LUKE WASH FLOOD INSURANCE STUDY

Between the Gila River Floodplain and the Southern Pacific Railroad

FLOOD CONTROL
DISTRICT
OF
MARICOPA
COUNTY

SURVEY DATA

CVL

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LUKE WASH
FLOOD INSURANCE STUDY

Between the Gila River Floodplain and the Southern Pacific Railroad

FCDMC CONTRACT #90-68

SURVEY DATA

December 1, 1992

FLOOD CONTROL DISTRICT
RECEIVED
MAR 23 1993

	CH ENG		P & PM
	DEP		HYDRO
	ADMIN		LMGT
	FINANCE		FILE
	C & O		
	ENGR		

REMARKS

Prepared for:

Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009
(602) 506-1501

Prepared by:

Coe & Van Loo Consultants, Inc.
4550 N. 12th Street
Phoenix, AZ 85014
(602) 264-6831

CVL

Coe & Van Loo Consultants, Inc., (CVL) has contracted with the Flood Control District of Maricopa County (FCDMC) to perform a Flood Insurance Study (FIS) for a portion of Luke Wash located in Maricopa County, Arizona.

The project consists of topographic mapping and floodplain delineation of approximately 9 miles of Luke Wash and its tributaries from the Gila River Floodplain to the Southern Pacific Railroad. In addition, topographic mapping has been produced and ponding limits established on the upstream side of the Arlington Canal. CVL developed the hydrology for the entire watershed contributing to the Gila River between the Hassayampa River and Centennial Wash watershed boundaries using the Corps of Engineer's HEC-1 computer model. Backwater analysis has been conducted using the HEC-2 computer model to determine floodplain delineation for the 100-year peak flood.

The specific scope of this report is to document the survey data used for the Luke Wash Flood Insurance Study. Aerial Mapping Company, Inc. has been contracted by CVL to provide topographic and aerial mapping for the portion of Luke Wash and its tributaries between the Gila River floodplain and the Southern Pacific Railroad. Aerial Mapping Company also provided survey control for this same portion of the study. See Sections I-IV in this document for this backup survey data provided by Aerial Mapping Company. CVL provided the structure survey portion of the survey data. This includes all of the bridge and culvert structures along Old U.S. Highway 80 within the study, and the portion of the Arlington Canal that was beyond the aerial mapping limits. See Section V in this document for this structural survey data provided by CVL.

HORIZONTAL and VERTICAL CONTROL TABULATION

for the

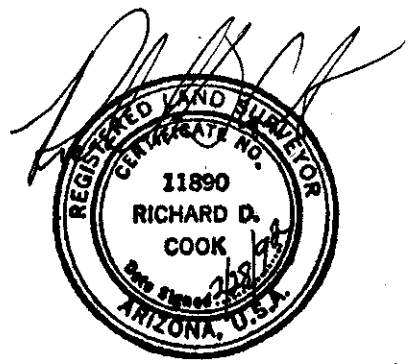
LUKE WASH PROJECT, ARLINGTON, ARIZONA

Floodplian Study
FCD 90-68

Prepared for:
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Prepared by:
Aerial Mapping Company, Inc.
3141 West Clarendon Avenue
Phoenix, Arizona 85017

AMC JN 91122



Richard D. Cook, RLS
Aerial Mapping Company, Inc.
3141 West Clarendon Avemue
Phoenix, Arizona 85017

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SECTION II	EDM Reductions sheets for vertical angle bench marks, spirit level diagram and spirit level adjustments.
SECTION III	Point descriptions and XYZ coordinates.
SECTION IV	Horizontal field notes, Book 1 and Book 2. Vertical field notes Book 2 and Book 3.

January 28, 1992

SURVEY CONTROL REPORT

LUKE WASH FIS for Coe & Van Loo Engineers
and The Flood Control District of Maricopa County

SUMMARY OF GEODETIC SURVEY

Field survey commenced on 9-9-91 and completed at the end of September with some check surveys completed 10-8-91.

Horizontal Datum for this project is NAD 83, Arizona State Plane Coordinate System, Central Zone. The survey originated at USC & GS published triangulation stations "Powers Butte" and "C-GLO-2". Horizontal geodetic survey consisted of 37 miles of primary and secondary traverse.

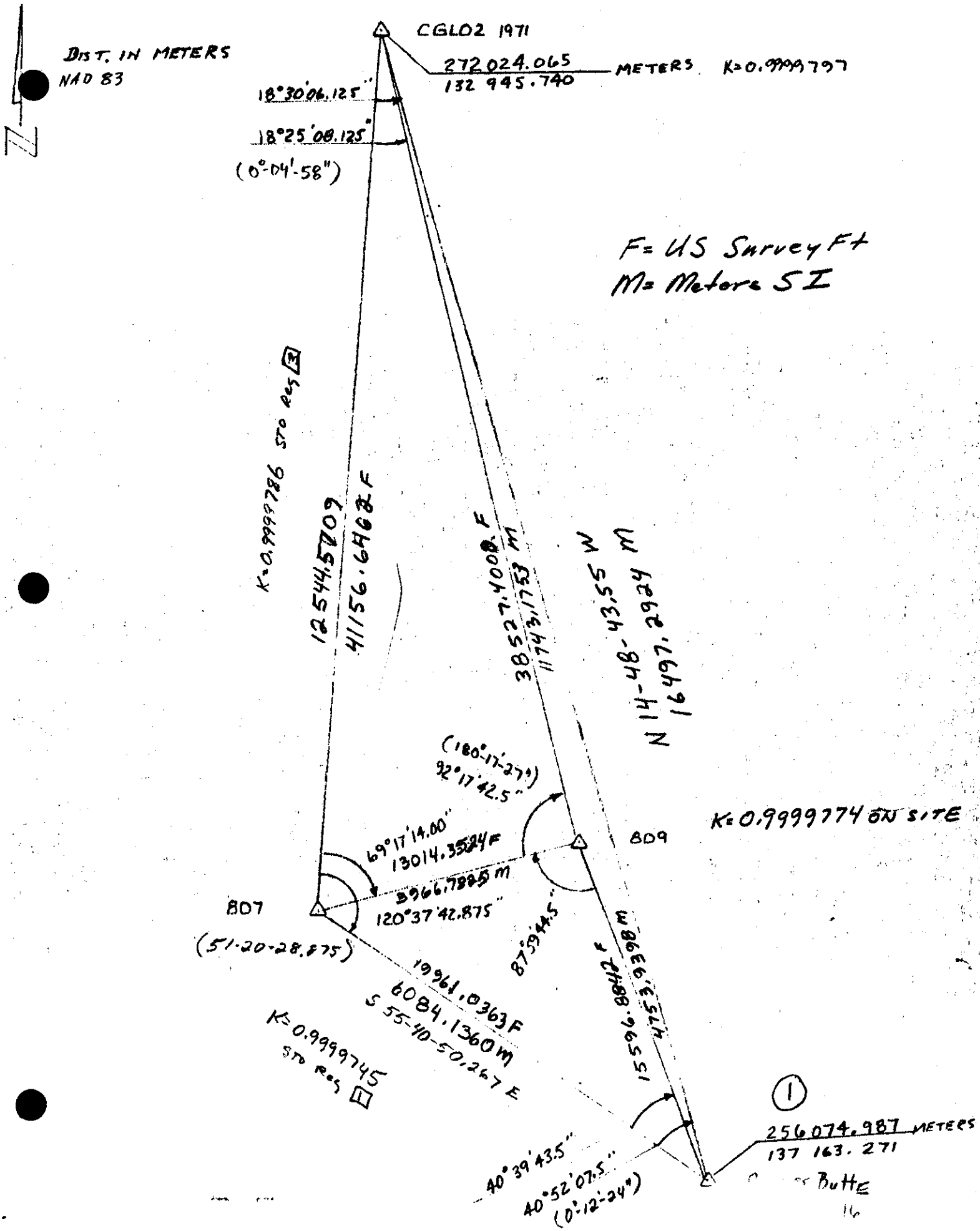
Angles were measured with a one second theodolite taking multiple observations. Horizontal distances were measured in both feet and meters on a H.P. 3810 EDM to calibrated prism reflectors. Final closures ranged from 1:60,000 to 1:325,000 accuracy with an average closure of well over 1:150,000.

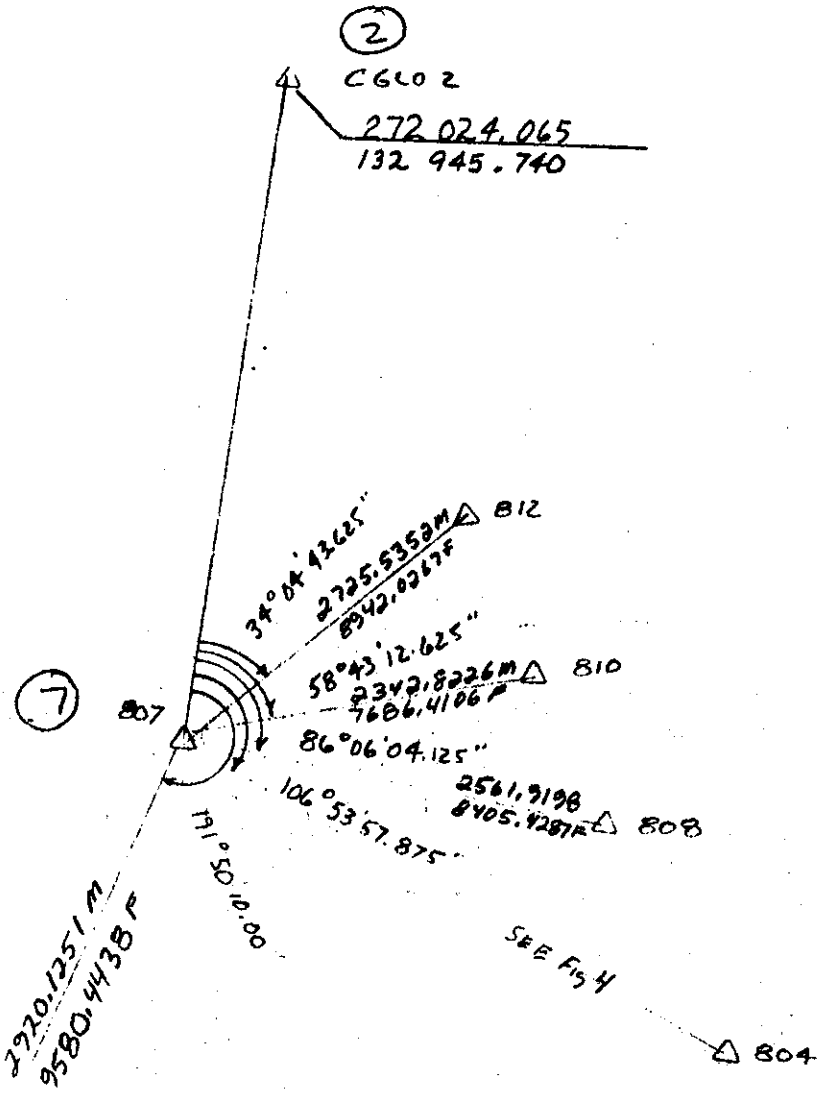
Vertical Datum is mean sea level MSL 1929. Five separate published bench marks were used in the primary vertical differential level networks.

More than 42 linear miles of spirit levels and 31 miles of trigonometric levelling were completed and field crews established or recovered 70 elevation points. 64 of these are recoverable, TBM points established by conventional differential levels. 12 points are Brass Caps and suitable for FEMA Elevation Reference Marks (ERM's) for this project.

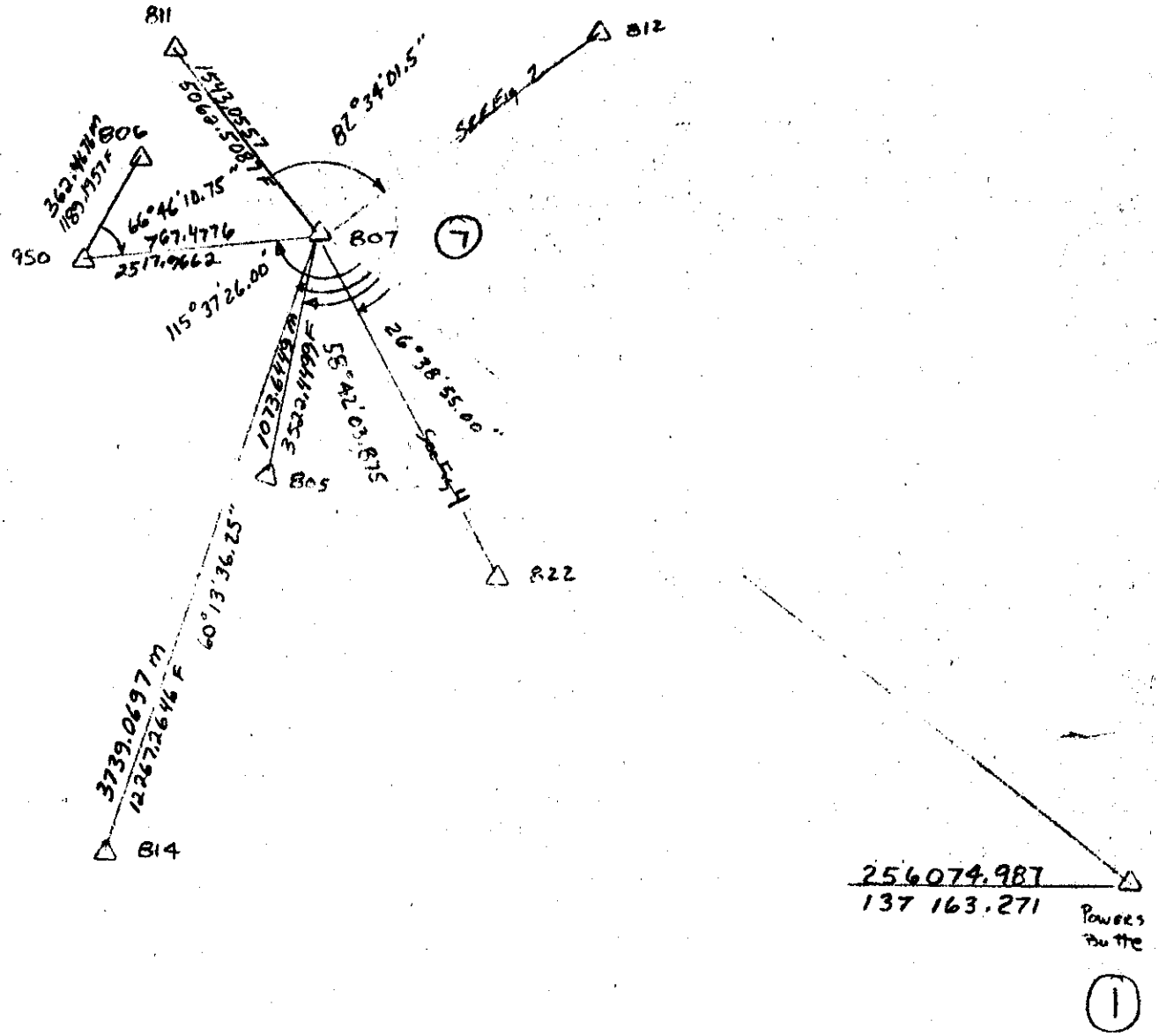
Aerial Photography was flown 9-11-91, consisting of 22 stereo photographs at a photo scale of approx. 1"=700'. Analytical aerotriangulation was completed 10-23-91. The results of Analytics confirmed field control positions were well within the requirements for this project with a root mean square error of X=0.102, Y=0.140 and Z=0.220. This verified that there were no transpositions, blunders or significant errors in the field survey.

