000  3462.000  4845.000  3460.000  4860.000  3458.000  4990.000
GR  3458.000  5010.000  3461.000  5020.000     0.000     0.000     0.000     0.000     0.000     0.000

X1  2280.000    10.000  4890.000  5220.000   390.000   280.000   400.000     0.000     0.000     0.000
GR  3471.500  4890.000  3470.000  4945.000  3468.000  4980.000  3466.000  4990.000  3464.000  4995.000
GR  3463.500  5000.000  3464.000  5020.000  3464.000  5090.000  3466.000  5180.000  3466.500  5220.000

X1  2600.000    11.000  4860.000  5080.000   340.000   190.000   320.000     0.000     0.000     0.000
X3    10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
GR  3478.000  4860.000  3476.000  4875.000  3474.000  4885.000  3472.000  4900.000  3470.000  4930.000
GR  3469.000  4950.000  3470.000  4965.000  3469.500  5000.000  3470.000  5020.000  3472.000  5040.000
GR  3473.000  5080.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
```

X1	2940.000	7.000	4970.000	5270.000	340.000	300.000	340.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	3478.000	4970.000	3476.000	4990.000	3474.500	5000.000	3476.000	5020.000	3478.000	5220.000
GR	3480.000	5230.000	3482.000	5270.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	3340.000	15.000	4850.000	5230.000	380.000	440.000	400.000	0.000	0.000	0.000
GR	3488.000	4850.000	3488.000	4910.000	3486.000	4940.000	3484.000	4950.000	3483.000	4960.000
GR	3484.000	4980.000	3484.000	5000.000	3484.000	5030.000	3486.000	5070.000	3484.000	5140.000
GR	3483.000	5150.000	3484.000	5160.000	3486.000	5170.000	3488.000	5185.000	3488.500	5230.000
X1	3700.000	12.000	4840.000	5475.000	340.000	410.000	360.000	0.000	0.000	0.000
GR	3496.000	4840.000	3494.000	4900.000	3492.000	4930.000	3490.000	4945.000	3492.000	4970.000
GR	3490.000	4980.000	3490.000	5000.000	3490.000	5090.000	3492.000	5105.000	3494.000	5255.000
GR	3496.000	5405.000	3497.000	5475.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	4060.000	15.000	4800.000	5330.000	360.000	360.000	360.000	0.000	0.000	0.000
GR	3506.000	4800.000	3504.000	4830.000	3502.000	4835.000	3500.000	4840.000	3498.000	4850.000
GR	3498.000	4880.000	3497.500	4910.000	3498.000	4950.000	3498.000	4980.000	3498.000	5030.000
GR	3500.000	5075.000	3502.000	5140.000	3502.000	5200.000	3502.000	5265.000	3502.500	5330.000
QT	0.000	250.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	-2600.000	11.000	4860.000	5080.000	340.000	190.000	320.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	3478.000	4860.000	3476.000	4875.000	3474.000	4885.000	3472.000	4900.000	3470.000	4930.000
GR	3469.000	4950.000	3470.000	4965.000	3469.500	5000.000	3470.000	5020.000	3472.000	5040.000
GR	3473.000	5080.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	1.000	8.000	4860.000	5040.000	330.000	330.000	330.000	0.000	0.000	0.000
GR	3484.500	4860.000	3484.000	4890.000	3482.000	4920.000	3480.000	4950.000	3478.000	4970.000
GR	3476.000	4990.000	3476.000	5010.000	3478.000	5040.000	0.000	0.000	0.000	0.000
X1	2.000	12.000	4770.000	5170.000	340.000	340.000	340.000	0.000	0.000	0.000
GR	3492.000	4770.000	3490.000	4845.000	3488.000	4880.000	3486.000	4925.000	3484.000	4970.000
GR	3482.000	4985.000	3480.000	4990.000	3480.000	5005.000	3482.000	5010.000	3484.000	5020.000
GR	3486.000	5110.000	3487.500	5170.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	3.000	15.000	4660.000	5230.000	310.000	310.000	310.000	0.000	0.000	0.000
GR	3499.000	4660.000	3498.000	4720.000	3496.000	4775.000	3494.000	4840.000	3492.000	4880.000
GR	3490.000	4925.000	3488.000	4990.000	3486.000	4995.000	3486.000	5010.000	3488.000	5020.000
GR	3490.000	5060.000	3490.000	5100.000	3492.000	5130.000	3494.000	5180.000	3495.000	5230.000
QT	0.000	68.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	-1100.000	8.000	4865.000	5240.000	90.000	110.000	100.000	0.000	0.000	0.000
GR	3448.000	4865.000	3446.000	4920.000	3446.000	4970.000	3444.000	5000.000	3446.000	5045.000
GR	3448.000	5065.000	3450.000	5110.000	3452.000	5240.000	0.000	0.000	0.000	0.000
X1	11.000	6.000	4940.000	5070.000	350.000	350.000	350.000	0.000	0.000	0.000
GR	3454.000	4940.000	3452.000	4980.000	3450.000	5000.000	3452.000	5010.000	3454.000	5025.000
GR	3457.000	5070.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	12.000	8.000	4960.000	5190.000	400.000	400.000	400.000	0.000	0.000	0.000
GR	3462.000	4960.000	3460.000	4980.000	3458.000	5000.000	3460.000	5070.000	3458.000	5090.000
GR	3460.000	5100.000	3462.000	5130.000	3464.000	5190.000	0.000	0.000	0.000	0.000
X1	13.000	5.000	4880.000	5090.000	370.000	370.000	370.000	0.000	0.000	0.000
GR	3468.000	4880.000	3466.500	5000.000	3468.000	5020.000	3470.000	5050.000	3472.000	5090.000
X1	14.000	5.000	4935.000	5040.000	340.000	300.000	320.000	0.000	0.000	0.000
GR	3476.000	4935.000	3474.000	4980.000	3472.000	5000.000	3474.000	5020.000	3476.000	5040.000
X1	15.000	5.000	4930.000	5055.000	270.000	250.000	260.000	0.000	0.000	0.000
GR	3482.000	4930.000	3480.000	4990.000	3478.000	5000.000	3480.000	5010.000	3482.000	5055.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

5-DEC-85 10:51:25

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= 0.100 CEHV= 0.300

*SECNO 1000.000

3720 CRITICAL DEPTH ASSUMED

1000.00	2.85	3445.85	3445.85	3447.00	3446.88	1.03	0.00	0.00	3446.50
3228.	0.	3228.	0.	0.	397.	0.	0.	0.	3458.00
0.00	0.00	8.13	0.00	0.060	0.035	0.060	0.000	3443.00	4836.86
0.014952	0.	0.	0.	0	14	0	0.00	202.39	5039.25

*SECNO 1100.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1100.00	3.98	3447.98	3447.98	0.00	3449.01	1.03	1.49	0.00	3448.00
3228.	0.	3228.	0.	0.	396.	0.	1.	0.	3452.00
0.00	0.00	8.15	0.00	0.060	0.035	0.060	0.000	3444.00	4865.55
0.014775	90.	100.	110.	2	14	0	0.00	199.25	5064.80

*SECNO 1400.000

3280 CROSS SECTION 1400.00 EXTENDED 0.57 FEET

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1400.00	2.57	3452.57	3452.57	0.00	3453.51	0.94	4.44	0.01	3453.00
3228.	0.	3228.	0.	0.	415.	0.	4.	2.	3452.00
0.01	0.00	7.78	0.00	0.060	0.035	0.060	0.000	3450.00	4966.47
0.014819	310.	300.	200.	4	14	0	0.00	223.53	5190.00

*SECNO 1880.000

3280 CROSS SECTION 1880.00 EXTENDED 0.23 FEET

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1880.00	3.23	3461.23	3461.23	0.00	3462.37	1.14	6.93	0.06	3465.00
3228.	0.	3228.	0.	0.	377.	0.	8.	4.	3461.00
0.03	0.00	8.56	0.00	0.060	0.035	0.060	0.000	3458.00	4850.80
0.014072	520.	480.	180.	14	11	0	0.00	169.20	5020.00

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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 2280.000
3280 CROSS SECTION 2280.00 EXTENDED 0.24 FEET

2280.00	3.24	3466.74	0.00	0.00	3467.53	0.79	5.13	0.04	3471.50
3228.	0.	3228.	0.	0.	453.	0.	12.	6.	3466.50
0.05	0.00	7.13	0.00	0.060	0.035	0.060	0.000	3463.50	4986.30
0.011719	380.	400.	280.	4	0	0	0.00	233.70	5220.00

*SECNO 2600.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 3478.00 ELREA= 3473.00

2600.00	3.79	3472.79	3472.79	0.00	3473.87	1.09	4.06	0.09	3478.00
3228.	0.	3228.	0.	0.	386.	0.	15.	7.	3473.00
0.06	0.00	8.36	0.00	0.060	0.035	0.060	0.000	3469.00	4894.11
0.013790	340.	320.	190.	12	8	0	0.00	177.33	5071.44

*SECNO 2940.000
3280 CROSS SECTION 2940.00 EXTENDED 0.48 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 3478.00 ELREA= 3482.00

2940.00	3.98	3478.48	3478.48	0.00	3479.38	0.90	5.06	0.02	3478.00
3228.	0.	3228.	0.	0.	424.	0.	18.	9.	3482.00
0.07	0.00	7.61	0.00	0.060	0.035	0.060	0.000	3474.50	4970.00
0.016141	340.	340.	300.	4	8	0	0.00	252.42	5222.42

*SECNO 3340.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3340.00	3.28	3486.28	3486.28	0.00	3487.20	0.92	6.30	0.01	3488.00
3228.	0.	3228.	0.	0.	419.	0.	22.	11.	3468.50
0.08	0.00	7.70	0.00	0.060	0.035	0.060	0.000	3483.00	4935.86
0.015354	380.	400.	440.	3	15	0	0.00	236.21	5172.07

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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 3700.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3700.00	2.67	3492.67	3492.67	0.00	3493.58	0.91	5.45	0.00	3496.00
3228.	0.	3228.	0.	0.	422.	0.	25.	13.	3497.00
0.10	0.00	7.65	0.00	0.060	0.035	0.060	0.000	3490.00	4919.98
0.014938	340.	360.	410.	3	15	0	0.00	235.10	5155.08

*SECNO 4060.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4060.00	2.45	3499.95	3499.95	0.00	3500.86	0.92	5.39	0.00	3506.00
3228.	0.	3228.	0.	0.	420.	0.	29.	15.	3502.50
0.11	0.00	7.68	0.00	0.060	0.035	0.060	0.000	3497.50	4840.26
0.014987	360.	360.	360.	13	11	0	0.00	233.55	5073.81

*SECNO -2600.000
START TRIB COMP
-2600.000 2600.000 3472.786

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 3478.00 ELREA= 3473.00

-2600.00	3.79	3472.79	0.00	0.00	3472.79	0.01	0.00	0.00	3478.00
250.	0.	250.	0.	0.	386.	0.	32.	17.	3473.00
0.25	0.00	0.65	0.00	0.060	0.035	0.060	0.000	3469.00	4894.11
0.000083	340.	320.	190.	0	0	0	0.00	177.33	5071.44

*SECNO 1.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1.00	1.29	3477.29	3477.29	0.00	3477.74	0.45	0.10	0.13	3484.50
250.	0.	250.	0.	0.	47.	0.	34.	18.	3478.00
0.26	0.00	5.37	0.00	0.060	0.035	0.060	0.000	3476.00	4977.11
0.018693	330.	330.	330.	20	17	0	0.00	52.23	5029.34

*SECNO 2.000

2.00	2.05	3482.05	0.00	0.00	3482.62	0.57	4.85	0.04	3492.00
250.	0.	250.	0.	0.	41.	0.	34.	18.	3487.50
0.28	0.00	6.06	0.00	0.060	0.035	0.060	0.000	3480.00	4984.63
0.011235	340.	340.	340.	4	0	0	0.00	25.62	5010.25

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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 3.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3.00	1.75	3487.75	3487.75	0.00	3488.43	0.68	4.20	0.03	3499.00
250.	0.	250.	0.	0.	38.	0.	34.	18.	3495.00
0.29	0.00	6.60	0.00	0.060	0.035	0.060	0.000	3486.00	4990.61
0.016698	310.	310.	310.	8	15	0	0.00	28.16	5018.77

*SECNO -1100.000
START TRIB COMP

-1100.000	1100.000	3447.980							
-1100.00	3.98	3447.98	0.00	0.00	3447.98	0.00	0.00	0.00	3448.00
68.	0.	68.	0.	0.	396.	0.	35.	18.	3452.00
0.45	0.00	0.17	0.00	0.060	0.035	0.060	0.000	3444.00	4865.55
0.000007	90.	100.	110.	0	0	0	0.00	199.25	5064.80

*SECNO 11.000
3685 20 TRIALS ATTEMPTED WSEL;CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

11.00	1.38	3451.38	3451.38	0.00	3451.73	0.35	0.01	0.11	3454.00
68.	0.	68.	0.	0.	14.	0.	36.	19.	3457.00
0.47	0.00	4.77	0.00	0.060	0.035	0.060	0.000	3450.00	4986.21
0.020976	350.	350.	350.	20	22	0	0.00	20.69	5006.90

*SECNO 12.000

3265 DIVIDED FLOW

12.00	0.86	3458.86	0.00	0.00	3459.00	0.14	7.25	0.02	3462.00
68.	0.	68.	0.	0.	22.	0.	36.	20.	3464.00
0.51	0.00	3.04	0.00	0.060	0.035	0.060	0.000	3458.00	4991.37
0.015806	400.	400.	400.	4	0	0	0.00	51.80	5094.32

*SECNO 13.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

13.00	0.66	3467.16	3467.16	0.00	3467.33	0.17	7.48	0.01	3468.00
68.	0.	68.	0.	0.	20.	0.	37.	20.	3472.00
0.54	0.00	3.32	0.00	0.060	0.035	0.060	0.000	3466.50	4947.01
0.026759	370.	370.	370.	5	15	0	0.00	61.82	5008.83

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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
*SECNO 14.000									
14.00	1.32	3473.32	0.00	0.00	3473.56	0.24	6.21	0.02	3476.00
68.	0.	68.	0.	0.	17.	0.	37.	20.	3476.00
0.56	0.00	3.89	0.00	0.060	0.035	0.060	0.000	3472.00	4986.78
0.014701	340.	320.	300.	6	0	0	0.00	26.44	5013.22
*SECNO 15.000									
7185 MINIMUM SPECIFIC ENERGY									
3720 CRITICAL DEPTH ASSUMED									
15.00	1.62	3479.62	3479.62	0.00	3480.04	0.42	4.45	0.05	3482.00
68.	0.	68.	0.	0.	13.	0.	37.	21.	3482.00
0.58	0.00	5.18	0.00	0.060	0.035	0.060	0.000	3478.00	4991.90
0.020212	270.	260.	250.	4	11	0	0.00	16.21	5008.10

THIS RUN EXECUTED 5-DEC-85 10:51:35

****
HEC2 RELEASE DATED NOV 76-UPDATED MAR. 1982
ERROR CORR - 01,02,03,04,05
MODIFICATION - 50,51,52,53,54,55
****

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

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	1000.000	0.00	0.00	0.00	3443.00	3228.00	3445.85	3445.85	3446.88	149.52	8.13	397.11	263.99
*	1100.000	100.00	0.00	0.00	3444.00	3228.00	3447.98	3447.98	3449.01	147.75	8.15	396.00	265.57
*	1400.000	300.00	0.00	0.00	3450.00	3228.00	3452.57	3452.57	3453.51	148.19	7.78	414.67	265.17
*	1880.000	480.00	0.00	0.00	3458.00	3228.00	3461.23	3461.23	3462.37	140.72	8.56	376.89	272.12
	2280.000	400.00	0.00	0.00	3463.50	3228.00	3466.74	0.00	3467.53	117.19	7.13	452.84	298.19
*	2600.000	320.00	0.00	0.00	3469.00	3228.00	3472.79	3472.79	3473.87	137.90	8.36	385.94	274.89
*	2940.000	340.00	0.00	0.00	3474.50	3228.00	3478.48	3478.48	3479.38	161.41	7.61	424.24	254.08
*	3340.000	400.00	0.00	0.00	3483.00	3228.00	3486.28	3486.28	3487.20	153.54	7.70	419.31	260.53
*	3700.000	360.00	0.00	0.00	3490.00	3228.00	3492.67	3492.67	3493.58	149.38	7.65	421.91	264.11
*	4060.000	360.00	0.00	0.00	3497.50	3228.00	3499.95	3499.95	3500.86	149.87	7.68	420.15	263.61
	-2600.000	320.00	0.00	0.00	3469.00	250.00	3472.79	0.00	3472.79	0.83	0.65	385.94	274.8
*	1.000	330.00	0.00	0.00	3476.00	250.00	3477.29	3477.29	3477.74	186.93	5.37	46.56	18.2
	2.000	340.00	0.00	0.00	3480.00	250.00	3482.05	0.00	3482.62	112.35	6.06	41.25	23.5
*	3.000	310.00	0.00	0.00	3486.00	250.00	3487.75	3487.75	3488.43	166.98	6.60	37.86	19.3
	-1100.000	100.00	0.00	0.00	3444.00	68.00	3447.98	0.00	3447.98	0.07	0.17	396.00	265.5
*	11.000	350.00	0.00	0.00	3450.00	68.00	3451.38	3451.38	3451.73	209.76	4.77	14.26	4.7
	12.000	400.00	0.00	0.00	3458.00	68.00	3458.86	0.00	3459.00	158.06	3.04	22.36	5.4

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	13.000	370.00	0.00	0.00	3466.50	68.00	3467.16	3467.16	3467.33	267.59	6.32	20.47	4.16
	14.000	320.00	-0.00	0.00	3472.00	68.00	3473.32	0.00	3473.56	147.01	3.89	17.47	5.61
*	15.000	260.00	0.00	0.00	3478.00	68.00	3479.62	3479.62	3480.04	202.12	5.18	13.13	4.78

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SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	1000.000	3228.00	3445.85	0.00	0.00	-1.15	202.39	0.00
*	1100.000	3228.00	3447.98	0.00	2.13	0.00	199.25	100.00
*	1400.000	3228.00	3452.57	0.00	4.59	0.00	223.53	300.00
*	1880.000	3228.00	3461.23	0.00	8.66	0.00	169.20	480.00
	2280.000	3228.00	3466.74	0.00	5.51	0.00	233.70	400.00
*	2600.000	3228.00	3472.79	0.00	6.05	0.00	177.33	320.00
*	2940.000	3228.00	3478.48	0.00	5.70	0.00	252.42	340.00
*	3340.000	3228.00	3486.28	0.00	7.79	0.00	236.21	400.00
*	3700.000	3228.00	3492.67	0.00	6.39	0.00	235.10	360.00
*	4060.000	3228.00	3499.95	0.00	7.28	0.00	233.55	360.00
	-2600.000	250.00	3472.79	0.00	-27.16	0.00	177.33	320.00
*	1.000	250.00	3477.29	0.00	4.50	0.00	52.23	330.00
	2.000	250.00	3482.05	0.00	4.76	0.00	25.62	340.00
*	3.000	250.00	3487.75	0.00	5.70	0.00	28.16	310.00
	-1100.000	68.00	3447.98	0.00	-39.77	0.00	199.25	100.00
*	11.000	68.00	3451.38	0.00	3.40	0.00	20.69	350.00
	12.000	68.00	3458.86	0.00	7.48	0.00	51.80	400.00
*	13.000	68.00	3467.16	0.00	8.31	0.00	61.82	370.00
	14.000	68.00	3473.32	0.00	6.16	0.00	26.44	320.00
*	15.000	68.00	3479.62	0.00	6.30	0.00	16.21	260.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1000.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 1100.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1100.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1400.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1400.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1880.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1880.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2600.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2600.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2940.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2940.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 3340.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 3340.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 3700.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 3700.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 4060.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 4060.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 3.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 3.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 11.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 11.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 11.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 13.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 13.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 15.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 15.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

HYDROLOGIC AND HYDRAULIC REPORT FOR UNITS 22,23 AND 24 AT NEW TUCSON

PREPARED FOR
MR. JEFF KAY

AUGUST 26, 1985
REVISED DECEMBER 10, 1985

DJA JOB NO. 84-077.01

(REP-2)

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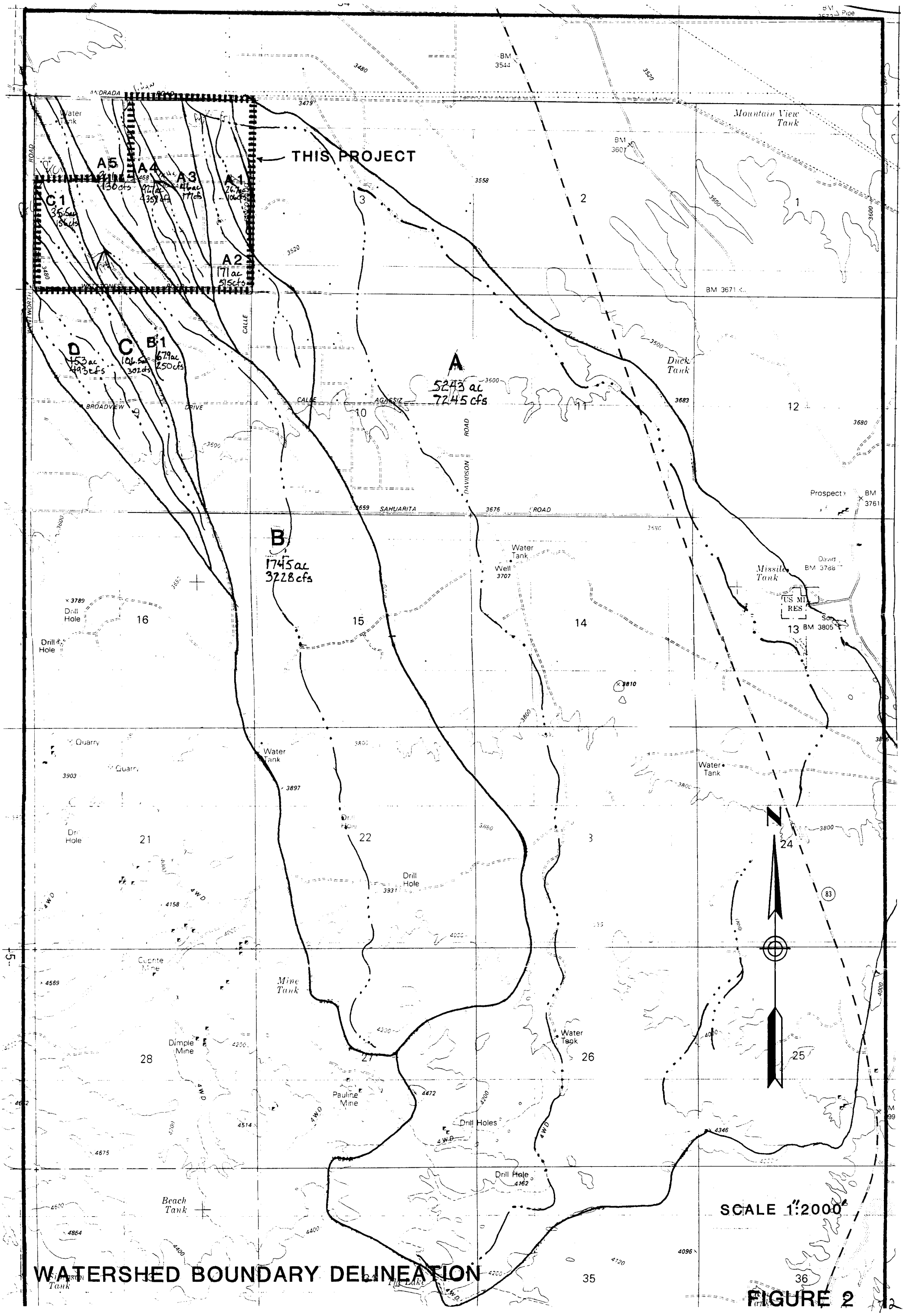
INTRODUCTION

This parcel is Unit 22, 23 and 24 of New Tucson (Book 17, page 42, 43 and 44), located in Section 4, Township 17 South, Range 16 East, Gila and Salt River Base and Meridian. The Location Map is given in Figure 1. The property is owned by Mr. Jeff Kay and is currently zoned TR. There are some houses already constructed on the parcel. Most of the area is left undeveloped. The whole area can be classified as desert foothills.

