

# JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY

FCD 90-05

## TECHNICAL DATA NOTEBOOK HYDRAULICS

BOOK 1 OF 2

Prepared For:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY  
3335 West Durango Street  
Phoenix, Arizona 85009  
(602) 262-1501

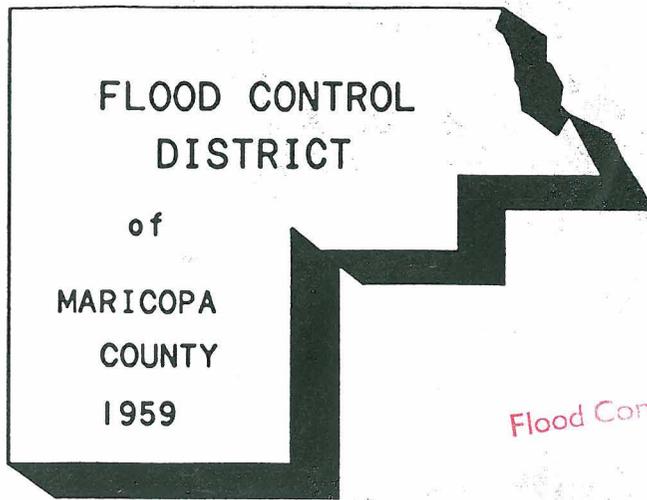
Prepared By:

BURGESS & NIPLE, INC.  
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Project No. 10310

February, 1991





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**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY  
JACKRABBIT WASH  
FLOODPLAIN DELINEATION STUDY**

**INTRODUCTION**

**Purpose of Study**

The purpose of this Floodplain Delineation Study is to investigate the existence and severity of flood hazards in western Maricopa County for the following:

- \* Jackrabbit Wash from the Central Arizona Project (CAP) Canal to Vulture Mine Road
- \* Unnamed tributary of Jackrabbit Wash from the mouth to Vulture Mine Road
- \* Star Wash from the mouth to 2.1 miles upstream of the mouth
- \* Upstream embankment of the CAP Canal from structures CAP-1 to CAP-11 in Reach 7.

The area studied includes portions of unincorporated areas of Maricopa County, Arizona.

**Coordination and Acknowledgements**

References used in this study are described in Section 6 of Study Documentation.

The Flood Control District of Maricopa County provided copies of two, six, and 24 hour rainfall distributions and miscellaneous articles on the Green and Ampt procedure.

Soil information was obtained from the Soil Conservation Service. The Arizona State University Climatological Laboratory provided copies of precipitation records for the Deer Valley Airport Station for the period of record, 1950 to 1985.

The Arizona Projects Office of the United States Bureau of Reclamation provided design hydrology summaries, structure locations, and applicable plan sections for the Central Arizona Project Canal.

The study was publicized in local print media, with no subsequent response from the public. Intermediate review meetings have been held between personnel of Burgess & Niple, the Flood Control District of Maricopa County, and the Arizona Department of Water Resources.

## **AREA STUDIED**

### **Scope of Study**

Areas selected for study were based upon potential for future development. This floodplain delineation study covers unincorporated areas of Maricopa County as described below:

- \* Jackrabbit Wash from the CAP Canal (River Mile 7.84) to Vulture Mine Road (River Mile 17.80)
- \* Unnamed tributary of Jackrabbit Wash from the mouth (River Mile 0 - Tributary, River Mile 10.39 - Jackrabbit Wash) to Vulture Mine Road (River Mile 7.07)
- \* Star Wash from the mouth to a point 2.10 miles upstream
- \* Ponded areas upstream of the CAP Canal embankment for Structures CAP-1 to CAP-11 in Reach 7.

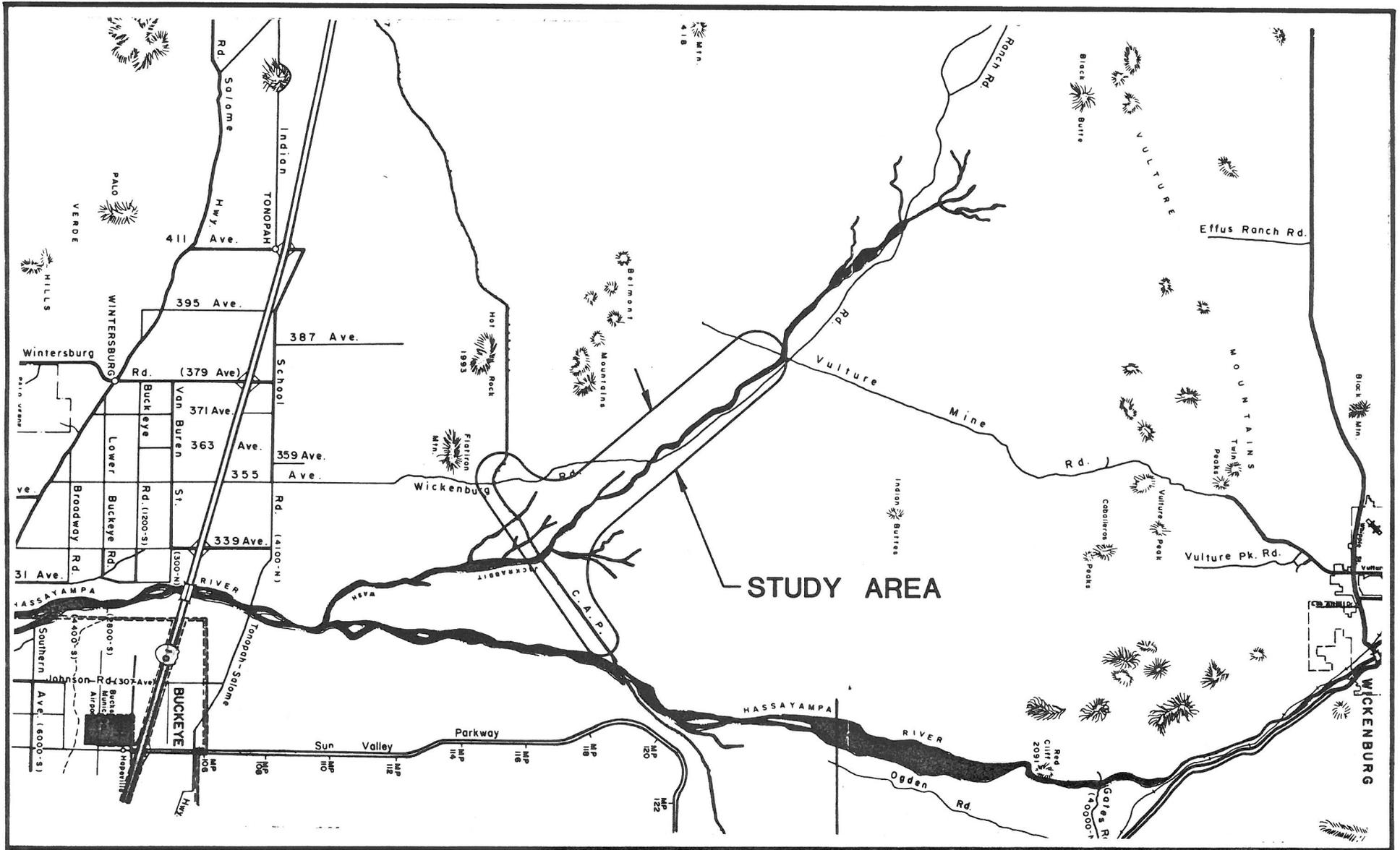
The study area is shown in Figure 1 on page 3.

### **Community Description**

Maricopa County has a total area of 9,238 square miles and is located in the south central region of Arizona. Total Maricopa County population in 1990 was 2,122,101. The area is experiencing rapid population growth, having grown from 1,509,262 in 1980.

Terrain in Maricopa County varies from mountains to plains. Numerous small, intermittent streams and washes traverse the county. Major streams include the Gila, Salt, Agua Fria, New and Hassayampa Rivers.

The area is located within the Sonoran Desert with mild, short winters and long, hot summers.



**FIGURE 1**

**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY**

**JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY  
MARICOPA COUNTY**

GRAPHIC SCALE IN MILES



**VICINITY MAP**

## **Principal Flood Problems**

Storms during summer months generally originate in the Gulf of Mexico area and tend to be intense and of short duration. Storms at other times of the year generally originate in the Pacific Ocean and tend to be gentler rains of longer duration. Flooding may occur at any time of the year.

Jackrabbit Wash, the unnamed tributary, and Star Wash within the study area are located in wide floodplains. Flood hazards along the streams result when the channels overflow and inundate development which may occur along the streams. Flood hazards along the CAP Canal embankment result when floodwaters are impounded upstream of the canal and metered through structures to the downstream side of the canal. The structures and embankment are intended to impound stormwater and protect the CAP Canal.

## **Flood Protection Measures**

No flood protection measures exist upstream of the CAP Canal. Structures CAP-1 to CAP-4 and Structures CAP-6 to CAP-11 serve to reduce downstream flood peaks by storing floodwater upstream of the CAP Canal.

## **ENGINEERING METHODS**

### **Hydrologic Analyses**

The watershed was modeled using the U.S. Army, Corps of Engineers HEC-1 computer program. The program (Version 4.0) is dated September, 1990, as implemented by Dodson and Associates, Inc. ProHEC1. Modeling was accomplished using the SCS Unit Hydrograph, Initial and Uniform Losses, and routing, combining and diversion of sub-basin hydrographs. Derivation of input data, assumptions and procedures used in preparation of the computer model are discussed in the accompanying Hydrology Technical Data Notebook prepared by Burgess & Niple, Inc.

Table 1

Summary of Discharges

<u>Flooding Source and Location</u>	<u>D.A.</u> <u>(S.M.)</u>	<u>100-YR</u> <u>(cfs)</u>
<b>Jackrabbit Wash</b>		
Below Star Wash	319.2	33,200
Above Star Wash	152.4	19,300
Below unnamed tributary	148.7	19,800
Above unnamed tributary	140.3	19,700
At Wickenburg Road	140.3	20,000
At Vulture Mine Road	138.1	21,100
<b>Star Wash</b>		
Mouth	166.8	17,300
Below Powerline Wash	160.6	17,600
Above Powerline Wash	125.7	14,000
<b>Unnamed Tributary of Jackrabbit Wash</b>		
Mouth	8.4	2,900
At Wickenburg Road	8.4	3,000
At Vulture Mine Road	3.7	3,000

## Hydraulic Analyses

Standard hydraulic methods were used to determine 100-year recurrence interval flood hazards for this study. Analyses reported herein reflect current conditions of the streams.

Cross sections for the backwater analysis are digitized from aerial mapping at 1:4800 scale (Reference 1) with a contour interval of 4 feet. Locations of selected cross sections used in the hydraulic analysis are shown in the Flood Profiles (Exhibit 1). Cross section locations are also shown on the Flood Boundary/Floodway Map (Exhibit 2). Mannings "n" values were obtained during a field reconnaissance December 6, 1990. Values ranged from 0.03 to 0.06.

Flood profiles are drawn showing computed water surface elevations to an accuracy of 0.5 feet for a flood of 100-year frequency. Water surface elevations for Jackrabbit Wash, Star Wash, and the unnamed tributary of Jackrabbit Wash are computed through the use of the Department of the Army, Corps of Engineers HEC-2 Water Surface Profiles computer program as implemented by Dodson and Associates, Inc. in their 1989 version of ProHEC2. Starting elevations were obtained using normal depth. Elevations used are referenced to the National Geodetic Vertical Datum of 1929. Locations of Elevation Reference Marks used in this study are shown on the maps (Exhibit 2) and are described in the Elevation Reference Marks Table.

Ponded flood boundaries for structures CAP-1 to CAP-4 and CAP-6 to CAP-11 were obtained by routing the 100-year storm through the structures. Upstream storage volumes were computed by average end areas planimetered from contour mapping (Reference 1). The HEC-1 computer program was used to perform the routing and compute the maximum ponded flood elevation upstream of the canal. Hydraulic rating curves for the structures were computed using the computer program: "Hydraulics of Bridge and Culvert Waterways."

Structure CAP-5 is the Jackrabbit Wash crossing, and is included in the Jackrabbit Wash HEC-2 model.

Hydraulic analyses are based upon unobstructed flow conditions. Flood elevations presented herein are considered valid only if the CAP Canal structures remain unobstructed, and the CAP Canal embankment does not fail.

## **FLOODPLAIN MANAGEMENT APPLICATIONS**

This study has been performed to meet the standards of the National Flood Insurance Program as defined by Reference 10.

A prime purpose of the National Flood Insurance Program is to encourage state and local governments to adopt sound floodplain management programs. This study, therefore, includes a flood boundary map designed to assist communities in developing sound floodplain management measures.

### **Flood Boundaries**

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the Federal Emergency Management Agency (FEMA) as the base flood for purposes of floodplain management measures. The boundary of the 100-year flood has been delineated using flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:4800 with a contour interval of 4 feet (Reference 1.)

The boundary of the 100-year flood is shown on the Flood Boundary and Floodway Map (Exhibit 2). Small areas within the flood boundaries may lie above the flood elevations, and therefore, may not be subject to flooding. Due to limitations of the map scale and lack of detailed topographic data, such areas are not shown.

### **Floodways**

Encroachment on floodplains, such as artificial fill, reduces the flood carrying capacity, increases flood heights of streams, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment in order that the 100-year flood can be

carried without substantial increase in flood heights. Minimum federal standards limit such increases in flood heights to 1.0 foot, provided that hazardous velocities are not produced. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown below in Figure 2.

The floodway presented for this study was computed on the basis of equal conveyance reduction from each side of the floodplain and adjusted for high velocities and physical discontinuities. The results of these computations are tabulated at selected cross sections for each stream segment for which a floodway is computed (Table 2).

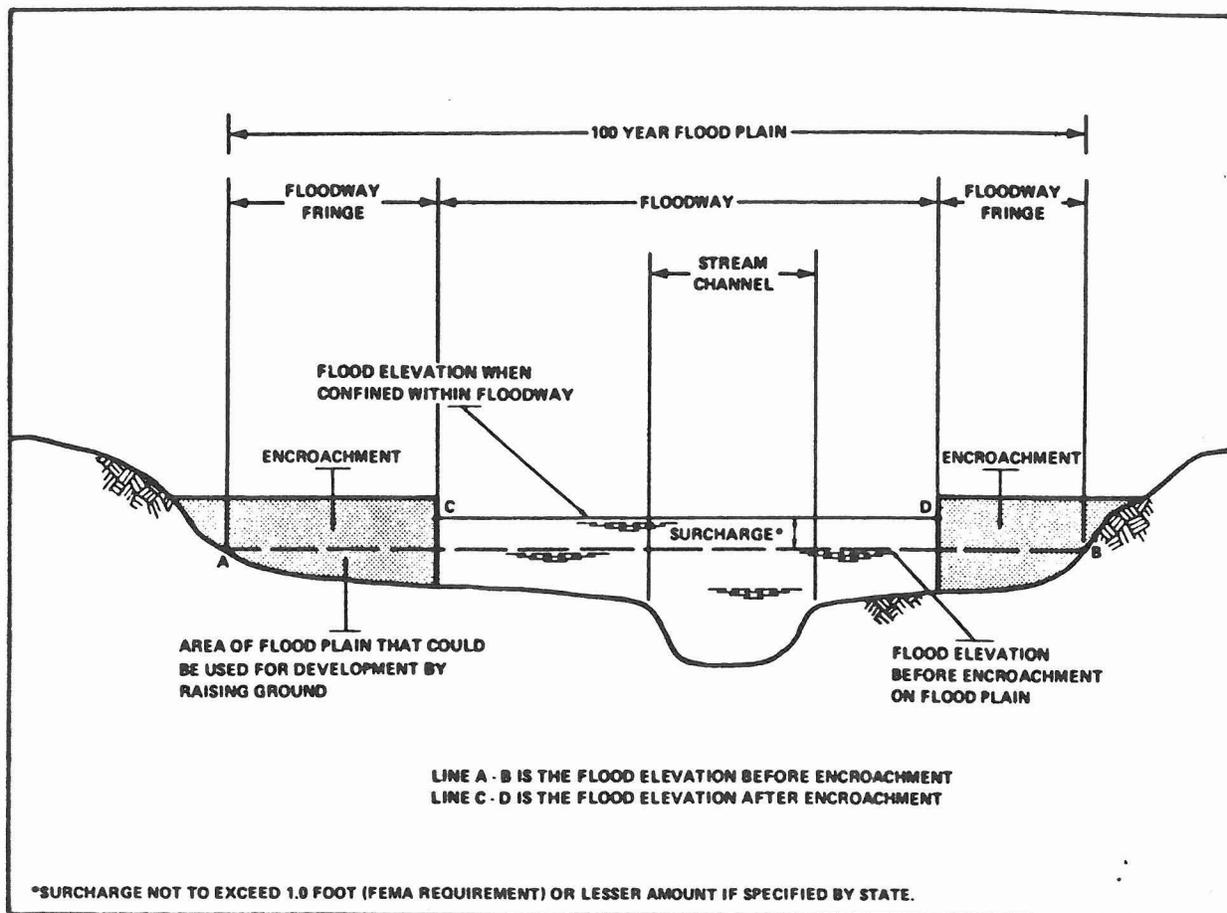


FIGURE 2

FLOODING SOURCE		FLOODWAY			WATER SURFACE ELEVATION <sup>2</sup>		
Cross Section	Distance <sup>1</sup>	Width (Feet)	Section Area (Sq. Ft.)	Mean Velocity (Feet/Sec.)	With Floodway	Without Floodway	Increase
A	7.842	1130.	4058.	8.2	1362.7	1362.2	.5
B	8.062	700.	3559.	9.3	1370.5	1369.7	.8
C	8.279	515.	2001.	9.9	1379.9	1379.2	.7
D	8.485	490.	2231.	8.9	1388.8	1388.3	.5
E	8.680	540.	2444.	8.1	1395.0	1394.2	.8
F	8.870	465.	1974.	10.0	1401.1	1400.6	.5
G	9.060	520.	2327.	8.5	1408.4	1407.4	1.0
H	9.310	519.	2365.	8.4	1415.4	1414.7	.7
I	9.492	391.	2041.	9.7	1421.1	1420.5	.6
J	9.702	550.	2956.	6.7	1427.9	1427.8	.1
K	9.896	499.	2374.	8.3	1432.9	1431.9	1.0
L	10.095	500.	2293.	8.6	1439.6	1439.6	.0
M	10.271	420.	1842.	10.8	1446.9	1446.6	.3
N	10.454	340.	2544.	7.8	1453.3	1452.5	.8
O	10.644	300.	1525.	12.9	1458.5	1458.4	.1
P	10.835	350.	2320.	8.5	1467.4	1466.5	.9
Q	11.028	350.	1921.	10.3	1472.7	1472.2	.5
R	11.235	400.	2050.	9.6	1481.0	1480.6	.4
S	11.425	400.	2202.	8.9	1487.5	1486.5	1.0
T	11.608	375.	1845.	10.7	1493.8	1493.1	.7
U	11.815	350.	2125.	9.3	1501.8	1500.8	1.0
V	12.032	450.	1908.	10.3	1508.3	1507.9	.4
W	12.220	550.	2297.	8.6	1514.1	1513.3	.8
X	12.360	350.	1721.	11.4	1517.4	1517.3	.1

<sup>1</sup> Miles above mouth

<sup>3</sup> Elevation computed without consideration

<sup>2</sup> Feet, NGVD 1929

of backwater from Jackrabbit Wash

TABLE 2

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

**Burgess & Niple, Inc.**

Engineers and Architects

**FLOODWAY DATA**

**JACKRABBIT WASH**

FLOODING SOURCE		FLOODWAY			WATER SURFACE ELEVATION <sup>2</sup>		
Cross Section	Distance <sup>1</sup>	Width (Feet)	Section Area (Sq. Ft.)	Mean Velocity (Feet/Sec.)	With Floodway	Without Floodway	Increase
Y	12.500	300.	1855.	10.6	1522.4	1521.4	1.0
Z	12.711	300.	1681.	11.7	1529.1	1528.6	.5
AA	12.978	300.	1929.	10.2	1539.9	1538.9	1.0
AB	13.164	380.	1810.	10.9	1545.7	1545.6	.1
AC	13.358	300.	1617.	12.2	1553.4	1553.3	.1
AD	13.548	350.	1738.	11.3	1560.7	1560.2	.5
AE	13.740	400.	2125.	9.3	1568.1	1567.5	.6
AF	13.929	450.	2224.	8.9	1574.7	1574.1	.6
AG	14.137	450.	2127.	9.3	1582.2	1582.1	.1
AH	14.323	500.	2300.	8.6	1588.3	1587.4	.9
AI	14.547	500.	1864.	10.6	1595.9	1595.8	.1
AJ	14.743	500.	2499.	7.9	1602.5	1601.6	.9
AK	14.943	450.	1846.	10.7	1607.2	1607.1	.1
AL	15.128	500.	2521.	8.4	1614.9	1614.2	.7
AM	15.304	600.	2216.	9.5	1621.6	1620.8	.8
AN	15.507	930.	2732.	7.7	1631.5	1630.5	1.0
AO	15.715	1130.	2271.	9.3	1638.0	1637.0	1.0
AP	15.923	650.	1779.	11.9	1645.2	1644.2	1.0
AQ	16.129	550.	2701.	7.8	1651.4	1650.5	.9
AR	16.315	425.	1945.	10.9	1657.0	1657.0	.0
AS	16.515	700.	3305.	6.4	1664.5	1663.5	1.0
AT	16.711	600.	2214.	9.5	1669.7	1669.4	.3
AU	16.900	500.	2538.	8.3	1677.6	1676.8	.8
AV	17.087	450.	1959.	10.8	1683.4	1683.2	.2

<sup>1</sup> Miles above mouth<sup>3</sup> Elevation computed without consideration<sup>2</sup> Feet, NGVD 1929

of backwater from Jackrabbit Wash

TABLE 2

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

**Burgess & Niple, Inc.**

Engineers and Architects

**FLOODWAY DATA****JACKRABBIT WASH**

FLOODING SOURCE		FLOODWAY			WATER SURFACE ELEVATION <sup>2</sup>		
Cross Section	Distance <sup>1</sup>	Width (Feet)	Section Area (Sq. Ft.)	Mean Velocity (Feet/Sec.)	With Floodway	Without Floodway	Increase
AW	17.287	550.	2669.	7.9	1691.0	1690.0	1.0
AX	17.487	500.	2223.	9.5	1697.2	1696.4	.8
AY	17.720	500.	2260.	9.3	1706.8	1705.8	1.0
AZ	17.840	400.	2125.	9.9	1710.5	1709.6	.9

<sup>1</sup>Miles above mouth

<sup>3</sup>Elevation computed without consideration

<sup>2</sup>Feet, NGVD 1929

of backwater from Jackrabbit Wash

TABLE 2

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

**Burgess & Niple, Inc.**

Engineers and Architects

FLOODWAY DATA

JACKRABBIT WASH

FLOODING SOURCE		FLOODWAY			WATER SURFACE ELEVATION <sup>2</sup>		
Cross Section	Distance <sup>1</sup>	Width (Feet)	Section Area (Sq. Ft.)	Mean Velocity (Feet/Sec.)	With Floodway	Without Floodway	Increase
A	.321	314.	1853.	9.5	1377.6 <sup>3</sup>	1376.6 <sup>3</sup>	1.0
B	.504	470.	2589.	6.8	1382.2	1381.6	.6
C	.694	810.	3490.	5.0	1385.5	1384.6	.9
D	.885	795.	2213.	8.0	1389.8	1389.5	.3
E	1.100	800.	3197.	5.5	1396.2	1395.2	1.0
F	1.269	580.	1813.	9.7	1400.6	1400.6	.0
G	1.464	655.	3107.	5.7	1407.3	1406.6	.7
H	1.660	740.	2311.	7.6	1411.7	1410.7	1.0
I	1.886	610.	2393.	5.9	1418.5	1417.6	.9
J	2.097	580.	2042.	6.9	1423.0	1422.3	.7

<sup>1</sup> Miles above mouth<sup>3</sup> Elevation computed without consideration<sup>2</sup> Feet, NGVD 1929

of backwater from Jackrabbit Wash

TABLE 2

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

**Burgess & Niple, Inc.**

Engineers and Architects

FLOODWAY DATA

STAR WASH

FLOODING SOURCE		FLOODWAY			WATER SURFACE ELEVATION <sup>2</sup>		
Cross Section	Distance <sup>1</sup>	Width (Feet)	Section Area (Sq. Ft.)	Mean Velocity (Feet/Sec.)	With Floodway	Without Floodway	Increase
A	.060	300.	893.	3.2	1448.3 <sup>3</sup>	1447.3 <sup>3</sup>	1.0
B	.292	200.	360.	8.0	1457.9	1457.9	.0
C	.460	185.	528.	5.5	1465.9	1464.9	1.0
D	.667	140.	431.	6.7	1472.0	1471.6	.4
E	.865	100.	322.	9.0	1481.0	1480.4	.6
F	1.064	150.	512.	5.7	1489.2	1488.4	.8
G	1.241	100.	334.	8.7	1494.7	1494.5	.2
H	1.432	100.	410.	7.1	1501.3	1500.4	.9
I	1.640	90.	351.	8.5	1507.7	1507.5	.2
J	1.800	90.	452.	6.6	1513.7	1512.8	.9
K	1.999	80.	354.	8.5	1519.7	1519.7	.0
L	2.182	110.	438.	6.9	1526.9	1526.2	.7
M	2.356	115.	347.	8.6	1534.5	1533.5	1.0
N	2.550	100.	442.	6.8	1542.0	1541.2	.8
O	2.728	80.	321.	9.3	1546.9	1546.6	.3
P	2.916	80.	386.	7.8	1554.4	1553.5	.9
Q	3.108	75.	369.	8.1	1560.4	1560.0	.4
R	3.288	75.	312.	9.6	1566.5	1566.0	.5
S	3.513	75.	365.	8.2	1574.3	1573.4	.9
T	3.680	75.	280.	10.7	1579.7	1579.7	.0
U	3.875	175.	532.	5.6	1588.0	1587.0	1.0
V	4.066	150.	382.	7.8	1595.2	1594.3	.9
W	4.260	150.	537.	5.6	1601.3	1600.5	.8
X	4.452	150.	356.	8.4	1606.6	1606.4	.2

<sup>1</sup> Miles above mouth<sup>3</sup> Elevation computed without consideration<sup>2</sup> Feet, NGVD 1929

of backwater from Jackrabbit Wash

TABLE 2

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

**Burgess & Niple, Inc.**

Engineers and Architects

**FLOODWAY DATA****UNNAMED TRIBUTARY**

FLOODING SOURCE		FLOODWAY			WATER SURFACE ELEVATION <sup>2</sup>		
Cross Section	Distance <sup>1</sup>	Width (Feet)	Section Area (Sq. Ft.)	Mean Velocity (Feet/Sec.)	With Floodway	Without Floodway	Increase
Y	4.671	180.	506.	5.9	1616.3	1615.3	1.0
Z	4.844	120.	398.	7.5	1621.7	1621.2	.5
AA	5.036	120.	384.	7.8	1629.7	1628.9	.8
AB	5.228	120.	370.	8.1	1637.7	1636.7	1.0
AC	5.415	100.	457.	6.6	1642.8	1641.9	.9
AD	5.607	100.	317.	9.5	1649.4	1649.4	.0
AE	5.815	396.	746.	4.0	1657.6	1656.6	1.0
AF	6.022	160.	350.	8.6	1664.9	1664.8	.1
AG	6.223	160.	466.	6.4	1672.9	1671.9	1.0
AH	6.424	150.	359.	8.4	1679.4	1679.2	.2
AI	6.628	140.	518.	5.8	1687.3	1686.3	1.0
AJ	6.853	100.	327.	9.2	1694.7	1694.4	.3
AK	7.074	100.	441.	6.8	1703.5	1702.7	.8

<sup>1</sup> Miles above mouth<sup>3</sup> Elevation computed without consideration<sup>2</sup> Feet, NGVD 1929

of backwater from Jackrabbit Wash

TABLE 2

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

**Burgess & Niple, Inc.**

Engineers and Architects

FLOODWAY DATA

UNNAMED TRIBUTARY

As shown on the Flood Boundary and Floodway Map (Exhibit 2), the floodway widths were determined at cross sections; between cross sections, the boundaries were interpolated. In cases where the boundaries of the floodway and the 100-year flood are either close, together or colinear, only the floodway boundary has been shown.

The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point.

## **INSURANCE APPLICATION**

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

**Zone A:** Zone A is the flood insurance rate zone that corresponds to 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. No base flood elevations or depths are shown within this zone.

**Zone AE:** Zone AE is the flood insurance rate zone that corresponds to 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot based flood elevations derived from detailed hydraulic analyses are shown at selected intervals within this zone.

**Zone E:** Zone E is the flood insurance rate zone that corresponds to erodable areas within the 100-year floodplain which are above the 100-year flood elevations. If eroded, these areas may be below the 100-year flood elevation.

**Zone X:** Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

## **OTHER STUDIES**

The United States Bureau of Reclamation performed hydrologic and hydraulic analyses for design of the CAP Canal, drainage structures, and protective embankment (Reference 23). Flood hazards along the CAP Canal and Jackrabbit Wash have been previously delineated by FEMA using approximate methods.

The Master Drainage Study for Belmont Planned Community (Reference 17) presented hydrology developed for areas south of the CAP Canal. Reference 17 also included a discussion of hydrology previously developed for detailed study of the Hassayampa River by FEMA.

## **LOCATION OF DATA**

Survey, hydrologic, hydraulic, and other pertinent data used in this study may be obtained from the Flood Control District of Maricopa County, 3335 West Durango Street, Phoenix, Arizona 85009.

## ELEVATION REFERENCE MARKS

1. ERM EL. = 1354.03

This station is located 3.2 miles east of Wickenburg Road along the north service road of the C.A.P. Canal. The mark is the N.W. corner of a concrete headwall at the north inlet of a pipe culvert at C.A.P. Station 571+50.

2. ERM EL. = 1344.74

This station is located 3.0 miles east of Wickenburg Road along the north service road of the C.A.P. Canal. The mark is the N.E. corner of a concrete headwall at the north inlet of a pipe culvert at C.A.P. Station 561+50.

3. ERM EL. = 1393.09

This station is located at the corner common to Sections 4, 5, 8 and 9, T.3N., R.5W. The mark is a G.L.O. brass cap dated 1915 and is 0.6 feet above ground.

4. ERM EL. = 1408.88

This station is located at the 1/4 corner common to sections 4 and 5, T.3N., R.5W. The mark is a G.L.O. brass cap dated 1915.

5. ERM EL. = 1434.54

This station is located at the corner common to Sections 4 and 5, T.3N., R.5W. and Sections 32 and 33, T.4N., R.5W. The mark is a G.L.O. brass cap dated 1915 and is 0.60 feet above ground.

6. ERM EL. = 1425.87

This station is located at the corner common to Sections 5, 6, 7 and 8, T.3N., R.5W. This mark is a G.L.O. brass cap dated 1915 and is 1.3 feet above ground.

7. ERM EL. = 1454.78

This station is located at the corner common to Sections 5 and 6, T.3N., R.5W. and Sections 31 and 32, T.4N., R.5W. The mark is a G.L.O. brass cap dated 1915 and is 0.9 feet above ground.

8. ERM EL. = 1462.95

This station is located at the 1/4 corner common to Section 6, T.3N., R.5W. and Section 31, T.4N., R.5W. The mark is a G.L.O. brass cap dated 1915.

9. ERM EL. = 1469.45

This station is located at the corner common to Section 1, T.3N., R.6W. - Section 6, T.3N., R.5W. - Section 31, T.4N., R.5W. and Section 36, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1915 and is 1.1 feet above ground.

10. ERM EL. = 1504.55

This station is located at the corner common to Sections 25 and 36, T.4N., R.6W. and Sections 30 and 31, T.4N., R.5W. The mark is a G.L.O. brass cap dated 1916 and is 1.2 feet above ground.

11. ERM EL. = 1513.418

This station is located 4.0 miles north of the centerline of the C.A.P. Canal along Wickenburg Road. The mark is a standard U.S.G.S. brass cap in a concrete post located 39 feet west of the roadway centerline and is stamped "31 WLS 1957 1513."

12. ERM EL. = 1526.57

This station is located at the corner common to Sections 25, 26, 35 and 36, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916 and is 1.1 feet above ground.

13. ERM EL. = 1532.409

This station is located 4.9 miles north of the centerline of the C.A.P. Canal along Wickenburg Road. The mark is a standard U.S.G.S. brass cap in a concrete post located 48 feet east of the roadway centerline and is stamped "30 WLS 1957 1532."

14. ERM EL. = 1554.23

This station is located at the corner common to Sections 23, 24, 25 and 26, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916 and is 0.6 feet above ground.

15. ERM EL. = 1575.309

This station is located 6.1 miles north of the centerline of the C.A.P. Canal along Wickenburg Road. The mark is a standard U.S.G.S. brass cap in a concrete post located 40 feet southwest of the roadway centerline and is stamped "29 WLS 1957 1575."

16. ERM EL. = 1572.39

This station is located at the 1/4 corner common to Sections 23 and 26, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916.

17. ERM EL. = 1578.59

This station is located at the corner common to Sections 22, 23, 26, and 27, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916.

18. ERM EL. = 1608.84

This station is located at the corner common to Sections 14, 15, 22 and 23, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916 and is 1.2 feet above ground.

19. ERM EL. = 1618.581

This station is located 7.2 miles north of the centerline of the C.A.P. Canal along Wickenburg Road. The mark is a standard U.S.G.S. brass cap in a concrete post located 42 feet northeast of the roadway centerline and is stamped "28 WLS 1957 1619."

20. ERM EL. = 1619.88

This station is located at the 1/4 corner common to Sections 15 and 22, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916 and is 1.0 feet above ground.

21. ERM EL. = 1637.92

This station is located at the corner common to Sections 15, 16, 21 and 22, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916 and is 1.3 feet above ground.

22. ERM EL. = 1652.905

This station is located 8.2 miles north of the centerline of the C.A.P. Canal along Wickenburg Road. The mark is a standard U.S.G.S. brass cap in a concrete post located 40 feet southwest of the roadway centerline and is stamped "27 WLS 1957 1653."

23. ERM EL. = 1652.98

This station is located at the corner common to Sections 9, 10, 15 and 16, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916 and is 1.5 feet above ground.

24. ERM EL. = 1670.36

This station is located at the 1/4 corner common to Sections 9 and 16 T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916 and is 1.5 feet above ground.

25. ERM EL. = 1700.58

This station is located at the corner common to Sections 8, 9, 16 and 17, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916 and is 1.2 feet above ground.

26. ERM EL. = 1681.152

This station is located 9.0 miles north of the centerline of the C.A.P. Canal along Wickenburg Road. The mark is a standard U.S.G.S. brass cap in a concrete post located 43 feet southwest of the roadway centerline and is stamped "26 WLS 1957 1681."

27. ERM EL. = 1717.94

This station is located at the corner common to Sections 4, 5, 8 and 9, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916 and is 1.6 feet above ground.

28. ERM EL. = 1726.074

This station is located 10.1 miles north of the centerline of the C.A.P. Canal along Wickenburg Road. The mark is a standard U.S.G.S. brass cap in a concrete post located 103 feet north of the roadway intersection and is stamped "25 WLS 1957 1726."

## FLOOD PROFILES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

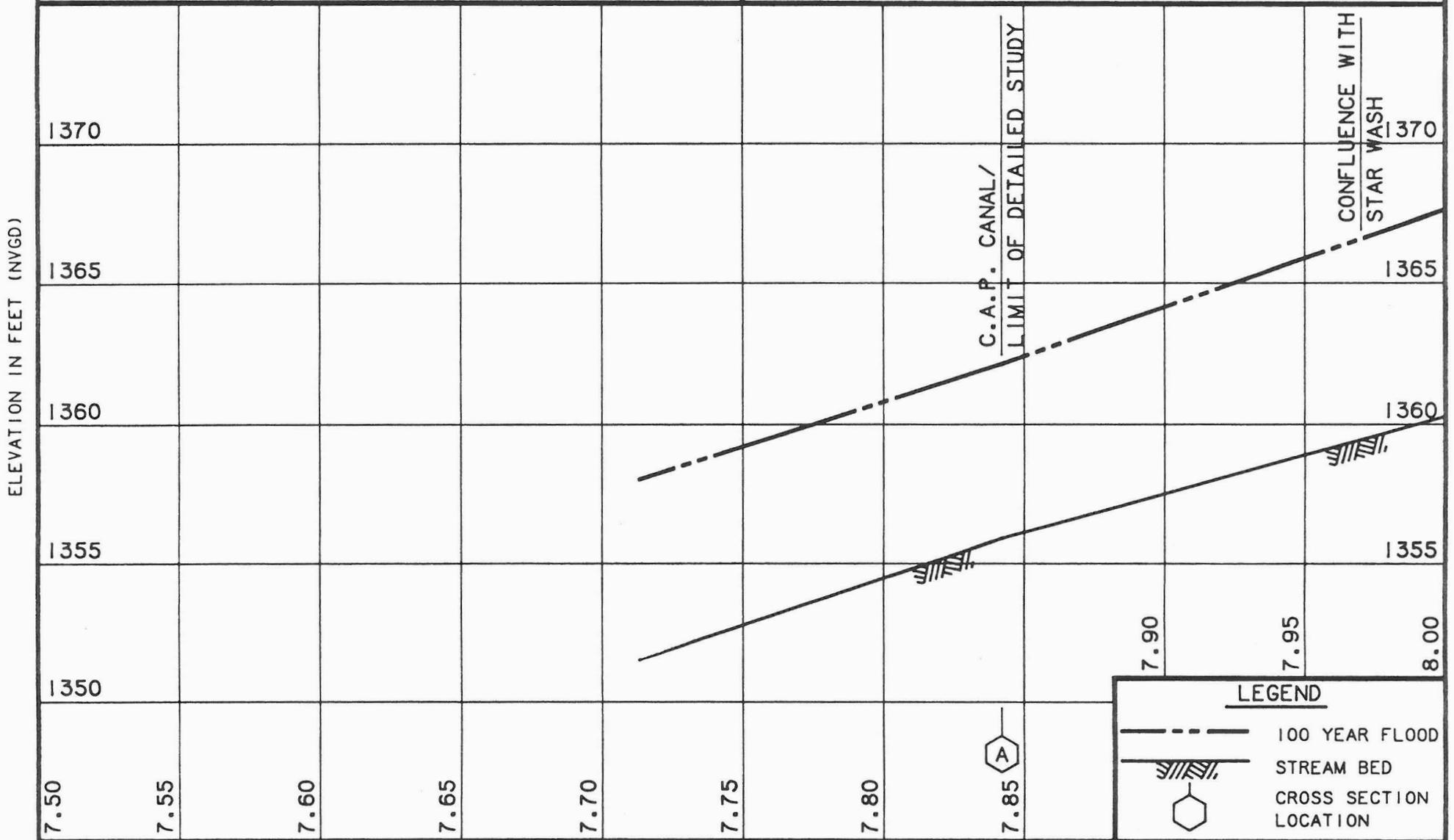
**Burgess & Niple, Inc.**

**Engineers and Architects**



# FLOOD PROFILES

## JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

### LEGEND

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

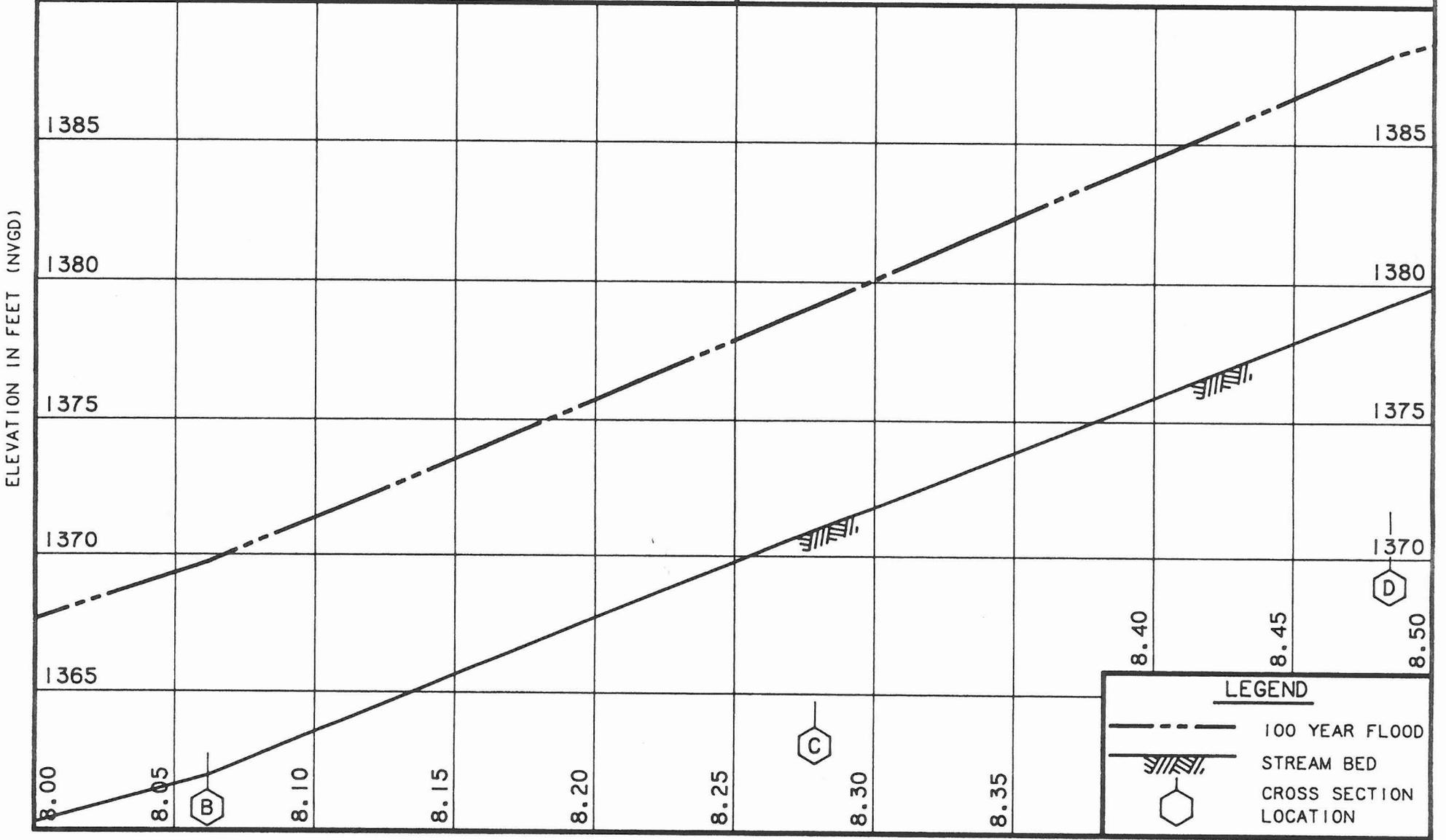
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**Engineers and Architects**



# FLOOD PROFILES

## JACKRABBIT WASH



ELEVATION IN FEET (NVGD)

DISTANCE IN MILES ABOVE MOUTH

**LEGEND**

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

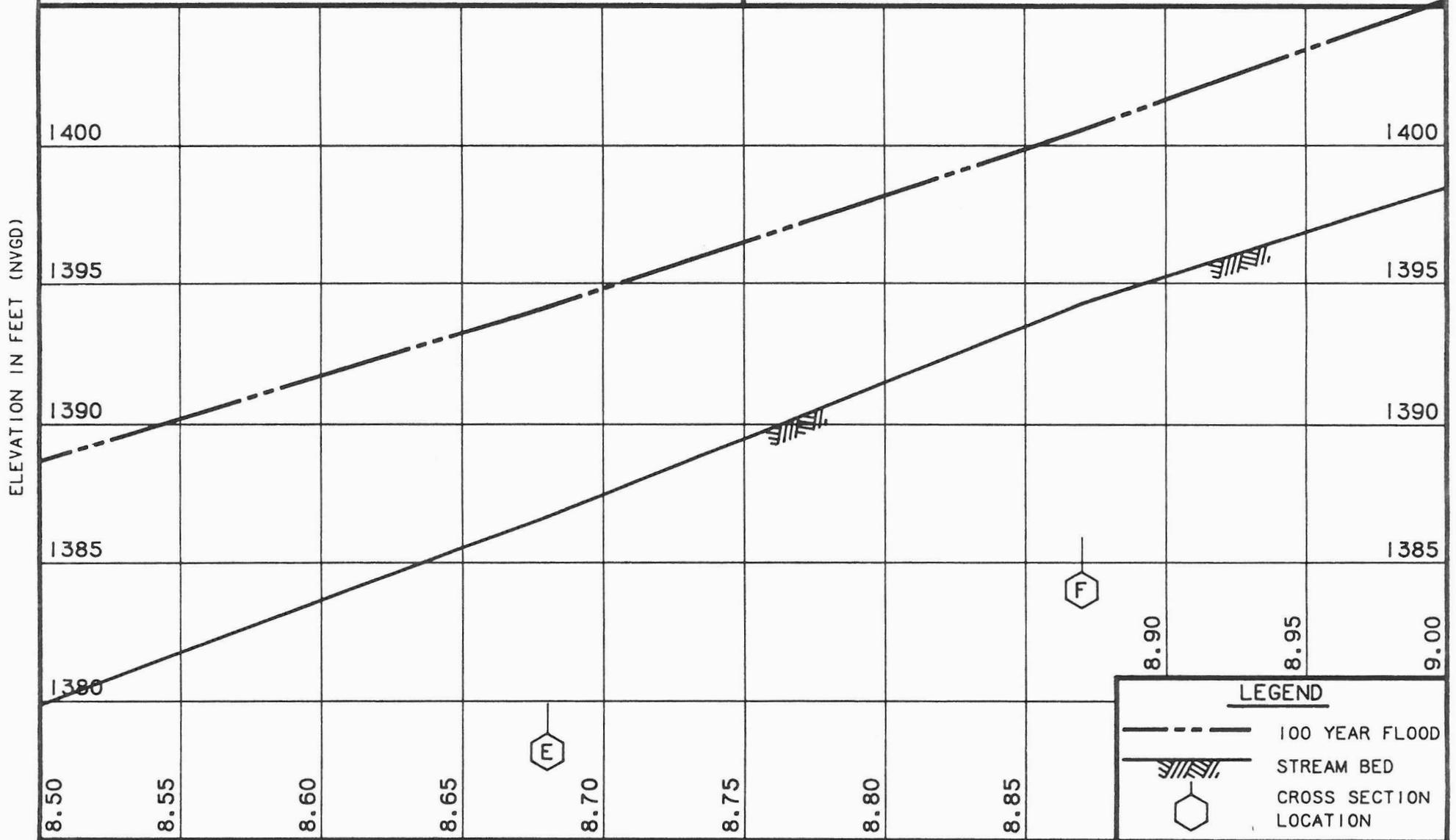
**Burgess & Niple, Inc.**

**Engineers and Architects**



# FLOOD PROFILES

## JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

### LEGEND

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

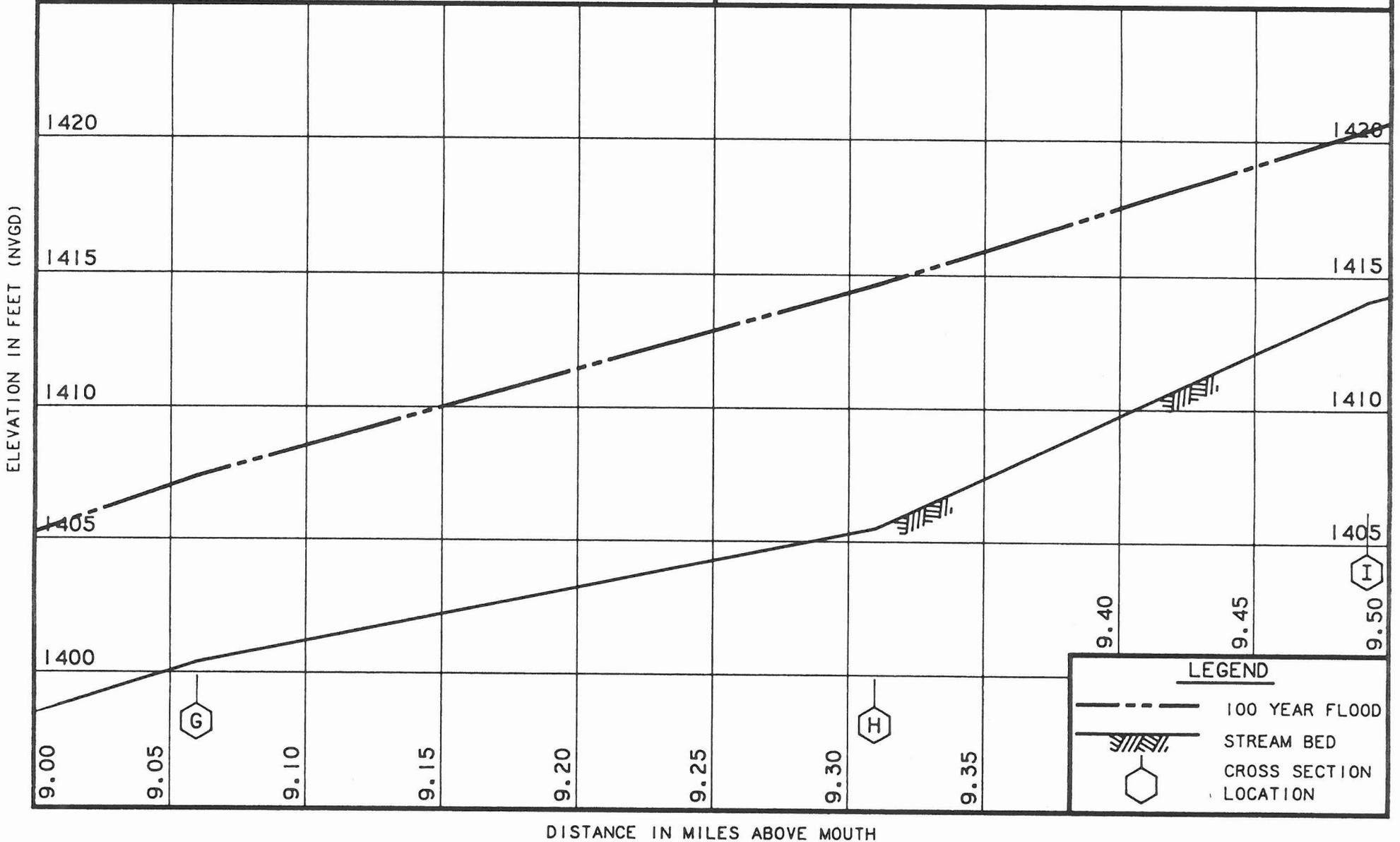
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**Engineers and Architects**



# FLOOD PROFILES

## JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

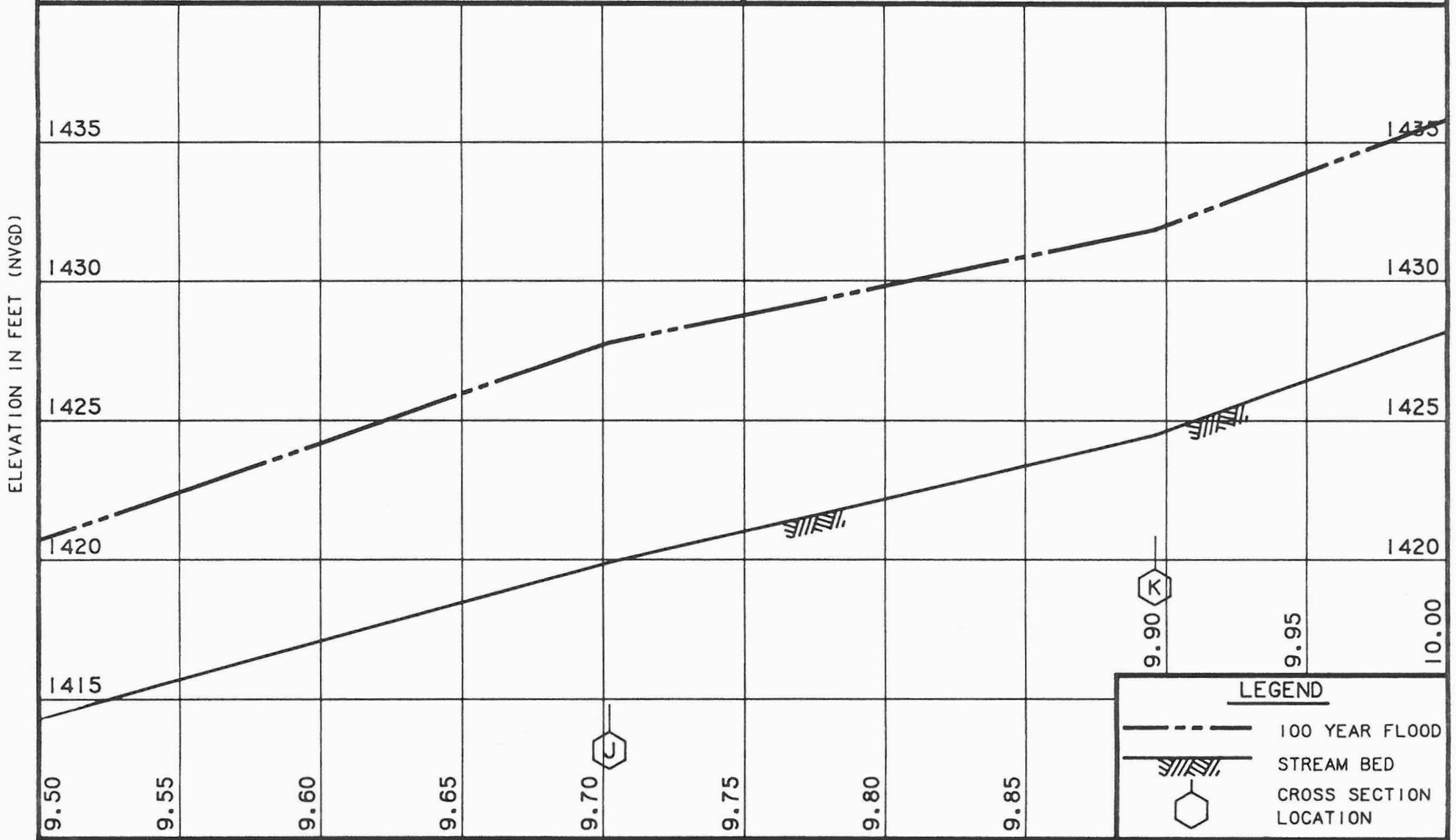
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**Engineers and Architects**



# FLOOD PROFILES

## JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

**LEGEND**

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

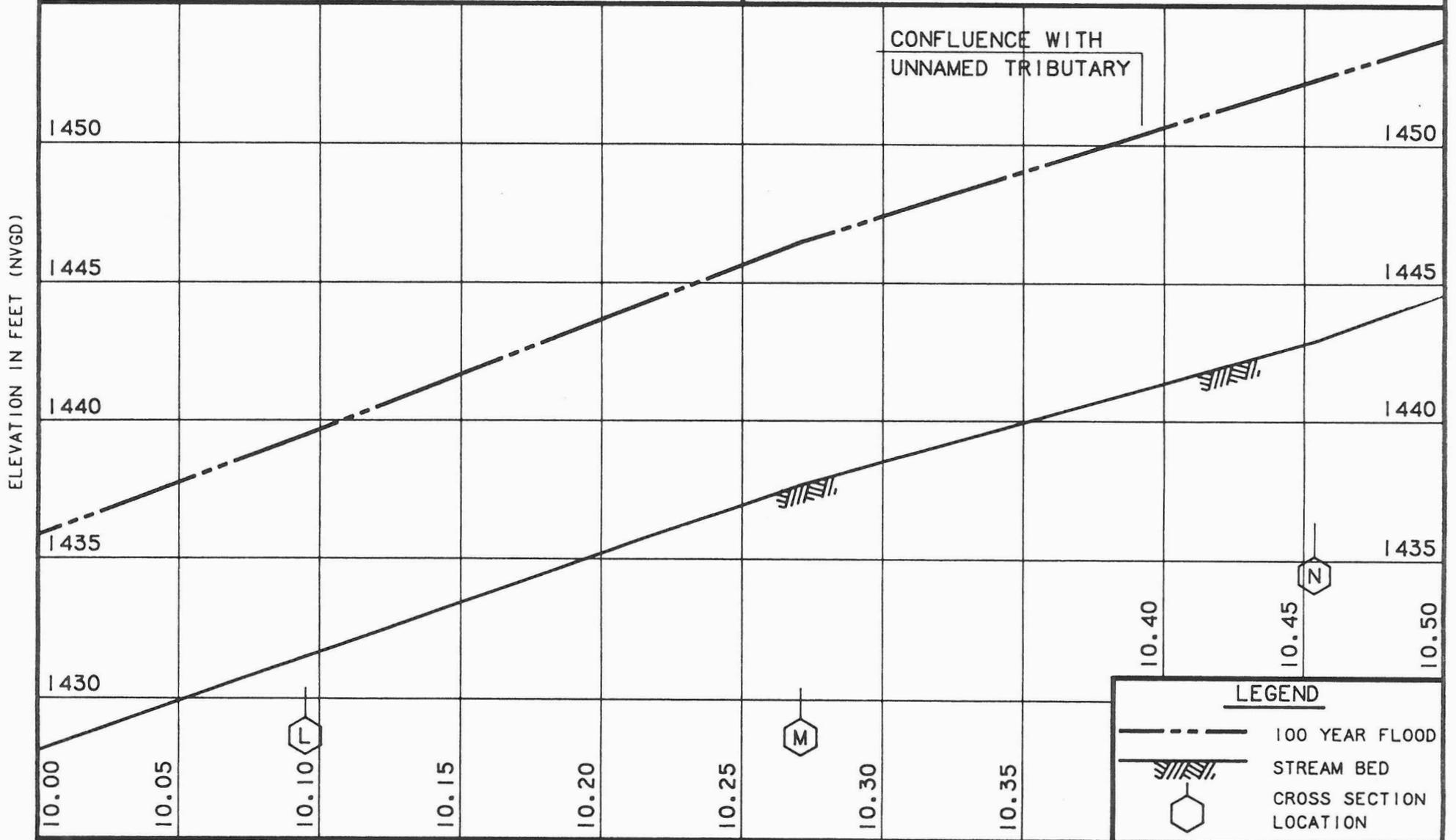
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**Engineers and Architects**



# FLOOD PROFILES

## JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

**LEGEND**

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

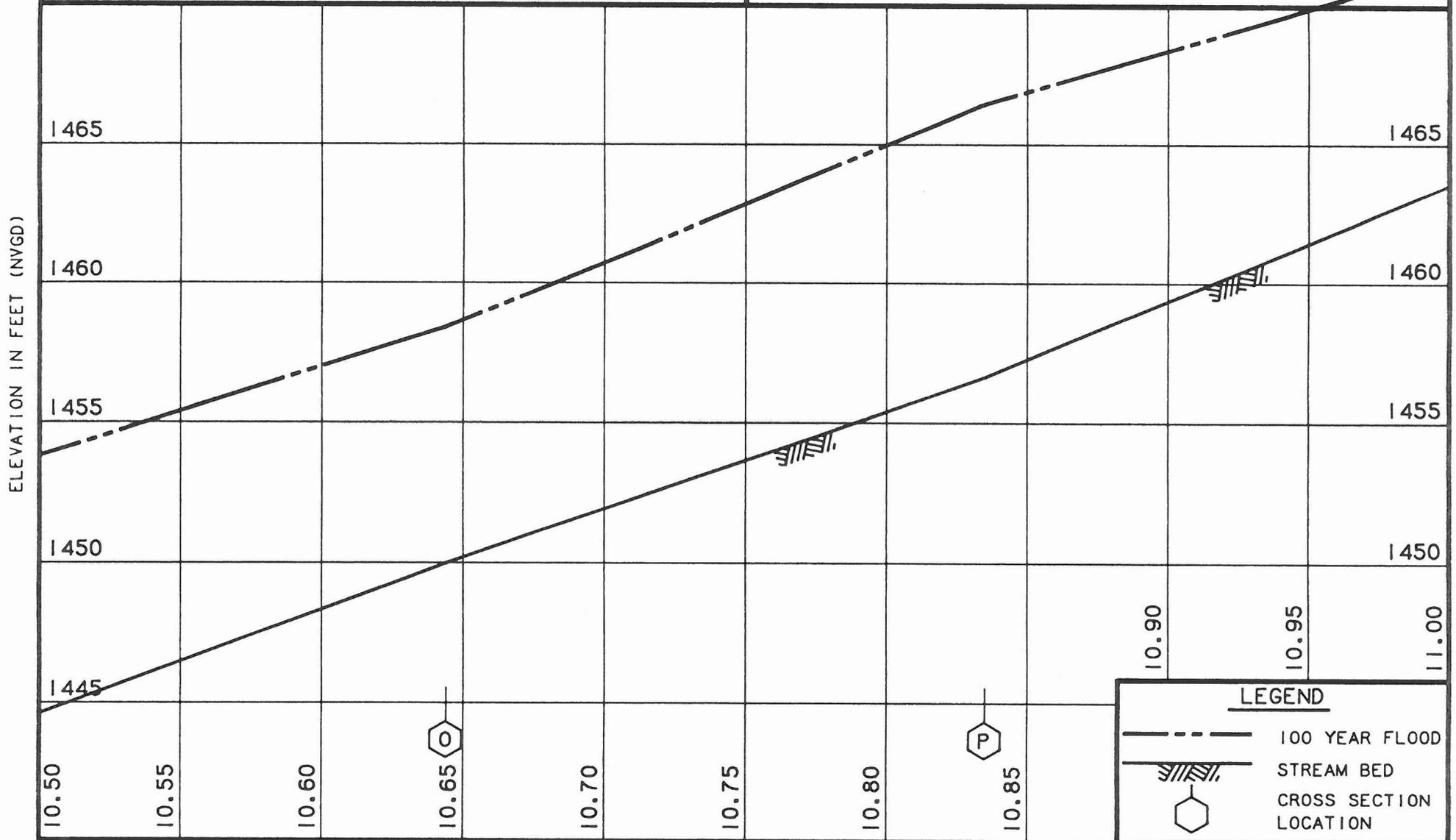
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**Engineers and Architects**



# FLOOD PROFILES

## JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

### LEGEND

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

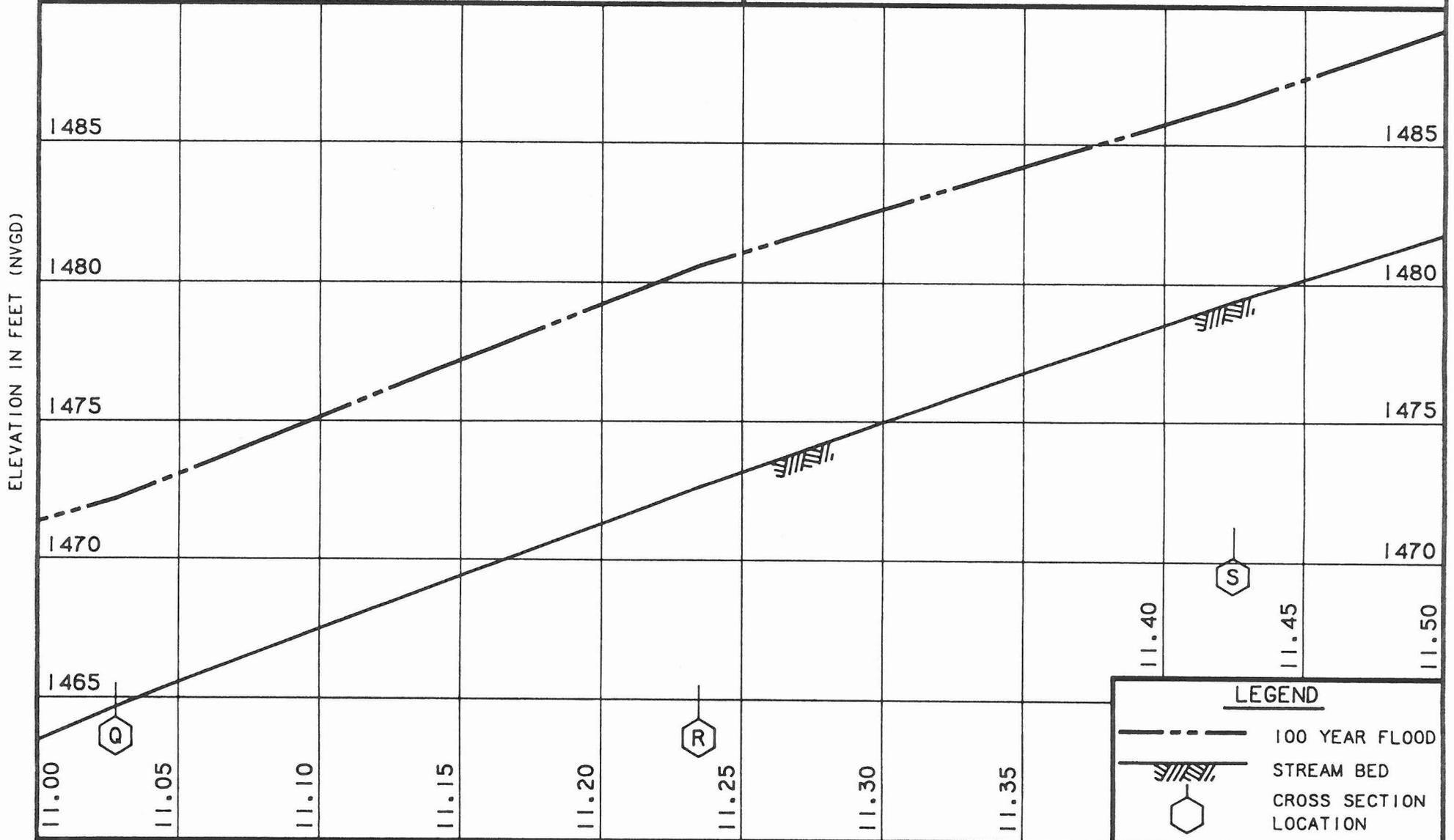
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**Engineers and Architects**



# FLOOD PROFILES

## JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

### LEGEND

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

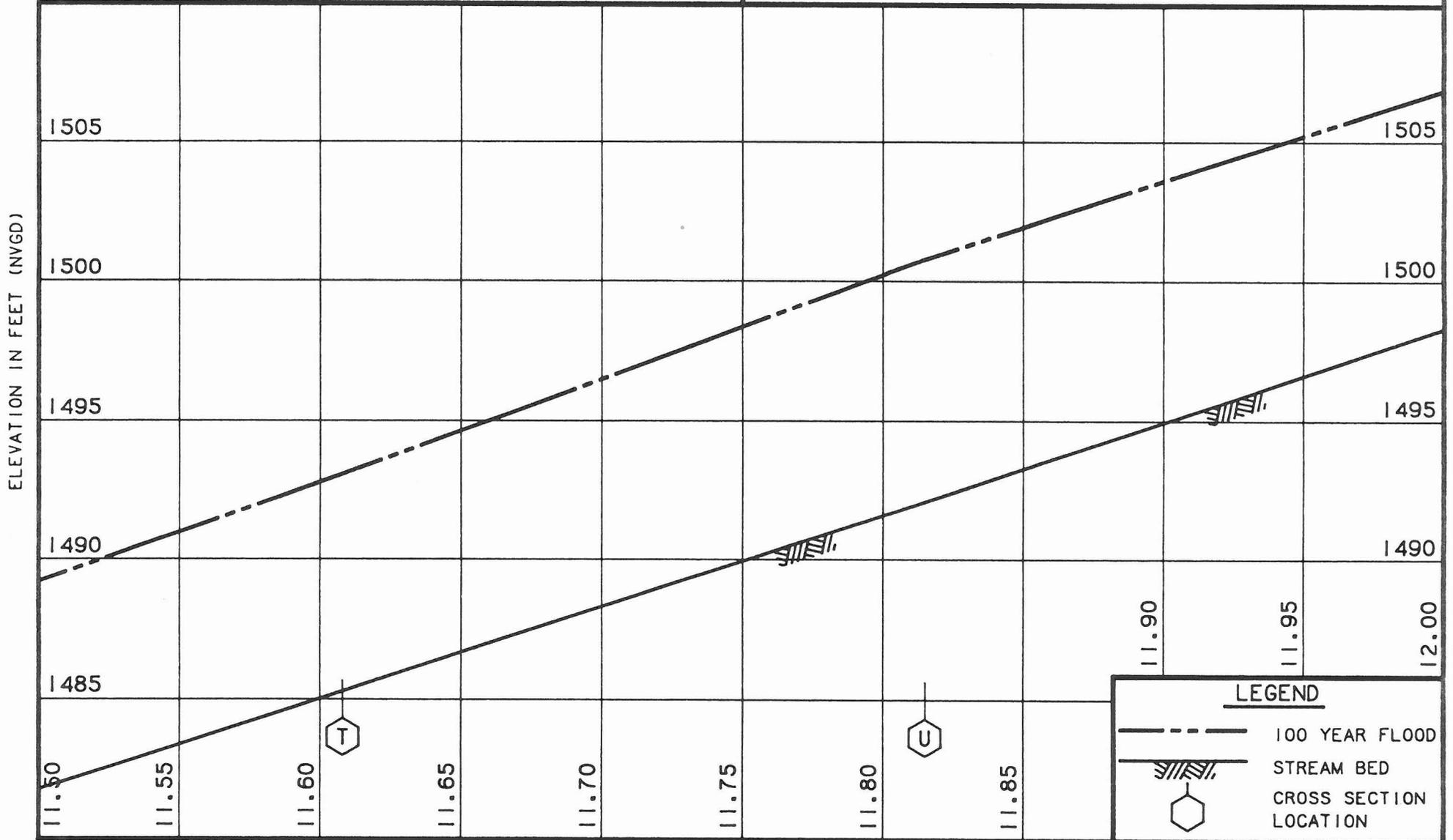
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# FLOOD PROFILES

## JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

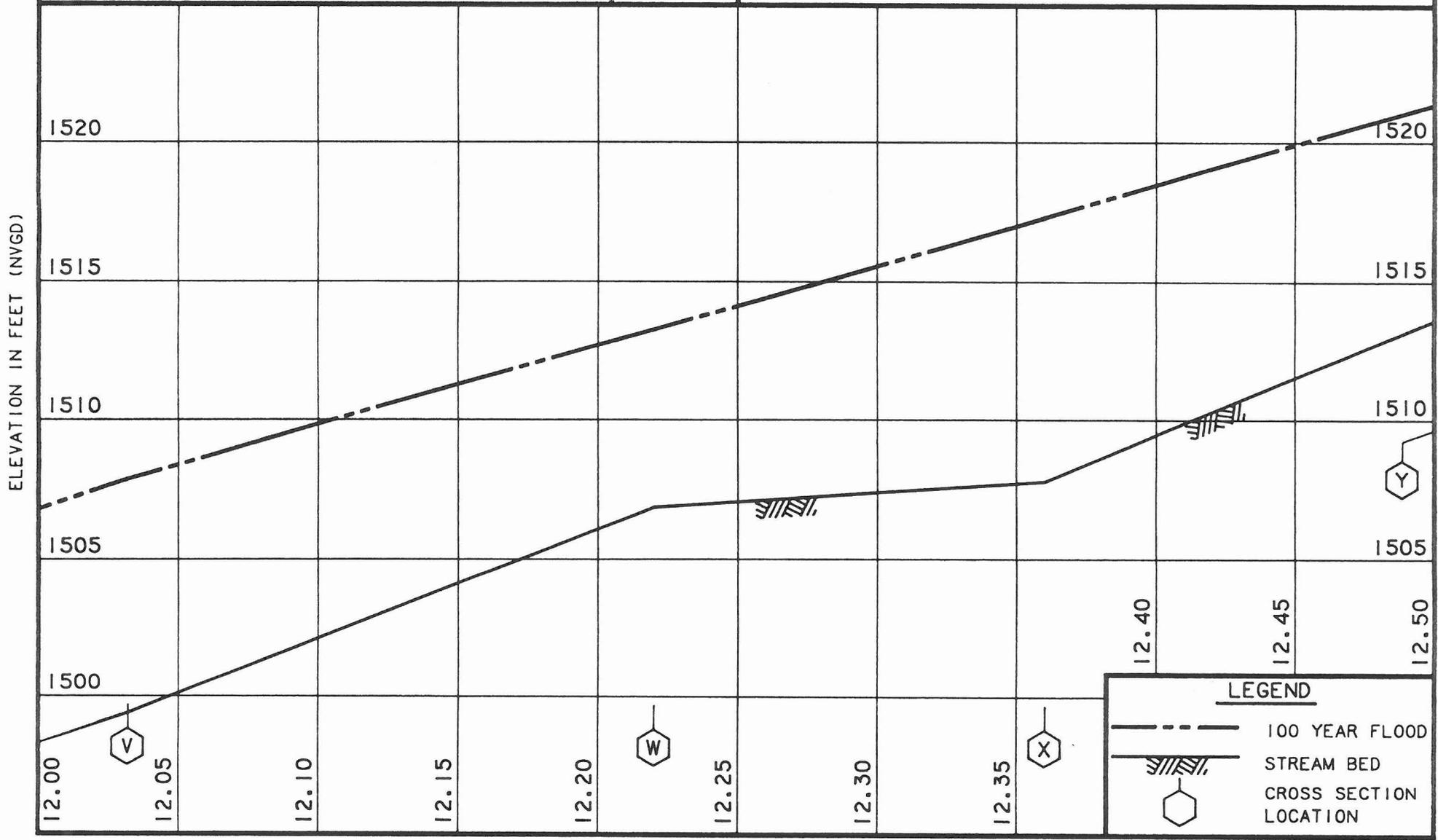
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**Engineers and Architects**



# FLOOD PROFILES

## JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

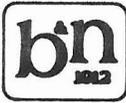
### LEGEND

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

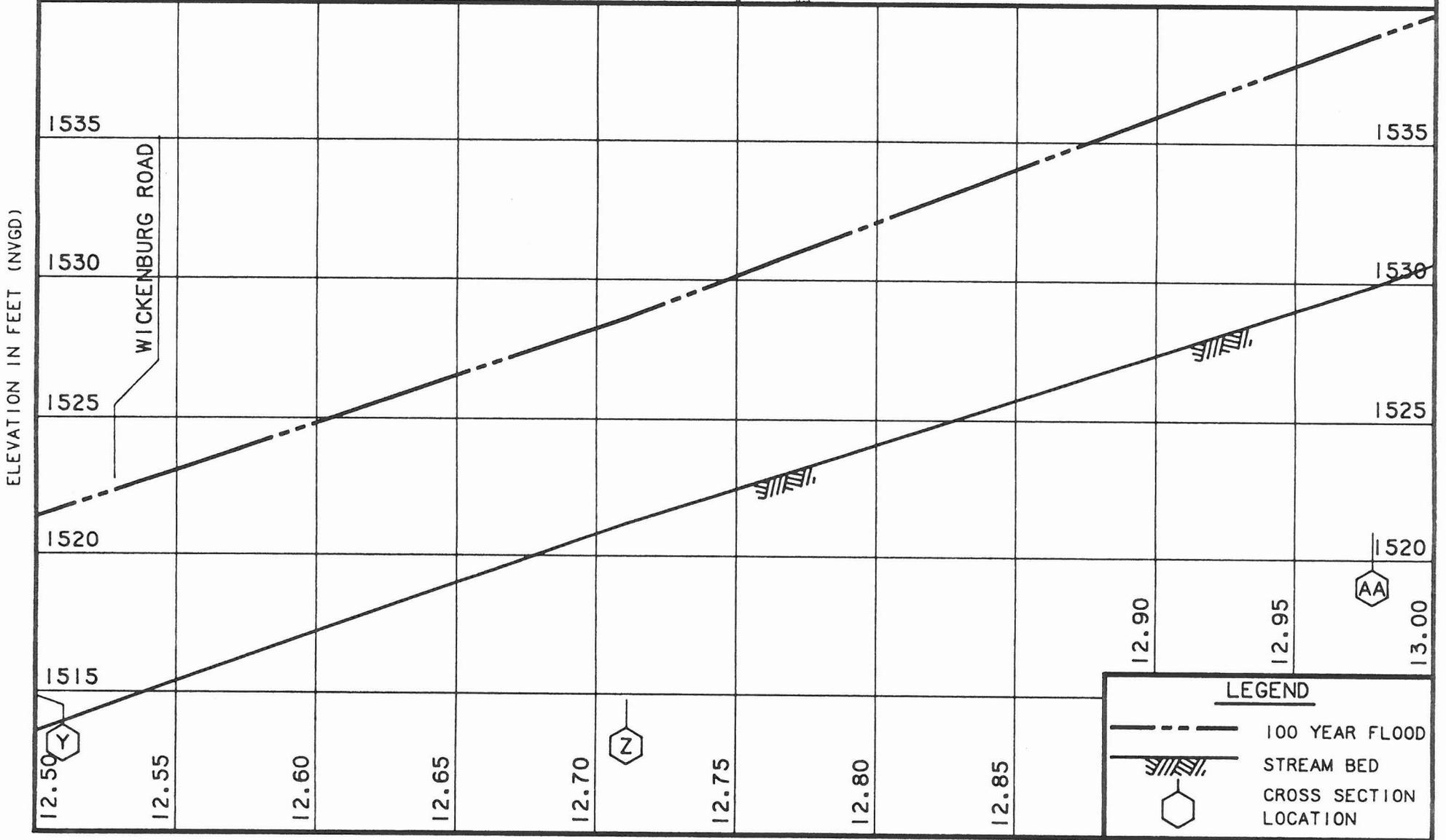
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# FLOOD PROFILES

## JACKRABBIT WASH



ELEVATION IN FEET (NVGD)

DISTANCE IN MILES ABOVE MOUTH

**LEGEND**

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

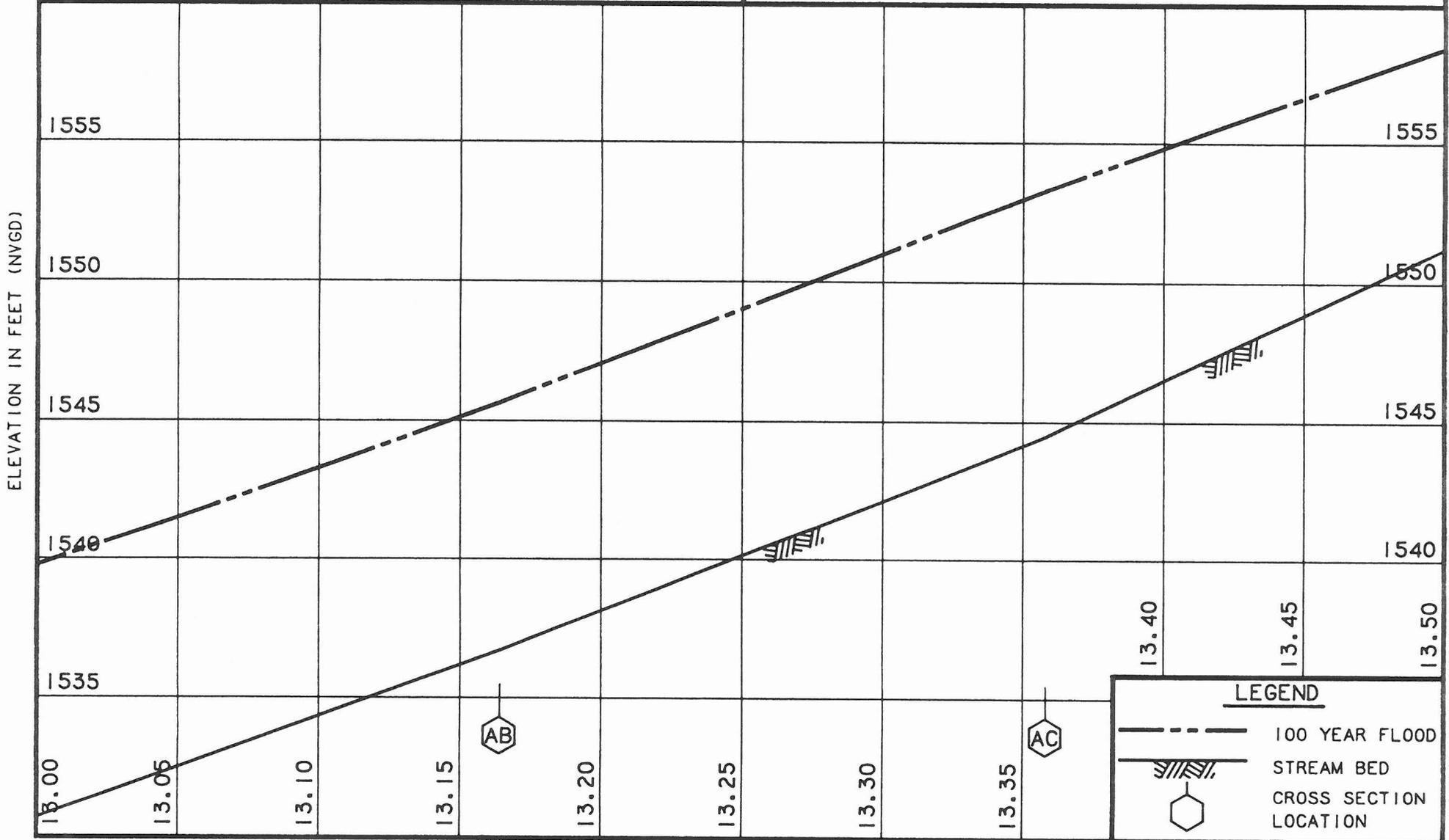
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# FLOOD PROFILES

## JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

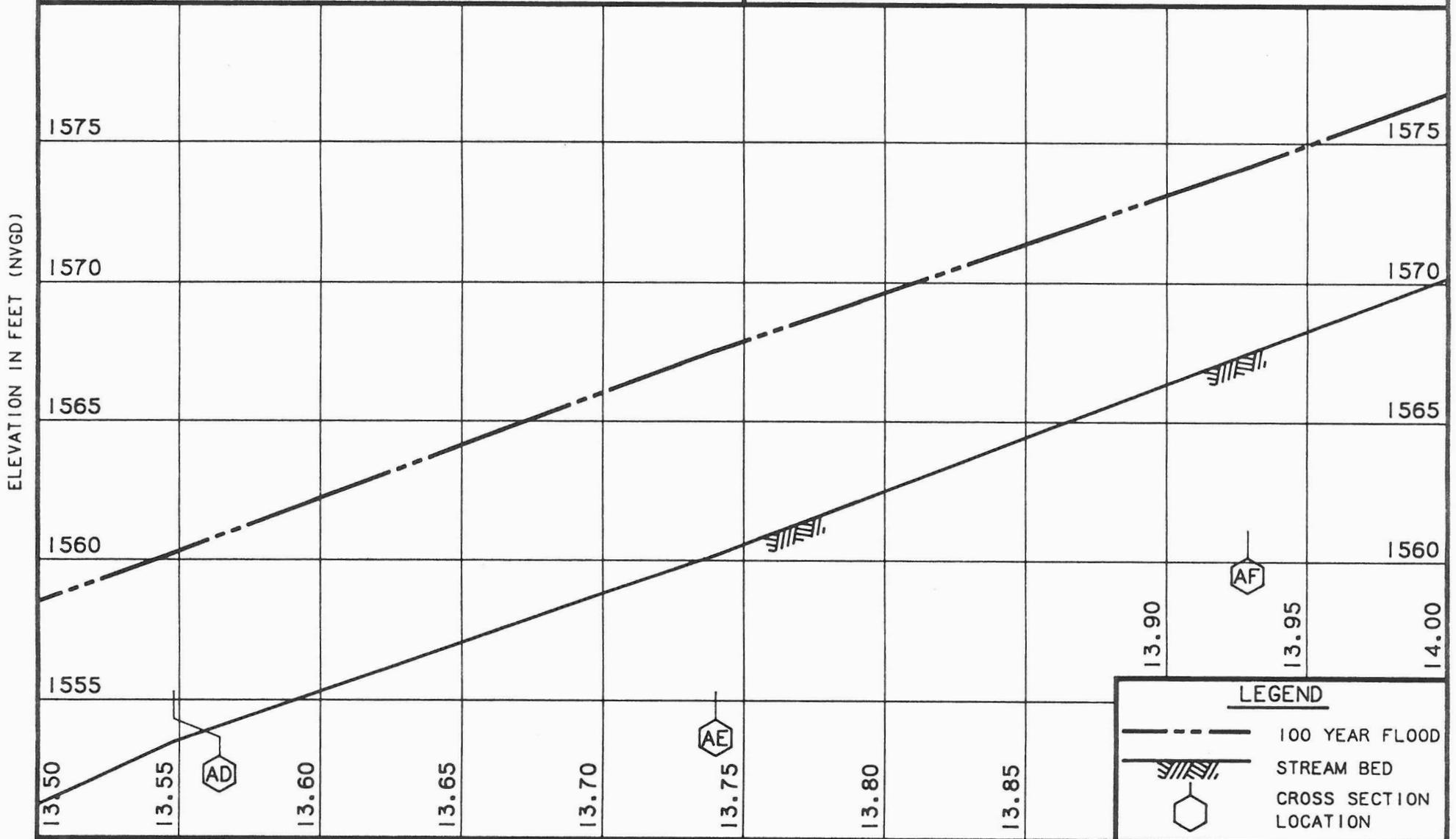
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# FLOOD PROFILES

## JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

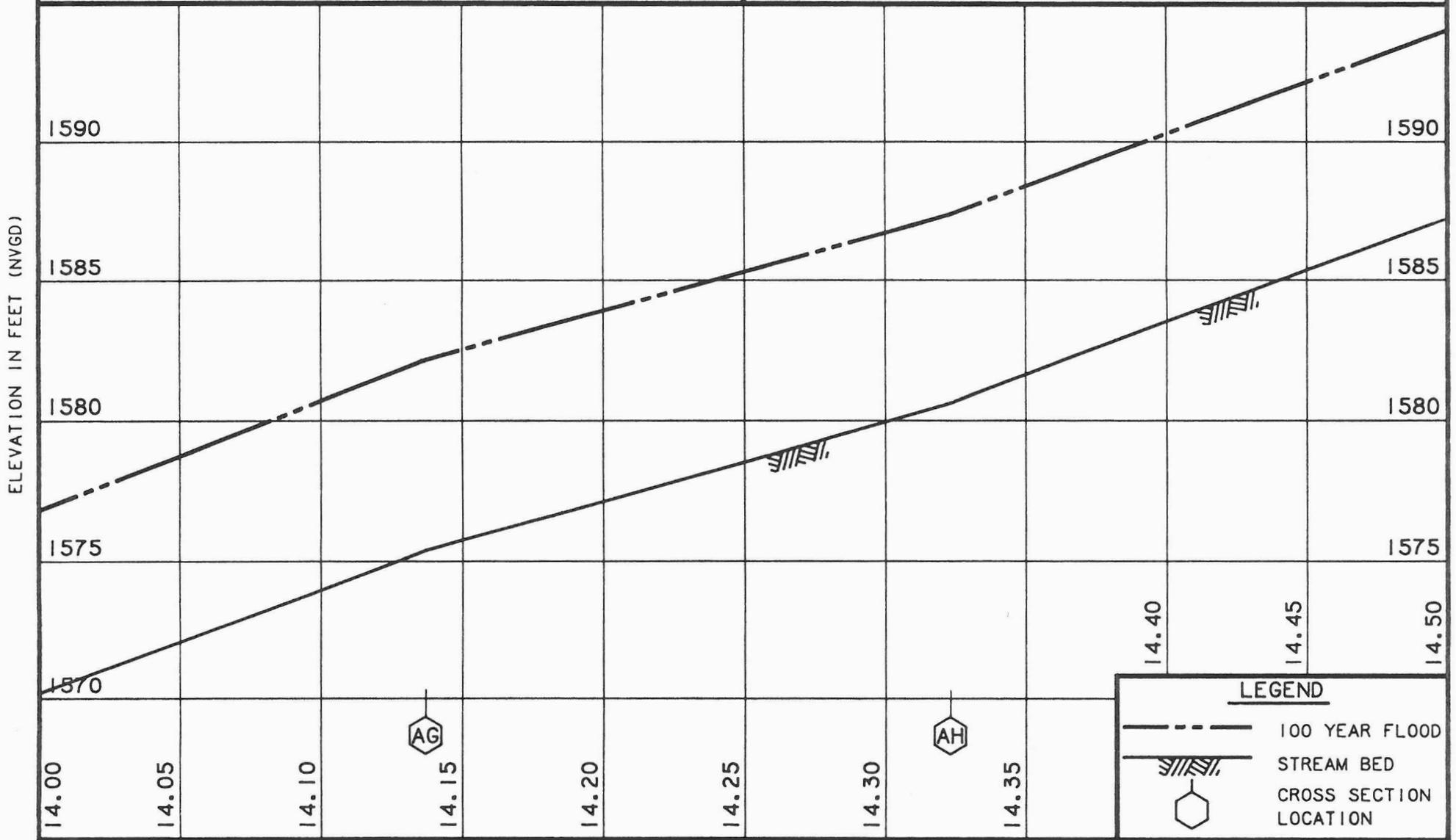
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# FLOOD PROFILES

## JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

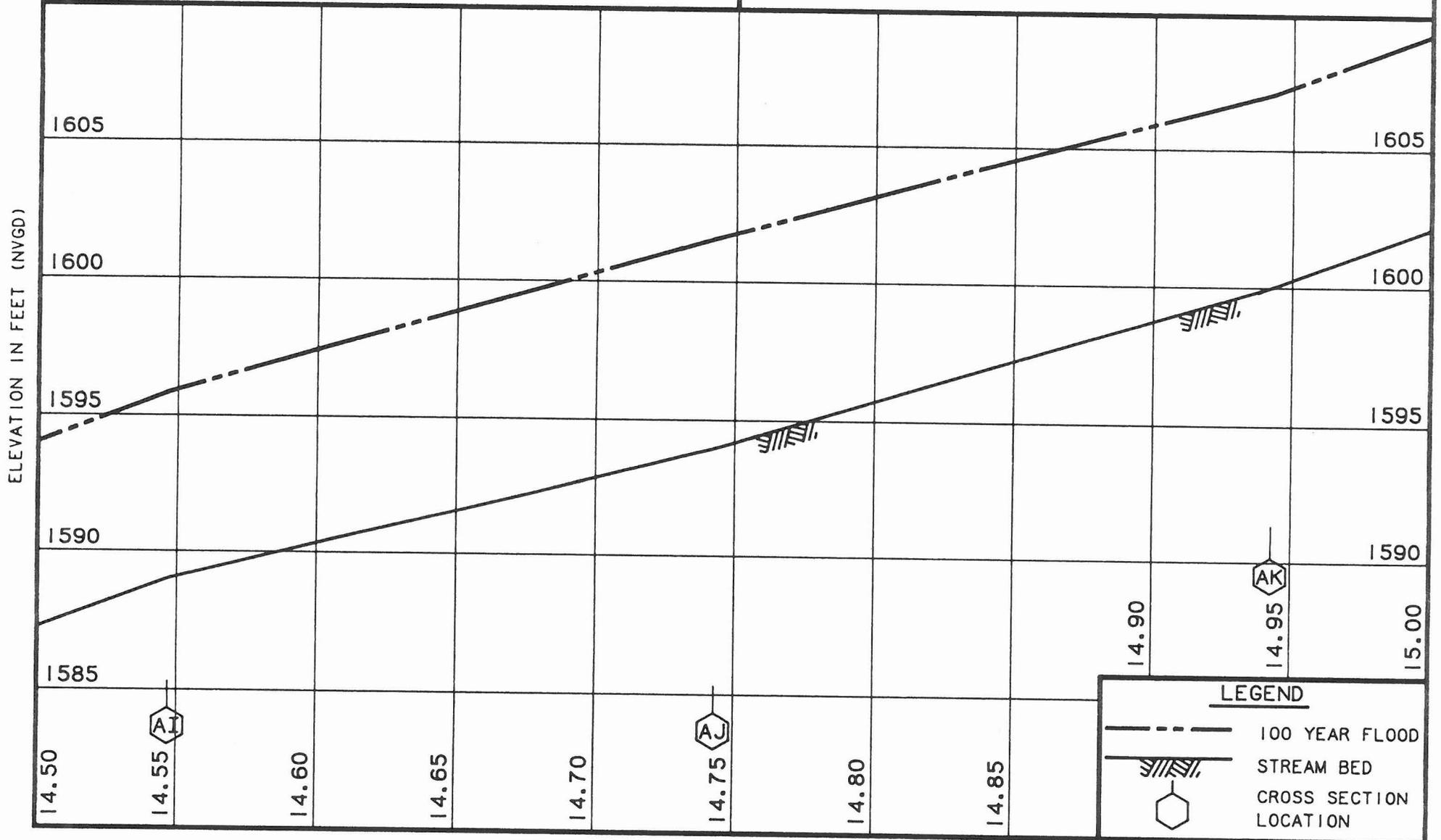
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# FLOOD PROFILES

## JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

### LEGEND

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

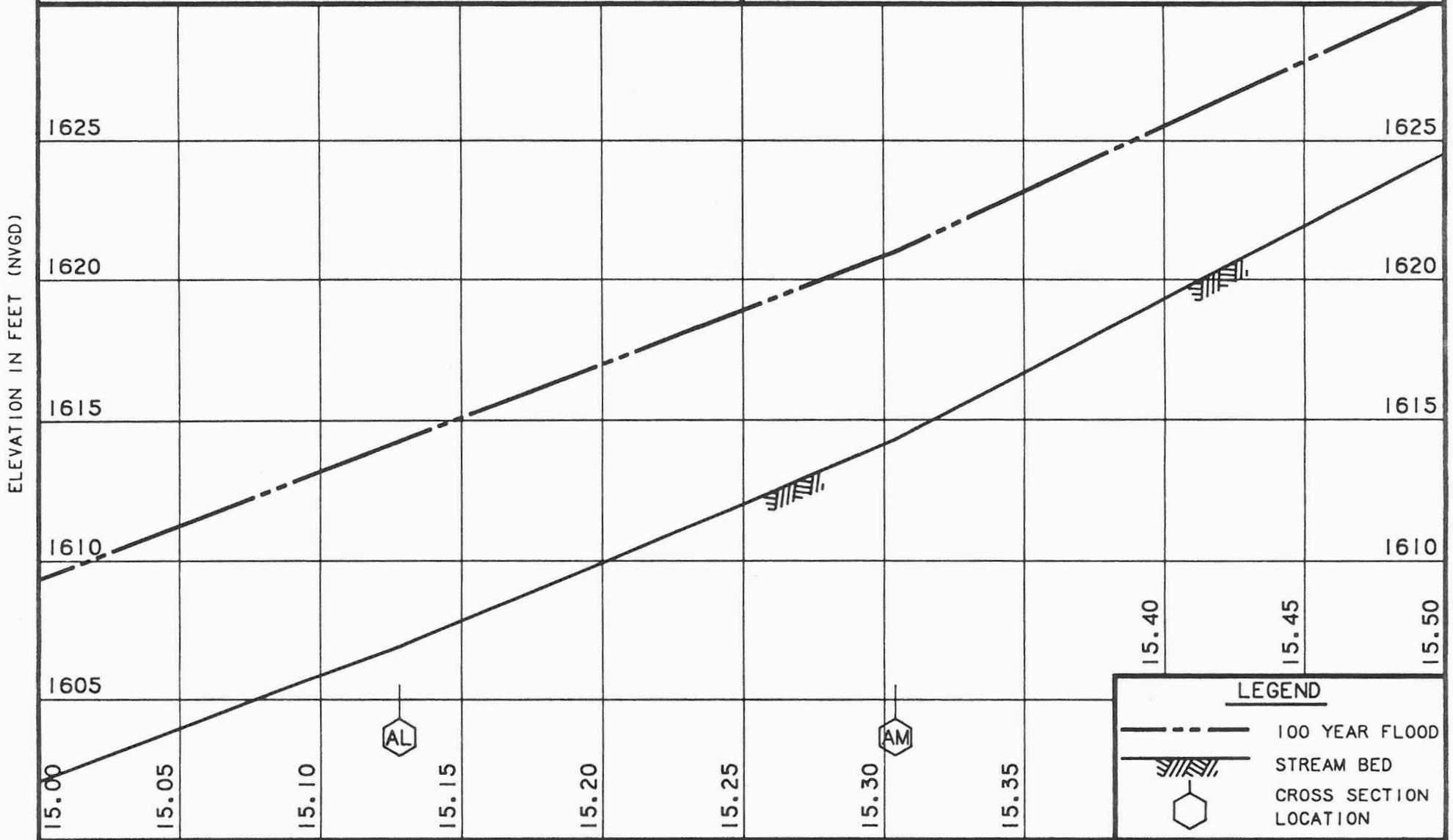
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# FLOOD PROFILES

## JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

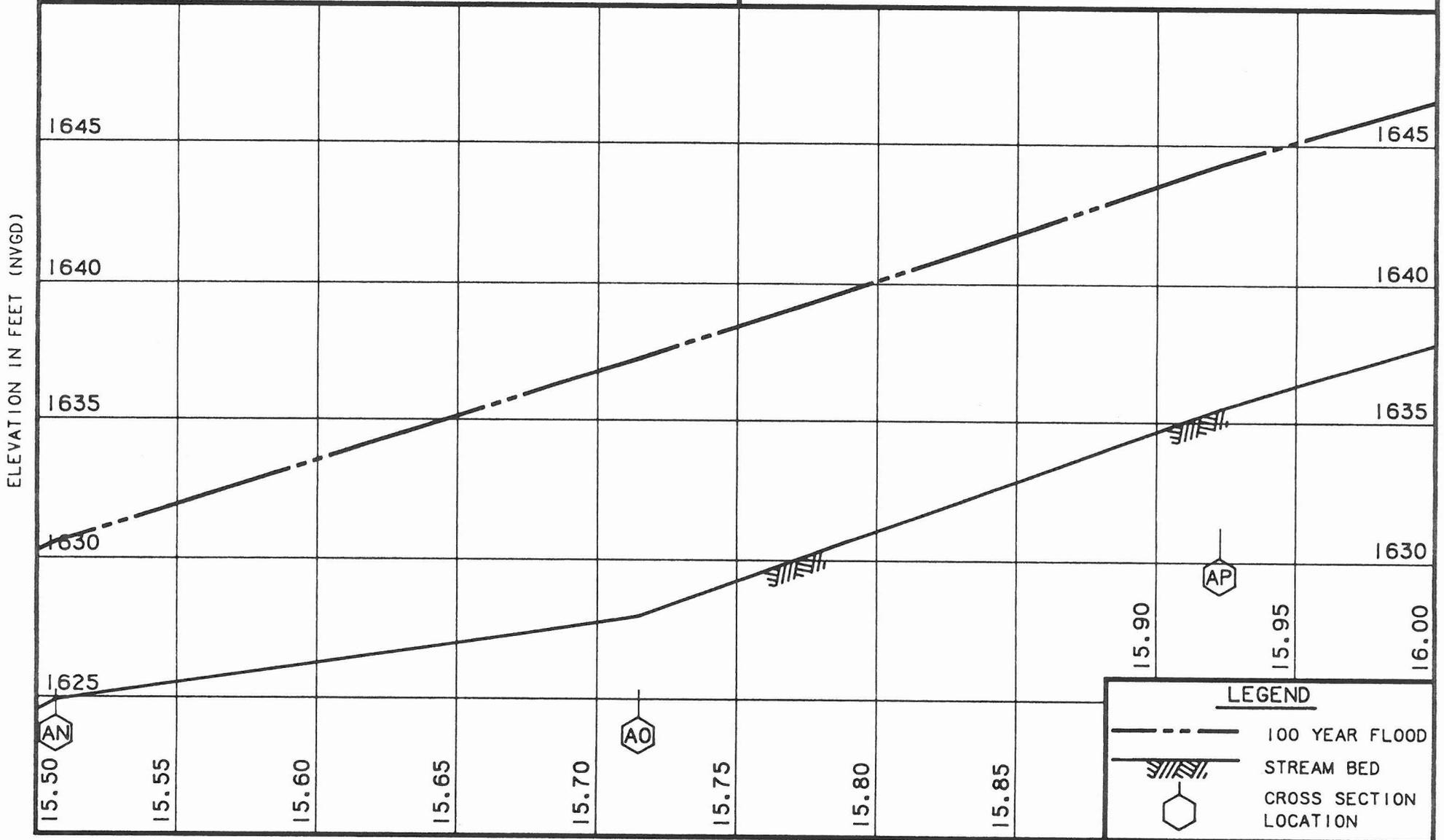
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# FLOOD PROFILES

## JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

### LEGEND

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

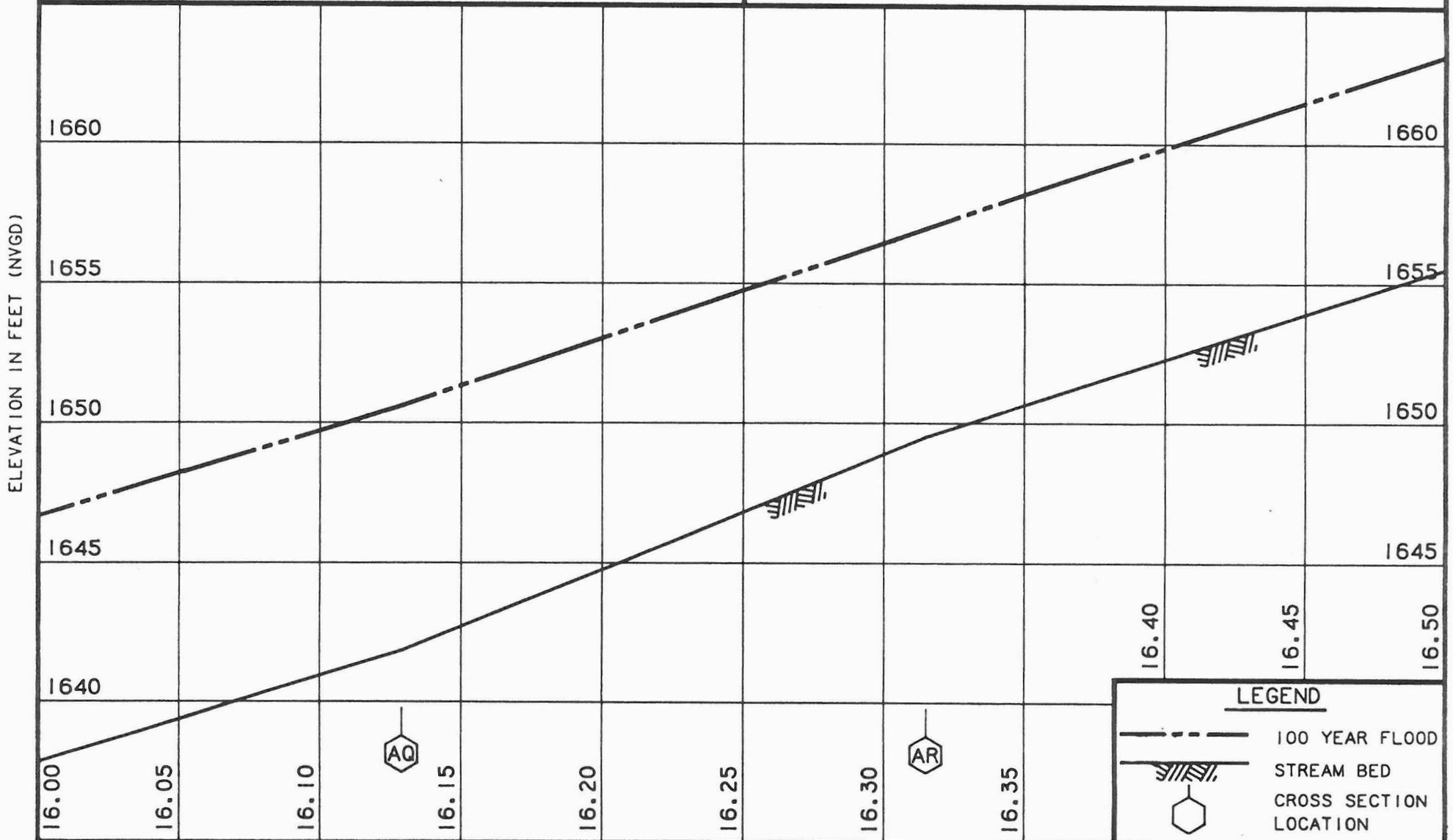
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# FLOOD PROFILES

## JACKRABBIT WASH



ELEVATION IN FEET (NVGD)

DISTANCE IN MILES ABOVE MOUTH

**LEGEND**

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

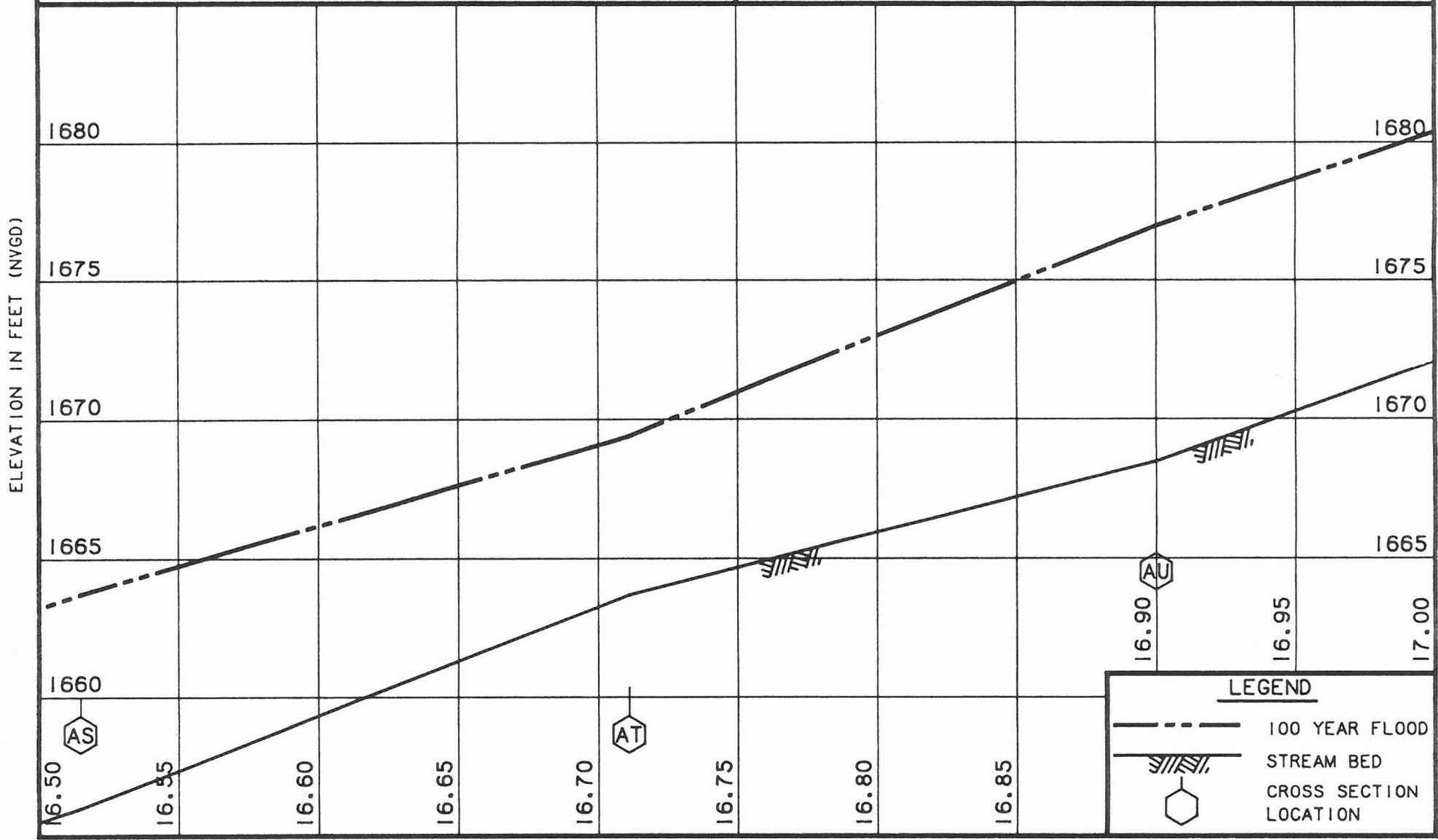
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# FLOOD PROFILES

## JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

### LEGEND

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

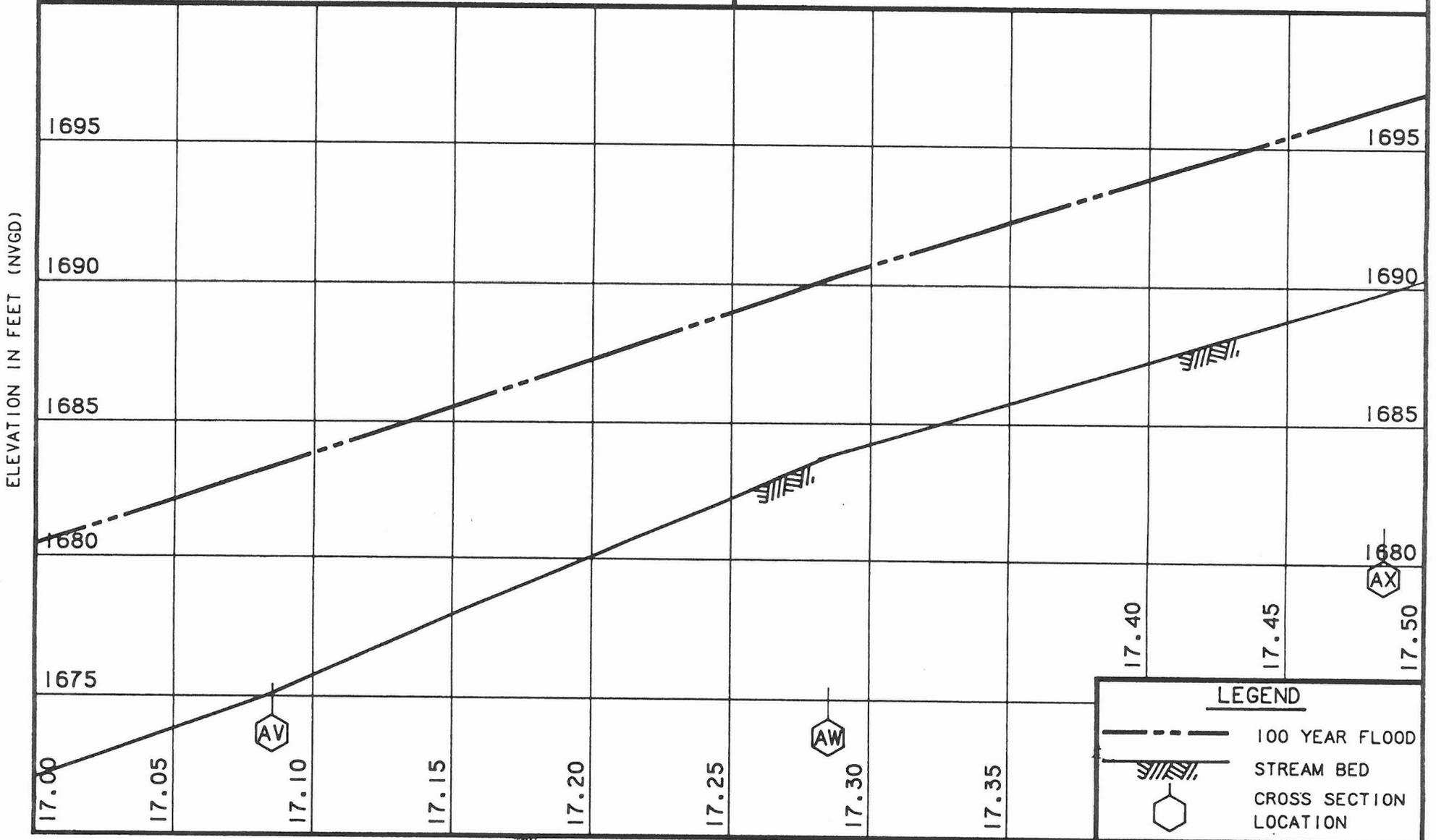
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# FLOOD PROFILES

## JACKRABBIT WASH



ELEVATION IN FEET (NVGD)

DISTANCE IN MILES ABOVE MOUTH

### LEGEND

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

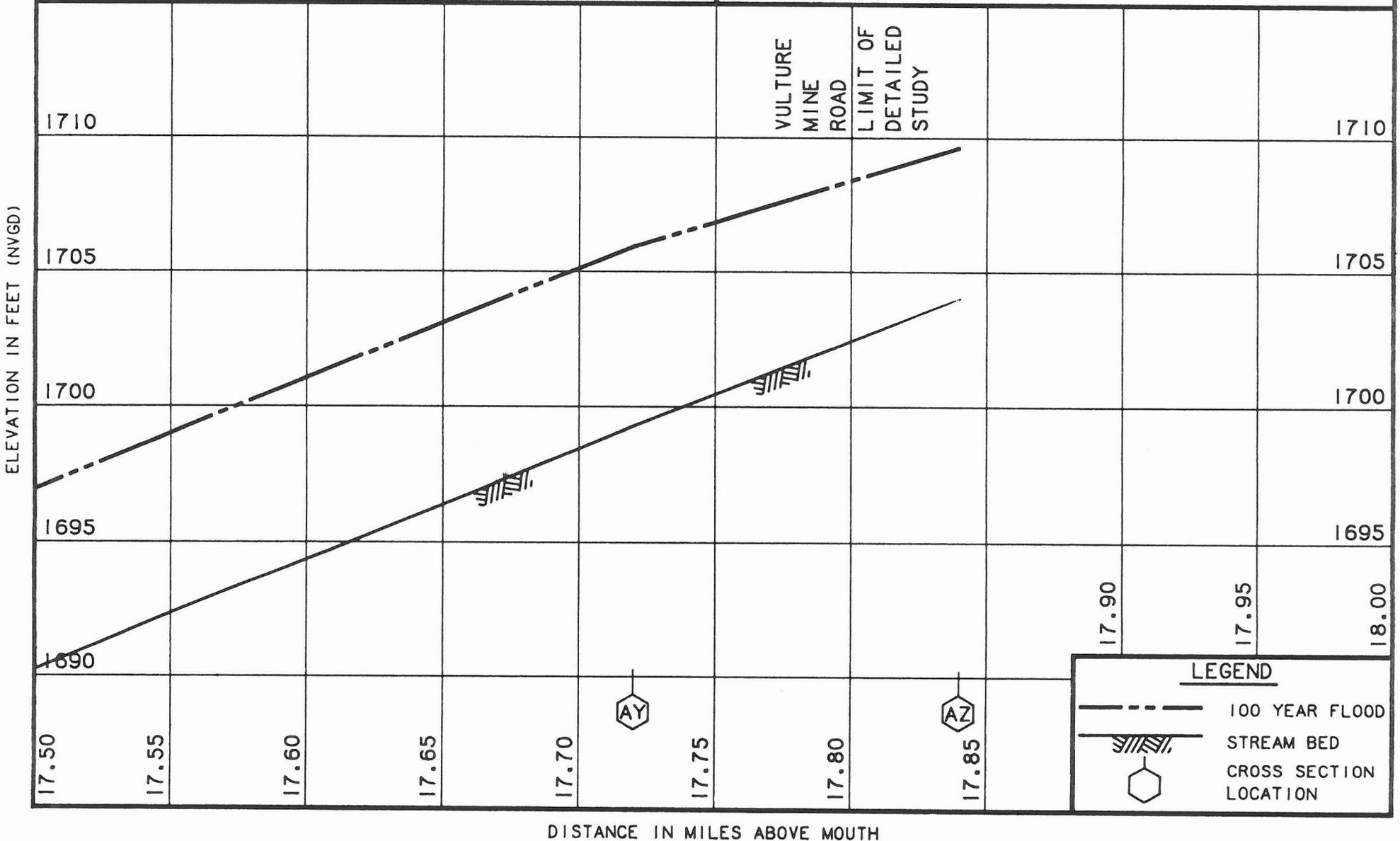
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# FLOOD PROFILES

## JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

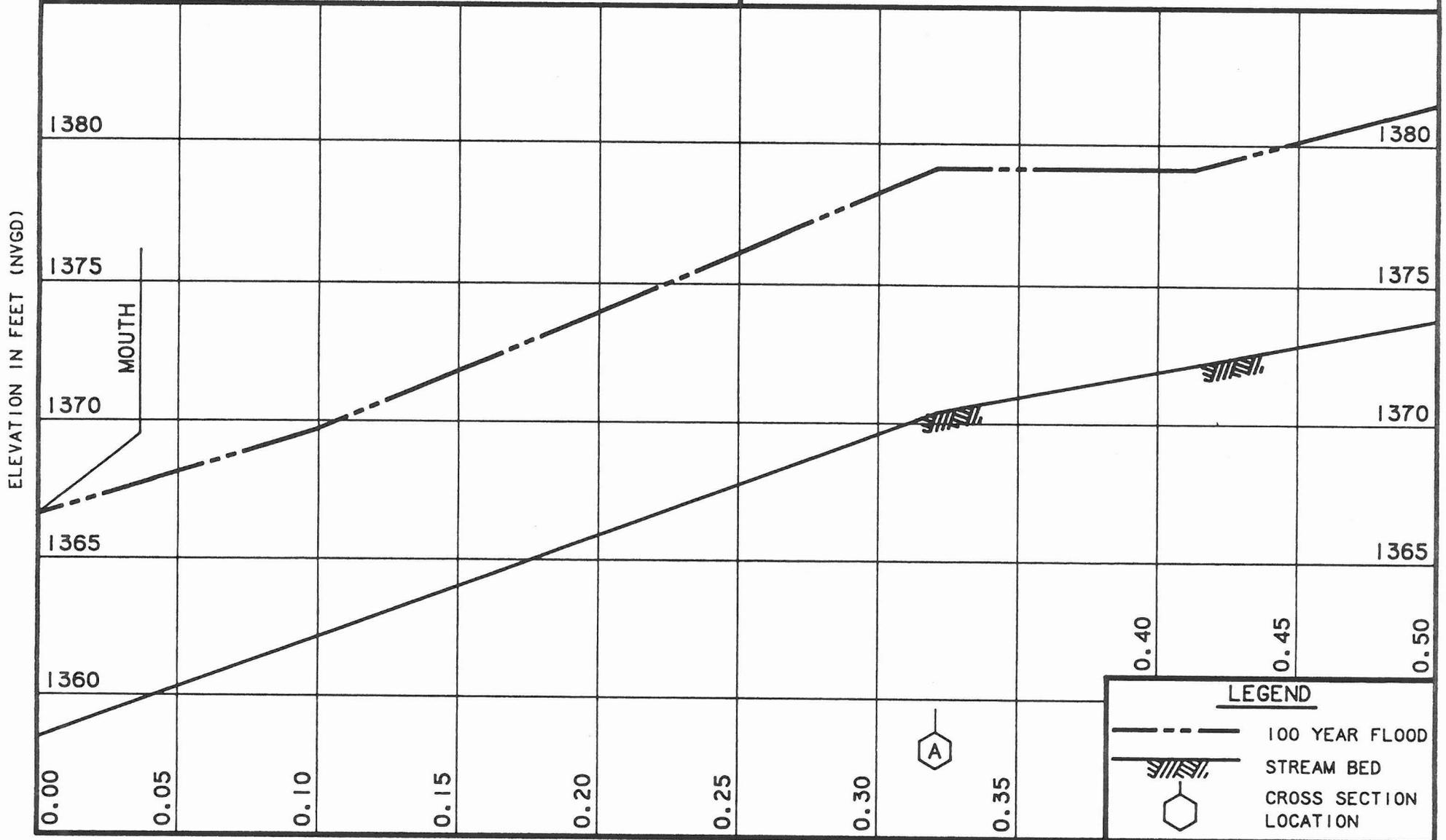
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# FLOOD PROFILES

## STAR WASH



DISTANCE IN MILES ABOVE MOUTH

### LEGEND

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

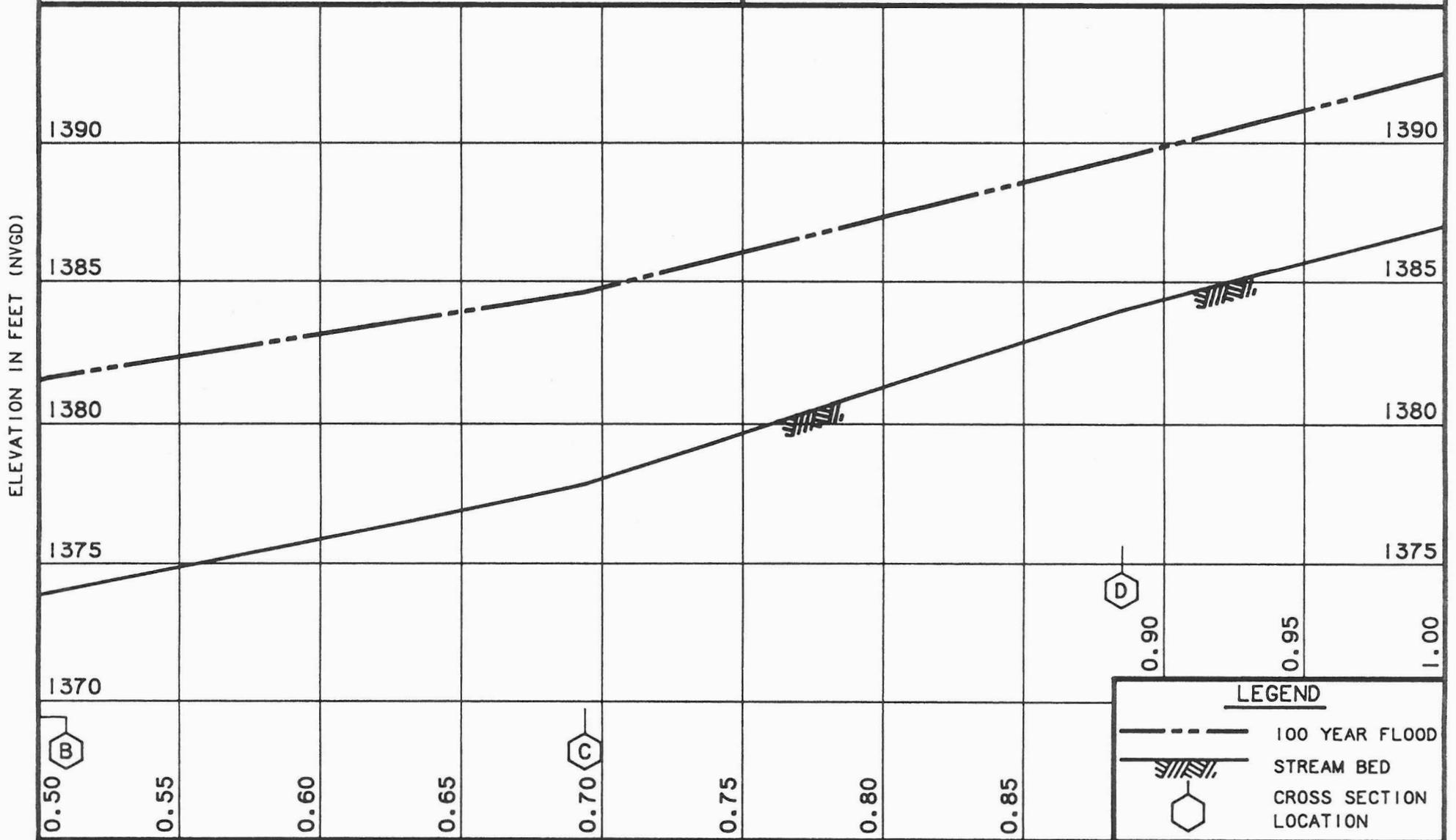
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# FLOOD PROFILES

## STAR WASH



ELEVATION IN FEET (NVGD)

DISTANCE IN MILES ABOVE MOUTH

### LEGEND

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

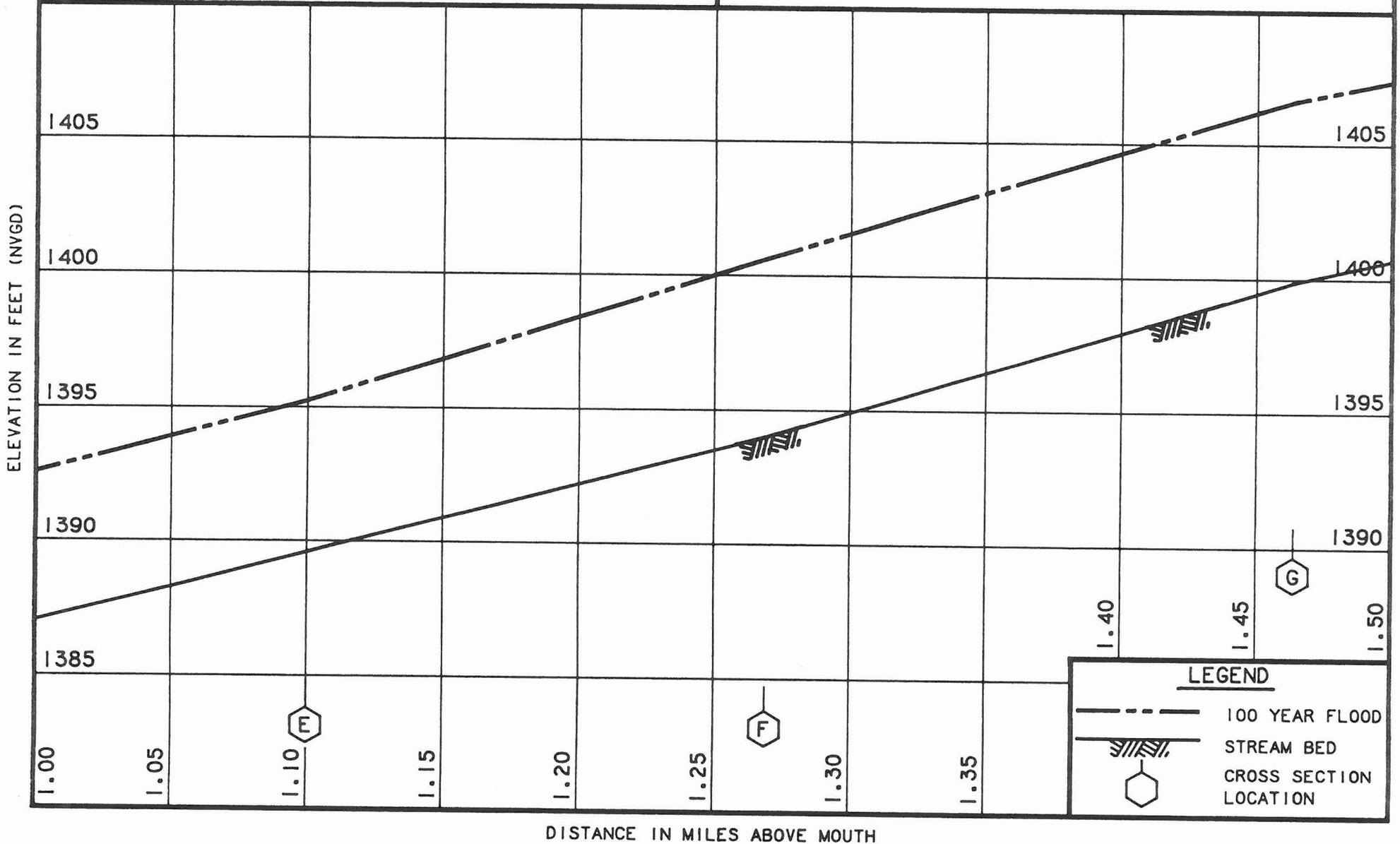
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**Engineers and Architects**



# FLOOD PROFILES

## STAR WASH



DISTANCE IN MILES ABOVE MOUTH

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

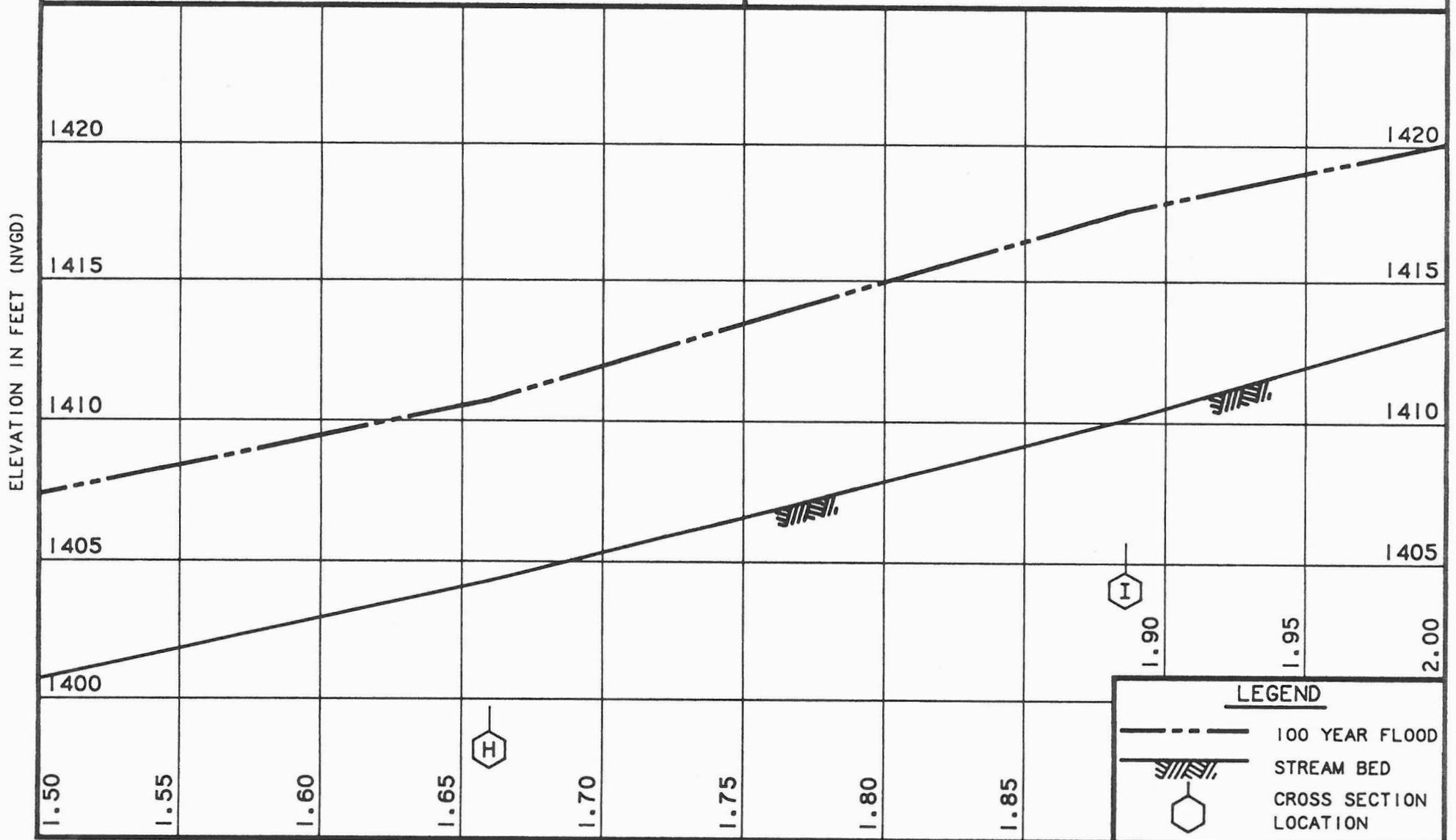
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# FLOOD PROFILES

## STAR WASH



DISTANCE IN MILES ABOVE MOUTH

### LEGEND

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

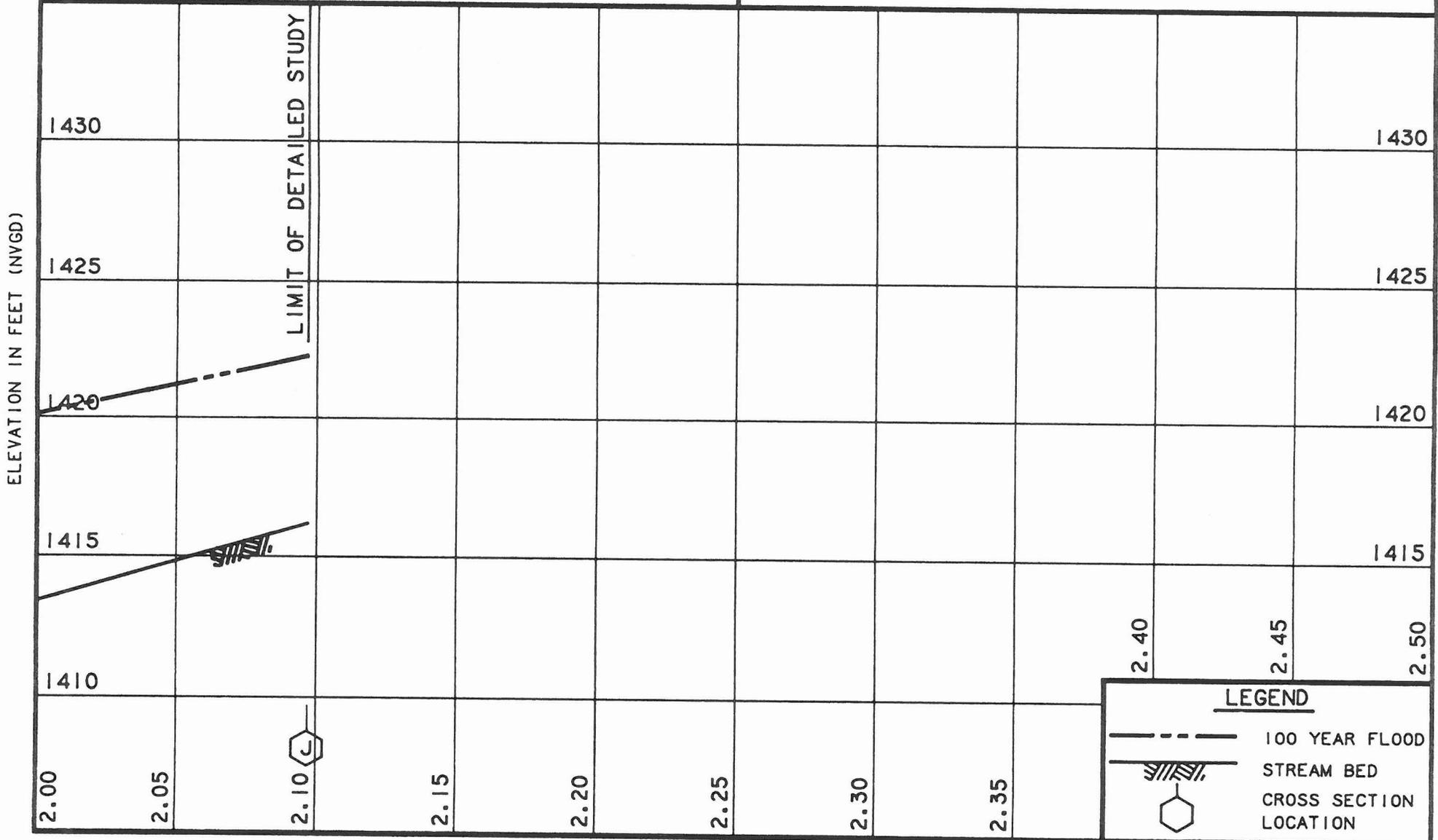
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**Engineers and Architects**



# FLOOD PROFILES

## STAR WASH



ELEVATION IN FEET (NVGD)

LIMIT OF DETAILED STUDY

### LEGEND

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

DISTANCE IN MILES ABOVE MOUTH

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

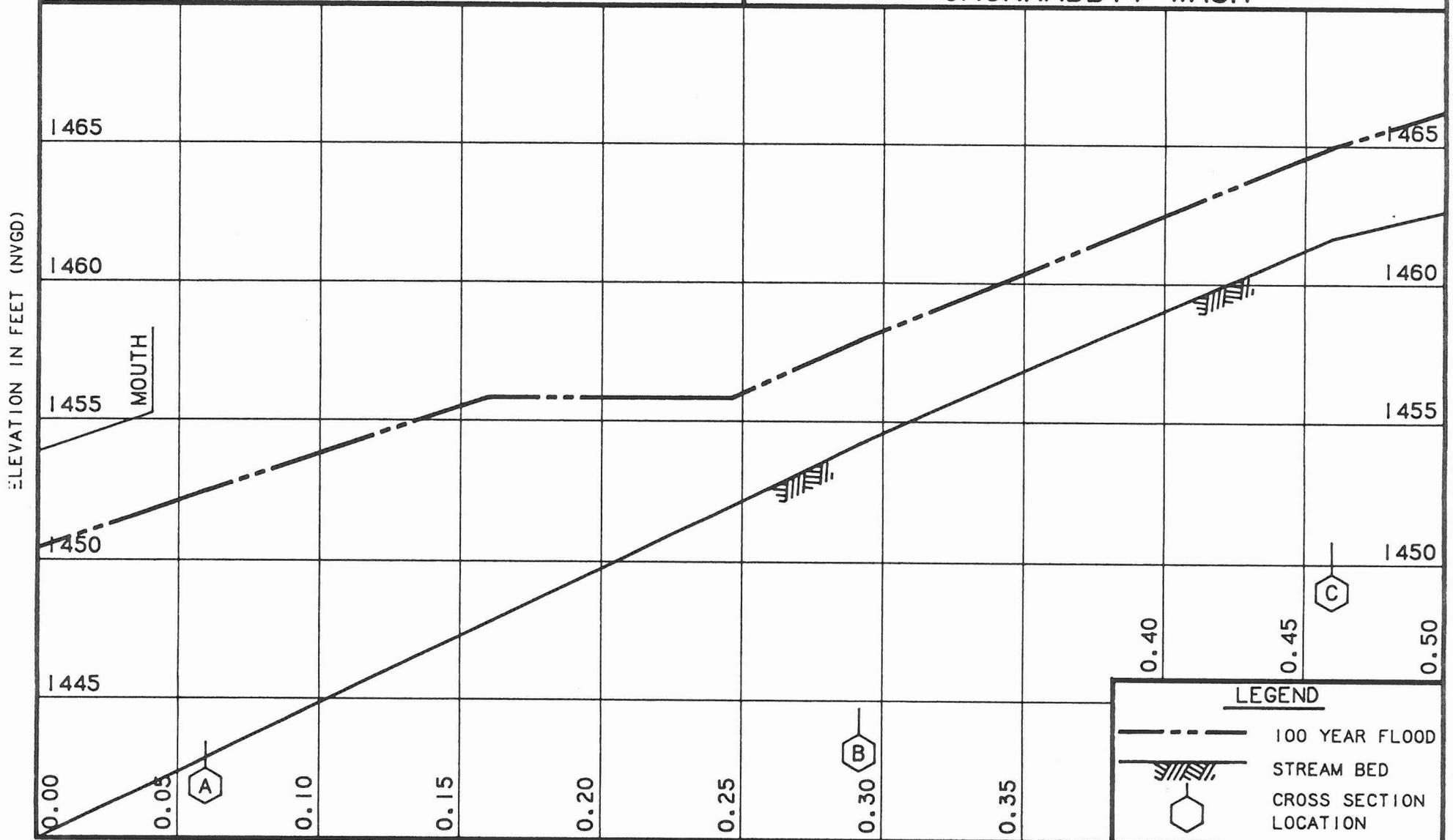
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**Engineers and Architects**



# FLOOD PROFILES

## UNNAMED TRIBUTARY OF JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

**LEGEND**

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

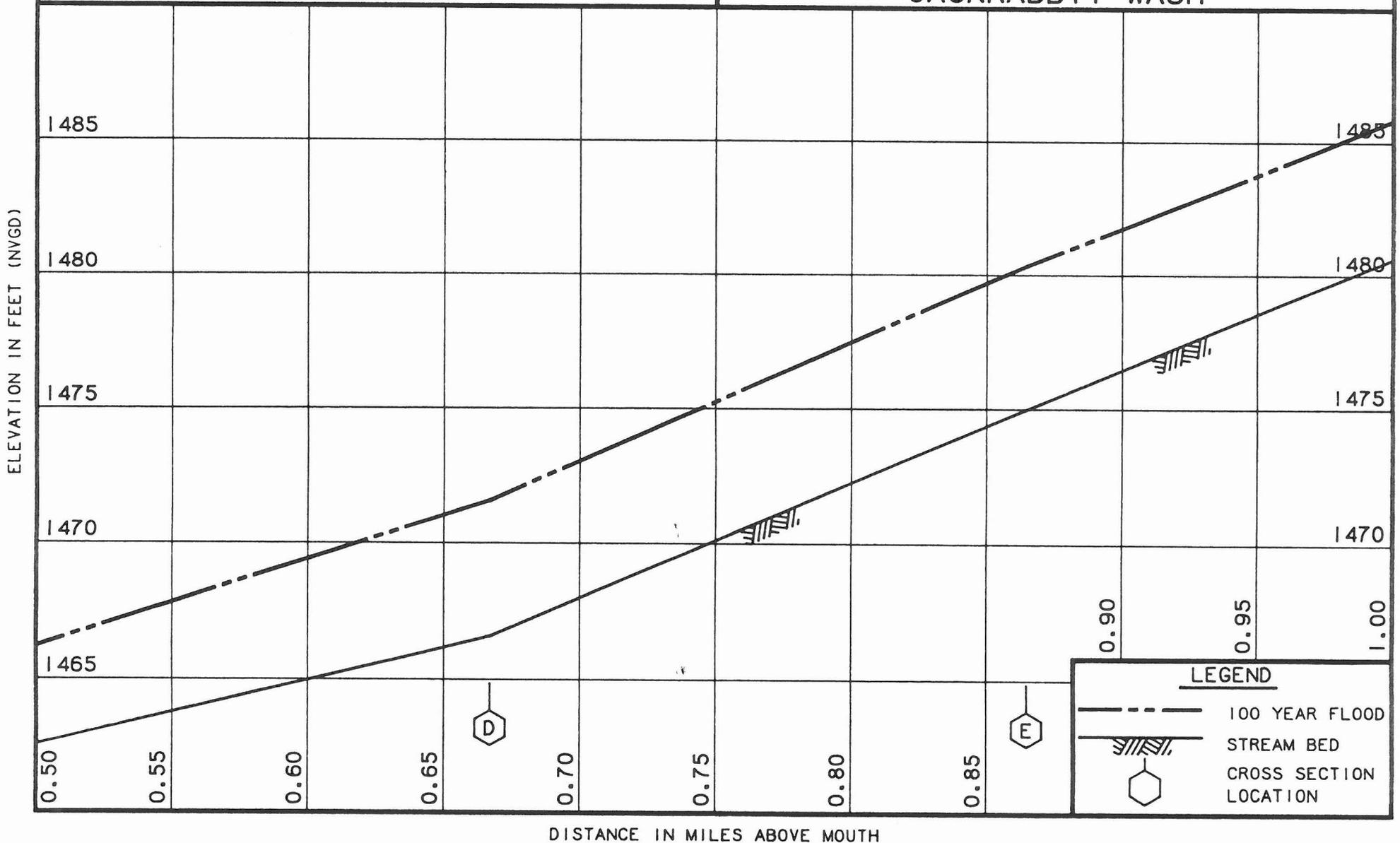
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**Engineers and Architects**