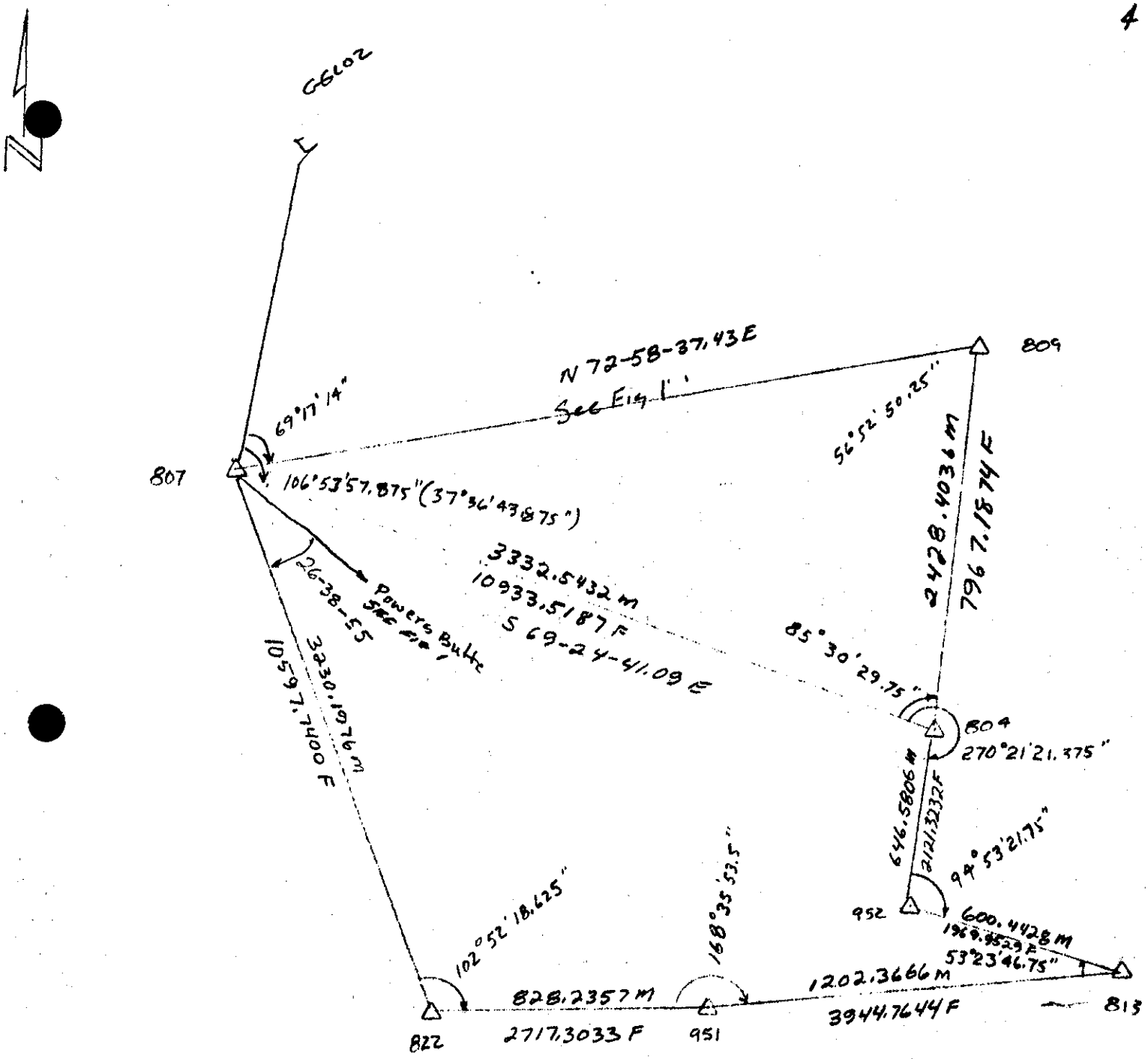
PALO VERDE NUCLEAR GENERATING STATION
Arlington Substation
Arlington Station
Arlington Mesa
Hassayampa Cotton Gin
Hassayampa River
Gila River
Gila
Wash
Phillips
Dickey
Luke
Cemennial
Powers Butte Fence
ARLINGTON VALLEY
Dixie
Hassayampa
LUKE AUXILIARY AIRFIELD
MISSOURI
STATE OF ARIZONA
GGL02
806
805
804
809
810
811
812
813
814
815
808
950
951
952
822
27' 30"
25'
20'
17' 30"
870000 FEET

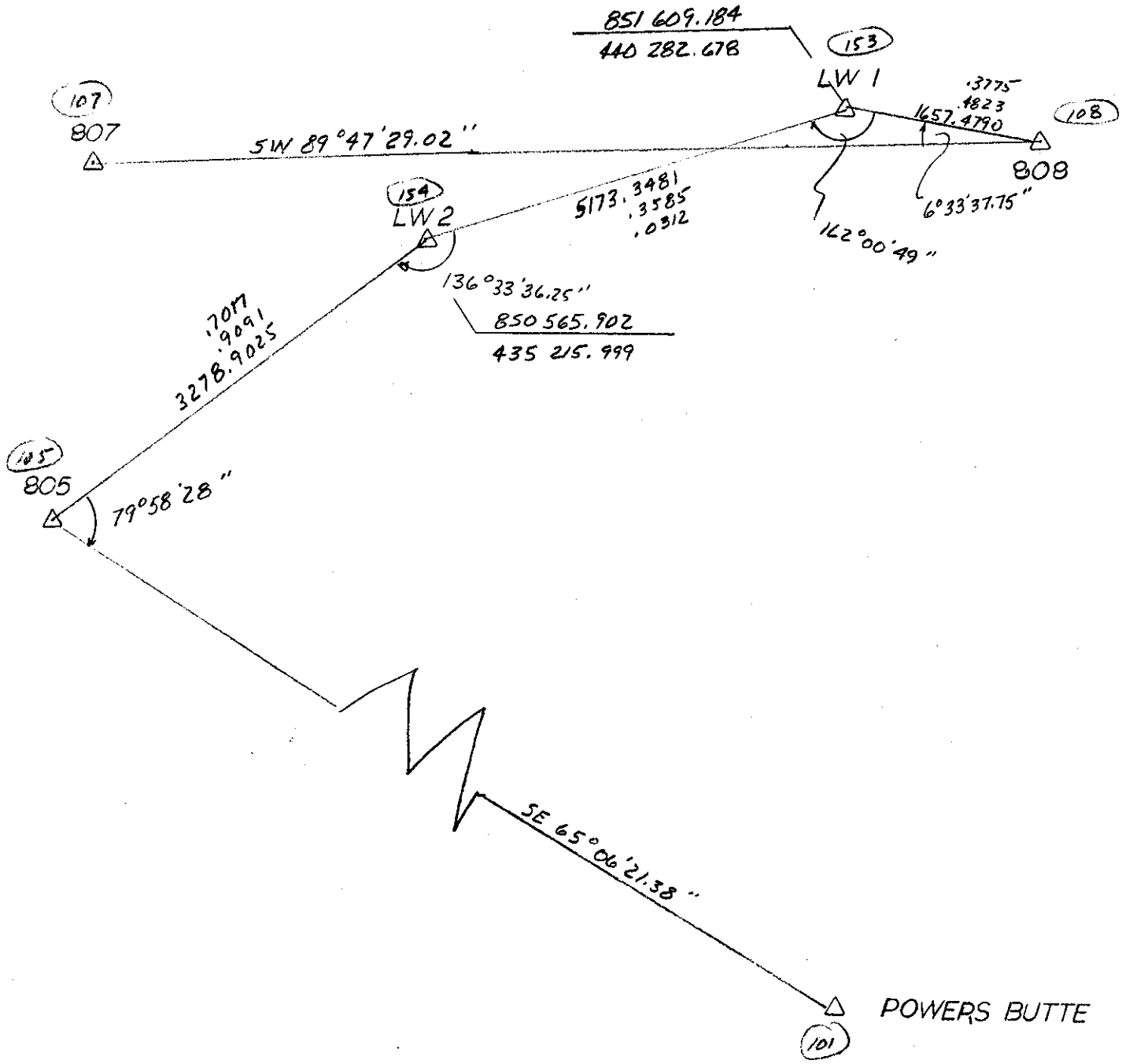

2
DIST. IN METERS
NAD 83
N
CGLO2 1971
272 024.065
132 945.740
METERS
K=0.9999797
18°30'06.125"
18°25'08.125"
(0°-04'-58")
F= US Survey Ft
M= Meters SI
K=0.9999786 STD REQ
12544.5709
4156.6468 F
38527.4008 F
11743.1753 M
N 14-48-43.55 W
16497.2924 M
(180°-17'-27")
92°17'42.5"
K=0.9999774 ON SITE
69°17'14.00"
13014.3524 F
3966.7825 M
120°37'42.875"
B09
B07
(51-20-28.875)
87°59'44.5"
19961.0363 F
6084.1360 M
S 55-40-50.267 E
K=0.9999745
STD REQ
15596.8842 F
4753.9398 M
1
256 074.987 METERS
137 163.271
Butte
40°39'43.5"
40°52'07.5"
(0°-12'-24")


2
CGLO 2
272 024.065
132 945.740
34°04'42.625"
2725.5353m
8942.0267F
B12
58°43'12.625"
2342.8226m
7686.4106F
B10
7
807
86°06'04.125"
2561.9198
8405.9287F
808
106°53'57.875"
191°50'10.00"
2920.1251m
9580.4438F
SEE FIG 4
804

815


811
812
1543.0557
5062.5087
82°34'01.5"
806
362.4478 m
1189.1957 F
66°46'10.75"
767.4776
2517.9662
950
807
7
115°37'26.00"
26°38'55.00"
1073.6479 m
3523.4499 F
55°42'03.875
805
822
3739.0697 m
12267.2646 F
60°13'36.25"
814
256074.987
137 163.271
Powers Butte
1


G6L02
N 72-58-37.43E
See Fig 1
809
69°17'14"
807
106°53'57.875" (37°36'43.875")
56°52'50.25"
2428.4036 m
7967.1874 F
3332.5432 m
10933.5187 F
S 69-24-41.09 E
26-38-55
Powers Butte
85°30'29.75"
3230.1976 m
10597.7400 F
804
270°21'21.375"
646.5806 m
2121.3232 F
94°53'21.75"
952
600.4428 m
1969.9529 F
53°23'46.75"
168°35'53.5"
102°52'18.625"
828.2357 m
2717.3033 F
951
1202.3666 m
3944.7644 F
813
822


851 609.184
440 282.678
153
LW 1
.3775
.4823
1657.4790
108
107
807
SW 89°47'29.02"
808
154
LW 2
5173.3481
.3585
.0312
6°33'37.75"
162°00'49"
136°33'36.25"
850 565.902
435 215.999
.7077
.9091
3278.9025
105
805
79°58'28"
SE 65°06'21.38"
POWERS BUTTE
101

COORDINATE FILE:LUKWSH LENGTH = 200 POINTS; TIME ON FILE: 0 30 07.24
LUKE WASH F.I.S.FCDMC CVL ***** JOB #91

6

********** COGO **********

FROM TYPE	BEARING	DISTANCE	TO	NORTHING	EASTING	ELEVATION
ENTER & ASSIGN						
			101	256,074.98700	137,163.27100	PWSBTT
			102	272,024.06500	132,945.74000	CGLO2
START			101	256,074.98700	137,163.27100	PWSBTT
101 INV NW	14 48 43.55	16497.2924	102	272,024.06500	132,945.74000	CGLO2

TIME FOR THIS RUN: 0 04 22.87; TOTAL TIME ON FILE: 0 34 30.11
COORDINATES STORED

***** LDR. ...ION ******

5069.9662 SLOPE DIST
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4.9000 H.I. REFLECTOR
86 57 37.00 ZENITH
5.1900 H.I. THEODOLITE
6.0000 H.I. TARGET
1140.5927 ELEV TARGET PT
5062.8292 H DIST INST PT
5062.6101 H DIST SEA LEVEL

5069.9662 SLOPE DIST
1140.5927 ELEV INST PT
4.9000 H.I. DM
5.1900 H.I. REFLECTOR
93 01 24.50 ZENITH
4.5000 H.I. THEODOLITE
6.0000 H.I. TARGET
872.2084 ELEV TARGET PT
5062.9042 H DIST INST PT
5062.6280 H DIST SEA LEVEL

12272.7707 SLOPE DIST
802.0270 ELEV INST PT
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5.0900 H.I. REFLECTOR
91 35 21.00 ZENITH
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12267.5436 H DIST SEA LEVEL

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8405.6165 H DIST SEA LEVEL

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8942.2336 H DIST SEA LEVEL

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8942.2240 H DIST SEA LEVEL

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⑧

***** EDM [illegible]CTION ******

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---

(16)

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2121.3711 H DIST SEA LEVEL

***** L... ...TION ******

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***** EDM ...TION ******

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7967.3617 H DIST SEA LEVEL

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7967.3733 H DIST SEA LEVEL

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13014.6310 H DIST SEA LEVEL

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90 27 54.00 ZENITH
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19963.3078 SLOPE DIST
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4.9600 H.I. REFLECTOR
89 32 06.00 ZENITH
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19961.4021 H DIST SEA LEVEL

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13015.3732 H DIST INST PT
13014.6459 H DIST SEA LEVEL

41159.[illegible] DIST
1067.7390 ELEV INST PT
4.6300 H.I. DM
5.6000 H.I. REFLECTOR
1140.5328 ELEV TARGET PT
41159.6291 H DIST INST PT
41157.5270 H DIST SEA LEVEL

15598.7204 SLOPE DIST
1294.6294 ELEV INST PT
4.9600 H.I. DM
4.3500 H.I. REFLECTOR
1168.3362 ELEV TARGET PT
15598.2478 H DIST INST PT
15597.2819 H DIST SEA LEVEL

19963.3078 SLOPE DIST
1294.6294 ELEV INST PT
4.9600 H.I. DM
4.9000 H.I. REFLECTOR
1140.5328 ELEV TARGET PT
19962.7815 H DIST INST PT
19961.5453 H DIST SEA LEVEL

38530.4236 SLOPE DIST
1168.3360 ELEV INST PT
4.4700 H.I. DM
5.5700 H.I. REFLECTOR
1067.7390 ELEV TARGET PT
38530.3786 H DIST INST PT
38528.2254 H DIST SEA LEVEL

```
COORDINATE FILE LUKWSH LENGTH =  200 POINTS; TIME ON FILE:   2 09 43.27
LUKE WASH F.I.S.FCDMC CVL       ***** JOB #91
```

6


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COORDINATE FILE LUKWSH LENGTH =  200 POINTS; TIME ON FILE:   2 09 43.27
LUKE WASH F.I.S.FCDMC CVL       ***** JOB #91
```


```
OLD FIELD DATA FILE:LW1

ANGLE TRAVERSE RESTARTED

                0 00 03.50 ANG ERROR
CORRECT LEG 1
  1  101    AL  40 52 07.50
            SE  14 48 40.05    6084.1360                    107
                0 00 03.50 ANG ERROR
CORRECT LEG 2
  2  107    AL 120 37 42.88
            SE  14 48 40.05   12544.5709                    200
                0 00 03.50 ANG ERROR

 LEG FROM            ANGLE      S.DIST      ZENITH  H.I.  H.T.
                    BEARING     H.DIST      V.DIST              TO       NORTHING        EASTING       ELEVATI

            NW  14 48 43.55 REF BRG
                                                            101   256,074.98700   137,163.27100 PWSBTT
  1  101    AL  40 52 07.50
            NW  55 40 51.05    6084.1360                    107   259,505.23605   132,138.32301 807
  2  107    AL 120 37 42.88
            NE   3 41 26.07   12544.5709                    200   272,023.79225   132,945.79417 CL102
  3  200    AL  18 30 06.13
            SE  14 48 40.05       0.0000                    199   272,023.79225   132,945.79417 AZ101
                                                     CLOSING PT:  272,024.06500   132,945.74000
            SE  14 48 43.55 REF BRG
                0 00 03.50 ANG ERROR
              - 0 00 01.17 ANG BALANCE

HORIZONTAL CLOSURE
  NE  20 05 45.22
          .31897 CLOSING LINE
    18,628.70690 DIST TRAV
    59,905.11624 PRECISION

                0 00 00.00 ANG BALANCE

HORIZONTAL CLOSURE
  NW  11 13 58.64
          .27808 CLOSING LINE
    18,628.70690 DIST TRAV
    66,991.17105 PRECISION

LEAST SQUARES ADJUSTMENT

 LEG FROM            ANGLE      S.DIST      ZENITH  H.I.  H.T.
                    BEARING     H.DIST      V.DIST              TO       NORTHING        EASTING       ELEVATIO

                                                            101   256,074.98700   137,163.27100 PWSBTT
  1  101    NW  55 40 50.60    6084.1538                    107   259,505.25710   132,138.31585 807
  2  107    NE   3 41 25.04   12544.8191                    200   272,024.06500   132,945.74000 CL102
```

3 20 NE 00 00.00 0.0000 199 272,024.06500 132,945.74000 AZ101

STD. DEVIATION OF UNIT WT 0.1531

AREA. SF36753.3950 ACRES

TIME FOR THIS RUN: 0 10 54.65; TOTAL TIME ON FILE: 2 20 37.92

COORDINATES STORED

```
COORDINATE FILE LUKWSH LENGTH =  200 POINTS; TIME ON FILE:   2 20 37.92
LUKE WASH F.I.S.FCDMC CVL        ***** JOB #91

OLD FIELD DATA FILE:LW2

ANGLE TRAVERSE RESTARTED

                 0 00 05.00 ANG ERROR
CORRECT LEG 1
  1  101    AL   0 12 24.00
            SE  14 48 38.55    4753.9398                    109
                 0 00 05.00 ANG ERROR
CORRECT LEG 2
  2  109    AR 180 17 27.00
            SE  14 48 38.55   11743.1753                    198
                 0 00 05.00 ANG ERROR

 LEG FROM            ANGLE      S.DIST     ZENITH  H.I.  H.T.
                    BEARING     H.DIST     V.DIST          TO        NORTHING        EASTING        ELEVATION

            NW  14 48 43.55 REF BRG
                                                         101    256,074.98700   137,163.27100 PWSBTT
  1  101    AL   0 12 24.00
            NW  15 01 07.55    4753.9398                 109    260,666.53703   135,931.35708 809
  2  109    AR 180 17 27.00
            NW  14 43 40.55   11743.1753                 198    272,023.87781   132,945.89622 CL102
  3  198    AL   0 04 58.00
            SE  14 48 38.55       0.0000                 197    272,023.87781   132,945.89622 AZ101
                                                   CLOSING PT:  272,024.06500   132,945.74000
            SE  14 48 43.55 REF BRG
                 0 00 05.00 ANG ERROR
               - 0 00 01.67 ANG BALANCE

HORIZONTAL CLOSURE
  NE  14 42 34.34
          .25370 CLOSING LINE
     16,497.11510 DIST TRAV
     65,025.30823 PRECISION

                 0 00 00.00 ANG BALANCE

HORIZONTAL CLOSURE
  NW  39 50 49.43
          .24381 CLOSING LINE
     16,497.11510 DIST TRAV
     67,663.79781 PRECISION

LEAST SQUARES ADJUSTMENT

 LEG FROM            ANGLE      S.DIST     ZENITH  H.I.  H.T.
                    BEARING     H.DIST     V.DIST          TO        NORTHING        EASTING        ELEVATION

                                                         101    256,074.98700   137,163.27100 PWSBTT
  1  101    NW  15 01 07.95    4753.9708                 109    260,666.56459   135,931.34015 809
  2  109    NW  14 43 42.20   11743.3651                 198    272,024.06500   132,945.74000 CL102
  3  198    NE   0 00 00.00       0.0000                 197    272,024.06500   132,945.74000 AZ101
STD. DEVIATION OF UNIT WT      0.1186