New Tucson was recorded in 1964. This report is being prepared to map existing 100-year floodprone areas on the site.



WATERSHED BOUNDARY DELINEATION

FIGURE 2

OBJECTIVE

The objective of this report is to determine all of the flows generated by a 100-year storm in excess of 100 cfs and then map the floodprone boundaries for the flows.

METHODOLOGY AND PROCEDURE

Hydrology

(1) Offsite and Onsite Drainage:

The method outlined in the Pima County Hydrology Manual for Engineering Design and Flood Control Management (Reference 1) was used to determine the peak runoff magnitudes for all drainage areas affecting this parcel.

Under future developed conditions, offsite watershed types will be foothills and suburban foothills. Due to the large size of Watershed A, the basin factor and impervious cover have been weighted to obtain values of 0.0327 and 12.5% respectively. Basin factor and impervious cover for the remaining watersheds are 0.032 and 15% as suggested by Pima County. Cover density for all watersheds is 30%. Cover type is desert brush. Soil groups for the watersheds are 35% B, 15% C and 50% D. Precipitation values are derived from the hydrology manual.

The drainage areas and the corresponding discharges are given in Table 1. The watershed delineations are given in Figure 2. The on-site watershed delineations are given in Figure 3. Detailed calculations are included in Appendix 1.

Hydraulics

(1) Backwater Calculation:

The water surface elevations were computed using HEC-2 computer program (Reference 2). The discharges were obtained from the hydrology analysis. The parcel can be divided into eight watersheds. All of them have a discharge over 100 cfs. Therefore, eight models were setup to cover the whole study area. The computer outputs are included in Appendix 2.

(2) Starting Water Surface Elevation:

Because of the steepness of the slope, the flow regimes are very close to critical. The models are setup for subcritical flow. For watersheds B, C and D, the critical messages are shown in every cross-section. This indicates that the flow regimes for these two watersheds are supercritical. Since HEC-2 does not have the option of changing to supercritical flow calculations for a tributary stream system during a subcritical run. Also, in the supercritical flow case the critical depth is higher than normal depth. Therefore, to be conservative, subcritical models are used in these three cases for mapping purposes. The critical water surface elevations are used as the starting water surface elevations.

For the rest of the watersheds, the flow regimes are subcritical, but the Froude numbers are very close to 1. A small change of the starting water surface elevation can change the regime at an upstream station. It is very difficult to obtain the starting water surface elevation by the convergence of the backwater profiles calculated by a multiple profile run. So, normal depth water surface elevations are used as the starting water surface elevations.

(3) Floodprone Boundaries Delineation:

By locating the water surface elevations computed by HEC-2 on the topographic map on which every cross-section location is drawn, the boundaries of the flood can be determined. Connecting the points of the flood boundaries of every cross-section are the floodprone boundaries. The floodprone boundaries delineations are shown in Figure 4.

A "mock" plat has bee prepared showing the delineations of floodprone areas overlaying the preliminary parcel layout. The reason that the layout of roads and lots are not final is that until this study is complete, a more feasible layout cannot be developed.

RESULTS AND DISCUSSION

The results from a study of this nature are best explained by a series of maps and figures. The drainage areas and the corresponding discharges are given in Table 1. The watershed delineations are given in Figures 2 and 3. The floodprone boundaries are shown in Figure 4 as well as Figure 17. In Figure 17 the floodprone areas are incorporated with a preliminary or "mock" layout of roads and lots. As previously mentioned, the actual layout for the parcel will be determined once actual development is ready to proceed. Longitudinal water surface profiles are shown in Figures 5 through 16.

The parcel is affected by 7 major watersheds and an eighth which has a floodprone area associated with Watershed D and will not affect future development of this parcel. Some of the major watersheds have been subdivided to show the effect of contributing onsite tributaries that convey a Q100 flow in excess of 100 cfs.

As per comments from submittal dated November 12, 1985, Watershed areas A3 and B/A5 have been redelineated and corrections made to corresponding HEC-2 analysis. A 100-year floodprone area has been developed for Watershed D, located at

the southwestern margin of the parcel. The 100-year floodprone areas are shown with corresponding drainage areas and discharges. The tributary backwater for Wash B begins at Sections 1100 and 2600 for the two contributing tributary sub-basins. The floodprone area associated with B1 has been extended to parcel boundary.

TABLE 1

ACREAGE AND PEAK DISCHARGE FOR
NEW TUCSON WATERSHEDS

Watershed	Acreage (Acre)	Discharge (cfs)
A	5243.0	7245
A1	26.7	106
A2	171.7	515
A3	45.8	177
A3 (East)	21.2	96
A4 (West)	52.7	178
A4 (West-Tributary)	17.1	81
A4 (East)	22.9	100
A4 (Combined)	92.7	359
A5	26.1	130
B1	67.9	250
B2	14.7	68
B (Combined)	1754.0	3228
C1	35.5	156
C	106.5	302
D	153.0	493

BASIS OF ELEVATION

The basis of elevation is a bench mark: U.S.G.S. Datum, located at the northeast corner of Section 4, Mount Fagan Quadrangle, Elevation is 3451.0.

REFERENCE

1. Hydrology Manual for Engineering Design and Floodplain Management within Pima County, Arizona, Pima County Department of Transportation and Flood Control District, September, 1979.

2. HEC-2 Water Surface Profiles, the Hydrologic Engineering Center, Water Resources Support Center, Corps of Engineering, 1982.

3. USGS Quadrangle Map, Mount Fagan, Arizona, N3152.5-W11037.5/7.5, 1981.

This report prepared and written by H.Y. Lee and W.C. Gresham.

This report revised by W.C. Gresham.

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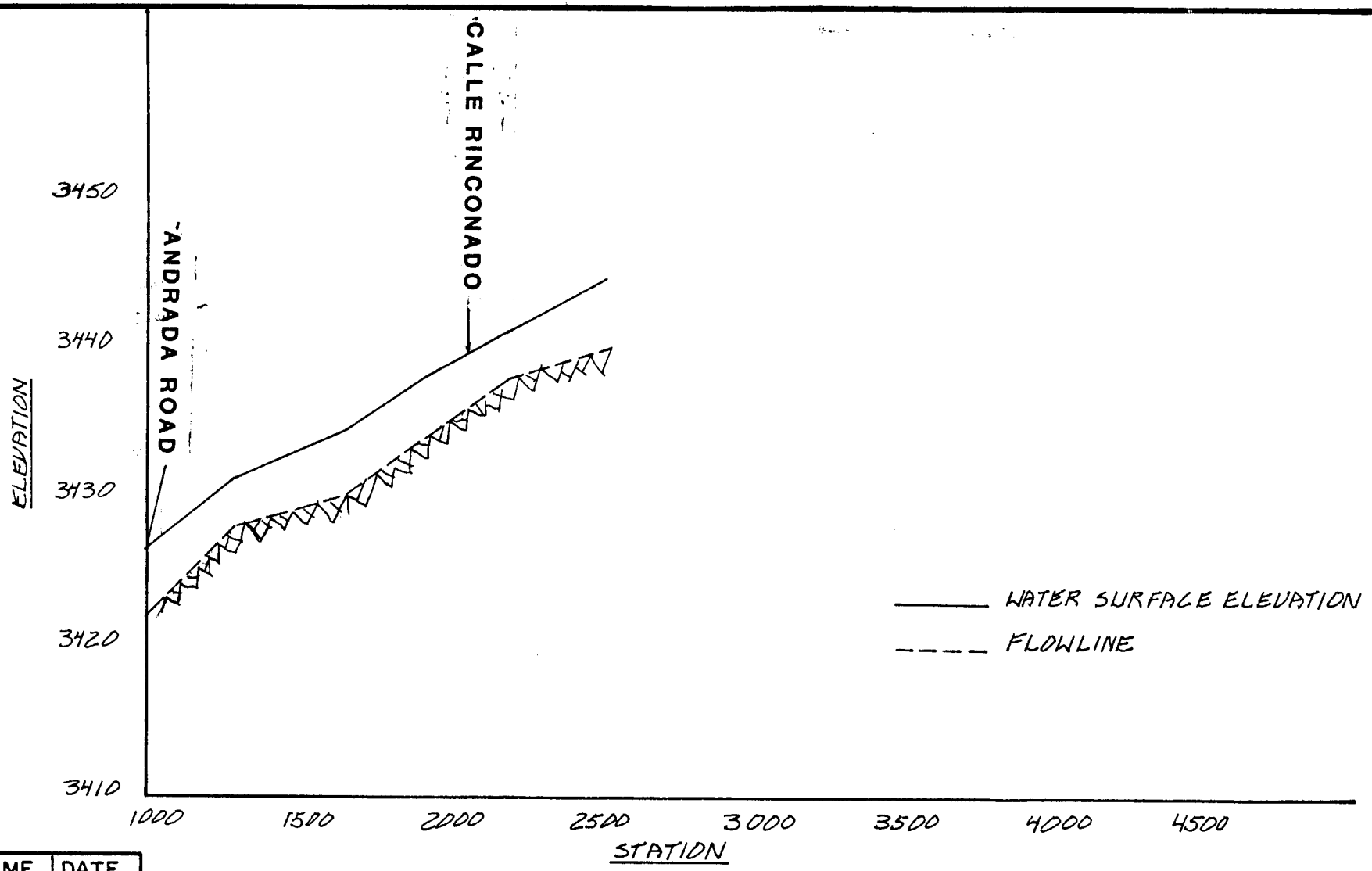


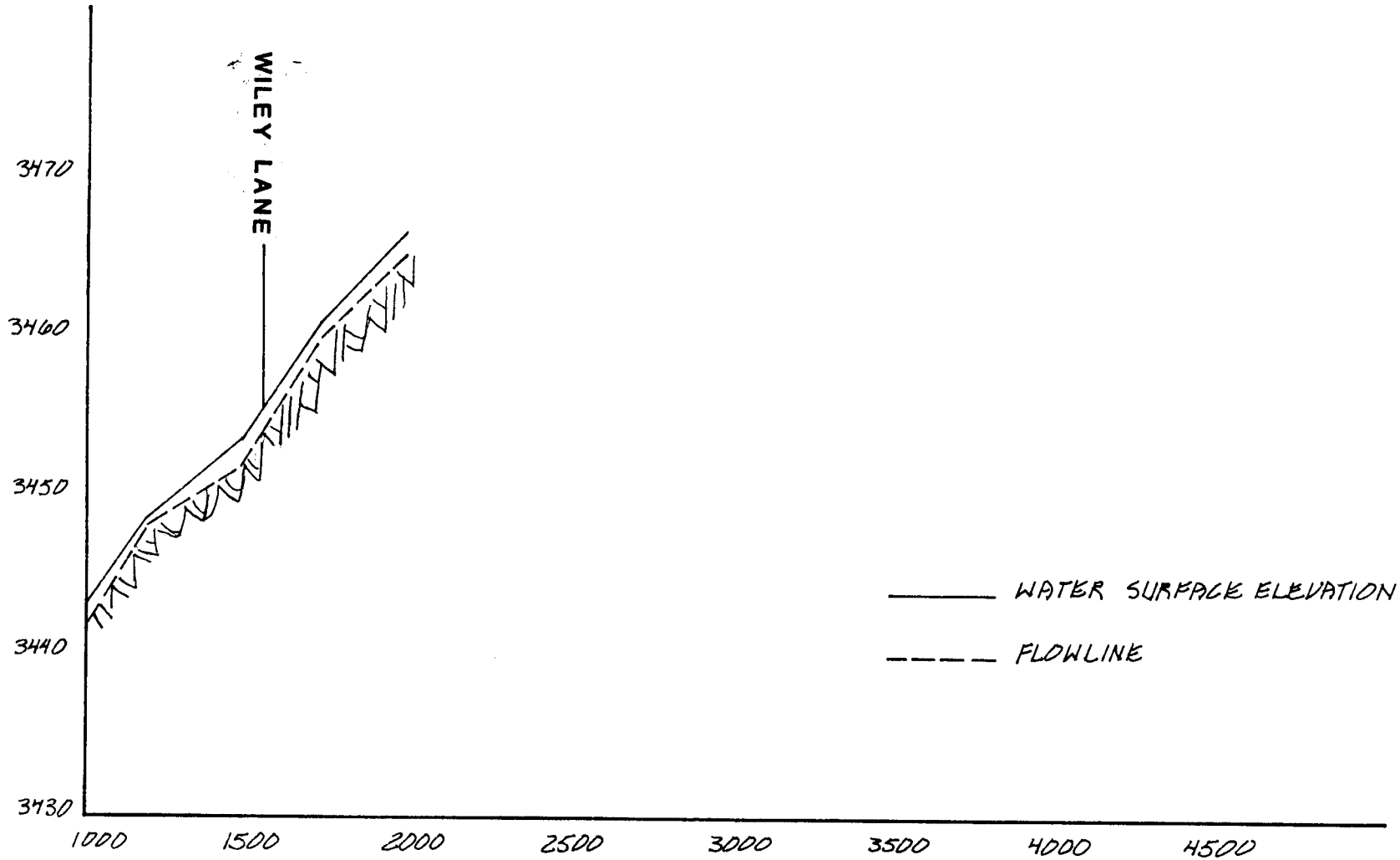
	NAME	DATE
DSN	HYL	9/9/85
DRN	LAH	8/29/85
CKD	HYL	9/9/85

NO.	NAME	DATE	REVISION

LONGITUDINAL WATER SURFACE PROFILE

WASHA

FIGURE 5



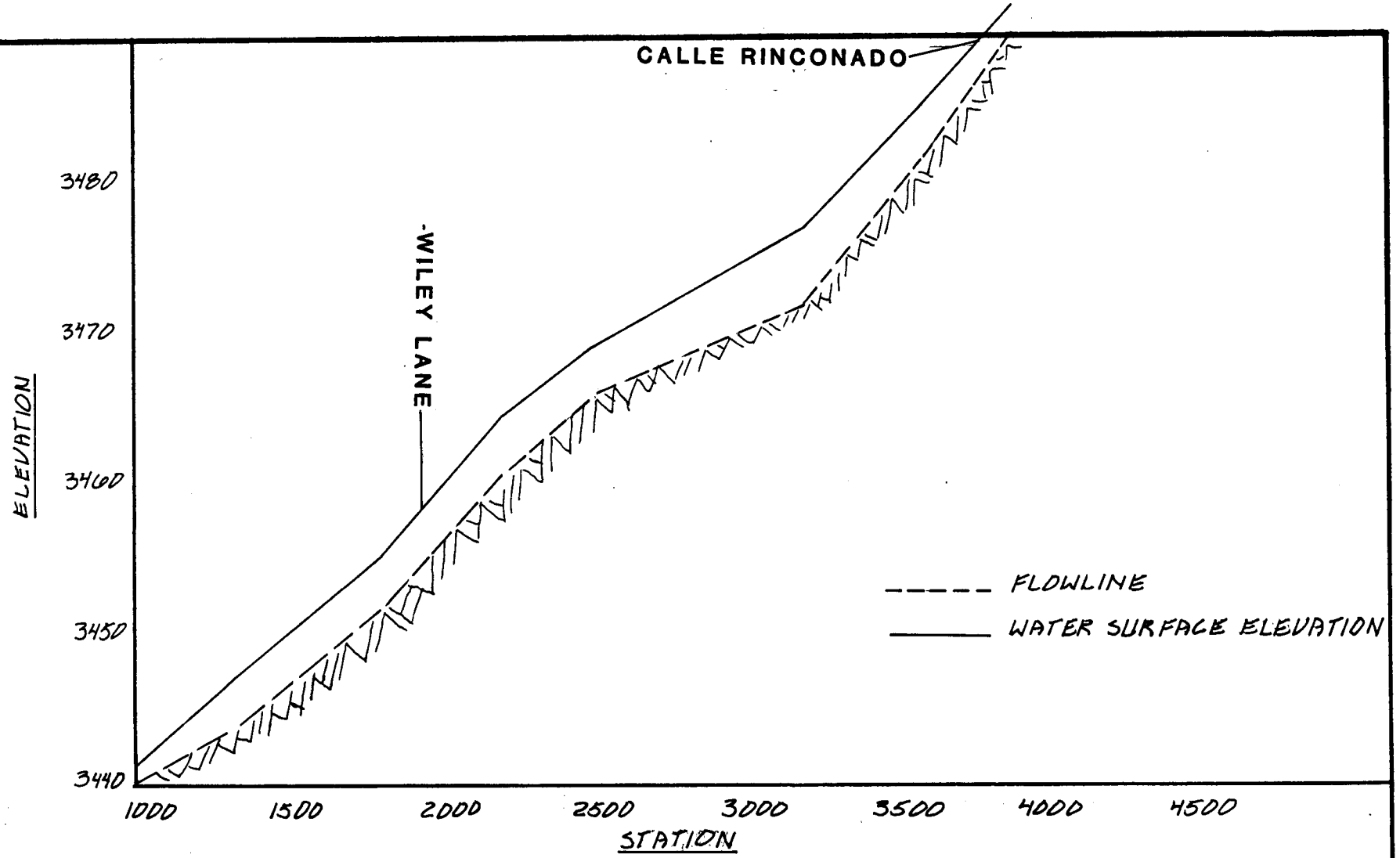
	NAME	DATE
DSN	H Y L	9/9/85
DRN	LAH	8/29/85
CKD	H Y L	9/9/85

NO.	NAME	DATE	REVISION

LONGITUDINAL WATER SURFACE PROFILE

WASH A1

FIGURE 6



LONGITUDINAL WATER SURFACE PROFILE

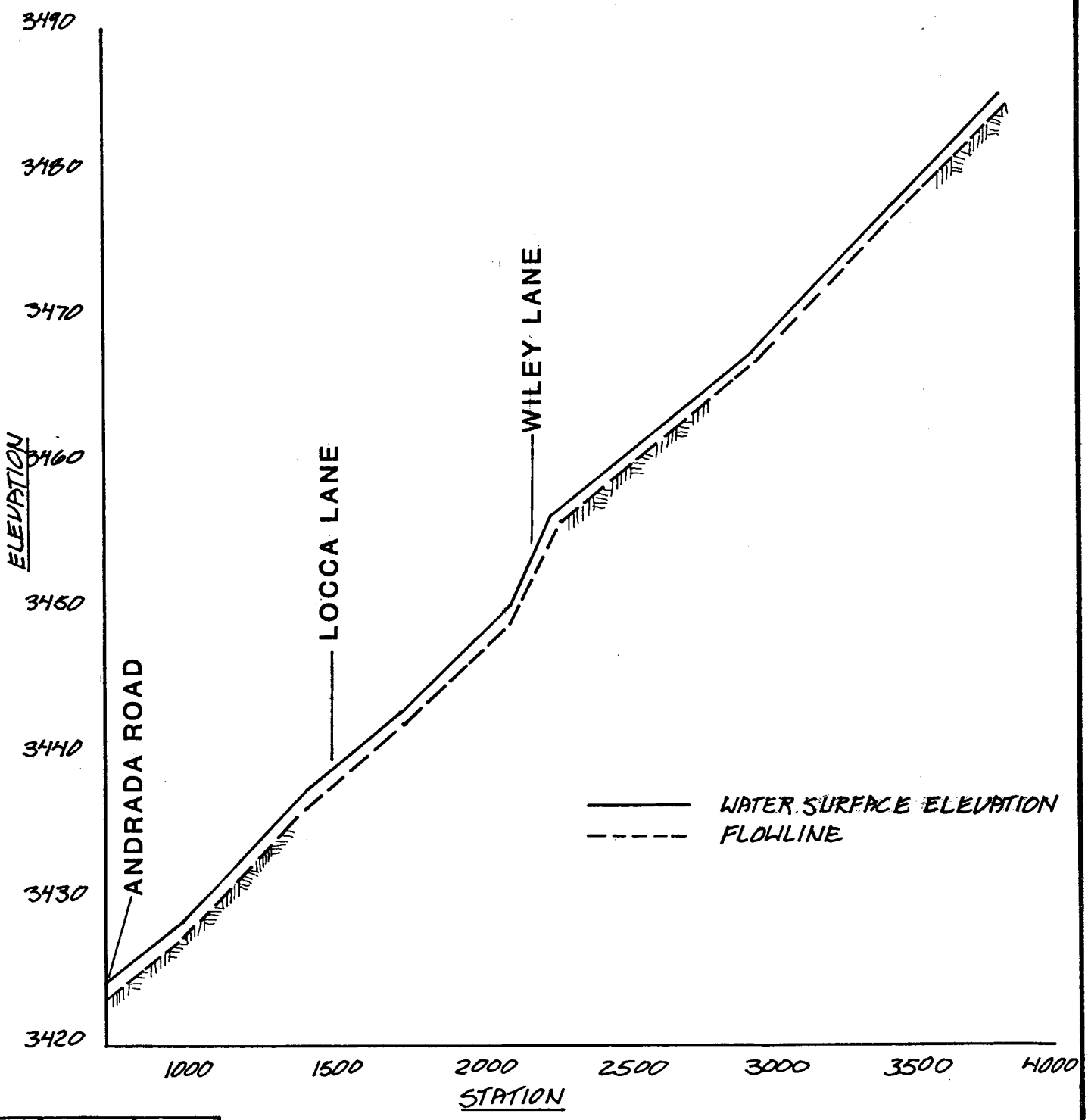
WASH A2

	NAME	DATE
DSN	HYL	9/9/85
DRN	LAH	8/29/85
CKD	HYL	9/9/85

NO.	NAME	DATE	REVISION

FIGURE 7

84-077.01



	NAME	DATE
DSN	HYL	9/10/85
DRN	LAH	9/10/85
CKD	HYL	9/10/85

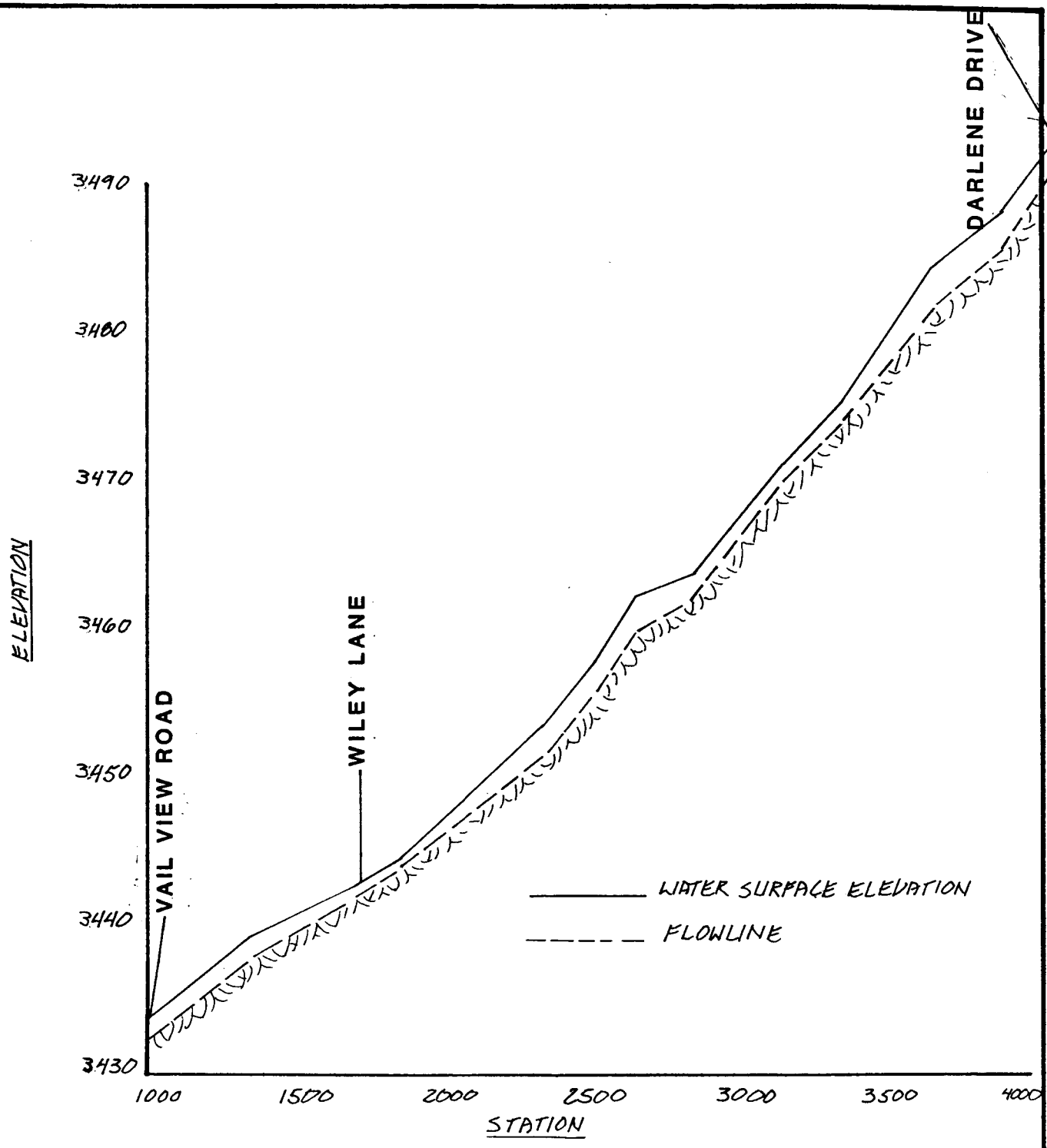
NO.	NAME	DATE	REVISION

LONGITUDINAL WATER SURFACE PROFILE

WASH A3

FIGURE 8

DJA JOB NO. 84-077.01



	NAME	DATE
DSN	H Y L	9/9/85
DRN	LAH	8/27/86
CKD	H Y L	9/9/85

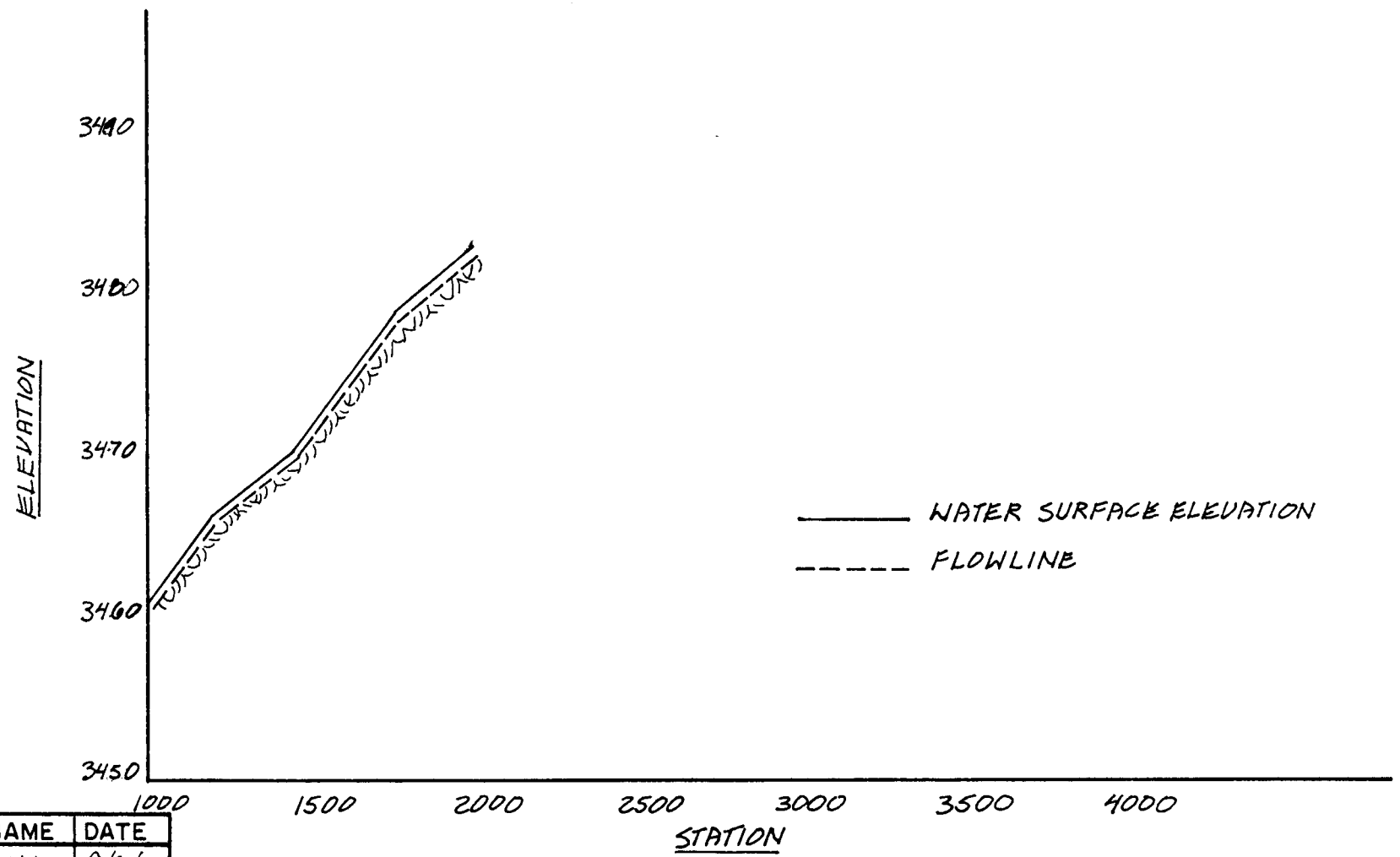
NO.	NAME	DATE	REVISION

LONGITUDINAL WATER SURFACE PROFILE

WASH A4

FIGURE 9

DJA JOB NO. 84077.01



	NAME	DATE
DSN	HYL	9/9/85
DRN	LAH	8/27/85
CKD	HYL	9/9/85

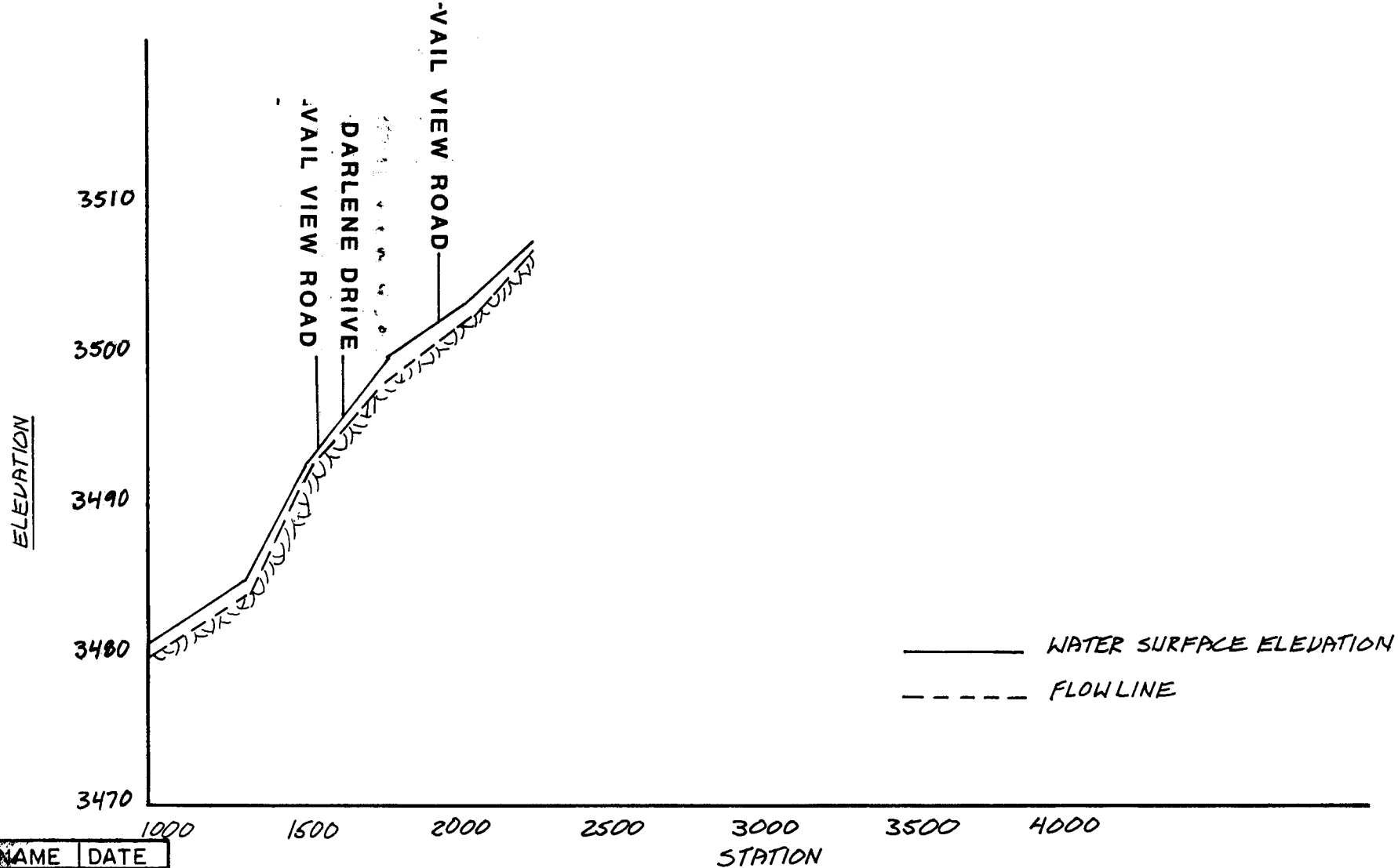
NO.	NAME	DATE	REVISION

LONGITUDINAL WATER SURFACE PROFILE

WASH A4 EAST

FIGURE 10

84-077.01



	NAME	DATE
DSN	HYL	9/9/85
DRN	LAH	8/27/85
CKD	HYL	9/9/85

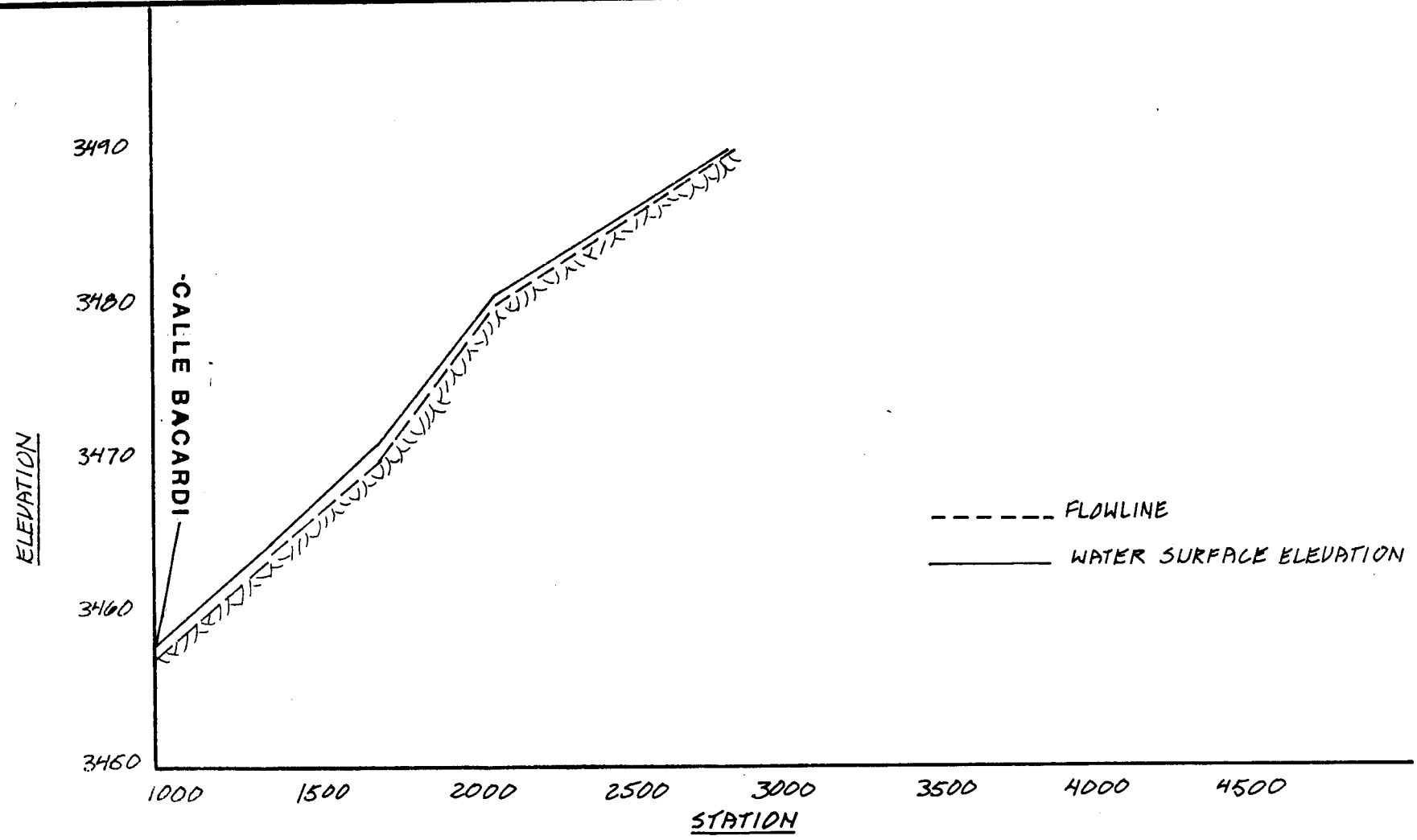
NO.	NAME	DATE	REVISION

LONGITUDINAL WATER SURFACE PROFILE

WASH A4 WEST

FIGURE 11

84077.01



LONGITUDINAL WATER SURFACE PROFILE

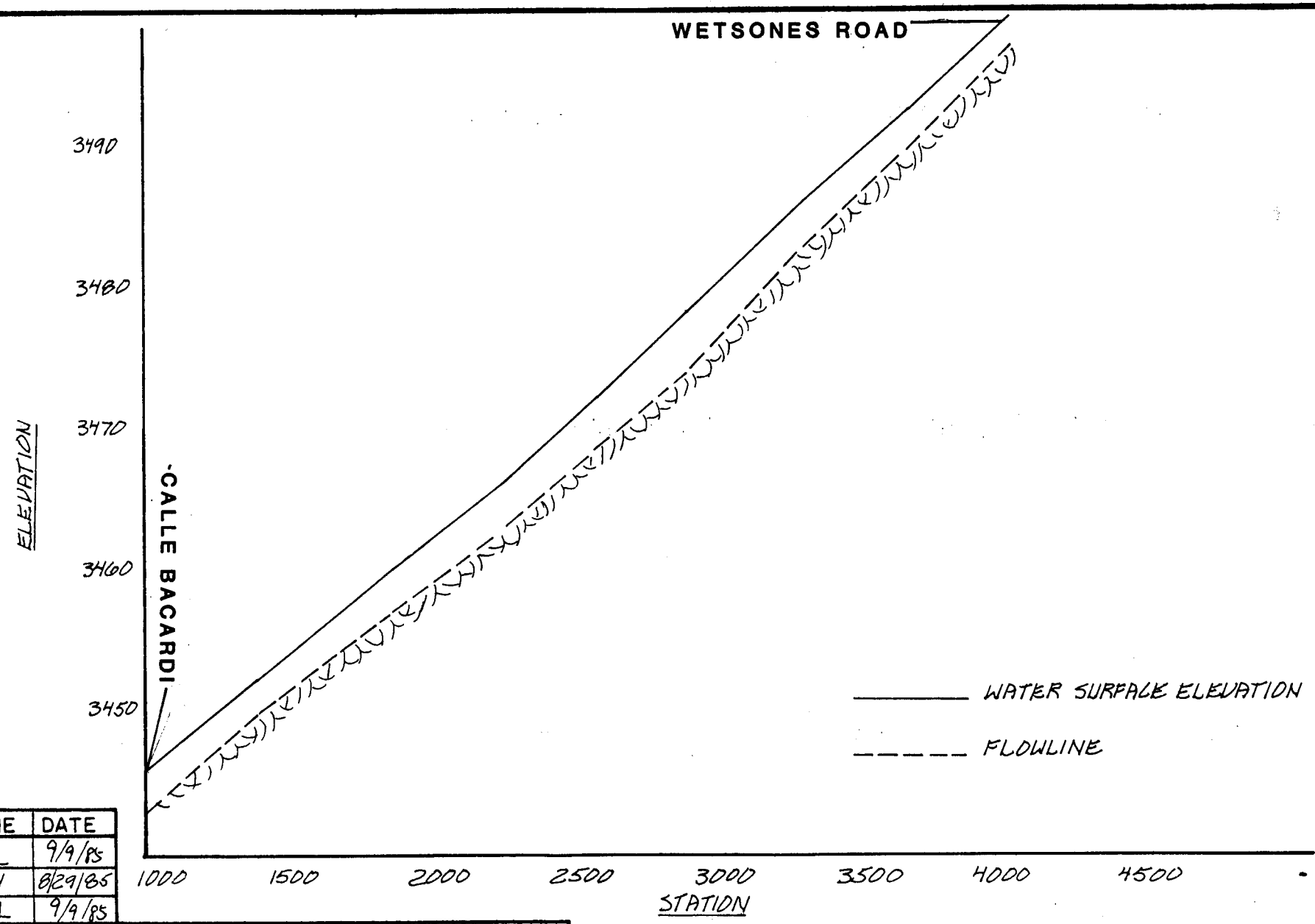
WASH A5

	NAME	DATE
DSN	H Y L	9/9/85
DRN	LAH	8/27/85
CKD	H Y L	9/9/85

NO.	NAME	DATE	REVISION

FIGURE 12

84-077.01



	NAME	DATE
DSN	HYL	9/9/85
DRN	LAH	8/29/85
CKD	HYL	9/9/85

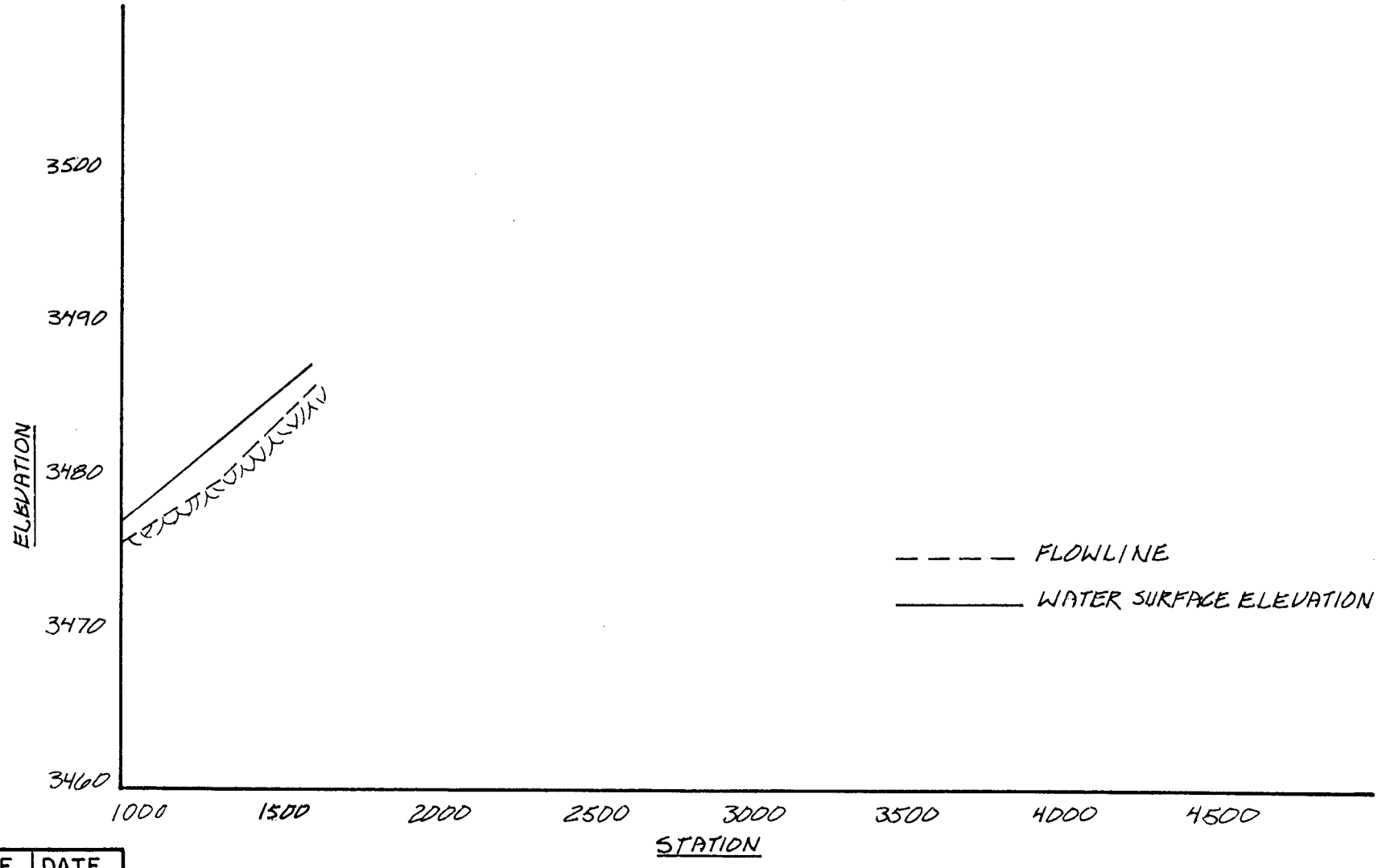
NO.	NAME	DATE	REVISION

LONGITUDINAL WATER SURFACE PROFILE

WASHB

FIGURE 13

84-077.01



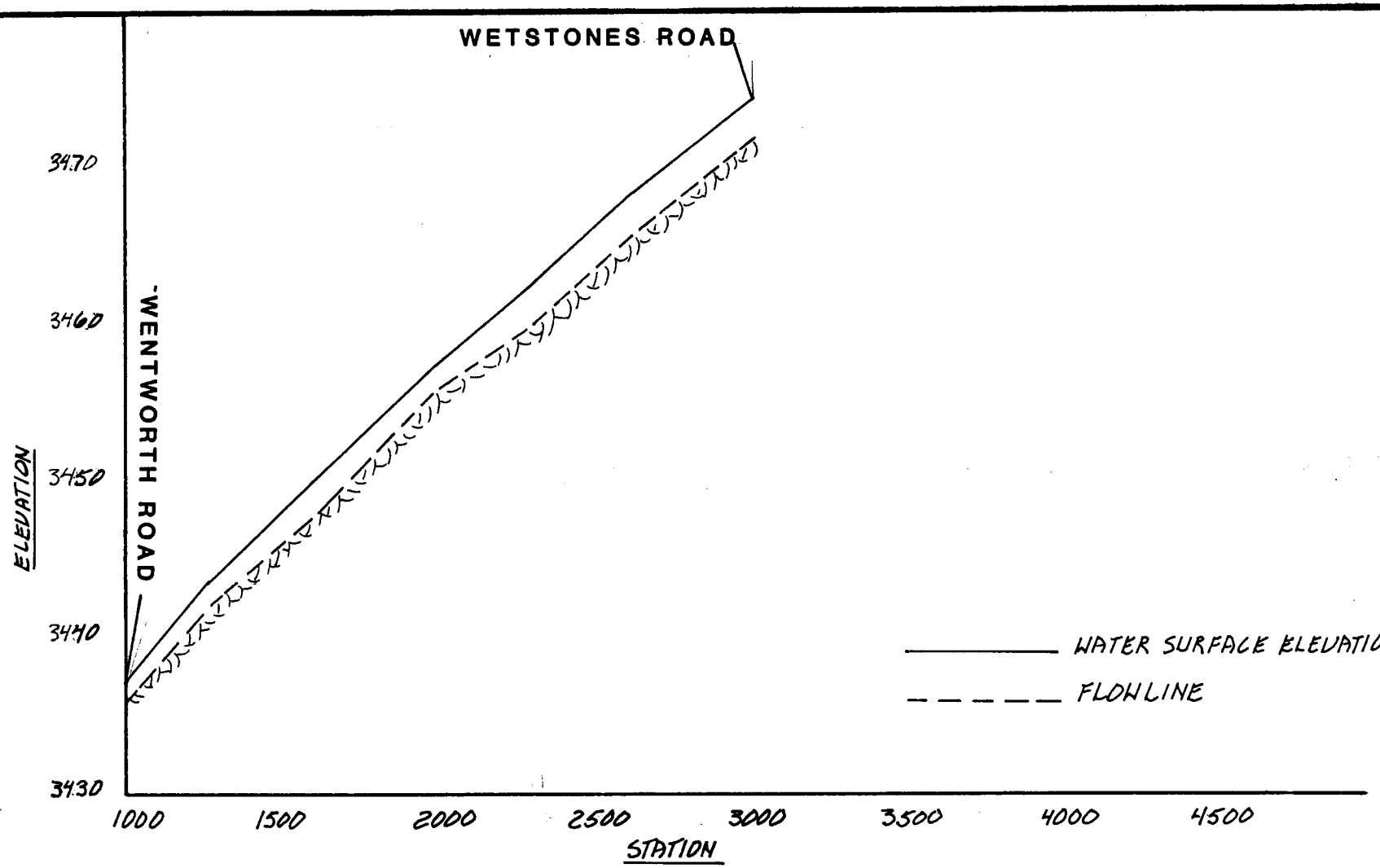
	NAME	DATE
DSN	HYL	9/9/85
DRN	LAH	8/29/85
CKD	HYL	9/9/85

NO.	NAME	DATE	REVISION

LONGITUDINAL WATER SURFACE PROFILE

WASH B1

FIGURE 14



LONGITUDINAL WATER SURFACE PROFILE

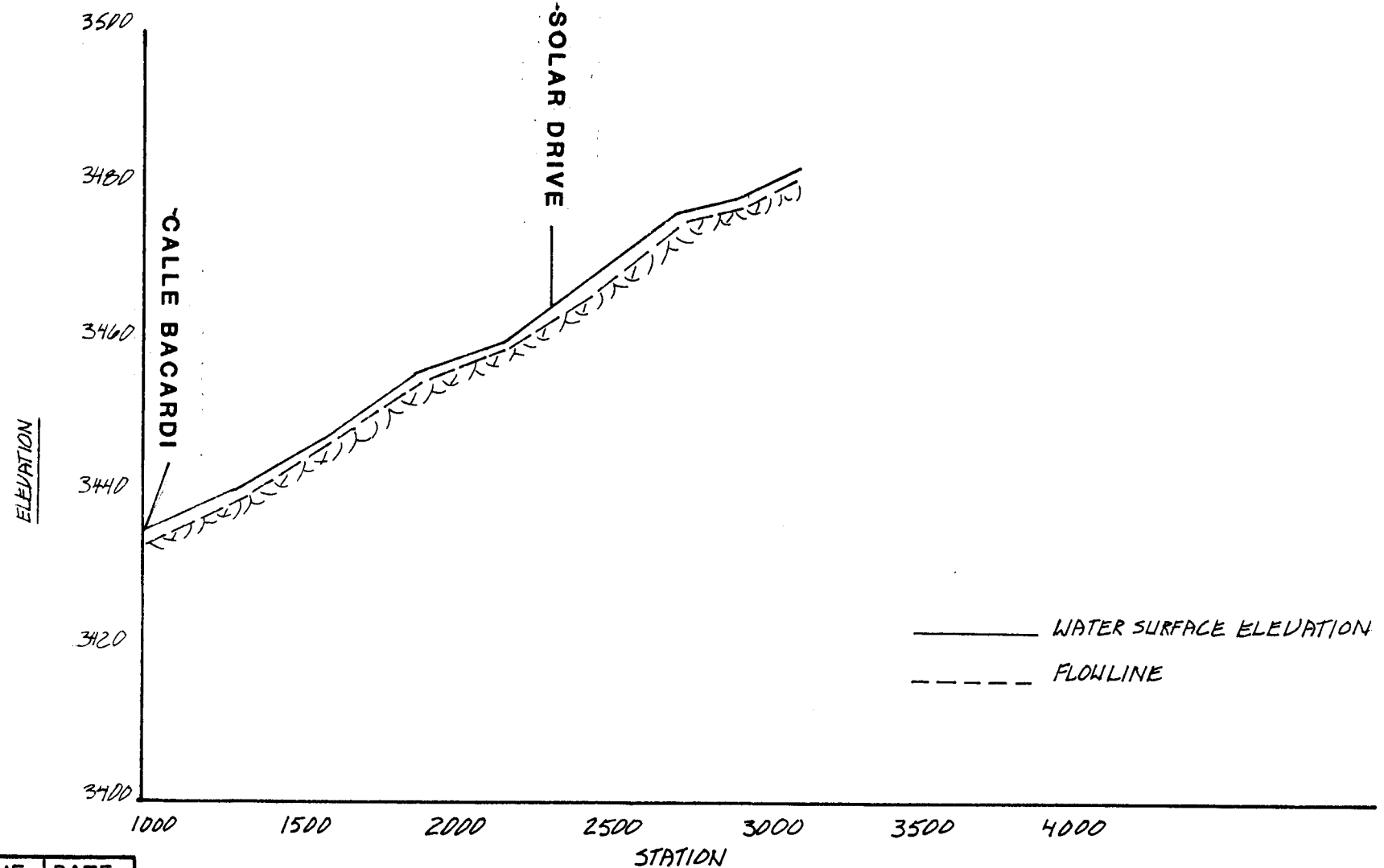
WASHC

	NAME	DATE
DSN	HYL	9/9/85
DRN	LAH	8/27/85
CKD	HYL	9/9/85

NO.	NAME	DATE	REVISION

FIGURE 15

84-077.01



	NAME	DATE
DSN	HYL	9/9/85
DRN	LAH	8/27/85
CKD	HYL	9/9/85

NO.	NAME	DATE	REVISION

LONGITUDINAL WATER SURFACE PROFILE

WASH C1

FIGURE 16

APPENDIX 1

Hydrology Calculation

HYDROLOGIC DATA SHEET

Project Name and Location: NEW TUCSON 84-077.01

Drainage Concentration Point: ANDRADA ROAD-OFFSITE AREA A

Watershed Area (A): 5243.00 Acres

Length of Watercourse(Lc): 35000. ft Length to Center of Gravity(Lca): 17500. ft

Incremental Change in Length(Li) -ft. Incremental Change in Elevation(Hi) -ft.

Mean Slope (Sc): 0.0210 ft/ft Watershed Type(s): FT.HILLS & SUB.FT.HI(future)

Basin Factor(nb): 0.0327 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr):	4.43	in.	Areal Value:	in.
P6 (6 hr):	3.34	in.	Areal Value:	in.
P1 (1 hr):	2.44	in.	Areal Value:	in.
P2 (2 hr):	2.75	in.	Areal Value:	in.
P3 (3 hr):	2.95	in.	Areal Value:	in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BR

Cover Density (pervious areas): 30.0% Impervious Cover: 12.7% (future)

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 0.0 0.0 0.0 0.0 85.8

Adjusted Curve Number(s) - CN*(s): 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas)

Runoff Supply Rate(a): 0.64 X i in/hr (function of i)

Time of Concentration (TC):1.5851 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 1.17 hrs. (K= 66.6)

Rainfall Intensity (i) at TC: 2.14 in./hr.

Runoff Supply Rate (a) at TC: 1.37 in./hr.

Peak Discharge:
1.008aA(acres): 7245. cfs

Discharge Location:

HYDROLOGIC DATA SHEET

Project Name and Location: NEW TUCSON A1

Drainage Concentration Point: PT A1

Watershed Area (A): 26.74 Acres

Length of Watercourse(Lc): 3150. ft Length to Center of Gravity(Lca): 1575. ft

Incremental Change in Length(Li) -ft.	Incremental Change in Elevation(Hi) -ft.
1250.0	16.0
550.0	16.0
500.0	14.0
600.0	12.0
450.0	4.0

Mean Slope (Sc): 0.0144 ft/ft Watershed Type(s): SUBURBAN FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr): 4.43 in. Areal Value: in.

P6 (6 hr): 3.34 in. Areal Value: in.

P1 (1 hr): 2.44 in. Areal Value: in.

P2 (2 hr): 2.75 in. Areal Value: in.

P3 (3 hr): 2.95 in. Areal Value: in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BRU

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future)

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 0.0 0.0 0.0 0.0 85.8

Adjusted Curve Number(s) - CN*(s): 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas)

Runoff Supply Rate(q): 0.65 X i in/hr (function of i)

Time of Concentration (TC):0.4235 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 12.4 mins. (K= 17.8)

Rainfall Intensity (i) at TC: 6.06 in./hr.

Runoff Supply Rate (q) at TC: 3.93 in./hr.

Peak Discharge:
1.008qA(acres): 106. cfs

HYDROLOGIC DATA SHEET

Project Name and Location: NEW TUCSON A2

Drainage Concentration Point: PT A2

Watershed Area (A): 171.67 Acres

Length of Watercourse(Lc): 8500. ft Length to Center of Gravity(Lca): 4250. f

Incremental Change in Length(Li) -ft. Incremental Change in Elevation(Hi) -ft.

8500.0 170.0

Mean Slope (Sc): 0.0200 ft/ft Watershed Type(s): SUBURBAN FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr):	4.43	in.	Areal Value:	in.
P6 (6 hr):	3.34	in.	Areal Value:	in.
P1 (1 hr):	2.44	in.	Areal Value:	in.
P2 (2 hr):	2.75	in.	Areal Value:	in.
P3 (3 hr):	2.95	in.	Areal Value:	in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT B

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future)

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 0.0 0.0 0.0 0.0 85.8

Adjusted Curve Number(s) - CN*(s): 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas

Runoff Supply Rate(q): 0.65 X i in/hr (function of i)

Time of Concentration (TC):0.6732 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 22.0 mins. (K= 28.3)

Rainfall Intensity (i) at TC: 4.59 in./hr.

Runoff Supply Rate (q) at TC: 2.98 in./hr.

Peak Discharge:
1.008qA(acres): 515. cfs

Discharge Location:

HYDROLOGIC DATA SHEET

Project Name and Location: NEW TUCSON A3

Drainage Concentration Point: ANDRADA ROAD

Watershed Area (A): 45.85 Acres

Length of Watercourse(Lc): 4400. ft Length to Center of Gravity(Lca): 2200. ft

Incremental Change in Length(Li) -ft. Incremental Change in Elevation(Hi) -ft.

4400.0 92.0

Mean Slope (Sc): 0.0209 ft/ft Watershed Type(s): SUBURBAN FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr): 4.43 in. Areal Value: in.

P6 (6 hr): 3.34 in. Areal Value: in.

P1 (1 hr): 2.44 in. Areal Value: in.

P2 (2 hr): 2.75 in. Areal Value: in.

P3 (3 hr): 2.95 in. Areal Value: in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BRU

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future)

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 0.0 0.0 0.0 0.0 85.8

Adjusted Curve Number(s) - CN*(s): 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas)

Runoff Supply Rate(q): 0.65 X i in/hr (function of i)

Time of Concentration (TC):0.4455 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 13.1 mins. (K= 18.7)

Rainfall Intensity (i) at TC: 5.90 in./hr.

Runoff Supply Rate (q) at TC: 3.83 in./hr.

Peak Discharge:
1.008qA(acres): 177. cfs

Discharge Location:

HYDROLOGIC DATA SHEET

Project Name and Location: NEW TUCSON A3E

Drainage Concentration Point: ANDRADA ROAD

Watershed Area (A): 21.20 Acres

Length of Watercourse(Lc): 2350. ft Length to Center of Gravity(Lca): 1275. ft

Incremental Change in Length(Li) -ft. Incremental Change in Elevation(Hi) -f

2350.0 46.0

Mean Slope (Sc): 0.0196 ft/ft Watershed Type(s): SUBURBAN FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr):	4.43	in.	Areal Value:	in.
P6 (6 hr):	3.34	in.	Areal Value:	in.
P1 (1 hr):	2.44	in.	Areal Value:	in.
P2 (2 hr):	2.75	in.	Areal Value:	in.
P3 (3 hr):	2.95	in.	Areal Value:	in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BRU

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 0.0 0.0 0.0 0.0 85.8

Adjusted Curve Number(s) - CN*(s): 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas)

Runoff Supply Rate(q): 0.65 X i in/hr (function of i)

Time of Concentration (TC):0.3217 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 8.9 mins. (K= 13.5)

Rainfall Intensity (i) at TC: 6.94 in./hr.

Runoff Supply Rate (q) at TC: 4.50 in./hr.

Peak Discharge:
1.008qA(acres): 96. cfs

Discharge Location:

HYDROLOGIC DATA SHEET

Project Name and Location: NEW TUCSON A4(WEST)

Drainage Concentration Point: PT A4W

Watershed Area (A): 52.70 Acres

Length of Watercourse(Lc): 6500. ft Length to Center of Gravity(Lca): 3250. ft

Incremental Change in Length(Li) -ft. Incremental Change in Elevation(Hi) -ft

6500.0 135.0

Mean Slope (Sc): 0.0208 ft/ft Watershed Type(s): SUBURBAN FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr):	4.43	in.	Areal Value:	in.
P6 (6 hr):	3.34	in.	Areal Value:	in.
P1 (1 hr):	2.44	in.	Areal Value:	in.
P2 (2 hr):	2.75	in.	Areal Value:	in.
P3 (3 hr):	2.95	in.	Areal Value:	in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BRU

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future)

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 0.0 0.0 0.0 0.0 85.8

Adjusted Curve Number(s) - CN*(s): 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas)

Runoff Supply Rate(q): 0.65 X i in/hr (function of i)

Time of Concentration (TC):0.5645 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 17.6 mins. (K= 23.7)

Rainfall Intensity (i) at TC: 5.16 in./hr.

Runoff Supply Rate (q) at TC: 3.35 in./hr.

Peak Discharge:
1.008qA(acres): 178. cfs

Discharge Location:

HYDROLOGIC DATA SHEET

Project Name and Location: NEW TUCSON A4(EAST)

Drainage Concentration Point: PT A4E

Watershed Area (A): 22.92 Acres

Length of Watercourse(Lc): 3080. ft Length to Center of Gravity(Lca): 1540. f

Incremental Change in Length(Li) -ft.	Incremental Change in Elevation(Hi) -ft.
1830.0	41.0
1250.0	30.0

Mean Slope (Sc): 0.0230 ft/ft Watershed Type(s): SUBURBAN FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr):	4.43	in.	Areal Value:	in.
P6 (6 hr):	3.34	in.	Areal Value:	in.
P1 (1 hr):	2.44	in.	Areal Value:	in.
P2 (2 hr):	2.75	in.	Areal Value:	in.
P3 (3 hr):	2.95	in.	Areal Value:	in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BRU

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 0.0 0.0 0.0 0.0 85.8

Adjusted Curve Number(s) - CN*(s): 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas`

Runoff Supply Rate(a): 0.65 X i in/hr (function of i)