# FLOOD PROFILES

## UNNAMED TRIBUTARY OF JACKRABBIT WASH



**LEGEND**

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

DISTANCE IN MILES ABOVE MOUTH

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

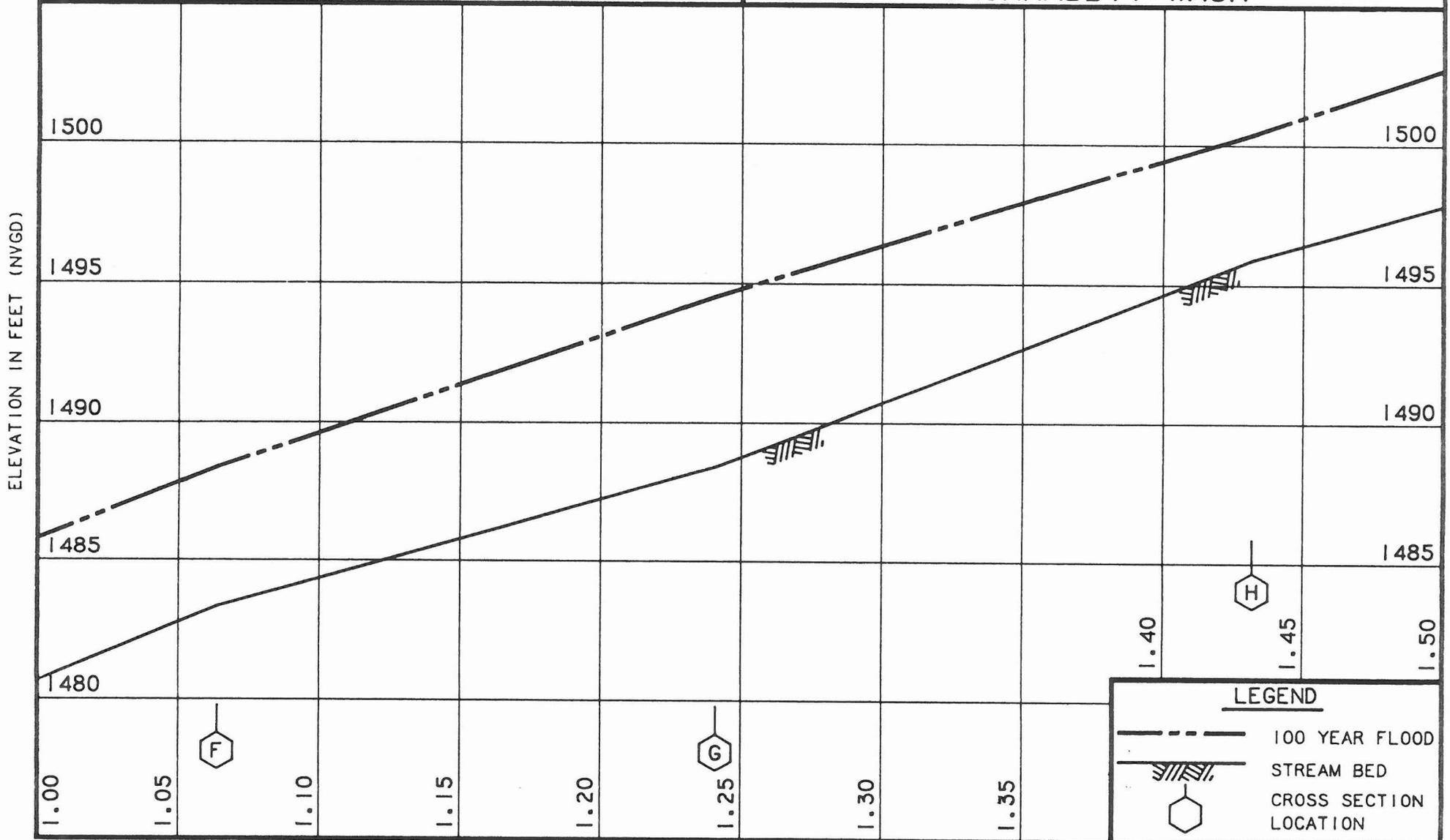
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**Engineers and Architects**



# FLOOD PROFILES

## UNNAMED TRIBUTARY OF JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

### LEGEND

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

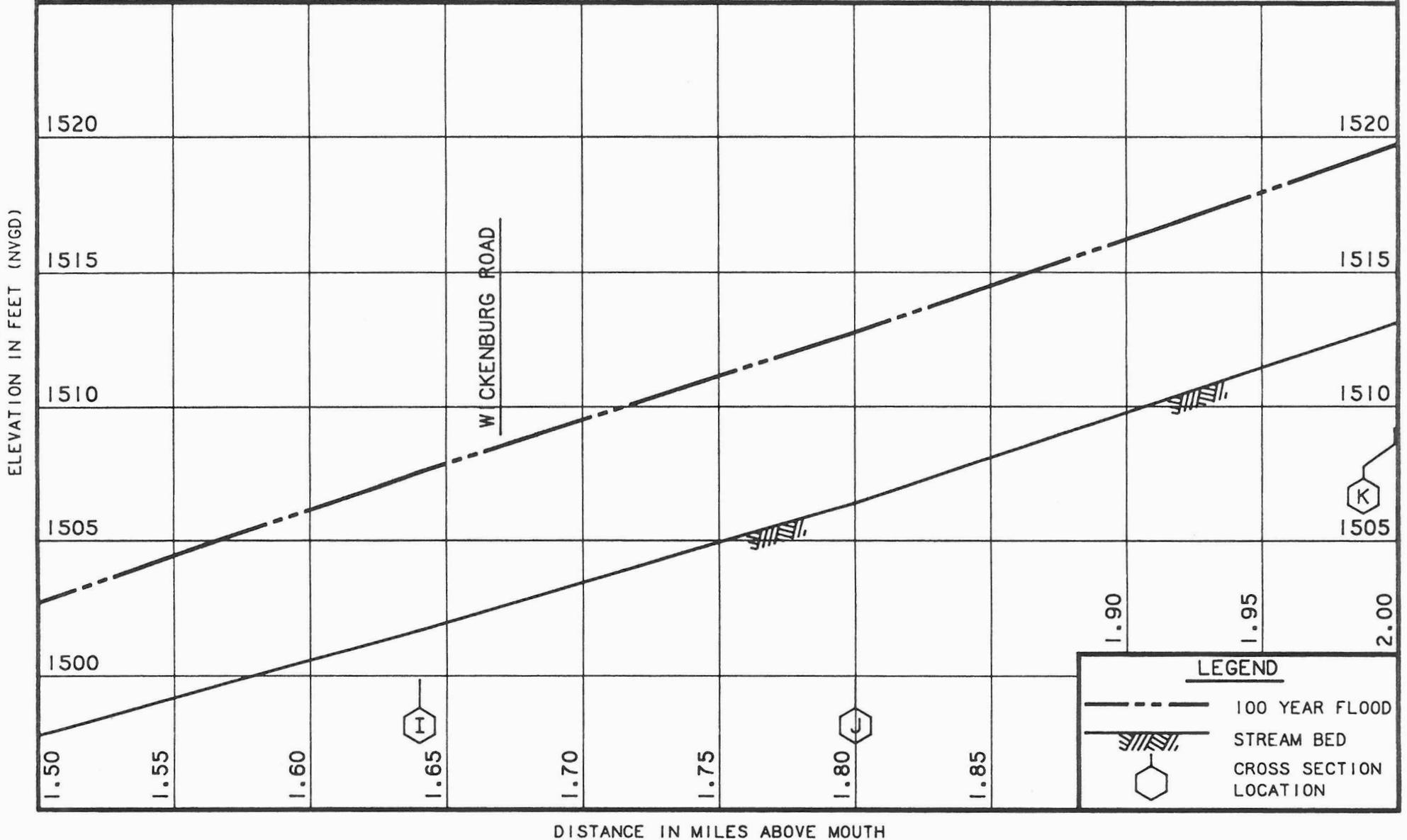
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**Engineers and Architects**



# FLOOD PROFILES

## UNNAMED TRIBUTARY OF JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

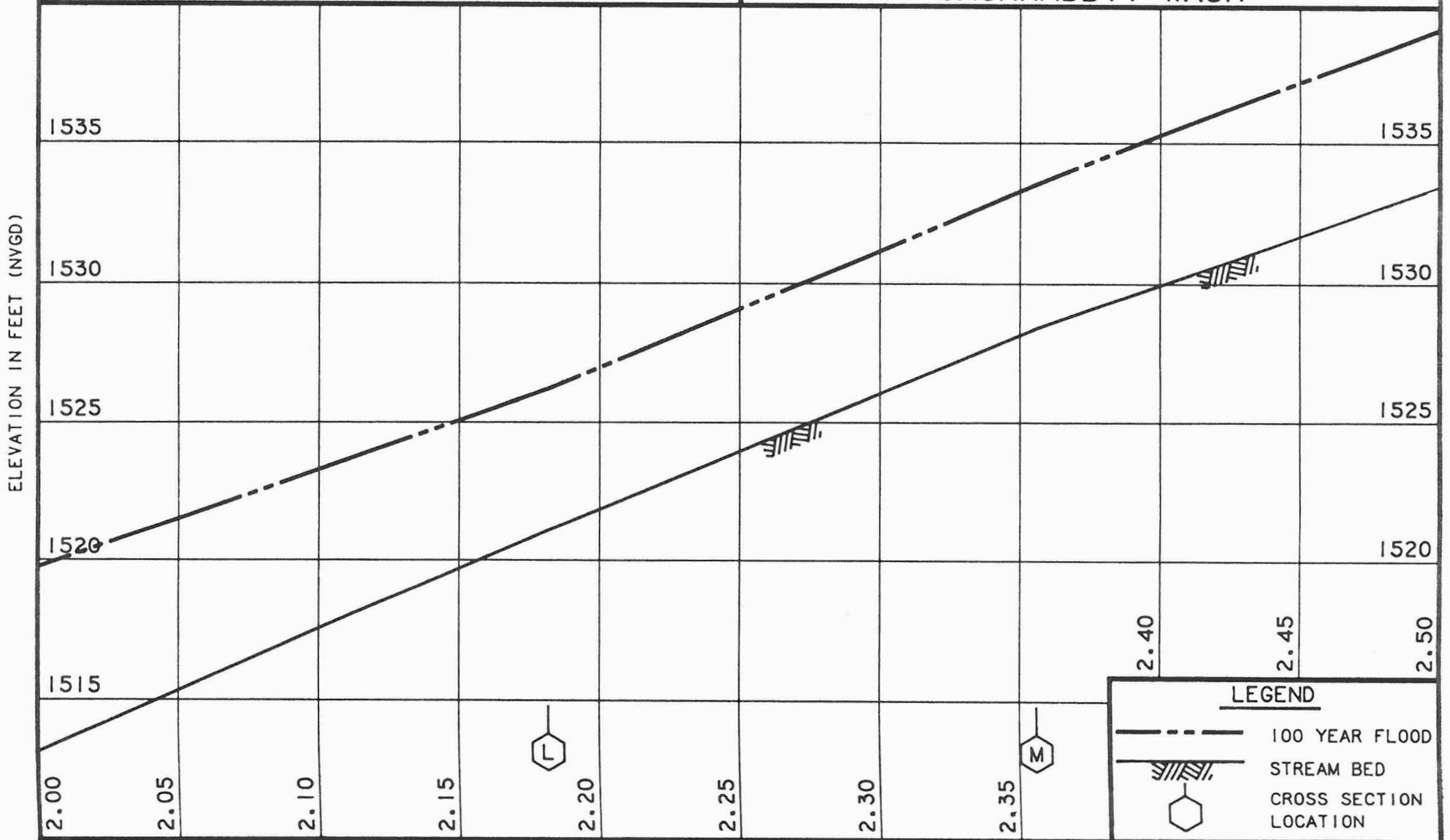
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**Engineers and Architects**



# FLOOD PROFILES

## UNNAMED TRIBUTARY OF JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

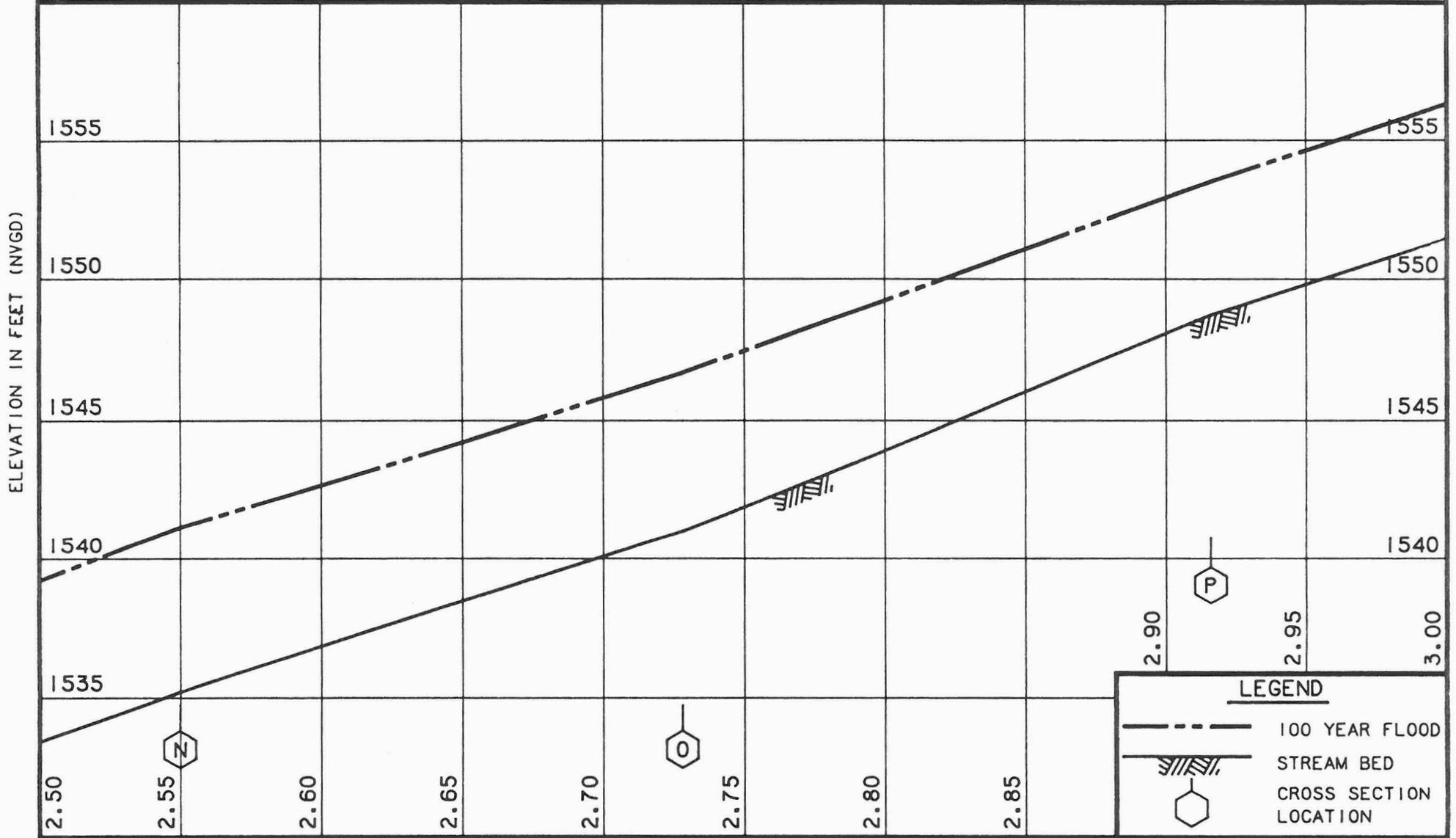
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**Engineers and Architects**



# FLOOD PROFILES

## UNNAMED TRIBUTARY OF JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

### LEGEND

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

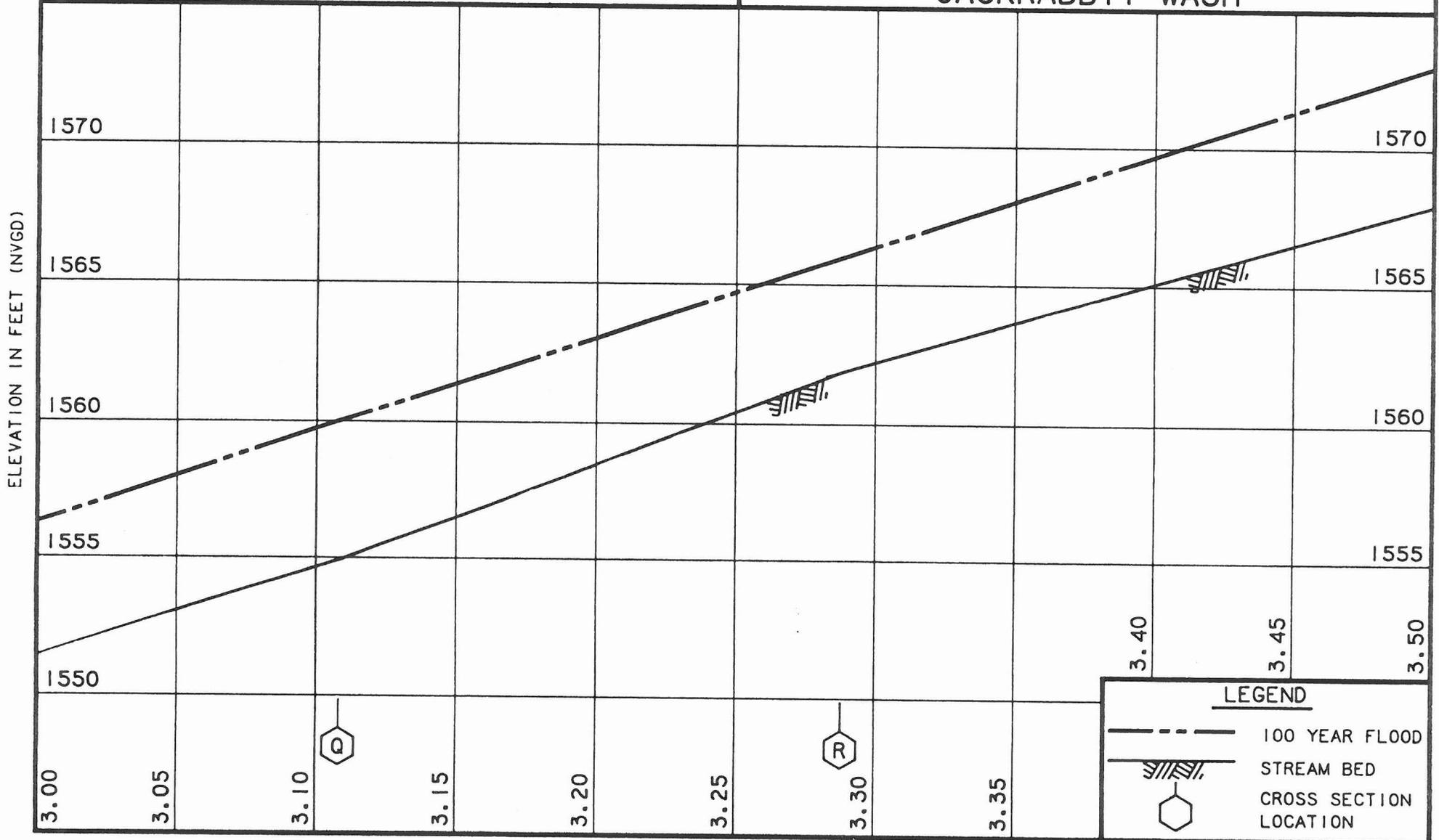
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**Engineers and Architects**



# FLOOD PROFILES

## UNNAMED TRIBUTARY OF JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

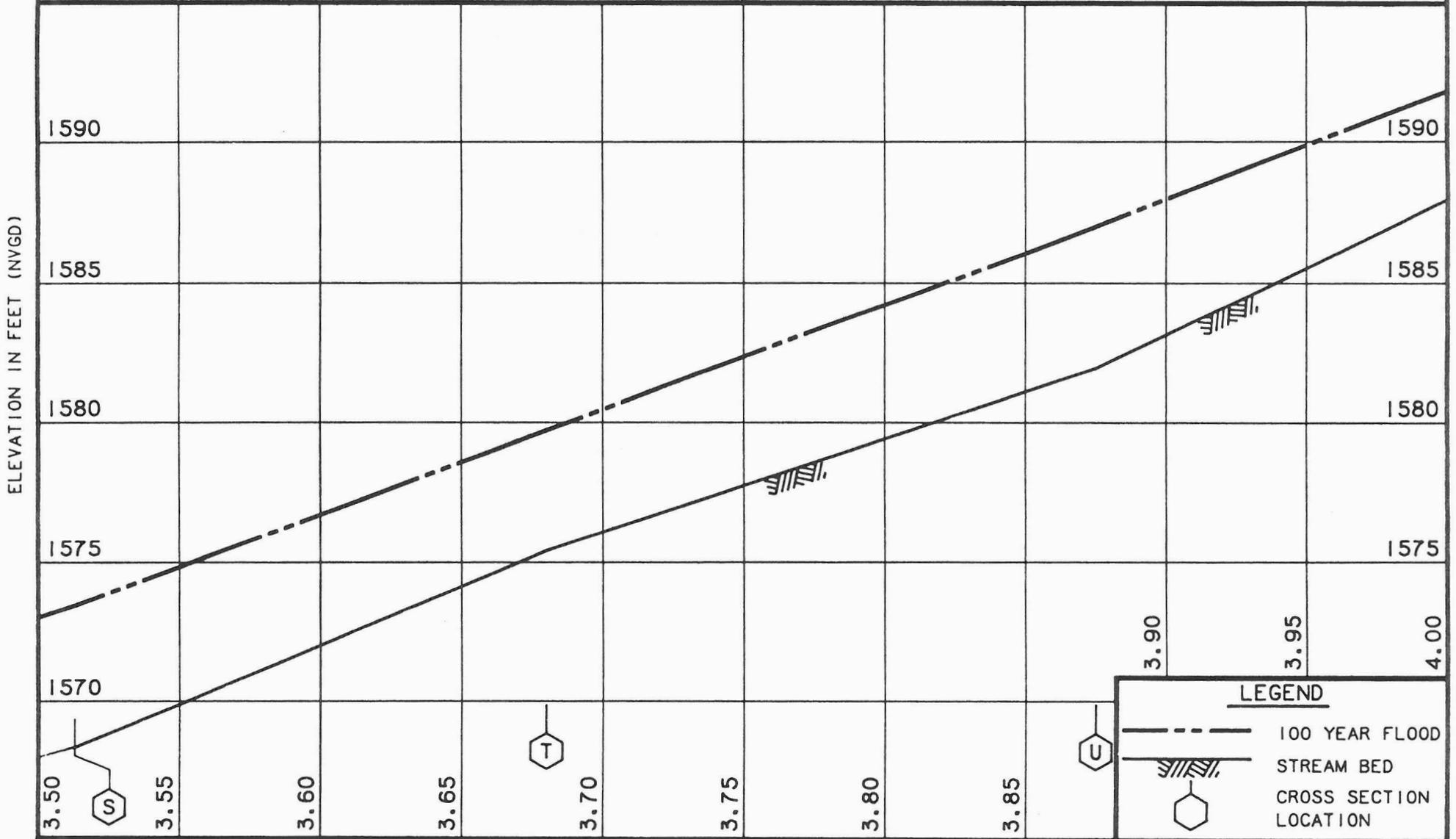
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**Engineers and Architects**



# FLOOD PROFILES

## UNNAMED TRIBUTARY OF JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

### LEGEND

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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# FLOOD PROFILES

## UNNAMED TRIBUTARY OF JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

**Burgess & Niple, Inc.**

**Engineers and Architects**



# FLOOD PROFILES

## UNNAMED TRIBUTARY OF JACKRABBIT WASH



**LEGEND**

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

DISTANCE IN MILES ABOVE MOUTH

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

**Burgess & Niple, Inc.**

**Engineers and Architects**



# FLOOD PROFILES

## UNNAMED TRIBUTARY OF JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

**LEGEND**

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

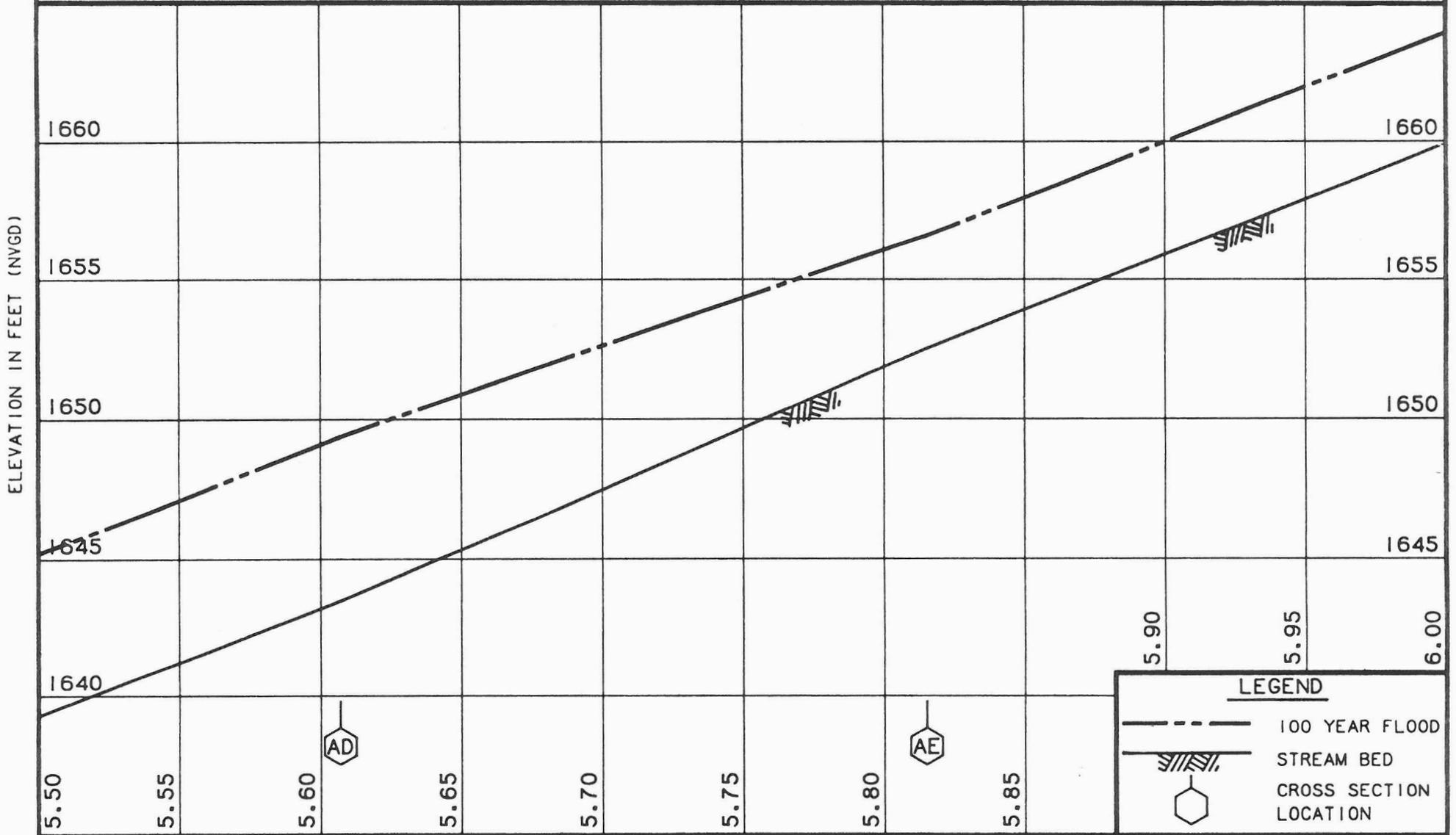
**Burgess & Niple, Inc.**

**Engineers and Architects**



# FLOOD PROFILES

## UNNAMED TRIBUTARY OF JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

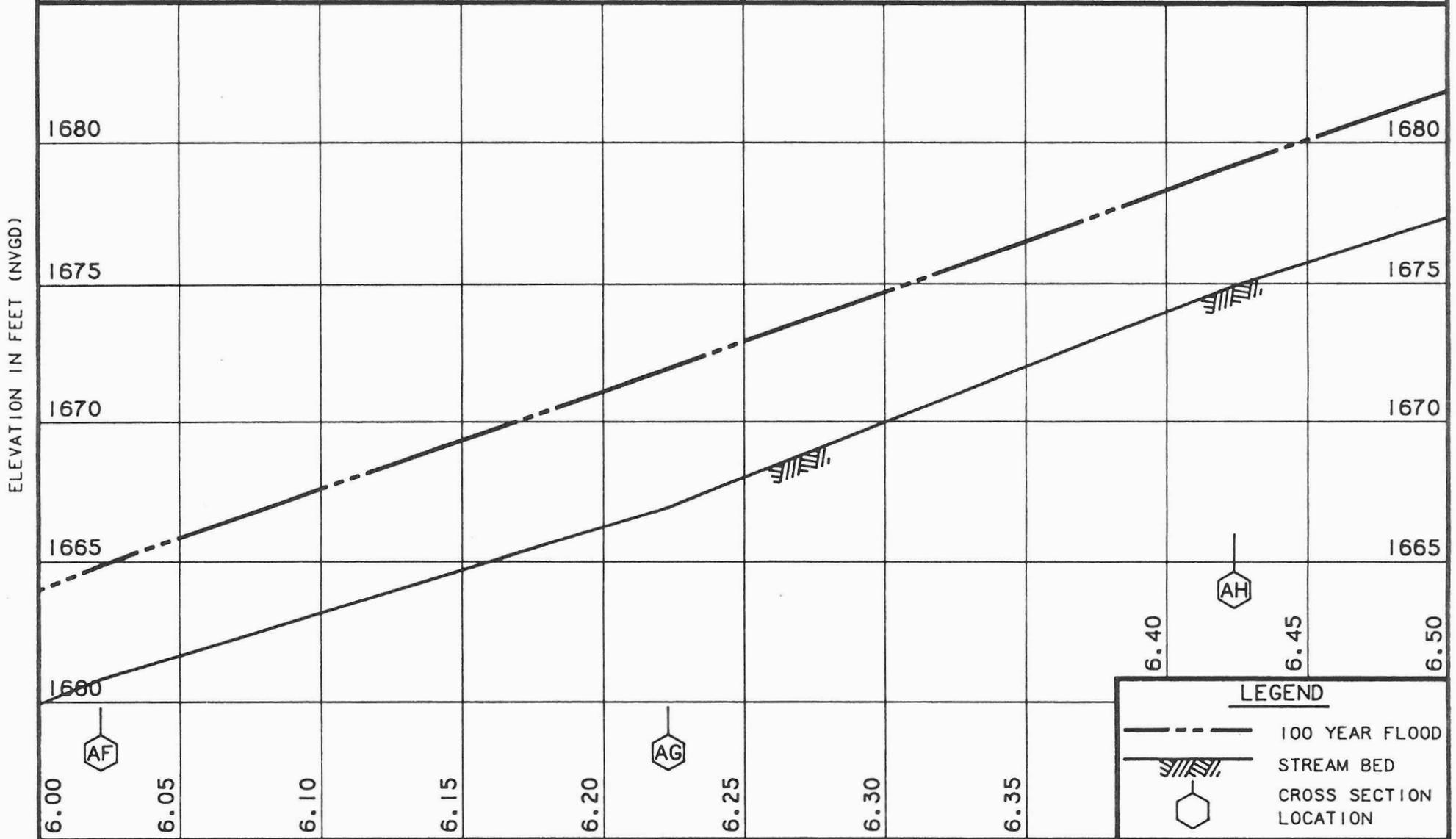
**Burgess & Niple, Inc.**

**Engineers and Architects**



# FLOOD PROFILES

## UNNAMED TRIBUTARY OF JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

### LEGEND

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

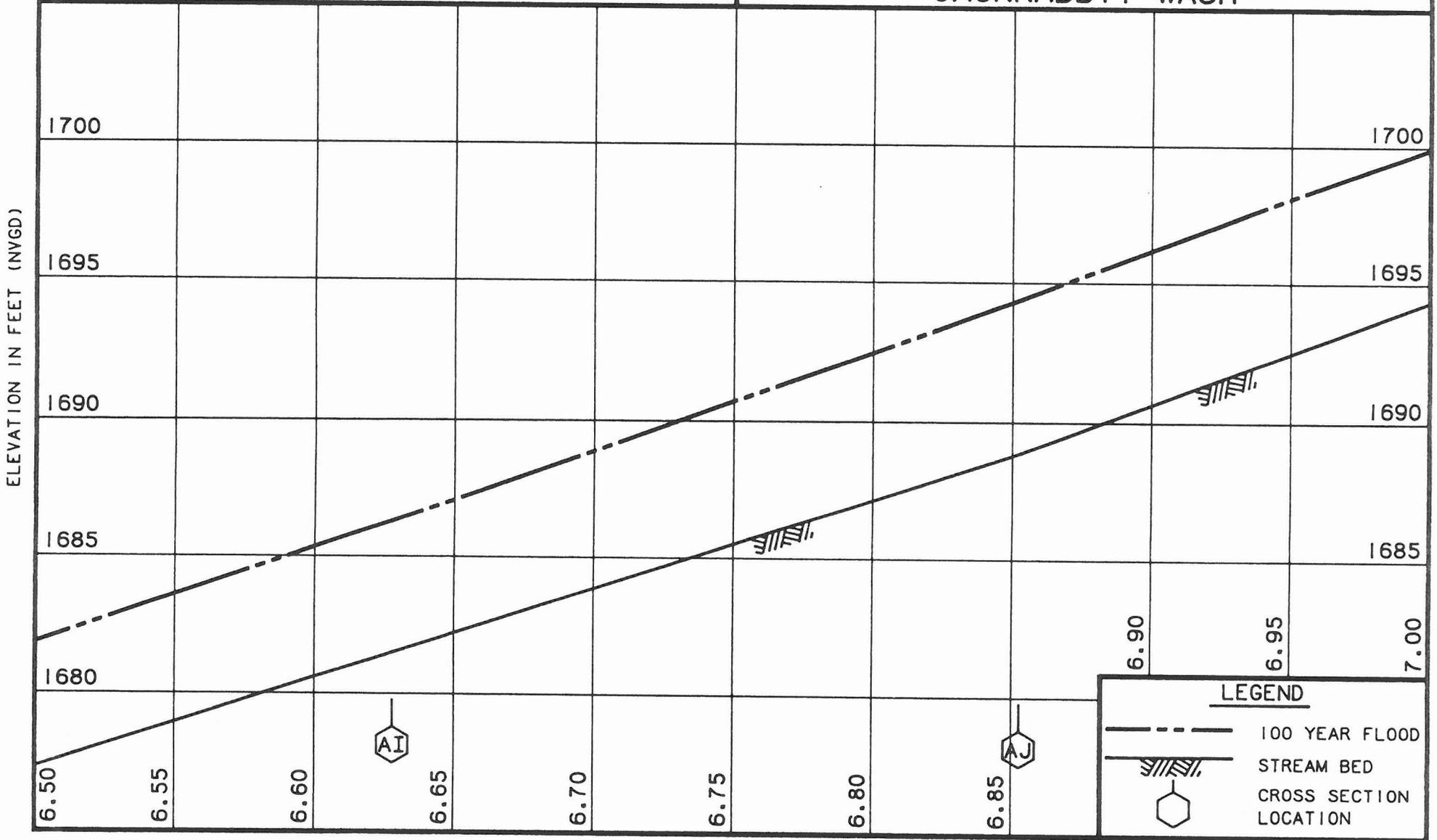
**Burgess & Niple, Inc.**

**Engineers and Architects**



# FLOOD PROFILES

## UNNAMED TRIBUTARY OF JACKRABBIT WASH



DISTANCE IN MILES ABOVE MOUTH

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

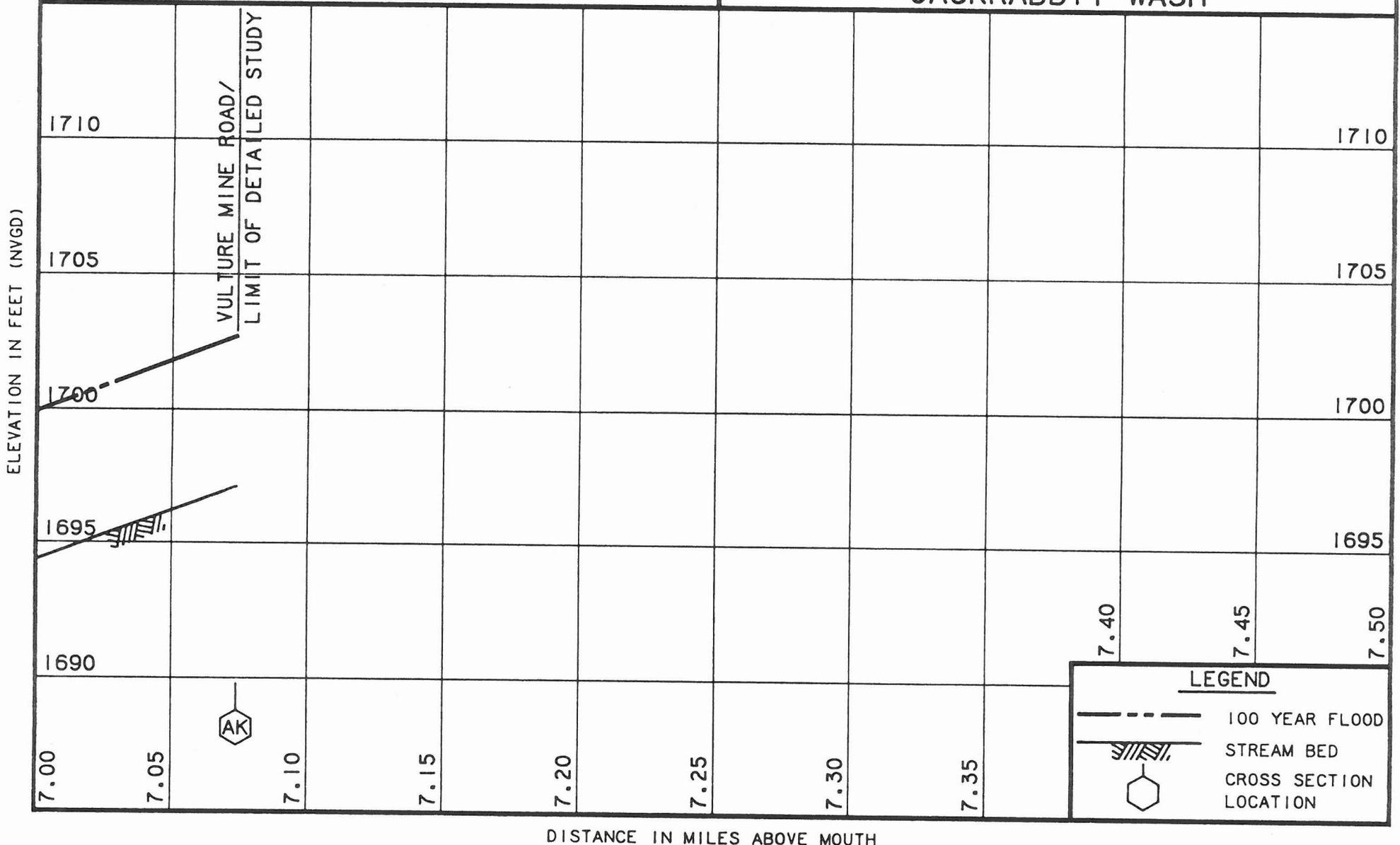
**Burgess & Niple, Inc.**

**Engineers and Architects**



# FLOOD PROFILES

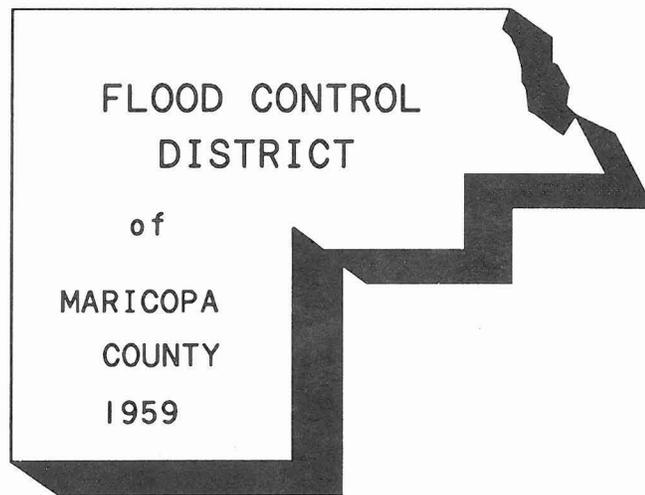
## UNNAMED TRIBUTARY OF JACKRABBIT WASH



**LEGEND**

- 100 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

DISTANCE IN MILES ABOVE MOUTH



**JACKRABBIT WASH  
FLOODPLAIN DELINEATION STUDY**

**FCD 90-05**

**SECTION 1: General Documentation  
and Correspondence**

Community: Maricopa County, Arizona

NFIP Community Number: 040037

County: Maricopa

State: Arizona

Date Study Accepted by FEMA: Pending

Study Contractor: Burgess & Niple, Inc.

Attn: Mr. James E. Mischler, P.E.

5025 East Washington Street, Suite 212

Phoenix, Arizona 85034

(602) 244-8100

FCD Contract 90-05

Subconsultants:

Aerial Mapping Co., Inc.

McKuen Global Positioning Systems, Inc.

FEMA Technical Reviewer: Pending

FEMA Regional Reviewer: Pending

State Reviewer: Mr. James R. Morris, P.E.

(602) 542-1541

Local Reviewer: Mr. Pedro Calza

(602) 262-1501

River of Stream Name:

\*Jackrabbit Wash

\*Star Wash

\*Unnamed Tributary of Jackrabbit Wash

\*CAP Canal Ponding Areas

Reach Description: The following areas are included on FIRM panel numbers 1050, 1075, and 1525.

\* Jackrabbit Wash, CAP Canal to Vulture Mine Road (approximately 10.0 miles)

\* Star Wash, confluence with Jackrabbit Wash to high voltage power lines  
(approximately 2.1 miles)

- \* Unnamed Tributary of Jackrabbit Wash, Confluence with Jackrabbit Wash to Vulture Mine Road (Approximately 7.1 miles)
- \* CAP Canal Ponding Areas, Reach 7 structures CAP-1 to CAP-11.

**Study Type: Jackrabbit Wash, Star Wash, Unnamed Tributary of Jackrabbit Wash - Detailed riverine using HEC-2 CAP Canal Ponding Areas - Approximate ponding using HEC-1.**

**SECTION 1: General Documentation  
and Correspondence**

*1.1 Special Problem Reports*

**SECTION 1: General Documentation  
and Correspondence**

*1.2 Contact (Telephone) Reports*

CONVERSATION RECORD

Job No. 10310 Job Name Fackrabbitt Wash Date 2/11/91

By J Mischler Time \_\_\_\_\_

With Roy Dodson, Dodson & Associates

By Telephone  Incoming  Outgoing Telephone No. ( \_\_\_\_\_ ) \_\_\_\_\_

Visit, Site \_\_\_\_\_ City \_\_\_\_\_

Regarding: New HEC-2 not yet available. No date known.  
COE has uncovered new error and is making modification

Conversation Items: \_\_\_\_\_

Our order is on file and will be  
sent as soon as it becomes available.

Action Required: \_\_\_\_\_

Action Taken: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

CONVERSATION RECORD

Job No. 10310 Job Name Jackerabbit Wash Date 9/19/90

By J. Mischler Time \_\_\_\_\_

With Dave Creighton, ADWR

By Telephone  Incoming  Outgoing Telephone No. (\_\_\_\_\_) \_\_\_\_\_

Visit, Site \_\_\_\_\_ City \_\_\_\_\_

Regarding: \_\_\_\_\_

Conversation Items: Sheet 17, Soil Survey maps.

72-73 orthophotos.

Check dams appear. - with extensive  
vegetation - Probably 10-15 yrs old in 72-73

Program started in mid-50's  
Could get date of check dams from BLM.

Action Required: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Action Taken: \_\_\_\_\_

cc: Tom Loomis  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# **SECTION 1: General Documentation and Correspondence**

## ***1.3 Meeting Minutes & Reports***

# Burgess & Niple, Inc.

Engineers and Architects

5025 East Washington Street • Suite 212 • Phoenix, AZ 85034 • (602) 244-8100



## MINUTES OF MEETING

**PROJECT:** FCD 90-05; Jackrabbit Wash Floodplain Delineation  
**SUBJECT:** Meeting No. 1  
**DATE:** August 24, 1990  
**TIME:** 10:00 AM  
**ATTENDANCE:** Mr. Pedro Calza, MCFCD  
Mr. Amir Motamedi, MCFCD  
Mr. Tom Loomis, B&N  
Mr. James Mischler, B&N

**NOTE:** If this discussion does not reflect your understanding of the subject matter covered in the meeting, please notify the preparer.

The primary purpose of this meeting was to review preliminary subbasin delineations prior to the field hydrology efforts.

1. Mr. Motamedi was satisfied with the subbasin delineations as presented in the meeting. It was noted that an additional subbasin break is needed for floodplain delineation of the unnamed tributary to Jackrabbit Wash.
2. Mr. Calza noted that Joe Tram had suggested a conservative hydrologic approach for ponding behind the CAP dike which is above the structural section but below the spoil elevation. The method would involve an additional HEC-1 analysis to find the most conservative result upstream and downstream with and without a breach in the dike. Mr. Mischler expressed concern that an assumption of dike failure as soon as the structural height was exceeded but before the spoil was overtopped could be overly conservative. Burgess & Niple will proceed with a single HEC-1 model to determine if the aforementioned condition will occur, at which time potential solutions will be discussed in more detail.
3. Mr. Calza noted that the CAP dike in the Wittman ADMS area has experienced breaches.
4. Mr. Loomis will begin hydrology field work on September 4. A field trip for District and ADWR personnel was scheduled for September 18. The trip will begin at the District office at 8:00 AM.

Respectfully Submitted,

*James E Mischler*  
James E. Mischler, P.E.  
BURGESS & NIPLE, INC.

JEM:sk

cc: Attendees

# Burgess & Niple, Inc.

## Engineers and Architects

1106 North Beeline Highway • Payson, AZ 85541 • (602) 474-5313

Fax. (602) 474-3511 • Columbus Fax. (614) 451-1385



### MINUTES OF MEETING

**Project:** FLD 90-05; Jackrabbit Wash Floodplain Delineation

**Subject:** Meeting Number 2

**Date:** October 26, 1990

**Time:** 11:00 A.M.

**Attendees:** Mr. Pedro Calza, Flood Control District of Maricopa County  
Mr. Amir Motamedi, Flood Control District of Maricopa County  
Ms. Sandra Shillito, Flood Control District of Maricopa County  
Mr. Tom Loomis, Burgess & Niple, Inc.

**NOTE:** If this discussion does not reflect your understanding of the subject matter covered in the meeting, please notify the preparer.

The primary purpose of this meeting was to review final sub-basin delineations and sub-basin parameters prior to creation of the HEC-1 computer models.

1. The revisions to sub-basin delineations subsequent to receipt of review comments from Mr. Dave Creighton of Arizona Department of Water Resources and performance of the field hydrology were discussed. No immediate problems were encountered. Mr. Motamedi stated that review comments should be forthcoming the week of October 29, 1990.
2. Mr. Calza requested that the spread sheet files used to calculate the sub-basin parameters be submitted on floppy diskette. Mr. Loomis agreed to furnish the files.
3. Mr. Motamedi requested that the Green and Ampt parameters proposed for each SCS Soil Map Unit be checked against Table 4.2 of the Flood Control District of Maricopa County Manual for uniformity of values for each soil classification. Mr. Loomis agreed to make the check.
4. Mr. Motamedi requested that trial sub-basin HEC-1 models be done to compare the effects of hillslope versus rangeland  $K_b$  values. The County has found that use of the rangeland values in some alluvium terrace areas yields unreasonable results. Mr. Loomis agreed to spot check Basin 10 for this effect.

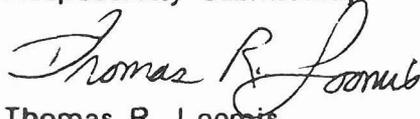
Burgess & Niple, Inc.

October 26, 1990  
Page 2

5. The preliminary time of concentration estimates, made using the Papadakis Method, were discussed. Mr. Motamedi pointed out that this method quite often yields a  $T_c$  value greater than the duration of rainfall excess. If this is found to be the case, then the S-Graph Method is to be used instead of the Clark Unit Hydrograph.
6. Mr. Calza requested that the aerial photograph contact prints be forwarded to him as soon as they are available. Mr. Loomis agreed to check on the status of the contact prints.
7. Mr. Calza requested that Burgess & Niple, Inc. obtain a price for preparing a high altitude photograph of the entire watershed. This shall be done as close to scale as possible without paneling the site.

The meeting adjourned at 12:50 P.M.

Respectfully Submitted,



Thomas R. Loomis

TRL:lms/Minutes/TRL/9010

cc: Attendees  
Mr. Jim Mischler

**B U R G E S S  
& N I P L E**

E N G I N E E R S  
A R C H I T E C T S

Project: FCD 90-05; Jackrabbit Wash Floodplain Delineation

Subject: Meeting No. 3

Date: November 8, 1990

Attendees: Mr. Russ Cruff, MCFCD  
Mr. Amir Motamedi, MCFCD  
Mr. Jim Morris, ADWR  
Mr. Tom Loomis, B&N  
Mr. James Mischler, B&N

**Burgess & Niple, Inc.**  
5025 East Washington Street  
Suite 212  
Phoenix, AZ 85034  
602 244-8100  
Fax 602 244-1915

Note: If this discussion does not reflect your understanding of the subject matter covered in the meeting, please notify the preparer.

1. The 100-Year pond may exceed structural height, but not spoil height. If this be the case, it may not be possible to presume, under FEMA guidelines, that the levee will hold.
2. Burgess & Niple will proceed as if the CAP will hold, and the problem, (if any), will be evaluated based on pond elevations vs. structural and spoil elevations.
3. Jim Morris recommends 2 hydrologic routings - with ponding and without ponding. The study will need to consider at structures at each location in more detail.

Respectfully submitted,

*James E Mischler*

James E. Mischler, P.E.

cc: Attendees  
Mr. Pedro Calza, MCFCD

**B U R G E S S  
& N I P L E  
E N G I N E E R S  
A R C H I T E C T S**

Project: FCD 90-05; Jackrabbit Wash Floodplain Delineation

Subject: Meeting No. 4

Date: November 27, 1990

Attendees: Mr. Pedro Calza, MCFCD  
Mr. James Mischler, B&N

**Burgess & Niple, Inc.**  
5025 East Washington Street  
Suite 212  
Phoenix, AZ 85034  
602 244-8100  
Fax 602 244-1915

Note: If this discussion does not reflect your understanding of the subject matter covered in the meeting, please notify the preparer.

1. Burgess & Niple presented preliminary locations of cross-sections for HEC-2 modelling. Locations were generally acceptable to the District. Mr. Calza requested that sections near roads be located to allow minimal future modifications for bridge modelling.

Respectfully submitted,



James E. Mischler, P.E.

cc: Attendees

**B U R G E S S  
& N I P L E**

**E N G I N E E R S  
A R C H I T E C T S**

**Project: FCD 90-05; Jackrabbit Wash Floodplain Delineation**

**Subject: Meeting No. 5**

**Date: December 20, 1990**

**Attendees: Mr. Pedro Calza, MCFCD  
Mr. James Mischler, B&N**

**Burgess & Niple, Inc.**  
5025 East Washington Street  
Suite 212  
Phoenix, AZ 85034  
602 244-8100  
Fax 602 244-1915

**Note: If this discussion does not reflect your understanding of the subject matter covered in the meeting, please notify the preparer.**

1. **Mr. Mischler presented copies of the draft Mannings "n" value report. Mr. Calza requested that the photos and documentation be included in the hydraulics report also.**

**Respectfully submitted,**

*James E Mischler*

**James E. Mischler, P.E.**

**cc: Attendees**

**B U R G E S S  
& N I P L E**

**E N G I N E E R S  
A R C H I T E C T S**

**Project: FCD 90-05; Jackrabbit Wash Floodplain Delineation**

**Subject: Meeting No. 6**

**Date: January 20, 1991**

**Attendees: Mr. Pedro Calza, MCFCD  
Mr. James Mischler, B&N**

**Burgess & Niple, Inc.**  
5025 East Washington Street  
Suite 212  
Phoenix, AZ 85034  
602 244-8100  
Fax 602 244-1915

**Note: If this discussion does not reflect your understanding of the subject matter covered in the meeting, please notify the preparer.**

1. Mr. Mischler submitted prints of floodplain mapping showing cross section locations and a computer diskette containing preliminary HEC-2 input files for Star, Jackrabbit, and the unnamed tributary of Jackrabbit Wash.
2. The split flow reach from Jackrabbit Wash, river mile 15.5 to river mile 16.0, has yet to be resolved. The final model will have an appropriate flow distribution.
3. Floodways will be calculated with method 6 initially, and adjusted using Method 1. In the final model, all floodway limits will be set by Method 1.

Respectfully submitted,

*James E Mischler*

James E. Mischler, P.E.

cc: Attendees

**B U R G E S S  
& N I P L E**

E N G I N E E R S  
A R C H I T E C T S

Project: FCD 90-05; Jackrabbit Wash Floodplain Delineation

Subject: Meeting No. 7

Date: February 12, 1991

Attendees: Mr. Amir Motamedi, MCFCD  
Mr. Thomas Loomis, B&N  
Mr. James Mischler, B&N

**Burgess & Niple, Inc.**  
5025 East Washington Street  
Suite 212  
Phoenix, AZ 85034  
602 244-8100  
Fax 602 244-1915

Note: If this discussion does not reflect your understanding of the subject matter covered in the meeting, please notify the preparer.

1. Mr. Motamedi requested that a sheet showing how composite soils were developed for the hydrology report be included following the tables to illustrate the procedures used.
2. For transmission losses, a composite loss rating was used. The model was not sensitive to different methods of considering rock areas.
3. Per SCS soil maps, no individual soil has infiltration greater than 4 inches. Burgess & Niple's composite values are generally from 1 to 3 inches. Mr. Motamedi requested that a discussion and justification of composite values that are much less than field measurements be included in the hydrology report.
4. Preliminary hydrology is approved by the District.

Respectfully submitted,

*James E Mischler*

James E. Mischler, P.E.

cc: Attendees  
Mr. Pedro Calza, MCFCD

**B U R G E S S  
& N I P L E**

**E N G I N E E R S  
A R C H I T E C T S**

**Project: FCD 90-05; Jackrabbit Wash Floodplain Delineation**

**Subject: Meeting No. 8**

**Date: February 13, 1991**

**Attendees: Mr. Jim Morris, ADWR  
Mr. Dave Creighton, ADWR  
Mr. Dan Lawrence, ADWR (Briefly)  
Mr. Thomas Loomis, B&N**

**Burgess & Niple, Inc.**  
5025 East Washington Street  
Suite 212  
Phoenix, AZ 85034  
602 244-8100  
Fax 602 244-1915

**Note: If this discussion does not reflect your understanding of the subject matter covered in the meeting, please notify the preparer.**

- 1. Mr. Loomis presented the problem with Daggs Wash at the Central Arizona Project Canal crossing, Structure CAP-8.**

**Problem: 100-Year 24-hour storm at structure. Stage exceeds the top of compacted embankment by 1.3' and is 0.9' below the top of uncompacted embankment. Flow probably tops the concrete overshoot walls and drains into the canal. The duration of stage above the top of compacted embankment is probably very short.**

**The CAP canal at this location is situated with the top of canal lining approximately at the original natural grand surface. The drainage structure crossing the canal is a concrete flume with a base width of 47.5' and a wall height of 7'. The height of the collective dikes is approximately 10'.**

**Mr. Loomis and Mr. Morris agreed the failure of the embankment is extremely unlikely, and that if a failure occurred, it would involve scouring of the uncompacted 2' at the top of the dike. It was tentatively agreed that the routed peak through the structure should be used for flood control regulation downstream, since any flow which overtops the**

February 13, 1991  
Page 2

embankment or flume walls will be trapped by the canal. Therefore, this would be a conservative assumption. Burgess & Niple is to estimate the time duration that the flood stage exceeds the top elevation of the compacted embankment. If it is, in fact, a very short time, then Burgess & Niple is to proceed with this assumption in preparation of the final report.

Respectfully submitted,

*James E Mischler, for*

Thomas R. Loomis, P.E.

cc: Attendees  
Mr. Pedro Calza, MCFCD  
Mr. James Mischler, B&N

**B U R G E S S  
& N I P L E**

**E N G I N E E R S  
A R C H I T E C T S**

**Project: FCD 90-05; Jackrabbit Wash Floodplain Delineation**

**Subject: Meeting No. 9**

**Date: February 15, 1991**

**Attendees: Mr. Pedro Calza, MCFCD  
Mr. James Mischler, B&N**

**Burgess & Niple, Inc.**  
5025 East Washington Street  
Suite 212  
Phoenix, AZ 85034  
602 244-8100  
Fax 602 244-1915

**Note: If this discussion does not reflect your understanding of the subject matter covered in the meeting, please notify the preparer.**

- 1. Mr. Mischler indicated that study documents suitable for submission to FEMA would be submitted by February 28, 1991.**
- 2. Mr. Calza noted that the preliminary HEC-2 natural profile model recently submitted seemed appropriate, pending adjustments at the split flow reach on Jackrabbit Wash.**

Respectfully submitted,

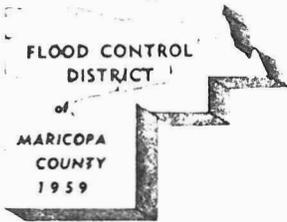


James E. Mischler, P.E.

cc: Attendees

**SECTION 1: General Documentation  
and Correspondence**

*1.4 General Correspondence*



**FLOOD CONTROL DISTRICT**  
of  
**Maricopa County**

3335 West Durango Street • Phoenix, Arizona 85009  
Telephone (602) 262-1501

---

BOARD OF DIRECTORS

Betsy Bayless  
James D. Bruner  
Carole Carpenter  
Tom Freestone  
Ed Pastor

D. E. Sagramoso, P.E., Chief Engineer and General Manager

**FEB 12 1991**

Mr. James E. Mischler, P.E.  
Burgess and Niple, Inc.  
5025 East Washington Street  
Suite 212  
Phoenix, Arizona 85034

SUBJECT: Jackrabbit Wash FIS (FCD 90-05)

Dear Mr. Mischler:

We have reviewed the Preliminary Data Notebooks, Hydrology, submitted to the Flood Control District on December 22, 1990, for the subject area. The report did not include the stage-storage routing for the CAP structures as of yet.

Our review emphasized mainly on the peak flows estimated using the HEC-1 simulation. It is our opinion that the results presented so far are reasonable and compare well with the results obtained by statistical analysis on the USGS gage on Jackrabbit.

We have a few minor comments on the report which we will discuss with you and Mr. Loomis at the February 12th meeting.

If you have any questions, please call Sandy Shillito or me at 262-1501.

Sincerely,

Amir M. Motamedi  
Hydrologist

HAND DELIVERED 12/27

Burgess & Niple, Inc.

Engineers and Architects

106 North Beeline Highway • Payson, AZ 85541

(602) 474-5313 FAX: (602) 474-3511



LETTER OF TRANSMITTAL

TO Flood Control District of Maricopa Co.  
3335 West Durango Street  
Phoenix, AZ. 85009  
Attn: Mr. Pedro Calzo

DATE	12/22/90	JOB NO	10310
RE	Jackrabbit Wash Floodplain Delineation Study FCD 90-05		

WE ARE SENDING YOU  Attached  Under separate cover via \_\_\_\_\_ the following items:

- Shop drawings
- Prints
- Plans
- Samples
- Specifications
- Copy of letter
- Change order
- \_\_\_\_\_

COPIES	DATE	NO.	DESCRIPTION
3	12/22/90		Preliminary Technical Data Notebook - Hydrology
1			Project Photographs

THESE ARE TRANSMITTED:

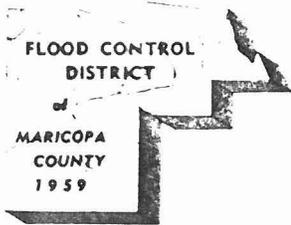
- For approval
- Approved as submitted
- Resubmit \_\_\_\_\_ copies for approval
- For your use
- Approved as note:
- Submit \_\_\_\_\_ copies for distribution
- As requested
- Returned for corrections
- Return \_\_\_\_\_ corrected prints
- For review and comment
- \_\_\_\_\_

REMARKS Pedro: I have included the field photographs to help you with the review. We will want them back. I am intending to use suitable photos in the final report. Please excuse the tabbing system. Your comments on report organization will be appreciated and incorporated into the final report. The order specified by ADWR for the TDN is somewhat cumbersome and will need "Fine Tuning". Have a Happy New Year!

COPY TO \_\_\_\_\_

SIGNED: Tom Jomus

cc: to T. Loomis



**FLOOD CONTROL DISTRICT**  
of  
**Maricopa County**

3335 West Durango Street • Phoenix, Arizona 85009  
Telephone (602) 262-1501

D. E. Sagramoso, P.E., Chief Engineer and General Manager

BOARD OF DIRECTORS

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Carole Carpenter  
Tom Freestone  
Ed Pastor

NOV 5 1990

RECEIVED

NOV 6 1990

BURGESS & NIPLE, INC.

Mr. Thomas R. Loomis, P.E.  
Burgess & Niple, Inc.  
5025 East Washington Street  
Suite 212  
Phoenix, Arizona 85034

SUBJECT: Subbasin Delineation Review of Jackrabbit Wash

Dear Mr. Loomis:

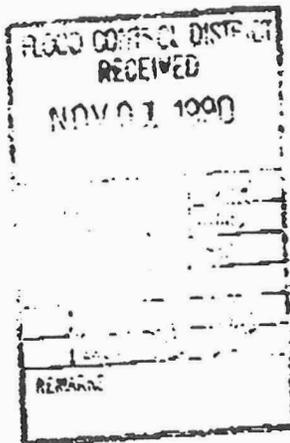
We have reviewed the subbasin delineations for the contributing area to Jackrabbit Wash. We feel the boundaries and concentration points are acceptable. Please continue with your determination of parameters for these subbasins.

If you have any questions concerning this review, please contact Sandy Shillito or myself at 262-1501.

Sincerely,

A handwritten signature in cursive script, appearing to read "Amir Motamedi".

Amir Motamedi  
Hydrologist



ARIZONA  
DEPARTMENT  
OF WATER  
RESOURCES

Rose Mofford, Governor  
N. W. Plummer  
Director

October 29, 1990

15 South 15th Avenue  
Phoenix, Arizona 85007

Joe Tram  
Floodplain Branch Manager  
Flood Control District of Maricopa County  
3335 West Durango Street  
Phoenix, Arizona 85009

RE: Central Arizona Project and Flood Insurance Studies

Dear Mr. Tram:

This is in response to your letter of 11 October 1990 requesting guidance on modeling CAP cross-drainage structures when completing studies for floodplain mapping purposes. ADWR recommends that CAP cross-drainage structures be critically examined during any floodplain study and only be credited if they can be certified according to FEMA requirements and if they have assured maintenance.

Since many of the CAP cross-drainage structures are sized for floods less than a 100-year event, this will mean that an evaluation of the CAP's effect both upstream for ponding and downstream for maximum expected outflows under 100-year condition will have to be made. We would be happy to discuss the exact procedure with you as necessary.

Please feel free to contact me at 542-1541 if you have any questions or need any additional information.

Sincerely,

James R. Morris, P.E.  
Chief  
Flood Management Section

JRM:bw

HAND DELIVERED

# Burgess & Niple, Inc.

Engineers and Architects

106 North Beeline Highway • Payson, AZ 85541

(602) 474-5313 FAX: (602) 474-3511

**TO** FLOOD CONTROL DISTRICT OF MARICOPA CO.

3335 West Durango Street

Phoenix, AZ 85009

Attention: Pedro Calza



# LETTER OF TRANSMITTAL

DATE	October 26, 1990	JOB NO	10310
RE	FCDMC Jackrabbit Wash		
	Floodplain Delineation Study		
	FCD 90-05		

WE ARE SENDING YOU  Attached  Under separate cover via \_\_\_\_\_ the following items:

- Shop drawings       Prints       Plans       Samples       Specifications
- Copy of letter       Change order       \_\_\_\_\_

COPIES	DATE	NO.	DESCRIPTION
2	10/26/90	1	Preliminary Exhibit "A"
2	"	5	Preliminary Exhibit "B"
2	"	5	Preliminary Exhibit "C"
2	10/18/90	35	Preliminary Appendix C, Table C-1
2	10/18/90	4	Preliminary Appendix C, Table C-2
2	10/24/90	31	Preliminary Appendix C, Table C-3
2	10/25/90	4	Preliminary Appendix C, Table C-4
2	10/25/90	4	Preliminary Appendix C, Table C-5

### THESE ARE TRANSMITTED:

- For approval       Approved as submitted       Resubmit \_\_\_\_\_ copies for approval
- For your use       Approved as noted       Submit \_\_\_\_\_ copies for distribution
- As requested       Returned for corrections       Return \_\_\_\_\_ corrected prints
- For review and comment       \_\_\_\_\_

REMARKS \_\_\_\_\_

**RECEIVED**

OCT 29 1990

BURGESS & NIPLE, INC.

COPY TO Jim Mischler

TRL:sj

SIGNED: \_\_\_\_\_

If enclosures are not as noted, kindly notify us at once. Thomas R. Loomis, P.E.

# Burgess & Niple, Inc.

## Engineers and Architects

1106 North Beeline Highway • Payson, AZ 85541 • (602) 474-5313

Fax. (602) 474-3511 • Columbus Fax. (614) 451-1385



October 19, 1990

Arizona Department of Water Resources  
15 South 15th Avenue  
Phoenix, AZ 85007

Attention: Dave Creighton, P.E.

Ref: M.C.F.C.D. Jackrabbit Wash Floodplain Delineation Study  
FCD 90-05  
Project No. 10310

Dear Dave:

Per your telephone conversations with Andy Romance on September 13, 1990 and September 14, 1990, your comments are addressed herein regarding Sub-Basin Delineations, Tc Path, and Flood Routing Paths.

Reference is made to the preliminary Burgess & Niple Exhibit "C".

### Sheet 1 of 5

- 1-1) The west boundary of Sub-Basin 18B has been modified and the Tc flow paths revised.
- 1-2) A shape adjustment is not being applied to the long and narrow Sub-Basins. The A.D.O.T. adjustment does not appear to be appropriate for this watershed.

### Sheet 2 of 5

- 2-1) The existing Tc Path shown in Sub-Basin 2A was found to yield the longest flow time, and therefore, has not been revised.
- 2-2) The Tc Path shown in Sub-Basin 5B has been revised.

# Burgess & Niple, inc.

October 19, 1990  
Page 2

## Sheet 3 of 5

- 3-1) The "7G" identifier has been removed from Sub-Basin 7E.
- 3-2) The "10K" identifier has been changed to "10J" in Sub-Basin 10J, and the "10AA" identifier has been changed to "10Z" in Sub-Basin 10Z. Note the remainder of Sub-Basins in Major Basin No. 10 have been adjusted accordingly.
- 3-3) A routing path has been added between CP-63 and CP-64.
- 3-4) The Tc Path in Sub-Basin 10AB has been revised.

## Sheet 4 of 5

- 4-1) The Tc Path in Sub-Basin 11 has been revised.
- 4-2) The Tc Path in Sub-Basin 3B has been revised.

## Sheet 5 of 5

- 5-1) A Tc Path in Sub-Basin 10Z has been added.
- 5-2) The existing Tc Path shown in Sub-Basin 10W has not been changed. In my opinion, the long and narrow area above the Tc starting point can be considered non-effective for the purpose of calculating the Tc.
- 5-3) The location of the routing path in Sub-Basin 10Y has been clarified where it approaches the boundary of Sub-Basin 12B.
- 5-4) A Tc Path in Sub-Basin 10G has been added.
- 5-5) The location of the routing path in Sub-Basin 10A has been clarified where it approaches the boundary of Sub-Basin 7C.

**Burgess & Niple, Inc.**

October 19, 1990  
Page 3

Dave, if you have further review comments, please call Andy or myself at your convenience. I have enclosed a new copy of Exhibit "C" which reflects the changes we have discussed.

Sincerely,

**BURGESS & NIPLE, INC.**

Thomas R. Loomis, P.E.

TRL:lms/L.ADWR/TRL/9010

Enclosure

cc: Jim Mischler  
Amir Motamedi

Burgess & Niple, Inc.

Engineers and Architects

2025 East Washington Street • Suite 212 • Phoenix, AZ 85034

(602) 244-8100 FAX: (602) 244-1915

TO Mr. Pedro Calza  
Flood Control District of Maricopa Co.  
3335 West Durango St.  
Phoenix Az 85009



# LETTER OF TRANSMITTAL

DATE	August 27, 1990	JOB NO	10310
RE	Jackrabbit Wash Floodplain Delineation Study		

WE ARE SENDING YOU  Attached  Under separate cover via \_\_\_\_\_ the following items:

- Shop drawings
- Prints
- Plans
- Samples
- Specifications
- Copy of letter
- Change order
- \_\_\_\_\_

COPIES	DATE	NO.	DESCRIPTION
1			Flood Hazard Study Announcement Affidavit of Publication - Original

THESE ARE TRANSMITTED:

- For approval
- For your use
- As requested
- For review and comment
- Approved as submitted
- Approved as noted
- Returned for corrections
- \_\_\_\_\_
- Resubmit \_\_\_\_\_ copies for approval
- Submit \_\_\_\_\_ copies for distribution
- Return \_\_\_\_\_ corrected prints

REMARKS \_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_

COPY TO \_\_\_\_\_

SIGNED: James E Mischler

THE ARIZONA REPUBLIC *The Phoenix Gazette*

STATE OF ARIZONA }  
COUNTY OF MARICOPA } SS.

JOAN LOHR, being first duly sworn, upon oath deposes and says: That she is the assistant legal advertising manager of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published at Phoenix, Arizona, by Phoenix Newspapers Inc., which also publishes The Arizona Republic and The Phoenix Gazette, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates as indicated.