AREA.          SF37504.0044 ACRES
```

TIME FOR THIS WOR. 0 04 31.30; TOTAL TIME ON FILE: 2 25 09.21

COORDINATES STORED

19

COORDINATE FILE:LUKWSH LENGTH = 200 POINTS; TIME ON FILE: 2 25 09.21
LUKE WASH F.I.S.FCDMC CVL ***** JOB #91

********** COGO **********

FROM	TYPE	BEARING	DISTANCE	TO	NORTHING	EASTING	ELEVATION
START				107	259,505.25710	132,138.31585	807
107	INV NE	72 58 37.28	3966.8209	109	260,666.56459	135,931.34015	809
109	INV SW	72 58 37.28	3966.8209	107	259,505.25710	132,138.31585	807
107	TRAV NE	72 58 37.28	1983.4105	196	260,085.91085	134,034.82800	

TIME FOR THIS RUN: 0 03 53.12; TOTAL TIME ON FILE: 2 29 02.33
COORDINATES STORED

COORDINATE FILE LUKWSH LENGTH = 200 POINTS; TIME ON FILE: 2 29 02.33
LUKE WASH F.I.S.FCDMC CVL ***** JOB #91

NEW FIELD DATA FILE: LK3 CREATED; LENGTH =3 LEGS
DESCR:809 CGL02 807

******* FIELD TRAVERSE *********

LEG	FROM	ANGLE / BEARING	S.DIST / H.DIST	ZENITH / V.DIST	H.I.	H.T.	TO	NORTHING	EASTING	ELEVATIO
		SW 72 58 37.28 REF BRG								
							109	260,666.56459	135,931.34015	809
1	109	AR 92 17 42.50								
		NW 14 43 40.22	11743.1753				195	272,023.91015	132,945.89746	
2	195	AR 18 25 08.13								
		SW 3 41 27.90	12544.5709				194	259,505.36111	132,138.31523	
3	194	AR 193 00 00.00								
		SW 16 41 27.90	3966.7760				193	255,705.71650	130,999.01163	
							CLOSING PT:	260,666.56459	135,931.34015	
		SW 72 58 37.28 REF BRG								
		- 56 17 09.38 ANG ERROR								

TEMPORARY DATA SAVED
TIME FOR THIS RUN: 0 08 03.37; TOTAL TIME ON FILE: 2 37 05.70

COORDINATES STORED

```
COORDINATE FILE LUKWSH LENGTH =  200 POINTS; TIME ON FILE:   2 37 05.70
LUKE WASH F.I.S.FCDMC CVL       ***** JOB #91

OLD FIELD DATA FILE:LK3

ANGLE TRAVERSE RESTARTED

              - 56 17 09.38 ANG ERROR
CORRECT LEG 3
  3  194    AR  69 17 14.00
            NE  72 58 41.90    3966.7825                    193
              -179 59 55.38 ANG ERROR

 LEG FROM              ANGLE      S.DIST      ZENITH  H.I.  H.T.
                      BEARING     H.DIST      V.DIST              TO        NORTHING        EASTING        ELEVATION

            SW  72 58 37.28 REF BRG
                                                             109    260,666.56459    135,931.34015 B09
  1  109    AR  92 17 42.50
            NW  14 43 40.22   11743.1753                     195    272,023.91015    132,945.09746 T102
  2  195    AR  18 25 08.12
            SW   3 41 27.90   12544.5709                     194    259,505.36111    132,138.31523 T107
  3  194    AR  69 17 14.00
            NE  72 58 41.90    3966.7825                     193    260,666.57225    135,931.32882 CL109
                                                       CLOSING PT:  260,666.56459    135,931.34015
            NE  72 58 37.28 REF BRG
                 0 00 04.62 ANG ERROR
              -  0 00 01.54 ANG BALANCE

HORIZONTAL CLOSURE
  SW  48 02 50.01
          .08724 CLOSING LINE
    20,254.52870 DIST TRAV
   323,872.62487 PRECISION

COMPASS ADJUSTMENT

 LEG FROM              ANGLE      S.DIST      ZENITH  H.I.  H.T.
                      BEARING     H.DIST      V.DIST              TO        NORTHING        EASTING        ELEVATION

                                                             109    260,666.56459    135,931.34015 B09
  1  109    NW  14 43 42.33   11743.1587                     195    272,023.86360    132,945.70561 T102
  2  195    SW   3 41 25.27   12544.5986                     194    259,505.27659    132,138.36171 T107
  3  194    NE  72 58 37.55    3966.7714                     193    260,666.56459    135,931.34015 CL109

AREA 23272539.40 SF  534.2640 ACRES

TIME FOR THIS RUN:    0 02 30.99; TOTAL TIME ON FILE:   2 39 36.69

COORDINATES STORED
```

COORDINATE F... ...RWSH LENGTH = 200 POINTS; TIME ON FILE: 2 39 36.69
LUKE WASH F.I.S.FCDMC CVL ***** JOB #91

OLD FIELD DATA FILE:LK3

ANGLE TRAVERSE RESTARTED

0 00 04.62 ANG ERROR

LEG	FROM		ANGLE BEARING	S.DIST H.DIST	ZENITH V.DIST	H.I.	H.T.	TO	NORTHING	EASTING	ELEVAT
		SW	72 58 37.28 REF BRG								
								109	260,666.56459	135,931.34015	809
1	109	AR	92 17 42.50								
		NW	14 43 40.22	11743.1753				195	272,023.91015	132,945.89746	T102
2	195	AR	18 25 08.12								
		SW	3 41 27.98	12544.5709				194	259,505.36111	132,138.31523	T107
3	194	AR	69 17 14.00								
		NE	72 58 41.90	3966.7825				193	260,666.57225	135,931.32882	CL109
								CLOSING PT:	260,666.56459	135,931.34015	
		NE	72 58 37.28 REF BRG								
			0 00 04.62 ANG ERROR								
		-	0 00 01.54 ANG BALANCE								

HORIZONTAL CLOSURE
SW 48 02 50.81
.08724 CLOSING LINE
20,254.52870 DIST TRAV
323,872.62487 PRECISION

0 00 00.00 ANG BALANCE

HORIZONTAL CLOSURE
SE 55 56 41.85
.01367 CLOSING LINE
20,254.52870 DIST TRAV
2,066,644.05005 PRECISION

LEAST SQUARES ADJUSTMENT

LEG	FROM		ANGLE BEARING	S.DIST H.DIST	ZENITH V.DIST	H.I.	H.T.	TO	NORTHING	EASTING	ELEVAT
								109	260,666.56459	135,931.34015	809
1	109	NW	14 43 42.26	11743.1655				195	272,023.87109	132,945.78750	T102
2	195	SW	3 41 25.28	12544.6116				194	259,505.27120	132,138.36173	T107
3	194	NE	72 58 37.28	3966.7730				193	260,666.56459	135,931.34015	CL109

STD. DEVIATION OF UNIT WT 0.0776

AREA 23272560.45 SF 534.2645 ACRES

TIME FOR THIS RUN: 0 02 15.06; TOTAL TIME ON FILE: 2 41 51.75

COORDINATES STORED

```
COORDINATE FILE LUKWSH LENGTH =  200 POINTS; TIME ON FILE:   2 41 51.75
LUKE WASH F.I.S.FCDMC CVL        ***** JOB #91

NEW FIELD DATA FILE: LK4      CREATED; LENGTH =3 LEGS
DESCR:809 PB 807

******* FIELD TRAVERSE *********

 LEG FROM              ANGLE       S.DIST      ZENITH  H.I.  H.T.
                      BEARING      H.DIST      V.DIST              TO        NORTHING        EASTING        ELEVATION

            SW  72 58 37.28 REF BRG
                                                                 109    260,666.56459   135,931.34015 809
   1  109   AL  87 59 44.50
            SE  15 01 07.22    4753.9398                         192    256,075.01259   137,163.24672
   2  192   AL  40 39 43.50
            NW  55 40 50.72    6084.1360                         190    259,505.26968   132,138.30422
   3  190   AL  51 20 28.87
            NE  72 58 40.41    3966.7825                         189    260,666.50840   135,931.30936
                                                          CLOSING PT:   260,666.56459   135,931.34015
            NE  72 58 37.28 REF BRG
                 0 00 03.13 ANG ERROR
               - 0 00 01.04 ANG BALANCE

HORIZONTAL CLOSURE
  NE  54 07 57.13
          .07384 CLOSING LINE
     14,804.85830 DIST TRAV
    200,502.69217 PRECISION

                 0 00 00.00 ANG BALANCE

HORIZONTAL CLOSURE
  NE  28 42 52.49
          .06408 CLOSING LINE
     14,804.85830 DIST TRAV
    231,052.30076 PRECISION

LEAST SQUARES ADJUSTMENT

 LEG FROM              ANGLE       S.DIST      ZENITH  H.I.  H.T.
                      BEARING      H.DIST      V.DIST              TO        NORTHING        EASTING        ELEVATION

                                                                 109    260,666.56459   135,931.34015 809
   1  109   SE  15 01 08.61    4753.9204                         192    256,075.03957   137,163.27256 T101
   2  192   NW  55 40 51.81    6084.1186                         190    259,505.26036   132,138.32632 T107
   3  190   NE  72 58 37.28    3966.8100                         189    260,666.56459   135,931.34015 CL109
STD. DEVIATION OF UNIT WT      0.0368

AREA  9423182.95 SF  216.3265 ACRES

TIME FOR THIS RUN:    0 04 38.80; TOTAL TIME ON FILE:   2 46 30.55

COORDINATES STORED
```

COORDINATE FILE:LUKWSH LENGTH = 200 POINTS; TIME ON FILE: 2 46 30.55
LUKE WASH F.I.S.FCDMC CVL ***** JOB #91

********** COGO **********

FROM	TYPE	BEARING	DISTANCE	TO	NORTHING	EASTING	ELEVATION
ENTER & ASSIGN	Final Junc. Adj'd Coord's						
				107	259,505.26290	132,138.32465	807
START				107	259,505.26290	132,138.32465	807
107	INV NE	72 58 37.43	3966.8108	109	260,666.56459	135,931.34015	809
109	INV SW	72 58 37.43	3966.8108	107	259,505.26290	132,138.32465	807

TIME FOR THIS RUN: 0 03 15.06; TOTAL TIME ON FILE: 2 49 45.61
COORDINATES STORED

```
COORDINATE FILE LUKWSH LENGTH =  200 POINTS; TIME ON FILE:   2 49 45.61
LUKE WASH F.I.S.FCDMC CVL        ***** JOB #91

NEW FIELD DATA FILE: LK1      CREATED; LENGTH =3 LEGS
DESCR:807 804 809

******* FIELD TRAVERSE *********

 LEG FROM              ANGLE       S.DIST      ZENITH  H.I.  H.T.
                      BEARING      H.DIST      V.DIST              TO        NORTHING        EASTING        ELEVATI

            NE  72 58 37.43 REF BRG
                                                                 107    259,505.26290   132,138.32465 807
   1  107    AR  37 36 43.88
             SE  69 24 38.69    3332.5432                        104    258,333.32064   135,258.00340 804
   2  104    AR  85 30 29.75
             NE  16 05 51.06    2428.4036                        188    260,666.50939   135,931.33412 CL109
   3  188    AR  56 55 02.50  CORRECTION:
   3  188    AR  56 52 50.25
             SW  72 58 41.31       0.0000                        187    260,666.50939   135,931.33412 AZ107
                                                          CLOSING PT:   260,666.56459   135,931.34015
            SW  72 58 37.43 REF BRG
                 0 00 03.88 ANG ERROR
               - 0 00 01.29 ANG BALANCE

HORIZONTAL CLOSURE
  NE  45 42 57.10
          .03900 CLOSING LINE
     5,760.94680 DIST TRAV
   147,735.40071 PRECISION

                 0 00 00.00 ANG BALANCE

HORIZONTAL CLOSURE
  NE   6 14 15.09
          .05552 CLOSING LINE
     5,760.94680 DIST TRAV
   103,754.61398 PRECISION

LEAST SQUARES ADJUSTMENT

 LEG FROM              ANGLE       S.DIST      ZENITH  H.I.  H.T.
                      BEARING      H.DIST      V.DIST              TO        NORTHING        EASTING        ELEVATIO

                                                                 107    259,505.26290   132,138.32465 807
   1  107    SE  69 24 41.09    3332.5620                        104    258,333.35031   135,258.03458 804
   2  104    NE  16 05 48.40    2428.4211                        188    260,666.56459   135,931.34015 CL109
   3  188    NE   0 00 00.00       0.0000                        187    260,666.56459   135,931.34015 AZ107
STD. DEVIATION OF UNIT WT      0.0269