Time of Concentration (TC):0.3460 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 9.7 mins. (K= 14.5)

Rainfall Intensity (i) at TC: 6.66 in./hr.

Runoff Supply Rate (a) at TC: 4.32 in./hr.

Peak Discharge:
1.008aA(acres): 100. cfs

Discharge Location:

HYDROLOGIC DATA SHEET

Project Name and Location: NEW TUCSON A4E TRIB

Drainage Concentration Point: A4W CHANNEL

Watershed Area (A): 17.10 Acres

Length of Watercourse(Lc): 2250. ft Length to Center of Gravity(Lca): 1125. ft

Incremental Change in Length(Li) -ft. Incremental Change in Elevation(Hi) -ft.

2250.0 48.0

Mean Slope (Sc): 0.0213 ft/ft Watershed Type(s): SUBURBAN FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr): 4.43 in. Areal Value: in.

P6 (6 hr): 3.34 in. Areal Value: in.

P1 (1 hr): 2.44 in. Areal Value: in.

P2 (2 hr): 2.75 in. Areal Value: in.

P3 (3 hr): 2.95 in. Areal Value: in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BRL

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future)

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 0.0 0.0 0.0 0.0 85.8

Adjusted Curve Number(s) - CN*(s): 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas)

Runoff Supply Rate(q): 0.65 X i in/hr (function of i)

Time of Concentration (TC):0.2955 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 8.0 mins. (K= 12.4)

Rainfall Intensity (i) at TC: 7.26 in./hr.

Runoff Supply Rate (q) at TC: 4.71 in./hr.

Peak Discharge:

1.008qA(acres): 81. cfs

Discharge Location:

HYDROLOGIC DATA SHEET

Project Name and Location: NEW TUCSON A5

Drainage Concentration Point: PT.A5

Watershed Area (A): 26.10 Acres

Length of Watercourse(Lc): 1880. ft Length to Center of Gravity(Lca): 940. ft

Incremental Change in Length(Li) -ft. Incremental Change in Elevation(Hi) -f .

1880.0 40.0

Mean Slope (Sc): 0.0213 ft/ft Watershed Type(s): SUBURBAN FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr):	4.43	in.	Areal Value:	in.
P6 (6 hr):	3.34	in.	Areal Value:	in.
P1 (1 hr):	2.44	in.	Areal Value:	in.
P2 (2 hr):	2.75	in.	Areal Value:	in.
P3 (3 hr):	2.95	in.	Areal Value:	in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BRU

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 0.0 0.0 0.0 0.0 85.8

Adjusted Curve Number(s) - CN*(s): 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas)

Runoff Supply Rate(q): 0.65 X i in/hr (function of i)

Time of Concentration (TC):0.2656 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 7.1 mins. (K= 11.2)

Rainfall Intensity (i) at TC: 7.63 in./hr.

Runoff Supply Rate (q) at TC: 4.95 in./hr.

Peak Discharge:
1.008qA(acres): 130. cfs

Discharge Location:

HYDROLOGIC DATA SHEET

Project Name and Location: NEW TUCSON, B, 84-077.01

Drainage Concentration Point: CALLE BACARDI

Watershed Area (A): 1754.00 Acres

Length of Watercourse(Lc): 24500. ft Length to Center of Gravity(Lca): 13750. ft

Incremental Change in Length(Li) -ft. Incremental Change in Elevation(Hi) -ft.

Mean Slope (Sc): 0.0260 ft/ft Watershed Type(s): FT.HILLS & SUB.FT.HI(future)

Basin Factor(nb): 0.0325 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr):	4.43	in.	Areal Value:	in.
P6 (6 hr):	3.34	in.	Areal Value:	in.
P1 (1 hr):	2.44	in.	Areal Value:	in.
P2 (2 hr):	2.75	in.	Areal Value:	in.
P3 (3 hr):	2.95	in.	Areal Value:	in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BRU

Cover Density (pervious areas): 30.0% Impervious Cover: 13.3% (future)

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 0.0 0.0 0.0 0.0 85.8

Adjusted Curve Number(s) - CN*(s): 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas)

Runoff Supply Rate(q): 0.64 X i in/hr (function of i)

Time of Concentration (TC):1.2073 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 47.7 mins. (K= 50.7)

Rainfall Intensity (i) at TC: 2.84 in./hr.

Runoff Supply Rate (q) at TC: 1.83 in./hr.

Peak Discharge:
1.008qA(acres): 3228. cfs

Discharge Location:

HYDROLOGIC DATA SHEET

Project Name and Location: NEW TUCSON B1

Drainage Concentration Point: PT B1

Watershed Area (A): 67.87 Acres

Length of Watercourse(Lc): 6000. ft Length to Center of Gravity(Lca): 3000. f

Incremental Change in Length(Li) -ft.	Incremental Change in Elevation(Hi) -ft.
6000.0	160.0

Mean Slope (Sc): 0.0267 ft/ft Watershed Type(s): SUBURBAN FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr):	4.43	in.	Areal Value:	in.
P6 (6 hr):	3.34	in.	Areal Value:	in.
P1 (1 hr):	2.44	in.	Areal Value:	in.
P2 (2 hr):	2.75	in.	Areal Value:	in.
P3 (3 hr):	2.95	in.	Areal Value:	in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT B (

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future)

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 0.0 0.0 0.0 0.0 85.8

Adjusted Curve Number(s) - CN*(s): 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas

Runoff Supply Rate(q): 0.65 X i in/hr (function of i)

Time of Concentration (TC):0.4869 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 14.6 mins. (K= 20.4)

Rainfall Intensity (i) at TC: 5.63 in./hr.

Runoff Supply Rate (q) at TC: 3.65 in./hr.

Peak Discharge:
1.008qA(acres): 250. cfs

Discharge Location:

HYDROLOGIC DATA SHEET

Project Name and Location: NEW TUCSON B2

Drainage Concentration Point: 150 FT. SOUTH OF CALLE BACARDI

Watershed Area (A): 14.70 Acres

Length of Watercourse(Lc): 2400. ft Length to Center of Gravity(Lcg): 1200. ft

Incremental Change in Length(Li) -ft.	Incremental Change in Elevation(Hi) -ft.
2400.0	50.0

Mean Slope (Sc): 0.0208 ft/ft Watershed Type(s): SUBURBAN FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr):	4.43	in.	Areal Value:	in.
P6 (6 hr):	3.34	in.	Areal Value:	in.
P1 (1 hr):	2.44	in.	Areal Value:	in.
P2 (2 hr):	2.75	in.	Areal Value:	in.
P3 (3 hr):	2.95	in.	Areal Value:	in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BRU

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future)

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 0.0 0.0 0.0 0.0 85.8

Adjusted Curve Number(s) - CN*(s): 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas)

Runoff Supply Rate(q): 0.65 X i in/hr (function of i)

Time of Concentration (TC):0.3103 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 8.5 mins. (K= 13.0)

Rainfall Intensity (i) at TC: 7.08 in./hr.

Runoff Supply Rate (q) at TC: 4.60 in./hr.

Peak Discharge:

1.008qA(acres): 68. cfs

Discharge Location:

HYDROLOGIC DATA SHEET

Project Name and Location: NEW TUCSON C1

Drainage Concentration Point: PT C1

Watershed Area (A): 35.54 Acres

Length of Watercourse(Lc): 3000. ft Length to Center of Gravity(Lca): 1500. f

Incremental Change in Length(Li) -ft. Incremental Change in Elevation(Hi) -ft.

3000.0 68.0

Mean Slope (Sc): 0.0227 ft/ft Watershed Type(s): SUBURBAN FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr):	4.43	in.	Areal Value:	in.
P6 (6 hr):	3.34	in.	Areal Value:	in.
P1 (1 hr):	2.44	in.	Areal Value:	in.
P2 (2 hr):	2.75	in.	Areal Value:	in.
P3 (3 hr):	2.95	in.	Areal Value:	in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT B

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future)

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 0.0 0.0 0.0 0.0 85.8

Adjusted Curve Number(s) - CN*(s): 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas

Runoff Supply Rate(q): 0.65 X i in/hr (function of i)

Time of Concentration (TC):0.3428 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 9.6 mins. (K= 14.4)

Rainfall Intensity (i) at TC: 6.69 in./hr.

Runoff Supply Rate (q) at TC: 4.34 in./hr.

Peak Discharge:
1.008qA(acres): 156. cfs

Discharge Location:

HYDROLOGIC DATA SHEET

Project Name and Location: NEW TUCSON C

Drainage Concentration Point: PT C

Watershed Area (A): 106.50 Acres

Length of Watercourse(Lc): 10000. ft Length to Center of Gravity(Lca): 5000. ft

Incremental Change in Length(Li) -ft. Incremental Change in Elevation(Hi) -ft

10000.0 210.0

Mean Slope (Sc): 0.0210 ft/ft Watershed Type(s): SUBURBAN FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr): 4.43 in. Areal Value: in.

P6 (6 hr): 3.34 in. Areal Value: in.

P1 (1 hr): 2.44 in. Areal Value: in.

P2 (2 hr): 2.75 in. Areal Value: in.

P3 (3 hr): 2.95 in. Areal Value: in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BRU

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future)

Curve Number(s) - CN(s): 82. 87. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 0.0 0.0 0.0 0.0 85.8

Adjusted Curve Number(s) - CN*(s): 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas)

Runoff Supply Rate(q): 0.65 X i in/hr (function of i)

Time of Concentration (TC):0.7278 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 24.3 mins. (K= 30.6)

Rainfall Intensity (i) at TC: 4.33 in./hr.

Runoff Supply Rate (q) at TC: 2.81 in./hr.

Peak Discharge:
1.008qA(acres): 302. cfs

Discharge Location:

HYDROLOGIC DATA SHEET

Project Name and Location: NEW TUCSON D

Drainage Concentration Point: SE CORNER OF PARCEL

Watershed Area (A): 153.00 Acres

Length of Watercourse(Lc): 8500. ft Length to Center of Gravity(Lca): 4250. ft

Incremental Change in Length(Li) -ft. Incremental Change in Elevation(Hi) -f

8500.0 220.0

Mean Slope (Sc): 0.0259 ft/ft Watershed Type(s): SUBURBAN FOOTHILLS (future)

Basin Factor(nb): 0.0320 (future) Flood Frequency: 100.0 yrs.

P24 (24 hr):	4.43	in.	Areal Value:	in.
P6 (6 hr):	3.34	in.	Areal Value:	in.
P1 (1 hr):	2.44	in.	Areal Value:	in.
P2 (2 hr):	2.75	in.	Areal Value:	in.
P3 (3 hr):	2.95	in.	Areal Value:	in.

Soil Group(s): 0.0 %A 35.0 %B 15.0 %C 50.0 %D Cover Type(s): DESERT BRU

Cover Density (pervious areas): 30.0% Impervious Cover: 15.0% (future

Curve Number(s) - CN(s): 82. 8/. 90. 99(pervious & impervious areas)

Adjusted Curve Number(s) - CN*(s): 0.0 0.0 0.0 0.0 85.8

Adjusted Curve Number(s) - CN*(s): 89.7 92.1 99.0

Runoff to Rainfall Ratio(s),(C): 0.596 (pervious areas) 0.952 (impervious areas

Runoff Supply Rate(q): 0.65 X i in/hr (function of i)

Time of Concentration (TC):0.6072 X i**-0.4 hrs. (function of i)

Iterative Solution of TC: 19.2 mins. (K= 25.5)

Rainfall Intensity (i) at TC: 4.93 in./hr.

Runoff Supply Rate (q) at TC: 3.20 in./hr.

Peak Discharge:
1.008qA(acres): 493. cfs

Discharge Location:

APPENDIX 2

Hydraulic Calculation

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**********************************************************
*  WATER SURFACE PROFILES                                *
*  VERSION OF NOVEMBER 1976                              *
*  UPDATED MARCH 1982                                    *
*                                                        *
*  RUN DATE 27-AUG-85  TIME 15:15:45                     *
**********************************************************
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WASH A


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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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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 11-NOV-85 14:08:10

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**************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
 ERROR CORR -  01,02,03,04,05
 MODIFICATION -  50,51,52,53,54,55
**************************************************

T1 NEW TUCSON DJA JOB NO. 84-077.01
T2 FILE WASHA.DAT
T3

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.       2.        0.        0.  0.000000      0.00      0.0       0.  3426.400     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLOC     IRW       CHNIM     ITRACE

     -1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000


NC      0.060     0.060     0.035     0.100     0.300     0.000     0.000     0.000     0.000     0.000
RT      0.000  7245.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
X1   1000.000    15.000  4810.000  5040.000     0.000     0.000     0.000     0.000     0.000     0.000
GR   3434.000  4810.000  3432.000  4850.000  3430.000  4870.000  3428.000  4880.000  3430.000  4900.000
GR   3428.000  4910.000  3426.000  4930.000  3424.000  4965.000  3422.000  4990.000  3422.000  5020.000
GR   3424.000  5025.000  3426.000  5030.000  3424.000  5040.000  3424.000  5140.000  3425.000  5200.000

X1   1300.000    18.000  4720.000  5300.000   300.000   300.000   300.000     0.000     0.000     0.000
GR   3440.000  4720.000  3438.000  4745.000  3439.000  4800.000  3438.000  4870.000  3436.000  4900.000
GR   3434.000  4910.000  3432.000  4930.000  3430.000  4935.000  3428.000  4945.000  3428.000  4980.000
GR   3428.000  5010.000  3428.000  5050.000  3428.000  5150.000  3430.000  5170.000  3428.000  5200.000
GR   3430.000  5225.000  3427.500  5290.000  3432.000  5520.000     0.000     0.000     0.000     0.000

X1   1660.000    21.000  4720.000  5300.000   360.000   360.000   360.000     0.000     0.000     0.000
GR   3445.000  4720.000  3444.000  4805.000  3442.000  4820.000  3440.000  4850.000  3438.000  4870.000
GR   3436.000  4885.000  3434.000  4920.000  3432.000  4930.000  3432.000  4945.000  3434.000  4965.000
GR   3432.000  4980.000  3431.000  5000.000  3432.000  5020.000  3432.000  5050.000  3430.000  5070.000
GR   3432.000  5090.000  3434.000  5095.000  3432.000  5115.000  3434.000  5205.000  3435.000  5300.000
GR   3435.500  5480.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

X1   1940.000    13.000  4890.000  5225.000   330.000   250.000   280.000     0.000     0.000     0.000
GR   3448.000  4890.000  3446.000  4920.000  3444.000  4935.000  3442.000  4945.000  3440.000  4955.000
GR   3438.000  4965.000  3436.000  4980.000  3434.000  4990.000  3434.000  5030.000  3436.000  5070.000
GR   3438.000  5225.000  3439.000  5300.000  3439.200  5350.000     0.000     0.000     0.000     0.000

X1   2200.000    15.000  4630.000  5225.000   240.000   260.000   250.000     0.000     0.000     0.000
GR   3452.000  4630.000  3450.000  4685.000  3448.000  4730.000  3446.000  4750.000  3444.000  4760.000
GR   3442.000  4790.000  3440.000  4805.000  3438.000  4855.000  3438.000  4875.000  3438.000  4950.000
GR   3438.000  4975.000  3438.000  5040.000  3440.000  5090.000  3442.000  5120.000  3443.000  5225.000
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X1	2540.000	11.000	4630.000	5120.000	480.000	250.000	340.000	0.000	0.000	0.000
GR	3450.000	4630.000	3448.000	4690.000	3446.000	4715.000	3444.000	4895.000	3444.000	4925.000
GR	3442.000	4960.000	3440.000	4995.000	3440.000	5010.000	3442.000	5060.000	3444.000	5080.000
GR	3446.000	5120.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BT	0.000	515.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	-1660.000	20.000	4720.000	5300.000	360.000	360.000	360.000	0.000	0.000	0.000
GR	3445.000	4720.000	3444.000	4805.000	3442.000	4820.000	3440.000	4850.000	3438.000	4870.000
GR	3436.000	4885.000	3434.000	4920.000	3432.000	4930.000	3432.000	4945.000	3434.000	4965.000
GR	3432.000	4980.000	3431.000	5000.000	3432.000	5020.000	3432.000	5050.000	3430.000	5070.000
GR	3432.000	5090.000	3434.000	5095.000	3432.000	5115.000	3434.000	5205.000	3435.000	5300.000
X1	1.000	14.000	4850.000	5170.000	320.000	600.000	450.000	0.000	0.000	0.000
GR	3450.000	4850.000	3448.000	4870.000	3448.000	4910.000	3446.000	4930.000	3444.000	4945.000
GR	3442.000	4955.000	3440.000	4970.000	3440.000	5010.000	3442.000	5040.000	3444.000	5050.000
GR	3446.000	5070.000	3448.000	5080.000	3450.000	5110.000	3452.000	5170.000	0.000	0.000
X1	2.000	15.000	4870.000	5190.000	340.000	360.000	350.000	0.000	0.000	0.000
GR	3456.000	4870.000	3454.000	4910.000	3452.000	4925.000	3450.000	4955.000	3448.000	4970.000
GR	3446.000	4990.000	3444.000	4995.000	3444.000	5005.000	3446.000	5010.000	3448.000	5060.000
GR	3450.000	5075.000	3452.000	5090.000	3454.000	5100.000	3456.000	5135.000	3456.500	5190.000
X1	3.000	13.000	4855.000	5150.000	520.000	450.000	480.000	0.000	0.000	0.000
GR	3464.000	4855.000	3462.000	4885.000	3460.000	4900.000	3458.000	4940.000	3456.000	4975.000
GR	3454.000	4990.000	3452.000	4995.000	3452.000	5005.000	3460.000	5015.000	3462.000	5020.000
GR	3464.000	5030.000	3466.000	5050.000	3466.500	5150.000	0.000	0.000	0.000	0.000
X1	4.000	11.000	4860.000	5150.000	430.000	410.000	420.000	0.000	0.000	0.000
GR	3470.000	4860.000	3468.000	4875.000	3466.000	4910.000	3464.000	4980.000	3462.000	4990.000
GR	3461.000	5000.000	3464.000	5020.000	3470.000	5045.000	3472.000	5060.000	3474.000	5070.000
GR	3475.000	5150.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	5.000	13.000	4930.000	5150.000	280.000	380.000	310.000	0.000	0.000	0.000
GR	3476.000	4930.000	3474.000	4960.000	3472.000	4970.000	3470.000	4985.000	3466.000	4995.000
GR	3466.000	5005.000	3468.000	5010.000	3470.000	5020.000	3472.000	5035.000	3474.000	5045.000
GR	3476.000	5060.000	3478.000	5100.000	3480.000	5150.000	0.000	0.000	0.000	0.000
X1	6.000	15.000	4920.000	5320.000	590.000	500.000	550.000	0.000	0.000	0.000
GR	3486.000	4920.000	3484.000	4935.000	3482.000	4950.000	3480.000	4980.000	3472.000	5000.000