*The Arizona Republic*  
~~*The Phoenix Gazette*~~

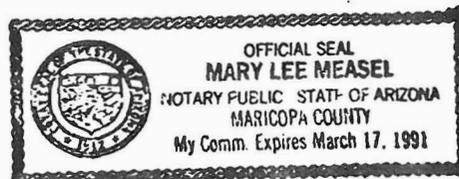
AUGUST 16, 1990

*Joan Lohr*

Sworn to before me this

20TH day of

AUGUST A.D. 19 90



*Mary Lee Measel*  
Notary Public

INVOICE NO. 05601  
ANNOUNCEMENT OF FLOOD HAZARD STUDY

The Flood Control District of Maricopa County, under authority of the National Flood Insurance Act of 1968 (P.L. 90-448), as amended, and the Flood Disaster Protection Act of 1973 (P.L. 93-234), is funding a detailed study of flood hazard areas in western Maricopa County as follows:  
Jackrabbit Wash from Vulture Mine Road to the CAP Canal; an unnamed tributary to Jackrabbit Wash from Vulture Mine Road to its mouth in Section 6, T.3N., R.5W.; Star Wash from the electric power line crossing to its mouth; and adjacent ponding areas along the CAP Canal.  
The study is being performed for the Flood Control District by Burgess & Niple, Inc., Engineers & Architects, of Phoenix, Arizona.  
The purpose of this study is to examine and evaluate flood hazard areas which are developed or which are likely to be developed and to determine flood elevations for those areas. Flood elevations will be used by Maricopa County to carry out floodplain management objectives of the National Flood Insurance Program. They will be used as the basis for determining appropriate flood insurance premium rates applicable for buildings and their contents.  
This announcement is intended to notify interested persons of the commencement of this study so that they may have an opportunity to bring any relevant facts and technical data concerning local flood hazards to the attention of the Flood Control District for consideration in the course of this study. Such information should be furnished to Mr. Pedro Caiza or Mr. Joe Trem, Flood Control District of Maricopa County, 3335 West Durango Street, Phoenix, AZ 85009, telephone (602) 262-1581 for Burgess & Niple's use in performing the study.  
Published: Arizona Republic, August 16, 1990.

#10310

# Burgess & Niple, Inc.

Engineers and Architects

5025 East Washington Street • Suite 212 • Phoenix, AZ 85034 • (602) 244-8100



August 13, 1990

WEST VALLEY VIEW  
310 North 8th Street  
Avondale, AZ 85323

Attention: Newsroom

To Whom It May Concern:

Enclosed is a news release, "Announcement of Flood Elevation Study", for Maricopa County that the Flood Control District of Maricopa County has requested be published. Would you please place this as a news item in your newspaper, and provide us a copy of same. If you have any questions, please call me.

Very truly yours,

BURGESS & NIPLE, INC.

James E. Mischler, P.E.

JEM:pr

Enclosure

cc: Mr. Pedro Calza, Flood Control District

# Burgess & Niple, Inc.

Engineers and Architects

5025 East Washington Street • Suite 212 • Phoenix, AZ 85034 • (602) 244-8100



August 13, 1990

DAILY NEWS - SUN  
P.O. Box 1779  
Sun City, AZ 85372

Attention: Newsroom

To Whom It May Concern:

Enclosed is a news release, "Announcement of Flood Elevation Study", for Maricopa County that the Flood Control District of Maricopa County has requested be published. Would you please place this as a news item in your newspaper, and provide us a copy of same. If you have any questions, please call me.

Very truly yours,

BURGESS & NIPLE, INC.

*James E Mischler*

James E. Mischler, P.E.

JEM:pr

Enclosure

cc: Mr. Pedro Calza, Flood Control District

# Burgess & Niple, Inc.

Engineers and Architects

5025 East Washington Street • Suite 212 • Phoenix, AZ 85034 • (602) 244-8100



August 13, 1990

Mr. Michael Hart, Editor  
THE PEORIA TIMES  
7122 North 59th Avenue  
Glendale, AZ 85301

Dear Mr. Hart:

Enclosed is a news release, "Announcement of Flood Elevation Study", for Maricopa County that the Flood Control District of Maricopa County has requested be published. Would you please place this as a news item in your newspaper, and provide us a copy of same. If you have any questions, please call me.

Very truly yours,

BURGESS & NIPLE, INC.

*James E Mischler*

James E. Mischler, P.E.

JEM:pr

Enclosure

cc: Mr. Pedro Calza, Flood Control District

# Burgess & Niple, Inc.

Engineers and Architects

5025 East Washington Street • Suite 212 • Phoenix, AZ 85034 • (602) 244-8100



August 13, 1990

Mr. Red Ulbrick, Editor  
THE WESTER NEWS  
12001 North 112th Avenue  
Youngtown, AZ 85363

Dear Mr. Ulbrick:

Enclosed is a news release, "Announcement of Flood Elevation Study", for Maricopa County that the Flood Control District of Maricopa County has requested be published. Would you please place this as a news item in your newspaper, and provide us a copy of same. If you have any questions, please call me.

Very truly yours,

BURGESS & NIPLE, INC.

*James E Mischler*

James E. Mischler, P.E.

JEM:pr

Enclosure

cc: Mr. Pedro Calza, Flood Control District

\*\*\* NEWS RELEASE \*\*\*

### ANNOUNCEMENT OF FLOOD HAZARD STUDY

The Flood Control District of Maricopa County, under authority of the National Flood Insurance Act of 1968 (P.L. 90-448), as amended, and the Flood Disaster Protection Act of 1973 (P.L. 93-234), is funding a detailed study of flood hazard areas in western Maricopa County as follows:

Jackrabbit Wash from Vulture Mine Road to the CAP Canal; an unnamed tributary to Jackrabbit Wash from Vulture Mine Road to it's mouth in Section 6, T.3N., R.5W.; Star Wash from the electric power line crossing to it's mouth; and adjacent ponding areas along the CAP Canal.

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This announcement is intended to notify all interested persons of the commencement of this study so that they may have an opportunity to bring any relevant facts and technical data concerning local flood hazards to the attention of the Flood Control District for consideration in the course of this study. Such information should be furnished to Mr. Pedro Calza or Mr. Joe Tram, Flood Control District of Maricopa County, 3335 West Durango Street, Phoenix, AZ 85009, telephone (602) 262-1501 for Burgess & Niple's use in performing the study.

**SECTION 1: General Documentation  
and Correspondence**

*1.5 Contract Scope of Work*

# FLOOD CONTROL DISTRICT

of

Maricopa County

3335 West Durango Street • Phoenix, Arizona 85009  
Telephone (602) 262-1501

BOARD OF DIRECTORS

Betsy Bayless  
James D. Bruner  
Carole Carpenter  
Tom Freestone  
Ed Pastor

D. E. Sagramoso, P.E., Chief Engineer and General Manager

AUG 02 '90

RECEIVED  
AUG 3 1990  
BURGESS & NIPLE, INC.

Mr. Donn E. Abegglen, P.E.  
Vice President  
Burgess & Niple, Inc.  
5025 East Washington Street, Suite 212  
Phoenix, Arizona 85034

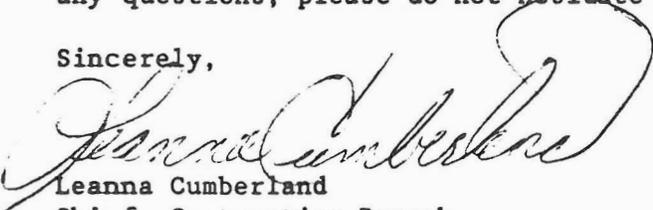
SUBJECT: FCD 90-05, Jackrabbit Wash Floodplain Delineation Study

Dear Mr. Abegglen:

This letter will serve as confirmation of the July 23, 1990, verbal Notice To Proceed for the work under the above-referenced contract that was approved by the Board of Directors on the same date.

A copy of the fully executed contract is enclosed for your use. If you have any questions, please do not hesitate to contact Mr. Pedro Calza at 262-1501.

Sincerely,

  
Leanna Cumberland  
Chief, Contracting Branch

Enclosure (1)

EXHIBIT "A"  
SCOPE OF WORK  
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY  
JACKRABBIT WASH TOPOGRAPHIC MAPPING AND  
FLOOD INSURANCE STUDY  
FCD 90-05

General

The project consists of topographic mapping and floodplain and floodway delineations of the following streams:

- \* Jackrabbit Wash from the Vulture Mine Road crossing in Section 4, R.6W., T.4N. to the Central Arizona Project (CAP) Canal overshoot.
- \* Star Wash from the powerlines in Section 33 T.4N., R.5W. to the Central Arizona Project (CAP) Canal overshoot.
- \* Unnamed tributary to Jackrabbit Wash which crosses Vulture Mine Road in the southeastern 1/4 of Section 8, T.4N., R.6W.; from Vulture Mine Road to the confluence with Jackrabbit Wash.

The project also consist of topographic mapping and ponded floodplain delineations (Zone A) along the upstream side of the CAP Canal; from the southwest 1/4 of Section 13, T.3N., R.6W. to the Hassayampa River. Hydraulic analyses of pipe siphons and box overshoots within the CAP Canal study area will be made for use in the ponding analysis.

The Consultant will develop the hydrology using the Corps of Engineer's HEC-1 computer model and backwater analysis using the HEC-2 computer model to determine floodplain and floodway delineations for the 100-year peak flood. Work must be reviewed and accepted by the Federal Emergency Management Agency (FEMA) prior to the finalization of this contract. As part of this requirement, the Consultant shall be responsible for Public Notification regarding this project. Work under this Scope will be completed within 240 calendar days from the date of the Notice to Proceed, including 60 days for Flood Control District reviews.

Task 1 Data Collection

- 1.1 The Consultant will collect and review pertinent data from the District and other outside sources. Data to be collected will include previous flood hazard reports and hydrology for the study area; existing topographic mapping; historical flooding information; as-built plans for existing structures; FEMA Flood Hazard Boundary Maps and any Letters of Map Amendment and/or Revisions and other pertinent information.
- 1.2 A written summary of the data collection effort will be submitted to the District for information purposes.
- 1.3 The Consultant will submit a project schedule showing coordination meetings and completion dates for each of the tasks in the contract.

## Task 2 Topographic Mapping

- 2.1 The Consultant will notify property owners and obtain necessary Rights-of-Entry for the study areas. The District will assist Consultant as may be necessary to complete this task.
- 2.2 An aerial survey subcontractor shall be retained by the firm as part of this contract. The Consultant shall coordinate the aerial surveying work with the aerial surveying consultant to ensure that the specifications of the aerial surveying work are met. Quality control on surveys will be per FEMA 37, Flood Insurance Study Guidelines and Specifications for Study Contractors.
  - 2.2.1 Prepare topographic mapping to a 4-foot contour interval, 1"=400' scale, with spot elevations on section line and mid-section line roads.
  - 2.2.2 Ground Control:
    - a. The Consultant shall provide survey control.
    - b. The Consultant shall systematically set panel points and establish horizontal and vertical control throughout the areas to be mapped for use in compilation by the aerial survey consultant. Where readily available, surveys will tie into the State Plane Coordinate System. Field control shall be sufficient to readily allow for compilation of maps by the aerial survey contractor at the desired map scale and contour interval and will be based on the National Geodetic Vertical Datum (NGVD).
    - c. The horizontal and vertical control points shall be located and marked by the Consultant. The controls for the area mapping shall be in sufficient numbers and shall be in locations which will be compatible with the accuracy of the mapping requirements. The controls shall be of at least third order accuracy. Section corners, quarter corners, and mid-section points shall be used for control points wherever possible.
  - 2.2.3 Digital contour and planimetric data developed for this project shall be delivered in AutoCAD DXF ASCII format, as specified in Autodesk, Inc., publication TD106-009 (May 7, 1986). Layer names and graphics attributes shall be fully documented by the Consultant. The delivered DXF files shall be compatible with the requirements, and subject to the limitations, of the ESRI DXFARC or the ESRI SIF2ARC software translator as detailed in the January 1989 release of the "ARC/INFO Users Guide". File deliveries shall be in ASCII format on industry-standard 1/2" magnetic tape, 2400-foot reels, written in generic unlabeled COPY format, with specified record-lengths and block sizes.
  - 2.2.4 The Consultant shall provide permanent non-erasable topographic mylar sheets 24" x 36" with a scale of 1-inch equal to 400 feet, with a contour interval of 4 feet for mapping. A cover sheet will be provided with the project title, date of topographic mapping,

and a location map showing geographic range covered by each specific mapping sheet. Each manuscript shall include a minimum of north arrow, scale, section corners and quarter corners, current and proposed streets and highway names, State Plane Coordinate System, major drainage features, corporate boundaries, cross-section lines, channel station center line, index map, description and elevation of control points and ERM's and reference marks used in ground control. The mapping will have an accuracy such that ninety percent (90%) of contours shall be within one-half contour of the true elevations and the remaining ten percent (10%) of the contours shall not be in error by more than one contour interval.

- 2.2.5 The Consultant shall provide permanent non-erasable topographic mylars as described above in Section 2.2.4 with delineated floodplains included.
- 2.2.6 Sketch maps no larger than 11" x 17" for the study area must be included in the final narrative report along with the flood profiles.

### Task 3 Hydrology

- 3.1 The hydrologic study of the watershed will be delivered to the District under separate cover from the hydraulic analysis. The watershed study limits are:
  - a. The watershed upstream of the CAP Canal, from Reach 7 Station 121+60 to Station 571+50 (hereinafter referred to as the CAP Canal Study Reach); and
  - b. The watershed downstream from the CAP Canal Study Reach bounded on the east by the Hassayampa River, on the west by 371st Avenue and on the south by Interstate 10.

The Consultant will use the U.S. Army Corps of Engineers (COE) computer program HEC-1, 1989 Version, to develop a 100-year hydrologic model or models for the area. Using appropriate hydrologic judgement, sub-basins will be identified that provide a reasonable depiction of the watershed condition. The sub-basins will be as homogeneous as possible, using watershed area, watershed type (mountain versus valley), and time of concentration as criteria. Sub-basin break-downs will be done in sufficient detail to provide peak discharges at the following locations:

- a. Drainage structures along the CAP Canal Study Reach.
- b. Tributary confluences along the following washes where a significant change in peak discharge will occur or where the wash crosses a County road:

- \* Jackrabbit Wash
- \* Coyote Wash
- \* Star Wash
- \* Daggs Wash
- \* Dead Horse Wash

The watershed upstream of the CAP Canal will be broken into sub-basins of an average size of five (5) square miles. The watershed downstream from the CAP Canal will be broken into sub-basins of an average size of three (3) square miles.

An appropriate hydrograph time increment and number of hydrograph ordinates will be selected to allow for complete calculation of the flood hydrograph without sacrificing resolution of the flood peak. Calculations, or assumptions used in developing sub-basin and routing parameters, will be documented and made a part of the appendices for the hydrology report.

3.2 The specific hydrologic techniques to be used in this study are:

- a. Rainfall: Peak discharges for the 100-year 6-hour storm will be estimated using rainfall distributions provided by the District. The peak discharge and peak volume for the 100-year 24-hour storm will be estimated using the SCS Type II 24-hour rainfall distribution.

Point precipitation values will be derived using the information and procedures contained in the Hydrologic Design Manual for Maricopa County, Arizona (Design Manual). The most current edition as of the date of Notice to Proceed will be utilized for this contract.

- b. Areal Reduction: The point precipitation values will be areally reduced separately for critical concentration points as well as for the entire watershed. Precipitation reduction factors will be applied in watershed area increments of five (5) square miles. The U.S. Army Corps of Engineers (COE) Queen Creek areal reduction curve will be applied for the 6-hour duration storm. NOAA Hydro-40 will be used for the 2-hour and 24-hour duration storms.
- c. Rainfall Excess: The Green and Ampt Infiltration Equation will be utilized for estimation of rainfall losses. This method will be applied in conformance with the Design Manual procedures using available soil texture data. It is anticipated that the SCS Soil Survey of Maricopa County, Arizona, Central and Aquila-Carefree Areas will be utilized for this effort in combination with additional data obtained during the initial records search. Where soils texture data is deemed insufficient, is not available, or deemed questionable, SCS curve numbers will be assigned based on hydrologic soil group, land-use and surface cover. The curve number values will then be used to estimate the Green and Ampt equation parameters, using the Design Manual procedures.

The average soils texture values for each sub-basin will be estimated by use of a grid averaging method. The grid interval will be one-half mile with an average number of grid points of 20 per sub-basin, unless conditions in a specific area dictate otherwise. Tightening or loosening of the grid in a specific area will be done at the discretion of the Consultant.

- d. Unit Hydrograph: The Clark Unit Hydrograph method will be used for this project.
- e. Time of Concentration: The Papadakis method will be used with the Clark unit hydrograph. If this method results in an unsuitable time of concentration, other methods will be applied and the results compared. The most realistic result as determined by the Consultant will be utilized.
- f. Hydrograph Channel Routing: Channel routing will be accomplished using the Normal Depth option under HEC-1 wherever possible. Average cross sections will be developed utilizing available mapping and field reconnaissance data. Where reasonable cross section data cannot be obtained, particularly in the upper reaches of the watershed, the Muskingum method will be applied. The choice of routing method for questionable reaches will be discussed with District personnel prior to estimating routing parameters.

The reach routing parameters for the lower reaches modeled using HEC-2 will be adjusted after the HEC-2 cross sections are available. The HEC-2 cross sections will be compared and a typical average cross section estimated.

- g. Hydrograph Reservoir Routing: Analysis of the backwater ponding areas against the north bank of the CAP Canal Study Reach will be accomplished using the level-pool reservoir routing option of HEC-1. Elevation and surface area data will be generated from the strip contour map of the canal alignment in combination with USGS quadrangle maps. Stage versus discharge tables for low-level outlets, channel outlets and canal bank overtopping conditions will be estimated using appropriate hydraulic methodology. These curves will then be incorporated into the HEC-1 computer model. The end result of this effort will be to define Zone A 100-year floodplain limits for ponding on the upstream side of the CAP Canal Study Reach, and to identify canal bank overtopping locations.
- h. Channel Transmission Losses: Channel transmission losses for the reaches modeled using the Normal Depth Channel method will be included in the model if deemed appropriate by the Consultant, and if sufficient data is available. Existing field data, or the literature, will be used as the basis for this effort. An average percolation rate for each routing reach considered will be estimated by calculating a composite by area of overbank soils versus channel bed soils in the reach. Separate average values will be estimated for each storm frequency modeled. The percolation rate estimates

arrived at will be checked for reasonableness by performing percolation tests in the field in channel bed and overbank soils. This will be accomplished during the field investigation phase.

Percolation testing will be done using a method which simulates the vertical rate only, and which also simulates an average flow depth to account for hydraulic head. The test depth will be between four and twelve inches based on judgement of the Consultant. This will not be an extensive effort and will only be done as necessary to provide confidence in, or adjustments to, the values estimated using available soils data. The losses will be modeled using the Channel Loss option under HEC-1. The SCS National Engineering Handbook, Section 4 Hydrology, Chapter 19 will be used as the base reference for estimating the loss parameter. Mr. Dave Creighton of ADWR and Mr. Harry Milsaps of the SCS will be consulted in this effort.

- 3.3 The District will provide appropriate references to facilitate parameter estimation.
- 3.4 The output of the computer model will be reviewed to determine if peak flows and volumes are realistic. This will be done by comparing the results with available gage data, previous studies and USGS gage regression analysis results. Adjustments to the input data areas of precipitation loss, routing, and transmission losses will be made in order to obtain realistic and justifiable results.
- 3.5 Attempts will be made to recover historic stream gage data where available and compare the data with the results obtained by the hydrologic model. Major differences will be discussed in the final report.
- 3.6 The Consultant will obtain the approval of the District at each of the following steps:
  - a. Soil and watershed boundary maps.
  - b. HEC-1 input parameters and parameter estimation.
  - c. HEC-1 flow diagram.
  - d. HEC-1 results.
- 3.7 The final report will include the following sections organized according to the latest draft of the ADWR State Standards Workgroup criteria at the time of Notice to Proceed for organizing and submitting technical documentation for flood studies:
  - a. Scope of the study.
  - b. Description of the watershed.
  - c. Previous studies and reports.

- d. Methodology.
- e. Assumptions.
- f. Results.
- g. Comparison of the results with other studies and/or stream gages.
- h. Conclusion.
- i. List of references and agencies contacted.

3.7.1 Tables and figures for the main text:

- a. Watershed area (18x24) foldout map.
- b. Table showing the flow peaks and volumes at critical concentration points for different frequency and duration storms.
- c. Table showing the critical peaks and volumes for major concentration points as compared to previous studies (where available).
- d. Spreadsheet showing sub-basins and their major parameters (slope, area, friction, total rainfall, time of concentration or Lag, major structures, etc.).

3.7.2 Tables and figures for the appendices:

- a. Topographic base map showing the sub-watershed delineations, routing reaches, Tc calculation paths, major man-made structures, and references (i.e. street names, Township Range Section, etc.) at a scale of 1"=2000'.
- b. Soils and land-use map at the same scale as the base map.
- c. Schematic map for the HEC-1 computer model which depicts the sub-basins (area, Tc), the flow paths, the routing reaches (length, slope, friction, width, associated velocities, associated transmission losses, etc.), order of combining the hydrographs, channel, pipe or culvert dimensions (where appropriate).
- d. Pertinent data on structures in the watershed (such as spillway elevation, rating curves, etc.).

3.8 The proposed approach to performing the hydrology portion of the contract is presented as follows, organized by work task:

- a. Data Collection: Research records and obtain CAP access privileges. Research records of the following agencies:
  - \* Flood Control District of Maricopa County (District)

- \* Maricopa County Highway Department (MCHD)
- \* Arizona Department of Water Resources (ADWR)
- \* U.S. Bureau of Reclamation (USBR)
- \* U.S. Geological Survey (USGS)
- \* U.S. Soil Conservation Service (SCS)

Prepare a summary of findings for submittal to the District. Included under this task is a field trip with District personnel at the start of the project to identify the critical points of the watershed and problem areas.

- b. Preliminary Sub-Basin Delineation: Prepare two sets of 1"=2000' scale base maps and one 1"=10000' scale base map from 7.5 minute USGS quadrangle maps. The 2000 scale maps will be on 5 - 36"x42" sheets, and the 10000 scale map will be on 1 - 18"x24" sheet.

The soils grid will be drafted on one set of 2000 scale maps, and the preliminary sub-basin delineations will be prepared and drafted on the second set. Tentative Tc flow paths and routing paths will be determined and drafted on the sub-basin maps.

Sample parameter calculation forms will be prepared for review by the District.

- c. Meeting Number One with the District: Copies of the base maps and parameter calculation forms will be submitted to the District for review one week prior to the meeting. These maps, the proposed parameter calculations and the findings of the records search will be discussed.

- d. Field Investigation: A detailed field reconnaissance will be done to accomplish the following:

1. Verify questionable sub-basin boundaries;
2. Verify Tc path locations. Estimate average low flow channel cross sections for use in calculating Tc values using TR-55 methodology. This data will be used to check approximately 10% of the Tc values estimated using the Papadakis method;
3. Verify routing path locations. Estimate reach route cross sections for use in determining HEC-1 Normal Depth parameters. Distances will be paced, and relative elevations obtained using a hand level. This will be done for approximately 20% of the routing reaches. The data obtained will be used to estimate average cross section configurations for the remainder of the reaches. This will be done by comparing the observed data with the USGS quadrangle maps and visually matching similar reaches;
4. Observe routing reach channel bed and overbank soils. Check for consistency with the SCS mapping. Take percolation tests at six representative locations. Take

three tests at each location, one in the channel bed and one on each overbank area, for a total of 18 tests. Use an 8 inch or 12 inch diameter plastic pipe, set 4 to 12 inches into the ground. The hole will be pre-soaked and the percolation test taken by applying a hydraulic head in the pipe at the average estimated flow depth at the test location. The test results will be used as confidence checks on the percolation values derived from the SCS soil survey data;

5. Vegetation transects will be taken in the watershed at representative locations to establish average vegetation cover densities. The regions will be established based on visual observations in the field;
6. The Tc data, routing reach data, and vegetation cover data will be documented and summarized for input to the parameter estimation spreadsheets where appropriate; and
7. The sub-basin delineation and soils boundary maps will be revised to reflect the findings of the field reconnaissance.

District personnel may accompany the Consultant at intervals during the field reconnaissance phase.

- e. Meeting Number Two with the District: Meeting number two will be held after the hydrologic field reconnaissance is accomplished and the sub-basin delineations are completed. The proposed approach to parameter estimation, routing methodology and channel transmission loss estimates will be discussed and finalized at this meeting.
- f. Final Sub-Basin Delineation: The areas of sub-basins will be planimetered. Areas of soils types from a representative sample (about 1/3 of the total) will be planimetered. Time of concentration flow paths and routing reach paths will be measured and elevations for the top and bottom of representative reaches will be determined. The data collected will then be placed into the parameter estimation and summary spreadsheets. Sub-basin identifiers, Tc path data, and routing reach data will be drafted onto the exhibit maps.
- g. Parameter Estimations: The following parameters will be estimated under this task:
  1. Green and Ampt Coefficients - Values will be assigned for the soil type at all grid locations for each sub-basin. These values will be input to the parameter spreadsheet, and composite values for each sub-basin calculated;
  2. Time of Concentration - The Green and Ampt values, sub-basin areas and Tc parameters will be input to the MCUHP1 computer program and the base HEC-1 input data files created. The resultant Tc estimates will then be input to

the summary spreadsheet, and average reach velocities calculated. The Tc estimates will be checked for reasonableness by inspecting velocities and by estimating Tc values for 25% of the sub-basins using TR-55 methodology; and

3. Reach Routing Data - The Normal Depth channel cross sections will be sketched, average velocities estimated for each reach, and the number of routing steps calculated. Velocities for the reaches to be modeled by the Muskingum method will be estimated and x and K coefficients assigned. The number of routing steps will then be calculated.
- h. Channel Losses: The average percolation rates for the routing reaches which will include transmission losses will be estimated as follows. This will be done after peak discharges are obtained from the initial HEC-1 runs made without transmission losses:
1. Only Normal Depth Channel routing reaches will be considered. The proposal is based on 50% of the Normal Depth Channel routing reaches being modeled to include transmission losses. The proposal is also based on the assumption that there will be a total of approximately 120 reaches modeled, and that 100 of these will be Normal Depth Channel reaches;
  2. The average inundation width for each storm will be estimated for each reach. The soils areas for channel bed soils versus channel overbank soils will then be estimated using the grid data to obtain a proportion of soils types across the cross section;
  3. Average percolation values for each reach for each storm will then be calculated in a spreadsheet; and
  4. The same process will be used for percolation losses in the ponding areas upstream of the CAP Canal Study Reach, where deemed appropriate.
- i. Meeting Number Three with the District: Meeting number three will be held after all the parameters except transmission losses have been estimated. A draft copy of parameter estimations will be submitted to the District at least one week prior to this meeting.
- j. HEC-1 Diagram: The HEC-1 schematic diagram will be prepared as described in Section 3.7.2C.
- k. HEC-1 Computer Models: The HEC-1 computer input data files, created under Task 3g, will be made into working models by the addition of hydrograph routing and combination control operations in accordance with the routing diagram. Comments on logic, assumptions, and watershed identification will also be

added to the files. The models will then be run, debugged, the results checked for reasonableness, and adjustments made accordingly.

- l. **Hydraulics of Structures and Storage Routing:** Hydraulic structures and crossings along the CAP Canal Study Reach will be analyzed utilizing the field survey data. Stage versus discharge and stage versus storage volume curves for each structure and crossing will be developed for input to the HEC-1 models. The new contour mapping will be used in conjunction with the USGS quadrangle maps for estimation of available ponding volumes.

- m. **Add Storage Routing to HEC-1 Model:** The stage versus discharge and stage versus volume curves will be added to the HEC-1 models as reservoir routing operations. The results will be checked for reasonableness and locations of overtopping of the CAP Canal banks determined.

The hydrology results will then be compared with previous studies and available gage data. The models will be calibrated or adjusted if necessary.

- n. **Preliminary Hydrology Report:** The preliminary hydrology report will be prepared as described under Section 3.7 and bound in a format suitable for review. Three (3) copies will be submitted to the District for review.

- o. **Meeting Number Four with the District:** Meeting number four will be held after the preliminary HEC-1 results have been obtained and a draft report has been prepared. A copy of the draft report and the copy of the HEC-1 input files on a floppy disk (compatible with the District's IBM-AT computer) will be delivered to the District one week prior to the meeting. A second copy will be forwarded to ADWR for their review and comment.

- p. **Meeting Number Five with the District:** Meeting number five will be held to review comments by the District and ADWR one week after the Consultant has received the District's comments. The District will require a minimum of two weeks to review the report and the models.

The second field trip may be scheduled for the same week as meeting number five so that the results obtained can be discussed in the field.

- q. **Final Hydrology Report:** The final hydrology report will be prepared as described under Section 3.7, and will reflect the review comments from the District and ADWR. The reach routing parameters for the lower reaches, modeled using HEC-2, will be adjusted using the HEC-2 cross sections. The HEC-2 cross sections available for each routing reach will be compared and

a typical average cross section estimated. The final report will reflect this effort. Six (6) copies will be submitted to the District.

- r. FEMA Revisions and Coordination: The response from FEMA will be reviewed and all comments addressed. This task will include revisions which are necessary to obtain FEMA approval both to the HEC-1 models and the final report.

#### Task 4 Field Survey

- 4.1 Prepare topographic mapping to a 4 foot contour interval with a scale of 1" = 400' feet, with spot elevations on section line and mid-section line roads, for floodplain/floodway delineation areas as identified in Task 2 or FEMA criteria, whichever is more stringent.
- 4.2 Ground Control for Floodplain Delineations:
  - a. Topographic mapping and survey work shall meet or exceed Federal Emergency Management Agency (FEMA) minimum criteria as defined in FEMA Document 37, Flood Insurance Study Guidelines and Specifications for Study Contractors, Appendix 4, September 1985. This would include, but is not limited to: the establishment of "permanent" elevation reference marks (ERM's); field control; and verification of profiles by the ground survey profile procedure.
  - b. Horizontal and Vertical Control; Systematically set panel points and establish horizontal and vertical control throughout the area to be mapped using the Global Positioning system supplemented by conventional field methods for use in compilation by the aerial survey contractor. Surveys will tie into State Plane Coordinate System. Field control shall be sufficient, at least one "permanent" point per mile, such point(s) being used as Elevation Reference Marks (ERM's). Surveys will be based on National Geodetic Vertical Datum (NGVD), per FEMA guidelines. "Permanent" survey points shall consist of existing monumentation, such as brass caps or similar survey monuments. Where additional monumentation is needed, survey markers conforming to Maricopa Association of Governments (MAG) Uniform Standard Detail for Public Works Construction, Detail 120-1, Type C, shall be placed 2" +/- above grade. Elevation Reference Marks will be labeled on available maps and described in a manor which allows them to be readily located in the field.
  - c. "As-Built" plans or surveys of bridges and hydraulic structures are to be obtained by the Study Consultant.
  - d. The Consultant shall verify profiles for mapped floodplains. The ground survey profile procedure as described in FEMA Document 37 or other methods approved by FEMA.

## Task 5 Floodplain and Floodway Delineation

- 5.1 Floodway and Floodway delineations must be obtained for the 100-year flood using the U.S. Army Corps of Engineers HEC-2 Water Surface Profiles computer model, 1989 version, and using methodology acceptable to FEMA. This model will simulate the effects of floodplain geomorphology, flow changes, bridges and culverts, hydraulic roughness factors, effective flow limitations, split-flows, and other considerations. The Consultant will prepare the study using the guidelines established in "The Flood Insurance Study Guidelines and Specification for Study Contractors", dated September 1985 and "Appeals, Revisions, and Amendments to Flood Insurance Maps", September 1985.
- 5.2 Bridges and Culverts must be modeled in compliance with HEC-2 modeling requirements for the selected routing. Where multiple bridges occur, each bridge will be modeled separately.
- 5.3 Cross sections shall be spaced an average of 1000 feet apart. Cross-sections will be plotted using a pen plotter. The cross-section plots will show water surface profiles, ineffective flow areas, "n" values, encroachments, channel stationing and other pertinent information. These plots are to be available at reviews.
- 5.4 Flood zones must be determined according to FEMA criteria.
- 5.5 The Contractor will prepare working maps and models of the 100-year floodplain and floodway during the course of the hydraulic modeling analysis for review by the Flood Control District at progress meetings. Floodways are to be determined using equal conveyance encroachment methods to start with, but only encroachment method 1 will be used in the final analysis.
- 5.6 The delineation work shall meet requirements for floodplain delineations as prescribed by FEMA and the Arizona Department of Water Resources.
- 5.7 The final report for the floodplain/floodway delineation study will include, but is not limited to the following:
  - I. Introduction
    - a. Purpose of study
    - b. Authority for study
    - c. Coordination and acknowledgments
  - II. Area Studied
    - a. Scope of study
    - b. Community description
    - c. Principal flood problems
    - d. Flood protection measures

- III. Engineering methods
  - a. Hydrologic analyses
  - b. Hydraulic analyses
- IV. Floodplain Management applications
  - a. Flood boundaries
  - b. Floodways
- V. Insurance applications
- VI. Other Studies
- VII. Location of data
- VIII. Bibliography

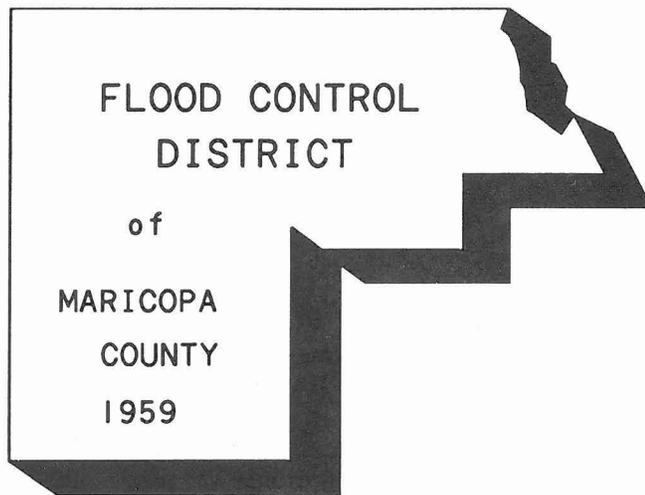
#### Task 6 Coordination

- 6.1 The Consultant shall participate in regular coordination meetings (at least every three weeks) with the District's Project Manager and in milestone coordination meetings in the development of the hydrologic and hydraulic analyses.
- 6.2 Prior to finalizing the hydraulic analysis, the Consultant will submit maps, report, and HEC-1 model to ADWR and other applicable governmental agency reviewers throughout the District. The Consultant will respond to questions by the reviewers and make modifications to the hydrologic maps, model, and report if necessary.
- 6.3 The Consultant will submit maps, report, and HEC-2 model to ADWR, FEMA for review by the Technical Evaluation Contractor (TEC), and other governmental agency reviewers through the District. The Consultant will respond to questions by the reviewers and make modifications to maps, models and report if required.

#### Task 7 Final Products

- 7.1 Mapping:
  - a. One complete set of 9" x 9" contact prints of the aerial stereo photographs sequentially numbered and catalogued.
  - b. One complete set of contour maps, blue-line, draft copy for Flood Control District reference during the project, delivered immediately following the topographic mapping.
  - c. One complete set of contour maps at 1" = 400' scale with the floodplain delineations in reproducible form (mylar) and six blue-line copies as outlined in Task 2.
  - d. One set of transparent overlays of photo-mylars.

- e. One complete set of mylars for the foldout maps (no larger than 11" x 17") used in the report.
- 7.2 One-half inch magnetic tape formatted at 1600 bpi containing the topographic data and the digitized floodplain/floodway boundaries in the AutoCAD DXF ASCII format.
- 7.3 Six hardcopies of the HEC-2 and HEC-1 printouts and a copy of the HEC-2 and HEC-1 model input files on 5-1/4", 1.2 Mb diskettes compatible with an IBM-At personal computer.
- 7.4 Tabular list of control points (ERM's) used with descriptions, elevations, and coordinates.
- 7.5 Reports:
  - a. The Consultant will produce a final report incorporating the comments of the District, FEMA and other reviewers. Six copies of the Hydrology and Hydraulics reports as outlined in Tasks 3 and 5 respectively, will be delivered.
- 7.6 Documentation for this study will be as outlined in Instructions for Organizing and Submitting Technical Documentation for Flood Studies as required by ADWR.



**JACKRABBIT WASH  
FLOODPLAIN DELINEATION STUDY**

**FCD 90-05**

## **SECTION 2: Mapping and Surveying Information**

## **SECTION 2: Mapping and Surveying Information**

### ***2.1 General***

## Hydrologic Mapping

Exhibits "A", "B" and "C" - The base mapping used for these exhibits consists of United States Geological Survey (USGS) 7.5 minute quadrangle maps. The maps were photo-mosaicked at full 2000 scale for use for Exhibits "B" and "C." A composite of all the USGS quadrangle maps was reduced to 10000 scale for Exhibit "A." The following are the USGS quadrangle maps used for this study:

AGUILA: 1990 provisional, 1951 and 1960 photo date, 20' contour interval (CI), 10' supplementary contour interval (SCI).

BELMONT MOUNTAIN: 1989 provisional, 1951 and 1960 photo date, 40' CI.

BLACK BUTTE: 1990 provisional, 1951 and 1960 photo date, 40 CI, 20 SPI.

BUCKEYE NW: 1982 Photo revised, 1955 and 1978 photo date, 10' CI.

BURNT MOUNTAIN: 1990 provisional, 1960 photo date, 20' CI.

DAGGS TANK: 1988 provisional, 1984 photo date, 20' CI.

FLATIRON MOUNTAIN: 1990 provisional, 1951 and 1960 photo date, 20' CI.

FOREPAUGH PEAK: 1990 provisional, 1951 and 1960 photo date, 20' CI, 10' SCI.

HOT ROCK MOUNTAIN: 1990 provisional, 1951 and 1960 photo date, 20' CI.

HUMMINGBIRD SPRING: 1990 provisional, 1960 photo date, 40' CI.

OUTLAW HILL: 1990 provisional, 1951 and 1960 photo date, 20 CI, 10' SCI.

STAR WELL: 1989 provisional, 1951 and 1960 photo date, 10' CI.

TIGER WELL: 1990 provisional, 1951 and 1960 photo date, 40' CI, 20' SCI.

VULTURE MINE: 1990 provisional, 1951 and 1960 photo date, 20' CI, 10' SCI.

VULTURE PEAK: 1990 provisional, 1951 and 1960 photo date, 20' CI, 10' SCI.

WAGNER WASH WELL: 1988 provisional, 1984 photo date, 20' CI.

WICKENBURG: 1978 photoinspected, 1962 photo date, 20' CI, 10' SCI.

WICKENBURG SW: 1965, 1962 photo date, 20' CI, 10' SCI.

WILDCAT WELL: 1990 provisional, 1951 and 1960 photo date, 20' CI.

WINTERSBURG: 1984 provisional, 1960 photo date, 10' CI.

Exhibit "D" - the cross sections on this exhibit were taken in the field during the period September 6, 1990 through September 20, 1990. The cross section vertical measurements were taken using a Hewlett-Packard Laser level. Distances were paced or measured with a Philadelphia Rod and hand tape. The horizontal location of each cross section is identified on Exhibit "C."

Each cross section was taken at a location deemed to be representative of that portion of a routing reach. Sufficient cross sections were taken to enable interpolation or estimation of typical cross sections for other representative reaches.

Exhibit "E" - The cross sections on this exhibit are plots of each reach route section used in the HEC-1 models. They were derived from the cross sections shown on Exhibit "D" using one of the following methods, or from contour mapping:

1. The actual cross section taken in a reach was used where appropriate. The end legs of the section were extended if necessary to contain the computed peak flows. The actual grades shot in the field, or slopes calculated from the USGS quadrangle maps, were used in the extension process.
2. Interpolation between known cross sections from Exhibit "D."

3. Known cross sections from Exhibit "D" were used for reaches deemed similar to the source reach. A reach was deemed similar based on field observation or examination of the terrain of the reach on the USGS quadrangle map.
4. Digitized HEC-2 cross sections for Jackrabbit Wash, the West Fork of Jackrabbit Wash, and Star Wash were used for those reaches mapped as a part of the floodplain delineation portion of this project. The mapping was prepared by Aerial Mapping Co. of Phoenix, AZ. The Aerial Mapping Co. job number is 90153, and the mapping flight date was September 28, 1990.
5. A portion of the watershed south of the Central Arizona Project Canal has been mapped at a scale of 1"=500' with a 1' contour interval. The mapping was used for cross sections south of the CAP Canal, where possible. The mapping was prepared by Kenney Aerial Mapping of Phoenix, AZ. The Kenney Aerial Mapping job number is 890414. The flight date is unknown. This mapping was prepared for a proposed residential development project known as the "Belmont Planned Community." The mapping is referred to as the "Belmont Mapping" in this report.

Exhibit "G" - The mapping for this exhibit was done to provide additional detail on the Coyote Wash split area. The mapping is at a scale of 1"=200' with a 2' contour interval. The mapping was prepared by Aerial Mapping Company. The Aerial Mapping Co. job number is 90153, and the flight date was September 28, 1990.

### **Hydraulic Mapping**

Mapping at a scale of 1:4800 with a 4-foot contour interval was prepared by Aerial Mapping Company, Inc. under subcontract to Burgess & Niple, Inc. Digitized cross sections at locations selected by Burgess & Niple were also provided by Aerial Mapping Company, Inc. The Aerial Mapping Company job number is 90153 and the flight date was September 28, 1990.

### **Mapping Control**

Standard field survey methods were used to establish control for aerial mapping. A Wild T-2 theodolite and Topcon DMS-2 were used. McKuen Global Positioning Systems, Inc. was employed to provide horizontal control for selected locations using satellite global positioning.

Vertical control was based on the U.S.C. & G.S. third order control survey by W.L. Settlemyer, in 1957. Adjusted field elevations are on NGVD 1929 datum.

Horizontal control was placed on the Arizona State Plane Coordinate System on NAD 1927 datum.

Five stream cross sections were obtained by both field and aerial mapping methods. Distribution of the sections is as follows:

<u>Stream</u>	<u>Section Label</u>
Jackrabbit Wash	7.874*
Jackrabbit Wash	12.711
Jackrabbit Wash	17.720
Star Wash	1.100
Unnamed Tributary	7.074

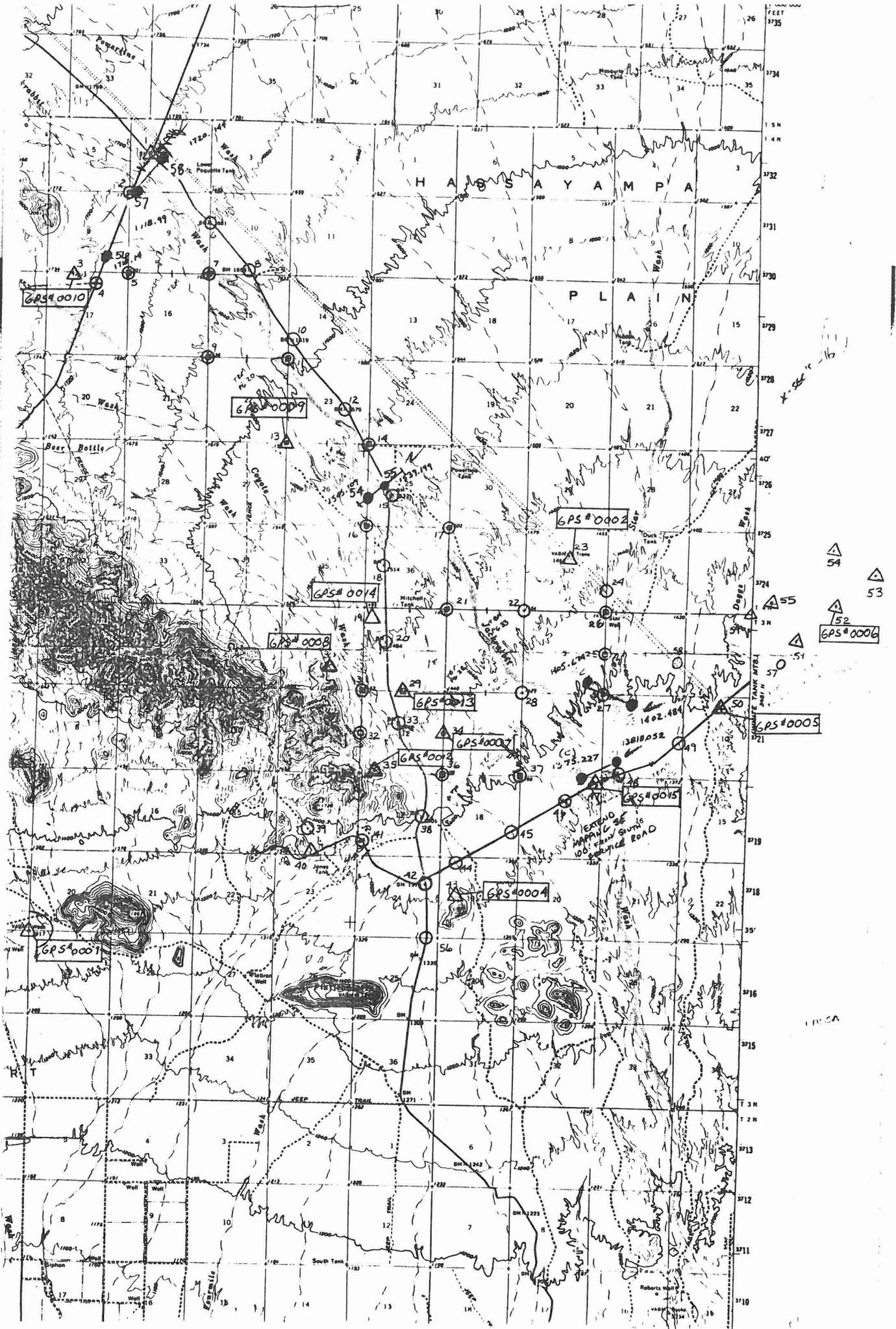
- \* Section 7.874 is not included in the Jackrabbit Wash HEC-2 computer model because of hydraulic reasons. It is, however, used to compute initial backwater for Star Wash. All five sections meet or exceed FEMA map accuracy criteria.

## **SECTION 2: Mapping and Surveying Information**

### ***2.2 Index of Maps***

## **SECTION 2: Mapping and Surveying Information**

### *2.3 Survey Field Notes*



7 DATUM

STATE PLANE COORDINATES FROM GEODETIC POSITIONS												
	STATION NAME		LATITUDE	LONGITUDE	X	Y	ZONE	CONVERGENCE	SCALE FACTOR	ELEV(ft)		
5	0001	WASH	(USC&GS)	33 34 50.23600	112 54 5.56500	200042.595	940178.834	AZ C	0-32 41.22	1.0000030187	1317.90	
6	0002	TRANS	(USC&GS)	33 38 53.44400	112 47 21.04800	234473.379	964453.832	AZ C	0-29 0.52	0.9999807248	1461.20	
7	0003	VALLEY	(USC&GS)	33 45 8.95800	112 51 54.13000	211736.382	1002612.442	AZ C	0-31 37.03	0.9999951394	1777.84	
8	0004			33 35 21.51776	112 48 44.42390	227239.618	943093.923	AZ C	0-29 43.97	0.9999851842	1424.66	
9	0005			33 37 19.86900	112 45 25.45845	244168.103	954914.940	AZ C	0-27 55.32	0.9999749381	1408.29	
10	0006			33 38 19.80994	112 43 45.90299	252634.307	960906.099	AZ C	0-27 0.90	0.9999700601	1393.42	
11	0007			33 37 1.49074	112 48 53.74561	226538.732	953205.375	AZ C	0-29 50.43	0.9999856220	1432.12	
12	0008			33 37 43.57820	112 50 23.63575	218974.891	957526.237	AZ C	0-30 40.77	0.9999904238	1511.36	
13	0009			33 40 3.35185	112 50 58.39629	216163.130	971680.177	AZ C	0-31 1.92	0.9999922415	1578.40	
14	0010			33 41 45.82964	112 53 44.03480	202261.729	982167.692	AZ C	0-32 35.22	1.0000014975	1793.92	
15	0011			33 43 5.52933	112 52 49.00779	206986.209	990179.681	AZ C	0-32 5.80	0.9999983015	1726.07	
16	0012			33 36 38.48833	112 49 35.80307	222961.590	950911.510	AZ C	0-30 13.42	0.9999878768	1450.16	
17	0013			33 37 27.68529	112 49 25.02537	223916.685	955876.035	AZ C	0-30 8.10	0.9999872717	1457.72	
18	0014			33 38 9.17407	112 49 46.00034	222180.031	960085.076	AZ C	0-30 20.27	0.9999883728	1492.39	
19	0015			33 36 29.86994	112 46 54.40147	236604.642	949923.359	AZ C	0-28 43.95	0.9999794348	1368.77	
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NATIONAL GEODETIC SURVEY

PROGRAM GPPC83

GP TO PC PROGRAM  
1983 DATUM

VERSION 1.0

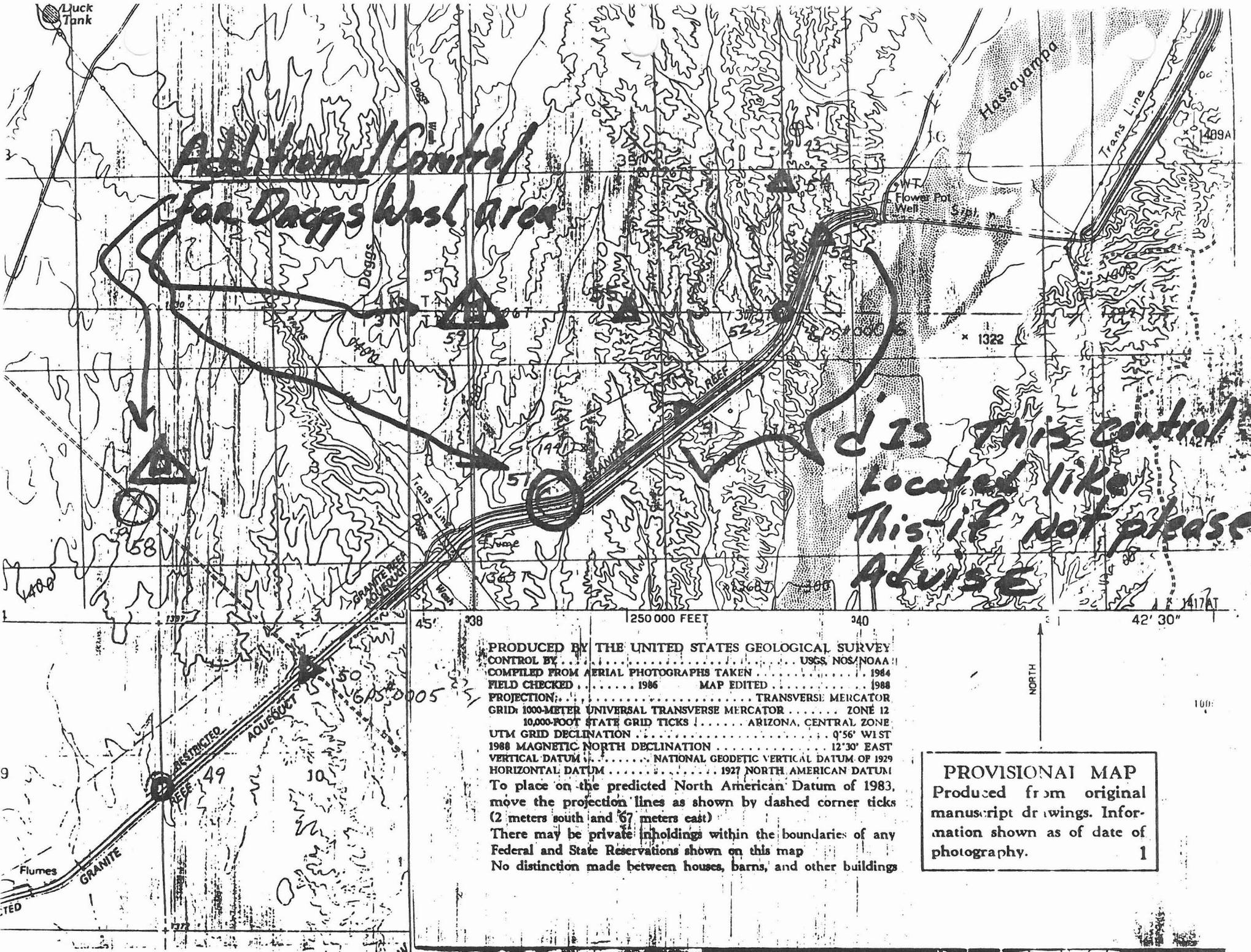
NAME		LATITUDE	LONGITUDE	NORTH (Y)	EAST (X)	ZONE	CONVERGENCE	SCALE	ELEV (m)
0001	WASH	(USC&GS) 33 34 50.37904	112 54 8.20941	286581.279	121866.682	AZ C	-0 32 42.69	1.00000317	401.697
0002	TRANS	(USC&GS) 33 38 53.56920	112 47 23.68179	293979.912	132361.296	AZ C	-0 29 1.98	0.99998086	445.374
0003	VALLEY	(USC&GS) 33 45 9.08076	112 51 56.78187	305611.002	125430.823	AZ C	-0 31 38.51	0.99999528	541.888
0004		33 35 21.65210	112 48 47.06283	287469.507	130156.311	AZ C	-0 29 45.43	0.99998532	434.238
0005		33 37 19.99577	112 45 28.09153	291072.401	135316.184	AZ C	-0 27 56.78	0.99997507	429.249
0006		33 38 19.93313	112 43 48.53355	292898.438	137896.708	AZ C	-0 27 2.36	0.99997018	424.716
0007		33 37 1.62085	112 48 56.38435	290551.447	129942.712	AZ C	-0 29 51.90	0.99998576	436.510
0008		33 37 43.70824	112 50 26.27570	291868.499	127637.279	AZ C	-0 30 42.24	0.99999056	460.662
0009		33 40 3.47806	112 51 1.03503	296182.644	126780.335	AZ C	-0 31 3.39	0.99999238	481.097
0010		33 41 45.95531	112 53 46.67661	299379.350	122543.220	AZ C	-0 32 36.69	1.00000165	546.789
0011		33 43 5.65181	112 52 51.64753	301821.374	123983.283	AZ C	-0 32 7.27	0.99999845	526.108
0012		33 36 38.62168	112 49 38.45018	289852.363	128852.202	AZ C	-0 30 14.89	0.99998802	442.009
0013		33 37 27.81684	112 49 27.67095	291365.540	129143.359	AZ C	-0 30 9.57	0.99998741	444.313
0014		33 38 9.30704	112 49 48.63558	292648.541	128614.314	AZ C	-0 30 21.73	0.99998851	454.880
0015		33 36 30.00374	112 46 57.03521	289551.150	133010.861	AZ C	-0 28 45.41	0.99997957	417.201

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*Additional Control  
for Daggs Wash Area*

*Is this control  
located like  
this - if not please  
advise*



PRODUCED BY THE UNITED STATES GEOLOGICAL SURVEY  
 CONTROL BY ..... USGS, NOS/NOAA .....  
 COMPILED FROM AERIAL PHOTOGRAPHS TAKEN ..... 1984  
 FIELD CHECKED ..... 1986 ..... MAP EDITED ..... 1988  
 PROJECTION: ..... TRANSVERSE MERCATOR  
 GRID: 1000-METER UNIVERSAL TRANSVERSE MERCATOR ..... ZONE 12  
 10,000-FOOT STATE GRID TICKS ..... ARIZONA, CENTRAL ZONE  
 UTM GRID DECLINATION ..... 0°56' WEST  
 1988 MAGNETIC NORTH DECLINATION ..... 12°30' EAST  
 VERTICAL DATUM ..... NATIONAL GEODETIC VERTICAL DATUM OF 1929  
 HORIZONTAL DATUM ..... 1927 NORTH AMERICAN DATUM  
 To place on the predicted North American Datum of 1983,  
 move the projection lines as shown by dashed corner ticks  
 (2 meters south and 67 meters east)  
 There may be private inholdings within the boundaries of any  
 Federal and State Reservations shown on this map  
 No distinction made between houses, barns, and other buildings

**PROVISIONAL MAP**  
 Produced from original  
 manuscript drawings. Informa-  
 tion shown as of date of  
 photography. 1

SEPTEMBER, 1990

JACKRABBIT WASH PRIMARY MAPPING CONTROL 19

EXISTING CONTROL FIT QUITE WELL ON NAD83, AND GOOD ON NAD27. SOME VERTICAL INACCURACY IS APPARENT; A CONTRIBUTING FACTOR IS THE RELATIONSHIP BETWEEN BENCHMARKS USED FOR THE PROJECT.

COMBINED SCALE FACTORS COMPUTED AT #0014 ARE AS FOLLOWS:

NAD27 GRID TO GROUND COMBINED FACTOR = 1.00008309  
NAD83 GRID TO GROUND COMBINED FACTOR = 1.00008297

THESE FACTORS ARE FOR #0014, AND SHOULD NOT BE CONSIDERED PRECISE FOR THE ENTIRE AREA MAPPED, BUT MAY BE USED FOR CONVERSION OF DISTANCES BETWEEN GRID AND GROUND.

## DAILY REPORT

JACKRABBIT WASH

SEP 12, 1990

DAY 255

## Session A (Static)

Operator	Station	Description	Receiver
BEN	0004	NAIL FLUSH	1
JERRY	0001	USC&GS WASH BC IN CONC POST	2
WOODY	0005	NAIL FLUSH	3
BILL	0002	USC&GS TRANS BC IN CONC POST	4

## Session B (Static)

BEN	0008	NAIL FLUSH	1
JERRY	0007	NAIL FLUSH APPX E1/4 S12	2
WOODY	0006	NAIL FLUSH	3
BILL	0002	USC&GS TRANS BC IN CONC POST	4

## Session C (Static)

BEN	0008	NAIL FLUSH	1
JERRY	0010	NAIL FLUSH	2
WOODY	0009	1/2" IP FLUSH APPX NE27	3
BILL	0011	BM 1726 USGS BC IN CONC POST	4

## Session D (Static)

BEN	0012	NAIL FLUSH	1
JERRY	0003	USC&GS VALLEY BC IN CONC POST	2
WOODY	0013	NAIL FLUSH APPX N1/2 S12	3
BILL	0011	BM 1726 USGS BC IN CONC POST	4

## Session E (Static)

BEN	0001	USC&GS WASH BC IN CONC POST	1
JERRY	0003	USC&GS VALLEY BC IN CONC POST	2
WOODY	0015	NAIL FLUSH	3
BILL	0014	NAIL FLUSH	4

## Session F (Static)

BEN			1
JERRY			2
WOODY			3
BILL			4

## Session G (Static)

BEN			1
JERRY			2
WOODY			3
BILL			4

# MGPS Inc

Adjusted Position Sta.(name) \_\_\_\_\_ Sta.# 0014

Latitude \_\_\_\_\_ Coord. Sys. \_\_\_\_\_

Longitude \_\_\_\_\_ Ellipsoid \_\_\_\_\_

Ellipsoidal Height \_\_\_\_\_ X \_\_\_\_\_

Geoid Height \_\_\_\_\_ Y \_\_\_\_\_

M.S.L. Elevation \_\_\_\_\_ Z \_\_\_\_\_

Vert. Datm Ref. \_\_\_\_\_

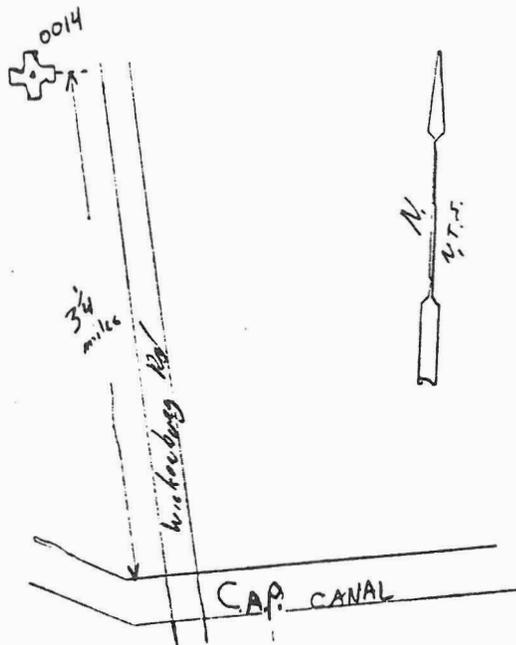
\*\*\*\*\*

## Location Sketch and Description

\*\*\*\*\*

Date 9.12.97 Project JACKRABBIT

Type of Mark Large nail Condition Flush with N/Ged



Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# MGPS Inc

Adjusted Position Sta.(name) \_\_\_\_\_ Sta.# 0011

Latitude \_\_\_\_\_ Coord. Sys. \_\_\_\_\_

Longitude \_\_\_\_\_ Ellipsoid \_\_\_\_\_

Ellipsoidal Height \_\_\_\_\_ X \_\_\_\_\_

Geoid Height \_\_\_\_\_ Y \_\_\_\_\_

M.S.L. Elevation \_\_\_\_\_ Z \_\_\_\_\_

Vert. Datm Ref. \_\_\_\_\_

\*\*\*\*\*

## Location Sketch and Description

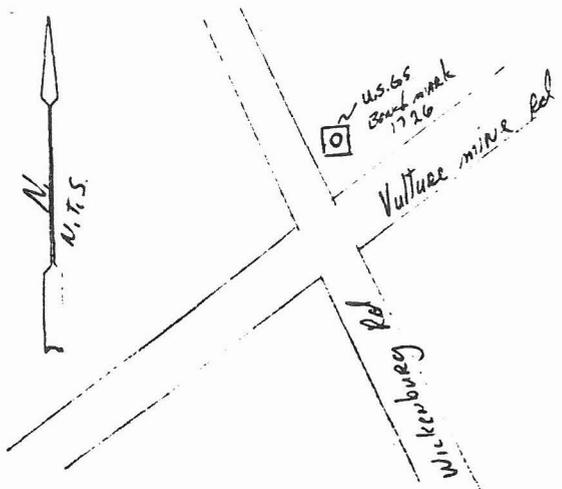
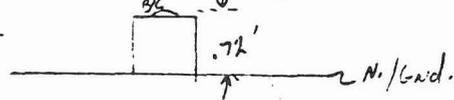
\*\*\*\*\*

Date 9.12.90 Project JACKRABBIT

1726 Feet (Marked as WLS)

Type of Mark U.S.G.S B/C Condition .72 above NAT GUM

Bench Mark  
1957



Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# MGPS Inc

Adjusted Position Sta.(name) TRANS Sta.# 0002

Latitude \_\_\_\_\_ Coord. Sys. \_\_\_\_\_

Longitude \_\_\_\_\_ Ellipsoid \_\_\_\_\_

Ellipsoidal Height \_\_\_\_\_ X \_\_\_\_\_

Geoid Height \_\_\_\_\_ Y \_\_\_\_\_

M.S.L. Elevation \_\_\_\_\_ Z \_\_\_\_\_

Vert. Datm Ref. \_\_\_\_\_

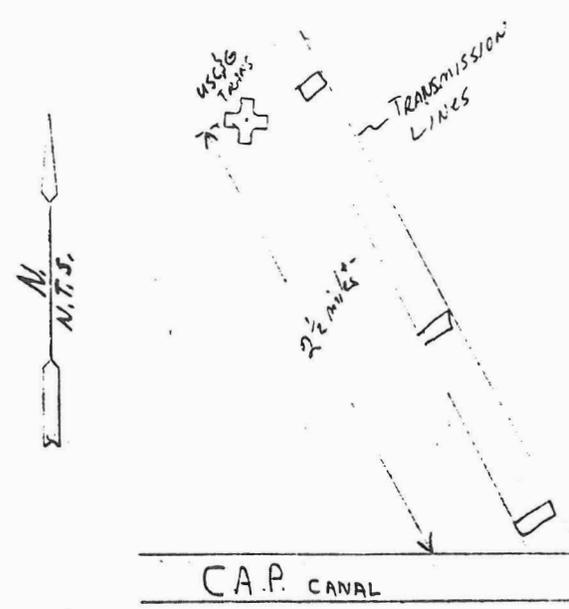
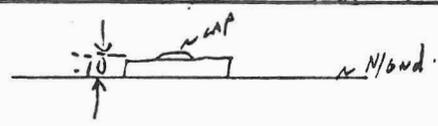
\*\*\*\*\*

## Location Sketch and Description

\*\*\*\*\*

Date 9.12.90 Project Jackrabbit Wash

Type of Mark TRANS USG 5G B/C Condition -10' Above NIG flush with panel  
1947



Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# MGPS Inc

Adjusted Position Sta.(name) 0015 Sta.# 0015

Latitude \_\_\_\_\_ Coord. Sys. \_\_\_\_\_

Longitude \_\_\_\_\_ Ellipsoid \_\_\_\_\_

Ellipsoidal Height \_\_\_\_\_ X \_\_\_\_\_

Geoid Height \_\_\_\_\_ Y \_\_\_\_\_

M.S.L. Elevation \_\_\_\_\_ Z \_\_\_\_\_

Vert. Datm Ref. \_\_\_\_\_

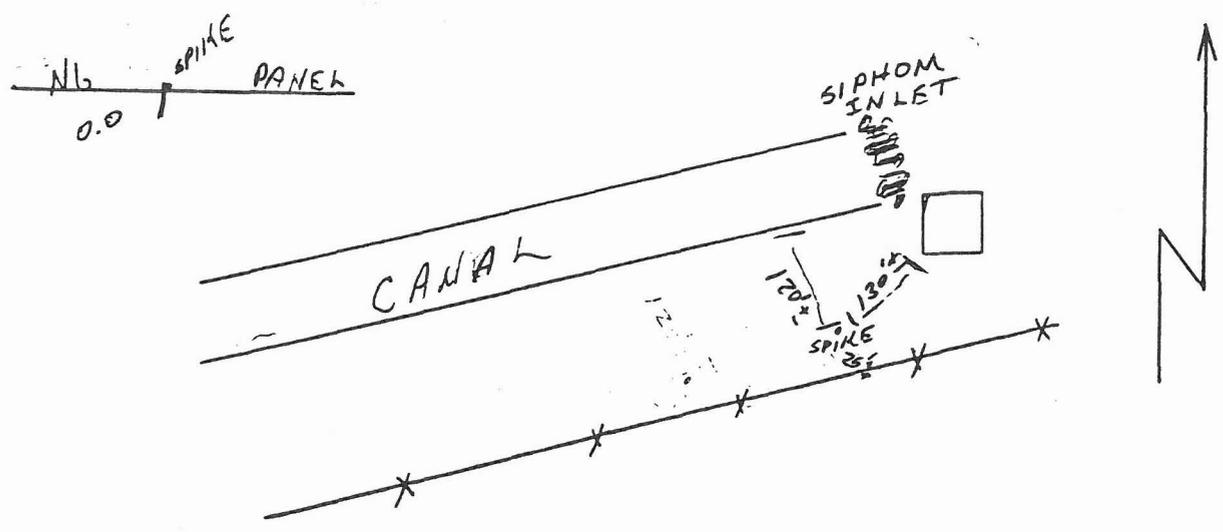
\*\*\*\*\*

## Location Sketch and Description

\*\*\*\*\*

Date 9/12/90 Project JACK RABBIT

Type of Mark SPIKE NAIL Condition Good



Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# MGPS Inc

Adjusted Position Sta.(name) 0013 Sta.# 0013

Latitude \_\_\_\_\_ Coord. Sys. \_\_\_\_\_

Longitude \_\_\_\_\_ Ellipsoid \_\_\_\_\_

Ellipsoidal Height \_\_\_\_\_ X \_\_\_\_\_

Geoid Height \_\_\_\_\_ Y \_\_\_\_\_

M.S.L. Elevation \_\_\_\_\_ Z \_\_\_\_\_

Vert. Datm Ref. \_\_\_\_\_

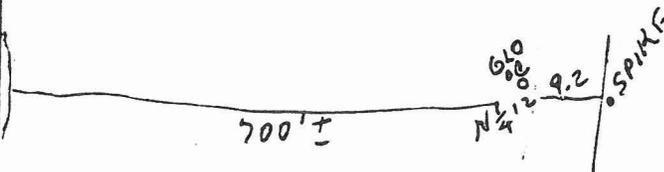
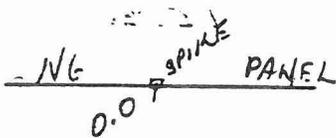
\*\*\*\*\*