AREA411393509.35 SF 9444.2954 ACRES

TIME FOR THIS RUN:    0 06 55.98; TOTAL TIME ON FILE:   2 56 41.59

COORDINATES STORED
```

COORDINATE FILE LUKWSH LENGTH = 200 POINTS; TIME ON FILE: 2 56 41.59
LUKE WASH F.I.S.FCDMC CVL ***** JOB #91

NEW FIELD DATA FILE: LK2 CREATED; LENGTH =6 LEGS
DESCR:807 822 951 813 952 804

******* FIELD TRAVERSE *********

LEG	FROM		ANGLE / BEARING	S.DIST / H.DIST	ZENITH / V.DIST	H.I.	H.T.	TO	NORTHING	EASTING	ELEVATION
		SE	55 40 50.27 REF BRG								
								107	259,505.26290	132,138.32465	807
1	107	AR	26 38 55.00								
		SE	29 01 55.27	3230.1976				122	256,680.94401	133,705.93408	822
2	122	AR	102 52 18.63								
		NE	73 50 23.36	828.2357				151	256,911.46156	134,501.44400	951
3	151	AR	168 35 53.50								
		NE	62 26 16.86	1202.3666				113	257,467.80613	135,567.35495	813
4	113	AR	53 23 46.75								
		NW	64 09 56.39	600.4428				152	257,729.46142	135,026.92173	952
5	152	AL	94 53 21.75								
		NE	20 56 41.86	646.5806				186	258,333.31872	135,258.05553	CL104
6	186	AL	270 21 21.38								
		NW	69 24 39.52	0.0000				185	258,333.31872	135,258.05553	AZ107
								CLOSING PT:	258,333.35031	135,258.03458	
		NW	69 24 41.09 REF BRG								
			0 00 01.57 ANG ERROR								
		-	0 00 00.26 ANG BALANCE								

HORIZONTAL CLOSURE
NW 33 54 21.85
.02987 CLOSING LINE
6,507.82330 DIST TRAV
217,877.72633 PRECISION

0 00 00.00 ANG BALANCE

HORIZONTAL CLOSURE
NW 33 32 52.60
.03790 CLOSING LINE
6,507.82330 DIST TRAV
171,692.75311 PRECISION

LEAST SQUARES ADJUSTMENT

LEG	FROM		ANGLE / BEARING	S.DIST / H.DIST	ZENITH / V.DIST	H.I.	H.T.	TO	NORTHING	EASTING	ELEVATION
								107	259,505.26290	132,138.32465	807
1	107	SE	29 01 55.61	3230.1765				122	256,680.96506	133,705.92849	822
2	122	NE	73 50 22.20	828.2349				151	256,911.48686	134,501.43636	951
3	151	NE	62 26 15.19	1202.3655				113	257,467.83952	135,567.34184	813
4	113	NW	64 09 58.07	600.4435				152	257,729.49074	135,026.90582	952
5	152	NE	20 56 40.10	646.5809				186	258,333.35031	135,258.03458	CL104
6	186	NE	0 00 00.00	0.0000				185	258,333.35031	135,258.03458	AZ107

STD. DEVIATION OF UNIT WT 0.0129

AREA477898656.25 SF10971.0435 ACRES

TIME FOR [illegible]: 0 14 24.67; TOTAL TIME ON FILE: 3 11 06.26

COORDINATES STORED

COORDINATE FILE:LUKWSH LENGTH = 200 POINTS; TIME ON FILE: 3 11 06.26
LUKE WASH F.I.S.FCDMC CVL ***** JOB #91

********** COGO **********

FROM	TYPE	BEARING	DISTANCE	TO	NORTHING	EASTING	ELEVATION
START				102	272,024.06500	132,945.74000	CGL02
102	INV SW	3 41 24.90	12544.0127	107	259,505.26290	132,138.32465	807
107	S.S. NE	37 46 08.52	2725.5352	112	261,659.76071	133,807.66024	812
107	S.S. NE	62 24 37.52	2342.8226	110	260,590.30560	134,214.73985	810
107	S.S. NE	89 47 29.02	2561.9198	108	259,514.59041	134,700.22747	808
107	TRAV SW	15 31 34.90	2920.1251	115	256,691.70076	131,356.66060	815
START				101	256,074.98700	137,163.27100	PWSBTT
101	INV NW	55 40 58.27	6084.1498	107	259,505.26290	132,138.32465	807
107	S.S. SW	3 01 13.61	1073.6449	105	258,433.10951	132,081.75180	805
107	S.S. SW	4 32 45.98	3739.0697	114	255,777.95679	131,841.96113	814
107	TRAV SW	59 56 35.73	767.4776	150	259,120.86607	131,474.04990	950
150	TRAV NW	6 49 35.02	362.4676	106	259,480.76409	131,430.96650	806
START				112	261,659.76071	133,807.66024	812
112	INV SW	37 46 08.52	2725.5352	107	259,505.26290	132,138.32465	807
107	TRAV NW	44 47 52.98	1543.0557	111	260,600.20710	131,051.07210	811

LIST METERS

101	256,074.98700	137,163.27180	PWSBTT
102	272,024.06500	132,945.74000	CGL02
104	258,333.35031	135,258.03458	804
105	258,433.10951	132,081.75180	805
106	259,480.76409	131,430.96650	806
107	259,505.26290	132,138.32465	807
108	259,514.59041	134,700.22747	808
109	260,666.56459	135,931.34015	809
110	260,590.30560	134,214.73985	810
111	260,600.20710	131,051.07210	811
112	261,659.76071	133,807.66024	812
113	257,467.83952	135,567.34184	813
114	255,777.95679	131,841.96113	814
115	256,691.70076	131,356.66060	815
122	256,680.96506	133,705.92849	822
150	259,120.86607	131,474.04990	950
151	256,911.48686	134,501.43636	951
152	257,729.49074	135,026.90582	952
185	258,333.35031	135,258.03458	AZ107
186	258,333.35031	135,258.03458	CL104
187	260,666.56459	135,931.34015	AZ107
188	260,666.56459	135,931.34015	CL109
189	260,666.56459	135,931.34015	CL109
190	259,505.26036	132,138.32632	T107
192	256,075.03957	137,163.27256	T101
193	260,666.56459	135,931.34015	CL109
194	259,505.27120	132,138.36173	T107
195	272,023.87109	132,945.78750	T102
196	260,085.91085	134,034.82800	
197	272,024.06500	132,945.74000	AZ101
198	272,024.06500	132,945.74000	CL102
199	272,024.06500	132,945.74000	AZ101
200	272,024.06500	132,945.74000	CL102

TIME FOR THIS RUN: 0 16 21.83; TOTAL TIME ON FILE: 3 27 28.09

COORDINATES STORED

24

**** COORDIN... ...E SYSTEM ****

- -

COORDINATE FILE:LUKWSH LENGTH= 200 POINTS; TIME ON FILE: 3 27 28
LUKE WASH F.I.S.FCDMC CVL ***** JOB #91

- -