GR	3480.000	5010.000	3482.000	5015.000	3484.000	5025.000	3486.000	5035.000	3488.000	5050.000
GR	3488.000	5120.000	3486.000	5170.000	3488.000	5215.000	3490.000	5255.000	3491.000	5320.000
X1	7.000	13.000	4870.000	5100.000	420.000	410.000	410.000	0.000	0.000	0.000
GR	3496.500	4870.000	3496.000	4900.000	3494.000	4930.000	3492.000	4955.000	3490.000	4970.000
GR	3486.000	4985.000	3482.000	4995.000	3482.000	5005.000	3486.000	5020.000	3490.000	5040.000
GR	3492.000	5060.000	3494.000	5080.000	3496.000	5100.000	0.000	0.000	0.000	0.000
X1	8.000	14.000	4860.000	5140.000	460.000	340.000	390.000	0.000	0.000	0.000
GR	3500.000	4860.000	3498.000	4900.000	3496.000	4930.000	3496.000	4970.000	3492.000	4990.000
GR	3490.000	4995.000	3490.000	5010.000	3492.000	5015.000	3494.000	5020.000	3496.000	5030.000
GR	3498.000	5035.000	3500.000	5045.000	3502.000	5070.000	3504.000	5140.000	0.000	0.000

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BT	0.000	106.000	0.000	0.000	0.000	0.000	0.000	0.000
K1	-2200.000	15.000	4630.000	5225.000	240.000	260.000	260.000	0.000
GR	3452.000	4630.000	3450.000	4685.000	3448.000	4730.000	3446.000	4750.000
GR	3442.000	4790.000	3440.000	4805.000	3438.000	4855.000	3438.000	4875.000
GR	3438.000	4975.000	3438.000	5040.000	3440.000	5090.000	3442.000	5120.000
X1	9.000	15.000	4880.000	5160.000	70.000	380.000	230.000	0.000
GR	3453.000	4880.000	3452.000	4940.000	3450.000	4970.000	3448.000	4975.000
GR	3444.000	4990.000	3442.000	4995.000	3442.000	5005.000	3444.000	5010.000
GR	3448.000	5040.000	3450.000	5065.000	3452.000	5090.000	3454.000	5130.000
K1	10.000	10.000	4915.000	5080.000	300.000	130.000	210.000	0.000
GR	3456.000	4915.000	3454.000	4935.000	3452.000	4950.000	3450.000	4965.000
GR	3448.000	5005.000	3450.000	5020.000	3452.000	5030.000	3454.000	5055.000
X1	11.000	12.000	4880.000	5120.000	260.000	260.000	260.000	0.000
GR	3462.000	4880.000	3460.000	4930.000	3460.000	4970.000	3458.000	4985.000
GR	3454.000	4995.000	3452.000	5005.000	3454.000	5020.000	3456.000	5035.000
GR	3460.000	5080.000	3462.000	5120.000	0.000	0.000	0.000	0.000
X1	12.000	11.000	4850.000	5130.000	210.000	250.000	250.000	0.000
GR	3467.000	4850.000	3466.000	4950.000	3464.000	4980.000	3462.000	4985.000
GR	3460.000	5010.000	3460.000	5050.000	3462.000	5070.000	3464.000	5080.000
GR	3467.000	5130.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	13.000	11.000	4800.000	5340.000	250.000	280.000	270.000	0.000
GR	3472.000	4800.000	3470.000	4910.000	3468.000	4925.000	3466.000	4990.000
GR	3466.000	5010.000	3468.000	5020.000	3470.000	5035.000	3472.000	5095.000
GR	3476.000	5340.000	0.000	0.000	0.000	0.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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= 0.100 CEHV= 0.300
*SECNO 1000.000
3280 CROSS SECTION 1000.00 EXTENDED 2.07 FEET

3720 CRITICAL DEPTH ASSUMED

1000.00	5.07	3427.07	3427.07	3426.40	3428.52	1.45	0.00	0.00	3434.00
7245.	0.	4365.	2880.	0.	393.	461.	0.	0.	3424.00
0.00	0.00	11.38	6.24	0.060	0.035	0.060	0.000	3422.00	4919.30
0.015586	0.	0.	0.	0	10	0	0.00	280.70	5200.00

*SECNO 1300.000

3301 HV CHANGED MORE THAN HVINS

1300.00	4.11	3431.61	0.00	0.00	3431.93	0.33	3.30	0.11	3440.00
7245.	0.	0.	7245.	0.	0.	1584.	8.	3.	3490.00
0.02	0.00	0.00	4.58	0.060	0.035	0.060	0.000	3427.50	4930.97
0.008162	300.	300.	300.	2	0	0	0.00	569.17	5500.14

*SECNO 1660.000

3301 HV CHANGED MORE THAN HVINS

7165 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1660.00	5.10	3435.10	3435.10	0.00	3436.22	1.12	3.85	0.24	3445.00
7245.	0.	7244.	1.	0.	853.	2.	18.	7.	3435.00
0.03	0.00	8.49	0.42	0.060	0.035	0.060	0.000	3430.00	4900.67
0.014610	360.	360.	360.	3	11	0	0.00	436.95	5337.62

*SECNO 1940.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1940.00	5.12	3439.12	3439.12	0.00	3440.43	1.31	3.60	0.06	3448.00
7245.	0.	7155.	90.	0.	774.	48.	24.	10.	3438.00
0.04	0.00	9.25	1.87	0.060	0.035	0.060	0.000	3434.00	4959.41
0.011421	330.	280.	250.	3	5	0	0.00	370.20	5329.61

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

*SECNO 2200.000

*301 HV CHANGED MORE THAN HVINS

2200.00	3.81	3441.81	0.00	0.00	3442.59	0.78	2.11	0.05	3452.00
7245.	0.	7245.	0.	0.	1023.	0.	29.	12.	3443.00
0.05	0.00	7.08	0.00	0.060	0.035	0.060	0.000	3438.00	4791.42
0.006057	240.	260.	260.	2	0	0	0.00	325.74	5117.16

*SECNO 2540.000
*3685 20 TRIALS ATTEMPTED WSEL,CWSEL
*3693 PROBABLE MINIMUM SPECIFIC ENERGY
*3720 CRITICAL DEPTH ASSUMED

2540.00	5.69	3445.69	3445.69	0.00	3446.85	1.16	2.99	0.11	3450.00
7245.	0.	7245.	0.	0.	839.	0.	37.	14.	3446.00
0.06	0.00	8.63	0.00	0.060	0.035	0.060	0.000	3440.00	4742.97
0.013918	480.	340.	250.	20	8	0	0.00	370.81	5113.78

*SECNO -1660.000
START TRIB COMP
-1660.000 1660.000 3435.104
*3280 CROSS SECTION -1660.00 EXTENDED 0.10 FEET

-1660.00	5.10	3435.10	0.00	0.00	3435.11	0.01	0.00	0.00	3445.00
515.	0.	515.	0.	0.	853.	0.	44.	18.	3435.00
0.23	0.00	0.60	0.00	0.060	0.035	0.060	0.000	3430.00	4900.67
0.000074	360.	360.	360.	0	0	0	0.00	399.33	5300.00

*SECNO 1.000

*301 HV CHANGED MORE THAN HVINS

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

1.00	3.49	3441.49	3441.49	0.00	3442.07	0.58	0.12	0.17	3450.00
515.	0.	515.	0.	0.	95.	0.	48.	20.	3452.00
0.25	0.00	6.09	0.00	0.060	0.035	0.060	0.000	3440.00	4958.82
0.017094	320.	450.	600.	20	14	0	0.00	73.54	5032.36

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 2.000									
2.00	3.24	3447.24	3447.20	0.00	3447.86	0.62	5.78	0.01	3456.00
515.	0.	515.	0.	0.	82.	0.	49.	21.	3456.50
0.26	0.00	6.30	0.00	0.060	0.035	0.060	0.000	3444.00	4977.59
0.015960	340.	350.	360.	6	14	0	0.00	63.45	5041.04
*SECNO 3.000									
7185 MINIMUM SPECIFIC ENERGY									
3720 CRITICAL DEPTH ASSUMED									
3.00	3.47	3455.47	3455.47	0.00	3456.52	1.05	7.51	0.13	3464.00
515.	0.	515.	0.	0.	63.	0.	50.	21.	3466.50
0.28	0.00	8.22	0.00	0.060	0.035	0.060	0.000	3452.00	4978.98
0.015341	520.	480.	450.	2	8	0	0.00	30.35	5009.34
*SECNO 4.000									
7185 MINIMUM SPECIFIC ENERGY									
3720 CRITICAL DEPTH ASSUMED									
4.00	3.54	3464.54	3464.54	0.00	3465.25	0.72	6.61	0.03	3470.00
515.	0.	515.	0.	0.	76.	0.	51.	22.	3475.00
0.29	0.00	6.79	0.00	0.060	0.035	0.060	0.000	3461.00	4961.20
0.016138	430.	420.	410.	12	5	0	0.00	52.95	5014.15
*SECNO 5.000									
7185 MINIMUM SPECIFIC ENERGY									
3720 CRITICAL DEPTH ASSUMED									
5.00	3.30	3469.30	3469.30	0.00	3470.29	0.99	4.85	0.08	3476.00
515.	0.	515.	0.	0.	64.	0.	51.	22.	3480.00
0.31	0.00	7.99	0.00	0.060	0.035	0.060	0.000	3466.00	4986.75
0.015172	280.	310.	380.	3	11	0	0.00	33.00	5019.75
*SECNO 6.000									
6.00	5.42	3477.42	3477.41	0.00	3478.78	1.35	8.38	0.11	3486.00
515.	0.	515.	0.	0.	55.	0.	52.	22.	3491.00
0.32	0.00	9.33	0.00	0.060	0.035	0.060	0.000	3472.00	4986.44
0.015289	590.	550.	500.	5	14	0	0.00	20.35	5006.78
*SECNO 7.000									
7185 MINIMUM SPECIFIC ENERGY									

THIS RUN EXECUTED 11-NOV-85 14:08:44

****
HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
ERROR CORR - 01,02,03,04,05
MODIFICATION - 50,51,52,53,54,55
****

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

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	1000.000	0.00	0.00	0.00	3422.00	7245.00	3427.07	3427.07	3428.52	155.86	11.38	844.71	580.32
	1300.000	300.00	0.00	0.00	3427.50	7245.00	3431.61	0.00	3431.93	81.62	0.00	1583.51	801.92
*	1660.000	360.00	0.00	0.00	3430.00	7245.00	3435.10	3435.10	3436.22	146.10	8.49	854.85	599.40
*	1940.000	280.00	0.00	0.00	3434.00	7245.00	3439.12	3439.12	3440.43	114.21	9.25	822.04	677.92
	2200.000	260.00	0.00	0.00	3438.00	7245.00	3441.81	0.00	3442.59	60.57	7.08	1022.94	930.90
*	2540.000	340.00	0.00	0.00	3440.00	7245.00	3445.69	3445.69	3446.85	139.18	8.63	839.42	614.12
	-1660.000	360.00	0.00	0.00	3430.00	515.00	3435.10	0.00	3435.11	0.74	0.60	852.88	599.23
*	1.000	450.00	0.00	0.00	3440.00	515.00	3441.49	3441.49	3442.07	170.94	6.09	84.61	39.39
	2.000	350.00	0.00	0.00	3444.00	515.00	3447.24	3447.20	3447.86	159.60	6.30	81.79	40.77
	3.000	480.00	0.00	0.00	3452.00	515.00	3455.47	3455.47	3456.52	153.41	9.22	62.65	41.58
*	4.000	420.00	0.00	0.00	3461.00	515.00	3464.54	3464.54	3465.25	161.38	6.79	75.81	40.54
	5.000	310.00	0.00	0.00	3466.00	515.00	3469.30	3469.30	3470.29	151.72	7.99	64.43	41.81
	6.000	550.00	0.00	0.00	3472.00	515.00	3477.42	3477.41	3478.78	152.89	9.33	55.19	41.65
*	7.000	410.00	0.00	0.00	3482.00	515.00	3485.15	3485.15	3486.20	145.70	8.23	62.55	42.67
*	8.000	390.00	0.00	0.00	3490.00	515.00	3492.83	3492.83	3493.86	148.96	8.13	63.35	42.20
	-2200.000	260.00	0.00	0.00	3438.00	106.00	3441.81	0.00	3441.81	0.01	0.10	1023.94	932.15
*	9.000	230.00	0.00	0.00	3442.00	106.00	3443.34	3443.34	3443.99	185.88	5.93	17.86	7.77

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

*SECNO 11.000

11.00	1.80	3453.80	3453.78	0.00	3454.23	0.43	5.03	0.03	3462.00
106.	0.	106.	0.	0.	20.	0.	59.	25.	3462.00
1.08	0.00	5.26	0.00	0.060	0.035	0.060	0.000	3452.00	4996.02
0.018050	260.	260.	260.	7	17	0	0.00	22.44	5018.47

*SECNO 12.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

12.00	0.45	3460.45	3460.45	0.00	3460.67	0.22	5.18	0.02	3467.00
106.	0.	106.	0.	0.	28.	0.	59.	25.	3467.00
1.10	0.00	3.75	0.00	0.060	0.035	0.060	0.000	3460.00	4988.87
0.024004	210.	250.	250.	5	11	0	0.00	65.63	5054.50

*SECNO 13.000

13.00	1.46	3466.46	3466.47	0.00	3466.78	0.32	6.08	0.03	3472.00
106.	0.	106.	0.	0.	24.	0.	59.	26.	3476.00
1.12	0.00	4.51	0.00	0.060	0.035	0.060	0.000	3465.00	4974.74
0.021167	250.	270.	280.	6	23	0	0.00	37.61	5012.35

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

3720 CRITICAL DEPTH ASSUMED

7.00	3.15	3485.15	3485.15	0.00	3486.20	1.05	6.12	0.03	3496.50
515.	0.	515.	0.	0.	63.	0.	52.	22.	3496.00
0.34	0.00	8.23	0.00	0.060	0.035	0.060	0.000	3482.00	4987.12
0.014570	420.	410.	410.	3	11	0	0.00	29.70	5016.82

*SECNO 8.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

8.00	2.83	3492.83	3492.83	0.00	3493.86	1.03	5.75	0.00	3500.00
515.	0.	515.	0.	0.	63.	0.	53.	23.	3504.00
0.35	0.00	8.13	0.00	0.060	0.035	0.060	0.000	3490.00	4985.85
0.014896	460.	390.	340.	8	11	0	0.00	31.23	5017.08

*SECNO -2200.000

START TRIB COMP

-2200.000	2200.000	3441.813							
-2200.00	3.81	3441.81	0.00	0.00	3441.81	0.00	0.00	0.00	3452.00
106.	0.	106.	0.	0.	1024.	0.	56.	24.	3443.00
1.05	0.00	0.10	0.00	0.060	0.035	0.060	0.000	3438.00	4791.40
0.000001	240.	260.	260.	0	0	0	0.00	325.80	5117.20

*SECNO 9.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

0693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

9.00	1.34	3443.34	3443.34	0.00	3443.89	0.55	0.00	0.16	3453.00
106.	0.	106.	0.	0.	18.	0.	59.	25.	3455.00
1.06	0.00	5.93	0.00	0.060	0.035	0.060	0.000	3442.00	4991.65
0.018588	70.	230.	380.	20	22	0	0.00	16.69	5008.35

*SECNO 10.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

10.00	0.84	3448.84	3448.84	0.00	3449.17	0.33	4.12	0.02	3456.00
106.	0.	106.	0.	0.	23.	0.	59.	25.	3456.00
1.07	0.00	4.63	0.00	0.060	0.035	0.060	0.000	3448.00	4976.62
0.020760	300.	210.	130.	4	14	0	0.00	34.66	5011.28

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	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	10.000	210.00	0.00	0.00	3448.00	106.00	3448.84	3448.84	3449.17	207.60	4.63	22.89	7.36
	11.000	260.00	0.00	0.00	3452.00	106.00	3453.80	3453.78	3454.23	180.50	5.26	20.15	7.89
*	12.000	250.00	0.00	0.00	3460.00	106.00	3460.45	3460.45	3460.67	240.04	3.75	28.28	6.84
	13.000	270.00	0.00	0.00	3465.00	106.00	3466.46	3466.47	3466.78	211.67	4.51	23.53	7.29

UMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	1000.000	7245.00	3427.07	0.00	0.00	0.67	280.70	0.00
	1300.000	7245.00	3431.61	0.00	4.54	0.00	569.17	300.00
	1660.000	7245.00	3435.10	0.00	3.50	0.00	436.95	360.00
*	1940.000	7245.00	3439.12	0.00	4.01	0.00	370.20	280.00
	2200.000	7245.00	3441.81	0.00	2.69	0.00	325.74	260.00
*	2540.000	7245.00	3445.69	0.00	3.88	0.00	370.81	340.00
	-1660.000	515.00	3435.10	0.00	-10.58	0.00	399.33	360.00
*	1.000	515.00	3441.49	0.00	6.39	0.00	73.54	450.00
	2.000	515.00	3447.24	0.00	5.75	0.00	63.45	350.00
	3.000	515.00	3455.47	0.00	8.23	0.00	30.35	480.00
*	4.000	515.00	3464.54	0.00	9.07	0.00	52.95	420.00
	5.000	515.00	3469.30	0.00	4.76	0.00	33.00	310.00
	6.000	515.00	3477.42	0.00	8.12	0.00	20.35	550.00
*	7.000	515.00	3485.15	0.00	7.73	0.00	29.70	410.00
	8.000	515.00	3492.83	0.00	7.68	0.00	31.23	390.00
	-2200.000	106.00	3441.81	0.00	-51.02	0.00	325.80	260.00
	9.000	106.00	3443.34	0.00	1.52	0.00	16.69	230.00
*	10.000	106.00	3448.84	0.00	5.50	0.00	34.66	210.00
	11.000	106.00	3453.80	0.00	4.96	0.00	22.44	260.00
	12.000	106.00	3460.45	0.00	6.65	0.00	65.63	250.00
	13.000	106.00	3466.46	0.00	6.01	0.00	37.61	270.00

X1	2970.000	8.000	4790.000	5370.000	470.000	590.000	490.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	3473.000	4790.000	3472.000	4870.000	3470.000	4910.000	3468.000	4970.000	3467.000	5000.000
GR	3468.000	5040.000	3469.000	5150.000	3468.000	5370.000	0.000	0.000	0.000	0.000
X1	3450.000	5.000	4840.000	5220.000	410.000	600.000	480.000	0.000	0.000	0.000
GR	3480.000	4840.000	3478.000	4960.000	3477.000	5080.000	3478.000	5160.000	3480.000	5220.000
X1	3810.000	4.000	4820.000	5215.000	360.000	360.000	360.000	0.000	0.000	0.000
GR	3485.000	4820.000	3484.500	5000.000	3486.000	5125.000	3486.500	5215.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

5-DEC-85 10:32:24 PAGE 1

THIS RUN EXECUTED 5-DEC-85 10:32:24

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
  ERROR CORR -  01,02,03,04,05
  MODIFICATION -  50,51,52,53,54,55
**************************************************

T1 NEW TUCSON
T2 DJA JOB NO 84-077.01
T3 FILE WASHA3.DAT

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        0.        0.        0.  0.000000      0.00      0.0     177.  3424.280     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     -1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000


NC     0.060     0.060     0.035     0.100     0.300     0.000     0.000     0.000     0.000     0.000
X1   730.000     8.000  4700.000  5030.000     0.000     0.000     0.000     0.000     0.000     0.000
GR  3431.000  4700.000  3430.000  4735.000  3428.000  4800.000  3426.000  4880.000  3424.000  4950.000
GR  3423.000  5000.000  3424.000  5020.000  3425.000  5030.000     0.000     0.000     0.000     0.000

X1  1000.000    13.000  4730.000  5610.000   160.000   300.000   270.000     0.000     0.000     0.000
X3    10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
GR  3433.000  4730.000  3432.000  4800.000  3430.000  4875.000  3428.000  4960.000  3427.500  5000.000
GR  3428.000  5040.000  3430.000  5185.000  3432.000  5220.000  3432.000  5270.000  3430.000  5360.000
GR  3428.000  5385.000  3430.000  5410.000  3432.000  5610.000     0.000     0.000     0.000     0.000

X1  1430.000    12.000  4580.000  5790.000   420.000   540.000   430.000     0.000     0.000     0.000
GR  3440.000  4580.000  3438.000  4760.000  3436.000  5000.000  3436.000  5020.000  3438.000  5050.000
GR  3440.000  5090.000  3441.000  5200.000  3440.000  5400.000  3440.000  5520.000  3440.500  5630.000
GR  3440.000  5720.000  3441.000  5790.000     0.000     0.000     0.000     0.000     0.000     0.000

X1  1750.000     9.000  4830.000  5440.000   310.000   320.000   330.000     0.000     0.000     0.000
GR  3446.500  4830.000  3446.000  4870.000  3444.000  4960.000  3442.000  4990.000  3442.000  5010.000
GR  3442.000  5025.000  3444.000  5190.000  3446.000  5270.000  3447.000  5440.000     0.000     0.000

X1  2130.000     7.000  4570.000  5180.000   500.000   240.000   380.000     0.000     0.000     0.000
GR  3454.500  4570.000  3454.000  4630.000  3452.000  4910.000  3450.000  4970.000  3449.000  5000.000
GR  3450.000  5070.000  3452.000  5180.000     0.000     0.000     0.000     0.000     0.000     0.000

X1  2480.000    13.000  4520.000  5600.000   350.000   350.000   350.000     0.000     0.000     0.000
X3    10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
GR  3462.000  4520.000  3463.000  4700.000  3462.000  4815.000  3460.000  4870.000  3458.000  4945.000
GR  3456.000  4995.000  3456.000  5010.000  3458.000  5050.000  3459.500  5150.000  3458.000  5245.000
GR  3456.000  5390.000  3456.500  5500.000  3456.000  5600.000     0.000     0.000     0.000     0.000
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**********************************************************
*  WATER SURFACE PROFILES                                *
*  VERSION OF NOVEMBER 1976                              *
*  UPDATED MARCH 1982                                    *
*                                                        *
*  RUN DATE 29-AUG-85  TIME 07:52:54                     *
**********************************************************
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WASH A3


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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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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
```