## Location Sketch and Description

\*\*\*\*\*

Date 9/12/90 Project JACK RABBIT

Type of Mark SPIKE NAIL Condition GOOD



Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# MGPS Inc

Adjusted Position Sta.(name) 0009 Sta.# 0009

Latitude \_\_\_\_\_ Coord. Sys. \_\_\_\_\_

Longitude \_\_\_\_\_ Ellipsoid \_\_\_\_\_

Ellipsoidal Height \_\_\_\_\_ X \_\_\_\_\_

Geoid Height \_\_\_\_\_ Y \_\_\_\_\_

M.S.L. Elevation \_\_\_\_\_ Z \_\_\_\_\_

Vert. Datm Ref. \_\_\_\_\_

\*\*\*\*\*

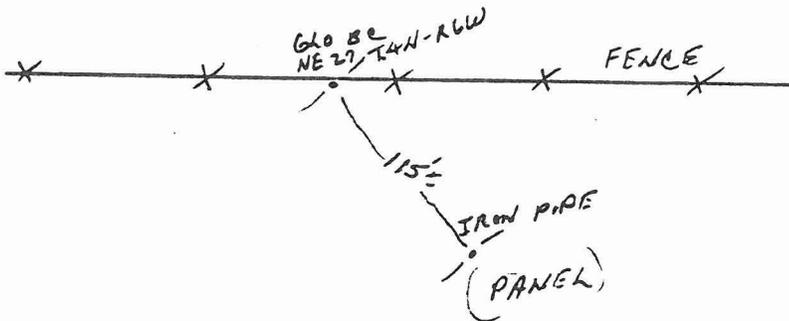
## Location Sketch and Description

\*\*\*\*\*

Date 9/12/90 Project JACKRABBIT

Type of Mark 1/2" IRON PIPE Condition GOOD

NO. 0.0  
FLUSH  
IRON PIPE  
PANEL



Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# MGPS Inc

Adjusted Position Sta.(name) 0006 Sta.# 0006

Latitude \_\_\_\_\_ Coord. Sys. \_\_\_\_\_

Longitude \_\_\_\_\_ Ellipsoid \_\_\_\_\_

Ellipsoidal Height \_\_\_\_\_ X \_\_\_\_\_

Geoid Height \_\_\_\_\_ Y \_\_\_\_\_

M.S.L. Elevation \_\_\_\_\_ Z \_\_\_\_\_

Vert. Datm Ref. \_\_\_\_\_

\*\*\*\*\*

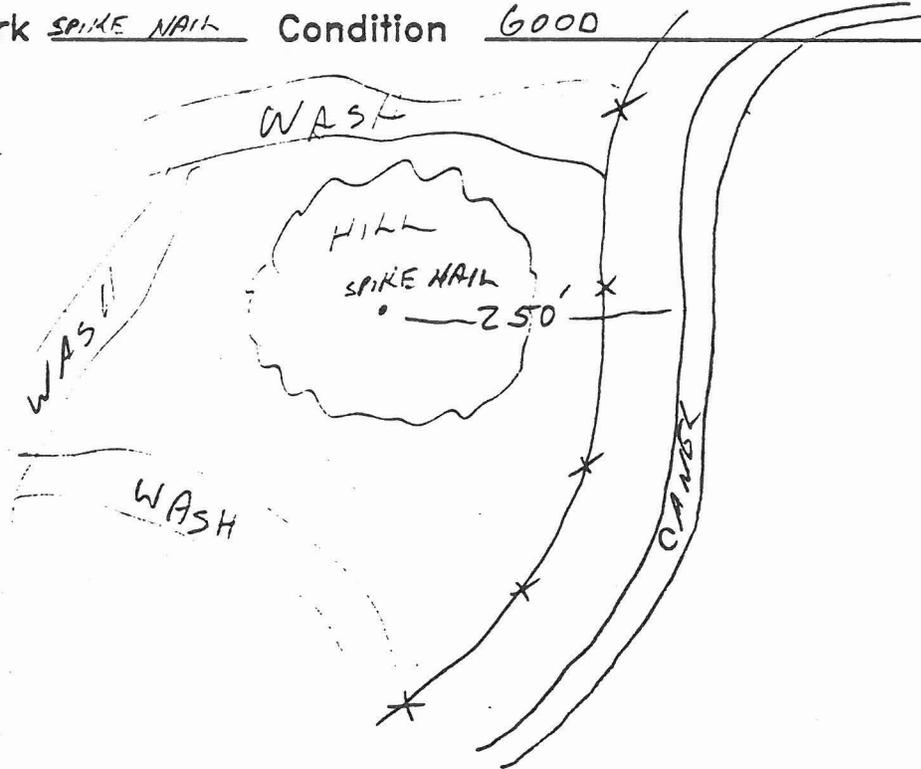
## Location Sketch and Description

\*\*\*\*\*

Date 9/12/90 Project JACK RABBIT

Type of Mark SPIKE NAIL Condition GOOD

NG NAIL  
FRUSH 0.0 PANEL



Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# MGPS Inc

Adjusted Position Sta.(name) 0005 Sta.# 0005

Latitude \_\_\_\_\_ Coord. Sys. \_\_\_\_\_

Longitude \_\_\_\_\_ Ellipsoid \_\_\_\_\_

Ellipsoidal Height \_\_\_\_\_ X \_\_\_\_\_

Geoid Height \_\_\_\_\_ Y \_\_\_\_\_

M.S.L. Elevation \_\_\_\_\_ Z \_\_\_\_\_

Vert. Datm Ref. \_\_\_\_\_

\*\*\*\*\*

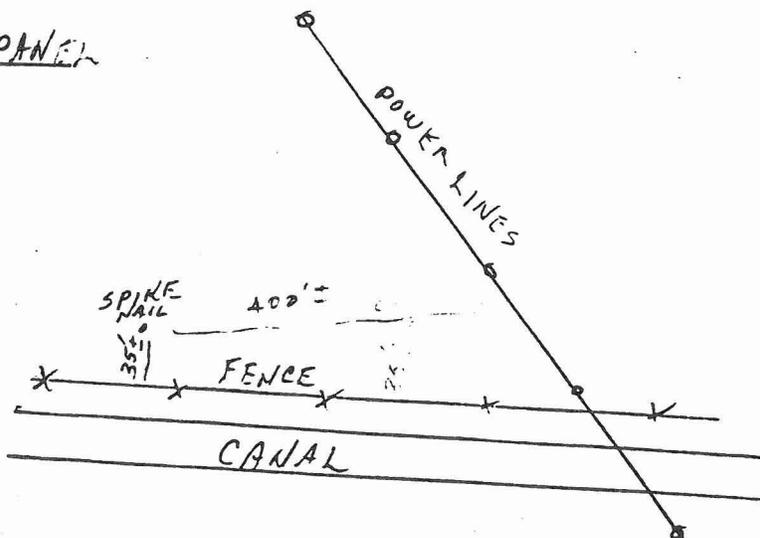
## Location Sketch and Description

\*\*\*\*\*

Date 9/12/90 Project JACK RABBIT

Type of Mark SPIKE NAIL Condition GOOD

N/12  
FLUSH NAIL  
0.0  
PANEL



Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# MGPS Inc

Adjusted Position Sta.(name) \_\_\_\_\_ Sta.# 0003

Latitude \_\_\_\_\_ Coord. Sys. \_\_\_\_\_

Longitude \_\_\_\_\_ Ellipsoid \_\_\_\_\_

Ellipsoidal Height \_\_\_\_\_ X \_\_\_\_\_

Geoid Height \_\_\_\_\_ Y \_\_\_\_\_

M.S.L. Elevation \_\_\_\_\_ Z \_\_\_\_\_

Vert. Datm Ref. \_\_\_\_\_

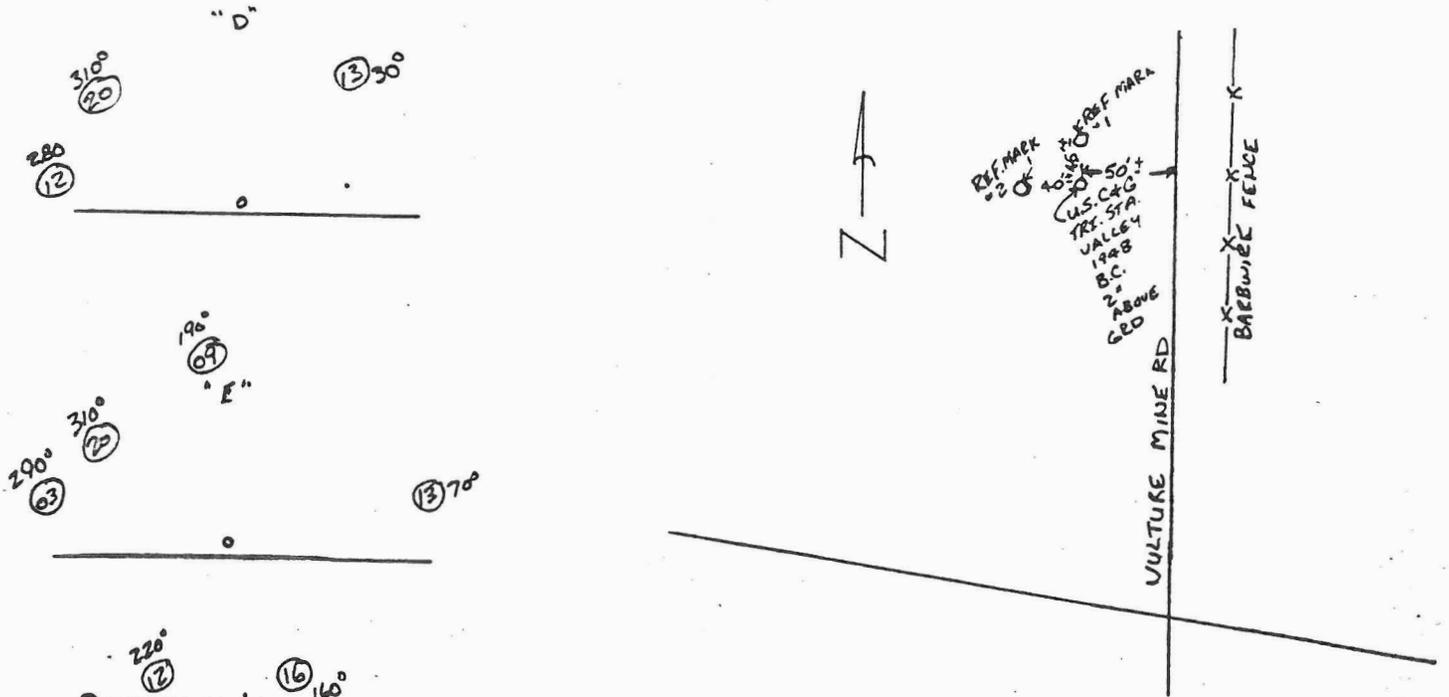
\*\*\*\*\*

## Location Sketch and Description

\*\*\*\*\*

Date 9/12/00 Project JACK RABBIT

Type of Mark \_\_\_\_\_ Condition \_\_\_\_\_



Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# MGPS Inc

Adjusted Position Sta.(name) \_\_\_\_\_ Sta.# 0010

Latitude \_\_\_\_\_ Coord. Sys. \_\_\_\_\_

Longitude \_\_\_\_\_ Ellipsoid \_\_\_\_\_

Ellipsoidal Height \_\_\_\_\_ X \_\_\_\_\_

Geoid Height \_\_\_\_\_ Y \_\_\_\_\_

M.S.L. Elevation \_\_\_\_\_ Z \_\_\_\_\_

Vert. Datm Ref. \_\_\_\_\_

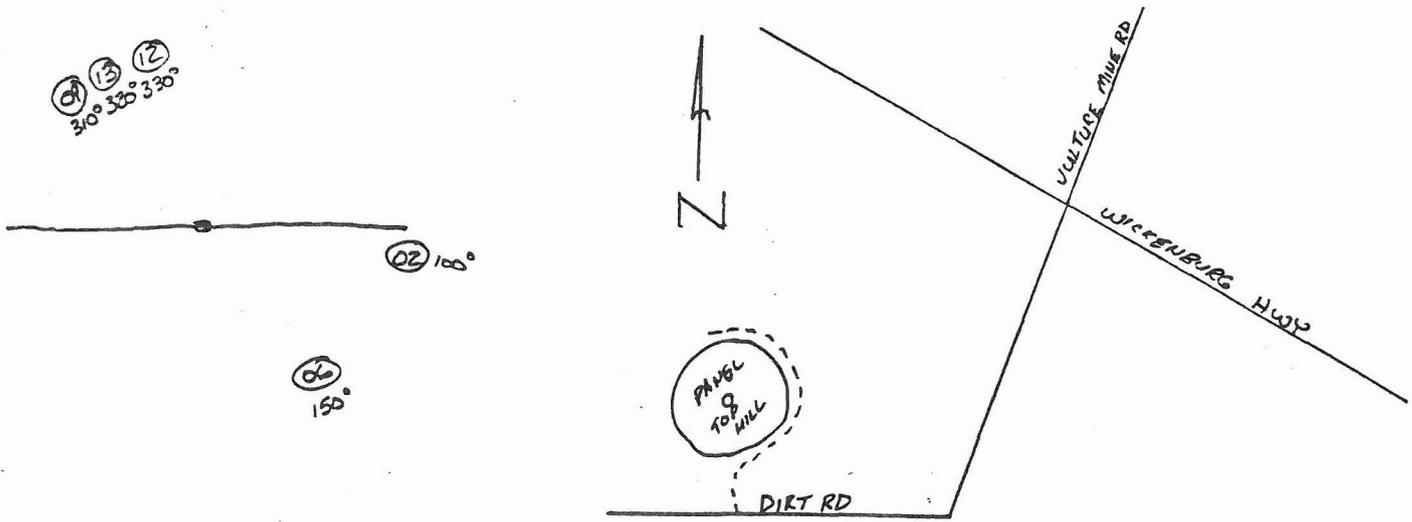
\*\*\*\*\*

## Location Sketch and Description

\*\*\*\*\*

Date 9/12/90 Project JACKRABBIT

Type of Mark \_\_\_\_\_ Condition \_\_\_\_\_



Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# MGPS Inc

Adjusted Position Sta.(name) \_\_\_\_\_ Sta.# 0007

Latitude \_\_\_\_\_ Coord. Sys. \_\_\_\_\_

Longitude \_\_\_\_\_ Ellipsoid \_\_\_\_\_

Ellipsoidal Height \_\_\_\_\_ X \_\_\_\_\_

Geoid Height \_\_\_\_\_ Y \_\_\_\_\_

M.S.L. Elevation \_\_\_\_\_ Z \_\_\_\_\_

Vert. Datm Ref. \_\_\_\_\_

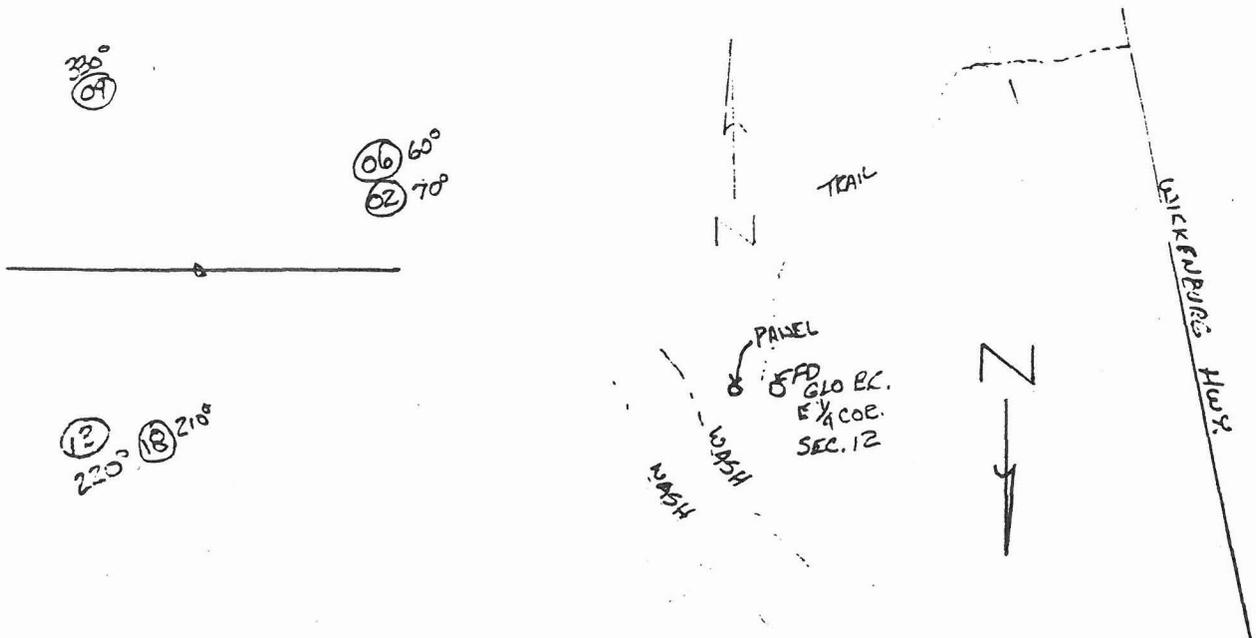
\*\*\*\*\*

## Location Sketch and Description

\*\*\*\*\*

Date 9/2/70 Project TACK RAFF-T

Type of Mark \_\_\_\_\_ Condition \_\_\_\_\_



Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# MGPS Inc

Adjusted Position Sta.(name) \_\_\_\_\_ Sta.# 0001

Latitude \_\_\_\_\_ Coord. Sys. \_\_\_\_\_

Longitude \_\_\_\_\_ Ellipsoid \_\_\_\_\_

Ellipsoidal Height \_\_\_\_\_ X \_\_\_\_\_

Geoid Height \_\_\_\_\_ Y \_\_\_\_\_

M.S.L. Elevation \_\_\_\_\_ Z \_\_\_\_\_

Vert. Datm Ref. \_\_\_\_\_

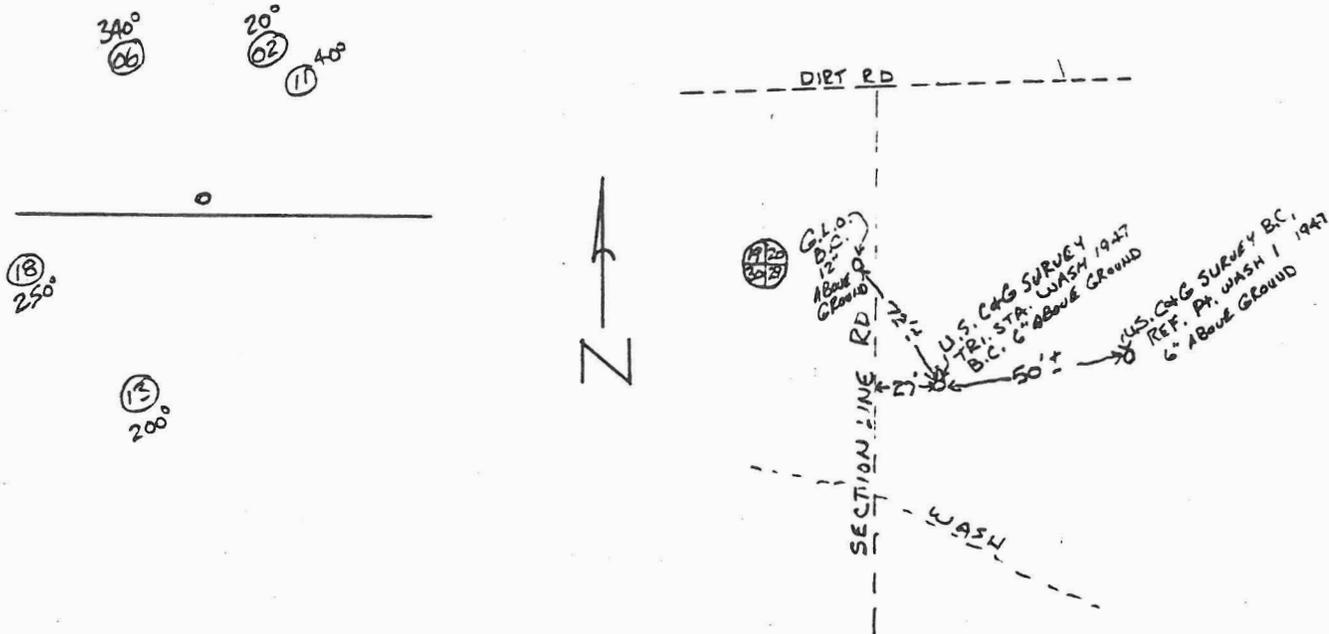
\*\*\*\*\*

## Location Sketch and Description

\*\*\*\*\*

Date 9/12/90 Project JACKRABBIT

Type of Mark \_\_\_\_\_ Condition \_\_\_\_\_



Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

# MGPS Inc

Adjusted Position Sta.(name) WASH Sta.# 0001

Latitude \_\_\_\_\_ Coord. Sys. \_\_\_\_\_

Longitude \_\_\_\_\_ Ellipsoid \_\_\_\_\_

Ellipsoidal Height \_\_\_\_\_ X \_\_\_\_\_

Geoid Height \_\_\_\_\_ Y \_\_\_\_\_

M.S.L. Elevation \_\_\_\_\_ Z \_\_\_\_\_

Vert. Datm Ref. \_\_\_\_\_

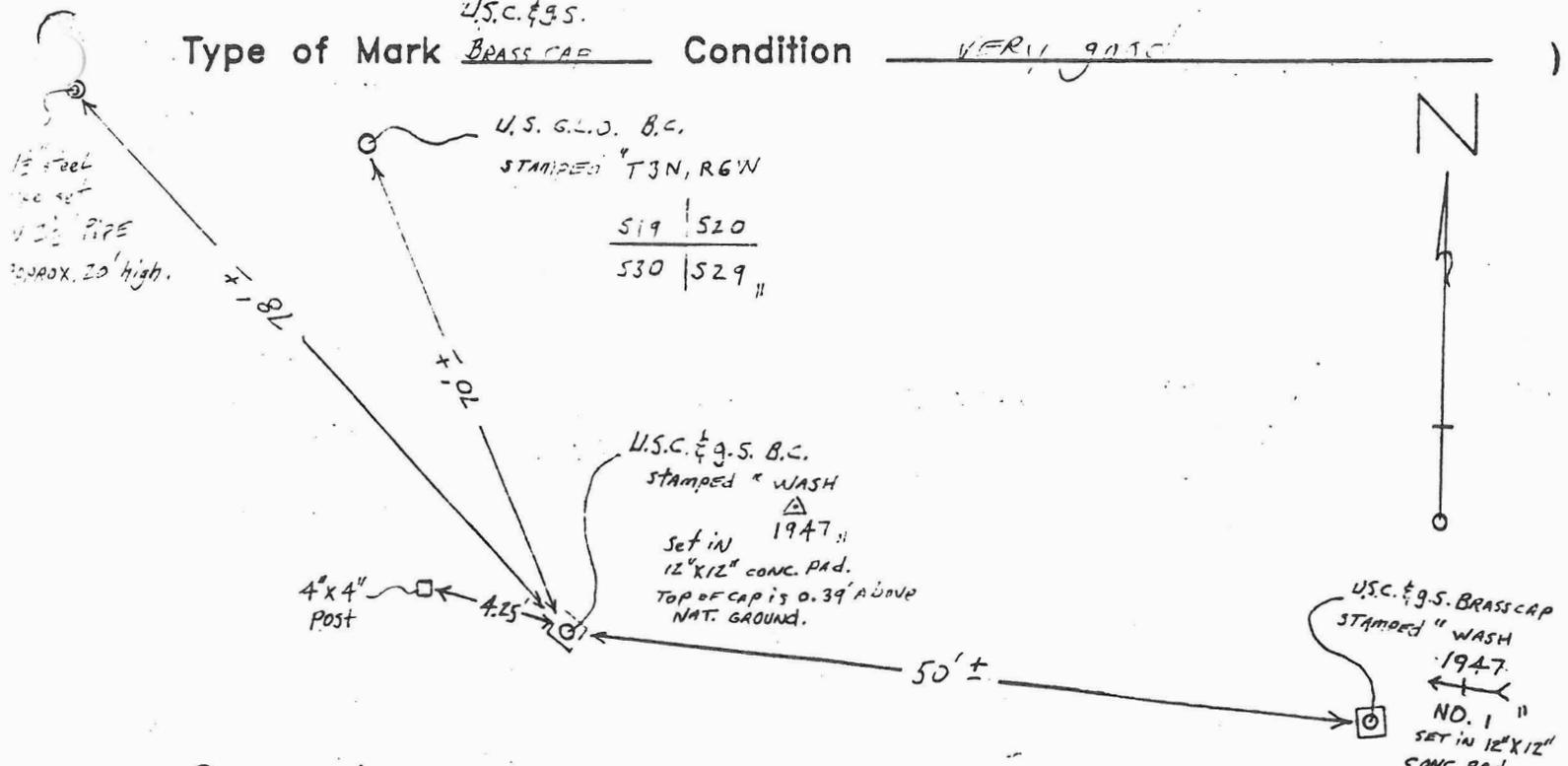
\*\*\*\*\*

## Location Sketch and Description

\*\*\*\*\*

Date 12 SEPT 1977 Project TRAC RABBIT

Type of Mark BRASS CAP Condition VERY GOOD



Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

# MGPS Inc

Adjusted Position Sta.(name) 0012 Sta.# 0012

Latitude \_\_\_\_\_ Coord. Sys. \_\_\_\_\_

Longitude \_\_\_\_\_ Ellipsoid \_\_\_\_\_

Ellipsoidal Height \_\_\_\_\_ X \_\_\_\_\_

Geoid Height \_\_\_\_\_ Y \_\_\_\_\_

M.S.L. Elevation \_\_\_\_\_ Z \_\_\_\_\_

Vert. Datm Ref. \_\_\_\_\_

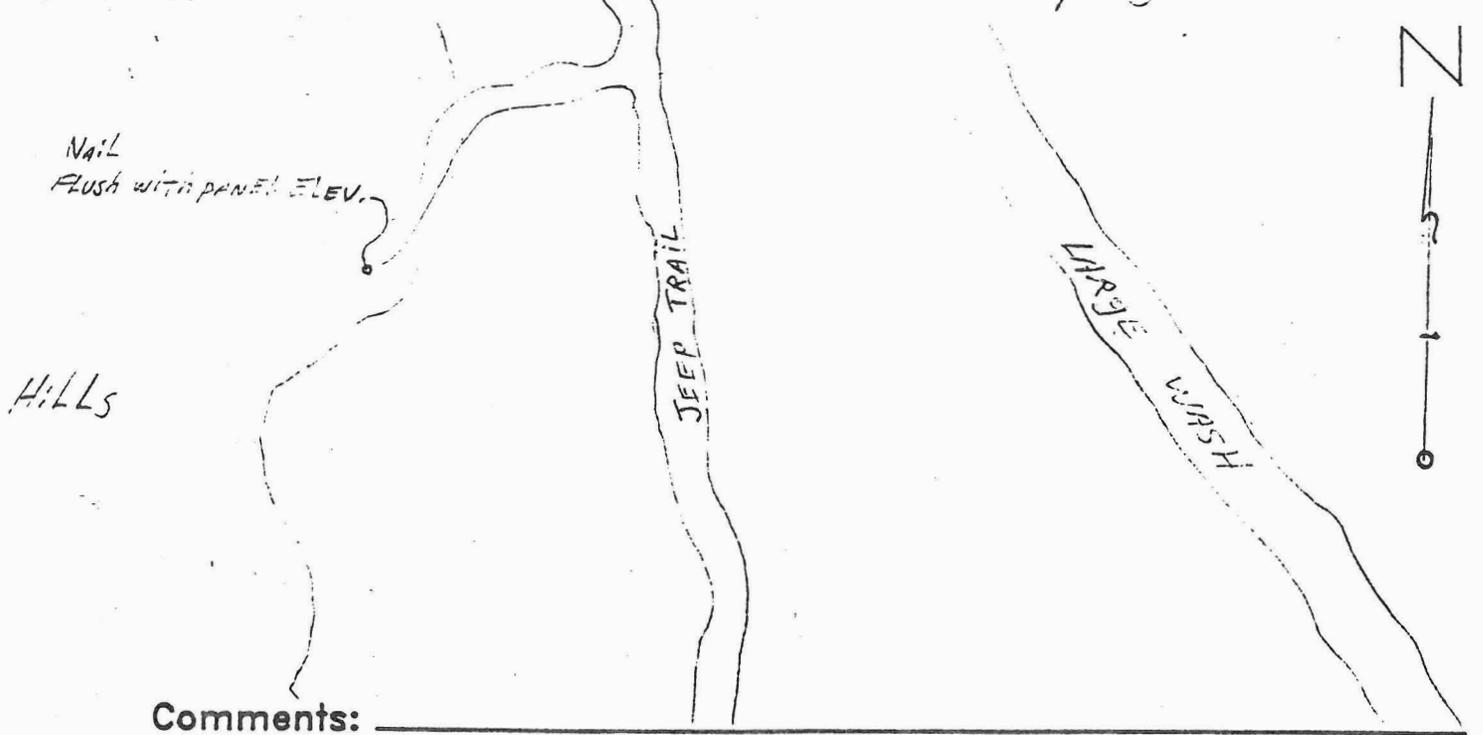
\*\*\*\*\*

## Location Sketch and Description

\*\*\*\*\*

Date 12 Sept. 1990 Project Jack Rabbit

Type of Mark Nail Condition VERY good



Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# MGPS Inc

Adjusted Position Sta.(name) 0008 Sta.# 0008

Latitude \_\_\_\_\_ Coord. Sys. \_\_\_\_\_

Longitude \_\_\_\_\_ Ellipsoid \_\_\_\_\_

Ellipsoidal Height \_\_\_\_\_ X \_\_\_\_\_

Geoid Height \_\_\_\_\_ Y \_\_\_\_\_

M.S.L. Elevation \_\_\_\_\_ Z \_\_\_\_\_

Vert. Datm Ref. \_\_\_\_\_

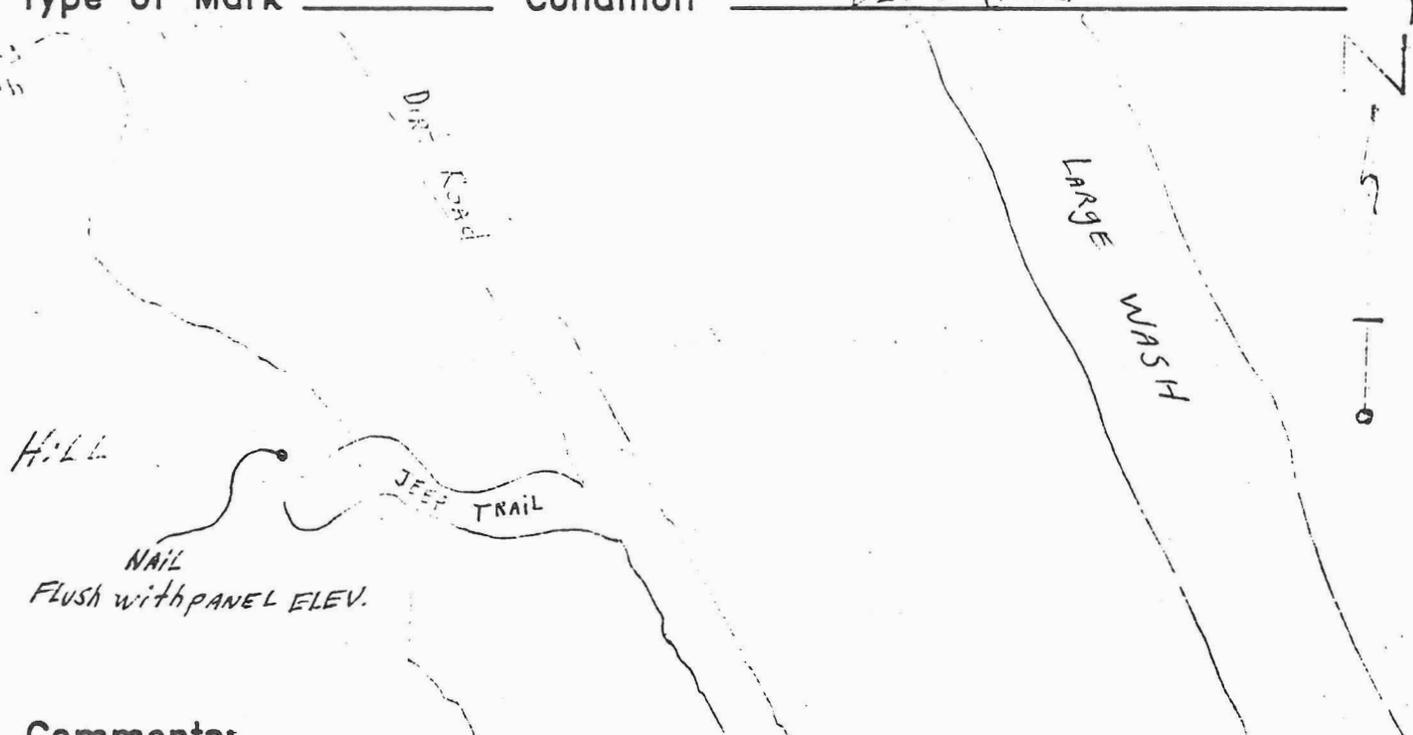
\*\*\*\*\*

## Location Sketch and Description

\*\*\*\*\*

Date 12 SEPT. 1990 Project TACK RABBIT

Type of Mark NAIL Condition VERY GOOD



Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# MGPS Inc

Adjusted Position Sta.(name) 0004 Sta.# 0004

Latitude \_\_\_\_\_ Coord. Sys. \_\_\_\_\_

Longitude \_\_\_\_\_ Ellipsoid \_\_\_\_\_

Ellipsoidal Height \_\_\_\_\_ X \_\_\_\_\_

Geoid Height \_\_\_\_\_ Y \_\_\_\_\_

M.S.L. Elevation \_\_\_\_\_ Z \_\_\_\_\_

Vert. Datm Ref. \_\_\_\_\_

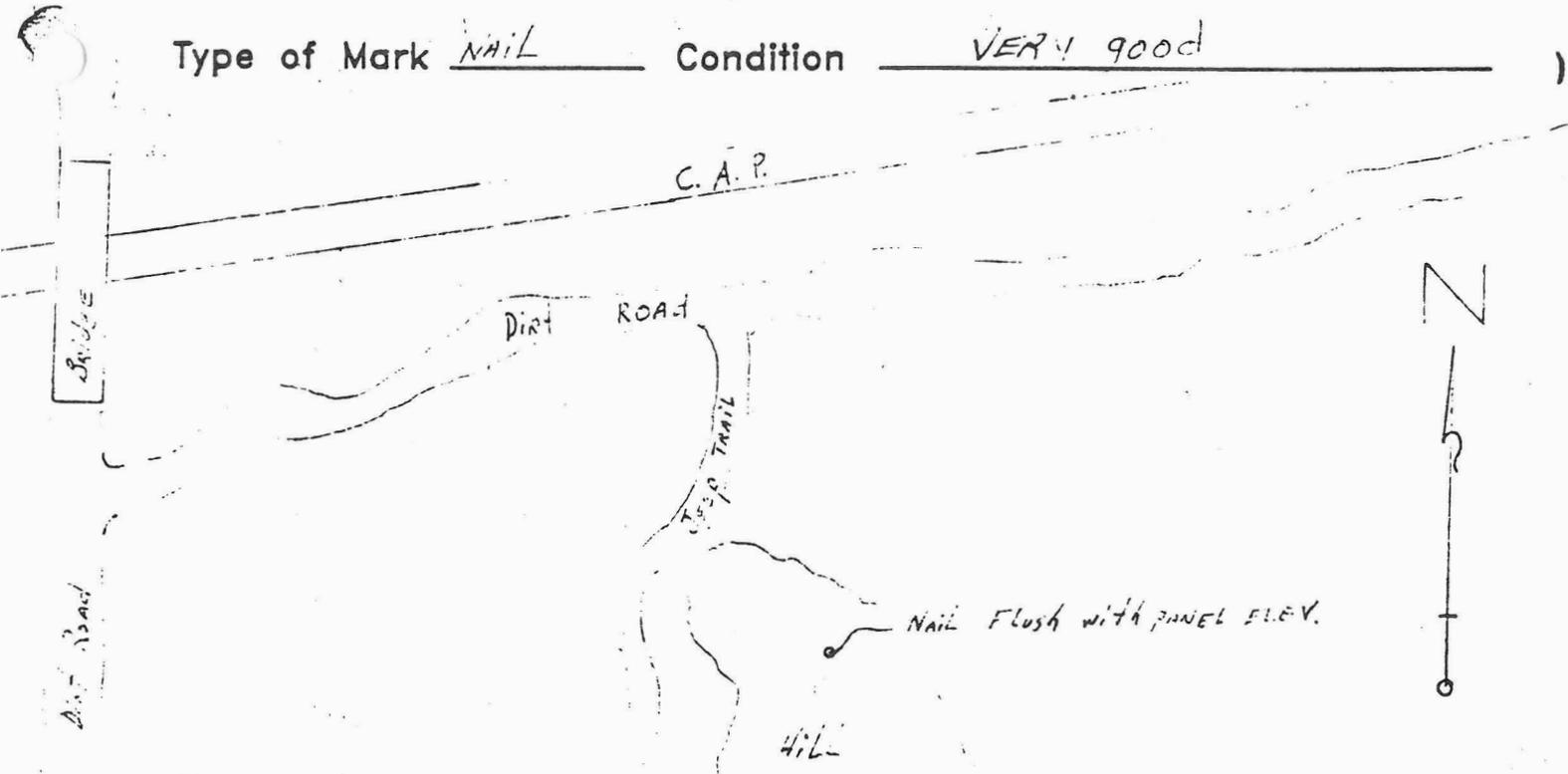
\*\*\*\*\*

## Location Sketch and Description

\*\*\*\*\*

Date 12 Sept. 1990 Project JACK RABBIT

Type of Mark NAIL Condition VERY GOOD



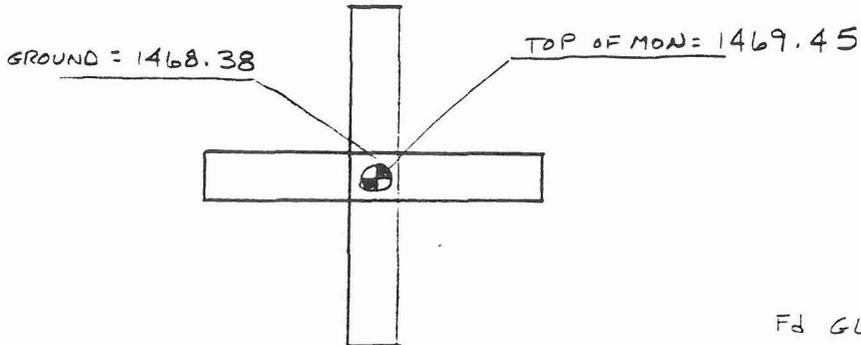
Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

BURGESS & NIPLE, INC. - COMPUTATION SHEET

JOB NO. \_\_\_\_\_ JOB NAME \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_ SHEETS  
 SUBJECT \_\_\_\_\_ PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 \_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

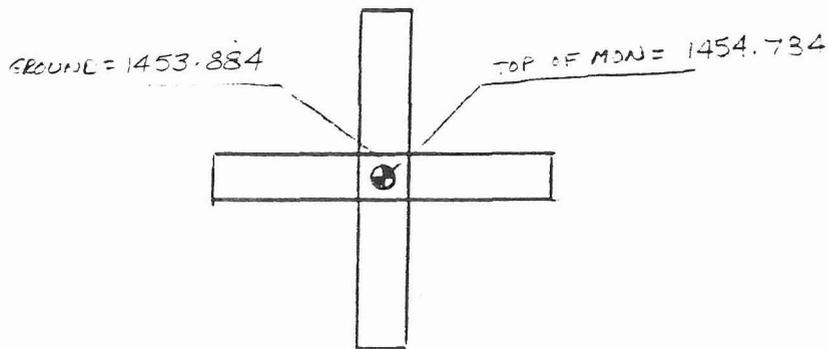
#21



PG 34

Fd GLO BC  
 T4N  
 R6W R5W  
 S36 S31  
 S1 S6  
 T3N  
 1915

#22



PG 38

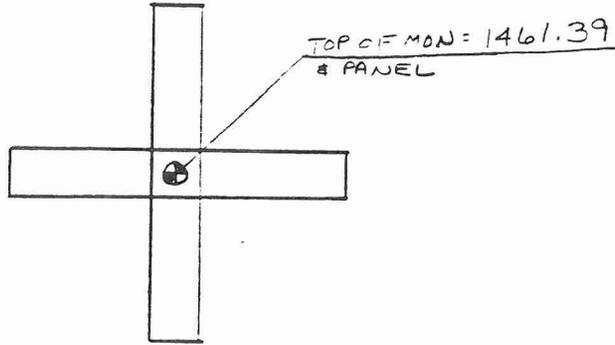
Fd GLO BC  
 T4N R5W  
 S31 S32  
 S6 S5  
 T3N  
 1915

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JOB NO. \_\_\_\_\_ JOB NAME \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_ SHEETS  
SUBJECT \_\_\_\_\_ PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_  
CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

#23

PG 39



FD BC IN CONC.  
JAEM TRANS  
STA 1947

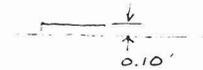
W. OF TRANSMISSION LINE

$$E = 234473.379$$

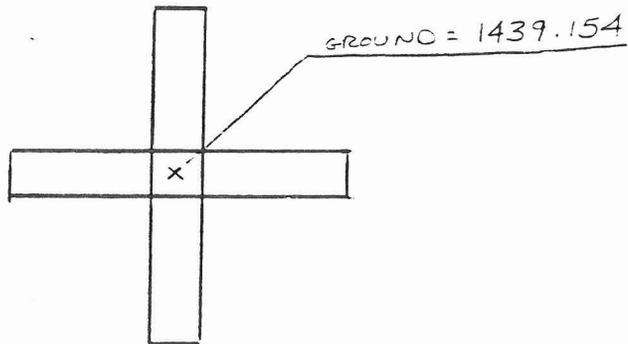
$$N = 964453.832$$

GPS 0002  
461.20 GPS  
141' 39 SPIRIT

D. 7' ...



#24



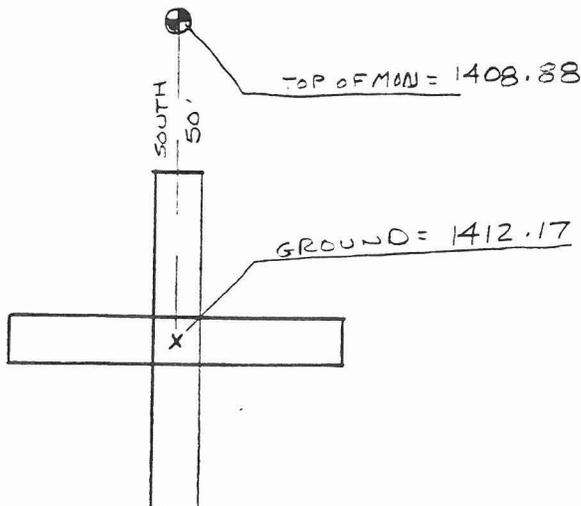
SET NAIL  $\approx$  SEC. LIT  
# TRANS. SERVICE RD.

PG 40

BURGESS & NIPLE, INC. - COMPUTATION SHEET

JOB NO. \_\_\_\_\_ JOB NAME \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_ SHEETS  
 SUBJECT \_\_\_\_\_ PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 \_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

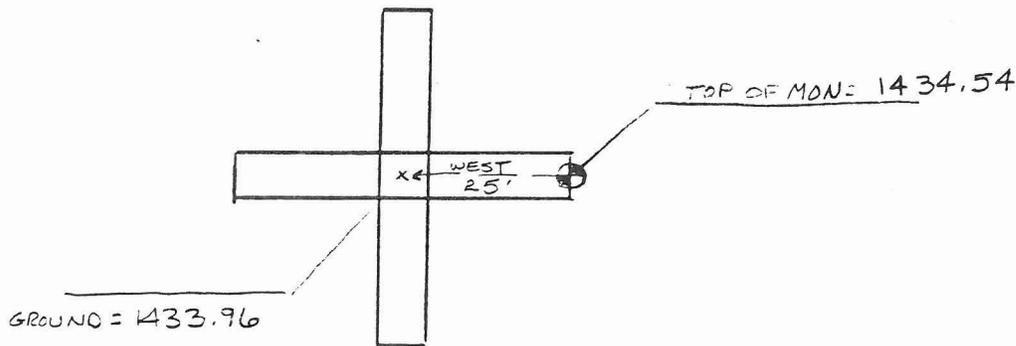
#25



Fd GLO BC  
 1/4  
 S5 | S4  
 1915

PG 41

#26



SET OFFSET NAIL

Fd GLO BC  
 T4N R5W  
 = 32 | 533  
 S5 | S4  
 T3N  
 1915



PG 40  
 64

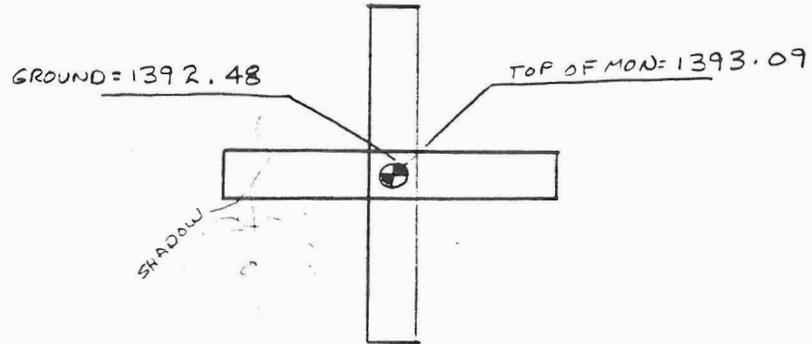
BURGESS & NIPLE, INC. - COMPUTATION SHEET

JOB NO. \_\_\_\_\_ JOB NAME \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_ SHEETS

SUBJECT \_\_\_\_\_ PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

\_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

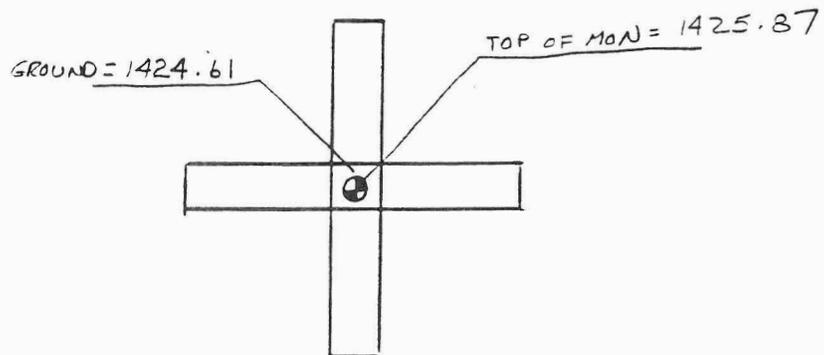
#27



PG 42  
61

FD GLO BC  
T3N R5W  
S5 | S4  
S8 | S9  
1915

#28



PG 27

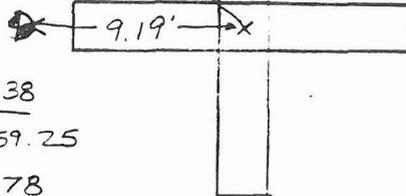
BURGESS & NIPLE, INC. - COMPUTATION SHEET

JOB NO. \_\_\_\_\_ JOB NAME \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_ SHEETS  
 SUBJECT \_\_\_\_\_ PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 \_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

#29

0' x 2'

GROUND = 1457.77



TOP OF MON = 1460.38

TOP OF MOUND = 1459.25

GROUND = 1457.78

PG 27  
 # PG 29

E = 223916.685

N = 955876.035

GPS 0013  
 STATION  
 1457.72 GPS  
 1457.77 SPIRIT

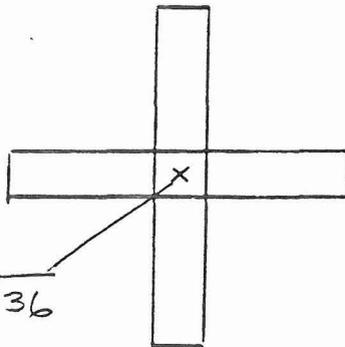


FB GLD BC IN MOUND OF STONE

S1  
 S12  
 1916

NOTE: BC WAS  
 FACING SOUTH

#30



GROUND = 1511.36

SET NAIL ON  
 E. HILLSIDE

E = 218974.891

N = 957526.237

GPS 0008

1511.36

SEC GPS  
 REF - VALUE

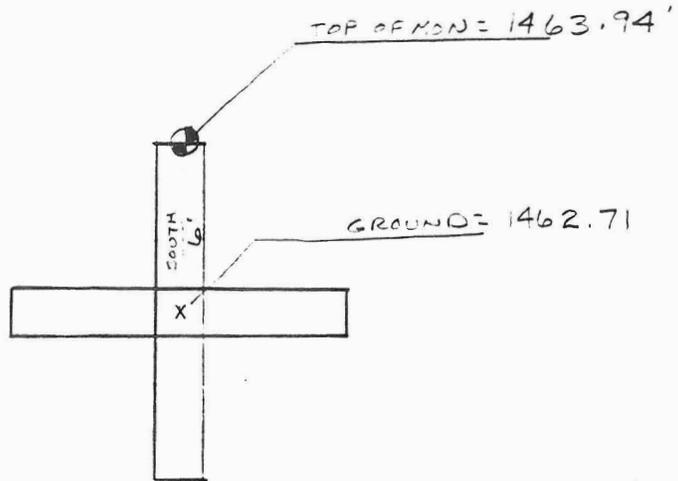
BURGESS & NIPLE, INC. - COMPUTATION SHEET

JOB NO. \_\_\_\_\_ JOB NAME \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_ SHEETS

SUBJECT \_\_\_\_\_ PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

\_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

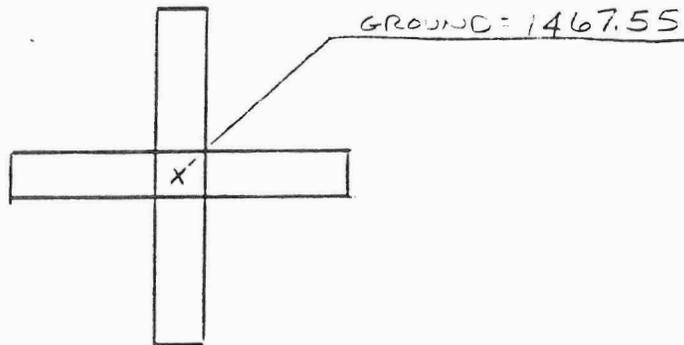
#31



PG 52  
60

FD GLO EC  
TEN R6W  
52 | 51  
---  
511 | 512  
1916

#32



PG 53

SET NAIL BY POST  
NO B.C.  
≈ 511 | 512  
1/4

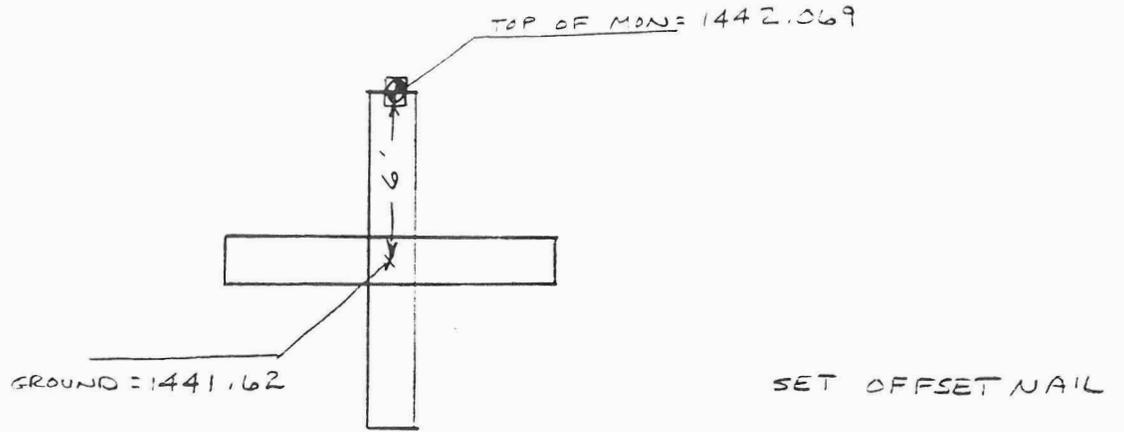
BURGESS & NIPLE, INC. - COMPUTATION SHEET

JOB NO. \_\_\_\_\_ JOB NAME \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_ SHEETS

SUBJECT \_\_\_\_\_ PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

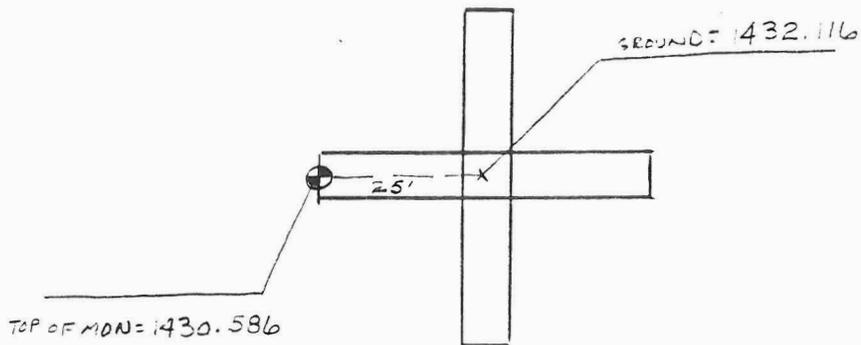
\_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

#33



3"x9"  
FD B.C. IN CONC. MONUMENT  
MKD 33 WLS 1957 144

#34



$E = 226538.732$

$N = 953205.375$

GPS 0007

432.0  
GIVEN

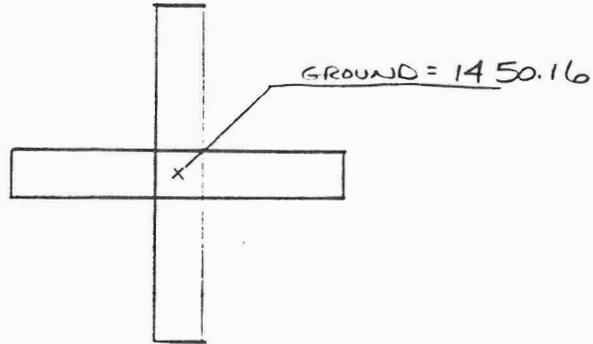
BURGESS & NIPLE, INC. - COMPUTATION SHEET

JOB NO. \_\_\_\_\_ JOB NAME \_\_\_\_\_ SHEET \_\_\_\_ OF \_\_\_\_\_ SHEETS

SUBJECT \_\_\_\_\_ PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

\_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

#35



SET NAIL ON E. SLOPE

E = 222961.590

N = 950911.510

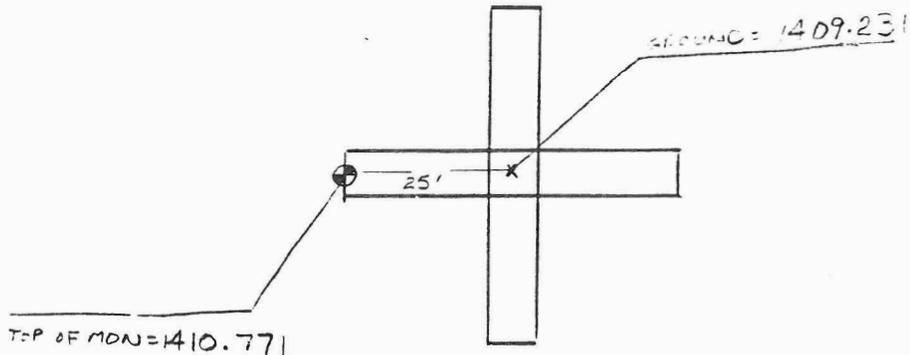
GPS 0012

1450.16  
GPS Z

TRIG ELEV. = 1450.111 ✓

1450.11  
TRIG LEVEL OK.

#36



SET OFFSET NAIL

F<sub>d</sub> G.L.O. RC  
T3N R6W R5W  
S12. S 7  
S 13 S 18  
1915

PG 24  
FPG 36

BURGESS & NIPLE, INC. - COMPUTATION SHEET

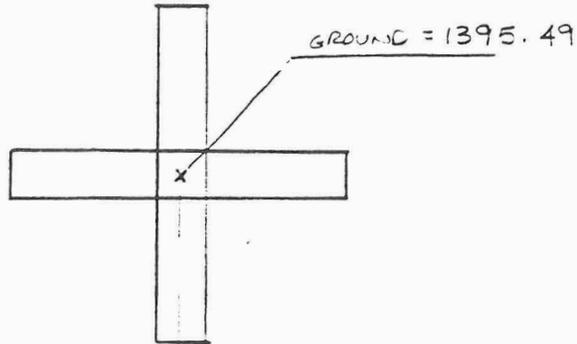
JOB NO. \_\_\_\_\_ JOB NAME \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_ SHEETS

SUBJECT \_\_\_\_\_ PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

\_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

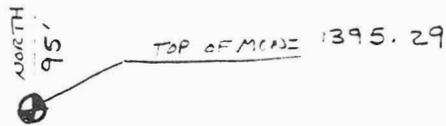
#37

PG 25



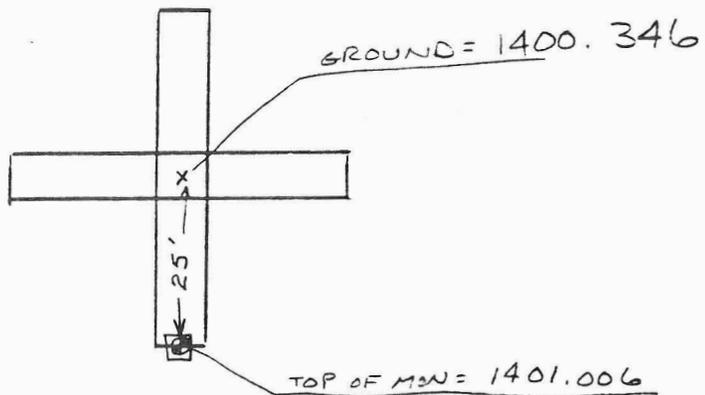
SET OFFSET NA

Fd GLO BC  
T3N R5W  
S 7 | S 8  
S 18 | S 17  
1915



#38

PG 24  
60



9"x9"  
Fd B.C. IN CONC. MONUMENT  
MKD 34 WLS 1957 1461

BURGESS & NIPLE, INC. - COMPUTATION SHEET

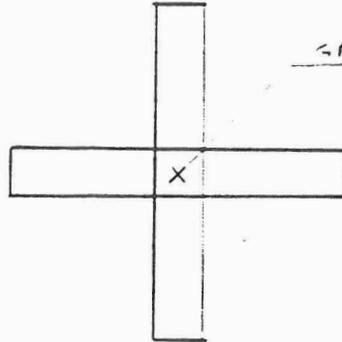
JOB NO. \_\_\_\_\_ JOB NAME \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_ SHEETS

SUBJECT \_\_\_\_\_ PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

\_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

#39

PG 54

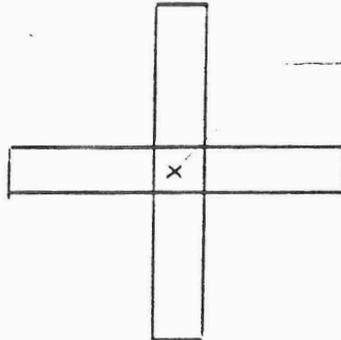


GROUND = 1331.36

SET NAIL

#40

PG 48



GROUND = 1373.54

$E = 218,046.97549$

$N = 945,112.63305$

BURGESS & NIPLE, INC. - COMPUTATION SHEET

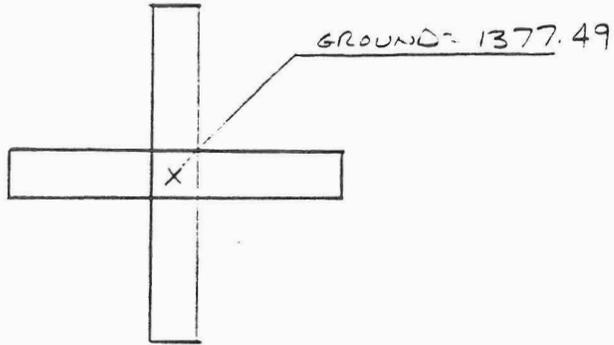
JOB NO. \_\_\_\_\_ JOB NAME \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_ SHEETS

SUBJECT \_\_\_\_\_ PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

\_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

#41

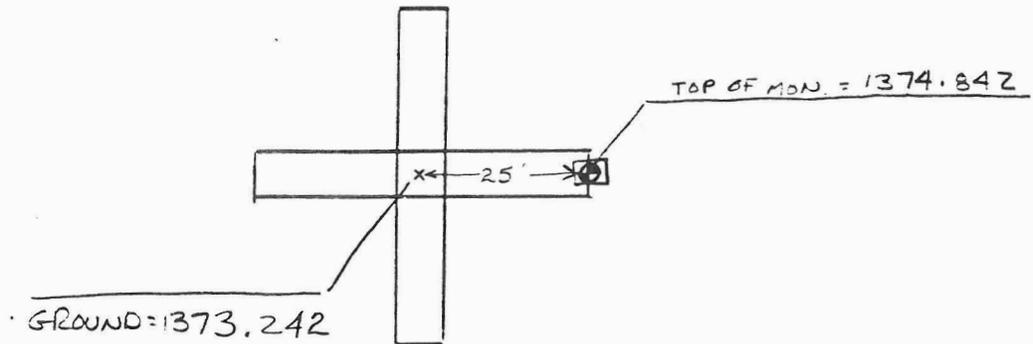
PG 47  
EC



SET OFFICE & BOX FLUME  
OVERCROP

#42

PG 48  
57



SET OFFSET NAIL

9" x 9"  
FD B.C. IN CONC. MONUMENT  
MKD 35 WLS 1959 1375

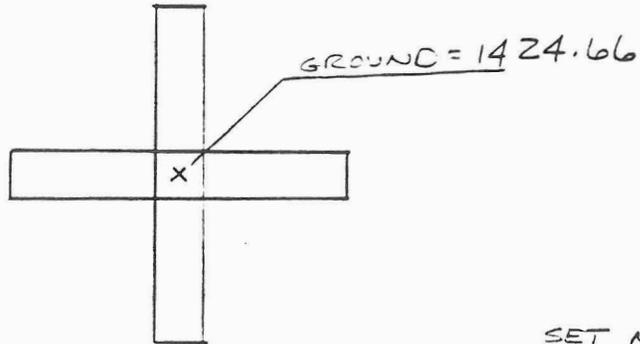
BURGESS & NIPLE, INC. - COMPUTATION SHEET

JOB NO. \_\_\_\_\_ JOB NAME \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_ SHEETS

SUBJECT \_\_\_\_\_ PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

\_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

#43



N.  
SET NAIL ON HILLSIDE

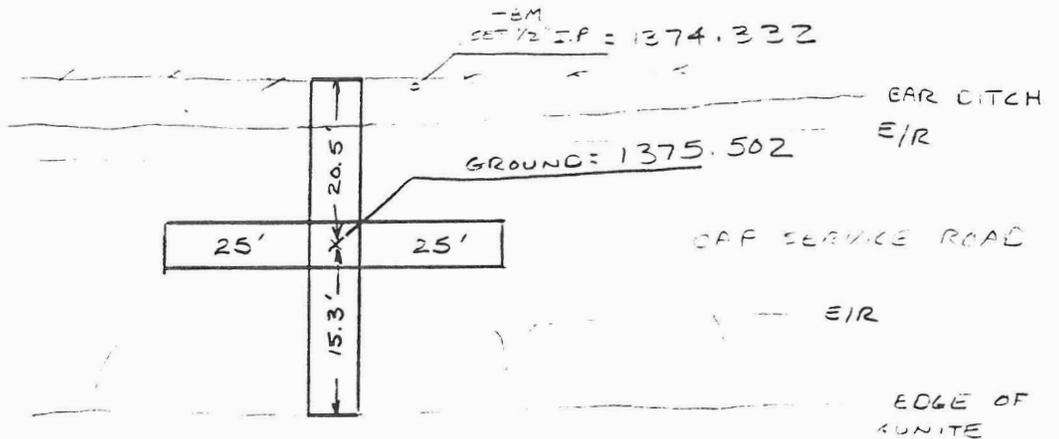
E = 227239.618

N = 943693.923

GPS 0004

22.4.11  
05 10:00 AM

#44



SET NAIL @ ☉ ROAD

PG 43  
64

BURGESS & NIPLE, INC. - COMPUTATION SHEET

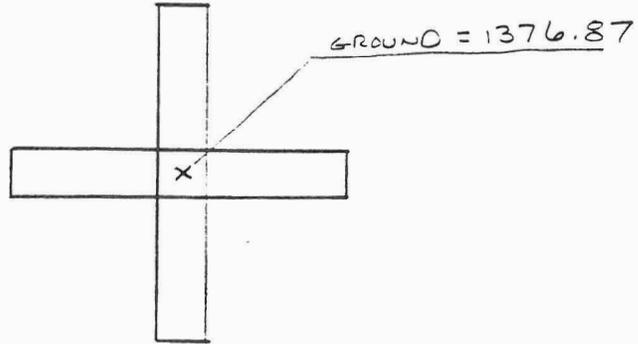
JOB NO. \_\_\_\_\_ JOB NAME \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_ SHEETS

SUBJECT \_\_\_\_\_ PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

\_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

#45

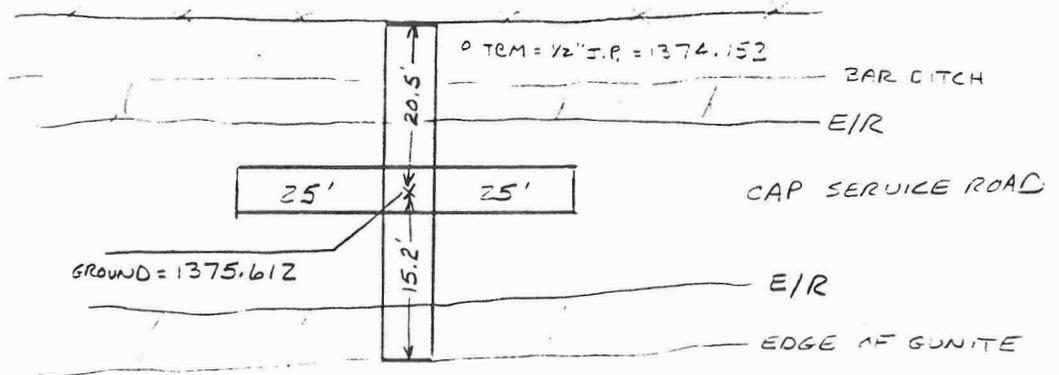
PG 44



SET NAIL @ NO. 4  
FROM THE CENTER

#46

PG 45



SET NAIL @  $\phi$  ROAD

BURGESS & NIPLE, INC. - COMPUTATION SHEET

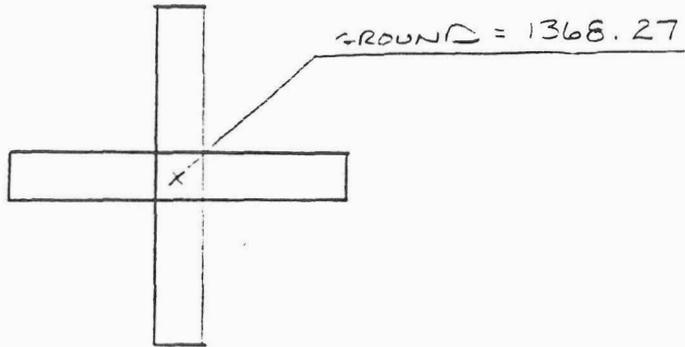
JOB NO. \_\_\_\_\_ JOB NAME \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_ SHEETS

SUBJECT \_\_\_\_\_ PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

\_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

#47

PG 25  
E (A)  
1368.27



SET NAIL  
S. SIDE OF SIPHON

E = 236604.642

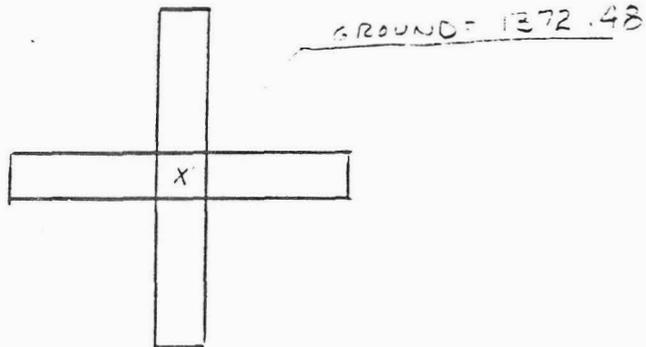
N = 749923.359

GPS 0015

1368.27 GPS  
1368.27 SPIRIT

#48

PG 05



SET NAIL  
S. SIDE OF CANAL

BURGESS & NIPLE, INC. - COMPUTATION SHEET

JOB NO. \_\_\_\_\_ JOB NAME \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_ SHEETS

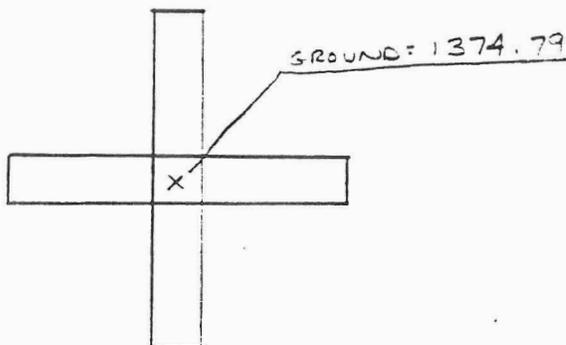
SUBJECT \_\_\_\_\_ PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

\_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

#49

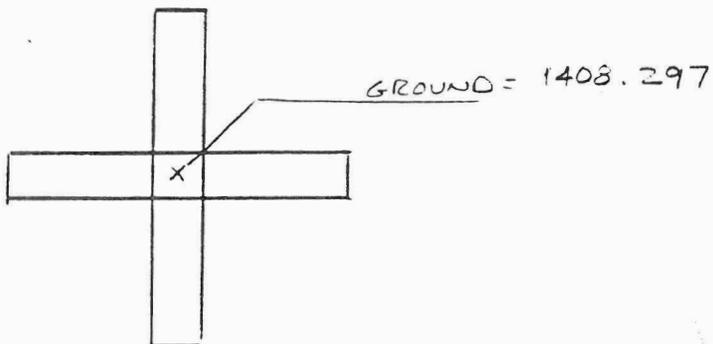
CAP SERVICE ROAD

PG 56



SET NAIL SOUTH  
SIDE OF CANAL

#50



E = 244168.103

N = 954914.940

— x — x — x — x — x

x

x

x

SET NAIL

PS 0005

1408.29 GPS

NOT GIVEN

1408.297 ELEVATION

TRANSMISSION

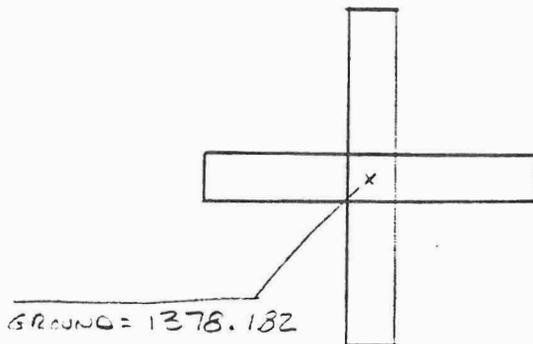
BURGESS & NIPLE, INC. - COMPUTATION SHEET

JOB NO. \_\_\_\_\_ JOB NAME \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_ SHEETS  
 SUBJECT \_\_\_\_\_ PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 \_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

#51

PG 4  
TRIG.