BACKUP FILE CREATED:

- -

COORDINATE FILE:LWIF LENGTH= 200 POINTS; TIME ON FILE: 3 27 28
LUKE WASH F.I.S.FCDMC CVL ***** JOB #91

- -

- -

COORDINATE FILE:LUKWSH LENGTH= 200 POINTS; TIME ON FILE: 3 27 28
LUKE WASH F.I.S.FCDMC CVL ***** JOB #91

- -

BACKUP FILE CREATED:

- -

COORDINATE FILE:LW27 LENGTH= 200 POINTS; TIME ON FILE: 3 27 28
LUKE WASH F.I.S.FCDMC CVL ***** JOB #91

- -

30

COORDINATE FILE:LWIF LENGTH = 200 POINTS; TIME ON FILE: 3 27 28.09
LUKE WASH F.I.S.FCDMC CVL ***** JOB #91

********** COGO **********

FROM	TYPE	BEARING	DISTANCE	TO	NORTHING	EASTING	ELEVATION
LIST							
				101	256,074.98700	137,163.27100	PWSBTT
				102	272,024.06500	132,945.74000	CGL02
				104	258,333.35031	135,258.03458	804
				105	258,433.10951	132,001.75180	805
				106	259,480.76409	131,430.96650	806
				107	259,505.26290	132,138.32465	807
				108	259,514.59041	134,700.22747	808
				109	260,666.56459	135,931.34015	809
				110	260,590.30560	134,214.73985	810
				111	260,608.20710	131,051.07210	811
				112	261,659.76071	133,807.66024	812
				113	257,467.03952	135,567.34184	813
				114	255,777.95679	131,041.96113	814
				115	256,691.70076	131,356.68060	815
				122	256,690.96586	133,705.92847	822
				150	259,120.86607	131,474.04990	950
				151	258,911.40686	134,501.43636	951
				152	257,729.49074	135,026.90582	952
START				101	256,074.98700	137,163.27100	PWSBTT
101	INV NW	14 48 43.55	16497.2924	102	272,024.06500	132,945.74000	CGL02

Metric Values Before Scaling

TIME FOR THIS RUN: 0 02 16.18; TOTAL TIME ON FILE: 3 29 44.26
COORDINATES STORED

COORDINATE FILE:LWIF LENGTH = 200 POINTS; TIME ON FILE: 3 29 44.26
LUKE WASH F.I.S.FCDMC CVL ***** JOB #91

********** ROTATION **********

ROTATE LINE 101TO 102 ABOUT 101 NW 14 48 43.55 16497.2924
TO NW 14 48 43.55
A ROTATION OF- 0 00 00.00
SCALE 3.2808399
TRANSLATE TO: 101 840,141.03400 450,010.73200

FROM	BEARING	DISTANCE	TO	NORTHING	EASTING
			101	840,141.03400	450,010.73200
			102	892,467.40539	436,173.68803
			104	847,550.36245	443,759.95635
			105	847,877.65642	433,339.08108
			106	851,314.84335	431,203.95871
			107	851,395.22003	433,524.68753
			108	851,425.82208	441,929.88051
			109	855,205.26495	445,968.96412
			110	854,955.07139	440,337.07336
			111	854,987.55662	429,957.58600
			112	858,463.78239	439,001.51034
			113	844,710.76011	444,774.74394
			114	839,166.52542	432,552.36627
			115	842,164.37311	430,960.17295
			122	842,129.15899	438,667.74477
			150	850,134.07558	431,345.30843
			151	842,885.45612	441,277.67072
			152	845,569.19589	443,001.65990

TIME FOR THIS RUN: 0 07 53.41
TOTAL TIME ON FILE: 3 37 37.67
COORDINATES STORED

COORDINATE FILE:LWIF LENGTH = 200 POINTS; TIME ON FILE: 3 37 37.67
LUKE WASH F.I.S.FCDMC CVL ***** JOB #91

********** COGO **********

FROM	TYPE	BEARING	DISTANCE	TO	NORTHING	EASTING	ELEVATION

PTS 153 THRU 200 CLEARED
TIME FOR THIS RUN: 0 00 48.68; TOTAL TIME ON FILE: 3 38 26.35
COORDINATES STORED

32

**** COOR[illegible] SYSTEM ****

- -

COORDINATE FILE:LWIF LENGTH= 200 POINTS; TIME ON FILE: 3 38 26
LUKE WASH F.I.S.FCDMC CVL ***** JOB #91

- -

NEW HEADER:

- -

COORDINATE FILE:LWIF LENGTH= 200 POINTS; TIME ON FILE: 3 38 26.35
LUKE WASH F.I.S.FCDMC CVL ***** JOB #91122

- -

33

COORDINATE FILE:LWIF LENGTH = 200 POINTS; TIME ON FILE: 3 38 26.35
LUKE WASH F.I.S.FCDMC CVL ***** JOB #91122

********** COGO ********** NAD 83 INT. FT.

FROM	TYPE	BEARING	DISTANCE	TO	NORTHING	EASTING	ELEVATION
LIST							
				101	840,141.034	450,010.732	PWSØTT
				102	892,467.405	436,173.688	CGL02
				104	847,550.362	443,759.956	804
				105	847,077.656	433,339.081	805
				106	851,314.043	431,203.959	806
				107	851,395.220	433,524.688	807
				108	851,425.822	441,929.881	808
				109	855,205.265	445,968.964	809
				110	854,955.071	440,337.073	810
				111	854,987.557	429,957.586	811
				112	858,463.782	439,001.510	812
				113	844,710.760	444,774.744	813
				114	839,166.525	432,552.366	814
				115	842,164.373	430,960.173	815
				122	842,129.151	438,667.745	822
				150	850,134.076	431,345.308	950
				151	842,885.456	441,277.679	951
				152	845,569.196	443,001.660	952

TIME FOR THIS RUN: 0 02 48.49; TOTAL TIME ON FILE: 3 41 14.84
COORDINATES STORED

• AMC • VERTICAL ANGLE TRAVERSE

JOB 91122

PAGE 1 of 4

FIELD WORK BY Barbee DATE Sept-Oct 91

CALCULATIONS BY Cook DATE

STATION	VERTICAL ANGLE	SLOPE DIST	H.I.	H.T.	C&R	ADJUSTED DIFF. IN ELEV.	MEAN DIFF. IN ELEV.	CALCULATED ELEVATION	ELEVATION
952	91-43-32	F 1970.9705	5.13	5.10				840.4140	840.491
		600.7530 m	5.13	5.10					
813	✓	SLF 1969.9974							781.014
952	89-38-24.5	F 2121.5000	5.13	9.12					
		646.6345	5.13	9.12					
804	✓	SLF 2121.3711						849.8413	850.001
809	92-16-54.5	F 7974.0802	4.75	6.65		-318.0720		1168.2210	11
		M 2430.5045	4.75	5.40			318.21995		
804	87-42-59.5	SLF 7967.3675	5.34	6.00		+ 318.3657			850.001

C&R = (dist. in thousands of feet)^2 X 0.02059

V