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1000.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 1660.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1660.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1940.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1940.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2540.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2540.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 2540.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 1.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 3.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 3.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 4.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 4.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 5.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 5.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 7.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 7.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 8.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 8.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 9.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 9.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 9.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 10.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 10.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 12.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 12.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

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= 0.100 CEHV= 0.300

*SECNO 730.000

730.00	1.28	3424.28	0.00	3424.28	3424.43	0.15	0.00	0.00	3431.00
177.	0.	177.	0.	0.	56.	0.	0.	0.	3425.00
0.00	0.00	3.14	0.00	0.060	0.035	0.060	0.000	3423.00	4940.20
0.009114	0.	0.	0.	0	0	0	0.00	82.60	5022.80

*SECNO 1000.000

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 3433.00 ELREA= 3432.00

1000.00	0.78	3428.28	3428.28	0.00	3428.49	0.21	3.81	0.02	3433.00
177.	0.	177.	0.	0.	48.	0.	0.	1.	3432.00
0.02	0.00	3.65	0.00	0.060	0.035	0.060	0.000	3427.50	4947.89
0.024756	160.	270.	300.	3	14	0	0.00	119.89	5388.56

*SECNO 1430.000

1430.00	0.78	3436.78	0.00	0.00	3436.93	0.15	8.43	0.01	3440.00
177.	0.	177.	0.	0.	56.	0.	1.	2.	3441.00
0.06	0.00	3.15	0.00	0.060	0.035	0.060	0.000	3436.00	4906.82
0.015923	420.	430.	540.	7	0	0	0.00	124.82	5031.65

*SECNO 1750.000

1750.00	0.70	3442.70	0.00	0.00	3442.91	0.21	5.96	0.02	3446.50
177.	0.	177.	0.	0.	48.	0.	1.	3.	3447.00
0.08	0.00	3.68	0.00	0.060	0.035	0.060	0.000	3442.00	4979.53
0.020674	310.	330.	320.	4	0	0	0.00	103.03	5082.56

*SECNO 2130.000

2130.00	1.00	3450.00	0.00	0.00	3450.20	0.20	7.29	0.00	3454.50
177.	0.	177.	0.	0.	50.	0.	2.	4.	3453.00
0.11	0.00	3.56	0.00	0.060	0.035	0.060	0.000	3449.00	4970.10
0.017838	500.	380.	240.	4	0	0	0.00	99.66	5069.76

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 2480.000

3265 DIVIDED FLOW

3280 CROSS SECTION 2480.00 EXTENDED 0.50 FEET

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 3462.00 ELREA= 3456.00

2480.00	0.51	3456.51	0.00	0.00	3456.59	0.09	6.38	0.01	3462.00
177.	0.	177.	0.	0.	74.	0.	2.	5.	3456.00
0.15	0.00	2.38	0.00	0.060	0.035	0.060	0.000	3456.00	4982.52
0.018660	350.	350.	350.	5	0	0	0.00	283.40	5600.00

*SECNO 2970.000

3265 DIVIDED FLOW

3280 CROSS SECTION 2970.00 EXTENDED 0.15 FEET

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 3473.00 ELREA= 3468.00

2970.00	1.15	3468.15	3468.15	0.00	3468.35	0.20	10.41	0.03	3473.00
177.	0.	177.	0.	0.	49.	0.	3.	7.	3468.00
0.19	0.00	3.60	0.00	0.060	0.035	0.060	0.000	3467.00	4965.58
0.024410	470.	490.	590.	6	17	0	0.00	123.00	5370.00

*SECNO 3450.000

3450.00	0.78	3477.78	0.00	0.00	3477.91	0.13	9.56	0.01	3480.00
177.	0.	177.	0.	0.	61.	0.	3.	9.	3480.00
0.24	0.00	2.91	0.00	0.060	0.035	0.060	0.000	3477.00	4986.46
0.016558	410.	480.	600.	6	0	0	0.00	155.90	5142.36

*SECNO 3810.000

3280 CROSS SECTION 3810.00 EXTENDED 0.03 FEET

3810.00	0.54	3485.04	0.00	0.00	3485.16	0.13	7.25	0.00	3485.00
177.	0.	177.	0.	0.	62.	0.	4.	11.	3486.50
0.27	0.00	2.85	0.00	0.060	0.035	0.060	0.000	3484.50	4820.00
0.024990	360.	360.	360.	4	0	0	0.00	224.16	5044.16

THIS RUN EXECUTED 5-DEC-85 10:32:30

****
HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
ERROR CORR - 01,02,03,04,05
MODIFICATION - 50,51,52,53,54,55
****

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

WASHA3.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	730.000	0.00	0.00	0.00	3423.00	177.00	3424.28	0.00	3424.43	91.14	3.14	56.36	18.54
*	1000.000	270.00	0.00	0.00	3427.50	177.00	3428.28	3428.28	3428.49	247.56	3.65	48.47	11.25
	1430.000	430.00	0.00	0.00	3436.00	177.00	3436.78	0.00	3436.93	159.23	3.15	56.23	14.03
	1750.000	330.00	0.00	0.00	3442.00	177.00	3442.70	0.00	3442.91	206.74	3.68	48.15	12.31
	2130.000	380.00	0.00	0.00	3449.00	177.00	3450.00	0.00	3450.20	178.38	3.56	49.67	13.25
	2480.000	350.00	0.00	0.00	3456.00	177.00	3456.51	0.00	3456.59	186.60	2.38	74.48	12.96
*	2970.000	490.00	0.00	0.00	3467.00	177.00	3468.15	3468.15	3468.35	244.10	3.60	49.20	11.33
	3450.000	480.00	0.00	0.00	3477.00	177.00	3477.78	0.00	3477.91	165.58	2.91	60.74	13.76
	3810.000	360.00	0.00	0.00	3484.50	177.00	3485.04	0.00	3485.16	249.90	2.85	62.08	11.20

28-AUG-85 13:54:01 PAGE 1

THIS RUN EXECUTED 28-AUG-85 13:54:01

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
  ERROR CORR -  01,02,03,04,05
  MODIFICATION -  50,51,52,53,54,55
**************************************************

T1 NEW TUCSON DJA JOB NO. 84-077.01
T2 FILE WASHA4.DAT
T3

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        2.        0.        0.  0.000000      0.00      0.0       0.  3433.630     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     -1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000


NC     0.060     0.060     0.035     0.100     0.300     0.000     0.000     0.000     0.000     0.000
QT     0.000   359.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
X1  1000.000     9.000  4870.000  5120.000     0.000     0.000     0.000     0.000     0.000     0.000
GR  3437.500  4870.000  3436.000  4940.000  3434.000  4980.000  3432.000  4990.000  3432.000  5010.000
GR  3434.000  5050.000  3436.000  5060.000  3438.000  5070.000  3439.000  5120.000     0.000     0.000

X1  1360.000    10.000  4580.000  5240.000   350.000   370.000   360.000     0.000     0.000     0.000
GR  3444.000  4580.000  3444.000  4660.000  3442.000  4930.000  3440.000  4980.000  3438.000  4990.000
GR  3438.000  5020.000  3440.000  5050.000  3442.000  5080.000  3444.000  5170.000  3445.000  5240.000

X1  1730.000    12.000  4860.000  5410.000   270.000    80.000   160.000     0.000     0.000     0.000
GR  3451.000  4860.000  3450.000  4915.000  3448.000  4960.000  3446.000  4980.000  3446.000  4990.000
GR  3442.000  4995.000  3442.000  5010.000  3444.000  5030.000  3446.000  5060.000  3448.000  5140.000
GR  3450.000  5180.000  3452.000  5410.000     0.000     0.000     0.000     0.000     0.000     0.000

X1  1860.000    13.000  4750.000  5240.000   320.000   460.000   370.000     0.000     0.000     0.000
GR  3456.000  4750.000  3456.000  4800.000  3454.000  4920.000  3452.000  4970.000  3450.000  4980.000
GR  3448.000  4985.000  3446.000  4990.000  3444.000  4995.000  3444.000  5010.000  3446.000  5020.000
GR  3448.000  5040.000  3450.000  5070.000  3452.000  5240.000     0.000     0.000     0.000     0.000

X1  2360.000    25.000  4690.000  5200.000   520.000   470.000   580.000     0.000     0.000     0.000
X3    10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
GR  3468.000  4690.000  3466.000  4750.000  3464.000  4810.000  3462.000  4860.000  3460.000  4910.000
GR  3458.000  4940.000  3456.000  4970.000  3454.000  4985.000  3452.000  4970.000  3452.000  5005.000
GR  3454.000  5015.000  3456.000  5020.000  3458.000  5040.000  3459.000  5060.000  3458.000  5080.000
GR  3456.000  5095.000  3454.000  5100.000  3452.000  5110.000  3452.000  5115.000  3454.000  5120.000
GR  3456.000  5125.000  3458.000  5130.000  3460.000  5140.000  3462.000  5170.000  3462.000  5200.000
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*********************************************************
*  WATER SURFACE PROFILES                               *
*  VERSION OF NOVEMBER 1976                             *
*  UPDATED MARCH 1982                                   *
*                                                       *
*  RUN DATE 28-AUG-85  TIME 13:54:00                    *
*********************************************************
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WASH A4


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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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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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SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1000.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1000.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2970.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2970.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WASHA3.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	730.000	177.00	3424.28	0.00	0.00	0.00	82.60	0.00
*	1000.000	177.00	3428.28	0.00	4.00	0.00	119.89	270.00
	1430.000	177.00	3436.78	0.00	8.49	0.00	124.82	430.00
	1750.000	177.00	3442.70	0.00	5.92	0.00	103.03	330.00
	2130.000	177.00	3450.00	0.00	7.30	0.00	99.66	380.00
	2480.000	177.00	3456.51	0.00	6.51	0.00	283.40	350.00
*	2970.000	177.00	3468.15	0.00	11.64	0.00	123.00	490.00
	3450.000	177.00	3477.78	0.00	9.64	0.00	155.90	480.00
	3810.000	177.00	3485.04	0.00	7.25	0.00	224.16	360.00