PG 66



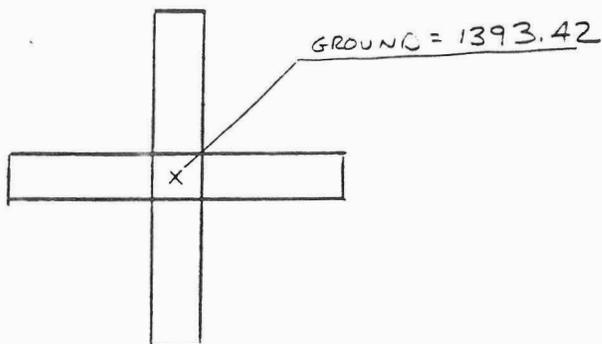
$E = 251,257.54807$

$N = 959,445.38281$

TRIG.  
1378.125  
3 82

#52

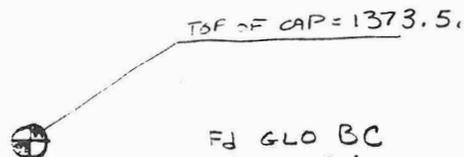
PG 39



$E = 252,634.307$

$N = 960,906.099$

SET NAIL



FD	GLO	BC
T4N	R5W	
S35	S36	
S 2	S 1	
T3N		
1915		

GPS 0006

1393.42  
GIVEN

BURGESS & NIPLE, INC. - COMPUTATION SHEET

JOB NO. \_\_\_\_\_ JOB NAME \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_ SHEETS

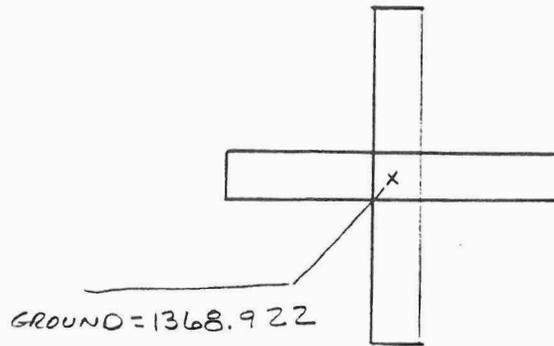
SUBJECT \_\_\_\_\_ PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

\_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

#53

HZ  
PG 4

VERT  
PG 71



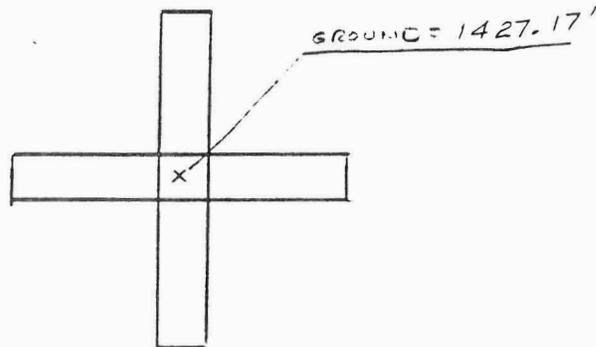
E = 253,443.77994

SET NAIL

N = 962359.47846

TELS  
368.89  
SPIRIT  
13 922

#54



E = 252,407.28551

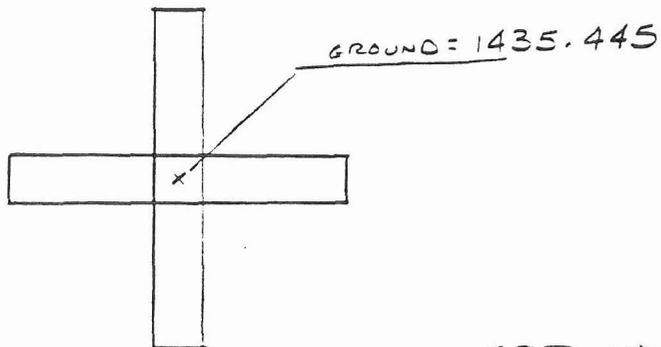
SET NAIL

N = 963,466.31941

BURGESS & NIPLE, INC. - COMPUTATION SHEET

JOB NO. \_\_\_\_\_ JOB NAME \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_ SHEETS  
SUBJECT \_\_\_\_\_ PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_  
CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

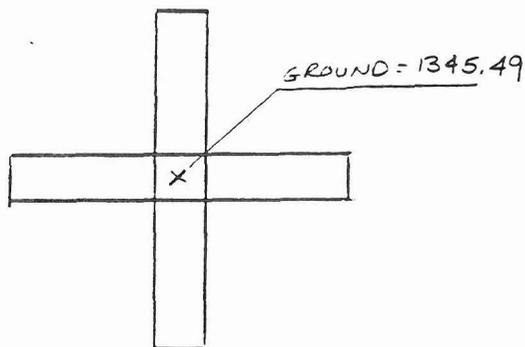
#55



E = 249,690.35281  
N = 960,433.31201

SET NAIL

#56



PG 65

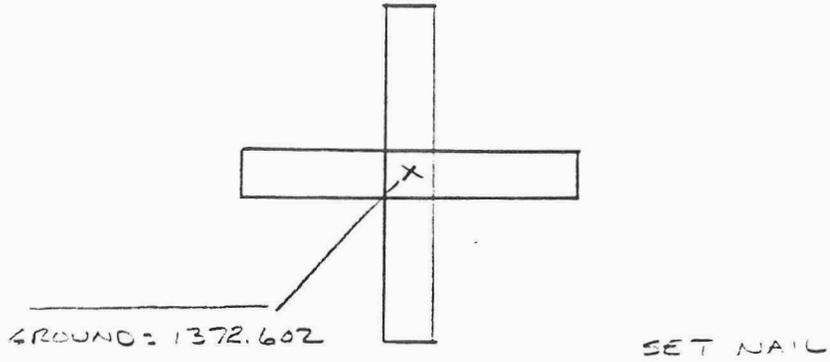
SET NAIL  
≈ N. LINE SEC. 25  
ON WEST SIDE OF  
WICKENBERG RD.

BURGESS & NIPLE, INC. - COMPUTATION SHEET

JOB NO. \_\_\_\_\_ JOB NAME \_\_\_\_\_ SHEET \_\_\_\_ OF \_\_\_\_\_ SHEETS  
SUBJECT \_\_\_\_\_ PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_  
\_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

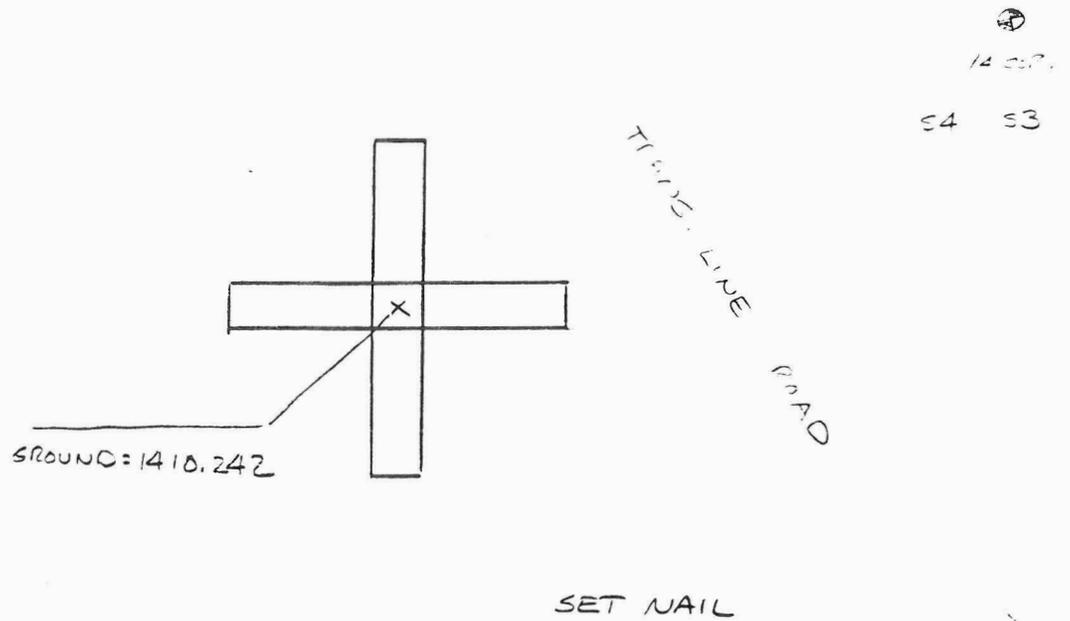
# 57

PG 66



# 58

PG 67



BURGESS & NIPLE, INC. - COMPUTATION SHEET

JOB NO. \_\_\_\_\_ JOB NAME \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_ SHEETS

SUBJECT \_\_\_\_\_ PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

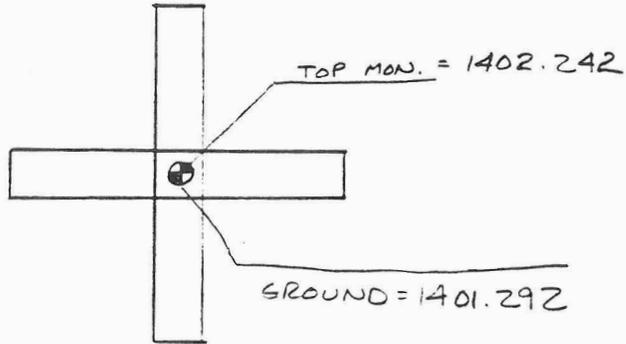
\_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

# 59

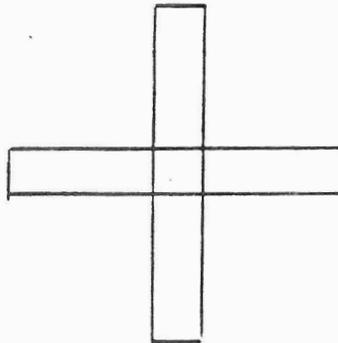
PG 69

E = 247,455.75543

N = 960922.42958



Fd GLO BC  
T4N R5W  
S34/S35  
S3/S2  
T3N  
1915



Field surveys were made between July and October, 1990. Field crews included the following personnel:

- \* Blair Meggitt, RLS
- \* Steve Perham, RLS
- \* John Davis, RLS
- \* Richard Dudley

The vertical datum is NGVD 1929. Horizontal control was placed on the Arizona State Plane Coordinate System, NAD 1927 datum.

Following are copies of the field books.

BOOK  
135

INDEX

PAGES	JOB No.	DESCRIPTION
1-8	10310	M.C.F.C.D. <sup>HORZ &amp;</sup> VERT. CONTROL FOR AERIAL MAPPING
9-27	10310	ELEV. FOR STRUCTURES ON C.A.P. (M.C.F.C.D)
28-48	10310	JACK RABBIT WASH - BENCH LOOPS & CROSSSECTIONS TO AERIAL PANELS

JOB# 10310

BOOK 135

"JACK RABBIT WASH"  
HORZ. CONTROL FOR  
AERIAL MAPPING

CLIENT: M.C.F.C.D

AUGUST 29, 1990

SONNY HOT

M-S. PERHAM

T- R. DUDLEY

B- B. MEGGITT

EQUIP: WILD T-2 THEODOLITE

TOPCON DM 5-2

SIGNAL 9

89°26'47"

(5807.665')

(5807.95')

INV. 270°33'18"

DIST. FROM "U" TO "V"

HORZ. 5807.675' SLOPE 5807.965' ZENITH  $\approx$  89°26'53"

INV. 270°35'27"

DIST. FROM "U" TO "W"

HORZ. 9412.43' SLOPE 9412.55' ZENITH  $\approx$  90°18'55"

INV. 269°41'17"

T.C. "U"

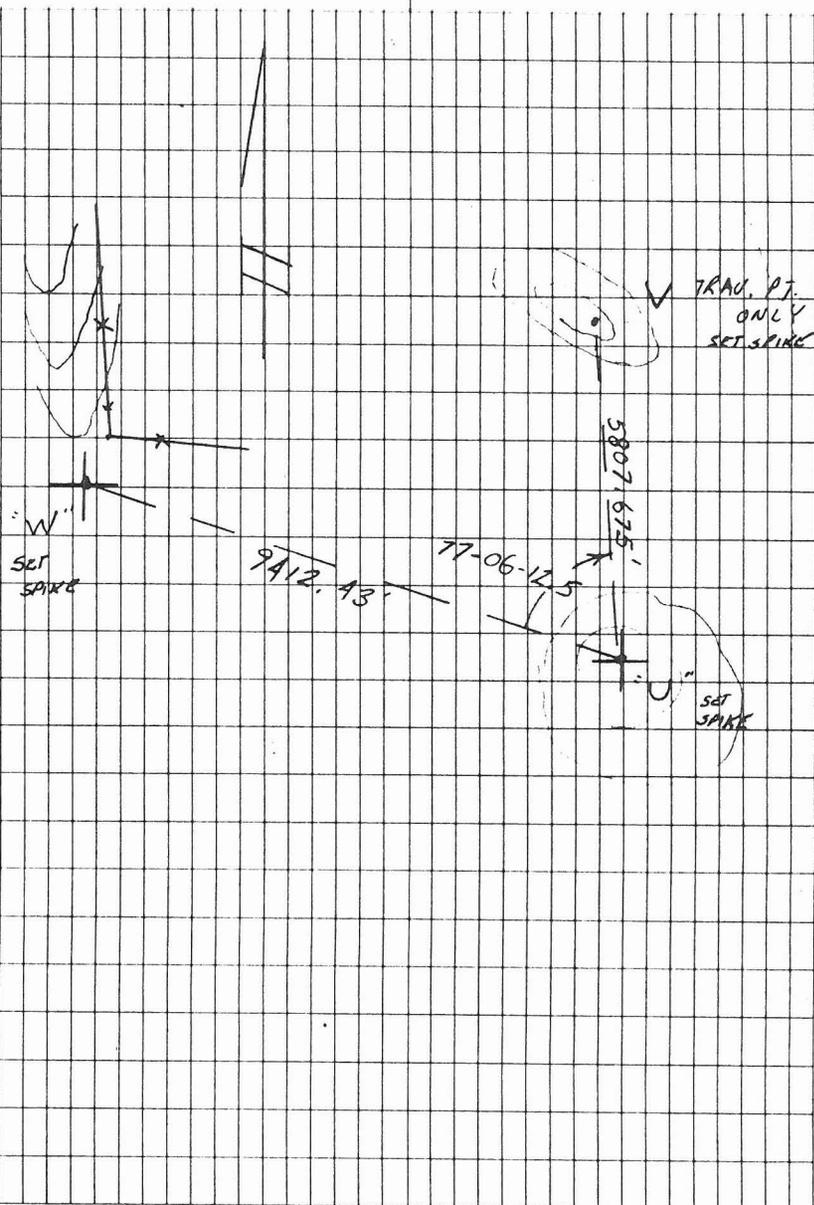
B.S. "W" D) 333-48-05 77-06-12 D) 333-48-05 77-06-13

F.S. "V" D) 50-54-17 R) 153-48-16 77-06-12 R) 153-48-12 77-06-13

R) 230-54-28 77-06-12.5 R) 230-54-28 77-06-13

MEAN  $\approx$  77-06-12.5

2



DIST. FROM "V" TO "X"

HORZ. 9474.24' SLOPE 9474.81' ZENITH  $\angle$  90°39'16"

(HAND HELD) 9474.19' (INU) 269°20'26"

(CHECK DIST) FROM "V" TO "U"

HORZ. 5807.705' SLOPE 5807.995' ZENITH  $\angle$  90°35'19"

$\angle$  @ "V"

B.S. "X"	D) 102-56-42	95-41-19.5	D) 102-56-40
F.S. "U"	D) 198-37-59		D) 198-37-55
	R) 282-56-30		R) 282-56-32
	R) 18-37-52		R) 18-37-49
			95-41-16
	MEAN $\angle$	95-41-17.8	

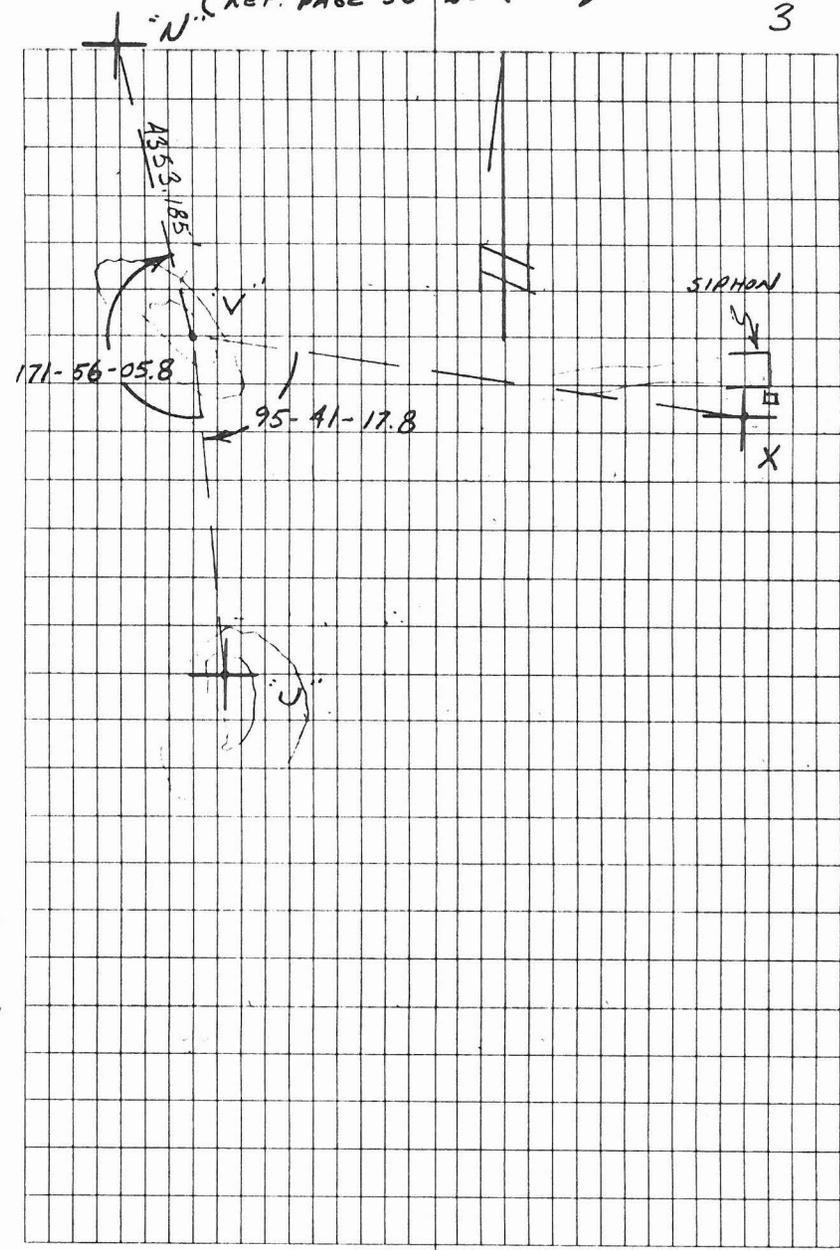
DIST FROM "V" TO "N"

HORZ. 4353.185' SLOPE 4353.485' ZENITH  $\angle$  90°41'05"

INU, 269°19'08"

$\angle$  @ "V"

B.S. "U"	D) 198-38-09	171-56-07	D) 198-38-09	171-56-04.5
F.S. "N"	D) 10-34-12		D) 10-34-14	
	R) 18-37-57		R) 18-37-58	
	R) 190-34-08		R) 190-34-02	
	MEAN $\angle$	171-56-05.8		





DIST. FROM A<sub>1</sub> TO E<sub>1</sub>

HORZ.	2007.47	SLOPE	2007.53	ZENITH	90°26'20"
	DIFF.		(HAND HELD)		
	ELEV.	-15.295	-15.38	INV.	269°33'40"

T @ A<sub>1</sub>

B.S. "Z" D) 338-51-35 R) 158-51-24

F.S. E<sub>1</sub> D) 332-36-21 R) 152-36-11MEAN  $\bar{x}$  353-44-46.5

DIST. FROM "Z" TO "Y"

HORZ.	6070.98	SLOPE	6071.035	ZENITH	90°15'20"
				INV.	269°44'36"

T @ "Z"

B.S. "Y" D) 340-11-31 171-10-05.5 D) 340-11-24 171-10-05

F.S. A<sub>1</sub> D) 151-21-35 R) 151-21-28

R) 160-11-18 R) 160-11-17

R) 331-21-25 R) 331-21-23

MEAN  $\bar{x}$  171-10-05.3

{ REF. PAGE 4 }

DIST. FROM "Z" TO A<sub>2</sub>  
 HORZ. 925.945' SLOPE 925.945' ZENITH  $\angle$  90°08'25"  
 (INV) 269°52'36"

A @ "Z"

B.S. "Y"	D) 305-53-52	64-44-56.5	D) 305-53-55
F.S. A <sub>2</sub>	D) 10-38-48		D) 10-38-48
	R) 125-53-50		R) 125-53-45
	R) 190-38-47		R) 190-38-40
	MEAN $\angle$ 64-44-55.3		

DIST. FROM A<sub>2</sub> TO B<sub>2</sub>  
 HORZ. 1299.35' SLOPE 1299.495' ZENITH  $\angle$  90°52'06"

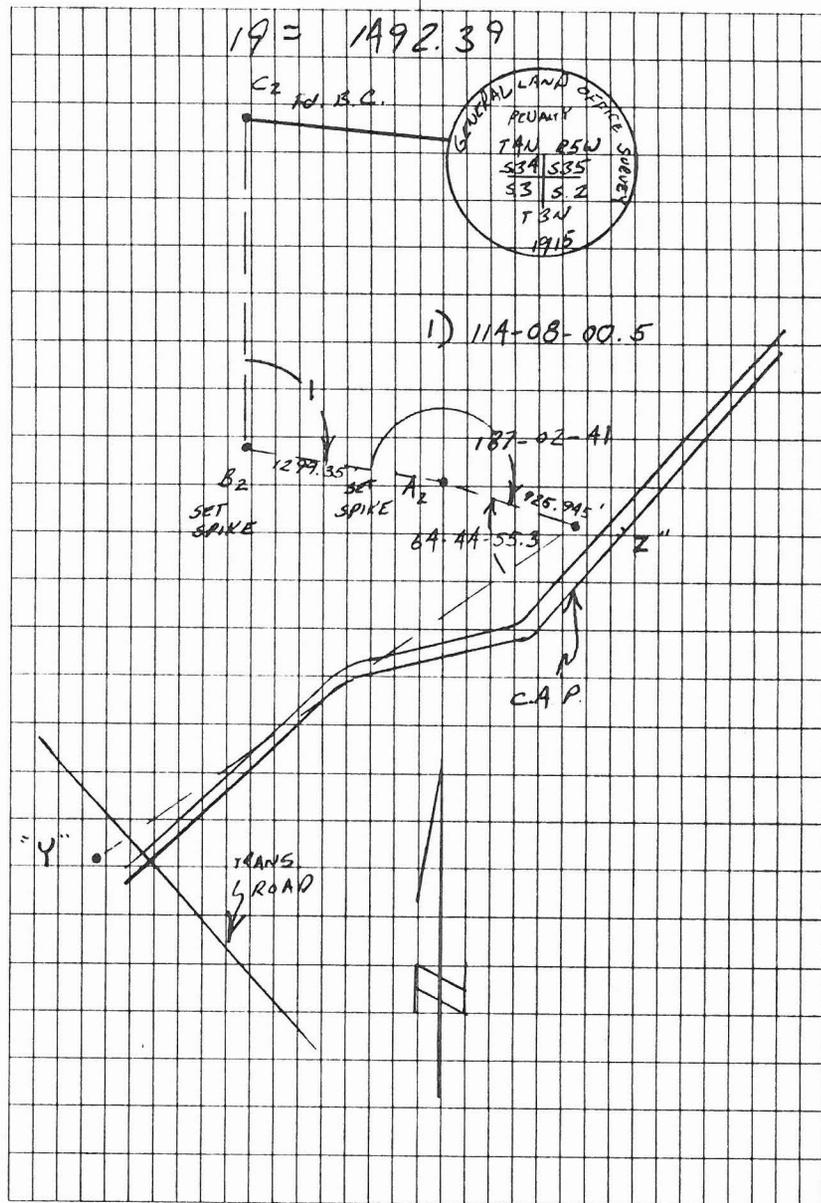
A @ A<sub>2</sub>

B.S. B <sub>2</sub>	D) 312-15-27	187-02-42	D) 312-15-25	187-02-40
F.S. "Z"	D) 139-18-06		D) 139-18-02	
	R) 132-15-20		R) 132-15-20	
	R) 319-18-05		R) 319-18-03	
	MEAN $\angle$ 187-02-41			

DIST. FROM B<sub>2</sub> TO C<sub>2</sub>  
 HORZ. 1749.405' SLOPE 1749.45' ZENITH  $\angle$  90°26'24"  
 (INV) 269°33'57"

Y = 1A08.29

6



R@B<sub>2</sub>

B.S. C<sub>2</sub> D) 7-32-21 D) 7-32-20

F.S. A<sub>2</sub> D) 121-40-22 D) 121-40-21

R) 187-32-13 R) 187-32-17

R) 301-40-16 R) 301-40-14

MEAN 114-08-00.5

114-08-02

114-07-59

{ REF. PAGE 6 }

DIST. FROM "N" TO G<sub>2</sub>

HORZ. 4250.345' SLOPE 4250.42' ZENITH  $\angle$  89°39'30"

VERT. DIFF. +25.72

INCL. 270°20'37"

CALC. =  $\frac{7.725}{0.425}$

VERT. DIFF. +17.995

7@N

B.S. "V"	D) 299-47-58	65-54-16.5	D) 299-47-54	65-54-15
F.S. G <sub>2</sub>	D) 5-42-17		D) 5-42-06	
	R) 119-47-49		R) 119-47-47	
	R) 185-42-03		R) 185-42-05	
	MEAN $\angle$ 65-54-15.8			

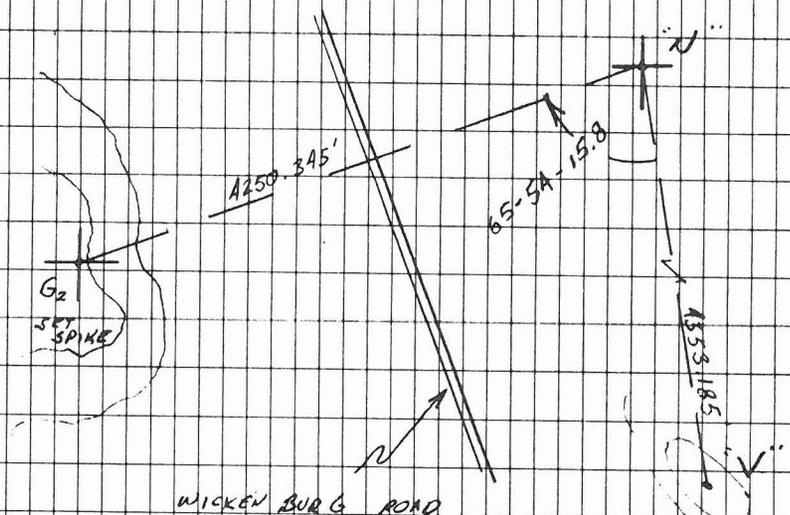
CHECK DIST. FROM "N" TO "V"

HORZ. 4353.185' SLOPE 4353.47' ZENITH  $\angle$  89°21'11"

8

H.I. 5.795 PRISM 13.52

DIFF. = 7.725



JOB#10310  
BOOK 135

ELEV.'S FOR STRUCTURES  
ON C.A.P.

M- S. PERHAM  
T- R. DUNLEY

STA.	+ B.S.	H.I.	- F.S.	ELEV.
1A6+50				1360.002
	19.99	1379.992		
1A6+50			24.77	1355.222
	5.49	1360.712		
1A6+50			11.55	1349.162
"			11.50	1349.212
"			12.09	1348.622
"			9.18	1351.532
T.P. 1			10.38	1350.332
	2.67	1353.002		
T.P. 2			1.94	1351.062
	2.06	1353.122		
T.P. 3			10.37	1342.752
	5.75	1348.502		
T.P. 4			.95	1347.552
	14.85	1362.402		
T.P. 5			4.72	1357.682
	2.36	1360.042		
121+60			4.76	1355.282
121.60			9.29	1350.752 FE
121+60			8.93	1351.112
T.P.			6.43	1353.612
	.60	1354.212		
T.P. 6			8.10	1346.112

DESCRIPTION	10
TOP CONC. HEADWALL EAST END AND NORTH SIDE OF C.A.P. @ STA. 1A6+50 <sup>PIPE</sup> CULVERT	
TOP CONC. HEADWALL EAST END AND SOUTH SIDE OF C.A.P. @ STA 1A6+50 (OUTLET)	
FE 48" PIPES (OUTLET)	
12' SOUTH CONC.	
25' SOUTH OF STRUCTURE	
50' SOUTH OF STRUCTURE	
CONC. @ FENCE POST	
ROCK	
ROCK	
ROCK	
ROCK	
TOP CONC. HEADWALL EAST END AND SOUTH SIDE OF C.A.P.	
25' SOUTH OF STRUCTURE	
ROCK	
ROCK	

STA.	B.S.	H.I.	F.S.	ELEV.
TP. 6				1346.112
	6.25	1352.362		
110+00			8.40	1343.962
110+00			7.35	1345.012
110+00			2.87	1349.492
	20.18	1369.672		
			3.13	1366.542
	12.82	1379.362		
TBM. L <sub>1</sub>			18.03	1361.332
				1361.342
				-01 ✓

DESCRIPTION	11
ROCK	
25' SOUTH OF STRUCTURE	
E. OUTLET 30" CULVERT	
TOP EAST END OF CONC. HEADWALL	
OUTLET	
ROCK	
TOP CONC. HEADWALL EAST END AND NORTH:	
SIDE OF CAP. @ STA. 110+00 AIR CULVERT	

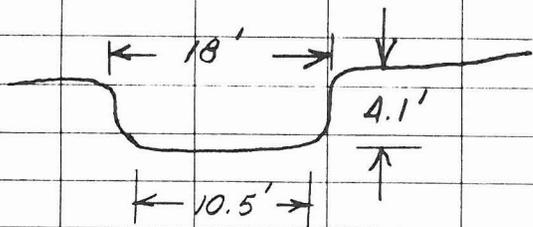
PROFILE ELEU'S FOR BOX  
FLUME OVER CHUTE STA. 180+50

STA.	B.S.	H.I.	F.S.	ELEV.
PANEL I,				1377.49
	13.42	1390.91		
0+100			13.71	1377.2
0+25.5			13.78	1377.13
0+72			13.72	1377.19
1+21			13.74	1377.17
1+24			13.83	1377.08
1+33			17.75	1373.16
1+47.8			17.73	1373.18
1+47.8			15.98	1374.93
1+50			16.26	1374.65
1+63.8			22.90	1368.01
2+27.8			17.45	1373.46
BM. G <sub>2</sub>			5.22	1385.69
	5.03	1390.72		
PANEL I,			13.24	1377.48

12

DESCRIPTION
TOP OF SPIKE NAIL FOR VERT PANEL C
BOX FLUME OVER CHUTE
CONC. @ E OF FLUME
"
"
"
"
"
"
"
"
CONC. SHOT BEFORE WATER LEVEL
GROUND SHOT AFTER SCOUR HOLE
U.S. DEPT. OF THE INTERIOR B.C. @ N. WEST
COR BOX FLUME OVER CHUTE @ STA. 180+50
{ SAME AS ABOVE }

TYPICAL SECTION OF  
WASH SOUTH OF BOX FLUME  
OVERCUTE @ STA. 180+50



## PROFILE ELEV.'S FOR BOX

FLUME OVERCHUTE STA. 295+50

STA.	B.S.	H.I.	F.S.	ELEV.
PANEL G,				1376.87
	13.58	1390.45		
0+100			13.77	1376.68
0+25.5			13.83	1376.62
0+73			13.81	1376.64
1+21.8			13.85	1376.60
1+26			14.25	1376.20
1+34			17.83	1372.62
1+49			17.80	1372.65
1+49			16.10	1374.35
1+51			16.50	1373.95
1+74			27.3	1363.15
Z+29			21.1	1369.35
SM. H <sub>2</sub>			5.20	1385.25
	4.91	1390.16		
PANEL G,			13.295	1376.865

## DESCRIPTION

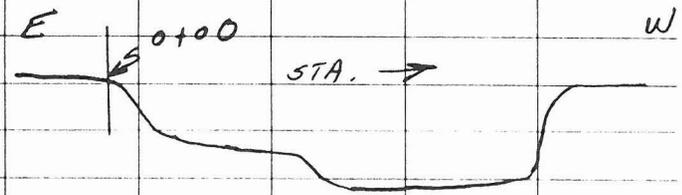
TOP SPIKE NAIL FOR UERT PANEL @ BOX  
FLUME OVERCHUTE STA. 295+50

CONC. SHOT FOR DET. SLOP.

GROUND SHOT AFTER SCOUR HOLE

U.S. DEPT. OF THE INTERIOR B.C. @ N. WEST  
COR BOX FLUME OVERCHUTE @ STA. 295+50

TYPICAL SECTION OF WASH  
SOUTH OF BOX FLUME OVERCHUTE  
@ STA. 295+50



STA.	B.S.	H.I.	F.S.	ELEV.
0+00				100.00
	5.25	105.25		
0+27			7.40	97.85
0+50			10.8	94.45
0+69			12.0	93.25
0+77			14.3	90.95
0+86			13.3	91.95
1+05			12.8	92.45
1+06			16.5	88.75
1+52			16.9	88.35
1+63			8.1	97.15
1+83			5.1	100.15

DESCRIPTION

ASSUMED ELEV @ STA. 0+00 TOP BANK

G.B.

"

"

"

"

"

TOP E WASH

" " "

G.B.

TOP BANK

STA. 393+00 PIPE OVERCHUTE

STA.	B.S.	H.I.	F.S.	ELEV.
TBM: Q,				1378.452
	7.10	1385.552		
			13.37	1372.182
			5.96	1379.592
			7.06	1378.492
			14.48	1371.072
			13.50	1372.052

DESCRIPTION

TOP WEST END OF CONC. HEADWALL ON  
N. SIDE OF C.A.P. & S. SIDE ROAD @ PIPE  
OVERCHUTE STA. 393+00

E. N. END 66" CMP (INLET)

TOP CONC. HEADWALL EAST END "

TOP CONC. HEADWALL EAST END (OUTLET)

E. S. END 66" CMP.

GROUND 25' SOUTH OF OUTLET STRUCTURE

STA. 402+50 PIPE OVERCHUTE

STA.	B.S.	H.I.	F.S.	ELEV.
TBM, R,				1378.152
	7.69	1385.842		
			6.66	1379.182
			14.04	1371.802
			7.44	1378.402
			14.97	1370.872
			17.30	1368.542

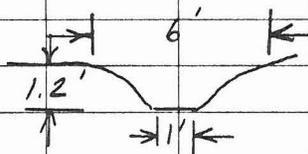
DESCRIPTION

TOP WEST END OF CONC. HEADWALL ON  
N. SIDE OF C.A.P. & S. SIDE ROAD STA.  
402+50 <sup>PIPE</sup> OVERCHUTE

TOP CONC. HEADWALL EAST END (INLET)  
E N. END 66" DIAM. CMP.

TOP CONC. HEADWALL EAST END (OUTLET)  
E S. END 66" DIAM. CMP.  
GROUND 25' SOUTH OF OUTLET STRUCTURE

TYPICAL SECTION OF WASH  
SOUTH OF PIPE OVERCHUTE  
@ STA. A02+50



PROFILE ELEV. FOR BOX  
FLUME OVERCHUTE @ STA. A85+00

STA.	B.S.	H.I.	F.S.	ELEV.
T.B.M. U.				1381.772
	A.55	1386.322		
0+00			13.04	1373.282 CONC.
0+25.3			13.00	1373.322
0+73			13.04	1373.282
1+20.5			13.02	1373.302
1+25			13.44	1372.882
1+33			17.00	1369.322
1+47.7			16.95	1369.372
1+47.7			15.30	1371.022
1+49			15.40	1370.922
1+75.7			27.7	1358.622
2+27.7			25.3	1361.022
T.B.M. U.			4.55	1381.772

DESCRIPTION

U.S. DEPT. OF THE INTERIOR B.C. @ TOP  
OF N. WEST COR. OF BOX FLUME OVERCHUTE  
@ STA. A85+00

CONC.

"

"

"

"

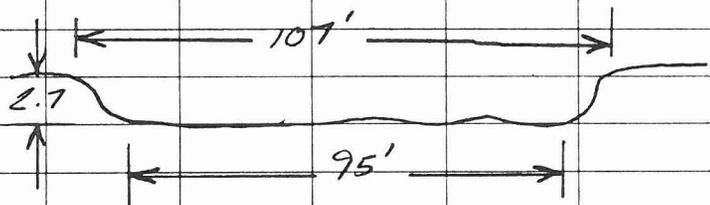
"

"

"

CONC. SHOT TO GET SLOPE  
GROUND SHOT AFTER SCOUR HOLE  
{SAME AS ABOVE}

TYPICAL SECTION OF WASH  
SOUTH OF BOX FLUME  
OVERCHUTE @ STA. 485+00



STA. 544+25 PIPE CULVERT

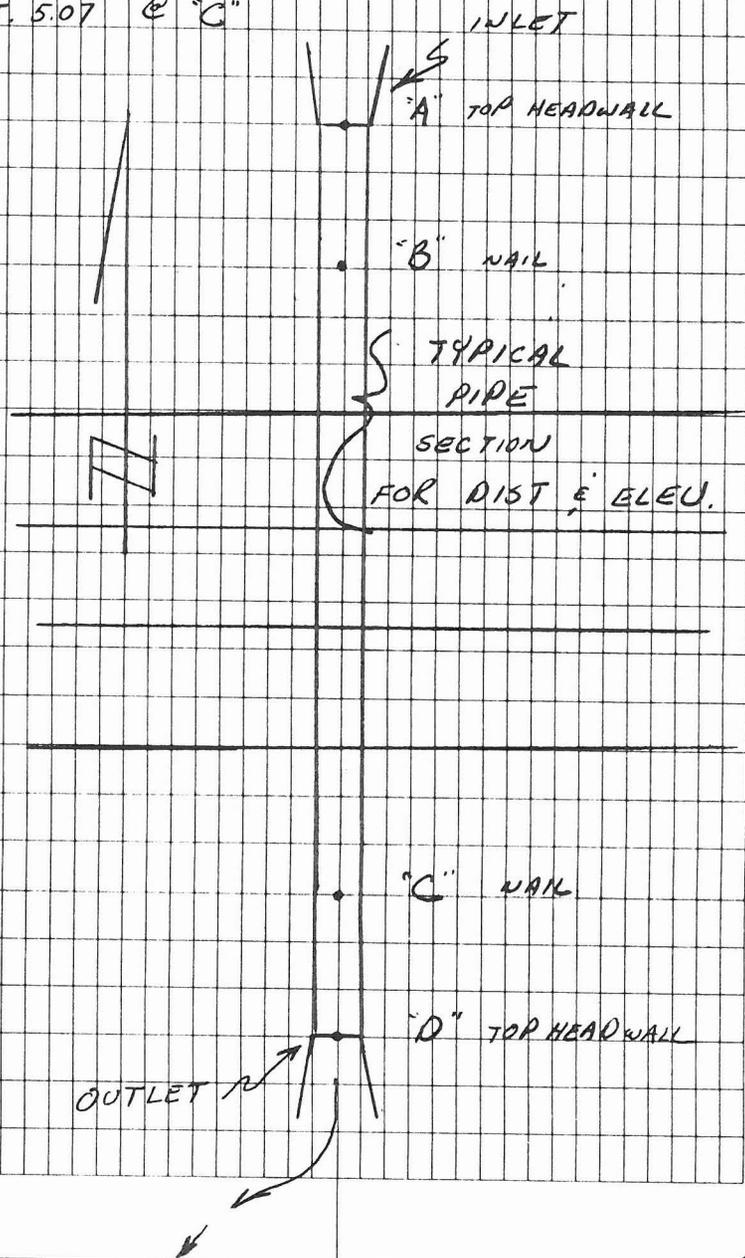
TC "B" DIST. FROM "B" TO "A"  
 HORZ. 41.525' SLOPE 47.885' ZENITH  $119^{\circ}52'05''$   
 VERT. DIFF. -23.85' INV.  $240^{\circ}08'50''$

TC "B" DIST. FROM "B" TO "C"  
 HORZ. 133.125' SLOPE 133.125' ZENITH  $90^{\circ}13'04''$   
 VERT. DIFF. -0.505' INV.  $269^{\circ}46'47''$

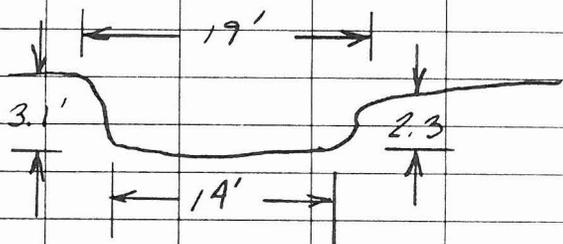
F.S. #	HORZ. DIST.	SLOPE DIST.	ZENITH	VERT. DIFF.	DESCRIPT.
"D"	51.27'	58.89'	$119^{\circ}27'56''$	-28.965'	TOP H/WALL
			$240^{\circ}32'31''$	-5.10'	R @ OUTLET
	85.105'	92.47'	$113^{\circ}01'26''$	-36.17'	25' SOUTH OF STRUCTURE

H.I. 5.29 @ "B"

H.I. 5.07 @ "C"



STA. 544 +25 TYPICAL  
CROSSECTION OF WASH  
SOOTH OF OUTLET



STA. 561+50 PIPE CULVERT

23

$\pi$ C-B" DIST. FROM "B" TO "A"  
 HORZ. 45.48' SLOPE 53.025' ZENITH  $\angle$  120°56'14"  
 VERT. DIFF. -27.26 INV. 239°03'22"

$\pi$ C-B" DIST. FROM "B" TO "C"  
 HORZ. 131.015' SLOPE 131.015' ZENITH  $\angle$  89°57'48"  
 VERT. DIFF. +.09 INV. 270°02'16"

F.S. #	HORZ. DIST.	SLOPE DIST.	ZENITH $\angle$	VERT. DIFF.
"D"	54.175'	62.84'	$\frac{120^{\circ}26'49''}{239^{\circ}33'51''}$	-31.845
				-4.54
	85.685'	93.685'	113°51'14"	-37.885

H.I. 5.38 @ "B"  
 H.I. 5.18 @ "C"

{ REF. PAGE 21 }

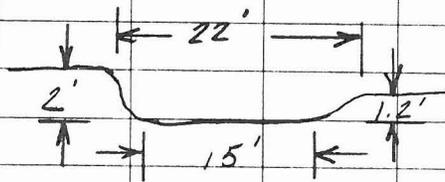
DESCRIPTION

TOP HEAD WALL

FE @ OUTLET

25' SOUTH OF OUTLET STRUCTURE

STA. 561+50 TYPICAL  
CROSSSECTION OF WASH  
SOUTH OF OUTLET



24

STA. 571+50 PIPE CULVERT

25

$\bar{A} @ \bar{B}$  DIST. FROM "B" TO "A"  
 HORZ. 33.82' SLOPE 38.315' ZENITH  $\angle$  118°01'33"  
 VERT. DIFF. -18.005 INV. 241°57'32"

$\bar{A} @ \bar{C}$  DIST. FROM "B" TO "C"  
 HORZ. 134.92' SLOPE 134.92' ZENITH  $\angle$  90°02'33"  
 VERT. DIFF. -.10 INV. 269°57'41"

F.S. #	HORZ. DIST.	SLOPE DIST.	ZENITH $\angle$	VERT. DIFF.
"D"	36.465	44.055	$\begin{matrix} 124^{\circ}08'21'' \\ 235^{\circ}52'35'' \end{matrix}$	-24.725
				-4.48
	68.10'	74.35'	113°37'41"	-29.84

H.I. 5.29 @ "B"  
 H.I. 5.26 @ "C"

{ REF. PAGE 21 }

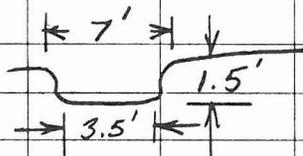
DESCRIPTION

TOP OF HEADWALL

# @ OUTLET

25' SOUTH OF OUTLET STRUCTURE

STA. 571+50 TYPICAL  
CROSSSECTION OF WASH SOUTH  
OF OUTLET



{ STA. 146+50 48" DOUBLE }  
{ CULVERT 200.30' L.F. }

{ STA. 121+60 30" PIPE }  
{ CULVERT 189.20' L.F. }

{ STA. 110+00 30" PIPE }  
{ CULVERT 202.00' L.F. }

BENCH LOOP TO PANEL 57

STA.	B.S.	M.I.	F.S.	ELEV.
TP. 8				1717.94
	6.31	1724.25		
PANEL 57			5.26	1718.99
	4.94	1723.93		
TP. 8			6.00	1717.93
				-.01 ✓
TP. 2A				1718.67
	4.26	1722.93		
TP. 1			6.95	1715.98
	5.73	1721.71		
TP. 2			5.05	1716.66
	3.87	1720.53		
TP. 3			3.83	1716.70
	3.43	1720.13		
PANEL 56			1.99	1718.14
	1.72	1719.86		
TP. 3			3.17	1716.69
	3.88	1720.57		
TP. 2			3.93	1716.64
	5.10	1721.74		
TP. 1			5.79	1715.95
	7.00	1722.95		
TP. 2A			4.31	1718.64
				-.03

28

DESCRIPTION
TOP OF G.L.O. B.C. $\frac{55.54}{58.59}$ T. 4N., R. 6W 1216
NAIL @ 32' PANEL EAST OF ABOVE DESCRIBED B.C. (SAME AS ABOVE)
TOP OF SPIKE NAIL FOR PANEL
ROCK
ROCK
ROCK
TOP SPIKE NAIL @ 32' PANEL
{ SAME AS ABOVE }

CROSSSECTION FROM 57 TO 58

ELEV. @ PT. 57 = 1718.99

ELEV. @ PT. 58 = 1720.144

DIST. FROM 57 TO 58

HORZ. 2384.445' SLOPE 2384.445' ZENITH  $89^{\circ}58'47''$   
 VERT. DIFF. + .96 100, 270°01'28"

PC 57

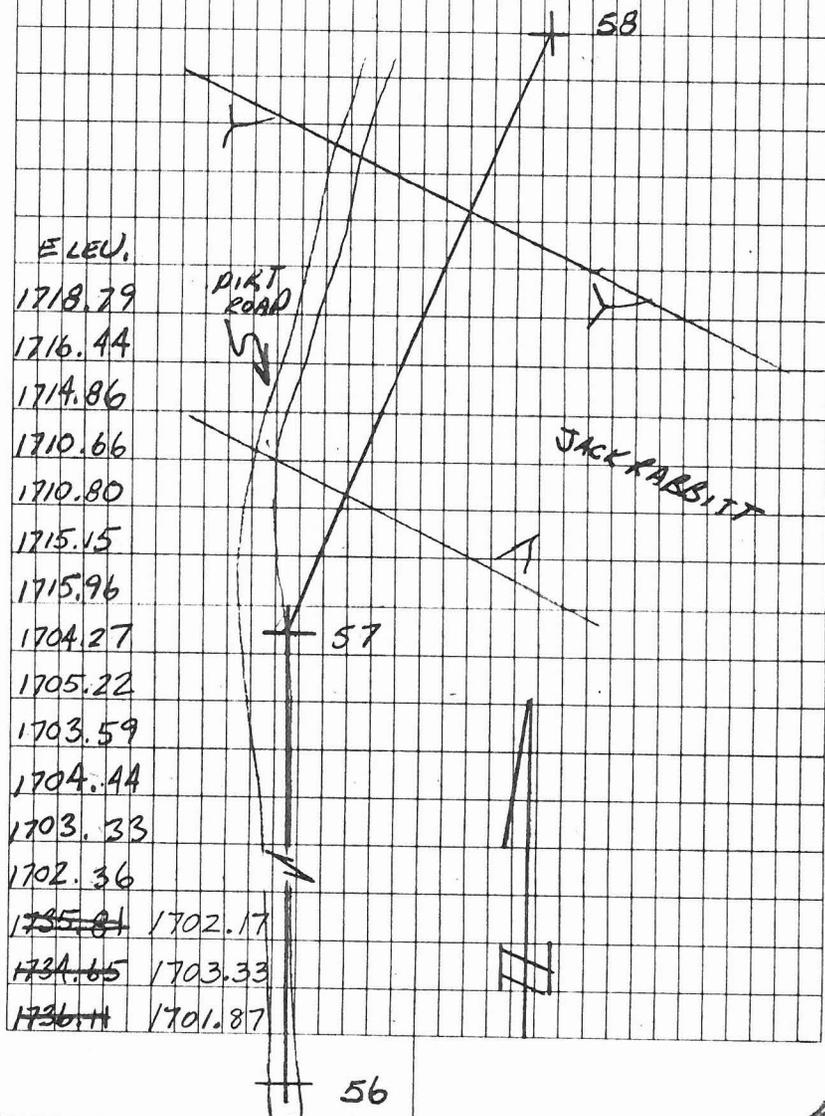
FS 58

PT. #	HORZ. DIST.	SLOPE DIST.	VERT. DIFF.	ZENITH $\angle$	DESCRIPTION
200	31.49'	31.49'	-.20	$90^{\circ}21'41''$	G. B.
201	78.51'	78.55'	-2.55	$91^{\circ}51'26''$	G. B.
202	95.23'	95.32'	-4.13	$92^{\circ}28'55''$	TOP BANK
203	112.78'	112.91'	-8.33	$92^{\circ}40'48''$	TOE WASH
204	132.07'	132.17'	-8.19	$92^{\circ}15'00''$	TOE WASH
205	151.51'	151.56'	-3.84	$91^{\circ}27'05''$	TOP BANK
206	228.62'	228.64'	-3.03	$90^{\circ}45'29''$	TOP BANK JACK RABBIT
207	293.50'	293.57'	-14.72	$91^{\circ}18'41''$	TOE JACK RABBIT
208	513.77'	513.95'	-13.77	$91^{\circ}32'09''$	G. B.
209	532.37'	532.59'	-15.40	$91^{\circ}59'26''$	G. B.
210	615.70'	615.87'	-14.54	$91^{\circ}21'12''$	G. B.
211	942.78'	942.91'	-15.69	$90^{\circ}57'16''$	TOP BANK
212	946.47'	947.12'	-16.63	$91^{\circ}00'25''$	TOE WASH
213	961.25'	961.39'	-16.82	$91^{\circ}00'14''$	TOE WASH
214	972.03'	972.16'	-15.66	$90^{\circ}55'27''$	TOP BANK
215	1160.79'	1160.88'	-17.12	$90^{\circ}41'54''$	TOP BANK

H.I. PT. 57 = 5.54

29

PRISM H.I. @ PT. 58 = 5.47



7@57

F.S. 58

PT. #	HORIZ. DIST.	SLOPE DIST.	VERT. DIFF.	ZENITH	DESCRIPTION
216	1165.65'	1165.72'	-17.70	90°37'32"	TOE WASH
217	1197.44'	1197.51'	-18.55	90°37'32"	TOE WASH
218	1206.97'	1207.05'	-17.26	90°40'42"	TOP BANK
219	1221.74'	1221.82'	-17.32	90°40'23"	G. B.
220	1229.52'	1229.61'	-17.92	90°41'47"	G. B.
221	1241.10'	1241.17'	-16.76	90°38'11"	G. B.
222	1277.74'	1277.77'	-17.00	90°27'01"	TOP BANK
223	1320.86'	1320.92'	-19.43	90°32'27"	TOE WASH
224	1373.37'	1323.43'	-20.23	90°35'13"	G. B. WASH
225	1452.49'	1452.53'	-18.45	90°27'12"	TOE WASH
226	1463.15'	1463.18'	-15.65	90°20'25"	G. B.
227	1468.13'	1468.13'	-3.78	90°08'57"	TOP BANK JACK RABBIT
228	1535.14'	1535.14'	-3.49	90°07'55"	G. B.
229	1675.76'	1675.78'	-8.19	90°16'55"	G. B.
230	1806.70'	1806.72'	-7.42	90°14'14"	G. B.
231	1914.91'	1914.41'	-3.23	90°05'56"	G. B.
232	1953.54'	1953.54'	-3.37	90°06'04"	G. B.
233	2023.94'	2023.94'	-5.49	90°04'22"	G. B.
234	2116.84'	2116.84'	-.53	90°01'00"	G. B.
235	2282.57'	2282.57'	+ .66	89°59'10"	TOP SHOULDER ROAD
236	2285.23'	2285.23'	+ .31	89°59'42"	TOE SHOULDER ROAD
237	2313.21'	2313.21'	+ .42	89°59'33"	"
238	2314.62'	2314.62'	+ .68	89°59'10"	TO P SHOULDER ROAD

ELEV.

1701.29

1700.44

1701.73

1701.67

1701.07

1702.23

1701.99

1699.56

1698.76

1700.54

1703.34

1715.21

1715.50

1710.80

1711.57

1715.76

1715.62

1713.50

1718.46

1719.65

1719.30

1719.41

1719.67

{ REF. PAGE 29 }

## CROSSSECTION FROM 57 TO 56

ELEV. @ PT. 57 = 1718.99

ELEV. @ PT. 56 = 1718.14

(CALCED) 1717.42

DIST. FROM 57 TO 56

HORZ.	4599.80	SLOPE	4599.80	ZENITH	90°01'32"
VERT. DIFF.	-1.62			INV.	269°58'52"

T @ 57

F.S. 56

PT. #	HORZ. DIST.	SLOPE DIST.	VERT. DIFF.	ZENITH	DESCRIPTION
239	4502.32'	4502.32'	-3.62	90°03'05"	G. B.
240	4385.24'	4385.25'	-10.41	90°08'28"	G. B.
241	4326.00'	4326.02'	-12.08	90°09'54"	G. B.
242	4261.58'	4261.59'	-10.50	90°08'46"	G. B.
243	4183.96'	4183.96'	-10.62	90°09'01"	G. B.
244	3975.27'	3975.28'	-8.27	90°07'28"	TOP BANK WASH
245	3764.20'	3764.24'	-22.53	90°15'05"	TOE WASH
246	3736.24'	3736.25'	-22.68	90°11'39"	TOE WASH
247	3624.98'	3625.00'	-13.46	90°13'01"	TOP BANK WASH
248	3590.14'	3590.17'	-13.07	90°12'46"	G. B.
249	3328.22'	3328.28'	-19.69	90°20'34"	G. B.
250	3136.16'	3136.22'	-20.43	90°22'37"	G. B.
251	3046.45'	3046.52'	-20.90	90°23'48"	G. B.
252	2741.68'	2741.74'	-18.20	90°23'01"	G. B.
253	2684.46'	2684.53'	-19.59	90°25'16"	G. B.

H.I. @ PT. 57 = 5.54

PRISM H.I. @ 56 = 5.49

REF. PAGE 293

ELEV.

1715.37

1708.58

1706.91

1708.49

1708.37

1710.72

1696.46

1696.31

1705.53

1705.92

1699.30

1698.56

1698.09

1700.79

1699.40

7057

F.S. 56

PT. #	HORZ. DIST.	SLOPE DIST.	VERT. DIFF.	ZENITH $\angle$	DESCRIPTION
254	2596.80	2596.85	-17.30	90°23'05"	G. B.
255	2536.67	2536.73	-17.27	90°23'35"	G. B.
256	2449.98	2450.04	-20.13	90°24'12"	G. B.
257	2413.71	2413.78	-20.97	90°25'46"	G. B.
258	2314.36	2314.42	-19.05	90°24'00"	G. B.
259	2099.08	2099.15	-13.82	90°22'27"	G. B.
260	1879.98	1880.00	-17.13	90°18'38"	G. B.
261	1670.20	1670.23	-12.43	90°19'31"	G. B.
262	1452.30	1452.34	-10.46	90°24'51"	G. B.
263	1282.22	1282.23	-4.63	90°12'30"	G. B.
264	1190.33	1190.34	-4.55	90°13'13"	G. B.
265	1078.47	1078.49	-6.47	90°20'42"	G. B.
266	1014.68	1014.69	-5.13	90°17'26"	G. B.
267	884.22	884.25	-6.81	90°26'52"	G. B.
268	762.71	762.76	-9.02	90°40'41"	G. B.
269	650.43	650.49	-8.60	90°45'27"	G. B.
270	503.41	503.44	-6.06	90°41'23"	G. B.
271	389.35	389.35	-2.30	90°20'16"	G. B.

ELEV.

1701.69

1701.72

1698.86

1698.02

1699.94

1705.37

1701.86

1706.56

1708.53

1714.36

1714.44

1712.52

1713.86

1712.18

1709.97

1710.39

1712.93

1716.69

REF. PAGE 29

BENCH LOOPS FOR CROSSSECTION  
PANELS.

STA.	B.S.	H.I.	F.S.	ELEV.
BM. 25				1726.074
	1.51	1727.584		
PANEL 58			7.44	1720.144
	7.13	1727.274		
BM. 25			1.20	1726.074 ✓
BM. 30				1532.409
	8.47	1540.879		
TP. 1			4.53	1536.349
	7.56	1543.909		
PANEL 55			4.71	1539.199
	3.78	1542.979		
TP. 1			6.63	1536.349
	4.07	1540.419		
BM. 30			8.01	1532.409 ✓

33

DESCRIPTION

" 25. WLS 1957 1726"

TOP NAIL @ 32' PANEL EAST OF BM. 25

{SAME AS ABOVE}

" 30 WLS 1957 1532

ROCK

TOP NAIL @ 32' PANEL N.W. OF BM. 30  
ON NORTH SIDE OF JACKRABBIT IN SEC. 25

{SAME AS ABOVE}

CROSSSECTION FROM 55 TO 54

ELEV. @ 55 = 1539.199

ELEV. @ 54 = 1545.109

(CALCED) 1545.029

DIST. FROM 55 TO 54

HORZ. 1385.175' SCOPE 1385.175' ZENITH  $\angle$  89°46'28"  
 VERT DIFF. +5.49 INCL. 270°13'45"

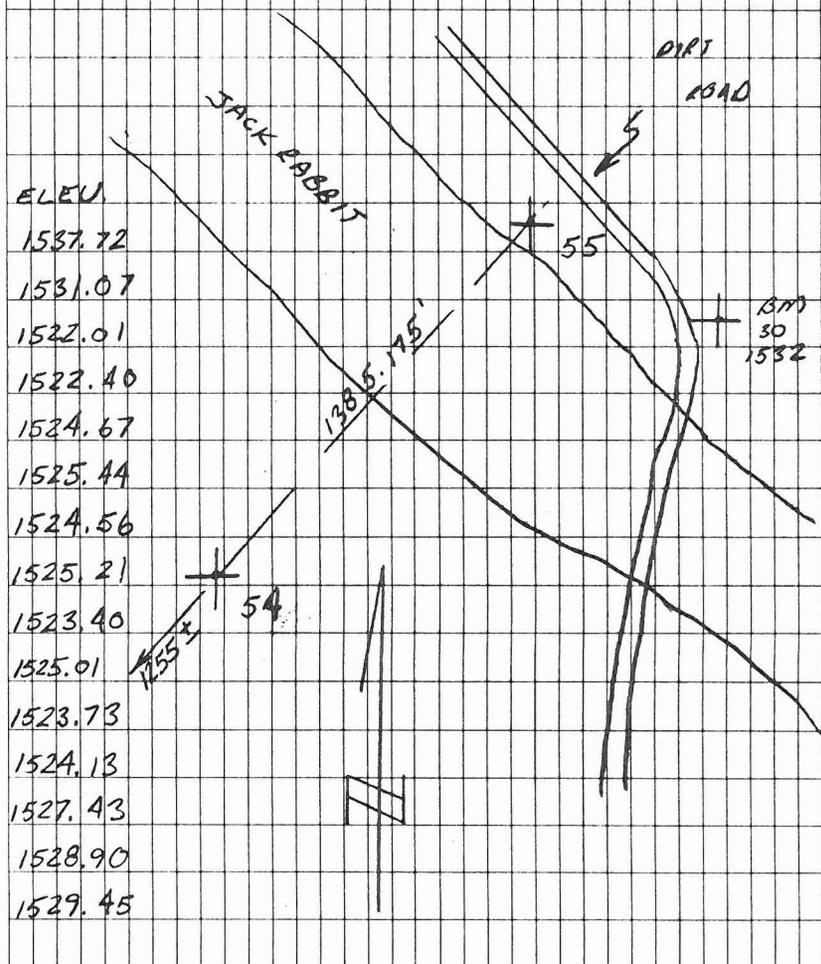
TC 55

F.S. 54

PT. #	HORZ. DIST.	SCOPE DIST.	VERT. DIFF.	ZENITH $\angle$	DESCRIPT.
272	16.39'	16.455'	-1.48	95°09'15"	TOP BANK JACK RABBIT
273	66.01'	66.51'	-8.13	97°01'19"	G.B.
274	85.36'	86.52'	-17.19	99°23'41"	TOP WASH JACK RABBIT
275	107.10'	108.40'	-16.80	98°54'43"	G.B.
276	117.86'	118.75'	-14.53	97°01'32"	G.B.
277	146.74'	147.38'	-13.76	95°21'20"	G.B.
278	158.83'	159.50'	-14.64	95°16'05"	G.B.
279	267.66'	268.02'	-13.99	92°59'35"	G.B.
280	282.45'	282.89'	-15.80	93°12'05"	G.B.
281	362.46'	362.73'	-14.19	92°14'30"	G.B.
282	373.43'	373.75'	-15.47	92°22'17"	G.B.
283	496.46'	496.69'	-15.07	91°44'22"	TOP WASH G.B.
284	503.66'	503.79'	-11.77	91°20'20"	G.B.
285	517.71'	517.81'	-10.30	91°08'26"	G.B.
286	593.51'	593.51'	-9.75	90°15'34"	G.B.

H.I. @ PT. 55 = 5.51

PRISM. H.I. @ 54 = 5.17



TC 55

F.S. 54

PT. #	HORZ. DIST.	SLOPE DIST.	VERT. DIFF.	ZENITH $\angle$	DESCRIPT.
287	601.35'	601.35'	-8.91	90°10'34"	G.B.
288	697.11'	697.12'	-7.80	90°18'45"	TOE WASH JACK RABBIT
289	758.96'	758.96'	-1.55	90°07'04"	TOP BANK JACK RABBIT
290	804.77'	804.77'	+1.96	89°55'57"	G.B.
291	854.05'	854.05'	+2.82	89°48'42"	G.B.
292	1046.90'	1046.90'	+2.02	89°53'27"	TOP BANK 1' WASH
293	1081.66'	1081.66'	-1.71	89°52'34"	TOE WASH
294	1089.07'	1089.08'	+1.64	89°48'21"	TOP BANK
295	1118.68'	1118.68'	+2.40	89°52'43"	G.B.
296	1223.50'	1223.50'	+2.62	89°52'43"	G.B.
297	1333.35'	1333.36'	+5.50	89°45'55"	G.B.

ELEV.

1530.29

1531.40

1537.65

1540.16

1542.02

1541.22

1538.49

1539.84

1541.60

1541.82

1544.70

REF. PAGE 34

CROSECTION FROM 52 TO 53

ELEV. @ 52 = 1405.674

ELEV. @ 53 = 1402.484

DIST. FROM 52 TO 53

HORZ. 2188.02 SLOPE 2188.025 ZENITH  $\angle$  90°05'43"  
 VERT. DIFF. -3.54 INV. 269°54'25"

PC 52

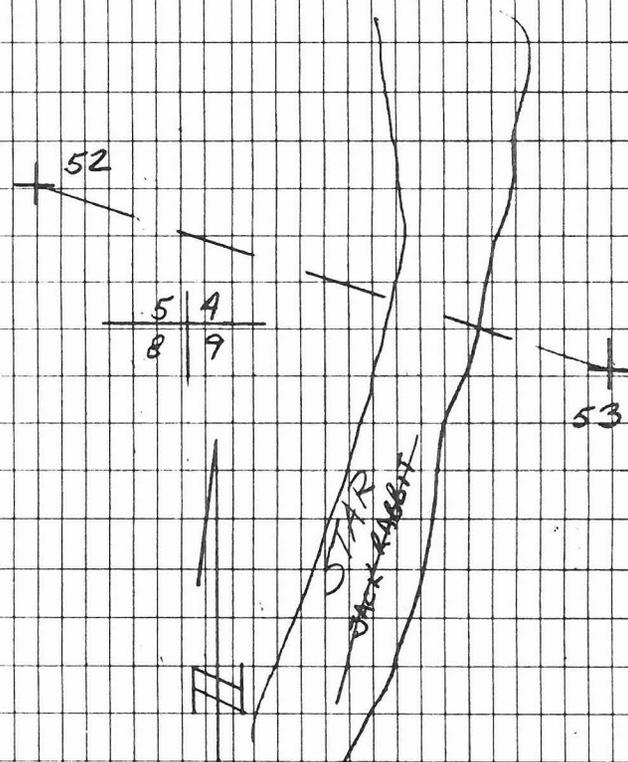
FS 53

PT. #	HORZ. DIST.	SLOPE DIST.	VERT. DIFF.	ZENITH $\angle$	DESCRIPTION
298	32.42'	32.45'	-0.88	91°33'23"	G.B.
299	79.72'	80.04'	-7.19	95°09'13"	TOP BANK
300	87.11'	87.61'	-9.38	96°08'48"	TOE WASH
301	93.08'	93.55'	-9.35	95°44'11"	TOE WASH
302	98.67'	98.96'	-7.53	94°21'43"	TOP BANK
303	123.23'	125.54'	-8.70	94°02'07"	G.B.
304	147.69'	147.74'	-3.65	91°24'55"	G.B.
305	221.98'	222.13'	-8.17	92°06'28"	G.B.
306	293.19'	293.20'	-2.90	90°34'02"	G.B.
307	326.84'	326.86'	-3.45	90°36'17"	G.B.
308	348.78'	348.84'	-6.16	91°00'42"	TOP BANK
309	357.52'	357.57'	-8.65	90°54'19"	TOE WASH
310	371.55'	371.60'	-9.21	90°57'27"	TOE WASH
311	402.16'	402.17'	-3.44	90°29'23"	TOP BANK
312	451.77'	451.79'	-3.71	90°28'17"	G.B.

H.I. @ PT. 52 = 5.58

PRISM H.I. @ 53 = 5.28

ELEV.
1404.79
1398.48
1396.29
1396.32
1398.14
1396.97
1402.02
1397.50
1402.77
1402.22
1399.51
1397.02
1396.46
1402.23
1401.96



TC 52

F.S. 53

PT. #	HORZ. DIST.	SLOPE DIST.	VERT. DIFF.	ZENITH <sup>2</sup>	DESCRIPTION
313	490.20'	490.21'	-3.84	90°26'59"	TOP BANK
314	515.05'	515.09'	-10.00	90°40'02"	TOE WASH
315	537.31'	537.34'	-12.67'	90°36'17"	FE WASH G.B.
316	601.02'	601.04'	-12.41	90°30'58"	TOE WASH
317	639.66'	639.61'	-7.79	90°20'23"	TOP BANK
318	710.21'	710.23'	-5.66	90°27'27"	G. B.
319	787.51'	787.54'	-6.53	90°28'34"	G. B.
320	823.20'	823.24'	-12.05	90°33'41"	G. B.
321	839.32'	839.34'	-10.26	90°25'42"	G. B.
322	951.61'	951.66'	-13.07	90°32'50"	G. B.
323	1064.67'	1064.71'	-13.03	90°29'14"	TOP BANK
324	1073.58'	1073.61'	-15.14	90°26'08"	TOE WASH
325	1112.67'	1112.71'	-15.80	90°27'15"	TOE WASH
326	1120.10'	1120.13'	-12.92	90°27'27"	TOP BANK
327	1254.29'	1254.31'	-11.31	90°20'07"	G. B.
328	1329.56'	1329.57'	-12.45	90°14'10"	TOP BANK
329	1334.86'	1334.88'	-13.87	90°17'46"	TOE WASH
330	1347.99'	1348.01'	-13.52	90°16'44"	TOE WASH
331	1362.45'	1362.46'	-11.92	90°12'30"	TOP BANK
332	1428.37'	1428.38'	-12.00	90°12'09"	G. B.
333	1437.56'	1437.57'	-13.33	90°15'14"	G. B.
334	1448.24'	1448.25'	-11.42	90°10'35"	G. B.

ELEV.

1401.83

1395.67

1393.00

1393.26

1397.88

1400.01

1399.14

1393.62

1395.41

1392.60

1392.64

1390.53

1389.87

1392.75

1394.36

1393.22

1391.80

1392.15

1393.75

1393.67

1392.34

1394.25

{ REF. PAGE 36 }

TC 52

F.S. 53

PT. #	HORIZ. DIST.	SLOPE DIST.	VERT. DIFF.	ZENITH	DESCRIPTION	ELEV.
335	1469.53'	1469.54'	-11.63	90°10'55"	G.B.	1394.04
336	1478.46'	1478.48'	-13.98	90°16'20"	G.B.	1391.69
337	1593.69'	1593.70'	-12.72	90°12'27"	G.B.	1392.95
338	1723.09'	1723.10'	-13.25	90°12'35"	TOP BANK WASH	1392.42
339	1731.67'	1731.68'	-14.33	90°14'40"	TOE WASH	1391.34
340	1824.41'	1824.42'	-14.64	90°14'51"	G.B.	1391.03
341	1835.40'	1835.41'	-13.80	90°12'52"	TOE WASH	1391.87
342	1843.41'	1843.42'	-11.89	90°09'15"	TOP BANK	1393.78
343	1872.46'	1872.47'	-13.00	90°11'09"	G.B.	1392.67
344	1929.60'	1929.61'	-11.61	90°13'41"	G.B.	1394.06
345	1947.60'	1947.61'	-10.69	90°11'56"	G.B.	1394.98
346	1966.81'	1966.83'	-11.77	90°13'43"	G.B.	1393.90
347	2023.91'	2023.91'	-10.86	90°11'47"	G.B.	1394.81
348	2064.79'	2064.80'	-6.05	90°10'13"	G.B.	1399.62
349	2092.48'	2092.49'	-5.80	90°09'40"	G.B.	1399.87
350	2116.45'	2116.46'	-7.22	90°11'52"	G.B.	1398.45
351	2160.69'	2160.69'	-4.12	90°06'42"	G.B.	1401.55

REF. PAGE 36

## BENCH LOOP FOR PANELS

52 &amp; 53

STA.	B.S.	H.I.	F.S.	ELEV.
BM. "T"				1393.094
	14.46	1407.554		
TP. 1			6.85	1400.704
	9.61	1410.314		
PANEL 52			4.64	1405.674
	4.44	1410.114		
TP. 1			9.41	1400.704
	6.96	1407.664		
BM. "T"			14.56	1393.104
				+ .01 ✓
BM. "T"				1393.094
	12.89	1405.984		
TP. 1			15.47	1390.514
	6.32	1396.834		
TP. 2			5.59	1391.244
	4.10	1395.344		
TP. 3			4.47	1390.874
	15.22	1406.094		
PANEL 53			3.61	1402.484
	3.22	1405.704		
TP. 3			14.83	1390.874

## DESCRIPTION

TOP G.L.O. B.C.  $\frac{55}{58} \frac{54}{59}$ 

ROCK

TOP P.K. NAIL @ 32' PANEL WEST OF JACK RABBIT

{ SAME AS ABOVE }

TOP G.L.O. B.C.  $\frac{55}{58} \frac{54}{59}$ 

ROCK

TIN CAN

ROCK

TOP SPIKE NAIL @ 32' PANEL EAST OF JACK RABBIT

## BENCH LOOPS FOR PANELS

52 &amp; 53 CONT.