• AMC • VERTICAL ANGLE TRAVERSE

F = US Surv Ft.
SLF = Sea Level US Ft

JOB 91122
PAGE 2 of 4
FIELD WORK BY BARBEE DATE Sept-Oct 91
CALCULATIONS BY COOK DATE

STATION	VERTICAL ANGLE	METERS SLOPE DIST	H.I.	H.T.	C&R	ADJUSTED DIFF. IN ELEV.	MEAN DIFF. IN ELEV.	CALCULATED ELEVATION	ELEVATION
811 ⊼	86°57'37"	F 5069.9662	5.19	6.00		+268.5727			872.020
		M 1545.3288	5.19	4.90			+268.4785		
807 ⊕	93°01'24.5" ✓	SLF 5062.6231	4.50	6.00		-268.3843		1140.4986	
814 ⊼	88°26'01.5"	F 12,272.7707	5.09	5.35		+338.2903			802.027
		M 3740.7480	5.09	4.9			+338.2228		
807 ⊕	91°35'21" ✓	SLF 12267.5418	4.5	5.40		-338.1553		1140.2498	
CGL02 ⊼	89°55'56.5"	F 41,159.7769	4.63	6.00		+82.1198		1063.3424	1067.739
*		M 12545.5251	4.63	5.60			-77.1905		
807 ⊕	10°08'42.5" ✓	SLF 41157.5270	4.50	6.00		-72.2611			1140.5328
Powers Bm #2 ⊼	90°28'49.5"	F 15,598.7204	4.96	5.45		-126.2692		1311.2483	1294.6294
*		M 4754.4995	4.96	4.35			-126.2151		
809 ⊕	89°32'59.5" ✓	SLF 15597.2819	4.60	6.00		+126.1609		1185.0333 ~~1175.6917~~	1168.3362
807 ⊕		F 13,015.3972							1140.5328
*		M 3967.1010	4.60	4.90			+28.1795	1168.2210 ~~1124.1977~~ ~~1175.6917~~	
809 ⊼	90-08-10 ✓	SLF 13014.6465	4.60	5.35					1168.3362
Powers Butte ⊼	90-27-54	F 19,963.3078	4.96	5.45				~~1311.2483~~	1294.6294
*		M 6084.8284	4.96	4.90			-154.2966	1294.4361	
807 ⊕	✓	SLF 19961.5453						1140.1395	1140.5328

C&R = (dist. in thousands of feet)^2 X 0.02059

V

• AMC • VERTICAL ANGLE TRAVERSE

JOB 91122

PAGE 3 of 4

FIELD WORK BY Barbee DATE Sept-Oct 91

CALCULATIONS BY Cook DATE

STATION	VERTICAL ANGLE	SLOPE DIST	H.I.	H.T.	C&R	ADJUSTED DIFF. IN ELEV.	MEAN DIFF. IN ELEV.	CALCULATED ELEVATION	ELEVATION
950	89-53-26	F 1189.2726	5.10	4.60				836.3984	
		M 362.4910	5.10	4.60					
806	✓	SLF 1189.2226							839.141
809	90-10-50	F 38530.4236	4.47	6.00		-92.3673		1175.6917	1168.336
*		M 11744.0966	4.47	5.57					
6402 C	✓	SLF 38528.2254						1083.3244	1067.739
950	83-06-30	F 2536.4336	5.17	5.35		+304.3100		836.2033	836.268
		773.1065 m	5.17	4.90			+304.3298		
807	96-51-39 ✓	SLF 2518.0231	4.50	6.00		-304.3495			1140.5330
822	88-03-22	F 10604.6392	5.31	5.35		—			778.407
		3232.3005 m	5.31	4.90			—		
807	91-57-22.5 ✓	SLF 10597.9795	4.50	6.50		—			1140.533
951	90-01-05	F 2717.4683	5.25	7.00				781.1655	781.130
		828.2860 m	5.25	5.10					
822	✓	SLF 2717.3647							778.407
951	89-59-43.5	F 3945.0020	5.25	5.95					
		1202.4390 m	5.25	5.32					
813	✓	SLF 3944.8536						781.1017	781.014

C&R = (dist. in thousands of feet)^2 X 0.02059

V

• AMC • VERTICAL ANGLE TRAVERSE F = US Survey Ft
SLF = Sea Level US FT

JOB 91122
PAGE 4 of 4
FIELD WORK BY BARBEIE DATE Sept-Oct-91
CALCULATIONS BY COOK DATE Oct 91

Dist in Meters

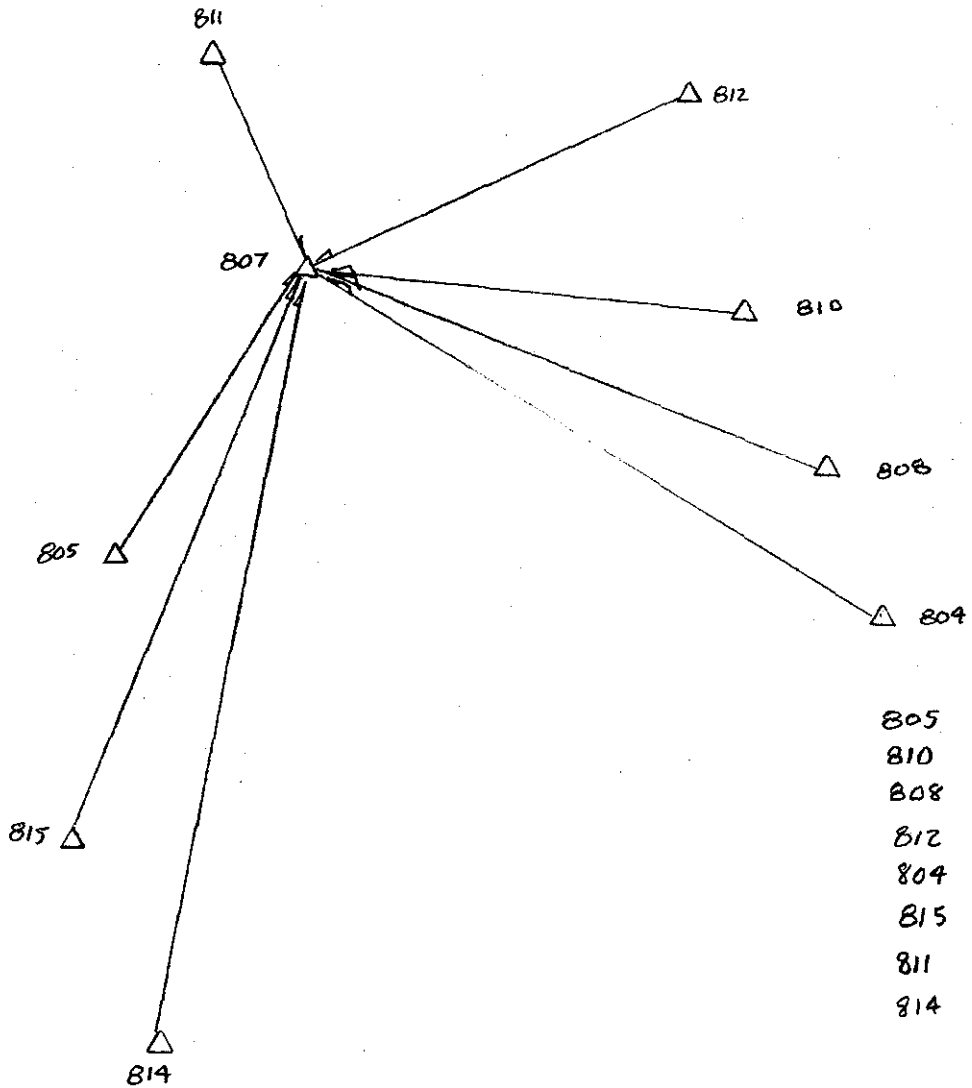
STATION	VERTICAL ANGLE	SLOPE DIST	H.I.	H.T.	C&R	ADJUSTED DIFF. IN ELEV.	MEAN DIFF. IN ELEV.	CALCULATED ELEVATION	ELEVATION
805 T	84°58'01.5"	F 3536.2567	5.23	6.00		+ 309.7230			830.802
		M 1077.8532	5.23	4.90			+309.7184		
807 P	95°00'16" ✓	SLF 3522.5295	4.5	6.00		- 309.7138		1140.5204	
810 T	87°57'12"	F 7691.8836	5.15	6.00		+ 275.0720			865.328
		M 2344.4908	5.15	5.35			+ 275.1121		
807 P	92°02'52.5" ✓	SLF 7686.5843	4.5	6.00		- 275.1522		1140.4401	
808 T	88°12'52"	F 8410.1374	5.14	6.00		+ 262.6459			877.849
		M 2563.4150	5.14	5.35			+ 262.7155		
807 P	91°47'25" ✓	SLF 8405.6187	4.50	6.00		- 262.7851		1140.5645	
812 T	88°18'44"	F 8946.5779	5.20	6.00		+ 264.3518			876.061
		M 2726.9224	5.20	5.35			+ 264.5145		
807 P	91°41'46.5" ✓	SLF 8942.2288	4.50	6.00		- 264.6772		1140.5755	
804 T	88°29'18"	F 10,938.1441	5.36	6.00		+ 290.3772			850.001
		M 3333.9530	5.36	5.35			+ 290.3883		
807 P	91°31'35" ✓	SLF 10,933.7658	4.50	6.00		- 290.3993		1140.3893	
815 T	88°02'13.5	F 9586.7797	5.00	6.00		+ 329.2651			811.085
		M 2922.0563	5.00	4.90			+ 329.7734		
807 P	91°58'21" ✓	SLF 9580.6603	4.50	6.70		- 330.2817		1140.8584	

C&R = (dist. in thousands of feet)^2 X 0.02059

V

91122 ①

VABM'



805	$830.802 + 309.7184 \frac{1}{1.078} \times 1140.5204 = 0.4827$
810	$865.321 + 275.1121 \frac{1}{2.344} \times 1140.4401 = 0.1878$
808	$877.849 + 262.7155 \frac{1}{2.563} \times 1140.5645 = 0.2202$
812	$876.061 + 264.5195 \frac{1}{2.727} \times 1140.5755 = 0.2110$
804	$850.001 + 290.3583 \frac{1}{3.334} \times 1140.3893 = 0.1168$
815	$811.085 + 329.7734 \frac{1}{2.922} \times 1140.8584 = 0.2938$
811	$872.020 + 268.4785 \frac{1}{1.545} \times 1140.4986 = 0.3227$
814	$802.027 + 338.2228 \frac{1}{12.268} \times 1140.2498 = 0.0204$

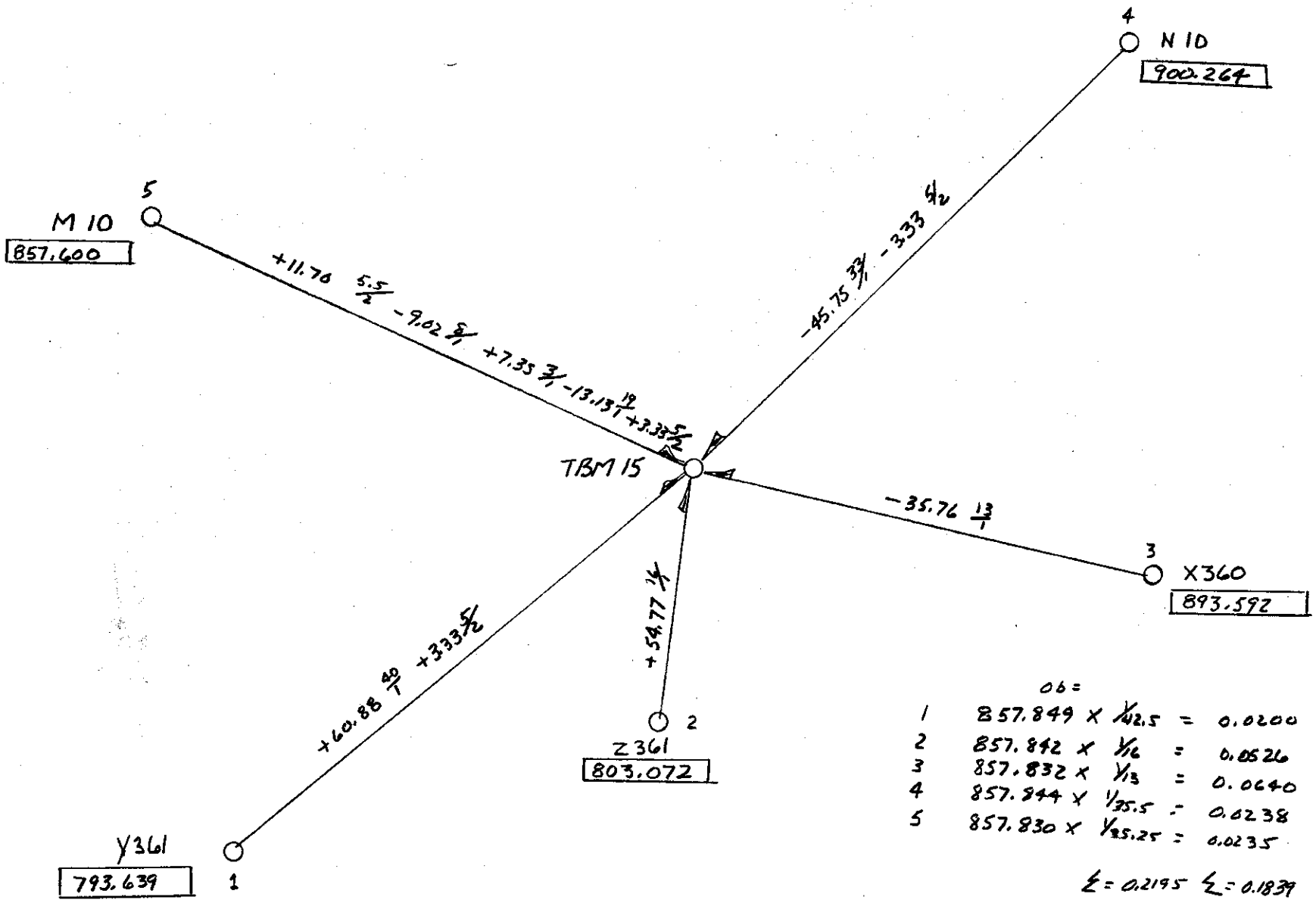
(CK AVE 8) $4.0966 = 0.5121$

$\Sigma\ 3.4820 \setminus \Sigma\ 1.8554 = 0.5328$

807 $\boxed{1140.5328}$

91122

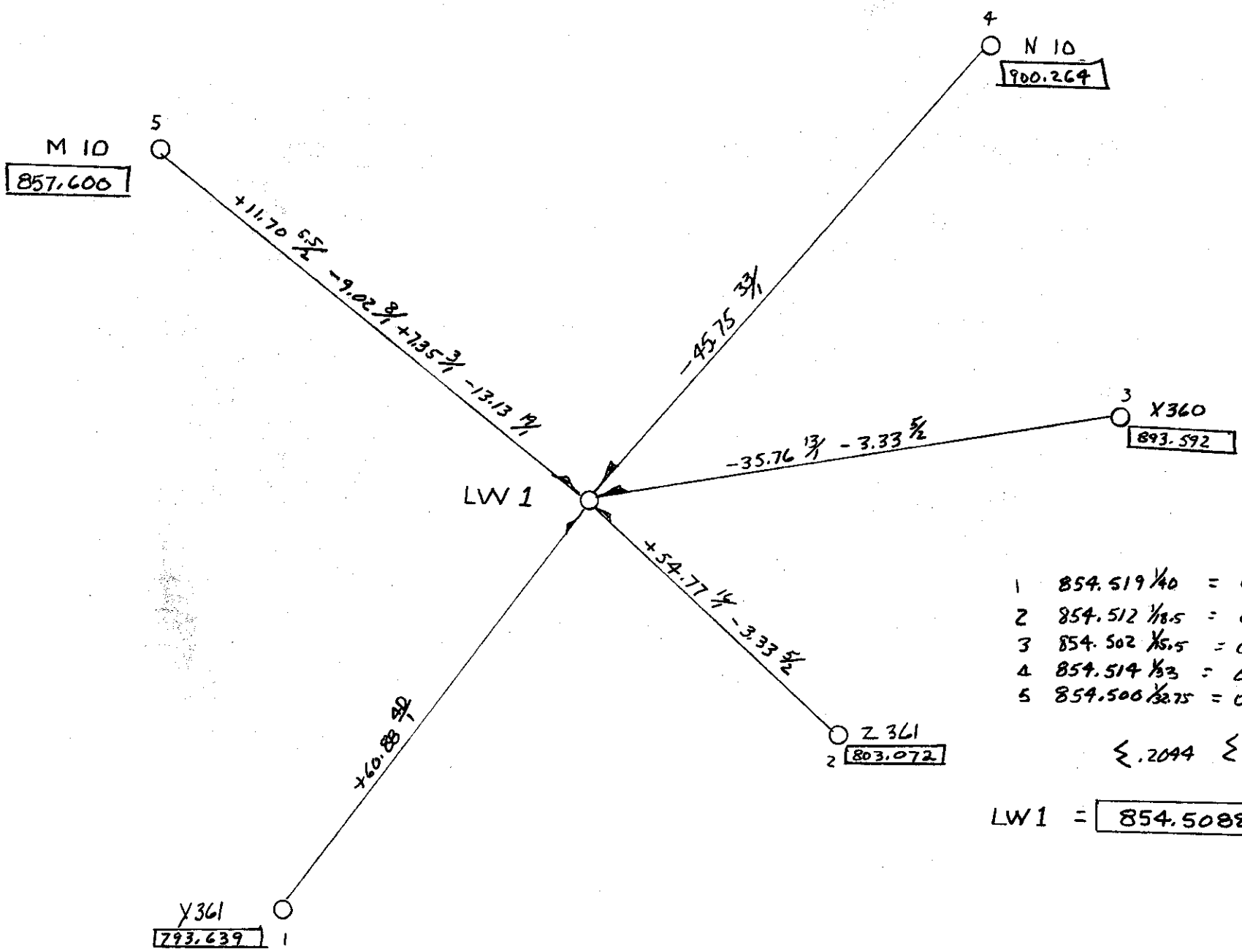
(2)



		OB =		
1	857.849	× 1/42.5	=	0.0200
2	857.842	× 1/16	=	0.0526
3	857.832	× 1/13	=	0.0640
4	857.844	× 1/35.5	=	0.0238
5	857.830	× 1/35.25	=	0.0235

$\Sigma = 0.2195$ $\Sigma = 0.1839$

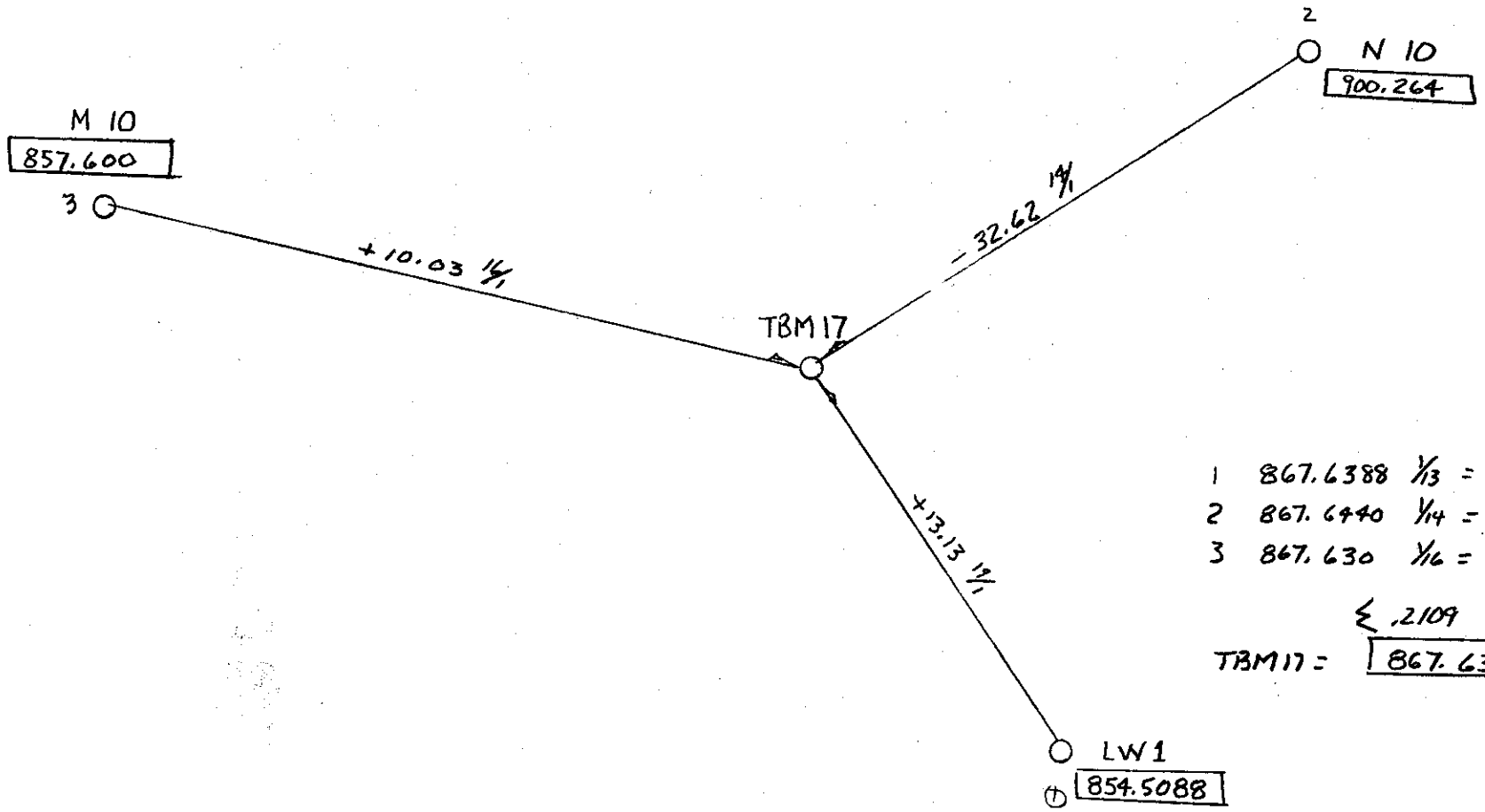