X1	2550.000	12.000	4940.000	5220.000	30.000	360.000	190.000	0.000	0.000	0.000
GR	3464.000	4940.000	3462.000	4970.000	3460.000	4980.000	3458.000	4990.000	3456.000	4995.000
GR	3456.000	5005.000	3453.000	5010.000	3460.000	5060.000	3462.000	5070.000	3464.000	5080.000
GR	3466.000	5110.000	3468.000	5220.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	2690.000	12.000	4820.000	5140.000	270.000	40.000	140.000	0.000	0.000	0.000
GR	3472.000	4820.000	3470.000	4860.000	3468.000	4885.000	3466.000	4920.000	3464.000	4960.000
GR	3462.000	4985.000	3460.000	4995.000	3460.000	5010.000	3462.000	5015.000	3464.000	5045.000
GR	3466.000	5095.000	3467.000	5140.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	2860.000	18.000	4840.000	5280.000	20.000	420.000	170.000	0.000	0.000	0.000
GR	3471.500	4840.000	3470.000	4920.000	3468.000	4960.000	3466.000	4980.000	3464.000	4990.000
GR	3462.000	4995.000	3462.000	5005.000	3464.000	5010.000	3466.000	5020.000	3468.000	5060.000
GR	3470.000	5080.000	3472.000	5100.000	3474.000	5110.000	3475.000	5150.000	3474.000	5190.000
GR	3476.000	5200.000	3478.000	5230.000	3480.000	5280.000	0.000	0.000	0.000	0.000
X1	3170.000	13.000	4860.000	5120.000	500.000	70.000	310.000	0.000	0.000	0.000
GR	3481.000	4860.000	3480.000	4900.000	3478.000	4940.000	3476.000	4955.000	3474.000	4970.000
GR	3472.000	4980.000	3470.000	4990.000	3470.000	5010.000	3472.000	5020.000	3474.000	5040.000
GR	3476.000	5060.000	3478.000	5080.000	3480.000	5120.000	0.000	0.000	0.000	0.000
X1	3380.000	12.000	4850.000	5110.000	130.000	270.000	210.000	0.000	0.000	0.000
GR	3481.000	4850.000	3480.000	4920.000	3478.000	4960.000	3476.000	4980.000	3474.000	4990.000
GR	3474.000	5010.000	3476.000	5020.000	3478.000	5030.000	3480.000	5040.000	3482.000	5070.000
GR	3484.000	5080.000	3486.000	5110.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	3680.000	9.000	4900.000	5100.000	380.000	230.000	300.000	0.000	0.000	0.000
GR	3487.000	4900.000	3486.000	4950.000	3484.000	4980.000	3482.000	4995.000	3480.000	5010.000
GR	3484.000	5015.000	3486.000	5030.000	3488.000	5050.000	3489.000	5100.000	0.000	0.000
X1	3920.000	10.000	4870.000	5110.000	250.000	230.000	240.000	0.000	0.000	0.000
GR	3494.000	4870.000	3492.000	4950.000	3490.000	4980.000	3488.000	4990.000	3486.000	4995.000
GR	3486.000	5005.000	3488.000	5010.000	3490.000	5015.000	3492.000	5060.000	3492.500	5110.000
X1	4170.000	6.000	4900.000	5080.000	160.000	300.000	250.000	0.000	0.000	0.000
GR	3497.000	4900.000	3496.000	4985.000	3494.000	4995.000	3494.000	5010.000	3496.000	5030.000
GR	3497.000	5080.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	0.000	100.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	-2360.000	25.000	4690.000	5200.000	520.000	470.000	500.000	0.000	0.000	0.000
GR	3468.000	4690.000	3466.000	4750.000	3464.000	4810.000	3462.000	4860.000	3460.000	4910.000
GR	3458.000	4940.000	3456.000	4970.000	3454.000	4985.000	3452.000	4990.000	3452.000	5000.000
GR	3454.000	5015.000	3456.000	5020.000	3458.000	5040.000	3459.000	5060.000	3456.000	5080.000
GR	3456.000	5095.000	3454.000	5100.000	3452.000	5110.000	3452.000	5115.000	3454.000	5120.000
GR	3456.000	5125.000	3458.000	5130.000	3460.000	5140.000	3462.000	5170.000	3463.000	5200.000
X1	1.000	10.000	4900.000	5080.000	430.000	240.000	230.000	0.000	0.000	0.000
GR	3467.000	4900.000	3466.000	4950.000	3464.000	4970.000	3462.000	4980.000	3460.000	4990.000
GR	3460.000	5005.000	3462.000	5010.000	3464.000	5020.000	3466.000	5040.000	3468.000	5080.000

X1	2.000	11.000	4880.000	5200.000	220.000	320.000	250.000	0.000	0.000	0.000
GR	3474.000	4880.000	3472.000	4935.000	3470.000	4960.000	3468.000	4980.000	3466.000	4990.000
GR	3466.000	5010.000	3468.000	5020.000	3470.000	5030.000	3472.000	5060.000	3474.000	5110.000
GR	3475.000	5200.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	3.000	12.000	4810.000	5070.000	320.000	240.000	280.000	0.000	0.000	0.000
GR	3481.000	4810.000	3480.000	4870.000	3478.000	4890.000	3476.000	4940.000	3474.000	4980.000
GR	3472.000	4990.000	3470.000	4995.000	3470.000	5005.000	3472.000	5010.000	3474.000	5015.000
GR	3476.000	5030.000	3478.000	5070.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	4.000	12.000	4730.000	5140.000	240.000	260.000	240.000	0.000	0.000	0.000
GR	3487.000	4730.000	3486.000	4800.000	3484.000	4870.000	3482.000	4910.000	3480.000	4960.000
GR	3478.000	4970.000	3478.000	4990.000	3478.000	5010.000	3480.000	5020.000	3480.000	5045.000
GR	3482.000	5060.000	3483.000	5140.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	5.000	8.000	4790.000	5140.000	230.000	180.000	200.000	0.000	0.000	0.000
GR	3490.000	4790.000	3488.000	4870.000	3486.000	4920.000	3484.000	4965.000	3482.000	4990.000
GR	3482.000	5010.000	3484.000	5020.000	3485.000	5140.000	0.000	0.000	0.000	0.000
QT	0.000	81.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	-3380.000	12.000	4850.000	5110.000	130.000	270.000	210.000	0.000	0.000	0.000
GR	3481.000	4850.000	3480.000	4920.000	3478.000	4960.000	3476.000	4980.000	3474.000	4990.000
GR	3474.000	5010.000	3476.000	5020.000	3478.000	5030.000	3480.000	5040.000	3482.000	5070.000
GR	3484.000	5080.000	3486.000	5110.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	11.000	10.000	4810.000	5080.000	360.000	300.000	320.000	0.000	0.000	0.000
GR	3489.000	4810.000	3488.000	4860.000	3486.000	4905.000	3484.000	4960.000	3482.000	4985.000
GR	3480.000	4995.000	3480.000	5005.000	3482.000	5010.000	3484.000	5020.000	3485.000	5080.000
X1	12.000	9.000	4800.000	5185.000	50.000	340.000	190.000	0.000	0.000	0.000
GR	3490.000	4800.000	3488.000	4970.000	3486.000	4990.000	3484.000	5000.000	3486.000	5010.000
GR	3488.000	5025.000	3490.000	5050.000	3492.000	5100.000	3494.000	5185.000	0.000	0.000
X1	13.000	8.000	4840.000	5410.000	340.000	250.000	270.000	0.000	0.000	0.000
GR	3496.000	4840.000	3494.000	4925.000	3492.000	5000.000	3494.000	5020.000	3494.000	5050.000
GR	3496.000	5190.000	3498.000	5305.000	3499.500	5410.000	0.000	0.000	0.000	0.000
X1	14.000	6.000	4835.000	5400.000	410.000	50.000	290.000	0.000	0.000	0.000
GR	3502.000	4835.000	3500.000	4975.000	3498.000	5000.000	3500.000	5025.000	3501.500	5110.000
GR	3500.500	5400.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	15.000	6.000	4900.000	5260.000	190.000	330.000	220.000	0.000	0.000	0.000
GR	3505.000	4900.000	3504.000	4965.000	3502.500	5000.000	3504.000	5080.000	3506.000	5150.000
GR	3507.000	5260.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	16.000	7.000	4900.000	5200.000	300.000	180.000	260.000	0.000	0.000	0.000
GR	3510.000	4900.000	3508.000	4965.000	3507.000	5000.000	3508.000	5010.000	3508.500	5070.000
GR	3508.000	5160.000	3510.000	5200.000	0.000	0.000	0.000	0.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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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     CONAR     TOPWID      ENDST

*PROF 1

CCHV=   0.100 CEHV=   0.300
*SECNO 1000.000
  1000.00     1.63  3433.63      0.00  3433.63  3434.09      0.46      0.00      0.00  3437.50
     359.       0.      359.       0.       0.      66.       0.        0.        0.    3439.00
     0.00     0.00     5.46      0.00     0.060    0.035     0.060     0.000  3432.00  4981.85
 0.014907       0.       0.        0.       0        0         0      0.00     60.75  5042.60

*SECNO 1360.000
  1360.00     1.40  3439.40   3439.40      0.00  3439.93      0.53      5.82      0.02  3444.00
     359.       0.      359.       0.       0.      61.       0.        1.        0.    3445.00
     0.02     0.00     5.84      0.00     0.060    0.035     0.060     0.000  3438.00  4983.01
 0.017563      350.     360.      370.        5       15         0      0.00     57.96  5040.97

*SECNO 1730.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1730.00     1.97  3443.97   3443.97      0.00  3444.66      0.69      2.73      0.05  3451.00
     359.       0.      359.       0.       0.      54.       0.        1.        1.    3452.00
     0.02     0.00     6.65      0.00     0.060    0.035     0.060     0.000  3442.00  4990.06
 0.016533      270.     160.       80.       15       11         0      0.00     39.68  5029.75

*SECNO 1860.000
  1860.00     3.11  3447.11      0.00      0.00  3447.38      0.27      2.68      0.04  3456.00
     359.       0.      359.       0.       0.      86.       0.        1.        1.    3452.00
     0.05     0.00     4.17      0.00     0.060    0.035     0.060     0.000  3444.00  4987.22
 0.004042      320.     370.      460.        5        0         0      0.00     43.88  5031.10

*SECNO 2360.000

3265 DIVIDED FLOW

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=     3468.00 ELREA=     3463.00
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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	IBC	ICONT	CORAR	TOPWID	ENDST
2360.00	1.72	3453.72	3453.72	0.00	3454.34	0.62	3.67	0.11	3468.00
359.	0.	359.	0.	0.	57.	0.	2.	2.	3463.00
0.07	0.00	6.33	0.00	0.060	0.035	0.060	0.000	3452.00	4985.69
0.017224	520.	500.	470.	20	11	0	0.00	45.84	5119.31
*SECNO 2550.000									
7185 MINIMUM SPECIFIC ENERGY									
3720 CRITICAL DEPTH ASSUMED									
2550.00	2.80	3458.80	3458.80	0.00	3459.45	0.65	3.28	0.01	3464.00
359.	0.	359.	0.	0.	56.	0.	2.	2.	3468.00
0.08	0.00	6.45	0.00	0.060	0.035	0.060	0.000	3456.00	4985.99
0.017317	30.	190.	360.	8	14	0	0.00	44.06	5030.05
*SECNO 2690.000									
7185 MINIMUM SPECIFIC ENERGY									
3720 CRITICAL DEPTH ASSUMED									
2690.00	2.23	3462.23	3462.23	0.00	3462.95	0.73	2.34	0.02	3472.00
359.	0.	359.	0.	0.	52.	0.	3.	2.	3467.00
0.08	0.00	6.84	0.00	0.060	0.035	0.060	0.000	3460.00	4982.19
0.016197	270.	140.	40.	2	15	0	0.00	36.19	5018.39
*SECNO 2860.000									
2860.00	2.78	3464.78	3464.74	0.00	3465.63	0.84	2.64	0.03	3471.50
359.	0.	359.	0.	0.	49.	0.	3.	2.	3480.00
0.09	0.00	7.36	0.00	0.060	0.035	0.060	0.000	3462.00	4986.08
0.014890	20.	170.	420.	6	11	0	0.00	27.84	5013.92
*SECNO 3170.000									
7185 MINIMUM SPECIFIC ENERGY									
3720 CRITICAL DEPTH ASSUMED									
3170.00	1.83	3471.83	3471.83	0.00	3472.53	0.70	4.84	0.01	3481.00
359.	0.	359.	0.	0.	53.	0.	3.	2.	3480.00
0.10	0.00	6.73	0.00	0.060	0.035	0.060	0.000	3470.00	4980.85
0.016387	500.	310.	70.	2	14	0	0.00	38.29	5019.15
*SECNO 3380.000									
7185 MINIMUM SPECIFIC ENERGY									
3720 CRITICAL DEPTH ASSUMED									

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	GLOB	GCH	GROB	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	ENDSTA
3380.00	1.83	3475.83	3475.83	0.00	3476.53	0.71	3.45	0.00	3481.00
359.	0.	359.	0.	0.	53.	0.	3.	2.	3486.00
0.11	0.00	6.74	0.00	0.060	0.035	0.060	0.000	3474.00	4980.86
0.016452	130.	210.	270.	3	5	0	0.00	38.27	5019.14

*SECNO 3680.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3680.00	2.08	3484.08	3484.08	0.00	3484.80	0.72	4.89	0.00	3487.00
359.	0.	359.	0.	0.	53.	0.	4.	3.	3489.00
0.12	0.00	6.81	0.00	0.060	0.035	0.060	0.000	3482.00	4978.85
0.016164	380.	300.	230.	3	8	0	0.00	36.72	5015.57

*SECNO 3920.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3920.00	2.73	3488.73	3488.73	0.00	3489.65	0.93	3.81	0.06	3494.00
359.	0.	359.	0.	0.	46.	0.	4.	3.	3492.50
0.13	0.00	7.72	0.00	0.060	0.035	0.060	0.000	3486.00	4986.37
0.015574	250.	240.	230.	2	11	0	0.00	25.44	5011.81

*SECNO 4170.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4170.00	1.90	3495.90	3495.90	0.00	3496.55	0.65	4.06	0.03	3497.00
359.	0.	359.	0.	0.	55.	0.	4.	3.	3497.00
0.14	0.00	6.48	0.00	0.060	0.035	0.060	0.000	3494.00	4985.52
0.016983	160.	250.	300.	3	19	0	0.00	43.44	5028.96

*SECNO -2360.000
START TRIB COMP
-2360.000 2360.000 3453.723

3265 DIVIDED FLOW

-2360.00	1.72	3453.72	0.00	0.00	3453.77	0.05	0.00	0.00	3468.00
100.	0.	100.	0.	0.	57.	0.	5.	4.	3463.00
0.22	0.00	1.76	0.00	0.060	0.035	0.060	0.000	3452.00	4985.69
0.001336	520.	500.	470.	0	0	0	0.00	45.84	5119.31

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

*SECNO 1.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1.00	1.02	3461.02	3461.02	0.00	3461.44	0.42	0.77	0.11	3467.00
100.	0.	100.	0.	0.	19.	0.	5.	4.	3468.00
0.23	0.00	5.22	0.00	0.060	0.035	0.060	0.000	3460.00	4984.91
0.019198	430.	230.	240.	20	11	0	0.00	22.64	5007.55

*SECNO 2.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2.00	0.85	3466.85	3466.85	0.00	3467.22	0.36	4.92	0.01	3474.00
100.	0.	100.	0.	0.	21.	0.	5.	4.	3475.00
0.25	0.00	4.84	0.00	0.060	0.035	0.060	0.000	3466.00	4985.74
0.020164	220.	250.	320.	10	15	0	0.00	28.51	5014.26

*SECNO 3.000

3.00	1.42	3471.42	0.00	0.00	3471.84	0.43	4.61	0.02	3481.00
100.	0.	100.	0.	0.	19.	0.	5.	4.	3478.00
0.26	0.00	5.24	0.00	0.060	0.035	0.060	0.000	3470.00	4991.47
0.013696	320.	280.	240.	4	0	0	0.00	17.05	5008.53

*SECNO 4.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4.00	0.57	3478.57	3478.57	0.00	3478.83	0.26	4.11	0.02	3487.00
100.	0.	100.	0.	0.	24.	0.	6.	4.	3483.00
0.28	0.00	4.13	0.00	0.060	0.035	0.060	0.000	3478.00	4967.17
0.022076	240.	240.	260.	4	18	0	0.00	45.66	5012.83

*SECNO 5.000

5.00	0.81	3482.81	3482.81	0.00	3483.13	0.32	4.39	0.02	3490.00
100.	0.	100.	0.	0.	22.	0.	6.	4.	3485.00
0.29	0.00	4.55	0.00	0.060	0.035	0.060	0.000	3482.00	4979.86
0.020755	230.	200.	180.	.5	11	0	0.00	34.20	5014.06

2

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

*SECNO -3380.000
START TRIB COMP
-3380.000 3380.000 3475.827

-3380.00	1.83	3475.83	0.00	0.00	3475.86	0.04	0.00	0.00	3481.00
81.	0.	81.	0.	0.	53.	0.	6.	5.	3486.00
0.33	0.00	1.52	0.00	0.060	0.035	0.060	0.000	3474.00	4980.86
0.000838	130.	210.	270.	0	0	0	0.00	38.27	5019.14

*SECNO 11.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

11.00	1.09	3481.09	3481.09	0.00	3481.52	0.43	0.74	0.12	3489.00
81.	0.	81.	0.	0.	15.	0.	6.	5.	3485.00
0.35	0.00	5.26	0.00	0.060	0.035	0.060	0.000	3480.00	4989.54
0.019594	360.	320.	300.	20	14	0	0.00	18.20	5007.73

*SECNO 12.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

12.00	1.74	3485.74	3485.74	0.00	3486.18	0.45	3.73	0.00	3490.00
81.	0.	81.	0.	0.	15.	0.	6.	5.	3494.00
0.36	0.00	5.36	0.00	0.060	0.035	0.060	0.000	3484.00	4991.31
0.019704	50.	190.	340.	5	14	0	0.00	17.39	5008.69

*SECNO 13.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

13.00	0.93	3492.93	3492.93	0.00	3493.17	0.24	5.82	0.02	3496.00
81.	0.	81.	0.	0.	21.	0.	6.	5.	3499.50
0.38	0.00	3.93	0.00	0.060	0.035	0.060	0.000	3492.00	4965.05
0.023697	340.	270.	250.	4	11	0	0.00	44.28	5009.32

*SECNO 14.000

14.00	1.23	3499.23	3499.21	0.00	3499.52	0.29	6.33	0.02	3502.00
81.	0.	81.	0.	0.	17.	0.	6.	5.	3500.50
0.40	0.00	4.33	0.00	0.060	0.035	0.060	0.000	3498.00	4984.71
0.020182	410.	290.	50.	6	11	0	0.00	30.57	5015.29

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 15.000

15.00	0.84	3503.34	0.00	0.00	3503.48	0.14	3.95	0.02	3505.00
81.	0.	81.	0.	0.	27.	0.	6.	6.	3507.00
0.42	0.00	3.01	0.00	0.060	0.035	0.060	0.000	3502.50	4980.46
0.016074	190.	220.	330.	5	0	0	0.00	64.21	5044.67

*SECNO 16.000

3265 DIVIDED FLOW

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

16.00	1.03	3508.03	3507.95	0.00	3508.21	0.17	4.58	0.48	3510.00
81.	0.	81.	0.	0.	24.	0.	7.	6.	3510.00
0.44	0.00	3.34	0.00	0.060	0.035	0.060	0.000	3507.00	4963.90
0.019413	300.	260.	180.	20	8	0	0.00	56.96	5160.80

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THIS RUN EXECUTED 28-AUG-85 13:54:15

****
HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
ERROR CORR - 01,02,03,04,05
MODIFICATION - 50,51,52,53,54,55
****

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

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	1000.000	0.00	0.00	0.00	3432.00	359.00	3433.63	0.00	3434.09	149.07	5.46	65.80	29.40
	1360.000	360.00	0.00	0.00	3438.00	359.00	3439.40	3439.40	3439.93	175.63	5.84	61.48	27.09
*	1730.000	160.00	0.00	0.00	3442.00	359.00	3443.97	3443.97	3444.66	165.33	6.65	53.99	27.92
	1860.000	370.00	0.00	0.00	3444.00	359.00	3447.11	0.00	3447.38	40.42	4.17	86.01	56.47
*	2360.000	500.00	0.00	0.00	3452.00	359.00	3453.72	3453.72	3454.34	172.24	6.33	56.72	27.35
*	2550.000	190.00	0.00	0.00	3456.00	359.00	3458.80	3458.80	3459.45	173.17	6.45	55.69	27.28
*	2690.000	140.00	0.00	0.00	3460.00	359.00	3462.23	3462.23	3462.95	161.97	6.84	52.45	28.21
	2860.000	170.00	0.00	0.00	3462.00	359.00	3464.78	3464.74	3465.63	148.90	7.36	48.75	29.42
*	3170.000	310.00	0.00	0.00	3470.00	359.00	3471.83	3471.83	3472.53	163.87	6.73	53.31	28.04
*	3380.000	210.00	0.00	0.00	3474.00	359.00	3475.83	3475.83	3476.53	164.52	6.74	53.24	27.99
*	3680.000	300.00	0.00	0.00	3482.00	359.00	3484.08	3484.08	3484.80	161.64	6.81	52.74	28.24
*	3920.000	240.00	0.00	0.00	3486.00	359.00	3488.73	3488.73	3489.65	155.74	7.72	46.49	28.77
*	4170.000	250.00	0.00	0.00	3494.00	359.00	3495.90	3495.90	3496.55	169.83	6.48	55.41	27.55
	-2360.000	500.00	0.00	0.00	3452.00	100.00	3453.72	0.00	3453.77	13.36	1.76	56.72	27.35
*	1.000	230.00	0.00	0.00	3460.00	100.00	3461.02	3461.02	3461.44	191.98	5.22	19.16	7.22
*	2.000	250.00	0.00	0.00	3466.00	100.00	3466.85	3466.85	3467.22	201.64	4.84	20.65	7.04
	3.000	280.00	0.00	0.00	3470.00	100.00	3471.42	0.00	3471.84	136.96	5.24	19.07	3.54

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	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	4.000	240.00	0.00	0.00	3478.00	100.00	3478.57	3478.57	3478.83	320.76	4.13	24.23	6.7
	5.000	200.00	0.00	0.00	3482.00	100.00	3482.81	3482.81	3483.13	207.55	4.56	21.99	6.94
	-3380.000	210.00	0.00	0.00	3474.00	81.00	3475.83	0.00	3475.86	8.38	1.52	53.24	27.9
*	11.000	320.00	0.00	0.00	3480.00	81.00	3481.09	3481.09	3481.52	195.94	5.26	15.41	5.79
*	12.000	190.00	0.00	0.00	3484.00	81.00	3485.74	3485.74	3486.18	197.04	5.36	15.12	5.7
*	13.000	270.00	0.00	0.00	3492.00	81.00	3492.93	3492.93	3493.17	236.97	3.93	20.64	5.2
	14.000	290.00	0.00	0.00	3498.00	81.00	3499.23	3499.21	3499.52	201.82	4.33	18.69	5.70
	15.000	220.00	0.00	0.00	3502.50	81.00	3503.34	0.00	3503.48	160.74	3.01	26.89	6.3
*	16.000	260.00	0.00	0.00	3507.00	81.00	3508.03	3507.95	3508.21	194.13	3.34	24.23	5.81

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	1000.000	359.00	3433.63	0.00	0.00	0.00	60.75	0.00
	1360.000	359.00	3439.40	0.00	5.77	0.00	57.96	360.00
*	1730.000	359.00	3443.97	0.00	4.58	0.00	39.68	160.00
	1860.000	359.00	3447.11	0.00	3.14	0.00	43.88	370.00
*	2360.000	359.00	3453.72	0.00	6.61	0.00	45.84	500.00
*	2550.000	359.00	3458.80	0.00	5.08	0.00	44.06	190.00
*	2690.000	359.00	3462.23	0.00	3.42	0.00	36.19	140.00
	2860.000	359.00	3464.78	0.00	2.56	0.00	27.84	170.00
*	3170.000	359.00	3471.83	0.00	7.05	0.00	38.29	310.00
*	3380.000	359.00	3475.83	0.00	4.00	0.00	38.27	210.00
*	3680.000	359.00	3484.08	0.00	8.25	0.00	36.72	300.00
*	3920.000	359.00	3488.73	0.00	4.65	0.00	35.44	240.00
*	4170.000	359.00	3495.90	0.00	7.17	0.00	43.44	250.00
	-2360.000	100.00	3453.72	0.00	-42.17	0.00	45.84	500.00
*	1.000	100.00	3461.02	0.00	7.30	0.00	22.64	230.00
*	2.000	100.00	3466.85	0.00	5.83	0.00	28.51	250.00
	3.000	100.00	3471.42	0.00	4.57	0.00	17.05	280.00
*	4.000	100.00	3478.57	0.00	7.15	0.00	45.66	240.00
	5.000	100.00	3482.81	0.00	4.24	0.00	34.29	200.00
	-3380.000	81.00	3475.83	0.00	-6.98	0.00	38.27	210.00
*	11.000	81.00	3481.09	0.00	5.27	0.00	18.20	320.00
*	12.000	81.00	3485.74	0.00	4.65	0.00	17.39	190.00
*	13.000	81.00	3492.93	0.00	7.19	0.00	44.28	270.00
	14.000	81.00	3499.23	0.00	6.29	0.00	30.57	290.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKUS	TOPWID	XLCH
	15.000	81.00	3503.34	0.00	4.12	0.00	64.21	220.00
*	16.000	81.00	3508.03	0.00	4.69	0.00	56.96	260.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION  SECNO= 1730.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1730.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 2360.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 2360.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 2360.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO= 2550.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 2550.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 2690.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 2690.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 3170.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 3170.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 3380.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 3380.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 3680.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 3680.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 3920.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 3920.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 4170.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 4170.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=    1.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    1.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    1.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=    2.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    2.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=    4.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    4.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=   11.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   11.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   11.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=   12.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   12.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=   13.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   13.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=   16.000  PROFILE= 1  WSEL ASSUMED BASED ON MIN DIFF
CAUTION  SECNO=   16.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
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**********************************************************
*  WATER SURFACE PROFILES                                *
*  VERSION OF NOVEMBER 1976                              *
*  UPDATED MARCH 1982                                    *
*                                                        *
*  RUN DATE 28-AUG-85  TIME 12:34:58                     *
**********************************************************
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WASH A5