STA.	<sup>+</sup> B.S.	H.I.	<sup>-</sup> F.S.	ELEV.
TP. 3				1390.874
	4.41	1395.284		
TP. 2			4.05	1391.234
	5.47	1396.704		
TP. 1			6.19	1390.514
	14.76	1405.274		
B.M. "T"			12.18	1393.094 ✓

## DESCRIPTION

TOP 6 L.O. B.C.  $\frac{55}{58} \frac{54}{59}$

## BENCH LOOP FOR PANEL 54

STA.	B.S.	H.I.	I.S.	ELEV.
BM. 30				1532.409
	2.32	1534.729		
TP. 1			18.19	1516.539
	9.35	1525.889		
TP. 2			.51	1525.379
	14.47	1539.849		
TP. 3			2.62	1537.229
	8.19	1545.419		
TP. 4			2.70	1542.719
	7.14	1549.859		
PANEL 54			4.75	1545.109
	4.43	1549.539		
TP. 4			6.82	1542.719
	3.64	1546.359		
TP. 3			9.12	1537.239
	3.77	1541.009		
TP. 2			15.63	1525.379
	.55	1525.929		
TP. 1			9.39	1516.539
	18.01	1534.549		
BM. 30			2.14	1532.409 ✓

## DESCRIPTION

"30 NLS 1957 1532"

ROCK

ROCK

ROCK

ROCK

TOP P.K. NAIL @ 32' PANEL SOUTH OF  
JACK RABBIT WASH

SAME AS ABOVE

CROSSSECTION FROM 55 TO 54  
EXTENDED S. WEST FROM PANEL 54

ELEV. @ 54 = 1545.109

TC 54

LINE EXTENDED S. WEST FROM LINE 55-54

PT.	HORZ. DIST.	SLOPE DIST.	VERT. DIFF.	ZENITH	DESCRIPTION
352	67.88'	67.89'	-.82	90°40'05"	G.B.
353	176.42'	176.45'	-3.49	91°07'57"	G.B.
354	246.97'	246.98'	-1.91	90°26'36"	G.B.
355	329.15'	329.16'	-1.63	90°17'00"	G.B.
356	373.69'	373.70'	-2.01	90°18'29"	G.B.
357	474.18'	474.18'	-5.05	90°14'47"	G.B.
358	547.62'	547.62'	-10.07	90°19'19"	G.B.
359	556.79'	556.79'	-8.32	90°08'32"	G.B.
360	576.04'	576.04'	-9.09	90°12'28"	TOP BANK
361	587.07'	587.12'	-14.55	90°44'13"	E 1.5' DITCH
362	593.05'	593.06'	-10.56	90°20'41"	TOP BANK
363	622.83'	622.84'	-9.90	90°16'03"	G.B.
364	668.62'	668.63'	-6.77	90°14'17"	G.B.
365	782.32'	782.32'	-4.19	90°00'53"	G.B.
366	808.20'	808.20'	-4.54	90°02'21"	G.B.
367	875.77'	875.77'	-1.41	89°49'53"	G.B.
368	906.96'	906.96'	-2.30	89°53'39"	G.B.
369	989.95'	989.95'	-7.87	90°03'08"	G.B.

H.I. @ 54 = 5.58

ELEV.

1544.29

1541.62

1543.20

1543.48

1543.10

1540.06

1535.04

1536.79

1536.02

1530.56

1534.55

1535.21

1538.34

1540.92

1540.57

1543.70

1542.81

1537.22

{ REF. PAGE 34 }

1054

LINE EXTENDED S. WEST FROM LINE 55-54					
PT.	HORIZ. DIST.	SLOPE DIST.	VERT. DIFF.	ZENITH	DESCRIPTION
370	1020.02'	1020.02'	-12.20	90°04'07"	G. B.
371	1040.04'	1040.05'	-16.80	90°19'15"	TOP BANK
372	1044.04'	—	-20.30	—	FL. 2' WASH
373	1048.66'	1048.67'	-16.07	90°16'41"	TOP BANK
374	1066.14'	1066.15'	-14.90	90°12'39"	G. B.
375	1078.59'	1078.40'	-16.78	90°18'30"	G. B.
376	1095.94'	1095.94'	-12.86	90°05'55"	G. B.
377	1165.10'	1165.10'	-13.18	90°06'30"	G. B.
378	1180.65'	1180.65'	-12.62	90°04'48"	G. B.
379	1240.24'	1240.24'	-12.55	90°04'22"	G. B.
380	1263.16'	1263.16'	-13.46	90°06'45"	G. B.

ELEV.

1532.91

1528.31

1524.81

1529.04

1530.21

1528.33

1532.25

1531.93

1532.49

1532.56

1531.65

REF. PAGE 34

BENCH LOOP FOR PANEL 51

STA.	B.S.	H.I.	F.S.	ELEV.
PANEL P <sub>1</sub>				1372.482
	11.87	1384.352		
PANEL 51			3.30	1381.052
	3.08	1384.132		
PANEL P <sub>1</sub>			11.64	1372.492
				+ .01 ✓

DESCRIPTION

TOP SPIKE NAIL FOR UERT PANEL @ SIPHON  
 OUTLET JACKRABBIT WASH S. SIDE OF C.A.P.  
 SPIKE NAIL @ 32' PANEL NORTH OF OUTLET  
 OF SIPHON ON JACK RABBIT WASH  
 {SAME AS ABOVE}

CROSSSECTION FROM 51 TO 50

ELEV. @ 51 = 1381.052

ELEV. @ 50 =

(CALC.) 1375.227

DIST. FROM 51 TO 50

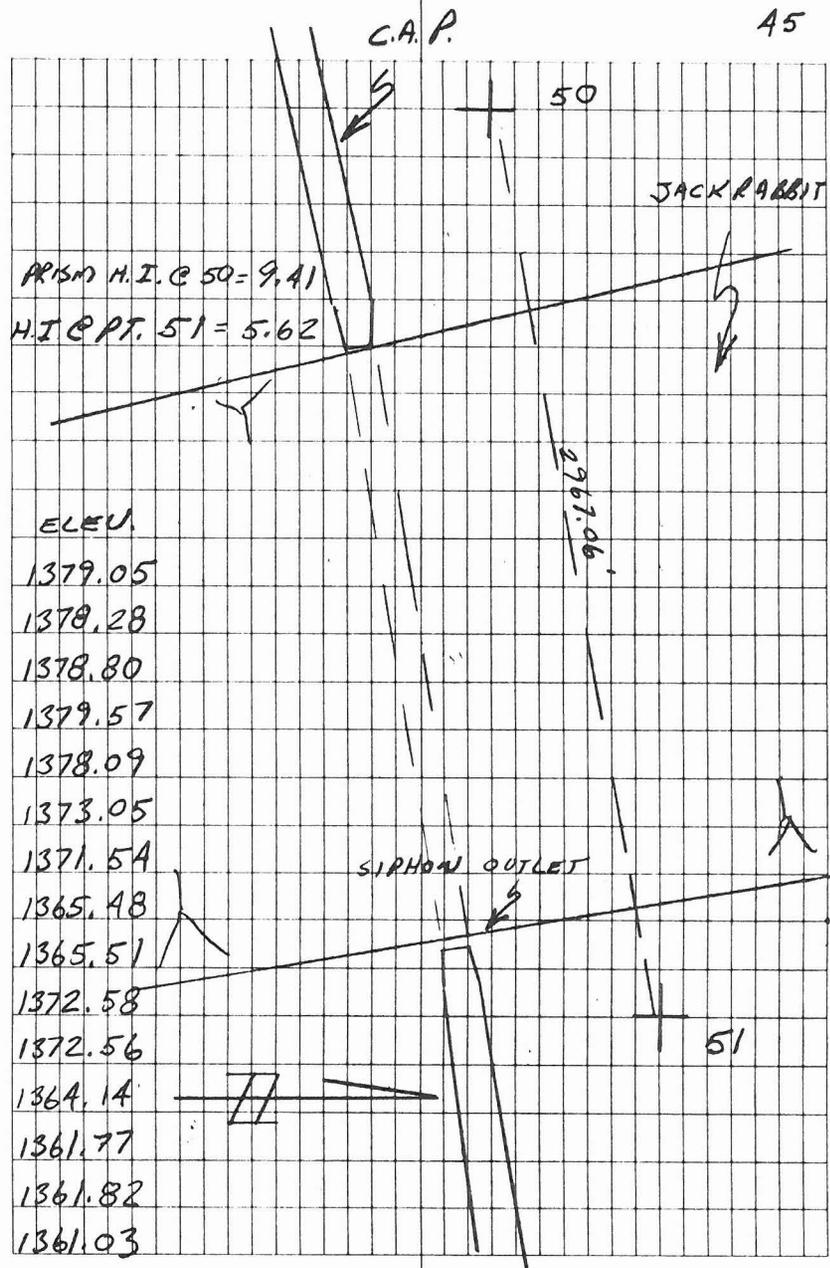
HORZ. 2967.06' SLOPE 2967.06' ZENITH  $\angle$  90°02'34"  
 VERT. DIFF. -2.035 INCL. 269°57'39"

TC 51

F.S. 50

PT. #	HORZ. DIST.	SLOPE DIST	VERT. DIFF.	ZENITH $\angle$	DESCRIPTION
381	38.34'	38.39'	-2.00	92°59'07"	G.B.
382	43.50'	43.59'	-2.77	93°38'23"	G.B.
383	56.69'	56.74'	-2.25	92°16'03"	G.B.
384	89.42'	89.44'	-1.48	90°56'38"	G.B.
385	179.10'	179.12'	-2.96	90°56'43"	G.B.
386	313.07'	313.17'	-8.00	91°27'47"	G.B.
387	334.20'	334.34'	-7.51	91°37'48"	G.B.
388	366.81'	367.03'	-15.57	91°57'45"	G.B.
389	378.20'	378.41'	-15.54	91°53'57"	G.B.
390	411.32'	411.41'	-8.47	91°10'49"	G.B.
391	425.33'	425.42'	-8.49	91°08'38"	TOP BANK JACKRABBIT
392	484.86'	485.03'	-16.91	91°31'30"	TOE WASH
393	536.30'	536.44'	-19.28	91°18'42"	G.B.
394	616.18'	616.30'	-19.23	91°08'14"	TOP BANK
395	620.84'	620.98'	-20.02	91°12'06"	E 2' WASH

45



ELEV.
1379.05
1378.28
1378.80
1379.57
1378.09
1373.05
1371.54
1365.48
1365.51
1372.58
1372.56
1364.14
1361.77
1361.82
1361.03

T@ 51

F.S. 50

PT. #	HORZ. DIST.	SLOPE DIST.	VERT. DIFF.	ZENITH $\angle$	DESCRIPTION
396	644.77'	644.84'	-16.69	90°51'42"	TOP BANK
397	678.66'	678.75'	-15.15	90°56'30"	G.B.
398	736.68'	736.78'	-15.79	90°55'03"	TOP BANK
399	744.76'	744.85'	-17.98	90°50'42"	TOE WASH
400	804.05'	804.16'	-20.18	90°56'25"	TOE WASH
401	812.84'	812.92'	-18.60	90°49'07"	TOP BANK
402	917.48'	917.58'	-20.38	90°49'48"	G.B.
403	921.31'	921.39'	-19.31	90°45'58"	G.B.
404	958.72'	958.81'	-19.65	90°45'25"	G.B.
405	999.35'	999.44'	-20.55	90°46'40"	TOP BANK
406	1002.99'	1003.09'	-20.98	90°47'58"	G.B.
407	1054.01'	1054.12'	-22.18	90°49'35"	TOE WASH
408	1059.01'	—	-20.18	—	TOP BANK
409	1108.42'	1108.51'	-21.45	90°44'54"	G.B.
410	1139.16'	1139.25'	-21.12	90°42'41"	TOP BANK
411	1140.66'	—	-22.62	—	TOE WASH
412	1161.07'	1161.14'	-23.59	90°37'22"	TOE WASH
413	1171.53'	1171.60'	-20.03	90°38'18"	TOP BANK
414	1207.07'	1207.13'	-18.83	90°33'46"	G.B.
415	1329.51'	1329.58'	-20.18	90°34'10"	TOP BANK
416	1337.45'	1337.53'	-21.81	90°38'09"	TOE WASH
417	1471.79'	1472.04'	-21.12	90°33'04"	TOE WASH

ELEV.

1364.36

1365.90

1365.26

1363.07

1360.87

1362.45

1360.67

1361.74

1361.40

1360.50

1360.07

1358.87

1360.87

1359.60

1359.93

1358.43

1357.46

1361.02

1362.22

1360.87

1359.24

1359.93

REF. PAGE 45

7051

F.S. 50

PT. #	HORZ. DIST.	SLOPE DIST.	VERT. DIFF.	ZENITH	DESCRIPTION
418	1481.85'	1481.89'	-15.59	90°26'59"	TOP BANK
419	1543.47'	1543.51'	-15.72	90°26'13"	G.B.
420	1555.58'	1555.60'	-10.74	90°15'00"	G.B.
421	1563.74'	1563.74'	-9.43	90°15'08"	G.B.
422	1572.89'	1572.93'	-15.67	90°25'36"	G.B.
423	1579.59'	1579.64'	-16.13	90°26'30"	G.B.
424	1584.23'	1584.27'	-18.04	90°24'04"	G.B.
425	1613.25'	1613.29'	-17.10	90°21'38"	G.B.
426	1795.98'	1796.02'	-16.80	90°24'37"	G.B.
427	1863.37'	1863.40'	-14.36	90°19'14"	G.B.
428	2016.65'	2016.66'	-10.54	90°18'06"	G.B.
429	2124.92'	2124.93'	-10.03	90°11'31"	G.B.
430	2230.23'	2230.25'	-9.72	90°15'08"	G.B.
431	2345.44'	2345.44'	-6.21	90°09'16"	G.B.
432	2428.96'	2428.96'	-6.50	90°05'07"	G.B.
433	2499.01'	2499.02'	-4.54	90°06'25"	G.B.
434	2572.49'	2572.49'	-6.70	90°05'07"	G.B.
435	2613.40'	2613.41'	-7.04	90°05'30"	G.B.
436	2656.21'	2656.21'	-5.86	90°03'53"	G.B.
437	2695.56'	2695.56'	-6.85	90°05'06"	G.B.
438	2717.39'	2717.39'	-8.47	90°07'07"	G.B.
439	2764.09'	2764.09'	-6.59	90°04'39"	G.B.

ELEV.
1365.46
1365.33
1370.31
1371.62
1365.38
1364.92
1363.01
1363.95
1364.25
1366.69
1370.51
1371.02
1371.33
1374.84
1374.55
1376.51
1374.35
1374.01
1375.19
1374.20
1372.58
1374.46

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7051

F.S. 50

PT. #	HORIZ. DIST.	SLOPE DIST.	VERT. DIFF.	ZENITH $\angle$	DESCRIPTION
440	2828.27'	2828.28'	-6.36	90°04'17"	G.B.
441	2874.48'	2874.48'	-7.31	90°05'21"	G.B.

ELEV.

1374.69

1373.74

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JOB No. 10310 BOOK No. 1

"JACKRABBIT WASH"  
 VERTICAL CONTROL FOR  
 AERIAL MAPPING

CLIENT M.C.F.C.D.

JULY 31 1990  
 SUNNY, HOT 100-110°S

J. DAVIS  
 S. PERHAM  
 R. DUDLEY  
 B. MEGGITT

EQUIP: WILD NARLEVEL  
 25' PHILLY ROD

BENCH		CIRCUIT # 1		ELEV.
STA	+	HI	-	
BM #25				1726.074
	2.17	28.24		
			-2.91	
S.S.				1725.33
			3.73	
S.S.				1724.51
			8.13	
tp 1				1720.11
	2.42	22.53		
			11.19	
tp 2				1711.34
	2.12	13.46		
			10.86	
tp 3				1702.60
	7.41	10.01		
			3.82	
tp 4				1706.19
	5.15	11.34		
			5.87	
tp 5				1705.47
	5.68	11.15		
			0.245	
tp 6				1710.905
	11.975	22.88		
			4.175	
tp 7.				1718.705

10.54 A.M.

## DESCRIPTION

TOP OF ALUM. CAP IN CONCRETE MONUMENT  
 STAMPED 25 WLS 1957 1726 BENCH MARK, LOC 2

GRD. SHOT @ B.M.

TOP OF 3/4" REBAR <sup>1</sup>/<sub>2</sub> REFERENCE ELEV. PT.

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK





STA	+	HI	-	ELEV.
tp 23				1716.26
	6.115	22.375		
			3.71	
tp 24	"PANEL"			1718.665
	3.68	22.345		
			6.81	
tp 25				1715.535
	2.57	18.105		
			5.22	
tp 26				1712.885
	3.12	16.005		
			6.60	
tp 27				1709.405
	3.21	12.615		
			7.07	
tp 28				1705.545
	3.84	09.385		
			8.155	
tp 29				1701.23
	3.78	05.01		
			5.59	
SS.				1699.42
			-4.43	
tp 30	PANEL			1700.58

DESCRIPTION	5
ROCK	
TOP OF SPIKE NAIL FOR PANEL	
LOC 70' E W.-NW OF CROSSROADS IN	
SEC. 17 T.4 N. R.6 W.	
ROCK	
ORD SHOT	
	$\frac{2}{9}$ $\frac{12}{16}$
TOP OF FO. BRASS CAP (GLO)	
$\frac{5.0}{17}$ 19/6 T. 4 W. R. 6 W.	
	$\frac{17}{16}$



STA	+	HI	-	ELEV.
tp 38				1665.265
	5.09	70.355		
			5.515	
tp 39				1664.84
	4.125	68.965		
			1.365	
tp 40				1667.60
	7.045	74.695		
			5.27	1
tp 41				1669.375
	2.46	71.835		
			14.25	
tp 42				1657.585
	4.405	61.99		
			7.365	
tp 43				1654.625
	5.15	59.775		
			5.40	
tp 44	" <del>PANEL</del> "			1654.375
	2.53	56.905		
			5.47	
S.S.	GRD			7651.435
			-3.93	
tp 45	"BRASS CAP"			1652.975
	"PANEL?"			

DESCRIPTION

7

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

TO  
TOP OF SET 3/4" IRON PIPE, SET FOR  
PANEL, NEAR APPROX LOC. OF  
NOTE: FD. GLO B.C. AFTER SET 3/4" I.P.

TOP OF FD. GLO BRASS CAP  
39 / 310 1916 T. & N., R. & W.  
516 / 515

STA	+	HI	-	ELEV.
tp 45	3.38	56.355		1652.975
			7.39	
tp 46	5.28	54.245		1648.965
			5.465	
tp 47	11.37	60.15		1648.78
			7.475	
tp 48	11.415	64.09		1652.675
			9.59	
tp 49	3.67	58.17		1654.50
			3.265	
tp 50	5.13	60.035		1654.905
			7.615	
tp 51	1.135	53.555		1652.42
			5.335	
tp 52	8.15	56.37		1648.22
			3.435	
B.M. #27				1652.935 (I)
				1652.905 (R)
				CLOSURE 0.03 HIGH

DESCRIPTION

SEE PG NO. 7
ROCK
NAIL
HASSAYAMPA, 28.0 MI. N. OF; 40 FT. W. OF CENTER OF RD.; BY WITNESS POST; IN CONCRETE POST; STANDARD TABLET STAMPED "27 WLS 1957 1653"

## BENCH CIRCUIT # 2

STA	+	#1	-	ELEV.
tp # 24 (B.C. #1)	Pg # 5 8.105			1718.465
			2.865	
tp 1	5.33	29.235		1723.905
			2.795	
tp 2	6.885	33.325		1726.44
			0.86	
tp 3	16.20	48.665		1732.465
			0.425	
tp 4	15.325	63.565		1748.24
			0.79	
tp 5	17.95	80.725		1762.775
			0.165	
tp 6	16.53	97.09		1780.56
			3.165	
tp 7	"PANEL"			1793.925
	0.77	94.695		
			19.495	
tp 8				1775.20

## DESCRIPTION

9

TOP OF SPIKE NAIL FOR PANEL, LOC. 10' W-NW OF CROSSROADS IN SEC. 17, N. END

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

TOP OF SPIKE NAIL SET FOR HORIZ. & VERTICAL MAPPING (ATOP HILL)

ROCK

STA	+	HI	-	ELEV.
tp 8				1775.20
	0.97	76.17		
			19.51	
tp 9				1756.66
	1.005	57.665		
			19.14	
tp 10				1738.525
	0.63	39.155		
			11.365	
tp 11				1727.79
	4.54	32.33		
			7.995	
tp 12				1724.335
	3.09	27.425		
			8.77	
tp 13				1718.655
	5.315	23.97		
			5.275	
tp 24	"PANEL"			1718.695
				1718.665
			CLOSURE = 0.03 HIGH	

DESCRIPTION

10

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

SEE PG NO. 9

## BENCH CIRCUIT # 3

STA	+	HI	-	ELEV.
BM # 30				B.C. = 1532.909
	8.01	40.42		GRD = 1531.99
			4.355	
tp 1				1536.065 RYK
	6.675	42.74		
			3.21	
tp 2				1539.53
	7.89	47.42		
			4.98	
tp 3				1542.44
	6.82	49.26		
			3.76	
tp 4				1545.50
	8.47	53.97		
			4.665	
tp 5				1549.305
	7.415	56.72		
			4.325	
tp 6				1552.395
	7.725	60.12		
S.S.			6.53	
				1553.59
tp 7 "PANEL"			5.89	
				1554.23

## DESCRIPTION

11

HASSAYAMPA, 24.7 mi. N. OF; 0.1 mi. NE  
OF JACKRABBIT WASH; 43 FT. E. OF CENTER  
OF BEND OF RD; AT WITNESS POST; IN CONCRETE  
POST; A STANDARD TABLET STAMPED "30 WLS 1957  
1532"

ROCK

ROCK

ROCK

ROCK

ROCK

GRD SHOT @ B.C.

TOP OF GLO BRASS CAP; TAN., R. 6W  
23 24  
20 25 1916

STA	+	HI	-	ELEV.
tp 7	"PANEL"			1554.23
	5.595	98.25		
			3.175	
tp 8				1556.65
	8.97	65.62		
			4.49	
tp 9				1561.13
	6.87	68.00		
			3.50	
tp 10				1564.50
	7.81	72.31		
			0.755	
tp 11				1571.555
	5.64	77.195		
			6.385	
tp 12				1570.81
	7.495	78.305		
			-3.47	
S.S. <sup>+</sup>				1574.835
			2.98	
BM # 29				1575.325
				1575.309
			CLOSURE:	0.015 <sup>H/6H</sup>

DESCRIPTION	12
SEE PG NO. 11	
ROCK	
GRID SHOT @ B.M. ↓	
HASSAYAMPA; 25.85 mi. N. OF; 40 FT. SW. OF CENTER OF RD.; AT WITNESS POST; IN CONCRETE POST; A STANDARD TABLET STAMPED "29 WLS 1957 1575"	

BENCH CIRCUIT #4

STA	+	HI	-	ELEV.
B.M. #31				1513.418 <sup>42</sup>
	4.61	18.03		
			4.15	
tp 1				1513.88
	5.845	19.725		
			2.93	
tp 2				1516.795
	7.73	24.525		
			3.355	
tp 3				1521.17
	6.085	27.255		
			4.26	
tp 4				1522.995
	7.085	30.08		
			3.28	
tp 5				1526.80
	7.57	34.37		
			4.91	
tp 6				1529.46
	5.27	34.73		
			9.28	
S.S.				1525.45
			8.165	
tp 7	PANEL			1526.565

DESCRIPTION

13

HASSAYAMPA, 23.8 MI. N. OF; 39 FT. W. OF  
 CENTER OF RD. AT WITNESS POST; IN CONCRETE  
 A STANDARD TABLET STAMPED "31 WLS 1957 1513"  
 ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

GRN SHOT @ B.C.



TOP OF GLO BRASS CAP T.4N. R.6W

<sup>26 25</sup>  
 3534 1916





STA	+	HI	-	ELFV.
tp 24				1571.47
	7.04	78.51		
			4.28	
tp 25				1574.23
	5.27	79.50		
			3.565	
tp 26				1575.935
	6.06	81.995		
			4.91	
tp 27				1577.085
	6.55	83.635		
			5.185	
tp 28	"PANEL"			1578.45
	5.985	84.435		(RUNNING CIRCUIT E) (ALONG N. LN. SECT. 26)
			7.79	
tp 29				1576.645
	1.80	78.445		
			11.49	
tp 30				1566.955
	5.98	72.935		
			1.78	
tp 31				1571.155
	10.145	81.30		
			3.82	
tp 32				1577.48

DESCRIPTION

16

ROCK

ROCK

ROCK

NAIL

ODOMETER  
24.30

TOP OF SET 1/2" I.P. FOR PANEL, LOC  
APPROX 110'± S-SE OF GLO B.C.

22/23  
27/26  
T. # N., R 6 W

ROCK

ROCK

ROCK

Rock

STA	+	HI	-	ELEV.
tp 32				1577.48
	4.49	81.97		
			3.85	
tp 33				1578.12
	7.14	85.26		
			9.15	
tp 34				1576.11
	3.79	79.90		
			7.51	
tp 35				1572.39
	2.22	74.61		
			1.22	
tp 36				1573.39
	1.89	75.28		
			14.39	
tp 37				1560.89
	7.44	68.33		
			12.50	
tp 38				1555.83
	3.60	59.43		
			5.82	
tp 39				1553.61
	2.05	55.66		
			5.345	
tp 40				1550.315

DESCRIPTION	17
ROCK	
ROCK	
ROCK	
TOP OF FD. GLO BRASS CAP $\frac{1}{4}$ $\frac{23}{26}$	
T. 4 IN., R. 6 W	
ROCK	

STA	+	H1	-	FLEV.
tp 40				1550.315
	14.88	65.195		
			8.645	
tp 41				1556.55
	3.52	60.07		
	✓ PG NO. 11		-5.805	
tp #7	G.L.O.	BRASS CAP		1554.265
				1554.23
			CLOSURE:	0.035 HIGH

DESCRIPTION	18
ROCK	
ROCK	
TOP OF GLO BRASS CAP; T. AN., R6W	
<sup>23</sup> / <sub>26</sub> <sup>24</sup> / <sub>25</sub> 1916 (SEE PG NO. 11)	

BENCH CIRCUIT # 5				
STA	+	HI	-	ELEV.
Bm # 28				1618.581
	2.95	21.53	(NOTES CIRCUIT RUNNING SOUTH TO SW. COR. OF S. 14)	
			6.84	
tp 1				1614.69
	5.36	20.05		
			7.16	
tp 2				1612.89
	3.65	16.54		
			8.95	
tp 3				1607.59
			- 7.70	
tp 4				1608.84
	2.81	11.65	(CIRCUIT RUNNING WEST)	
			10.89	
tp 5				1600.76
	4.93	05.69		
			4.92	
tp 6				1600.77
	10.17	10.94		
			4.505	
tp 7				1606.435
	15.795	22.23		
			3.21	
tp 8				1619.02

DESCRIPTION	19
HASSAYAMPA, 27.0 MI. N. OF; 42 FT E. OF CENTER OF RD.; AT WITNESS POST IN CONCRETE POST; A STANDARD TABLET STAMPED "28 WLS 1957 1619"	
ROCK	
ROCK	
GRD SHOT @ BRASS CAP ↴	
TOP OF FO GLD BRASS CAP T. 4 N., R. 6 W	
15/14 22/23 1916	
ROCK	
ROCK	
ROCK	
ROCK	

STA	+	#1	-	ELEV.
tp 8				1619.02
	6.19	25.21		
			4.245	
tp 9				1620.965
	3.16	24.125		
			7.865	
tp 10				1616.26
	8.375	24.635		
			4.77	
tp 11				1619.865
	3.435	23.30		
			12.05	
tp 12				1611.25
	15.005	26.255		
			3.325	
tp 13				1622.93
	5.565	28.495		
			5.425	
tp 14				1623.07
	7.10	30.17		
			2.88	
tp 15				1627.29
	7.03	34.32		
			2.61	
tp 16				1631.71

## DESCRIPTION

20

ROCK

ROCK

ROCK

1.0' ± ADV. ERR.  
 TOP OF FOL. GLO BRASS CAP  
 T.A.H., R.6W 1/4 5.15  
 5.22 1916

ROCK

ROCK

ROCK

ROCK

ROCK

STA	+	HI	-	ELEV
tp 16				1631.71
	6.75	38.46		
			4.645	
tp 17				1633.815
	8.38	42.195		
			5.61	
S.S.				1636.585
			4.28	
tp 18 "PANEL"				1637.915
	4.29	42.205		
			7.77	
tp 19				1634.435
	4.045	38.48		
			7.46	
tp 20				1631.02
	3.525	34.545		
			7.25	
tp 21				1627.295
	4.105	31.40		
			7.595	
tp 22				1623.805
	3.88	27.685		
			7.425	
tp 23				1620.26
	7.30	27.56		
			10.925	
tp 24				1616.635

DESCRIPTION	21
ROCK	
ROCK	
GRD SHOT @ B.C. 7	
TOP OF Fd. GLO. BRASS CAP, T. 4 IN	
R. 6 W $\frac{16}{21} \frac{15}{22}$ 1916	
ROCK	
ROCK	
ROCK 2 <sup>ND</sup> TIME ON TP #15	
ROCK	
ROCK	
ROCK	

STA	+	HI	-	FIFV.	DESCRIPTION
tp 24				1616.635	Rock
	7.875	24.51			
			9.13		
tp 25				1615.39	Rock
	8.92	24.30			
			4.41		
tp 26				1619.89	TOP OF GLO B.C. 1/4 <sup>3.15</sup> 3.22 1916
	5.36	25.25			Pb #20 tp #11 = 1619.865
			9.38		
tp 27				1615.87	Rock
	10.02	25.89			
			6.11		
tp 28				1619.78	Rock
	4.70	24.48			
			5.76		
tp 29				1618.72	Rock
	4.135	25.255			
			17.08		
tp 30				1605.775	Rock
	5.36	11.135			
			9.90		
tp 31				1601.235	Rock
	5.585	06.82			
			6.35		
tp 32				1600.47	Rock

STA	+	H1	-	...
tp 32				1600.47
	11.445	11.915		
			3.06	
tp 33 = (tp #4 pg #19)				1608.855
	7.83	16.685		1608.85
			4.54	
tp 34				1612.145
	6.975	19.12		
			4.555	
tp 35				1614.565
	8.075	22.64		
			4.045	
Bm #28				1618.595
				1618.581
				CLOSURE: 0.014 HIGH

DESCRIPTION	23
ROCK	
TOP OF GLO B.C. T. 4N, R. 6W	$\frac{1514}{2223}$
1916	
ROCK	
ROCK	
SEE PG NO. 19 FOR DETAIL ON BM	

BENCH CIRCUIT #6				
STA	+	HI	-	ELEVATION
B.M. #34				1401.006
	5.16	1406.166		
TP. 1			4.42	1401.746 ROCK
	7.25	1408.996		
TP. 2			1.865	1407.131 ROCK
	6.10	1413.231		
TP. 3			3.365	1409.866 ROCK
	5.59	1415.456		
TP. 4			5.91	1409.546
	6.57	1416.116		
TP. 5			2.175	1413.941
	5.60	1419.541		
TP. 6			3.68	1415.861
	4.565	1420.426		
TP. 7			6.35	1414.076
	4.905	1418.981		
B.M. "A"			8.21	1410.771
	4.83	1415.601		
TP. "A"			4.45	1411.151
	7.06	1418.211		
TP. 8			4.74	1413.471
	4.30	1417.771		
TP. 9			5.685	1412.086
	4.825	1416.911		
TP. 10			8.425	1408.486

DESCRIPTION		24
HASSAYAMPA, 20.6 MI. N. OF; 4947 S.W. OF CENTER OF CATTLE GUARD; 18 FT. S. OF FENCE; @ WITNESS POST; IN CONC. POST.; @ STANDARD TABLET STAMPED "3A WLS 1957 1401"		
ROCK	N 90° E 135.55'	
ROCK		
ROCK		
STUMP ON N. SIDE WASH		
TOP G.L.O. B.C. T3N R6W R5W 312   57 513   518 1915		
VERT PANEL N 90° E 135.55' FROM B.C. DESCRIBED ABOVE. [CHANGED 8/22/90]		
ROCK		
ROCK		
ROCK		



STA. PANEL C	+ B.S.	H.I	- F.S.	ELEV. 1395.491
	6.81	1402.301		
TP. 19			3.51	1398.791
	5.73	1404.521		
TP. 20			4.23	1400.291
	3.22	1403.511		
TP. 21			.49	1403.021
	6.92	1409.941		
TP. 22			5.645	1404.296
	6.77	1411.066		
TP. 23			5.28	1405.786
	5.925	1411.711		
B.M. 'D'			1.80	1409.911
	4.605	1414.516		
TP. 24			10.60	1403.916
	7.63	1411.546		
TP. 25			3.76	1407.786
	12.675	1420.461		
TP. 26			8.03	1412.431
	7.92	1420.351		
TP. 27			2.40	1417.951
	7.03	1424.981		
TP. 28			3.23	1421.751
	6.005	1427.756		

DESCRIPTION
ROCK
TOP G.L.O. BC. $\frac{1}{4}$ 1915
ROCK
ROCK
ROCK
ROCK

STA.	+	H.I.	-	F.S.	ELEV.
		1427.756			
TP. 29			4.08		1423.676
PANEL	5.91	1429.586			
"E"			TP. 3.715		1425.871
			4.98		1424.606
BM #33					1442.069
	8.255	1450.324			
TP. 30			1.67		1448.654 ROCK
	8.315	1456.969			
TP. 31			3.975		1452.994 ROCK
	7.17	1460.164			
TP. 32			8.075		1452.089
	5.315	1457.404			
T.P. 33			3.31		1454.094
	8.89	1462.984			
BM "F"			TP. 2.60		1460.384
			3.73		1459.254
			5.20		1457.784
	3.53	1463.914			
TP. 34			7.555		1456.359
	2.16	1459.119			
TP. 35			5.19		1453.929
	5.47	1459.399			
TP. 36			8.07		1451.329

## DESCRIPTION

ROCK

TOP G.L.O. B.C.

GROUND

13N	150N
36	55
<hr/>	
57	58
1915	

HASSAYANIPA 21.9 mi. N. of ; 100 yds. N.  
OF CROSSING of a LARGE WAS ; 34 FT. W.  
OF CENTER OF ROAD ; @ WITNESS POST ;  
INCORP. POST ; A STANDARD TABLE STAMPED  
"33 WLS 1957 1442"

TOP G.L.O. B.C.

TOP OF MOUND

GROUND @ PANEL

ROCK

ROCK

ROCK

9161

215

15

TURNED SOUTH

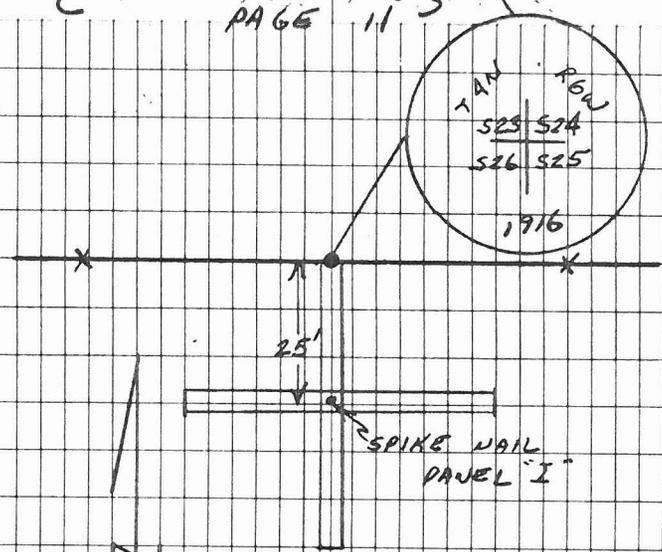


STA.	+ B.S.	H. I.	- F.S.	ELEV.
TP. 46				1424.619
	9.99	1434.609		
TP. 47			7.27	1427.339
	5.625	1432.964		
TP. 48			5.91	1427.054
	3.32	1430.374		
TP. 49			4.60	1425.774
	5.77	1431.544		
PANEL E			5.73	1425.814
				1425.871
				<u>.057</u> ✓
{ END BENCH CIRCUIT #6 }				
Gm. "F"				1460.384
	2.63	1463.014		
PANEL F			5.24	1457.774

DESCRIPTION	29
ROCK	
ROCK	
ROCK	
TOP G.L.O. B.C. DESCRIBED ON PAGE 27	
TOP G.L.O. B.C. TURNED SOUTH	
HORZ. QUERT PANEL 9.19' EAST OF N 1/4 SEC. 12 (REF. PAGE 27)	

DESCRIPTION		ELEV.	FOR.	PANEL
STA.	B.S.	H.I.	F.S.	ELEV.
TP. 7				1554.23
	3.94	1558.17		
PANEL "I"		5.24	1552.93	VERT PANEL

"I" { REF. PAGE 18 } 30  
PAGE 11



{ BENCH CIRCUIT # 7 }

STA.	B.S.	H.I.	F.S.	ELEV.
B.M. 30				1532.409
	7.325	1539.734		
TP. 1			4.09	1535.644
	6.52	1542.164		
TP. 2			4.45	1537.714
	6.63	1544.344		
TP. 3			7.65	1536.694
	4.01	1540.704		
TP. 4			6.17	1534.534
	3.56	1538.094		
TP. 5			7.80	1530.294
	4.33	1534.624		
TP. 6			7.935	1526.689
	3.63	1530.319		
TP. 7			8.00	1522.319
	5.33	1527.649		
TP. 8			7.90	1519.749
	4.13	1523.879		
TP. 9			7.81	1516.069

31

DESCRIPTION  
 HASSAYANPA, 24.7 mi. N. of O. 1 mi. N.E. of  
 a large wash; 48 ft. E. OF CENTER OF  
 BEND OF RD; @ WITNESS POST IN CONC. POST;  
 A STAN DARD TABLET STAMPED "30 WLS 1957  
 1532"

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

{ BENCH CIRCUIT #7 CONT. }

STA.	B.S.	H.I.	I.S.	ELEV.
TP. 9				1516.069
	3.86	1519.929		
TP. 10			6.99	1512.939
	4.04	1516.979		
TP. 11			7.59	1509.389
	4.33	1513.719		
TP. 12			6.75	1506.969
	4.48	1511.449		
PANEL "S"			8.13	1503.319
B.M. "S"		T.P.	6.90	1504.549
	4.39	1508.939		
TP. 13			6.61	1502.329
	3.82	1506.149		
TP. 14			7.28	1498.869
	4.15	1503.019		
TP. 15			6.96	1496.059
	3.26	1499.319		
TP. 16			7.50	1491.819
	3.43	1495.249		
TP. 17			4.59	1490.659
	3.75	1494.409		
TP. 18			6.57	1487.839
	3.14	1490.979		
TP. 19			7.53	1483.449

DESCRIPTION

ROCK

ROCK

ROCK

VERT. PANEL @ B.C. DESCRIBED BELOW  
TOP G.L.O. B.C.

TAN	
R6W	R5W
525	530
536	531
1916	

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

STA.	{ BENCH CIRCUIT # 7			ELEV.
	B.S.	H.I.	F.S.	
TP. 19				1483.449
	3.70	1487.149		
TP. 20			7.33	1479.819
	5.45	1485.269		
TP. 21			4.67	1480.599
	2.64	1483.239		
TP. 22			8.52	1474.719
	2.53	1477.249		
TP. 23			5.95	1471.299
	3.55	1474.849		
TP. 24			6.79	1468.059
	6.29	1474.349		
TBM. 25			5.77	1468.579
	2.49	1471.069		
BM. "K"			8.12	1462.949
	7.90	1470.849		
TP. 26			3.61	1467.239
	4.24	1471.479		
TP. 27			15.70	1455.779
	15.95	1471.729		
TP. 28			1.85	1469.879
	6.91	1476.789		
TP. 29			12.84	1463.949

## DESCRIPTION

ROCK

TOP ALUM CAP ON  $\frac{1}{8}$ " REBAR WA-96  
1970

ROCK

ROCK

ROCK

TOP SPIKE NAIL ON SEC. LINE  
BETWEEN SEC. 31 & SEC. 6TOP G.L.O. BC.  $\frac{1}{4}$   $\frac{5}{16}$   
4 5 6  
1915

ROCK

ROCK

ROCK

ROCK

BENCH CIRCUIT #7 CONT. 3				
STA.	B.S.	H.I.	I.S.	ELBU.
TP. 29				1463.949
	4.16	1468.109		
TP. 30			5.975	1462.134
	9.91	1472.044		
TP. 31			2.475	1469.569
	6.82	1476.389		
PANEL "L"			8.01	1468.379
B.M. "L"		TP.	6.94	1469.449
	10.15	1479.599		
TP. 32			7.17	1472.429
	11.92	1484.349		
TP. 33			3.06	1481.289
	4.75	1486.039		
TP. 34			5.80	1480.239
	8.07	1488.309		
TP. 35			4.64	1483.669
	7.85	1491.519		
TP. 36			4.675	1486.844
	6.47	1493.314		
TP. 37			4.26	1489.054
	6.655	1495.709		
B.M. "M"			3.70	1492.009
	5.035	1497.044		
TP. 38			8.83	1488.214

DESCRIPTION	
ROCK	
ROCK	
GROUND @ PANEL "L" ON B.C.	DESCRIBED BELOW
TOP G.L.O. B.C.	TAN
	R6W   R5W
ROCK	536   531
	51   56
ROCK	T 3 N
	1915
ROCK	
TOP G.L.O. B.C.	$\frac{536}{51}$ 1916
ROCK	

Σ BENCH CIRCUIT #7 CONT. }				
STA.	B.S.	H.I.	F.S.	ELEV.
TP. 38				1488.214
	10.37	1498.584		
TP. 39			4.77	1493.814
	3.82	1497.634		
TP. 40			6.69	1490.944
	5.35	1496.294		
TP. 41			5.92	1490.374
	2.45	1492.824		
TP. 42			7.37	1485.454
	5.44	1490.894		
TP. 43			7.67	1483.224
	4.18	1487.404		
B.M. 32			3.82	1483.584
				1483.542
				.042 ✓
Σ END BENCH CIRCUIT #7 }				

DESCRIPTION
ROCK
HASSAYAMPA 22.9 mi. N. OF; 50 FT. W. OF CENTER OF ROAD ; @ WITNESS POST ; IN CONC. POST. ; A STANDARD TABLET STAMPED " 32 WLS 1957 1A84

{ BENCH CIRCUIT #8 }				
BM. "A"				1410.771
	6.21	1416.981		
PANEL "A"			7.75	1409.231
	9.105	1418.336		
TP. 1			1.47	1416.866
	10.41	1427.276		
TP. 2			7.66	1419.616
	5.31	1424.926		
TP. 3			2.53	1422.396
	7.40	1429.796		
TP. 4			3.95	1425.846
	7.11	1432.956		
TP. 5			4.88	1428.076
	5.73	1433.806		
BM. "N"			3.22	1430.586
	6.86	1437.446		
PANEL "N"			5.33	1432.116
	2.96	1435.076		
TP. 6			7.26	1427.816
	5.59	1433.406		
TP. 7			5.87	1427.536
	3.96	1431.496		
TP. 8			7.03	1424.466
	3.61	1428.076		
TP. 9			7.87	1420.206
STA.	B.S.	H.I.	F.S.	ELEV.

DESCRIPTION		36
TOP G.L.O. B.C.	$\frac{512}{513} \frac{57}{518}$	{ REF. PAGE 24 }
VERT PANEL 25' EAST OF B.C. ABOVE		
ROCK		
TOP G.L.O. B.C.	$\frac{4}{512} \frac{57}{518}$ (TURNED N.W.)	
VERT PANEL 25' EAST OF B.C. ABOVE	1915	
ROCK		
ROCK		
ROCK		

{ BENCH CIRCUIT #8 CONT. }

STA.	B.S.	H.I.	F.S.	ELEV.
TP. 9				1420.206
	4.41	1424.616		
TP. 10			2.205	1422.411
	2.64	1425.051		
TP. 11			10.60	1414.451
	3.79	1418.241		
BM. "A"			7.46	1410.781
				1410.771
				.01 ✓

{ END BENCH CIRCUIT #8 }

DESCRIPTION

ROCK

ROCK

{ SAME AS PAGE 36 }



{ BENCH CIRCUIT #9 CONT. }

STA.	B.S.	H.I.	F.S.	ELEV.
TP. 10				1454.289
	5.10	1459.389		
TP. 11			10.03	1449.359
	2.60	1451.959		
TP. 12			2.48	1449.479
	12.04	1461.519		
TP. 13			8.07	1453.449
	4.09	1457.539		
TP. 14			4.63	1452.909
	2.73	1455.639		
TP. 15			9.04	1446.599
	9.27	1455.869		
TP. 16			0.61	1455.259
	9.23	1464.489		
PANEL "P"			3.10	1461.389
	2.33	1463.719		
TP. 17			9.135	1454.584
	2.81	1457.394		
TP. 18			6.83	1450.564
	4.54	1455.104		
TP. 19			6.37	1448.734
	4.66	1453.394		
TP. 20			6.485	1446.909

## DESCRIPTION

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

TOP B.C. @ TRANS STA. 1947 LOC.  
S. OF POWER LINE

ROCK

ROCK



STA.	BENCH CIRCUIT #9 CONT.			ELEV.
	B.S.	H.I.	F.S.	
TP. 26				1423.319
	8.37	1431.689		
TP. 27			7.04	1424.649
	3.75	1428.399		
TP. 28			17.62	1410.779
	7.76	1418.539		
TP. 29			7.865	1410.674
	4.26	1414.934		
TP. 30			.80	1414.134
	9.33	1423.464		
TP. 31			8.43	1415.034
	5.03	1420.064		
BM. "S"			11.18	1408.884
PANEL "S"		T.P.	7.89	1412.174
	7.14	1419.314		
TP. 32			6.05	1413.264
	3.82	1417.084		
TP. 33			5.72	1411.364
	4.20	1415.564		
TP. 34			8.02	1407.544
	4.12	1411.664		
TP. 35			7.17	1404.494

DESCRIPTION
ROCK
TOP G.L.O. B.C. $\frac{1}{4}$
55 SA
1715
VERT. PANEL 50' SOUTH OF B.C. DESCRIBED
ABOVE
ROCK
ROCK
ROCK
ROCK

BENCH CIRCUIT #9 CONT.				
STA.	B.S.	H.I.	I.S.	ELEV.
TP. 35				1404.494
	3.07	1407.564		
TP. 36			6.95	1400.614
	5.69	1406.304		
TP. 37			5.445	1400.859
	4.255	1405.114		
PANEL "T"			12.63	1392.484
B.M. "T"		TP.	12.02	1393.094

{ BENCH CIRCUIT #9 CONT. }  
 { ON PAGE 61 }

42

DESCRIPTION

ROCK

ROCK

VERT PANEL @ B.C. DESCRIBED BELOW

TOP G.L.O. B.C. 13N R 5W

55 54

58 59

1915

{ BEGIN BENCH CIRCUIT #10 }

STA.	B.S.	H.I.	F.S.	ELEV.
B.M. 35				1374.842
	8.01	1382.852		
TP. 1			5.48	1377.372
	4.15	1381.522		
TP. 2			5.72	1375.802
	5.75	1381.552		
TP. 3			5.71	1375.842
	5.43	1381.272		
TP. 4			5.57	1375.702
	5.43	1381.132		
TP. 5			5.24	1375.892
	5.41	1381.302		
BM F <sub>1</sub>			6.97	1374.332
	7.09	1381.422		
TP. 6			6.00	1375.422
	6.28	1381.702		
TP. 7			5.67	1376.032
	5.44	1381.472		
TP. 8			5.69	1375.782
	5.45	1381.232		
TP. 9			5.48	1375.752

## DESCRIPTION

HASSAYAMPA, 19.7 mi. N. OF, S. OF  
BRIDGE, 39 FT. W. OF E ROAD; @ WITNESS  
POST; IN CONC. POST A STANDARD TABLET  
STAMPED "35 WLS 1959 1375"

ROCK

ROCK

ROCK

ROCK

ROCK

SOUTH OF GAMEFENCE  
TOP 1/2" I.P. ON NORTH SIDE OF C.A.P.  
.43 MILES EAST OF BRIDGE @ WICKENBURG  
ROAD.

ROCK

ROCK

ROCK

{ BENCH CIRCUIT #10 CONT. }

STA.	B.S.	H.I.	F.S.	ELEV.
TP. 9	5.43	1381.182		1375.752
TP. 10	5.75	1381.242	5.69	1375.492
TP. 11	5.51	1381.382	5.37	1375.872
TP. 12	14.55	1390.062	5.87	1375.512
TP. 13	.24	1385.072	5.23	1384.832
PANEL G,	5.66	1382.532	8.20	1376.872
TP. 14	12.94	1390.792	4.68	1377.852 ROCK
TP. 15	2.96	1381.212	12.54	1378.252
TP. 16	5.64	1381.402	5.45	1375.762
TP. 17	5.52	1381.512	5.41	1375.992
TP. 18	5.35	1381.132	5.73	1375.782
TP. 19			5.18	1375.952

## DESCRIPTION

ROCK

ROCK

ROCK

ROCK

TOP SPIKE NAIL FOR VERT PANEL @ BOX  
FLUME OVER CHUTE 1.2 MILES EAST OF  
BRIDGE @ WICKENBURG ROAD.

ROCK

ROCK

ROCK

ROCK

ROCK



{ BEGIN BENCH CIRCUIT #11 }

STA.	B.S.	H.I.	F.S.	ELEV.
B.M. 35				1374.842
	7.17	1382.012		
TP. 1			5.98	1376.032
	5.48	1381.512		
TP. 2			5.48	1376.032
	5.59	1381.622		
TP. 3			5.31	1376.312
	5.41	1381.722		
TP. 4			5.52	1376.202
	5.46	1381.662		
TP. 5			5.71	1375.952
	5.56	1381.512		
TP. 6			5.30	1376.212
	5.33	1381.542		
TP. 7			5.64	1375.902
	5.84	1381.742		
TP. 8			5.73	1376.012
	5.72	1381.732		
TP. 9			5.75	1375.982
	16.07	1392.052		
TP. 10			13.79	1378.262

## DESCRIPTION

HASSAYAMPA, 19.7. MI. N. OF, S. OF  
BRIDGE, 39. FT. W. OF E ROAD; @ WITNESS  
POST; IN CONC. POST A STANDARD TABLET  
STAMPED "35 WLS 1959 1375"

ROCK

## { BENCH CIRCUIT #11 CONT. }

STA.	B.S.	H.I.	F.S.	ELEV.
TP. 10				1378.262
	5.55	1383.812		
PANEL I,			6.32	1377.492
	5.65	1383.142		
TP. 11			3.59	1379.552 ROCK
	12.44	1391.992		
TP. 12			15.61	1376.382
	5.59	1381.972		
TP. 13			5.51	1376.462
	5.56	1382.022		
TP. 14			5.44	1376.582
	5.40	1381.982		
TP. 15			5.59	1376.392
	5.44	1381.832		
TP. 16			5.73	1376.102
	5.81	1381.912		
TP. 17			5.32	1376.592
	5.30	1381.892		
TP. 18			5.29	1376.602
	5.07	1381.672		
IBM. J,			21.67	1360.002
	21.96	1381.962		
TP. 19			5.62	1376.342 ROCK

## DESCRIPTION

TOP OF SPIKE NAIL FOR UERT PANEL @ BOX  
FLUME OVER CHUTE .95 MILES WEST  
OF BRIDGE @ WICKENBURG ROAD.

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

TOP CONC. HEADWALL EAST END AND NORTH  
SIDE OF C.A.P. @ STA. 146+50 PIPE CULVERT

{ BENCH CIRCUIT # 11 CONT. }

48

STA.	B.S.	H.I.	F.S.	ELEV.
TP. 19				1376.342
	5.72	1382.062		
PANEL "W"			8.52	1373.542
	8.79	1382.332		
TP. 20			5.00	1377.332 ROCK
	5.11	1382.442		
TP. 21			5.41	1377.032
	5.50	1382.532		
TP. 22			5.68	1376.852
	5.66	1382.512		
TBM. K,			20.12	1362.392
	20.25	1382.642		
TP. 23			5.29	1377.352
	5.06	1382.412		
TP. 24			5.41	1377.002
	5.55	1382.552		
TBM. L,			21.21	1361.342
	21.01	1382.352		
TP. 24			5.36	1376.992
	5.44	1382.432		
TP. 23			5.07	1377.362
	5.33	1382.692		
TP. 22			5.84	1376.852

DESCRIPTION

HORIZ. CURT PANEL 350' WEST OF  
PIPE CULVERT @ STA. 146+50 ON N. SIDE OF  
C.A.P.

ROCK

ROCK

TOP CONC. HEADWALL EAST END AND NORTH  
SIDE OF C.A.P. @ STA. 121+60 PIPE CULVERT

ROCK

ROCK

TOP CONC. HEADWALL EAST END AND NORTH  
SIDE OF C.A.P. @ STA. 110+00 PIPE CULVERT



## { BENCH CIRCUIT # 11 CONT. }

STA.	B.S.	H.I.	F.S.	ELEV.
TP. 12	15.10	1391.482		1376.382
TP. 11	3.68	1383.222	11.94	1379.542
PANEL I,	6.32	1383.812	5.73	1377.492
TP. 10	13.56	1391.832	5.54	1378.272
TP. 9	5.79	1381.772	15.85	1375.982
TP. 8	5.65	1381.662	5.76	1376.012
TP. 7	5.56	1381.472	5.75	1375.912
TP. 6	5.37	1381.592	5.25	1376.222
TP. 5	5.64	1381.602	5.63	1375.962
TP. 4	5.54	1381.752	5.39	1376.212
TP. 3	5.33	1381.642	5.44	1376.312
TP. 2			5.61	1376.032

DESCRIPTION

## { END BENCH CIRCUIT #11 }

STA.	B.S.	H.I.	F.S.	ELEV.
TP. 2				1376.032
	5.48	1381.512		
TP. 1			5.47	1376.042
	6.05	1382.092		
BM. 35			7.25	1374.842 ✓

## DESCRIPTION

HASSAYAMPA, 19.7 MI. N. OF, S. OF  
 BRIDGE, 39 FT. W. OF E ROAD; @ WITNESS  
 POST; IN CONC. POST A STANDARD TABLET  
 STAMPED "35 WLS 1959 1375"



## { BENCH CIRCUIT #12 CONT. }

STA.	B.S.	H.I.	F.S.	ELEV.
TP. 10	9.32	1473.514		1464.194
TP. 11	2.89	1474.794	1.61	1471.904
TP. 12	5.40	1470.874	9.32	1465.474
PANEL N,	1.41	1468.964	3.32	1467.554
TP. 13	2.21	1460.364	10.81	1458.154
TP. 14	4.69	1454.574	10.48	1449.884
TP. 15	3.95	1450.794	7.73	1446.844
TP. 16	2.28	1447.794	5.28	1445.514
TP. 17	4.66	1447.704	4.75	1443.044
TP. 18	4.68	1444.174	8.21	1439.494
TP. 19	9.95	1446.874	7.25	1436.924
B.M.#33			4.84	1442.034
				1442.069
				.035 ✓

## DESCRIPTION

ROCK

ROCK

TOP SPIKE NAIL FOR NEXT PANEL @ LOC.  
OF W. 1/4 SEC. 12. FD. POST NO B.C.

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

HASSAYAMPA 21.9 mi. N. OF, 34 FT. W.  
OF E ROAD @ WITNESS POST; IN CONC. POST;  
A STANDARD TABLET STAMPED

"33 WLS 1957 1442"

{ BEGIN BENCH CIRCUIT #13 }

STA.	B.S.	H.I.	F.S.	ELEV.
TBM, J.				1360.002
	4.05	1364.052		
TP. 1			3.32	1360.732
	8.05	1368.782		
TP. 2			2.45	1366.332
	7.82	1374.152		
TP. 3			2.85	1371.302
	9.69	1380.992		
TP. A			1.53	1379.462
	7.28	1386.742		
PANEL O <sub>1</sub>			5.38	1381.362
	A.48	1385.842		
TP. 4			6.38	1379.462
	1.78	1381.242		
TP. 3			9.95	1371.292
	2.69	1373.982		
TP. 2			7.66	1366.322
	2.62	1368.942		
TP. 1			8.22	1360.722
	3.99	1364.712		
TBM. J.			A.71	1360.002 ✓

DESCRIPTION	(REF. PAGE 47)
TOP CONC. HEADWALL EAST END AND NORTH SIDE OF C.A.P. @ STA 146+50	PIPE CULVERT
ROCK	
ROCK	
ROCK	
ROCK	
TOP SPIKE NAIL FOR VERT PANEL 1500 ± N. OF C.A.P. & PIPE CULVERT STA 146+50	
TOP CONC. HEADWALL EAST END AND NORTH SIDE OF C.A.P. @ STA 146+50	PIPE CULVERT

{ BENCH CIRCUIT #10 CONT. }				
STA.	B.S.	H.I.	F.S.	ELEV.
PANEL "X"				1368.272
	5.53	1373.802		
TP. 27			10.91	1362.892 ROCK
	1.65	1364.542		
TP. 28			6.34	1358.202
	7.85	1366.052		
TP. 29			5.83	1360.222
	18.70	1378.922		
PANEL P,			6.44	1372.482
	6.61	1379.092		
TP. 30			5.96	1373.132
	5.48	1378.612		
TP. 31			5.32	1373.292
	5.51	1378.802		
TP. 32			5.88	1372.922
	6.17	1379.092		
IBM. Q,			.64	1378.452
	.93	1379.382		
TP. 33			6.33	1373.052
	5.30	1378.352		
IBM. R,			.20	1378.152
	.56	1378.712		
TP. 34			6.00	1372.712

55

DESCRIPTION
SPIKE NAIL FOR HORIZ. & VERT. PANEL "X"
ON SOUTH SIDE OF SIPHON INLET 2.4
MILES EAST OF BRIDGE @ WICKENBURG ROAD
ROCK
ROCK
TOP SPIKE NAIL FOR VERT. PANEL @ SIPHON
OUTLET JACK RABBIT WASH S. SIDE OF C.A.P.
ROCK
ROCK
ROCK
TOP WEST END OF CONC. HEADWALL ON N. SIDE
OF C.A.P. & S. SIDE ROAD STA 393+00 <sup>PIPE</sup> OVERCHUTE
ROCK
TOP WEST END OF CONC. HEADWALL ON N. SIDE
OF C.A.P. & S. SIDE ROAD STA 402+50 <sup>PIPE</sup> OVERCHUTE
ROCK

## { BENCH CIRCUIT #10 CONT. }

STA.	B.S.	H.I.	F.S.	ELEV.
TP. 34				1372.712
	6.08	1378.792		
TP. 35			5.47	1373.322
	5.41	1378.732		
TP. 36			5.65	1373.082
	5.71	1378.792		
PANELS,			4.00	1374.792
	3.68	1378.472		
TP. 37			5.42	1373.052
	5.73	1378.782		
TP. 38			5.42	1373.362
	5.13	1378.492		
TP. 39			5.56	1372.932
	5.44	1378.372		
TP. 40			5.27	1373.102
	5.54	1378.642		
TP. 41			5.46	1373.182
	5.05	1378.232		
TP. 42			5.52	1372.712
	5.57	1378.282		
TP. 43			5.45	1372.832
	7.92	1380.752		
B.M. T <sub>1</sub>			2.63	1378.122

## DESCRIPTION

ROCK

ROCK

TOP SPIKE NAIL FOR NEXT PANEL ON S. SIDE  
OF C.A.P. 1800' EAST OF STA. 402+50

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

U.S. DEPT. OF THE INTERIOR B. C. @ N WEST  
COR. OF BRIDGE WEST OF DOUBLE  
TRANSMISSION LINES.

{ BENCH CIRCUIT #10 CONT. }				
STA.	B.S.	H.I.	F.S.	ELEV.
TBM. T,				1378.122
	3.86	1381.982		
TP. 44			9.31	1372.672
	5.52	1378.192		
TP. 45			5.68	1372.512
	5.50	1378.012		
TP. 46			5.34	1372.672
	5.70	1378.372		
TP. 47			5.75	1372.622
	5.60	1378.222		
TP. 48			5.18	1373.042
	5.06	1378.102		
TP. 49			5.33	1372.772
	11.75	1384.522		
TBM. U,			2.75	1381.772
	7.12	1388.892		
TP. 50			17.18	1371.712 Rock
	6.45	1378.162		
TP. 51			6.68	1371.482
	6.96	1378.442		
TP. 52			5.54	1372.902
	5.66	1378.562		
TP. 53			5.07	1373.492

## DESCRIPTION

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

U.S. DEPT. OF THE INTERIOR B.C. @ TOP  
OF N. WEST COR OF BOX FRAME OVER CHUTE  
@ STA. 485+00

ROCK

NAIL

ROCK

## { BENCH CIRCUIT #10 CONT. }

STA.	B.S.	H.I.	I.S.	ELEV.
TP. 53				1373.492
	4.60	1378.092		
TP. 54			5.37	1372.722
	5.30	1378.022		
TP. 55			5.37	1372.652
	5.21	1377.862		
TP. 56			5.52	1372.342
	5.59	1377.932		
TP. 57			5.45	1372.482
	5.58	1378.062		
TP. 58			5.85	1372.212
	5.63	1377.842		
TP. 59			5.06	1372.782
	5.18	1377.962		
TP. 60			5.40	1372.562
	5.46	1378.022		
TP. 61			5.14	1372.882
	3.19	1376.072		
TP. 61			20.61	1355.462
	15.06	1370.522		
IBM. V <sub>1</sub>			21.82	1348.702
	6.02	1354.722		
TP. 62			.75	1353.972

DESCRIPTION
NAIL
NAIL
NAIL
ROCK
NAIL
NAIL ✓
ROCK
NAIL
ROCK
N. WEST COR. CONC. HEADWALL OVER PIPE CULVERT @ STA. 544+25
ROCK

STA.	BENCH CIRCUIT #10		CONT.	
	B.S.	H.I.	F.S.	ELEV
TP. 62				1353.972
	23.89	1377.862		
TP. 63			5.28	1372.582
	5.29	1377.872		
TP. 64			5.63	1372.242
	2.64	1374.882		
TP. 65			14.41	1360.472
	2.51	1362.982		
TBM W <sub>1</sub>			18.24	1344.742
	14.02	1358.762		
TP. 66			.47	1358.292
	10.26	1368.552		
TP. 67			5.36	1363.192
	1.64	1364.832		
TBM. X <sub>1</sub>			10.80	1354.032
	10.44	1364.472		
TP. 67			1.28	1363.192
	5.14	1368.332		
TP. 68			5.46	1362.872
	14.58	1377.452		
TP. 69			5.31	1372.142
	5.64	1377.782		
TBM. Y <sub>1</sub>			4.20	1373.582
	20.51	1394.092		
PANEL A <sub>1</sub>			.67	1393.422

DESCRIPTION				
NAIL				
NAIL				
ROCK				
N. EAST COR CONC. HEADWALL OVER PIPE CULVERT @ STA. 561+50				
ROCK				
ROCK				
N. WEST COR. CONC. HEADWALL OVER PIPE CULVERT @ STA. 571+50				
ROCK				
ROCK				
TOP OF G.L.O. B.C.				
<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>TAN RSW</td> </tr> <tr> <td>535   536</td> </tr> <tr> <td>52   51 (1915)</td> </tr> <tr> <td>T3N</td> </tr> </table>	TAN RSW	535   536	52   51 (1915)	T3N
TAN RSW				
535   536				
52   51 (1915)				
T3N				

HORZ & VERT PANEL ON HILL ABOVE B.C.  
DESCRIBED ABOVE

STA.	MISL. ELEV. ON PANELS		ELEV
	B.S.	H.I.	
B.M. 32			1483.542
	3.28	1486.822	
PANEL 32			3.79 1483.032
TP. M <sub>1</sub>			1463.944
	4.13	1468.074	
PANEL M <sub>1</sub>			5.36 1462.714
B.M. "A"			1410.771
	4.10	1414.871	
PANEL "A"			5.64 1409.231
B.M. 35			1374.842
	4.36	1379.202	
PANEL 35			5.96 1373.242
B.M. 34			1401.006
	4.07	1405.076	
PANEL 3A			4.73 1400.346

## DESCRIPTION

" 32 WLS 1957 1484

VERT. PANEL 6' SOUTH OF B.M. 32

TOP G.L.O. B.C.	52   51
	54   52

VERT. PANEL 6' SOUTH OF G.L.O. B.C.  
DESCRIBED ABOVE (REF. PAGE 52)

TOP G.L.O. B.C.	52   57
	53   58

VERT. PANEL 25' EAST OF G.L.O. B.C.  
DESCRIBED ABOVE

" 35 WLS 1957 1375"

VERT. PANEL 25' WEST OF STANDARD  
TABLET

" 34 WLS 1957 1401"

VERT. PANEL 25' NORTH OF STANDARD  
TABLET



## { BENCH CIRCUIT #9 CONT. }

STA.	B.S.	H.I.	F.S.	ELEV.
TP. 48				1364.294
	4.24	1368.534		
TP. 49			5.83	1362.704
	3.86	1366.564		
TP. 50			2.02	1364.544
	9.31	1373.854		
PANEL "X"			5.15	1368.404
				<u>1368.272</u>
				+ .132 ✓

{ END BENCH CIRCUIT #9 }

## DESCRIPTION

ROCK

ROCK

SPIKE NAIL FOR HORIZ. & VERT PANEL "X"  
 ON SOUTH SIDE OF SIPHON INLET 2.4  
 MILES EAST OF BRIDGE @ WICKENBURG ROAD

STA.	MISL. ELEV. ON PANELS		ELEV.
	B.S.	H.I. F.S.	
B.M. 33			1442.069
	2.69		1444.759
PANEL 33		3.14	1441.619
B.M. 31			1513.418
	4.78		1518.198
PANEL 31		5.09	1513.108
B.M. 30			1532.409
	5.16		1537.569
PANEL 30		5.57	1531.999
B.M. 29			1575.309
PANEL 29		.48	1574.829
B.M. 28			1618.581
PANEL 28		.72	1617.861

DESCRIPTION
"33 WLS 1957 1442"
VERT. PANEL 6' SOUTH OF STANDARD TABLET
"31 WLS 1957 1513"
VERT. PANEL 25' WEST OF STANDARD TABLET
"30 WLS 1957 1532"
VERT. PANEL 25' SOUTH OF STANDARD TABLET
"29 WLS 1957 1575"
VERT. PANEL @ STANDARD TABLET (GROUND)
"28 WLS 1957 1619"
VERT. PANEL @ STANDARD TABLET (GROUND)

{ MISL. ELEU. ON PANELS }

6A

STA.	B.S.	H.I.	F.S.	ELEV.
BM. 27				1652.905
PANEL 27			.57	1652.335
BM. 26				1681.152
PANEL 26			.50	1680.652
TBM. F <sub>i</sub>				1374.332
	6.74	1381.072		
PANEL 44			5.57	1375.502
TBM. H <sub>i</sub>				1374.152
	6.89	1381.042		
PANEL 95			5.43	1375.612
PANEL "R"				1433.959
	5.39	1439.349		
TBM. "R"			4.81	1434.539

DESCRIPTION												
"27 NLS 1957 1653"												
VERT. PANEL @ STANDARD TABLET (GROUND)												
"26 NLS 1957 1681"												
VERT. PANEL @ STANDARD TABLET (GROUND)												
N.E. LEG 1.7' SHORT												
TOP 1/2" I.P. ON NORTH SIDE OF C.A.P. .43 MILES EAST OF BRIDGE @ WICKENBURG ROAD												
VERT. PANEL @ E OF ROAD ON NORTH SIDE OF C.A.P.												
TOP 1/2" I.P. ON NORTH SIDE OF C.A.P. 1.95 MILES EAST OF BRIDGE @ WICKENBURG RD.												
VERT. PANEL @ E OF ROAD ON NORTH SIDE OF C.A.P.												
VERT. PANEL 25' WEST OF G.L.O. B.C.												
TOP G.L.O. B.C.												
<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>T</td> <td></td> </tr> <tr> <td></td> <td>AN</td> <td>RSW</td> </tr> <tr> <td></td> <td>532</td> <td>533</td> </tr> <tr> <td></td> <td>55</td> <td>5A</td> </tr> </table>		T			AN	RSW		532	533		55	5A
	T											
	AN	RSW										
	532	533										
	55	5A										
<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td>73W</td> </tr> <tr> <td>1915</td> </tr> </table>	73W	1915										
73W												
1915												

{ BEGIN BENCH CIRCUIT \* 14 }

B.M. 36	+	H.I.	-	1334.62
	6.35	1340.97		
TP. 1			4.08	1336.89
	8.32	1345.21		
TP. 2			2.61	1342.60
	6.06	1348.66		
TP. 3			4.22	1344.44
	6.19	1350.63		
PANEL 36			5.14	1345.49
	4.78	1350.27		
TP. 3			5.83	1344.44
	4.25	1348.69		
TP. 2			6.09	1342.60
	2.98	1345.58		
TP. 1			8.69	1336.89
	3.58	1340.47		
B.M. 36			5.85	1334.62 ✓

A STANDARD TABLET STAMPED "36 WLS  
1957 1335"

ROCK

ROCK

ROCK

VERT PANEL @ INTERSECTION OF WICKENBURG  
ROAD AND NORTH SEC. LINE OF SEC. 25

{ SAME AS ABOVE }

BENCH CIRCUIT TO PANEL "Y"				
STA.	B.S.	H.I.	F.S.	ELEV.
TBM. T,				1378.122
	24.79	1402.912		
TP. 1			5.40	1397.512 ROCK
	14.12	1411.632		
PANEL "Y"			3.33	1408.302
				1408.29 (G.P.S.)
MISL. ELEV. ON PANELS				
TP. 5A				1372.722
	5.27	1377.992		
PANEL E <sub>2</sub>			5.39	1372.602
	5.27	1377.872		
TP. 53			4.39	1373.482
				1373.492
				-.01 ✓
TP. 59				1372.782
	9.29	1382.072		
PANEL E <sub>1</sub>			3.89	1378.182
	3.63	1381.812		
TP. 60			9.26	1372.552
				1372.562
				-.01 ✓

66

DESCRIPTION
U.S. DEPT. OF THE INTERIOR B.C. @ N. WEST COR. OF BRIDGE WEST OF DOUBLE TRANS. LINES
HORIZ. VERT. PANEL N. WEST OF BRIDGE DESCRIBED ABOVE PANEL #50
NAIL TP. ON PAGE 58
"ADDITIONAL" PANEL .45 MILES EAST OF BOX FUME OVERMUTE STA. 485+00
ROCK TP. ON PAGE 57 PANEL #57
NAIL TP. ON PAGE 58
12'x12' HORIZ. VERT. PANEL ON N. S.W. OF C.A.P. @ CENTER SEC. 2
ROCK TP. ON PAGE 58 PANEL #51



{ BENCH CIRCUIT #15 CONT. }

STA.	B.S.	H.I.	F.S.	ELEV.
TP. 5				1404.672
	7.19	1411.862		
TP. A			5.27	1406.592
	8.45	1415.042		
TP. 3			9.39	1405.652
	2.23	1407.882		
TP. 2			8.51	1399.372
	.90	1400.272		
TP. 1			16.34	1383.932
	.42	1384.352		
T.M. T.			6.23	1378.122 ✓

{ END BENCH CIRCUIT #15 }

DESCRIPTION

U.S. DEPT. OF THE INTERIOR B.C. @ J. WEST  
COR. OF BRIDGE WEST OF DOUBLE TRANS. LINES.

STA.	B.S.	H.I.	F.S.	ELEV.
TBM. U.				1381.772
	6.19	1387.962		
TP. 1			7.31	1380.652 ROCK
	5.57	1386.222		
TP. 2			8.77	1377.452
	8.60	1386.052		
TP. 3			6.07	1379.982
	10.13	1390.112		
TP. 4			1.64	1388.472
	6.80	1395.272		
TP. 5			7.59	1387.682
	9.90	1397.582		
TP. 6			6.17	1391.412
	11.59	1403.002		
TP. 7			7.71	1395.292
	11.23	1406.522		
TP. 8			8.64	1397.882
	10.65	1408.532		
TBM C <sub>2</sub>			6.29	1402.242
PANEL C <sub>2</sub>			7.24	1401.292 ←
	6.08	1408.322		
TP. 8			10.44	1397.882
	8.56	1406.442		
TP. 7			11.15	1395.292

## DESCRIPTION

U.S. DEPT. OF THE INTERIOR B.C. @ TOP OF  
N. WEST COR. OF BOX FLUME OVERCHUTE @  
STA. 485+00

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

ROCK

TOP B.C. @ COMMON COR. FOR SEC.'S  
34, 35, 3 & 2.