TBM15 = 857.8378



1	854.519 1/40	=	0.0130
2	854.512 1/18.5	=	0.0277
3	854.502 1/15.5	=	0.0324
4	854.514 1/33	=	0.0156
5	854.506 1/32.75	=	0.0153

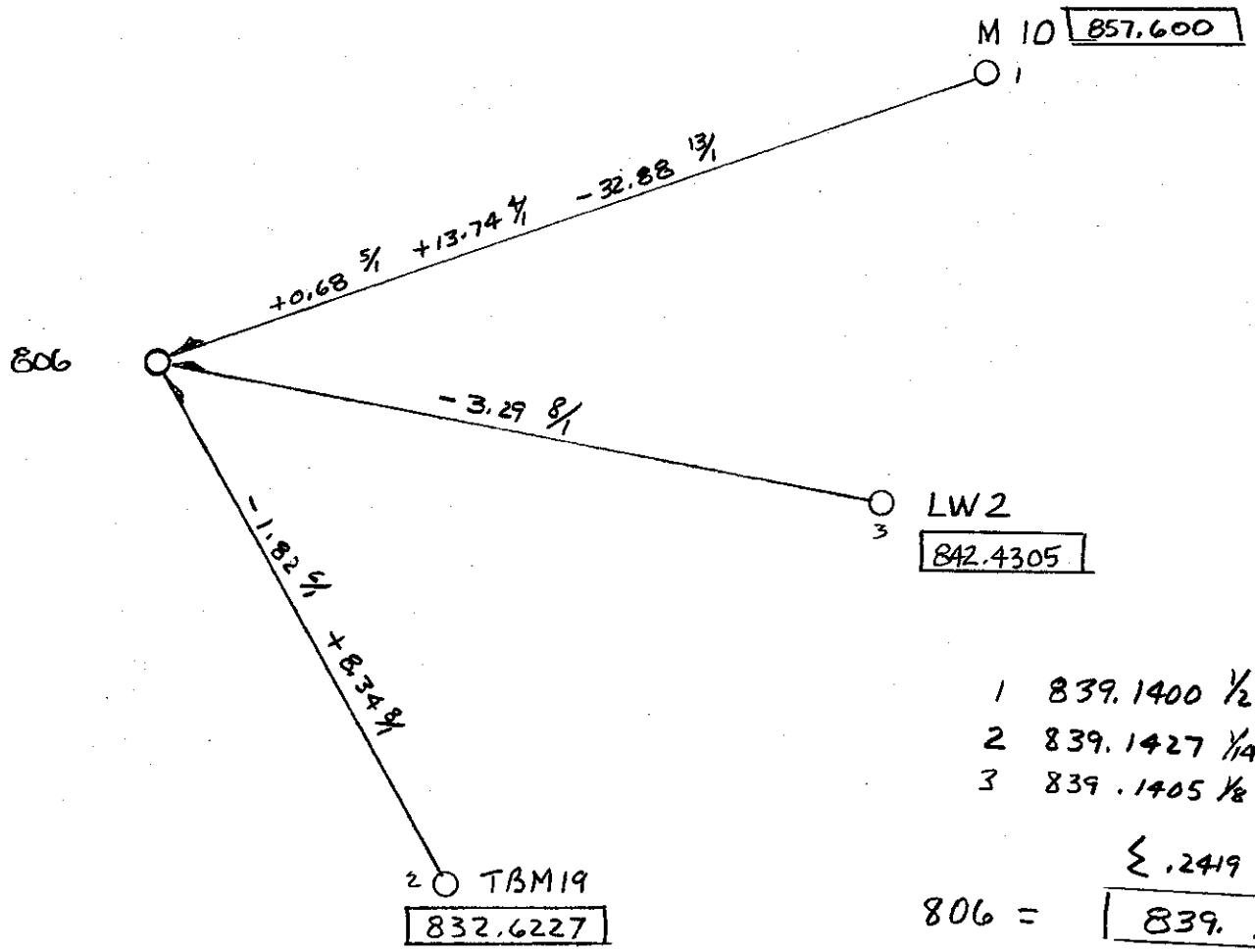
Σ .2044 Σ .1040

LW 1 = 854.5088



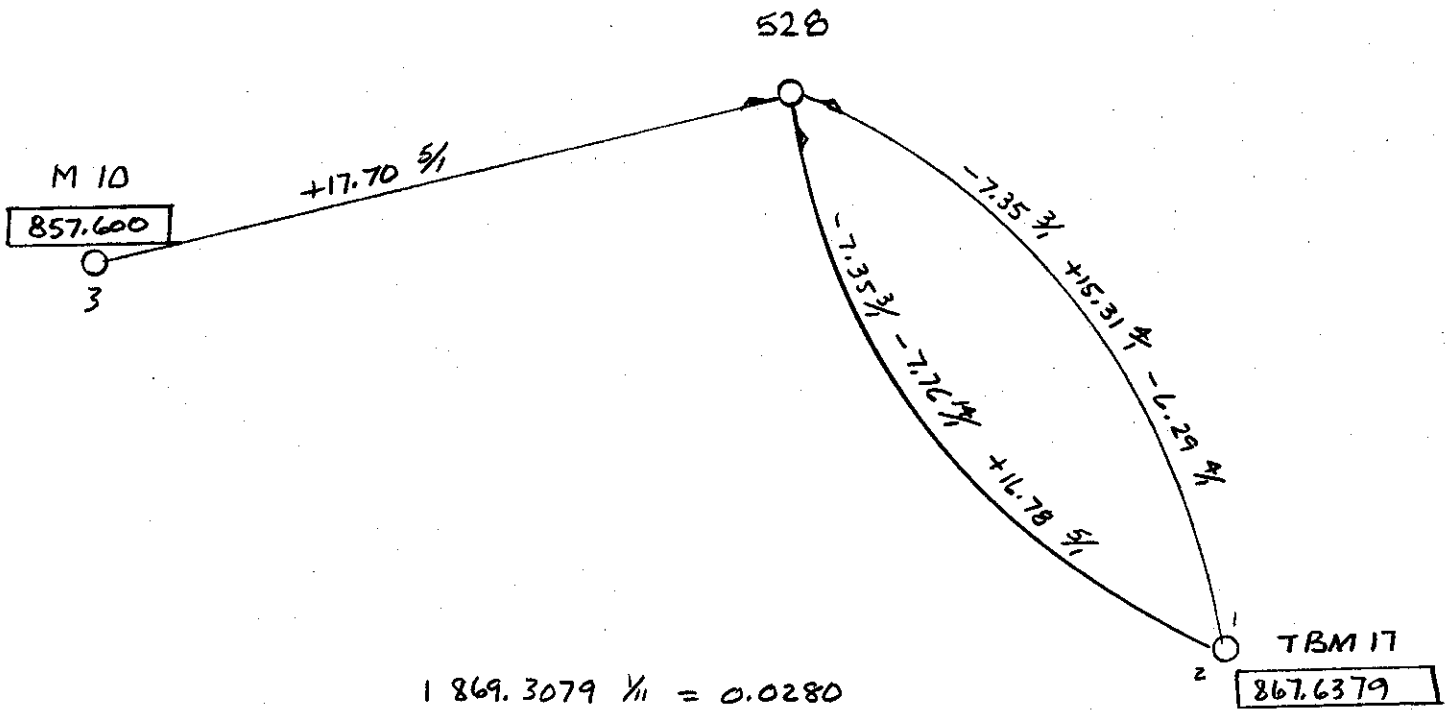
1	867.6388	1/13	= 0.0491
2	867.6440	1/14	= 0.0460
3	867.630	1/16	= 0.0394
		Σ .2109	Σ .1345

TBM17 = 867.6379



1	839.1400	1/22	= 0.0064
2	839.1427	1/14	= 0.0102
3	839.1405	1/8	= 0.0176
		Σ .2419	Σ .0341

806 = **839.1410**



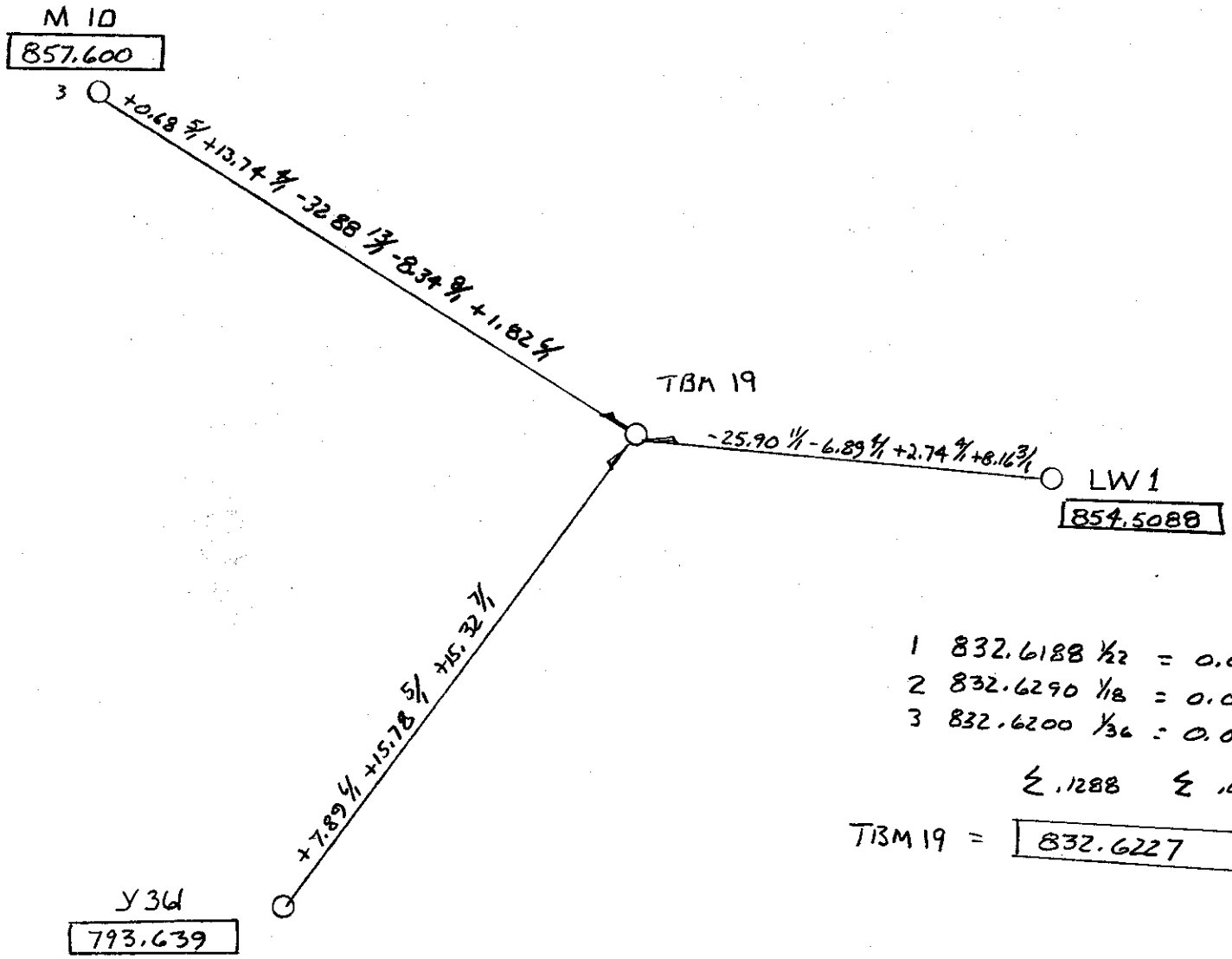
1 869.3079 1/11 = 0.0280

2 869.3079 1/22 = 0.0140

3 869.3000 1/5 = 0.0600

Σ .3364 Σ .1020

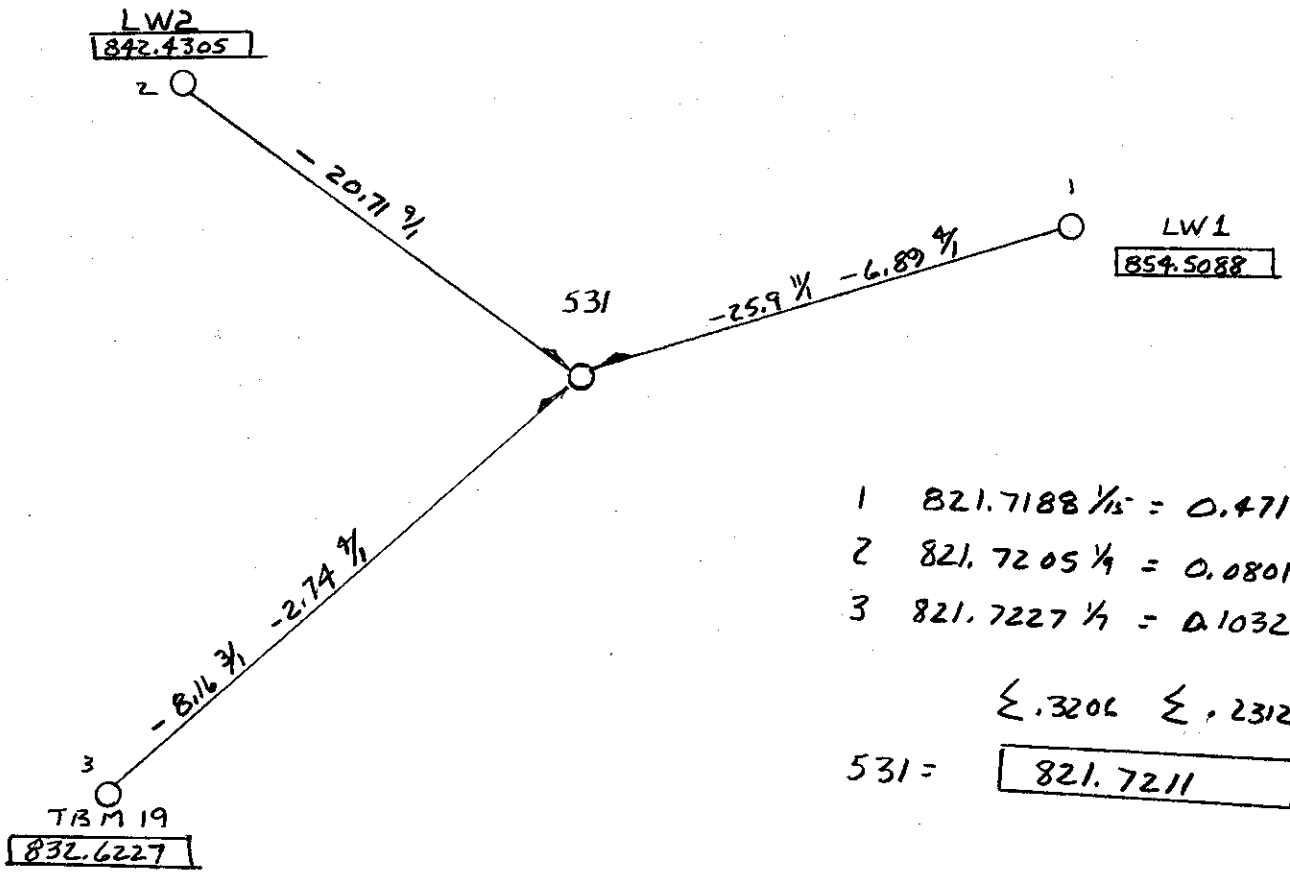
528 = 869.3032



1 832.6188 1/22 = 0.0281
2 832.6290 1/18 = 0.0349
3 832.6200 1/36 = 0.0172

Σ .1288 Σ .0802

TBM 19 = 832.6227



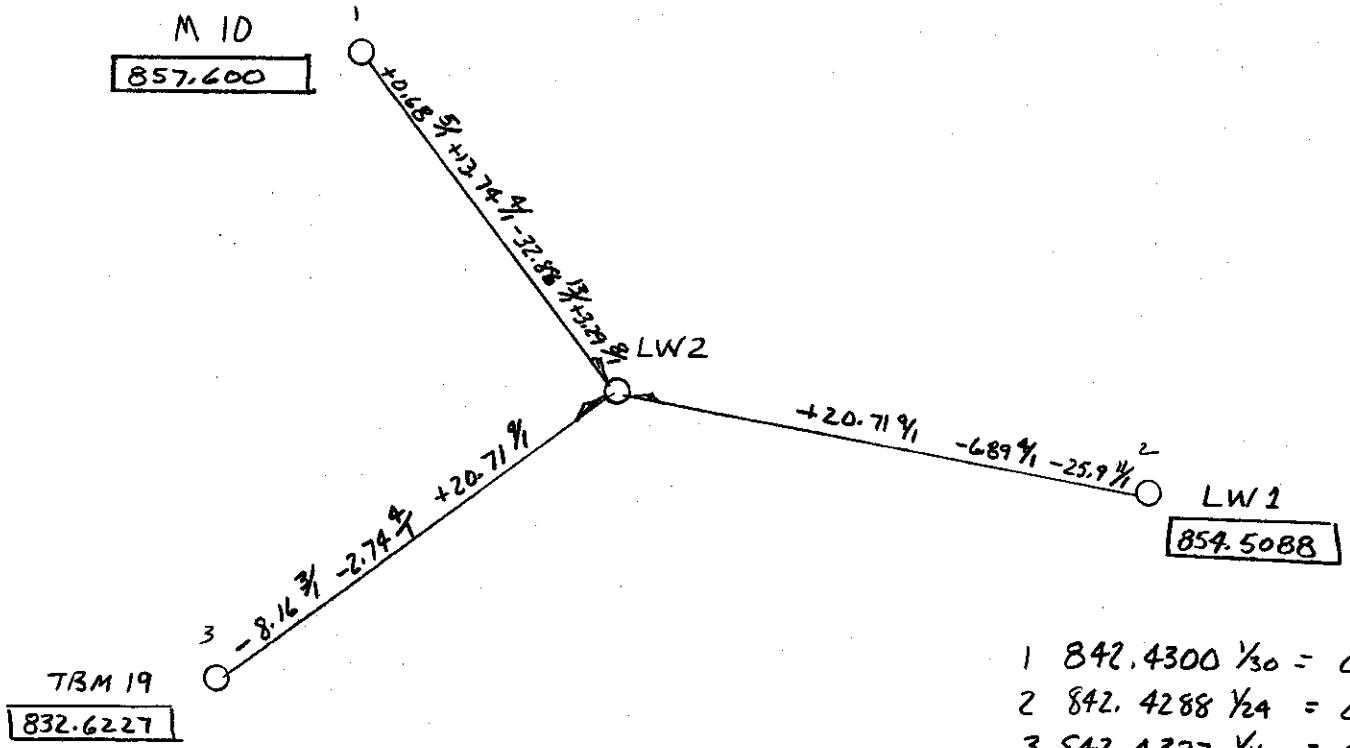
1 821.7188 1/15 = 0.471

2 821.7205 1/9 = 0.0801

3 821.7227 1/7 = 0.1032

Σ .3206 Σ .2312

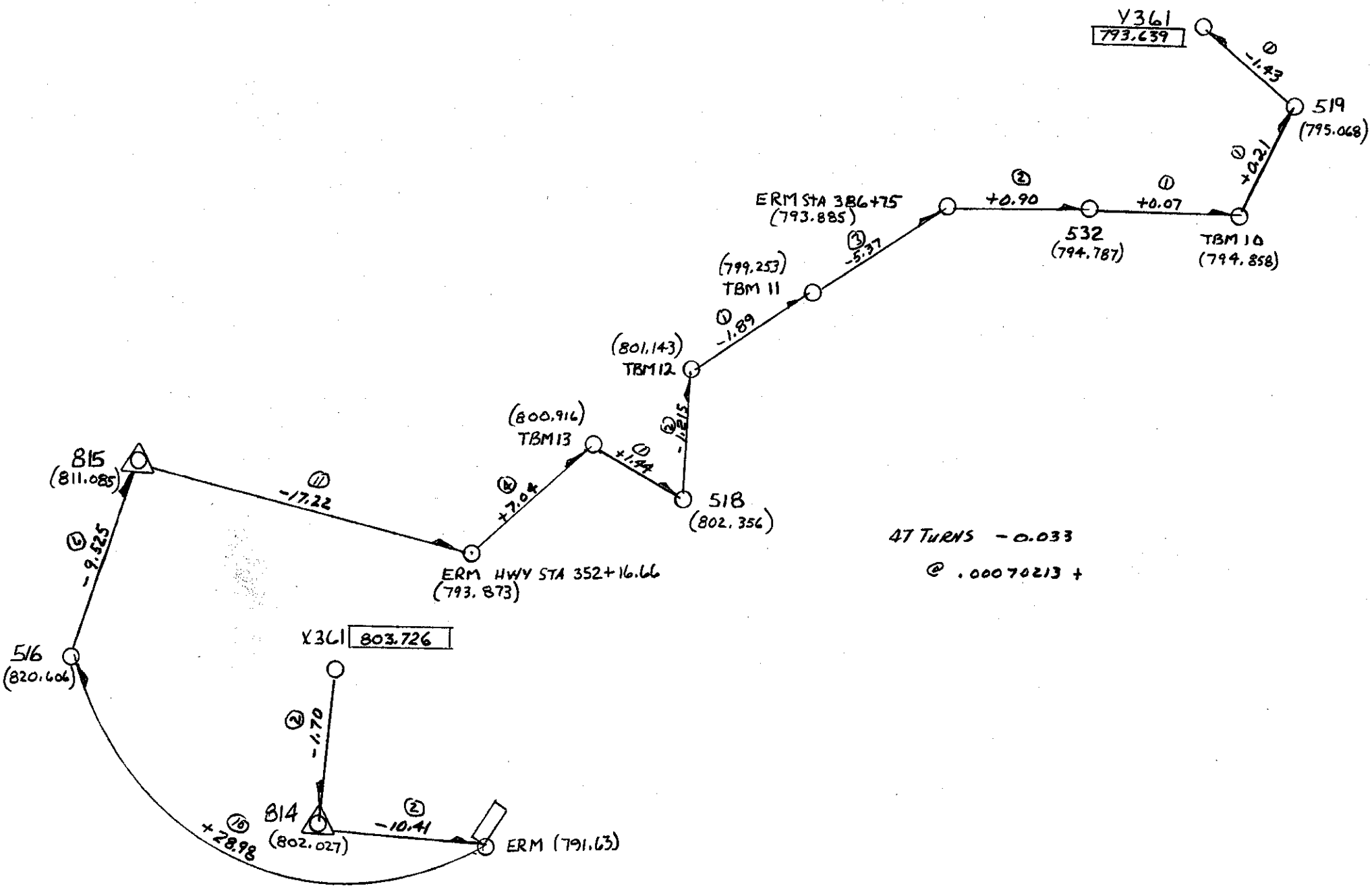
531 = 821.7211



1 842.4300 1/30 = 0.0143
2 842.4288 1/24 = 0.0179
3 842.4327 1/16 = 0.0270

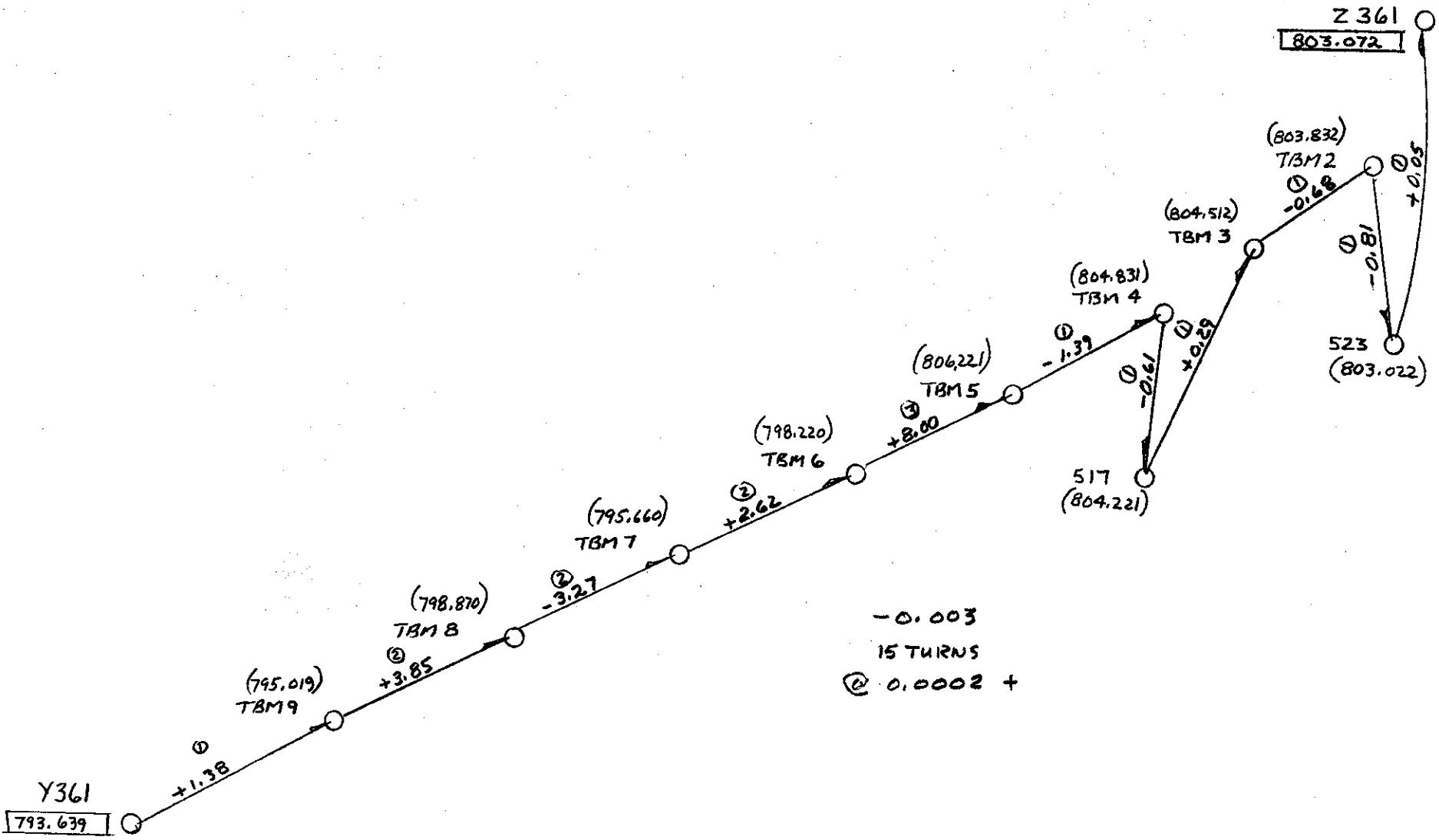
Σ .1375 Σ .0592

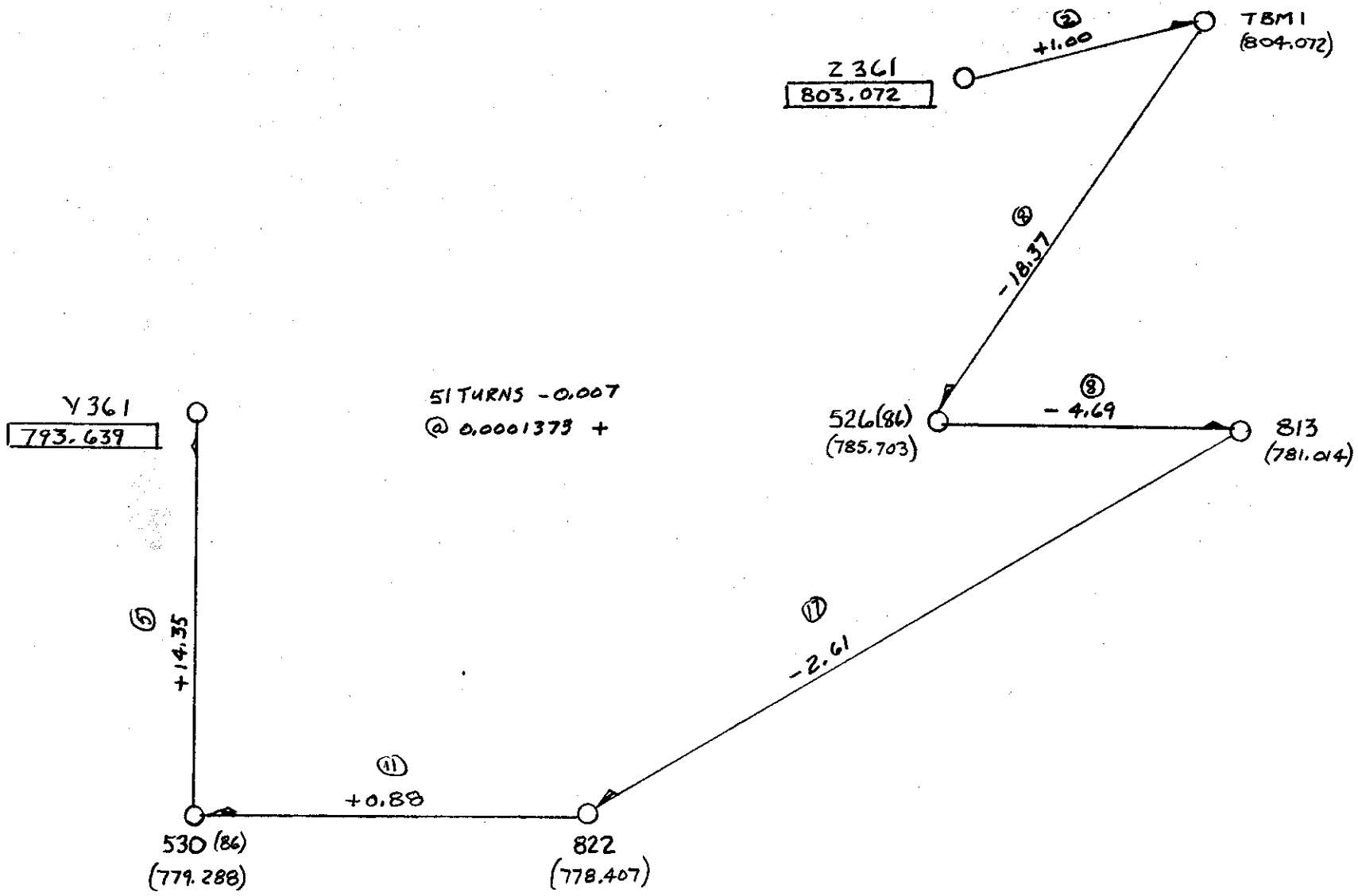
LW2 = 842.4305



47 TURNS -0.033

@ .00070213 +


Z 361
803.072
(803.832)
TBM 2
① -0.68
① +0.05
(804.512)
TBM 3
① -0.81
(804.831)
TBM 4
① -1.39
① +0.29
① -0.61
523
(803.022)
(806.221)
TBM 5
③ +8.00
517
(804.221)
(798.220)
TBM 6
② +2.62
(795.660)
TBM 7
② -3.27
(798.870)
TBM 8
② +3.85
(795.019)
TBM 9
① +1.38
Y361
793.639
-0.003
15 TURNS
@ 0.0002 +


Z 361
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2
+1.00
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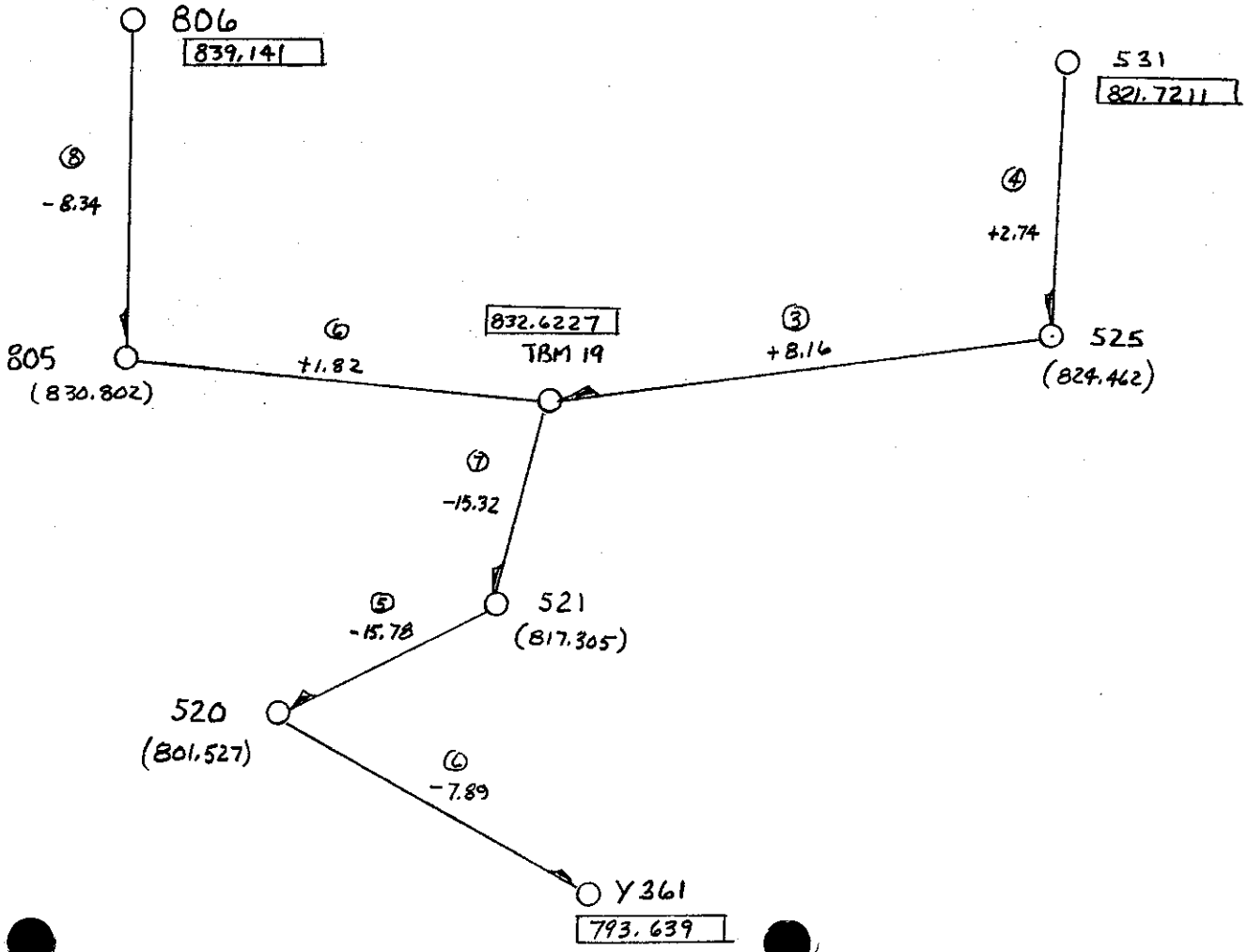
(804.072)
4
-18.37
526(86)
(785.703)
8
- 4.69
813
(781.014)
17
-2.61
822
(778.407)
11
+0.88
530 (86)
(779.288)
5
+14.35
Y 361
793.639
51 TURNS -0.007
@ 0.0001373 +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+2.74
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TBM 19
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3
+8.16
805
(830.802)
525
(824.462)
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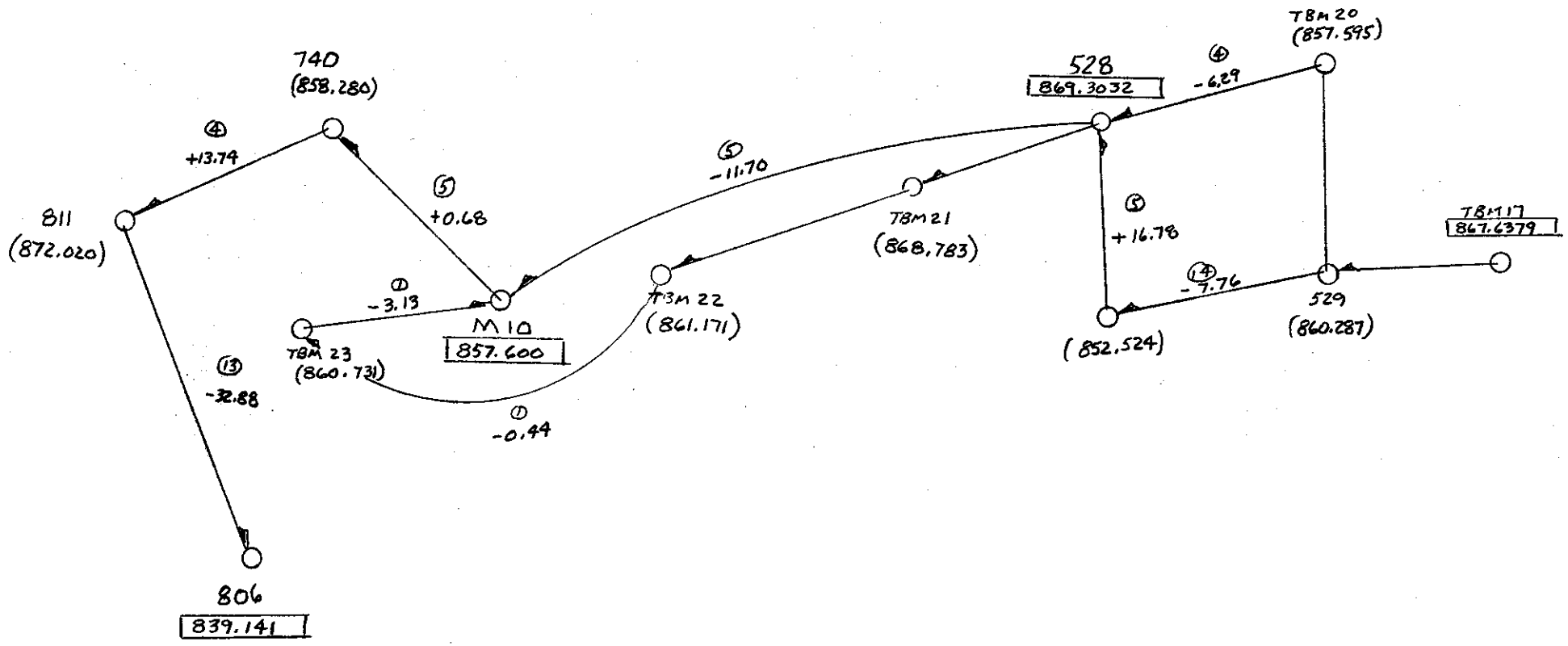
5
-15.78
521
(817.305)
520
(801.527)
6
-7.89
Y361
793.639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TBM 23
(860.731)
M10
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13
-32.88
1
-0.44
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839.141
5
-11.70
TBM 22
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TBM21
(868.783)
528
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4
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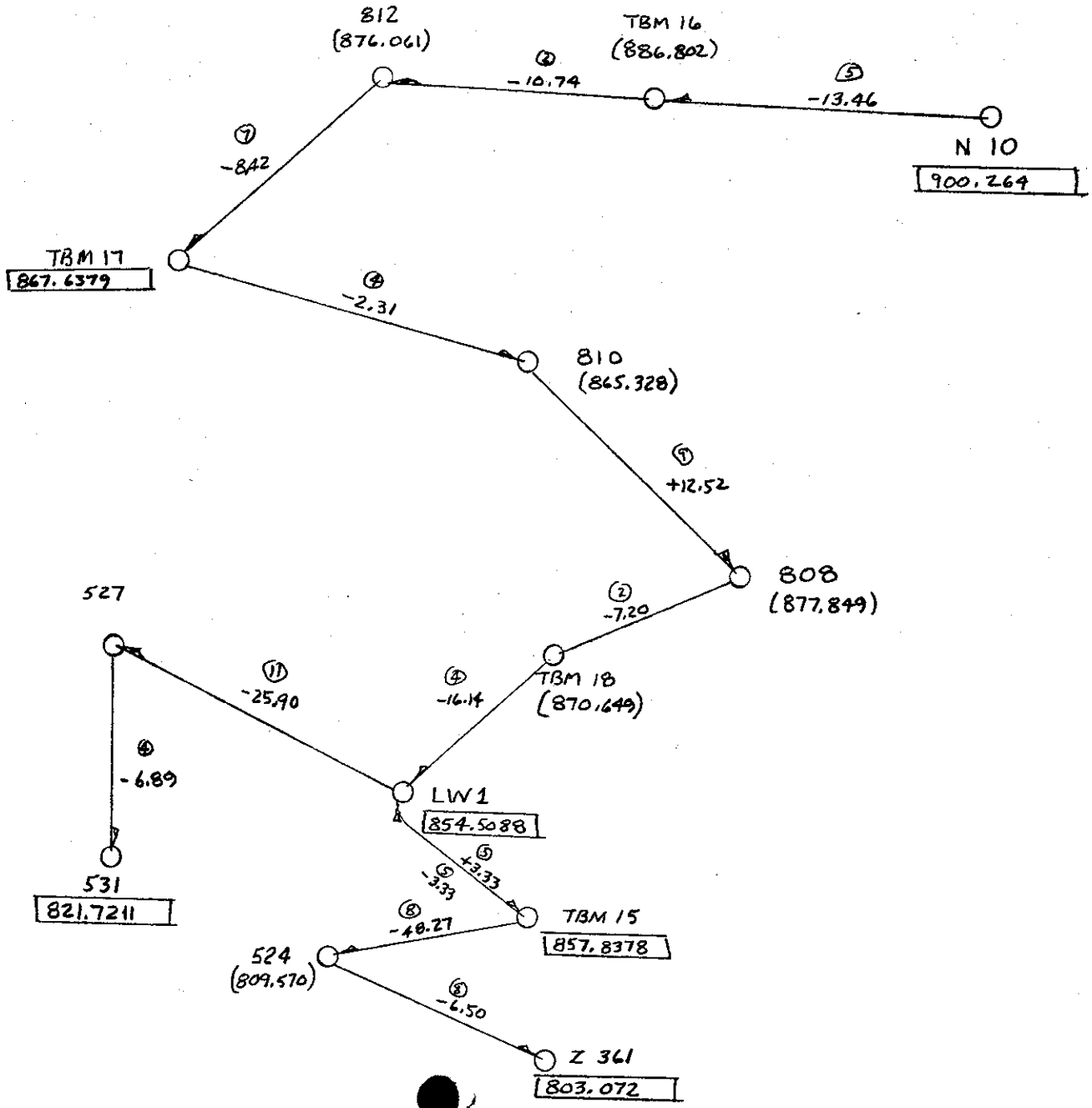
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(877.849)
527
TBM 18
(870.649)
LW 1
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531
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TBM 15
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524
(809.570)
Z 361
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7
-8.42
2
-10.74
5
-13.46
4
-2.31
9
+12.52
2
-7.20
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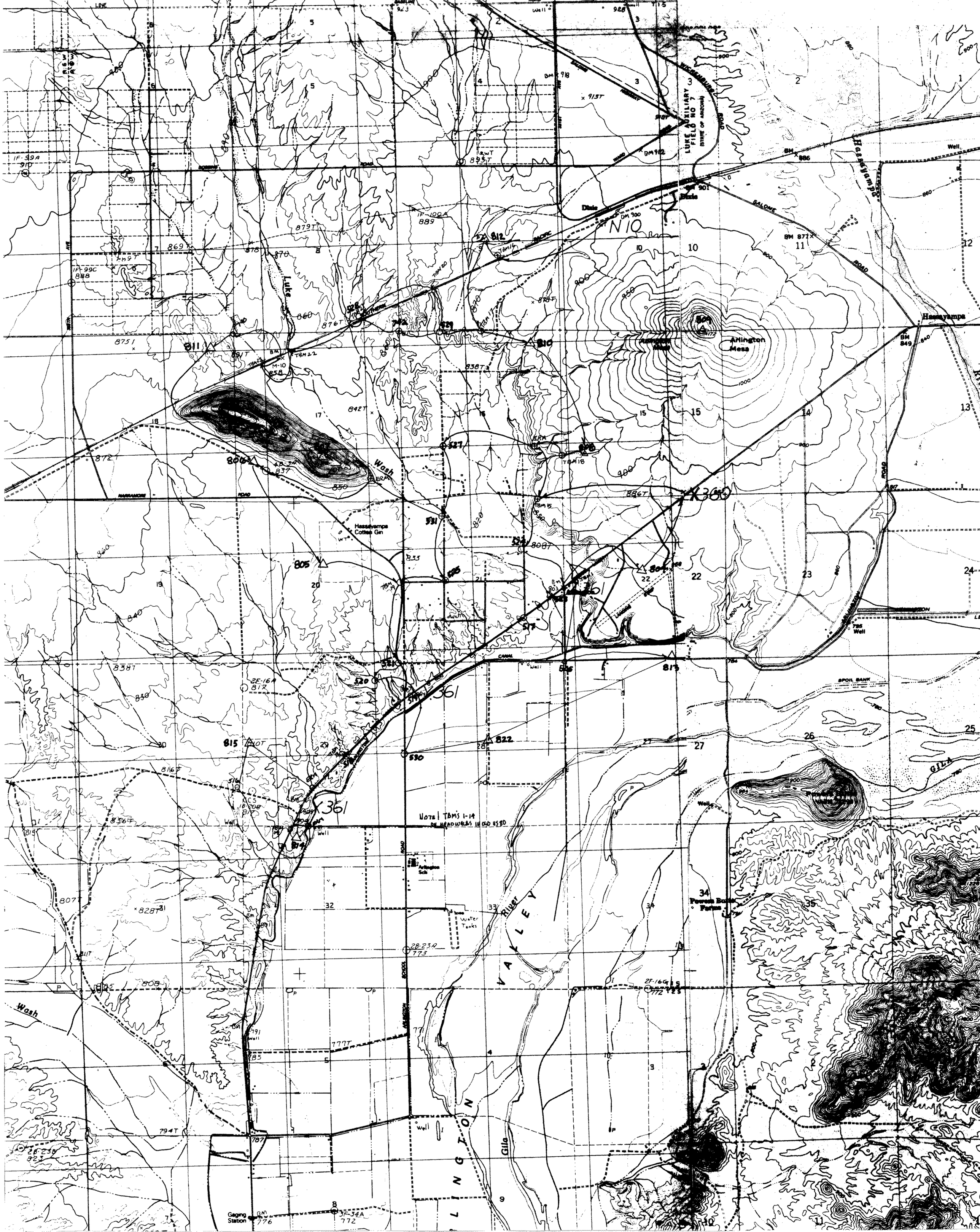
-6.50


LUKE AUXILIARY FIELD NO 7
STATE OF ARIZONA
Dixie
Luke
Hassayampa
Arlington Mess
Hassayampa Cotton Gin
Wash
Arlington Sch
Water Tanks
ARLINGTON VALLEY
Gila River
Gila
Gaging Station
Powers Butte Farm
SPOIL BANK
CANAL
SALOME ROAD
WICKENBURG ROAD
HARRAMORE ROAD
ARLINGTON SCHOOL ROAD
NOTE | TBM'S 1-14 ON HEADWORKS IN OLD USGS

ERM1

COUNTRY	TYPE OF MARK	STATION	
USA	BRASS CAP	"X"-361	
LOCALITY: PHOENIX	STAMPING ON MARK: X-361	AGENCY (CAST IN MARKS): USC & GS SURVEY	ELEVATION: 803.726 (FT) (M)
LATITUDE	LONGITUDE	DATUM	DATUM: MSL 1929
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY): USC & GS
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE: OCT 91 ORDER: /

TO OBTAIN GRID AZIMUTH, ADD ° ' " TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ' "	° ' "		

This station is located at/near ARLINGTON (city), MARICOPA (county), ARIZONA (state)

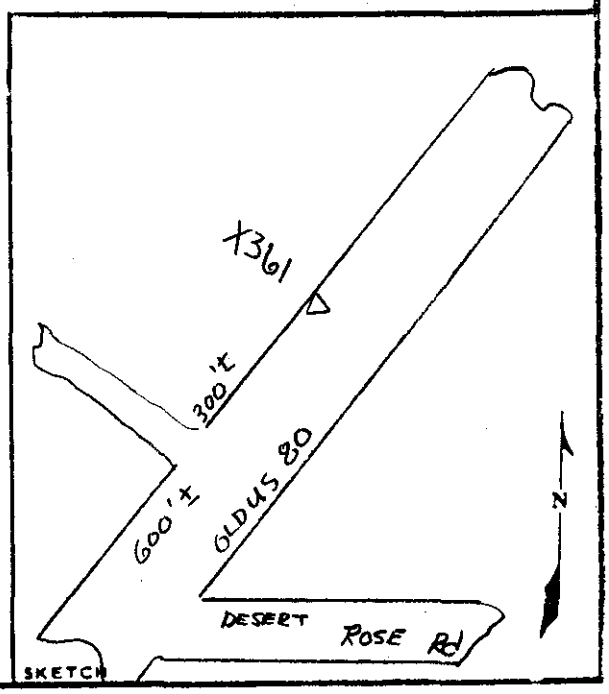
To reach this station from the

POST OFFICE IN ARLINGTON GO WEST
ALONG OLD HIGHWAY 80 2.1 MILES.

This station is located

600' NORTH OF OLD HIGHWAY 80
AND DESERT ROSE ROAD 40' WEST
OF THE CENTER LINE OF OLD HWY 80
1 FT EAST OF R/W FENCE SET IN 6"
IRON PIPE 3.7" OUT OF THE GROUND.
This station is a

STANDARD BRASS DISK SET
IN A 6" IRON PIPE.



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM2

COUNTRY	TYPE OF MARK	STATION
USA	GALV CAP ON 2" IRON PIPE	CD 15 (516)

LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARKS)	ELEVATION (FT) (M)
PHOENIX	CD-15		820.606

LATITUDE	LONGITUDE	DATUM	DATUM
			MSL 1929

(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
			usce

(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE	ORDER
			OCT 91	3

TO OBTAIN GRID AZIMUTH, ADD ° ' " TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ' "	° ' "		