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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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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
```

5-DEC-85 11:01:12 PAGE 1

THIS RUN EXECUTED 5-DEC-85 11:01:12

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
  ERROR CORR -  01,02,03,04,05
  MODIFICATION -  50,51,52,53,54,55
**************************************************
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T1 NEW TUCSON
T2 DJA JOB NO 84-077.01
T3 FILE WASHA5.DAT

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	0.	0.	1.	-1.000000	0.00	0.0	130.	3459.000	0.000

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	-1.000	0.000	-1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NC	0.060	0.060	0.030	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	1000.000	8.000	4650.000	5400.000	0.000	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	3459.000	4650.000	3458.000	4845.000	3457.000	5000.000	3458.000	5050.000	3458.000	5085.000
GR	3460.000	5160.000	3462.000	5300.000	3463.000	5400.000	0.000	0.000	0.000	0.000
X1	1380.000	10.000	4680.000	5520.000	480.000	250.000	380.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	3468.500	4680.000	3468.000	4730.000	3466.000	4875.000	3464.000	4915.000	3465.000	4950.000
GR	3464.000	4990.000	3464.000	5010.000	3466.000	5070.000	3468.000	5360.000	3469.000	5520.000
X1	1740.000	7.000	4810.000	5400.000	500.000	220.000	360.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	3474.000	4810.000	3472.000	4935.000	3470.000	4995.000	3470.000	5010.000	3472.000	5045.000
GR	3474.000	5210.000	3474.000	5400.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	2100.000	5.000	4860.000	5250.000	290.000	510.000	360.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	3482.000	4860.000	3480.000	4990.000	3480.000	5005.000	3482.000	5100.000	3483.000	5250.000
X1	2380.000	5.000	4790.000	5100.000	300.000	300.000	280.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	3488.000	4790.000	3488.500	4900.000	3488.000	4960.000	3488.000	5050.000	3488.000	5100.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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= 0.100 CEHV= 0.300
*SECNO 1000.000
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 3459.00 ELREA= 3463.00

1000.00	0.63	3457.63	3457.63	3459.00	3457.79	0.16	0.00	0.00	3459.00
130.	0.	130.	0.	0.	40.	0.	0.	0.	3463.00
0.00	0.00	3.21	0.00	0.060	0.030	0.060	0.000	3457.00	4902.60
0.019683	0.	0.	0.	0	16	0	0.00	128.83	5031.42

*SECNO 1380.000

3265 DIVIDED FLOW

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 3468.50 ELREA= 3469.00

1380.00	0.63	3464.63	3464.63	0.00	3464.82	0.19	0.00	0.02	3468.50
130.	0.	130.	0.	0.	37.	0.	0.	0.	3469.00
0.00	0.00	3.50	0.00	0.060	0.030	0.060	0.000	3464.00	4902.46
0.018367	0.	0.	0.	20	5	0	0.00	98.37	5028.81

*SECNO 1740.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 3474.00 ELREA= 3474.00

1740.00	0.87	3470.87	3470.87	0.00	3471.14	0.28	6.56	3.35	3474.00
130.	0.	130.	0.	0.	31.	0.	0.	1.	3474.00
0.02	0.00	4.23	0.00	0.060	0.030	0.060	0.000	3470.00	4969.04
0.016239	480.	380.	250.	20	11	0	0.00	56.10	5025.14

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

*SECNO 2100.000

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 3482.00 ELREA= 3483.00

2100.00	0.68	3480.68	3480.68	0.00	3480.88	0.20	6.26	3.16	3482.00
130.	0.	130.	0.	0.	36.	0.	1.	1.	3483.00
0.05	0.00	3.63	0.00	0.060	0.030	0.060	0.000	3480.00	4946.09
0.018659	500.	360.	220.	20	15	0	0.00	91.00	5037.09

*SECNO 2380.000

3265 DIVIDED FLOW

3280 CROSS SECTION 2380.00 EXTENDED 0.27 FEET

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

2380.00	0.27	3488.27	3488.27	0.00	3488.37	0.11	7.26	2.83	3488.00
130.	0.	130.	0.	0.	50.	0.	1.	3.	3488.00
0.09	0.00	2.62	0.00	0.060	0.030	0.060	0.000	3488.00	4790.00
0.021883	290.	360.	510.	20	18	0	0.00	230.89	5100.00

THIS RUN EXECUTED 5-DEC-85 11:01:16

****
HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
ERROR CORR - 01,02,03,04,05
MODIFICATION - 50,51,52,53,54,55
****

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

WASHA5.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	1000.000	0.00	0.00	0.00	3457.00	130.00	3457.63	3457.63	3457.79	196.83	3.21	40.48	9.27
*	1380.000	0.00	0.00	0.00	3464.00	130.00	3464.63	3464.63	3464.82	183.67	3.50	37.11	9.59
*	1740.000	380.00	0.00	0.00	3470.00	130.00	3470.87	3470.87	3471.14	162.39	4.23	30.76	10.20
*	2100.000	360.00	0.00	0.00	3480.00	130.00	3480.68	3480.68	3480.88	186.59	3.63	35.79	9.52
*	2380.000	360.00	0.00	0.00	3488.00	130.00	3488.27	3488.27	3488.37	218.83	2.62	49.57	8.79

WASHA5.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	1000.000	130.00	3457.63	0.00	0.00	-1.37	128.83	0.00
*	1380.000	130.00	3464.63	0.00	7.00	0.00	98.37	0.00
*	1740.000	130.00	3470.87	0.00	6.24	0.00	56.10	380.00
*	2100.000	130.00	3480.68	0.00	9.81	0.00	91.00	360.00
*	2380.000	130.00	3488.27	0.00	7.59	0.00	230.89	360.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1000.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 1380.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1380.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1380.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 1740.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1740.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1740.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 2100.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2100.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 2100.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 2380.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2380.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 2380.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

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**********************************************************
*  WATER SURFACE PROFILES                                *
*  VERSION OF NOVEMBER 1976                              *
*  UPDATED MARCH 1982                                    *
*                                                        *
*  RUN DATE 27-AUG-85  TIME 09:51:34                     *
**********************************************************
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WASH B


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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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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 5-DEC-85 10:51:25

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**************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
 ERROR CORR - 01,02,03,04,05
 MODIFICATION - 50,51,52,53,54,55
**************************************************

T1 NEW TUCSON DJA JOB NO 84-077.01
T2 FILE WASHB.DAT
T3

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        2.        0.        0. -1.000000      0.00      0.0       0.  3447.000     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     -1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

NC      0.060     0.060     0.035     0.100     0.300     0.000     0.000     0.000     0.000     0.000
QT      0.000  3228.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
X1   1000.000    15.000  4805.000  5570.000     0.000     0.000     0.000     0.000     0.000     0.000
GR   3446.500  4805.000  3446.000  4835.000  3444.000  4860.000  3444.000  4950.000  3443.000  4990.000
GR   3443.000  5015.000  3444.000  5030.000  3446.000  5040.000  3447.000  5100.000  3448.000  5125.000
GR   3450.000  5145.000  3452.000  5210.000  3454.000  5290.000  3456.000  5420.000  3458.000  5570.000

X1   1100.000     8.000  4865.000  5240.000    90.000   110.000   100.000     0.000     0.000     0.000
GR   3448.000  4865.000  3446.000  4920.000  3446.000  4970.000  3444.000  5000.000  3446.000  5045.000
GR   3448.000  5065.000  3450.000  5110.000  3452.000  5240.000     0.000     0.000     0.000     0.000

X1   1400.000     9.000  4960.000  5190.000   310.000   200.000   300.000     0.000     0.000     0.000
GR   3453.000  4960.000  3452.000  4975.000  3450.000  4990.000  3450.000  5005.000  3451.000  5025.000
GR   3450.000  5065.000  3451.000  5100.000  3450.000  5125.000  3452.000  5190.000     0.000     0.000

X1   1880.000     7.000  4750.000  5020.000   520.000   180.000   480.000     0.000     0.000     0.000
GR   3465.000  4750.000  3464.000  4810.000  3462.000  4845.000  3460.000  4860.000  3458.000  4990.000
GR   3458.000  5010.000  3461.000  5020.000     0.000     0.000     0.000     0.000     0.000     0.000

X1   2280.000    10.000  4890.000  5220.000   380.000   280.000   400.000     0.000     0.000     0.000
GR   3471.500  4890.000  3470.000  4945.000  3468.000  4980.000  3466.000  4990.000  3464.000  4995.000
GR   3463.500  5000.000  3464.000  5020.000  3464.000  5090.000  3466.000  5180.000  3466.500  5220.000

X1   2600.000    11.000  4860.000  5080.000   340.000   190.000   320.000     0.000     0.000     0.000
X3     10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
GR   3478.000  4860.000  3476.000  4875.000  3474.000  4885.000  3472.000  4900.000  3470.000  4930.000
GR   3469.000  4950.000  3470.000  4965.000  3469.500  5000.000  3470.000  5020.000  3472.000  5040.000
GR   3473.000  5080.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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X1	2940.000	7.000	4970.000	5270.000	340.000	300.000	340.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	3478.000	4970.000	3476.000	4990.000	3474.500	5000.000	3476.000	5020.000	3478.000	5220.000
GR	3480.000	5230.000	3482.000	5270.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	3340.000	15.000	4850.000	5230.000	380.000	440.000	400.000	0.000	0.000	0.000
GR	3488.000	4850.000	3488.000	4910.000	3486.000	4940.000	3484.000	4950.000	3483.000	4960.000
GR	3484.000	4980.000	3484.000	5000.000	3484.000	5030.000	3486.000	5070.000	3484.000	5140.000
GR	3483.000	5150.000	3484.000	5160.000	3486.000	5170.000	3488.000	5185.000	3488.500	5230.000
X1	3700.000	12.000	4840.000	5475.000	340.000	410.000	360.000	0.000	0.000	0.000
GR	3496.000	4840.000	3494.000	4900.000	3492.000	4930.000	3490.000	4945.000	3492.000	4970.000
GR	3490.000	4980.000	3490.000	5000.000	3490.000	5090.000	3492.000	5105.000	3494.000	5255.000
GR	3496.000	5405.000	3497.000	5475.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	4060.000	15.000	4800.000	5330.000	360.000	360.000	360.000	0.000	0.000	0.000
GR	3506.000	4800.000	3504.000	4830.000	3502.000	4835.000	3500.000	4840.000	3498.000	4850.000
GR	3498.000	4880.000	3497.500	4910.000	3498.000	4950.000	3498.000	4980.000	3498.000	5030.000
GR	3500.000	5075.000	3502.000	5140.000	3502.000	5200.000	3502.000	5265.000	3502.500	5330.000
QT	0.000	250.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	-2600.000	11.000	4860.000	5080.000	340.000	190.000	320.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	3478.000	4860.000	3476.000	4875.000	3474.000	4885.000	3472.000	4900.000	3470.000	4930.000
GR	3469.000	4950.000	3470.000	4965.000	3469.500	5000.000	3470.000	5020.000	3472.000	5040.000
GR	3473.000	5080.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	1.000	8.000	4860.000	5040.000	330.000	330.000	330.000	0.000	0.000	0.000
GR	3484.500	4860.000	3484.000	4890.000	3482.000	4920.000	3480.000	4950.000	3478.000	4970.000
GR	3476.000	4990.000	3476.000	5010.000	3478.000	5040.000	0.000	0.000	0.000	0.000
X1	2.000	12.000	4770.000	5170.000	340.000	340.000	340.000	0.000	0.000	0.000
GR	3492.000	4770.000	3490.000	4845.000	3488.000	4880.000	3486.000	4925.000	3484.000	4970.000
GR	3482.000	4985.000	3480.000	4990.000	3480.000	5005.000	3482.000	5010.000	3484.000	5020.000
GR	3486.000	5110.000	3487.500	5170.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	3.000	15.000	4660.000	5230.000	310.000	310.000	310.000	0.000	0.000	0.000
GR	3499.000	4660.000	3498.000	4720.000	3496.000	4775.000	3494.000	4840.000	3492.000	4880.000
GR	3490.000	4925.000	3488.000	4990.000	3486.000	4995.000	3486.000	5010.000	3488.000	5020.000
GR	3490.000	5060.000	3490.000	5100.000	3492.000	5130.000	3494.000	5180.000	3495.000	5230.000
QT	0.000	68.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	-1100.000	8.000	4865.000	5240.000	90.000	110.000	100.000	0.000	0.000	0.000
GR	3448.000	4865.000	3446.000	4920.000	3446.000	4970.000	3444.000	5000.000	3446.000	5045.000
GR	3448.000	5065.000	3450.000	5110.000	3452.000	5240.000	0.000	0.000	0.000	0.000
X1	11.000	6.000	4940.000	5070.000	350.000	350.000	350.000	0.000	0.000	0.000
GR	3454.000	4940.000	3452.000	4980.000	3450.000	5000.000	3452.000	5010.000	3454.000	5025.000
GR	3457.000	5070.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	12.000	8.000	4960.000	5190.000	400.000	400.000	400.000	0.000	0.000	0.000
GR	3462.000	4960.000	3460.000	4980.000	3458.000	5000.000	3460.000	5070.000	3458.000	5090.000
GR	3460.000	5100.000	3462.000	5130.000	3464.000	5190.000	0.000	0.000	0.000	0.000
X1	13.000	5.000	4880.000	5090.000	370.000	370.000	370.000	0.000	0.000	0.000
GR	3468.000	4880.000	3466.500	5000.000	3468.000	5020.000	3470.000	5050.000	3472.000	5090.000
X1	14.000	5.000	4935.000	5040.000	340.000	300.000	320.000	0.000	0.000	0.000
GR	3476.000	4935.000	3474.000	4980.000	3472.000	5000.000	3474.000	5020.000	3476.000	5040.000
X1	15.000	5.000	4930.000	5055.000	270.000	250.000	260.000	0.000	0.000	0.000
GR	3482.000	4930.000	3480.000	4990.000	3478.000	5000.000	3480.000	5010.000	3482.000	5055.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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	CURAR	TOPWID	ENDST

*PROF 1

CCHV= 0.100 CEHV= 0.300

*SECNO 1000.000

3720 CRITICAL DEPTH ASSUMED

1000.00	2.85	3445.85	3445.85	3447.00	3446.88	1.03	0.00	0.00	3446.50
3228.	0.	3228.	0.	0.	397.	0.	0.	0.	3458.00
0.00	0.00	8.13	0.00	0.060	0.035	0.060	0.000	3443.00	4836.86
0.014952	0.	0.	0.	0	14	0	0.00	202.39	5039.25

*SECNO 1100.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1100.00	3.98	3447.98	3447.98	0.00	3449.01	1.03	1.49	0.00	3448.00
3228.	0.	3228.	0.	0.	396.	0.	1.	0.	3452.00
0.00	0.00	8.15	0.00	0.060	0.035	0.060	0.000	3444.00	4865.55
0.014775	90.	100.	110.	2	14	0	0.00	199.25	5064.80

*SECNO 1400.000

3280 CROSS SECTION 1400.00 EXTENDED 0.57 FEET

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1400.00	2.57	3452.57	3452.57	0.00	3453.51	0.94	4.44	0.01	3453.00
3228.	0.	3228.	0.	0.	415.	0.	4.	2.	3452.00
0.01	0.00	7.78	0.00	0.060	0.035	0.060	0.000	3450.00	4966.47
0.014819	310.	300.	200.	4	14	0	0.00	223.53	5190.00

*SECNO 1880.000

3280 CROSS SECTION 1880.00 EXTENDED 0.23 FEET

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1880.00	3.23	3461.23	3461.23	0.00	3462.37	1.14	6.93	0.06	3465.00
3228.	0.	3228.	0.	0.	377.	0.	8.	4.	3461.00
0.03	0.00	8.56	0.00	0.060	0.035	0.060	0.000	3458.00	4850.80
0.014072	520.	480.	180.	14	11	0	0.00	169.20	5020.00

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

*SECNO 2280.000
3280 CROSS SECTION 2280.00 EXTENDED 0.24 FEET

2280.00	3.24	3466.74	0.00	0.00	3467.53	0.79	5.13	0.04	3471.50
3228.	0.	3228.	0.	0.	453.	0.	12.	6.	3466.50
0.05	0.00	7.13	0.00	0.060	0.035	0.060	0.000	3463.50	4986.30
0.011719	380.	400.	280.	4	0	0	0.00	233.70	5220.00

*SECNO 2600.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 3478.00 ELREA= 3473.00

2600.00	3.79	3472.79	3472.79	0.00	3473.87	1.09	4.06	0.09	3478.00
3228.	0.	3228.	0.	0.	386.	0.	15.	7.	3473.00
0.06	0.00	8.36	0.00	0.060	0.035	0.060	0.000	3469.00	4894.11
0.013790	340.	320.	190.	12	8	0	0.00	177.33	5071.44

*SECNO 2940.000
3280 CROSS SECTION 2940.00 EXTENDED 0.48 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 3478.00 ELREA= 3482.00

2940.00	3.98	3478.48	3478.48	0.00	3479.38	0.90	5.06	0.02	3478.00
3228.	0.	3228.	0.	0.	424.	0.	18.	9.	3482.00
0.07	0.00	7.61	0.00	0.060	0.035	0.060	0.000	3474.50	4970.00
0.016141	340.	340.	300.	4	8	0	0.00	252.42	5222.42

*SECNO 3340.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3340.00	3.28	3486.28	3486.28	0.00	3487.20	0.92	6.30	0.01	3488.00
3228.	0.	3228.	0.	0.	419.	0.	22.	11.	3488.50
0.08	0.00	7.70	0.00	0.060	0.035	0.060	0.000	3483.00	4935.86
0.015354	380.	400.	440.	3	15	0	0.00	236.21	5172.07

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 3700.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3700.00	2.67	3492.67	3492.67	0.00	3493.58	0.91	5.45	0.00	3496.00
3228.	0.	3228.	0.	0.	422.	0.	25.	13.	3497.00
0.10	0.00	7.65	0.00	0.060	0.035	0.060	0.000	3490.00	4919.98
0.014938	340.	360.	410.	3	15	0	0.00	235.10	5155.08

*SECNO 4060.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4060.00	2.45	3499.95	3499.95	0.00	3500.86	0.92	5.39	0.00	3506.00
3228.	0.	3228.	0.	0.	420.	0.	29.	15.	3502.50
0.11	0.00	7.68	0.00	0.060	0.035	0.060	0.000	3497.50	4840.26
0.014987	360.	360.	360.	13	11	0	0.00	233.55	5073.81

*SECNO -2600.000
START TRIB COMP
-2600.000 2600.000 3472.786

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 3478.00 ELREA= 3473.00

-2600.00	3.79	3472.79	0.00	0.00	3472.79	0.01	0.00	0.00	3478.00
250.	0.	250.	0.	0.	386.	0.	32.	17.	3473.00
0.25	0.00	0.65	0.00	0.060	0.035	0.060	0.000	3469.00	4894.11
0.000083	340.	320.	190.	0	0	0	0.00	177.33	5071.44

*SECNO 1.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1.00	1.29	3477.29	3477.29	0.00	3477.74	0.45	0.10	0.13	3484.50
250.	0.	250.	0.	0.	47.	0.	34.	18.	3478.00
0.26	0.00	5.37	0.00	0.060	0.035	0.060	0.000	3476.00	4977.11
0.018693	330.	330.	330.	20	17	0	0.00	52.23	5029.34

*SECNO 2.000

2.00	2.05	3482.05	0.00	0.00	3482.62	0.57	4.85	0.04	3492.00
250.	0.	250.	0.	0.	41.	0.	34.	18.	3487.50
0.28	0.00	6.06	0.00	0.060	0.035	0.060	0.000	3480.00	4984.63
0.011235	340.	340.	340.	4	0	0	0.00	25.62	5010.25

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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 3.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3.00	1.75	3487.75	3487.75	0.00	3488.43	0.68	4.20	0.03	3499.00
250.	0.	250.	0.	0.	38.	0.	34.	18.	3495.00
0.29	0.00	6.60	0.00	0.060	0.035	0.060	0.000	3486.00	4990.61
0.016698	310.	310.	310.	8	15	0	0.00	28.16	5018.77

*SECNO -1100.000
START TRIB COMP

-1100.000	1100.000	3447.980

-1100.00	3.98	3447.98	0.00	0.00	3447.98	0.00	0.00	0.00	3448.00
68.	0.	68.	0.	0.	396.	0.	35.	18.	3452.00
0.45	0.00	0.17	0.00	0.060	0.035	0.060	0.000	3444.00	4865.55
0.000007	90.	100.	110.	0	0	0	0.00	199.25	5064.80

*SECNO 11.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

11.00	1.38	3451.38	3451.38	0.00	3451.73	0.35	0.01	0.11	3454.00
68.	0.	68.	0.	0.	14.	0.	36.	19.	3457.00
0.47	0.00	4.77	0.00	0.060	0.035	0.060	0.000	3450.00	4986.21
0.020976	350.	350.	350.	20	22	0	0.00	20.69	5006.90

*SECNO 12.000

3265 DIVIDED FLOW

12.00	0.86	3458.86	0.00	0.00	3459.00	0.14	7.25	0.02	3462.00
68.	0.	68.	0.	0.	22.	0.	36.	20.	3464.00
0.51	0.00	3.04	0.00	0.060	0.035	0.060	0.000	3458.00	4991.37
0.015806	400.	400.	400.	4	0	0	0.00	51.80	5094.32

*SECNO 13.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

13.00	0.66	3467.16	3467.16	0.00	3467.33	0.17	7.48	0.01	3468.00
68.	0.	68.	0.	0.	20.	0.	37.	20.	3472.00
0.54	0.00	3.32	0.00	0.060	0.035	0.060	0.000	3466.50	4947.01
0.026759	370.	370.	370.	5	15	0	0.00	61.82	5008.83

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 14.000

14.00	1.32	3473.32	0.00	0.00	3473.56	0.24	6.21	0.02	3476.00
68.	0.	68.	0.	0.	17.	0.	37.	20.	3476.00
0.56	0.00	3.89	0.00	0.060	0.035	0.060	0.000	3472.00	4986.78
0.014701	340.	320.	300.	6	0	0	0.00	26.44	5013.22

*SECNO 15.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

15.00	1.62	3479.62	3479.62	0.00	3480.04	0.42	4.45	0.05	3482.00
68.	0.	68.	0.	0.	13.	0.	37.	21.	3482.00
0.58	0.00	5.18	0.00	0.060	0.035	0.060	0.000	3478.00	4991.90
0.020212	270.	260.	250.	4	11	0	0.00	16.21	5008.10

THIS RUN EXECUTED 5-DEC-85 10:51:35

****
HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
ERROR CORR - 01,02,03,04,05
MODIFICATION - 50,51,52,53,54,55
****

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

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	1000.000	0.00	0.00	0.00	3443.00	3228.00	3445.85	3445.85	3446.88	149.52	8.13	397.11	263.99
*	1100.000	100.00	0.00	0.00	3444.00	3228.00	3447.98	3447.98	3449.01	147.75	8.15	396.00	265.57
*	1400.000	300.00	0.00	0.00	3450.00	3228.00	3452.57	3452.57	3453.51	148.19	7.78	414.67	265.17
*	1880.000	480.00	0.00	0.00	3458.00	3228.00	3461.23	3461.23	3462.37	140.72	8.56	376.89	272.12
	2280.000	400.00	0.00	0.00	3463.50	3228.00	3466.74	0.00	3467.53	117.19	7.13	452.84	298.19
*	2600.000	320.00	0.00	0.00	3469.00	3228.00	3472.79	3472.79	3473.87	137.90	8.36	385.94	274.89
*	2940.000	340.00	0.00	0.00	3474.50	3228.00	3478.48	3478.48	3479.38	161.41	7.61	424.24	254.08
*	3340.000	400.00	0.00	0.00	3483.00	3228.00	3486.28	3486.28	3487.20	153.54	7.70	419.31	260.51
*	3700.000	360.00	0.00	0.00	3490.00	3228.00	3492.67	3492.67	3493.58	149.38	7.65	421.91	264.11
*	4060.000	360.00	0.00	0.00	3497.50	3228.00	3499.95	3499.95	3500.86	149.87	7.68	420.15	263.68
	-2600.000	320.00	0.00	0.00	3469.00	250.00	3472.79	0.00	3473.79	0.83	0.65	385.94	274.89
*	1.000	330.00	0.00	0.00	3476.00	250.00	3477.29	3477.29	3477.74	186.93	5.37	46.56	18.29
	2.000	340.00	0.00	0.00	3480.00	250.00	3482.05	0.00	3482.62	112.35	6.06	41.25	23.59
*	3.000	310.00	0.00	0.00	3486.00	250.00	3487.75	3487.75	3488.43	166.98	6.60	37.86	19.35
	-1100.000	100.00	0.00	0.00	3444.00	68.00	3447.98	0.00	3447.98	0.07	0.17	396.00	265.57
*	11.000	350.00	0.00	0.00	3450.00	68.00	3451.38	3451.38	3451.73	209.76	4.77	14.26	4.70
	12.000	400.00	0.00	0.00	3458.00	68.00	3458.86	0.00	3459.00	158.06	3.04	22.36	5.41

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	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	13.000	370.00	0.00	0.00	3466.50	68.00	3467.16	3467.16	3467.33	267.59	6.32	20.47	4.1
	14.000	320.00	0.00	0.00	3472.00	68.00	3473.32	0.00	3473.56	147.01	3.89	17.47	5.61
*	15.000	260.00	0.00	0.00	3478.00	68.00	3479.62	3479.62	3480.04	202.12	5.18	13.13	4.7

5-DEC-85 10:51:25

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	1000.000	3228.00	3445.85	0.00	0.00	-1.15	202.39	0.00
*	1100.000	3228.00	3447.98	0.00	2.13	0.00	199.25	100.00
*	1400.000	3228.00	3452.57	0.00	4.59	0.00	223.53	300.00
*	1880.000	3228.00	3461.23	0.00	8.66	0.00	169.20	480.00
	2280.000	3228.00	3466.74	0.00	5.51	0.00	233.70	400.00
*	2600.000	3228.00	3472.79	0.00	6.05	0.00	177.33	320.00
*	2940.000	3228.00	3478.48	0.00	5.70	0.00	252.42	340.00
*	3340.000	3228.00	3486.28	0.00	7.79	0.00	236.21	400.00
*	3700.000	3228.00	3492.67	0.00	6.39	0.00	235.10	360.00
*	4060.000	3228.00	3499.95	0.00	7.28	0.00	233.55	360.00
	-2600.000	250.00	3472.79	0.00	-27.16	0.00	177.33	320.00
*	1.000	250.00	3477.29	0.00	4.50	0.00	52.23	330.00
	2.000	250.00	3482.05	0.00	4.76	0.00	25.62	340.00
*	3.000	250.00	3487.75	0.00	5.70	0.00	28.16	310.00
	-1100.000	68.00	3447.98	0.00	-39.77	0.00	199.25	100.00
*	11.000	68.00	3451.38	0.00	3.40	0.00	20.69	350.00
	12.000	68.00	3458.86	0.00	7.48	0.00	51.80	400.00
*	13.000	68.00	3467.16	0.00	8.31	0.00	61.82	370.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1000.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 1100.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1100.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1400.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1400.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1880.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1880.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2600.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2600.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2940.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2940.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 3340.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 3340.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 3700.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 3700.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 4060.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 4060.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 3.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 3.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 11.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 11.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 11.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 13.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 13.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 15.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 15.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

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**********************************************************
*  WATER SURFACE PROFILES                                *
*  VERSION OF NOVEMBER 1976                              *
*  UPDATED MARCH 1982                                    *
*                                                        *
*  RUN DATE 27-AUG-85  TIME 10:12:47                     *
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WASH C


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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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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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27-AUG-85 10:12:48 PAGE 1

THIS RUN EXECUTED 27-AUG-85 10:12:48

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
  ERROR CORR -  01,02,03,04,05
  MODIFICATION -  50,51,52,53,54,55
**************************************************

T1 NEW TUCSON
T2 DJA JOB NO 84-077.01
T3 FILE WASHC.DAT

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        0.        0.        0. -1.000000      0.00      0.0     302.  3439.000     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     -1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000


NC     0.060     0.060     0.035     0.100     0.300     0.000     0.000     0.000     0.000     0.000
X1  1000.000    17.000  4910.000  5090.000     0.000     0.000     0.000     0.000     0.000     0.000
GR  3450.000  4850.000  3448.000  4910.000  3446.000  4930.000  3444.000  4950.000  3442.000  4960.000
GR  3440.000  4970.000  3438.000  4980.000  3436.000  4990.000  3436.000  5020.000  3438.000  5050.000
GR  3440.000  5060.000  3442.000  5080.000  3444.000  5090.000  3444.000  5130.000  3444.000  5140.000
GR  3446.000  5160.000  3448.000  5220.000     0.000     0.000     0.000     0.000     0.000     0.000

X1  1260.000    14.000  4910.000  5100.000   300.000   240.000   260.000     0.000     0.000     0.000
GR  3454.000  4830.000  3452.000  4890.000  3450.000  4910.000  3448.000  4930.000  3446.000  4950.000
GR  3444.000  4960.000  3442.000  5000.000  3442.000  5010.000  3444.000  5050.000  3446.000  5060.000
GR  3448.000  5080.000  3450.000  5100.000  3452.000  5140.000  3454.000  5210.000     0.000     0.000

X1  1620.000    19.000  4820.000  5100.000   320.000   420.000   360.000     0.000     0.000     0.000
GR  3464.000  4730.000  3462.000  4770.000  3460.000  4820.000  3458.000  4850.000  3456.000  4880.000
GR  3454.000  4910.000  3452.000  4930.000  3454.000  4950.000  3452.000  4980.000  3450.000  4990.000
GR  3448.000  5000.000  3448.000  5010.000  3450.000  5020.000  3452.000  5040.000  3454.000  5060.000
GR  3456.000  5070.000  3458.000  5080.000  3460.000  5100.000  3462.000  5130.000     0.000     0.000

X1  2010.000    19.000  4695.000  5230.000   350.000   420.000   390.000     0.000     0.000     0.000
GR  3472.000  4570.000  3470.000  4695.000  3468.000  4770.000  3466.000  4815.000  3464.000  4850.000
GR  3462.000  4870.000  3462.000  4900.000  3462.000  4940.000  3460.000  4950.000  3458.000  4960.000
GR  3456.000  4970.000  3456.000  4980.000  3456.000  5000.000  3460.000  5010.000  3462.000  5020.000
GR  3464.000  5050.000  3466.000  5120.000  3468.000  5180.000  3470.000  5230.000     0.000     0.000

X1  2320.000    21.000  4750.000  5210.000   310.000   310.000   310.000     0.000     0.000     0.000
GR  3478.000  4750.000  3476.000  4800.000  3474.000  4840.000  3472.000  4860.000  3470.000  4870.000
GR  3468.000  4880.000  3468.000  4935.000  3466.000  4945.000  3464.000  4990.000  3462.000  4995.000
GR  3460.000  5000.000  3460.000  5010.000  3462.000  5015.000  3464.000  5020.000  3466.000  5025.000
GR  3468.000  5035.000  3470.000  5050.000  3472.000  5070.000  3474.000  5115.000  3476.000  5155.000
GR  3478.000  5210.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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X1	2650.000	22.000	4700.000	5200.000	330.000	330.000	330.000	0.000	0.000	0.000
GR	3485.000	4700.000	3484.000	4800.000	3482.000	4835.000	3480.000	4860.000	3478.000	4900.000
GR	3476.000	4940.000	3474.000	4955.000	3472.000	4970.000	3470.000	4980.000	3468.000	4990.000
GR	3466.000	4995.000	3466.000	5005.000	3468.000	5010.000	3470.000	5030.000	3472.000	5045.000
GR	3474.000	5060.000	3476.000	5070.000	3478.000	5085.000	3480.000	5100.000	3482.000	5120.000
GR	3484.000	5165.000	3486.000	5200.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	3010.000	20.000	4830.000	5155.000	500.000	220.000	360.000	0.000	0.000	0.000
GR	3490.000	4830.000	3490.000	4885.000	3488.000	4890.000	3486.000	4895.000	3484.000	4905.000
GR	3482.000	4910.000	3480.000	4915.000	3478.000	4930.000	3476.000	4950.000	3474.000	4970.000
GR	3472.000	5000.000	3474.000	5010.000	3476.000	5012.000	3478.000	5015.000	3480.000	5020.000
GR	3482.000	5030.000	3484.000	5045.000	3486.000	5060.000	3488.000	5095.000	3490.000	5155.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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

*PROF 1

CCHV= 0.100 CEHV= 0.300

*SECNO 1000.000

3720 CRITICAL DEPTH ASSUMED

1000.00	1.26	3437.26	3437.26	3439.00	3437.75	0.49	0.00	0.00	3448.00
302.	0.	302.	0.	0.	54.	0.	0.	0.	3444.00
0.00	0.00	5.61	0.00	0.060	0.035	0.060	0.000	3436.00	4983.69
0.018175	0.	0.	0.	0	13	0	0.00	55.25	5038.94

*SECNO 1260.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1260.00	1.47	3443.47	3443.47	0.00	3443.89	0.42	4.82	0.01	3450.00
302.	0.	302.	0.	0.	58.	0.	0.	0.	3450.00
0.01	0.00	5.20	0.00	0.060	0.035	0.060	0.000	3442.00	4970.57
0.018901	300.	260.	240.	14	8	0	0.00	68.87	5039.43

*SECNO 1620.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1620.00	2.17	3450.17	3450.17	0.00	3450.86	0.69	6.30	0.08	3460.00
302.	0.	302.	0.	0.	45.	0.	1.	1.	3460.00
0.03	0.00	6.68	0.00	0.060	0.035	0.060	0.000	3448.00	4989.17
0.016230	320.	360.	420.	4	11	0	0.00	32.49	5021.66

*SECNO 2010.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

2010.00	1.37	3457.37	3457.37	0.00	3457.98	0.61	6.54	0.01	3470.00
302.	0.	302.	0.	0.	48.	0.	1.	1.	3470.00
0.05	0.00	6.26	0.00	0.060	0.035	0.060	0.000	3456.00	4963.14
0.017362	350.	390.	420.	5	14	0	0.00	40.29	5003.43

*SECNO 2320.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

2320.00	2.46	3462.46	3462.46	0.00	3463.36	0.90	5.12	0.09	3478.00
302.	0.	302.	0.	0.	40.	0.	1.	1.	3478.00
0.06	0.00	7.61	0.00	0.060	0.035	0.060	0.000	3460.00	4993.85
0.015731	310.	310.	310.	3	14	0	0.00	22.29	5016.15

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 2650.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2650.00	2.53	3468.53	3468.53	0.00	3469.31	0.78	5.29	0.01	3485.00
302.	0.	302.	0.	0.	43.	0.	2.	2.	3486.00
0.07	0.00	7.06	0.00	0.060	0.035	0.060	0.000	3466.00	4987.34
0.016369	330.	330.	330.	3	8	0	0.00	27.97	5015.31

*SECNO 3010.000

3010.00	2.31	3474.31	0.00	0.00	3474.81	0.51	5.48	0.03	3490.00
302.	0.	302.	0.	0.	53.	0.	2.	2.	3490.00
0.09	0.00	5.73	0.00	0.060	0.035	0.060	0.000	3472.00	4966.95
0.014200	500.	360.	220.	4	0	0	0.00	43.36	5010.31

27-AUG-85 10:12:48 PAGE 5

THIS RUN EXECUTED 27-AUG-85 10:12:56

****
HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
ERROR CORR - 01,02,03,04,05
MODIFICATION - 50,51,52,53,54,55
****

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

WASHC.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	1000.000	0.00	0.00	0.00	3436.00	302.00	3437.26	3437.26	3437.75	181.75	5.61	53.81	22.4
*	1260.000	260.00	0.00	0.00	3442.00	302.00	3443.47	3443.47	3443.89	189.01	5.20	58.03	21.9
*	1620.000	360.00	0.00	0.00	3448.00	302.00	3450.17	3450.17	3450.86	162.30	6.68	45.19	23.71
*	2010.000	390.00	0.00	0.00	3456.00	302.00	3457.37	3457.37	3457.98	173.62	6.26	48.21	22.9
*	2320.000	310.00	0.00	0.00	3460.00	302.00	3462.46	3462.46	3463.36	157.31	7.61	39.69	24.08
*	2650.000	330.00	0.00	0.00	3466.00	302.00	3468.53	3468.53	3469.31	163.69	7.06	42.75	23.6
	3010.000	360.00	0.00	0.00	3472.00	302.00	3474.31	0.00	3474.81	142.00	5.73	52.72	25.3

27-AUG-85 10:12:48 PAGE 6

WASHC.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	1000.000	302.00	3437.26	0.00	0.00	-1.74	55.25	0.00
*	1260.000	302.00	3443.47	0.00	6.21	0.00	68.87	260.00
*	1620.000	302.00	3450.17	0.00	6.69	0.00	32.49	360.00
*	2010.000	302.00	3457.37	0.00	7.21	0.00	40.29	390.00
*	2320.000	302.00	3462.46	0.00	5.09	0.00	22.29	310.00
*	2650.000	302.00	3468.53	0.00	6.07	0.00	27.97	330.00
	3010.000	302.00	3474.31	0.00	5.77	0.00	43.36	360.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1000.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 1260.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1260.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1620.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1620.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2010.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2010.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2320.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2320.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2650.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2650.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

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**********************************************************
*  WATER SURFACE PROFILES                                *
*  VERSION OF NOVEMBER 1976                              *
*  UPDATED MARCH 1982                                    *
*                                                        *
*  RUN DATE 27-AUG-85  TIME 13:37:48                     *
**********************************************************
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WASHC1


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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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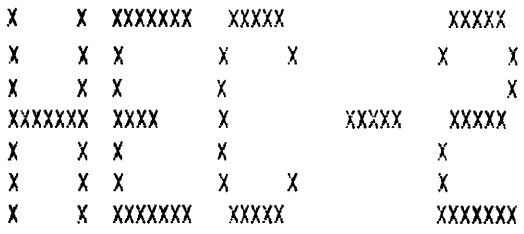

27-AUG-85 13:37:49 PAGE 1

THIS RUN EXECUTED 27-AUG-85 13:37:50

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
  ERROR CORR -  01,02,03,04,05
  MODIFICATION -  50,51,52,53,54,55
**************************************************
```