GROUND ON VERT PANEL @ B.C. DESCRIBED ABOVE  
PANEL # 59

{ BENCH CIRCUIT #16 CONT. }

STA.	B.S.	H.I.	F.S.	ELEV.
TP. 7				1395.292
	7.60	1402.892		
TP. 6			11.49	1391.402
	6.13	1397.532		
TP. 5			9.85	1387.682
	7.52	1395.202		
TP. 4			6.73	1388.472
	1.61	1390.082		
TP. 3			10.08	1380.002
	6.01	1386.012		
TP. 2			8.53	1377.482
	8.67	1386.152		
TP. 1			5.47	1380.682
	7.33	1388.012		
TBM. U.			6.22	1381.792
				1381.772
				+0.02 ✓

{ END BENCH CIRCUIT #16 }

DESCRIPTION

U.S. DEPT. OF THE INTERIOR B.C. @ TOP OF  
N. WEST COR. OF BOX FLUME OVERCROFT @  
STA. 485+00.

	MISL.	ELEV.	ON PANELS	
TBM. X <sub>1</sub>				1354.032
	20.37	1374.402		
PANEL D <sub>1</sub>			5.48	1368.922
	5.21	1374.132		
TBM. X <sub>1</sub>			20.10	1354.032 ✓
IP. 28				1578.45
	5.28	1583.73		
TBM. F <sub>2</sub>			5.14	1578.59
	5.36	1583.95		
IP. 28			5.49	1578.46

N. WEST COR. CONC. HEADWALL OVER PIPE  
 CULVERT @ STA. 571+50  
 12' x 12' HORIZ. EVERT PANEL THE LAST PANEL  
 ON EAST END OF C.A.P. BEFORE SIPHON  
 { SAME AS ABOVE } PANEL # 53

TOP OF 1/2" I.P. FOR PANEL LOC. S 20° E  
 115.66' FROM G.L.O. B.C.  $\frac{22}{27} \frac{23}{26}$  PANEL # 13  
 TOP G.L.O. B.C. DESCRIBED ABOVE

{ SAME AS ABOVE }

STA.	B.S. { BEGIN	H.I. BENCH	F.S. CIRCUIT #17 }	ELEV.
BM. 32				1483.542
	4.97	1488.512		
TP. 1			3.69	1484.822
	9.22	1494.042		
TP. 2			5.49	1488.552
	7.03	1495.582		
PANEL 19			3.79	1491.792
				1492.39 (G.P.S.)
	3.58	1495.372		
TP. 2			6.83	1488.542
	5.66	1494.202		
TP. 1			7.39	1484.812
	3.73	1488.542		
BM. 32			5.02	1483.522 ✓
				<u>- .02</u>

DESCRIPTION	72
"32 WLS 1957 1484"	
ROCK	
ROCK	
HORIZ & VERT PANEL 12' X 12' @ N. WEST COR.	
SEC. 1	PANEL # 19
"32 WLS 1957 1484"	

## **SECTION 2: Mapping and Surveying Information**

*2.5 Hydraulic Analysis Maps*

*2.6 FIRM/FHBM Draft Maps*

# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

D.E. SAGRAMOSO, CHIEF ENGINEER AND GENERAL MANAGER

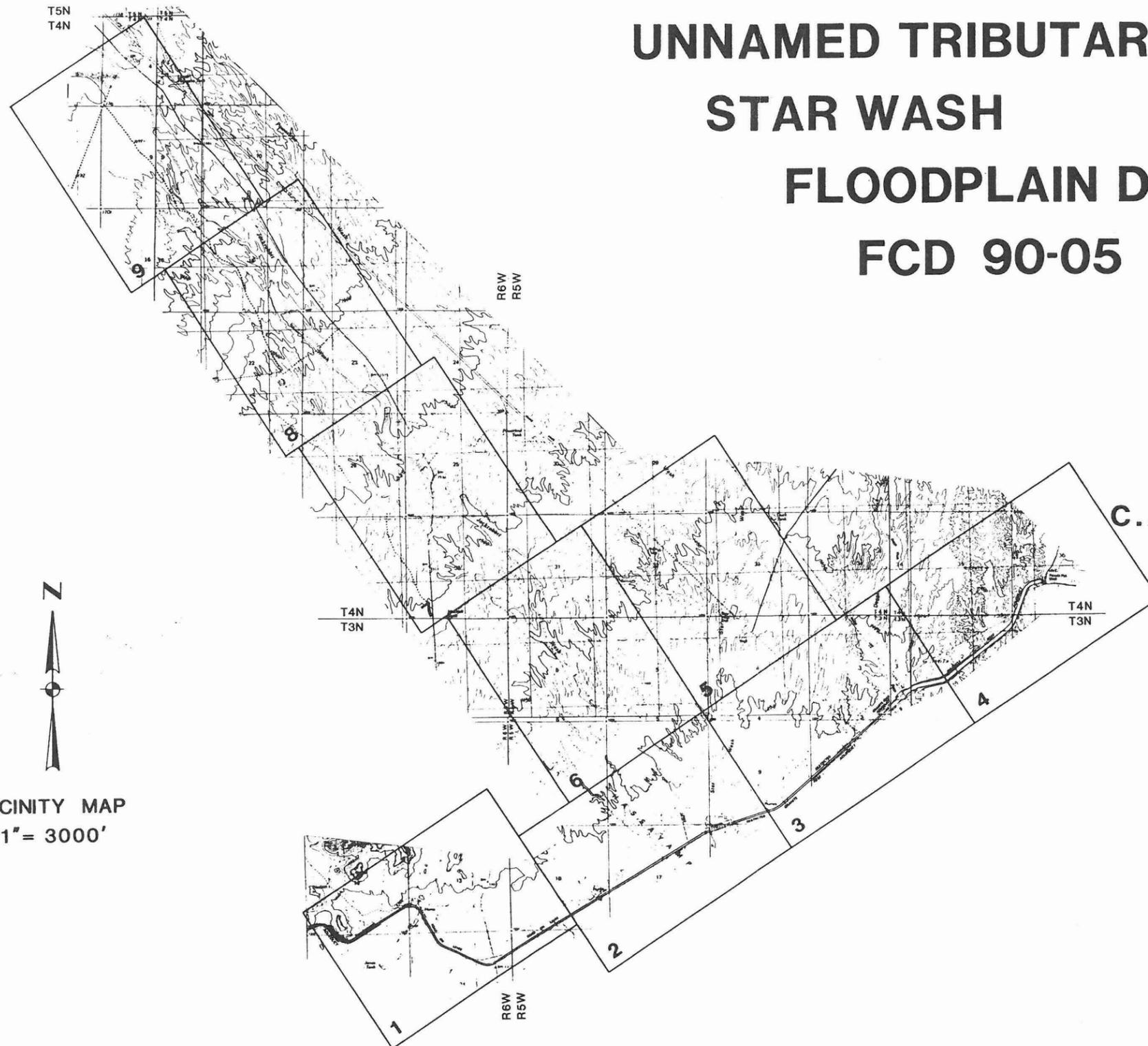
## JACKRABBIT WASH

### UNNAMED TRIBUTARY OF JACKRABBIT WASH

### STAR WASH

### FLOODPLAIN DELINEATION STUDY

### FCD 90-05



C.A.P. CANAL  
TO  
VULTURE MINE ROAD

VICINITY MAP  
1" = 3000'

AERIAL MAPPING CO., INC.  
FLOWN 9-28-90  
STUDY DATE: FEBRUARY 1991



Burgess & Niple, Inc.  
Engineers and Architects



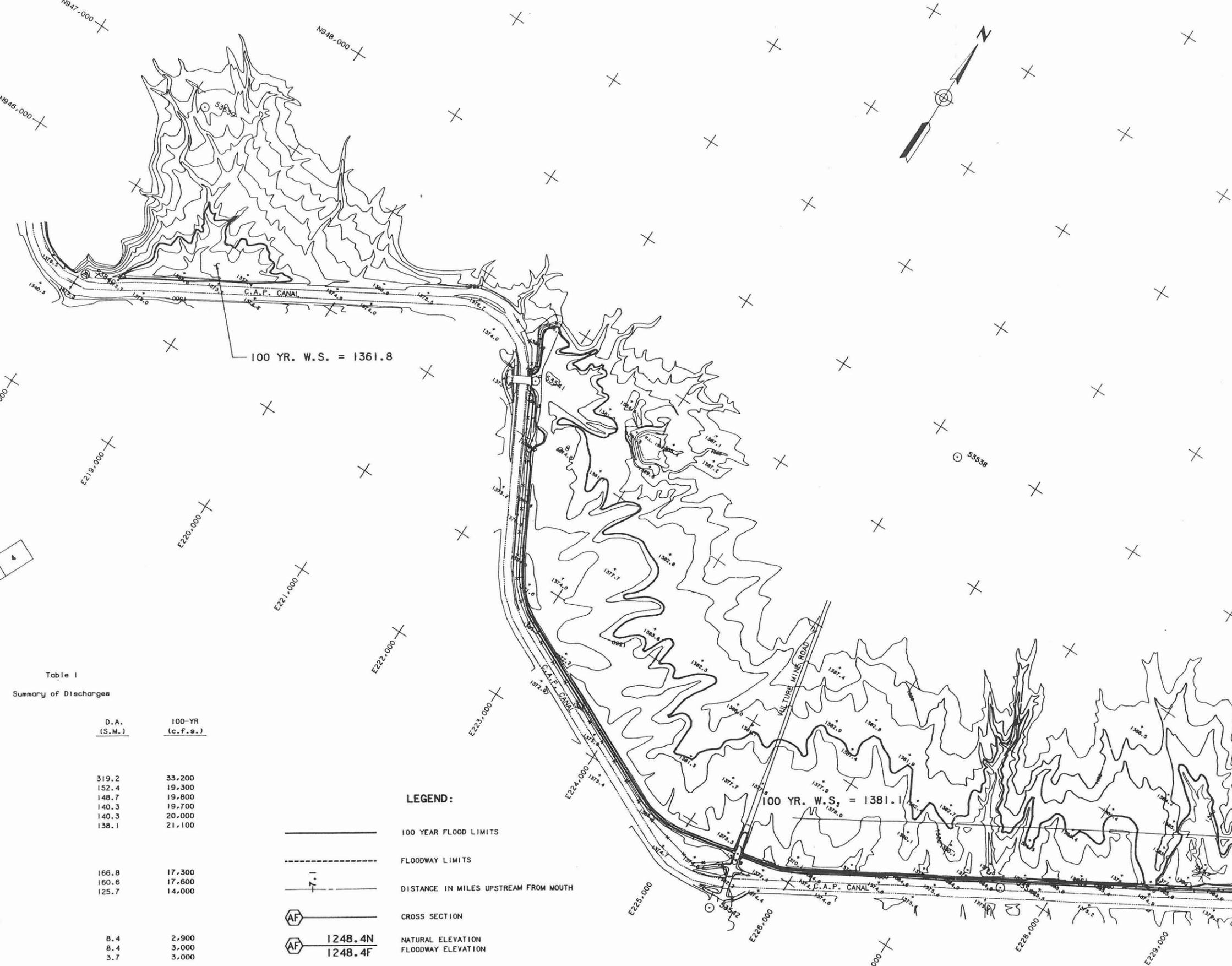
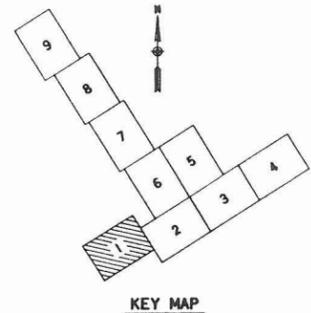


Table I  
Summary of Discharges

Flooding Source and Location	D.A. (S.M.)	100-YR (c.f.s.)
<b>Jackrabbit Wash</b>		
Below Star Wash	319.2	33,200
Above Star Wash	152.4	19,300
Below unnamed tributary	148.7	19,800
Above unnamed tributary	140.3	19,700
At Wickenburg Road	140.3	20,000
At Vulture Mine Road	138.1	21,100
<b>Star Wash</b>		
Mouth	166.8	17,300
Below Powerline Wash	160.6	17,600
Above Powerline Wash	125.7	14,000
<b>Unnamed Tributary of Jackrabbit Wash</b>		
Mouth	8.4	2,900
At Wickenburg Road	8.4	3,000
At Vulture Mine Road	3.7	3,000

- LEGEND:**
- 100 YEAR FLOOD LIMITS
  - FLOODWAY LIMITS
  - DISTANCE IN MILES UPSTREAM FROM MOUTH
  - CROSS SECTION
  - NATURAL ELEVATION
  - FLOODWAY ELEVATION
  - 1250 BASE FLOOD ELEVATION

MATCH SHEET 2



PORTION OF T.3N. R.6W. & T.3N. R.5W.

NO.	REVISIONS	DATE	BY	CHK.

**Burgess & Niple, Inc.**  
Engineers and Architects  
Akron, OH - Cincinnati, OH - Columbus, OH - Crestview Hills, KY  
Painesville, OH - Parkersburg, WV - Payson, AZ - Phoenix, AZ



**JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY**  
FCD 90-05  
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

JOB NO. 10310  
DESIGNED BY: JEM  
DRAWN BY: AK / CEU  
CHECKED BY: JEM  
APPROVED BY:  
DATE: JUNE-91

**FLOOD BOUNDARY AND FLOODWAY MAP**

SCALE: 0 200 400 SCALE IN FEET	
SHEET NO. 1	OF 9

MATCH SHEET 1

MATCH SHEET 3

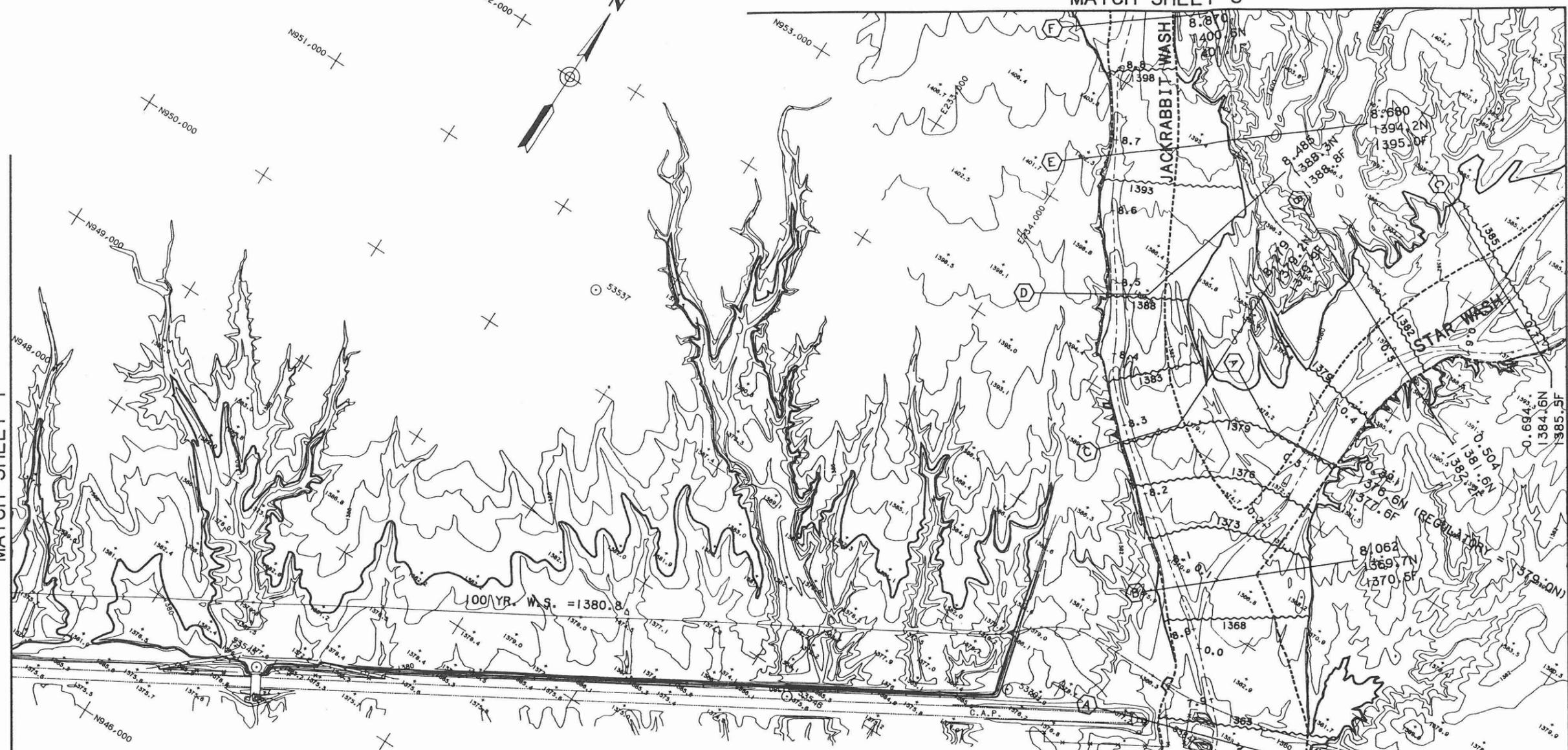
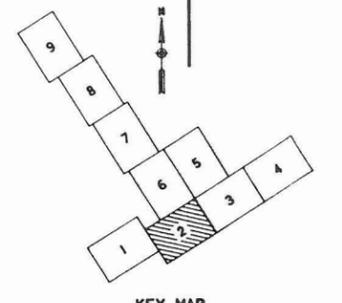


Table 1  
Summary of Discharges

Flooding Source and Location	D.A. (S.M.)	100-YR (c.f.s.)
Jackrabbit Wash		
Below Star Wash	319.2	33,200
Above Star Wash	152.4	19,300
Below unnamed tributary	148.7	19,800
Above unnamed tributary	140.3	19,700
At Wickenburg Road	140.3	20,000
At Vulture Mine Road	138.1	21,100
Star Wash		
Mouth	166.8	17,300
Below Powerline Wash	160.6	17,600
Above Powerline Wash	125.7	14,000
Unnamed Tributary of Jackrabbit Wash		
Mouth	8.4	2,900
At Wickenburg Road	8.4	3,000
At Vulture Mine Road	3.7	3,000

LEGEND:

- 100 YEAR FLOOD LIMITS
- FLOODWAY LIMITS
- DISTANCE IN MILES UPSTREAM FROM MOUTH
- CROSS SECTION
- NATURAL ELEVATION FLOODWAY ELEVATION
- BASE FLOOD ELEVATION



PORTION OF T.3N. R.5W.

NO.	REVISIONS	DATE	BY	CHK.

**Burgess & Niple, Inc.**  
Engineers and Architects

Alton, OH - Canton, OH - Columbus, OH - Creston Hills, KY  
Fayetteville, OH - Parkersburg, WV - Payson, AZ - Phoenix, AZ

**JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY**  
FCD 90-05  
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

JOB NO. 10310  
DESIGNED BY: JEM  
DRAWN BY: AK / CEU  
CHECKED BY: JEM  
APPROVED BY:  
DATE: JUNE-91

**FLOOD BOUNDARY AND FLOODWAY MAP**

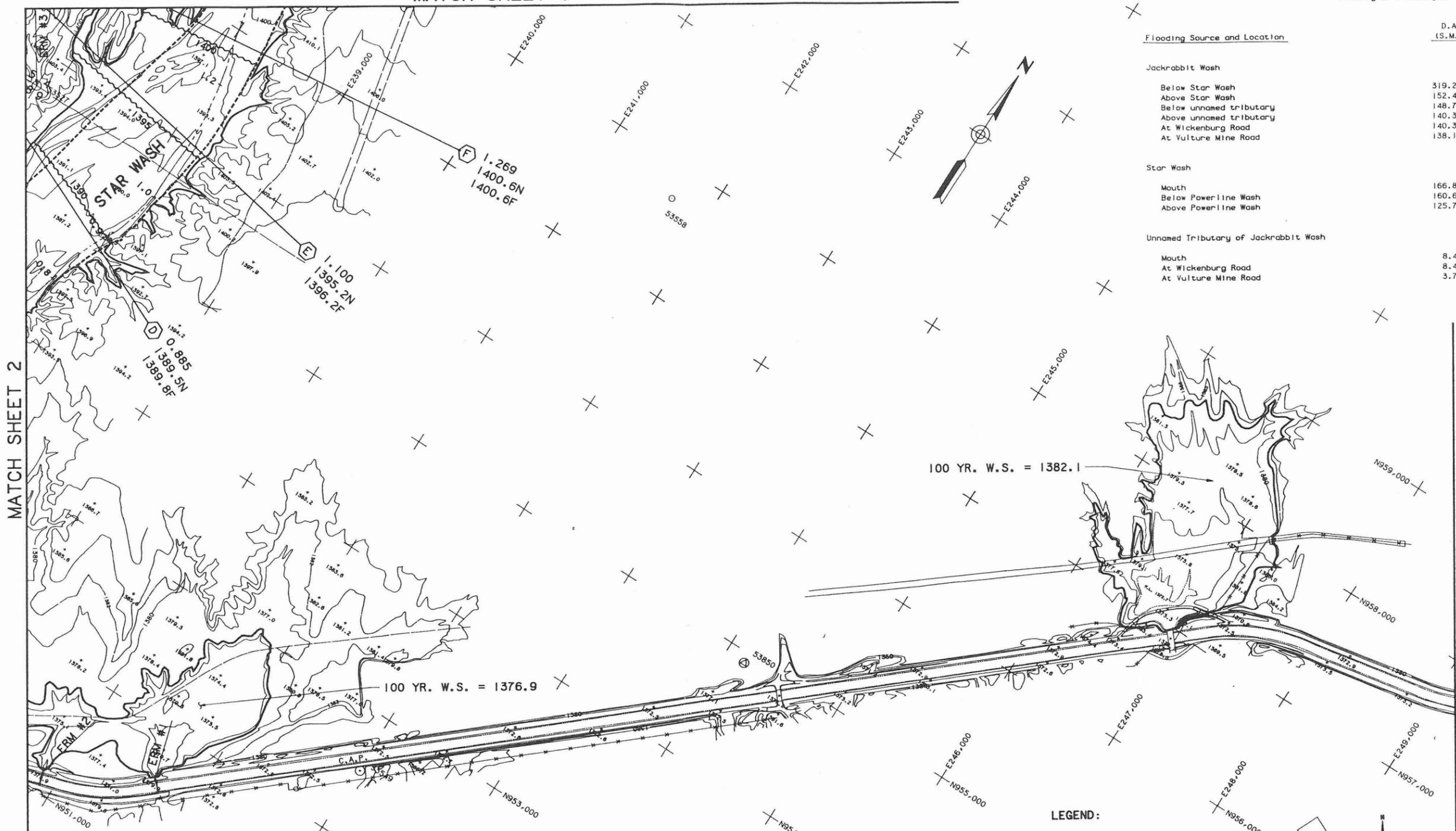
SCALE: 0 200 400  
SCALE IN FEET

SHEET NO.	OF
2	9

MATCH SHEET 5

Table 1  
Summary of Discharges

Flooding Source and Location	D.A. (S.M.)	100-YR (c.f.s.)
Jackrabbit Wash		
Below Star Wash	319.2	33-200
Above Star Wash	152.4	19-300
Below unnamed tributary	148.7	19-800
Above unnamed tributary	140.3	19-700
At Wickenburg Road	140.3	20-000
At Vulture Mine Road	138.1	21-100
Star Wash		
Mouth	166.8	17-300
Below Powerline Wash	160.6	17-600
Above Powerline Wash	125.7	14-000
Unnamed Tributary of Jackrabbit Wash		
Mouth	8.4	2-900
At Wickenburg Road	8.4	3-000
At Vulture Mine Road	3.7	3-000



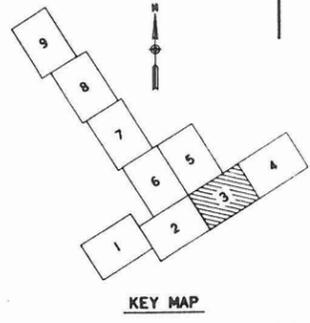
MATCH SHEET 2

MATCH SHEET 4

- ERM EL. = 1354.03  
This station is located 3.2 miles east of Wickenburg Road along the north service road of the C.A.P. Canal. The mark is the N.W. corner of a concrete headwall at the north inlet of a pipe culvert at C.A.P. Station 571+50.
- ERM EL. = 1344.74  
This station is located 3.0 miles east of Wickenburg Road along the north service road of the C.A.P. Canal. The mark is the N.E. corner of a concrete headwall at the north inlet of a pipe culvert at C.A.P. Station 561+50.
- ERM EL. = 1393.09  
This station is located at the corner common to Sections 4, 5, 8 and 9, T.3N., R.5W. The mark is a G.L.O. brass cap dated 1915 and is 0.6 Feet above ground.

**LEGEND:**

- 100 YEAR FLOOD LIMITS
- FLOODWAY LIMITS
- DISTANCE IN MILES UPSTREAM FROM MOUTH
- CROSS SECTION
- NATURAL ELEVATION FLOODWAY ELEVATION
- BASE FLOOD ELEVATION



NO.	REVISIONS	DATE	BY	CHK.

**Burgess & Niple, Inc.**  
Engineers and Architects

**bn**  
1912

Akron, OH - Cincinnati, OH - Columbus, OH - Crestview Hills, KY  
Painesville, OH - Parkersburg, WV - Payson, AZ - Phoenix, AZ

**JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY**  
FCD 90-05  
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

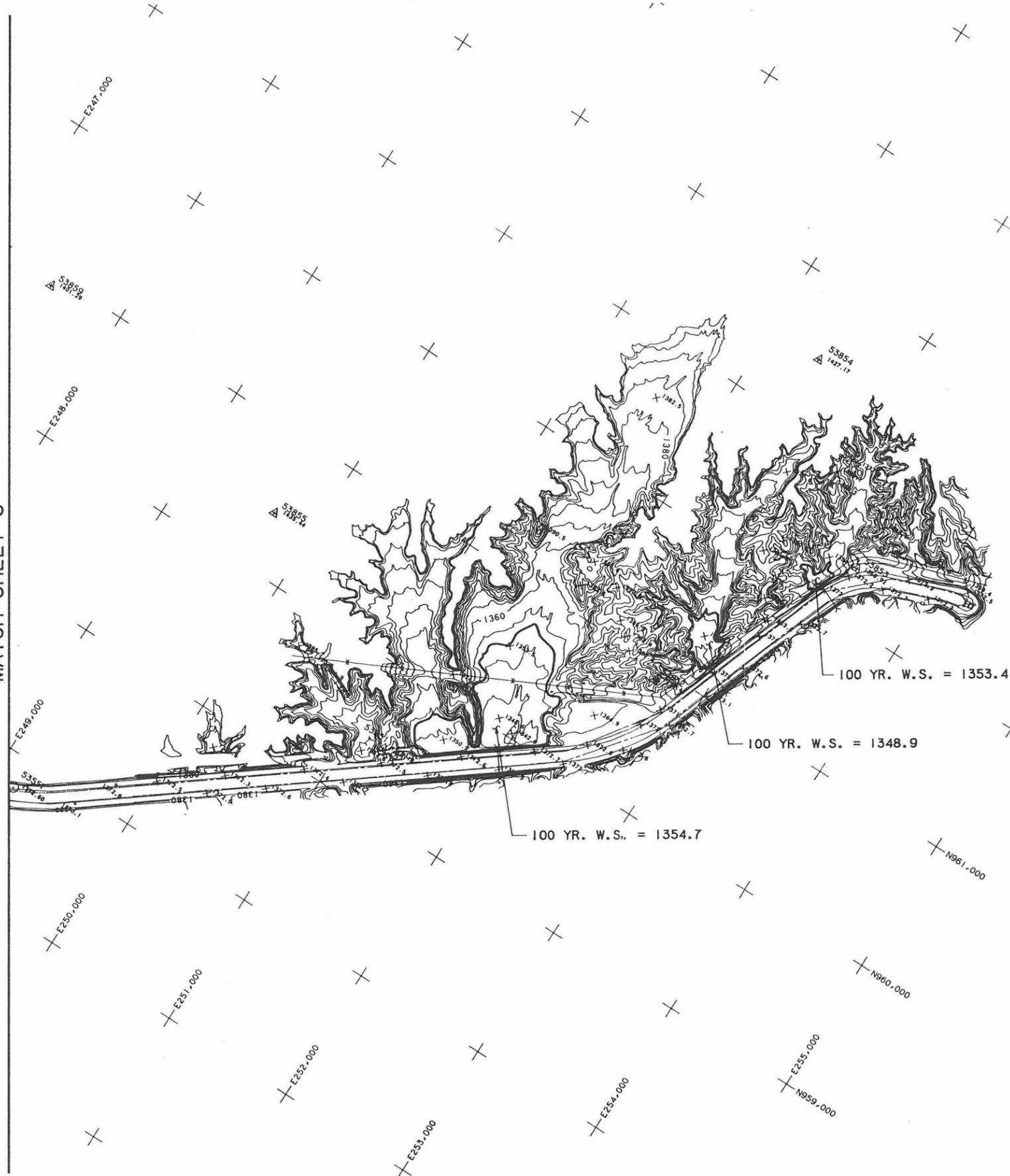
JOB NO. 10310  
DESIGNED BY: JEM  
DRAWN BY: AK / CEU  
CHECKED BY: JEM  
APPROVED BY:  
DATE: JUNE-91

**FLOOD BOUNDARY AND FLOODWAY MAP**

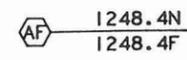
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SCALE 1"=100'  
SHEET NO. 3 OF 9

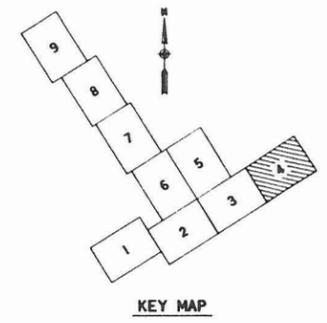
PORTION OF T.3N. R.5W.

MATCH SHEET 3



LEGEND:

-  100 YEAR FLOOD LIMITS
-  FLOODWAY LIMITS
-  DISTANCE IN MILES UPSTREAM FROM MOUTH
-  CROSS SECTION
-  NATURAL ELEVATION  
FLOODWAY ELEVATION
-  BASE FLOOD ELEVATION



PORTION OF T.3N. R.5W. & T.4N. R.5W.

NO.	REVISIONS	DATE	BY	CHK.

**Burgess & Niple, Inc.**  
Engineers and Architects  
Akron, OH - Cincinnati, OH - Columbus, OH - Crestview Hills, KY  
Parisoville, OH - Parkersburg, WV - Payson, AZ - Phoenix, AZ



**JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY**  
FCD 90-05  
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

JOB NO. 10310  
DESIGNED BY: JEM  
DRAWN BY: AK / CEU  
CHECKED BY: JEM  
APPROVED BY:  
DATE: JUNE-91

**FLOOD BOUNDARY AND FLOODWAY MAP**

SCALE: 0 200 400 SCALE IN FEET	
SHEET NO. 4	OF 9



6. ERM EL. = 1425.87

This station is located at the corner common to Sections 5, 6, 7 and 8, T.3N., R.5W. This mark is a G.L.O. brass cap dated 1915 and is 1.3 feet above ground.

7. ERM EL. = 1454.78

This station is located at the corner common to Sections 5 and 6, T.3N., R.5W. and Sections 31 and 32, T.4N., R.5W. The mark is a G.L.O. brass cap dated 1915 and is 0.9 feet above ground.

8. ERM EL. = 1462.95

This station is located at the 1/4 corner common to Section 6, T.3N., R.5W. and Section 31, T.4N., R.5W. The mark is a G.L.O. brass cap dated 1915.

9. ERM EL. = 1469.45

This station is located at the corner common to Section 1, T.3N., R.6W. - Section 6, T.3N., R.5W. - Section 31, T.4N., R.5W. and Section 36, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1915 and is 1.1 feet above ground.

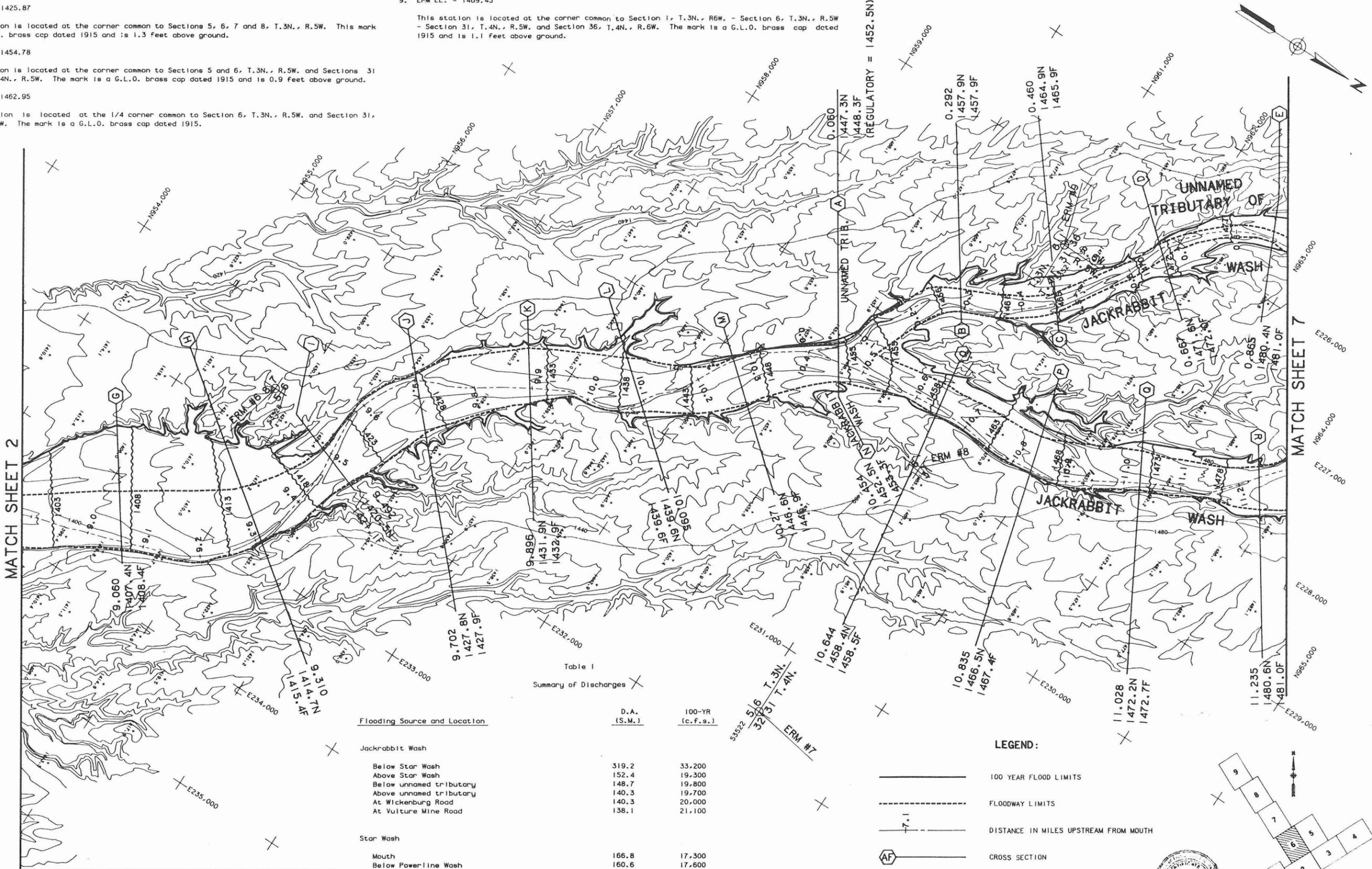
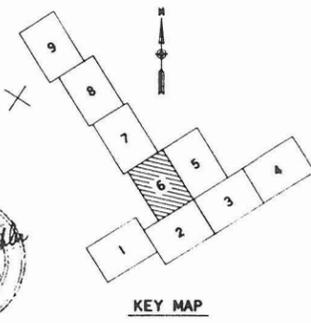


Table 1  
Summary of Discharges

Flooding Source and Location	D.A. (S.M.)	100-YR (c.f.s.)
Jackrabbit Wash		
Below Star Wash	319.2	33,200
Above Star Wash	152.4	19,300
Below unnamed tributary	148.7	19,800
Above unnamed tributary	140.3	19,700
At Wickenburg Road	140.3	20,000
At Vulture Mine Road	138.1	21,100
Star Wash		
Mouth	166.8	17,300
Below Powerline Wash	160.6	17,600
Above Powerline Wash	125.7	14,000
Unnamed Tributary of Jackrabbit Wash		
Mouth	8.4	2,900
At Wickenburg Road	8.4	3,000
At Vulture Mine Road	3.7	3,000

LEGEND:

- 100 YEAR FLOOD LIMITS
- FLOODWAY LIMITS
- DISTANCE IN MILES UPSTREAM FROM MOUTH
- CROSS SECTION
- 1248.4N NATURAL ELEVATION
- 1248.4F FLOODWAY ELEVATION
- 1250 BASE FLOOD ELEVATION



PORTION OF T.3N. R.5W., T.4N. R.5W., T.3N. R.6W. & T.4N. R.6W.

NO.	REVISIONS	DATE	BY	CHK.

**Burgess & Niple, Inc.**  
Engineers and Architects  
Akron, OH - Cincinnati, OH - Columbus, OH - Crestview Hills, KY  
Parsippany, NJ - Parkersburg, WV - Payson, AZ - Phoenix, AZ



**JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY**  
FCD 90-05  
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

JOB NO. 10310  
DESIGNED BY: JEM  
DRAWN BY: AK / CEU  
CHECKED BY: JEM  
APPROVED BY:  
DATE: JUNE-91

**FLOOD BOUNDARY AND FLOODWAY MAP**

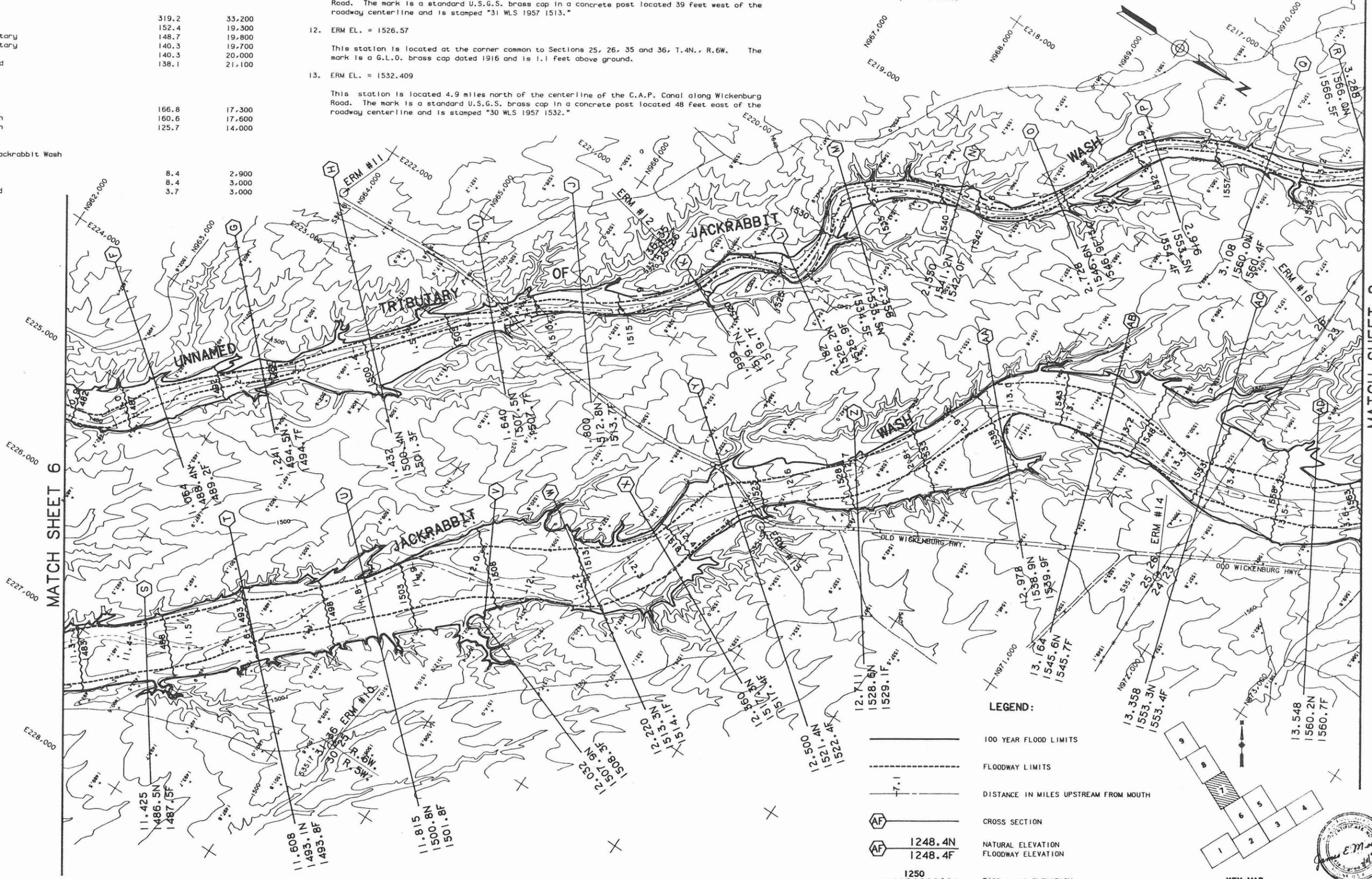
SCALE: 0 200 400 SCALE IN FEET	
SHEET NO. 6	OF 9

Table I  
Summary of Discharges

Flooding Source and Location	D.A. (S.M.)	100-YR (c.f.s.)
Jackrabbit Wash		
Below Star Wash	319.2	33,200
Above Star Wash	152.4	19,300
Below unnamed tributary	148.7	19,800
Above unnamed tributary	140.3	19,700
At Wickenburg Road	140.3	20,000
At Vulture Mine Road	138.1	21,100
Star Wash		
Mouth	166.8	17,300
Below Powerline Wash	160.6	17,600
Above Powerline Wash	125.7	14,000
Unnamed Tributary of Jackrabbit Wash		
Mouth	8.4	2,900
At Wickenburg Road	8.4	3,000
At Vulture Mine Road	3.7	3,000

10. ERM EL. = 1504.23  
This station is located at the corner common to Sections 25 and 36, T.4N., R.6W. and Sections 30 and 31, T.4N., R.5W. The mark is a G.L.O. brass cap dated 1916 and is 1.2 feet above ground.
11. ERM EL. = 1513.418  
This station is located 4.0 miles north of the centerline of the C.A.P. Canal along Wickenburg Road. The mark is a standard U.S.G.S. brass cap in a concrete post located 39 feet west of the roadway centerline and is stamped "31 WLS 1957 1513."
12. ERM EL. = 1526.57  
This station is located at the corner common to Sections 25, 26, 35 and 36, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916 and is 1.1 feet above ground.
13. ERM EL. = 1532.409  
This station is located 4.9 miles north of the centerline of the C.A.P. Canal along Wickenburg Road. The mark is a standard U.S.G.S. brass cap in a concrete post located 48 feet east of the roadway centerline and is stamped "30 WLS 1957 1532."

14. ERM EL. = 1554.23  
This station is located at the corner common to Sections 23, 24, 25 and 26, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916 and is 0.6 feet above ground.
16. ERM EL. = 1572.39  
This station is located at the 1/4 corner common to Sections 23 and 26, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916.



**LEGEND:**

- 100 YEAR FLOOD LIMITS
- FLOODWAY LIMITS
- DISTANCE IN MILES UPSTREAM FROM MOUTH
- CROSS SECTION
- 1248.4N  
1248.4F NATURAL ELEVATION  
FLOODWAY ELEVATION
- 1250 BASE FLOOD ELEVATION

**KEY MAP**

MATCH SHEET 8

PORTION OF T.4N. R.6W. & T.4N. R.5W.

NO.	REVISIONS	DATE	BY	CHK.

**Burgess & Niple, Inc.**  
Engineers and Architects

Akron, OH - Cincinnati, OH - Columbus, OH - Crestview Hills, KY  
Parsippany, NJ - Parkersburg, WV - Payson, AZ - Phoenix, AZ

**JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY**  
FCD 90-05  
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

JOB NO. 10310  
DESIGNED BY: JEM  
DRAWN BY: AK / CEU  
CHECKED BY: JEM  
APPROVED BY:  
DATE: JUNE-91

**FLOOD BOUNDARY AND FLOODWAY MAP**

SCALE: 0 200 400  
SCALE IN FEET

SHEET NO. 7 OF 9



Table 1

Summary of Discharges

Flooding Source and Location	D.A. (S.M.)	100-YR (c.f.s.)
Jackrabbit Wash		
Below Star Wash	319.2	33,200
Above Star Wash	152.4	19,300
Below unnamed tributary	148.7	19,800
Above unnamed tributary	140.3	19,700
At Wickenburg Road	140.3	20,000
At Vulture Mine Road	138.1	21,100
Star Wash		
Mouth	166.8	17,300
Below Powerline Wash	160.6	17,600
Above Powerline Wash	125.7	14,000
Unnamed Tributary of Jackrabbit Wash		
Mouth	8.4	2,900
At Wickenburg Road	8.4	3,000
At Vulture Mine Road	3.7	3,000

15. ERM EL. = 1575.309

This station is located 6.1 miles north of the centerline of the C.A.P. Canal along Wickenburg Road. The mark is a standard U.S.G.S. brass cap in a concrete post located 40 feet southwest of the roadway centerline and is stamped "29 WLS 1957 1575."

17. ERM EL. = 1578.59

This station is located at the corner common to Sections 22, 23, 26, and 27, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916.

18. ERM EL. = 1608.84

This station is located at the corner common to Sections 14, 15, 22 and 23, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916 and is 1.2 feet above ground.

19. ERM EL. = 1618.581

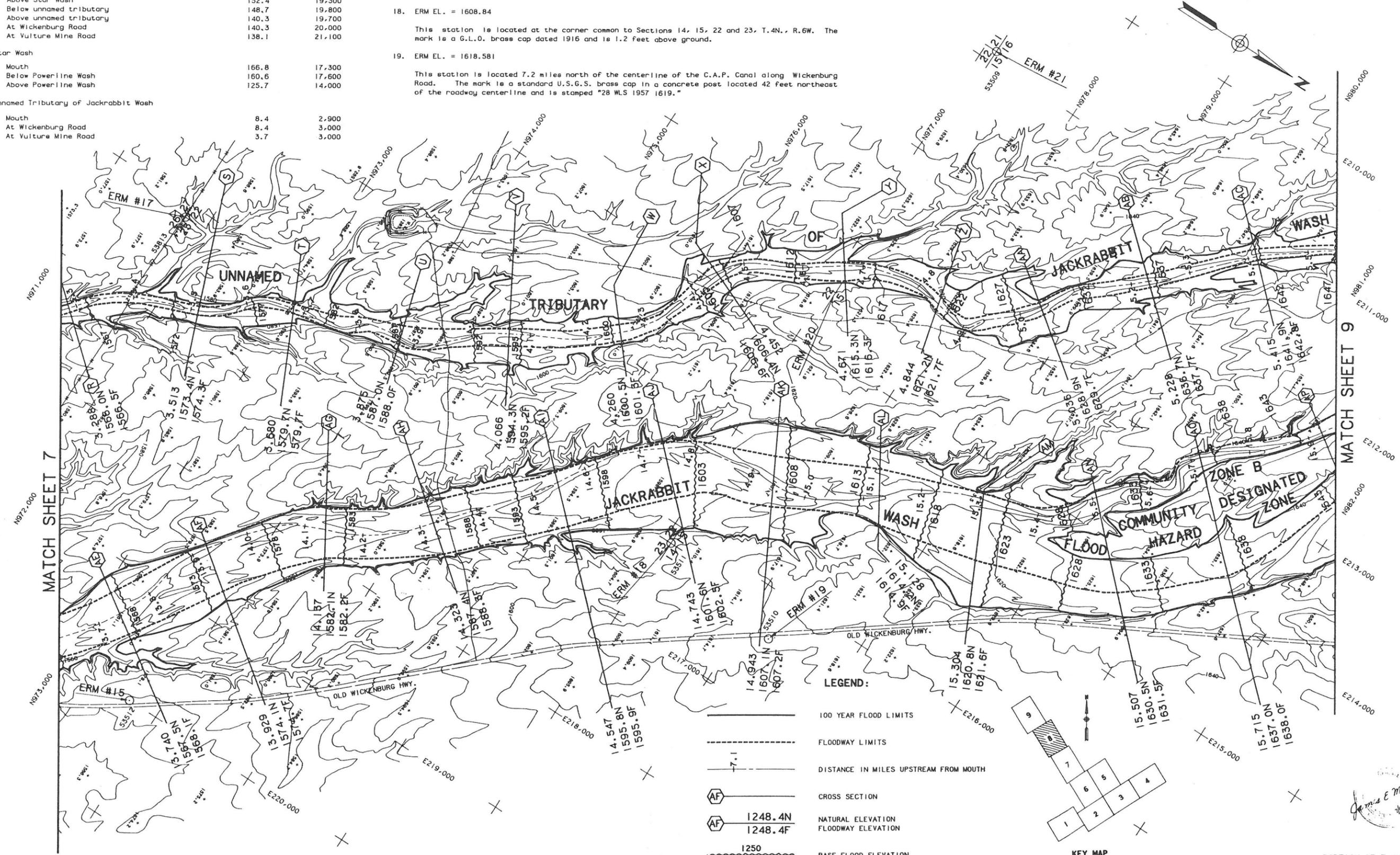
This station is located 7.2 miles north of the centerline of the C.A.P. Canal along Wickenburg Road. The mark is a standard U.S.G.S. brass cap in a concrete post located 42 feet northeast of the roadway centerline and is stamped "28 WLS 1957 1619."

20. ERM EL. = 1619.88

This station is located at the 1/4 corner common to Sections 15 and 22, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916 and is 1.0 feet above ground.

21. ERM EL. = 1637.92

This station is located at the corner common to Sections 15, 16, 21 and 22, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916 and is 1.3 feet above ground.



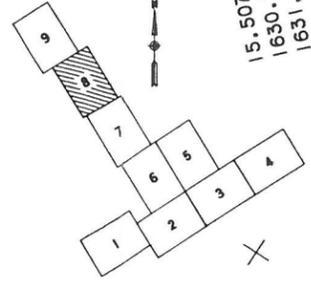
MATCH SHEET 7

MATCH SHEET 9

**LEGEND:**

- 100 YEAR FLOOD LIMITS
- FLOODWAY LIMITS
- DISTANCE IN MILES UPSTREAM FROM MOUTH
- CROSS SECTION
- NATURAL ELEVATION  
FLOODWAY ELEVATION
- 1250 BASE FLOOD ELEVATION

**KEY MAP**



PORTION OF T.4N. R.6W.

NO.	REVISIONS	DATE	BY	CHK.

**Burgess & Niple, Inc.**  
Engineers and Architects  
Akron, OH - Cincinnati, OH - Columbus, OH - Crestview Hills, KY  
Painesville, OH - Parkersburg, WV - Payson, AZ - Phoenix, AZ



**JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY**  
FCD 90-05  
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

JOB NO. 10310  
DESIGNED BY: JEM  
DRAWN BY: AK / CEU  
CHECKED BY: JEM  
APPROVED BY:  
DATE: JUNE-91

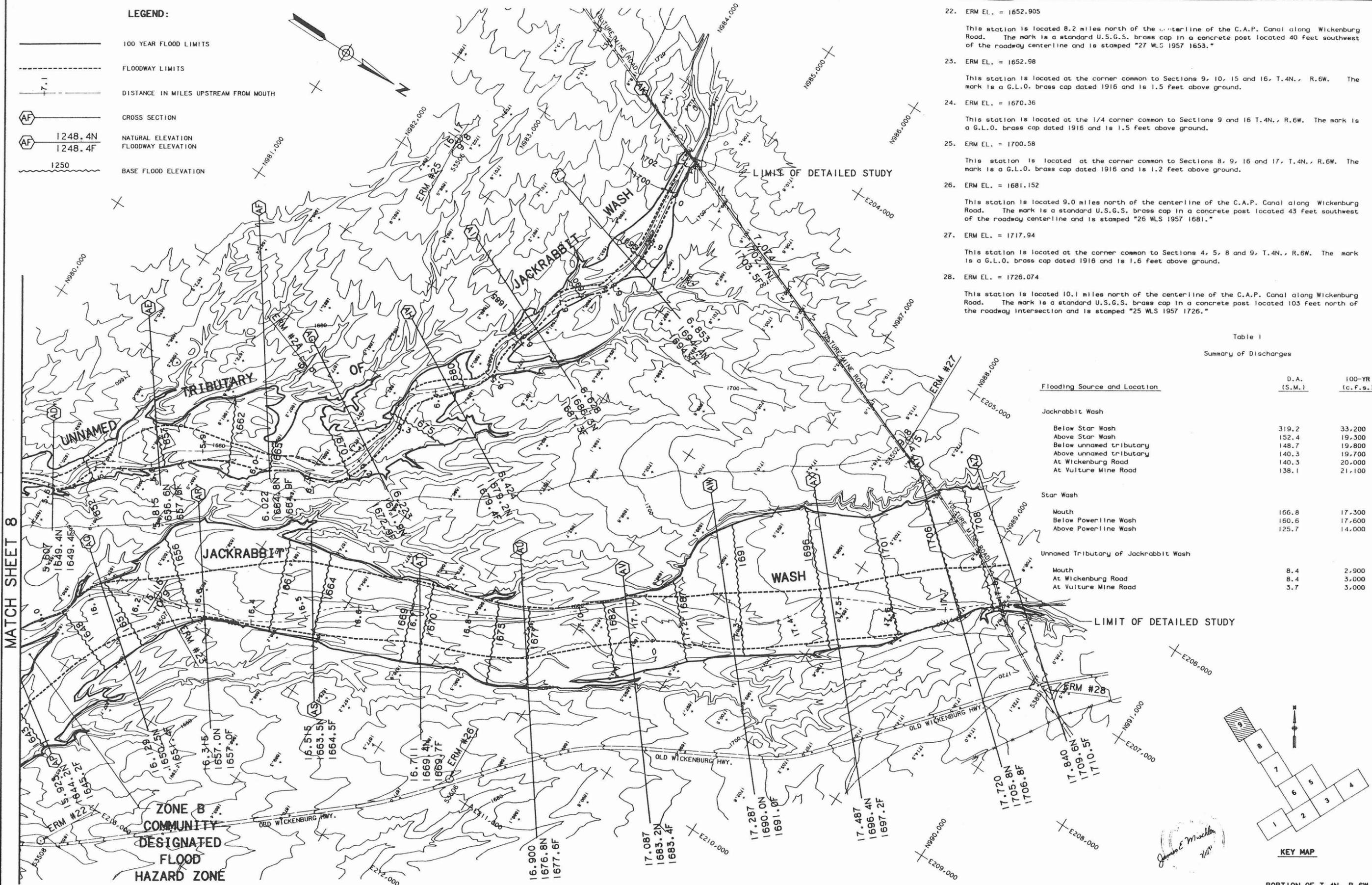
**FLOOD BOUNDARY AND FLOODWAY MAP**

SCALE: 0 200 400 SCALE IN FEET	
SHEET NO. 8	OF 9

*James E. Macklin*  
1/11

**LEGEND:**

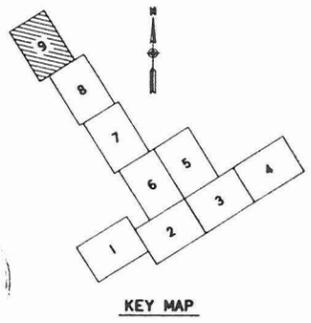
- 100 YEAR FLOOD LIMITS
- FLOODWAY LIMITS
- DISTANCE IN MILES UPSTREAM FROM MOUTH
- CROSS SECTION
- NATURAL ELEVATION  
FLOODWAY ELEVATION
- 1250 BASE FLOOD ELEVATION



- 22. ERM EL. = 1652.905  
This station is located 8.2 miles north of the centerline of the C.A.P. Canal along Wickenburg Road. The mark is a standard U.S.G.S. brass cap in a concrete post located 40 feet southwest of the roadway centerline and is stamped "27 WLS 1957 1653."
- 23. ERM EL. = 1652.98  
This station is located at the corner common to Sections 9, 10, 15 and 16, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916 and is 1.5 feet above ground.
- 24. ERM EL. = 1670.36  
This station is located at the 1/4 corner common to Sections 9 and 16 T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916 and is 1.5 feet above ground.
- 25. ERM EL. = 1700.58  
This station is located at the corner common to Sections 8, 9, 16 and 17, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916 and is 1.2 feet above ground.
- 26. ERM EL. = 1681.152  
This station is located 9.0 miles north of the centerline of the C.A.P. Canal along Wickenburg Road. The mark is a standard U.S.G.S. brass cap in a concrete post located 43 feet southwest of the roadway centerline and is stamped "26 WLS 1957 1681."
- 27. ERM EL. = 1717.94  
This station is located at the corner common to Sections 4, 5, 8 and 9, T.4N., R.6W. The mark is a G.L.O. brass cap dated 1916 and is 1.6 feet above ground.
- 28. ERM EL. = 1726.074  
This station is located 10.1 miles north of the centerline of the C.A.P. Canal along Wickenburg Road. The mark is a standard U.S.G.S. brass cap in a concrete post located 103 feet north of the roadway intersection and is stamped "25 WLS 1957 1726."

Table 1  
Summary of Discharges

Flooding Source and Location	D.A. (S.M.)	100-YR (c.f.s.)
Jackrabbit Wash		
Below Star Wash	319.2	33,200
Above Star Wash	152.4	19,300
Below unnamed tributary	148.7	19,800
Above unnamed tributary	140.3	19,700
At Wickenburg Road	140.3	20,000
At Vulture Mine Road	138.1	21,100
Star Wash		
Mouth	166.8	17,300
Below Powerline Wash	160.6	17,600
Above Powerline Wash	125.7	14,000
Unnamed Tributary of Jackrabbit Wash		
Mouth	8.4	2,900
At Wickenburg Road	8.4	3,000
At Vulture Mine Road	3.7	3,000



NO.	REVISIONS	DATE	BY	CHK.

**Burgess & Niple, Inc.**  
Engineers and Architects  
Akron, OH - Cincinnati, OH - Columbus, OH - Grandview Hills, KY  
Pittsboro, OH - Parkersburg, WV - Payson, AZ - Phoenix, AZ



**JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY**  
FCD 90-05  
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

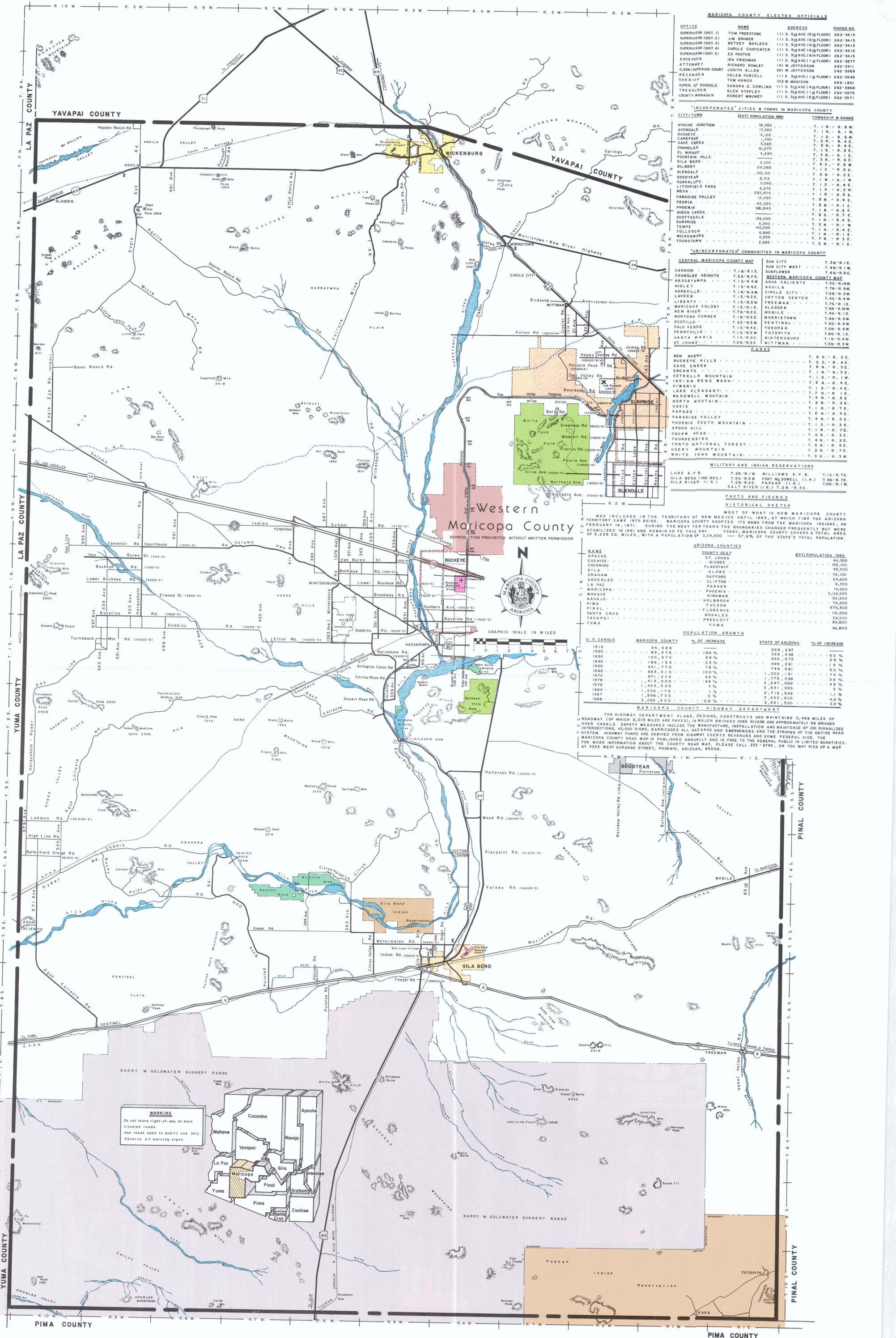
JOB NO. 10310  
DESIGNED BY: JEM  
DRAWN BY: AK / CEU  
CHECKED BY: JEM  
APPROVED BY:  
DATE: JUNE-91

**FLOOD BOUNDARY AND FLOODWAY MAP**

SCALE: 0 200 400 SCALE IN FEET	
SHEET NO. 9	OF 9

PORTION OF T.4N. R.6W.





**MARICOPA COUNTY ELECTED OFFICIALS**

OFFICE	NAME	ADDRESS	PHONE NO.
SUPERVISOR (DIST. 1)	TOM FREESTONE	111 S. 3rd Ave. (6th Floor)	262-3415
SUPERVISOR (DIST. 2)	JIM BRUNER	111 S. 3rd Ave. (6th Floor)	262-3415
SUPERVISOR (DIST. 3)	BETSEY BATES	111 S. 3rd Ave. (6th Floor)	262-3415
SUPERVISOR (DIST. 4)	CAROLE CARPENTER	111 S. 3rd Ave. (6th Floor)	262-3415
SUPERVISOR (DIST. 5)	ED PASTOR	111 S. 3rd Ave. (6th Floor)	262-3415
ASSESSOR	IRA FRIEDMAN	111 S. 3rd Ave. (1st Floor)	262-3877
ATTORNEY	RICHARD ROWLEY	101 W. JEFFERSON	262-3411
CLERK/SUPERIOR COURT	JUDITH ALLEN	201 W. JEFFERSON	262-3549
RECORDER	HELEN PURCELL	111 S. 3rd Ave. (1st Floor)	262-3545
SHERIFF	TOM AGOS	102 W. MADISON	256-1801
SUPER. OF SCHOOLS	SANDRA E. DOWLING	111 S. 3rd Ave. (14th Floor)	262-8868
TREASURER	GLEN STAPLEY	111 S. 3rd Ave. (1st Floor)	262-3975
COUNTY MANAGER	ROBERT MAUNEY	111 S. 3rd Ave. (6th Floor)	262-3571

**"INCORPORATED" CITIES & TOWNS IN MARICOPA COUNTY**

CITY/TOWN	(EST) POPULATION 1990	TOWNSHIP & RANGE
APACHE JUNCTION	18,365	T. 1 N. - R. 8 W.
AVONDALE	17,550	T. 1 N. - R. 1 W.
BUCKEYE	4,125	T. 1 N. - R. 1 W.
CAREFREE	1,740	T. 6 N. - R. 4 E.
CAVE CREEK	3,045	T. 6 N. - R. 4 E.
CHANDLER	91,275	T. 1 N. - R. 5 E.
EMMIGLETT	4,330	T. 3 N. - R. 1 E.
FOUNTAIN HILLS	29,085	T. 3 N. - R. 6 E.
GILA BEND	2,100	T. 6 S. - R. 5 W.
GILBERT	29,085	T. 1 S. - R. 5 E.
GLendale	145,050	T. 3 N. - R. 2 E.
GOODYEAR	5,715	T. 1 N. - R. 1 W.
GUADALUPE	5,095	T. 1 S. - R. 4 E.
LITCHFIELD PARK	4,275	T. 1 S. - R. 2 W.
MESA	282,405	T. 1 N. - R. 5 E.
PARADISE VALLEY	12,050	T. 2 N. - R. 4 E.
PHOENIX	46,330	T. 3 N. - R. 1 E.
QUEEN CREEK	98,845	T. 3 N. - R. 3 E.
SCOTTSDALE	36,905	T. 1 N. - R. 3 E.
SURPRISE	150,560	T. 1 N. - R. 4 E.
TEMPE	150,560	T. 1 N. - R. 1 W.
TOLLESON	6,350	T. 1 N. - R. 4 E.
WICKENBURG	4,890	T. 1 N. - R. 1 E.
YOUNGSTOWN	2,820	T. 3 N. - R. 5 E.

**"UNINCORPORATED" COMMUNITIES IN MARICOPA COUNTY**

CENTRAL MARICOPA COUNTY MAP	SUN CITY	T. 3 N. - R. 1 E.
CASHION	SUN CITY WEST	T. 3 N. - R. 1 W.
CHANDLER HEIGHTS	SUNFLOWER	T. 4 N. - R. 1 W.
AGUA CALIENTE	WESTERN MARICOPA COUNTY MAP	T. 1 S. - R. 10 W.
HIGLEY	AGUILA	T. 1 S. - R. 9 W.
HOPEVILLE	CITTON CITY	T. 5 N. - R. 3 W.
LAVERNE	COTTON CENTER	T. 4 S. - R. 4 W.
LIBERTY	FREEMAN	T. 1 S. - R. 7 W.
MARICOPA COLONY	GLADDEN	T. 7 S. - R. 1 E.
NEW RIVER	MOBILE	T. 4 S. - R. 1 E.
NORTON CORNER	MORRISTOWN	T. 4 N. - R. 10 W.
OCOTILLO	SENTINEL	T. 6 N. - R. 4 W.
PALO VERDE	TONOPAH	T. 2 N. - R. 6 W.
PERRYVILLE	TOTOPIK	T. 10 S. - R. 1 E.
SANTA MARIA	WINTERSBURG	T. 1 N. - R. 6 W.
ST. JOHNS	WITTMAN	T. 5 N. - R. 3 W.

**MILITARY AND INDIAN RESERVATIONS**

LUKE A.F.B.	T. 2 N. - R. 1 W.	WILLIAMS A.F.B.	T. 1 S. - R. 7 E.
GILA BEND (IND. RES.)	T. 5 S. - R. 5 W.	FORT McDOWELL (I.R.)	T. 4 N. - R. 7 E.
GILA RIVER (I.R.)	T. 2 N. - R. 2 E.	PAPAGO (I.R.)	T. 3 N. - R. 1 W.
		SALT RIVER (I.R.)	T. 2 N. - R. 3 W.

**FACTS AND FIGURES**

**HISTORICAL SKETCH**

MOST OF WHAT IS NOW MARICOPA COUNTY TERRITORY CAME INTO BEING IN FEBRUARY 14, 1871. DURING THE NEXT TEN YEARS THE BOUNDARIES CHANGED FREQUENTLY BUT WERE STABILIZED IN 1881 AND REMAIN TO THIS DAY. TODAY, MARICOPA COUNTY COVERS A TOTAL AREA OF 9,226 SQ. MILES, WITH A POPULATION OF 2,116,500 — 57.9% OF THE STATE'S TOTAL POPULATION.

**ARIZONA COUNTIES**

NAME	COUNTY SEAT	(EST) POPULATION 1989
APACHE	ST. JOHNS	49,300
COCHISE	BISSBEE	102,100
COCONINO	FLAGSTAFF	35,500
GILA	GLOBE	42,100
GRAHAM	SAFFORD	24,600
GREENLEE	CLIFTON	14,600
LA PAZ	PARKER	8,300
MARICOPA	PHOENIX	2,116,500
MOHAVE	KINGMAN	92,500
NAVAJO	HOLBROOK	79,200
PIMA	TUCSON	675,300
PINAL	FLORENCE	112,200
SANTA CRUZ	NOGALES	29,000
YAVAPAI	PRESCOTT	99,800
YUMA	YUMA	98,600

**POPULATION GROWTH**

U.S. CENSUS	MARICOPA COUNTY	% OF INCREASE	STATE OF ARIZONA	% OF INCREASE
1910	34,488		206,297	
1920	89,576	160%	335,641	63%
1930	150,970	69%	435,173	28%
1940	182,113	21%	499,261	15%
1950	331,770	78%	749,581	50%
1960	663,510	100%	1,302,161	74%
1970	971,228	46%	1,775,399	36%
1978	1,453,500	48%	2,547,000	43%
1980	1,509,173	4%	2,631,000	3%
1987	1,998,700	33%	2,716,546	3%
1988	2,055,400	3%	3,451,500	27%

**MARICOPA COUNTY HIGHWAY DEPARTMENT**

THE HIGHWAY DEPARTMENT PLANS, DESIGNS, CONSTRUCTS AND MAINTAINS 3,488 MILES OF ROADWAY (OF WHICH 2,015 MILES ARE PAVED), 14 MAJOR BRIDGES OVER RIVERS AND APPROXIMATELY 98 BRIDGES OVER CANALS. SAFETY MEASURES INCLUDE THE MANUFACTURE, INSTALLATION AND MAINTENANCE OF 100 SIGNALIZED INTERSECTIONS, 43,000 SIGNS, BARRICADES ALL HAZARDS AND EMERGENCIES AND THE STRIPING OF THE ENTIRE ROAD SYSTEM. HIGHWAY FUNDS ARE DERIVED FROM USER'S REVENUES AND SOME FEDERAL AID. THE MARICOPA COUNTY ROAD MAP IS PUBLISHED ANNUALLY AND IS FREE TO THE GENERAL PUBLIC IN LIMITED QUANTITIES. FOR MORE INFORMATION ABOUT THE COUNTY ROAD MAP, PLEASE CALL 233-8796, OR YOU MAY PICK UP A MAP AT 3325 WEST DURANGO STREET, PHOENIX, ARIZONA, 85009.

**WARNING**

Do not leave right-of-way on main traveled roads. Use roads open to public use only. Observe all warning signs.