T1 NEW TUCSON
T2 DJA JOB NO 84-077.01
T3 FILE WASHC1.DAT

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	0.	0.	0.	0.000000	0.00	0.0	156.	3434.270	0.000

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	-1.000	0.000	-1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NC	0.060	0.060	0.035	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	1000.000	13.000	4465.000	5300.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	3437.000	4465.000	3436.000	4530.000	3438.000	4610.000	3439.000	4725.000	3438.000	4820.000
GR	3436.000	4875.000	3434.000	4940.000	3433.500	5000.000	3434.000	5020.000	3436.000	5090.000
GR	3438.000	5145.000	3438.500	5230.000	3438.000	5300.000	0.000	0.000	0.000	0.000
X1	1340.000	13.000	4550.000	5570.000	260.000	420.000	340.000	0.000	0.000	0.000
GR	3444.000	4550.000	3444.000	4645.000	3446.000	4745.000	3446.500	4800.000	3446.000	4840.000
GR	3444.000	4900.000	3442.000	4970.000	3440.500	5000.000	3442.000	5090.000	3444.000	5165.000
GR	3446.000	5350.000	3446.500	5400.000	3446.000	5570.000	0.000	0.000	0.000	0.000
X1	1630.000	12.000	4520.000	5430.000	190.000	400.000	290.000	0.000	0.000	0.000
GR	3448.000	4520.000	3450.000	4650.000	3452.000	4780.000	3452.000	4845.000	3450.000	4890.000
GR	3448.000	4930.000	3447.000	5000.000	3448.000	5060.000	3450.000	5105.000	3452.000	5150.000
GR	3453.500	5280.000	3452.000	5430.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	1890.000	11.000	4590.000	5290.000	250.000	270.000	260.000	0.000	0.000	0.000
GR	3454.000	4590.000	3456.000	4720.000	3457.000	4810.000	3456.000	4890.000	3454.000	4960.000
GR	3453.000	5000.000	3454.000	5050.000	3456.000	5090.000	3458.000	5120.000	3460.000	5225.000
GR	3460.500	5290.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	2160.000	9.000	4620.000	5190.000	3700.000	150.000	270.000	0.000	0.000	0.000
GR	3462.500	4620.000	3464.000	4710.000	3464.000	4820.000	3462.000	4910.000	3460.000	4965.000
GR	3459.500	5000.000	3460.000	5030.000	3462.000	5100.000	3463.500	5190.000	0.000	0.000
X1	2460.000	7.000	4730.000	5150.000	190.000	360.000	300.000	0.000	0.000	0.000
GR	3468.000	4730.000	3469.000	4820.000	3468.000	4920.000	3466.000	4990.000	3466.000	5020.000
GR	3468.000	5065.000	3470.000	5150.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	2740.000	4.000	4900.000	5150.000	290.000	300.000	280.000	0.000	0.000	0.000
GR	3474.000	4900.000	3473.000	5000.000	3474.000	5070.000	3475.500	5150.000	0.000	0.000
X1	2940.000	6.000	4750.000	5175.000	330.000	130.000	200.000	0.000	0.000	0.000
GR	3481.500	4750.000	3480.000	4830.000	3478.000	4950.000	3476.000	5000.000	3476.000	5005.000
GR	3478.000	5175.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	3140.000	7.000	4640.000	5180.000	200.000	200.000	200.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	3486.500	4640.000	3486.000	4745.000	3484.000	4850.000	3482.000	4990.000	3482.000	5035.000
GR	3483.000	5070.000	3482.000	5180.000	0.000	0.000	0.000	0.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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	IBC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CCHV= 0.100 CEHV= 0.300

*SECNO 1000.000

1000.00	0.77	3434.27	0.00	3434.27	3434.46	0.19	0.00	0.00	3437.00
156.	0.	156.	0.	0.	44.	0.	0.	0.	3438.00
0.00	0.00	3.54	0.00	0.060	0.035	0.060	0.000	3433.50	4931.22
0.020256	0.	0.	0.	0	0	0	0.00	98.23	5029.45

*SECNO 1340.000

1340.00	0.99	3441.49	3441.49	0.00	3441.73	0.25	7.25	0.02	3444.00
156.	0.	156.	0.	0.	39.	0.	0.	1.	3446.00
0.02	0.00	3.98	0.00	0.060	0.035	0.060	0.000	3440.50	4980.21
0.022491	260.	340.	420.	5	11	0	0.00	79.17	5059.38

*SECNO 1630.000

1630.00	0.83	3447.83	0.00	0.00	3448.02	0.18	6.28	0.01	3448.00
156.	0.	156.	0.	0.	45.	0.	1.	1.	3452.00
0.05	0.00	3.43	0.00	0.060	0.035	0.060	0.000	3447.00	4941.44
0.020857	190.	290.	400.	5	0	0	0.00	108.75	5050.19

*SECNO 1890.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1890.00	0.94	3453.94	3453.94	0.00	3454.18	0.24	5.71	0.02	3454.00
156.	0.	156.	0.	0.	40.	0.	1.	2.	3460.50
0.07	0.00	3.91	0.00	0.060	0.035	0.060	0.000	3453.00	4962.31
0.023115	250.	260.	270.	4	8	0	0.00	84.79	5047.11

*SECNO 2160.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

2160.00	0.81	3460.31	3460.31	0.00	3460.55	0.24	6.31	0.00	3462.50
156.	0.	156.	0.	0.	40.	0.	1.	2.	3463.50
0.08	0.00	3.94	0.00	0.060	0.035	0.060	0.000	3459.50	4956.40
0.023611	3700.	270.	150.	7	15	0	0.00	84.55	5040.95

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 2460.000									
2460.00	0.76	3466.76	0.00	0.00	3467.00	0.24	6.45	0.00	3468.00
156.	0.	156.	0.	0.	40.	0.	1.	3.	3470.00
0.11	0.00	3.93	0.00	0.060	0.035	0.060	0.000	3466.00	4963.27
0.019665	190.	300.	360.	4	0	0	0.00	73.91	5037.18
*SECNO 2740.000									
3685 20 TRIALS ATTEMPTED WSEL,CWSEL									
3693 PROBABLE MINIMUM SPECIFIC ENERGY									
3720 CRITICAL DEPTH ASSUMED									
2740.00	0.73	3473.73	3473.73	0.00	3473.91	0.19	6.31	0.01	3474.00
156.	0.	156.	0.	0.	45.	0.	2.	4.	3475.50
0.13	0.00	3.49	0.00	0.060	0.035	0.060	0.000	3473.00	4927.44
0.026058	290.	280.	300.	20	11	0	0.00	123.35	5050.79
*SECNO 2940.000									
2940.00	0.96	3476.96	0.00	0.00	3477.08	0.12	3.16	0.01	3481.50
156.	0.	156.	0.	0.	56.	0.	2.	4.	3478.00
0.15	0.00	2.77	0.00	0.060	0.035	0.060	0.000	3476.00	4975.83
0.010607	330.	200.	130.	6	0	0	0.00	111.36	5087.18
*SECNO 3140.000									
3265 DIVIDED FLOW									
3280 CROSS SECTION 3140.00 EXTENDED 0.49 FEET									
7185 MINIMUM SPECIFIC ENERGY									
3720 CRITICAL DEPTH ASSUMED									
3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 3486.50 ELREA= 3482.00									
3140.00	0.49	3482.49	3482.49	0.00	3482.65	0.16	3.17	0.01	3486.50
156.	0.	156.	0.	0.	48.	0.	2.	5.	3482.00
0.17	0.00	3.22	0.00	0.060	0.035	0.060	0.000	3482.00	4955.41
0.026293	200.	200.	200.	5	8	0	0.00	151.24	5180.00

THIS RUN EXECUTED 27-AUG-85 13:38:03

****
HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
ERROR CORR - 01,02,03,04,05
MODIFICATION - 50,51,52,53,54,55
****

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

WASHC1.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	1000.000	0.00	0.00	0.00	3433.50	156.00	3434.27	0.00	3434.46	202.56	3.54	44.06	10.9
	1340.000	340.00	0.00	0.00	3440.50	156.00	3441.49	3441.49	3441.73	224.91	3.98	39.18	10.4
	1630.000	290.00	0.00	0.00	3447.00	156.00	3447.83	0.00	3448.02	208.57	3.43	45.49	10.80
*	1890.000	260.00	0.00	0.00	3453.00	156.00	3453.94	3453.94	3454.18	231.15	3.91	39.93	10.2
*	2160.000	270.00	0.00	0.00	3459.50	156.00	3460.31	3460.31	3460.55	236.11	3.94	39.63	10.15
	2460.000	300.00	0.00	0.00	3466.00	156.00	3466.76	0.00	3467.00	196.65	3.93	39.68	11.1
*	2740.000	280.00	0.00	0.00	3473.00	156.00	3473.73	3473.73	3473.91	260.58	3.49	44.75	9.6
	2940.000	200.00	0.00	0.00	3476.00	156.00	3476.96	0.00	3477.08	106.07	2.77	56.26	15.1
*	3140.000	200.00	0.00	0.00	3482.00	156.00	3482.49	3482.49	3482.65	262.93	3.22	48.49	9.6

WASHC1.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	1000.000	156.00	3434.27	0.00	0.00	0.00	98.23	0.00
	1340.000	156.00	3441.49	0.00	7.22	0.00	79.17	340.00
	1630.000	156.00	3447.83	0.00	6.35	0.00	108.75	290.00
*	1890.000	156.00	3453.94	0.00	6.11	0.00	84.79	260.00
*	2160.000	156.00	3460.31	0.00	6.37	0.00	84.55	270.00
	2460.000	156.00	3466.76	0.00	6.45	0.00	73.91	300.00
*	2740.000	156.00	3473.73	0.00	6.96	0.00	123.35	280.00
	2940.000	156.00	3476.96	0.00	3.24	0.00	111.36	200.00
*	3140.000	156.00	3482.49	0.00	5.53	0.00	151.24	200.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1890.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1890.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2160.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2160.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2740.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2740.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 2740.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 3140.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 3140.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

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**************************************************
*  WATER SURFACE PROFILES                        *
*  VERSION OF NOVEMBER 1976                      *
*  UPDATED MARCH 1982                            *
*                                                *
*  RUN DATE  5-DEC-85  TIME 10:32:23             *
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WASH D


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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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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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5-DEC-85 13:28:42 PAGE 1

THIS RUN EXECUTED 5-DEC-85 13:28:42

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
  ERROR CORR -  01,02,03,04,05
  MODIFICATION -  50,51,52,53,54,55
**************************************************

T1 NEW TUCSON
T2 DJA JOB NO 84-077.01
T3 FILE WASHD.DAT

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.        0.        0.        1. -1.000000      0.00      0.0      493.  3451.000     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    -1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

NC     0.060     0.060     0.030     0.100     0.300     0.000     0.000     0.000     0.000     0.000
X1  1000.000    10.000  4890.000  5095.000     0.000     0.000     0.000     0.000     0.000     0.000
GR  3456.000  4890.000  3454.000  4910.000  3452.000  4950.000  3450.000  4990.000  3449.000  5000.000
GR  3450.000  5020.000  3450.000  5050.000  3452.000  5060.000  3454.000  5075.000  3456.000  5095.000

X1  1130.000     8.000  4900.000  5070.000   130.000   130.000   130.000     0.000     0.000     0.000
GR  3458.000  4900.000  3456.000  4925.000  3454.000  4960.000  3452.000  4990.000  3451.000  5000.000
GR  3452.000  5035.000  3454.000  5050.000  3456.000  5070.000     0.000     0.000     0.000     0.000

X1  1380.000    10.000  4910.000  5145.000   240.000   260.000   250.000     0.000     0.000     0.000
GR  3466.000  4910.000  3464.000  4930.000  3462.000  4960.000  3460.000  4970.000  3458.000  4985.000
GR  3457.500  5000.000  3458.000  5070.000  3460.000  5095.000  3462.000  5120.000  3464.000  5145.000
EJ     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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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=   0.100 CEHV=   0.300
 *SECNO 1000.000
3720 CRITICAL DEPTH ASSUMED
  1000.00      1.96  3450.96  3450.96  3451.00  3451.49     0.53     0.00     0.00  3456.00
     493.        0.     493.       0.       0.       85.      0.       0.       0.   3456.00
     0.00     0.00     5.83     0.00    0.060    0.030    0.060    0.000  3449.00  4970.71
 0.013830        0.       0.       0.        0        4        0     0.00    84.12  5054.82


 *SECNO 1130.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1130.00      2.01  3453.01  3453.01     0.00  3453.61     0.60     0.00     0.06  3458.00
     493.        0.     493.       0.       0.       79.      0.       0.       0.   3456.00
     0.00     0.00     6.21     0.00    0.060    0.030    0.060    0.000  3451.00  4974.86
 0.012760        0.       0.       0.       20        8        0     0.00    67.71  5042.57


 *SECNO 1380.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1380.00      1.25  3458.75  3458.75     0.00  3459.21     0.46     1.73     0.87  3466.00
     493.        0.     493.       0.       0.       90.      0.       0.       0.   3464.00
     0.01     0.00     5.46     0.00    0.060    0.030    0.060    0.000  3457.50  4979.40
 0.013921      130.     130.     130.       20       14        0     0.00    99.94  5079.34
```

THIS RUN EXECUTED 5-DEC-85 13:28:49

****
HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
ERROR CORR - 01,02,03,04,05
MODIFICATION - 50,51,52,53,54,55
****

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

WASHD.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	1000.000	0.00	0.00	0.00	3449.00	493.00	3450.96	3450.96	3451.49	138.30	5.83	84.50	41.92
*	1130.000	0.00	0.00	0.00	3451.00	493.00	3453.01	3453.01	3453.61	127.60	6.21	79.38	43.64
*	1380.000	130.00	0.00	0.00	3457.50	493.00	3458.75	3458.75	3459.21	139.21	5.46	90.31	41.78

WASHD.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	1000.000	493.00	3450.96	0.00	0.00	-0.04	84.12	0.00
*	1130.000	493.00	3453.01	0.00	2.04	0.00	67.71	0.00
*	1380.000	493.00	3458.75	0.00	5.74	0.00	99.94	130.00

SUMMARY OF ERRORS AND SPECIAL NOTES

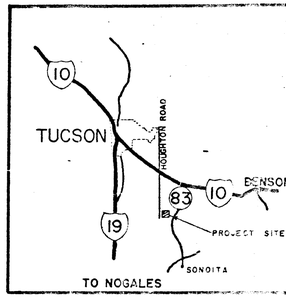
CAUTION SECNO= 1000.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 1130.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1130.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1130.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

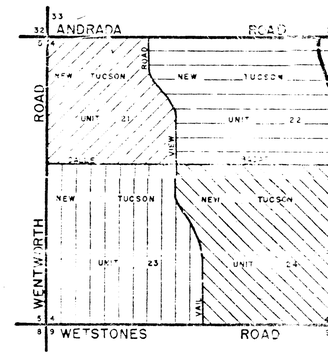
CAUTION SECNO= 1380.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1380.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1380.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

FLOODPLAIN USE PERMIT MAP

FOR NEW TUCSON



LOCATION MAP
NOT TO SCALE
SEC. 4 T16S R16E



N

1"=200' scale 200 0 400

* EROSION HAZARD SETBACK ANALYSIS BY P.E. AVAILABLE (SEE BOX 27)

LEGEND

- PROJECT BOUNDARY
- THALWEG LINE
- 125' BUILDING ~~SETBACK~~
- 55' BUILDING ~~SETBACK~~
- FLOODPLAIN USE ~~PERMIT~~ PERMIT REQ'D
- NONBUILDABLE LOT

27

84-077011

Dooley-Jones & Associates, I

100-YEAR FLOODPRONE DELINEATION

NEW TUCSON UNITS 22,23 AND 24

LEGEND

- PROPERTY BOUNDARY LINE
- FLOODPRONE BOUNDARY
- WATER SURFACE ELEVATION
- STATION

N

SCALE 1":200'

ANDRADA ROAD

CALLE BACARDI

WENTWORTH ROAD

VAIL VIEW ROAD

EGGCA LANE

WILEY LANE

DARLEN DRIVE

SOLAR DRIVE

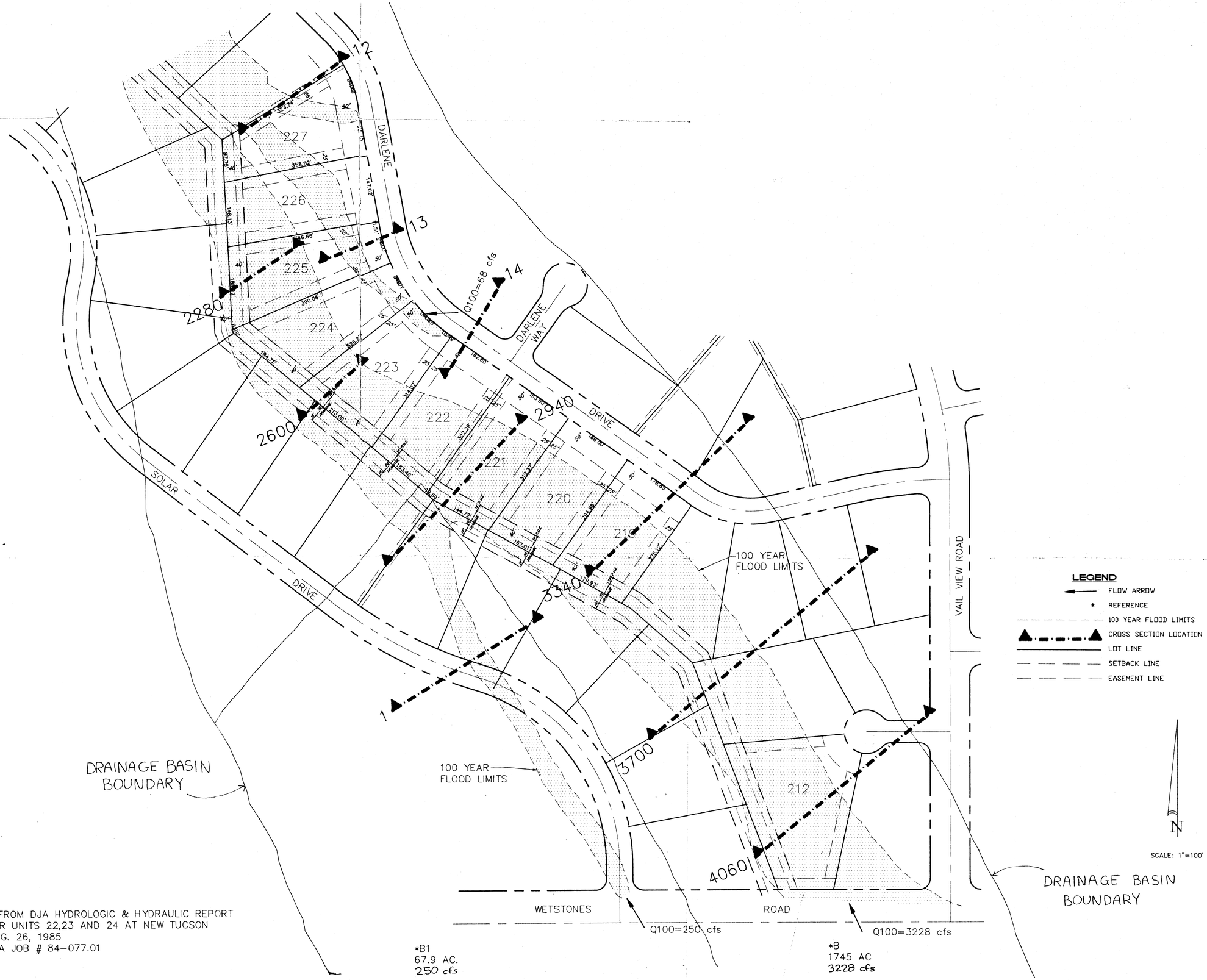
SHASTA LANE

WETSTONES ROAD

New Tucson Unit 24 (762-335)
New Tucson Unit 22 (63-139)
FIGURE 4
New Tucson Unit 23 (111-261)

Dooley-Jones & Associates, Inc.
CONSULTING ENGINEERS | PLANNERS
35 E. TOOLE AVE. - TUCSON, AZ 85701-(602) 624-2391

84-077.01



* FROM DJA HYDROLOGIC & HYDRAULIC REPORT FOR UNITS 22,23 AND 24 AT NEW TUCSON AUG. 26, 1985 DJA JOB # 84-077.01

Martin-McIntosh, L.L.C.
LAND SURVEYING CIVIL ENGINEERING
(602) 624 - 4403

450 WEST PASEO REDONDO, SUITE 120
TUCSON, ARIZONA 85701

APPROVED

DATE

REVISIONS

SITE PLAN FOR
EROSION HAZARD SETBACK ANALYSIS
NEW TUCSON UNIT 23
LOTS 212, 219-227

ARIZONA RLS 13170880

SHEET 1 OF 1 SHEETS