This station is located at (near) ARLINGTON (city), MARICOPA (county), ARIZONA (state)

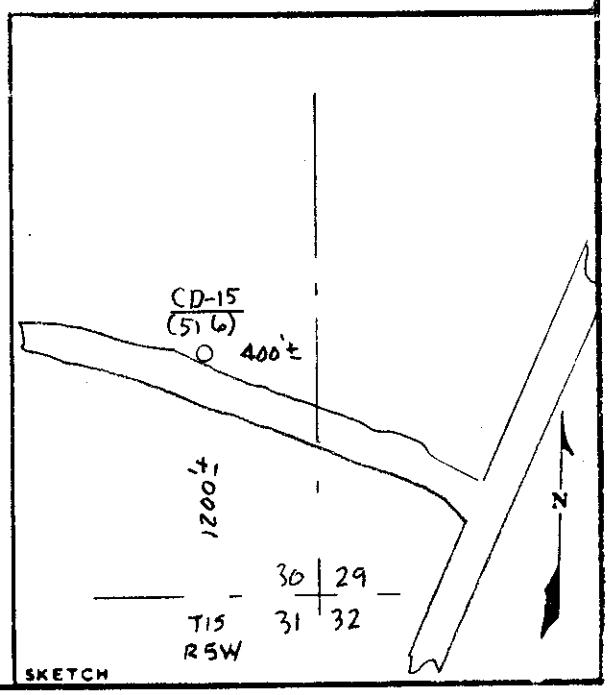
To reach this station from the
POST OFFICE IN ARLINGTON GO WEST 2.2 MILES
TO DIRT ROAD TO WEST, GO WEST ALONG ROAD
0.4 MILES.

This station is located

50' NORTH OF DIRT RAOD ON VERY
SMALL SAND HILL

This station is a

GALY, CAP ON 2" IRON PIPE
SET BY CORP OF ENGINEERS



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM3

COUNTRY	TYPE OF MARK	STATION	
USA	½" RE BAR	814	
LOCALITY	**STAMPING ON MARK**	**AGENCY (CAST IN MARKS)**	**ELEVATION**
PHOENIX	NONE	NONE	802.027 (FT) (M)
LATITUDE	**LONGITUDE**	**DATUM**	**DATUM**
		NAD 1983	MSL 1929
(NORTHING)(EASTING)	**(EASTING)(NORTHING)**	**GRID AND ZONE**	**ESTABLISHED BY (AGENCY)**
839,166.525 (FT) (M)	432,552.366 (FT) (M)	AZ T.M. CENTRAL	AMCI
(NORTHING)(EASTING)	**(EASTING)(NORTHING)**	**GRID AND ZONE**	**DATE** / **ORDER**
(FT) (M)	(FT) (M)		OCT 91 / 3

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

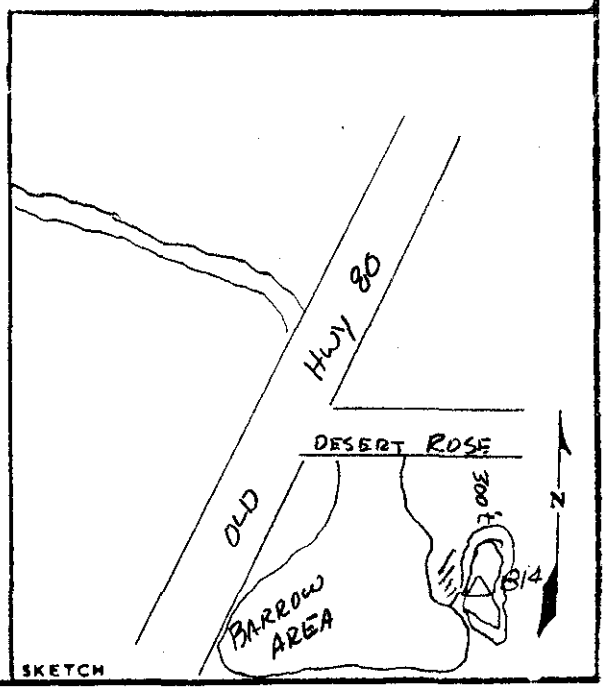
OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

This station is located at near ARLINGTON (city), MARICOPA (county), ARIZONA (state)

To reach this station from the
POST OFFICE IN ARLINGTON GO WEST 2.3 MILES
ALONG OLD HWY 80 TO ROAD EAST 100' EAST TURN
SOUTH IN BARROW AREA GO 400'±

This station is located
ON HILL EAST OF BARROW AREA 60'±
PINTS IN NW¼ SEC 32 T1S, R5W.

This station is a
½" RE BAR



DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM4

COUNTRY	TYPE OF MARK	STATION	
USA	B.C.	530 (86)	
LOCALITY: PHOENIX	STAMPING ON MARK: E¼ 29	AGENCY (CAST IN MARKS): MARICOPA COUNTY	ELEVATION: 779.288 (FT) (M)
LATITUDE	LONGITUDE	DATUM	DATUM: MSL 1929
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY): AMCI
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE: OCT 91 / ORDER: 3

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

This station is located at/near ARLINGTON (city), MARICOPA (county), ARIZONA (state)

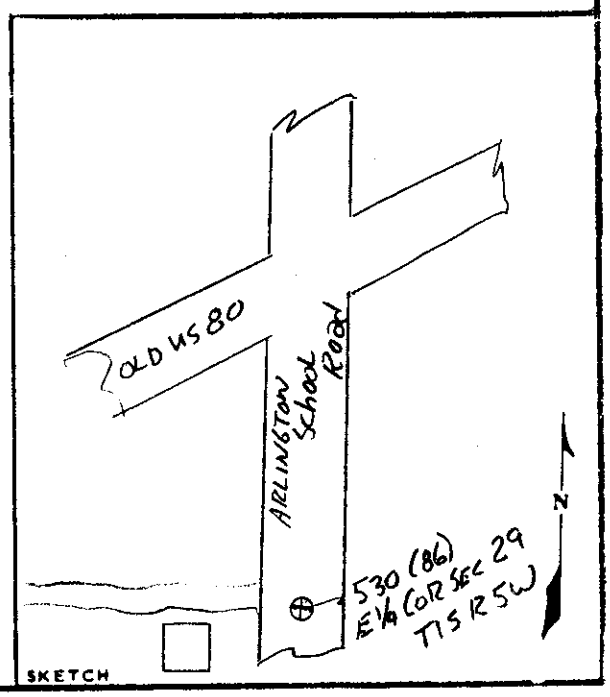
To reach this station from the
POST OFFICE IN ARLINGTON GO WEST 1.2 MILE
ALONG OLD HWY 80 TO ARLINGTON SCHOOL ROAD,
THEN SOUTH 0.3 MILE.

This station is located

NEAT CENTER OF PAVED ROAD

This station is a

MARICOPA COUNTY BRASS CAP IN
POT HOLE 0.59 BELOW SURFACE.



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM5

COUNTRY	TYPE OF MARK	STATION	
USA	BRASS CAP	Y-361	
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARKS)	ELEVATION (FT) (M)
PHOENIX	Y-361 USC & GS	USC & GS SURVEY	793.6 39
LATITUDE	LONGITUDE	DATUM	DATUM
			MSL 1929
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
			USC & GS
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE / ORDER
			OCT 91 /

TO OBTAIN GRID AZIMUTH, ADD ° ' " TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ' "	° ' "		

This station is located at (near) ARLINGTON (city), MARICOPA (county), ARIZONA (state)

To reach this station from the

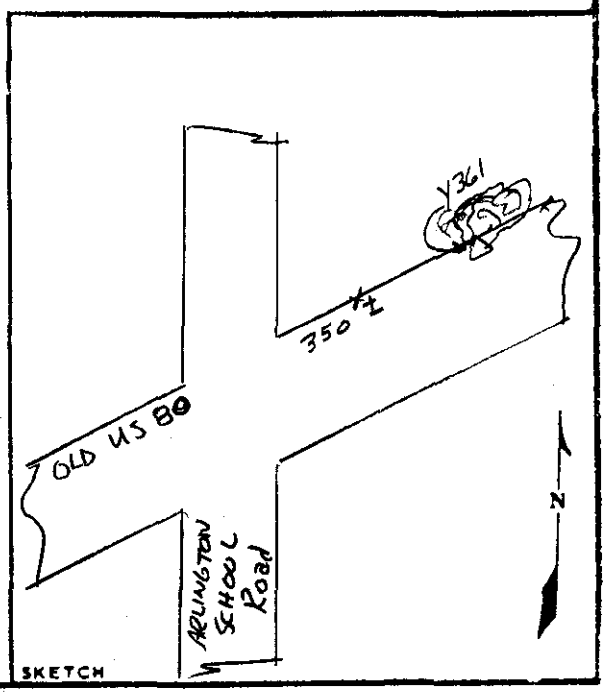
POST OFFICE IN ARLINGTON GO WEST ALONG OLD HIGHWAY 80 1.1 MILES.

This station is located

49' NORTH OF THE CENTER LINE OF OLD HIGHWAY 80, 1' SOUTH OF R/W FENCE, APROX 410' EAST OF ALINGTON SCHOOL ROAD(339TH AVENUE).

This station is a

STANDARD BRASS DISK SET IN CONCRETE POST.



DA FORM 1 OCT 44 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM6

COUNTRY	TYPE OF MARK	STATION	
USA	C.W.R.	526 (86)	
LOCALITY: PHOENIX	STAMPING ON MARK	AGENCY (CAST IN MARKS)	ELEVATION (FT) (M): 785.703
LATITUDE	LONGITUDE	DATUM	DATUM: MSL 1929
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY): AMCI
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE: OCT 91 / ORDER: 3

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

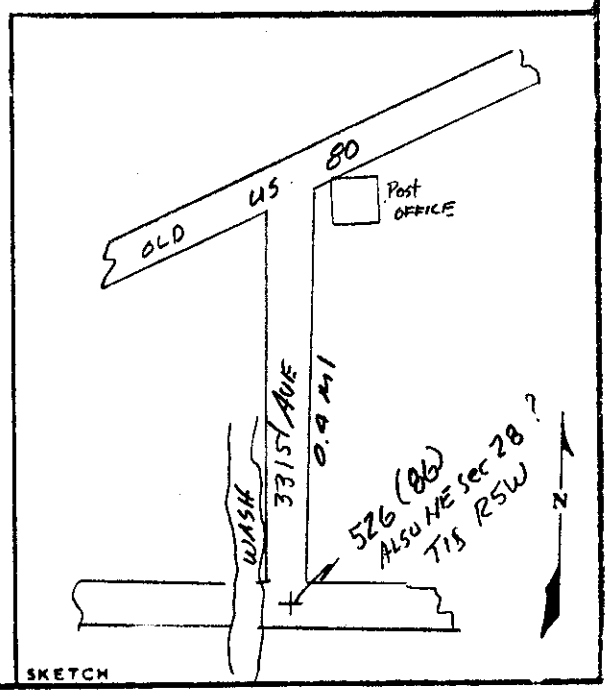
OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC) ° ′ ″	BACK AZIMUTH ° ′ ″	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)

This station is located at ~~near~~ ARLINGTON (city), MARICOPA (county), ARIZONA (state)

To reach this station from the POST OFFICE IN ARLINGTON GO SOUTH 0.4 MILES TO CROSS PAVED ROAD

This station is located IN THE INTERSECTION OF 331ST AVENUE AND ROAD SOUTH OF ARLINGTON CANAL

This station is a COPPERFIELD ROD IN HAND HOLE



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM7

COUNTRY	TYPE OF MARK	STATION	
USA	½" RE BAR	804	
LOCALITY: PHOENIX	STAMPING ON MARK: NONE	AGENCY (CAST IN MARKS): NONE	ELEVATION (FT) (M): 850.001
LATITUDE	LONGITUDE	DATUM: NAD 1983	DATUM: MSL 1929
(NORTHING)(EASTING) (FT) (M): 847,550.362	(EASTING)(NORTHING) (FT) (M): 443,759.956	GRID AND ZONE: AZ. T.M. CENTRAL	ESTABLISHED BY (AGENCY): AMCI
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE: OCT 91 / ORDER: 3

TO OBTAIN GRID AZIMUTH, ADD ° ' " TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ' " TO THE GEODETIC AZIMUTH

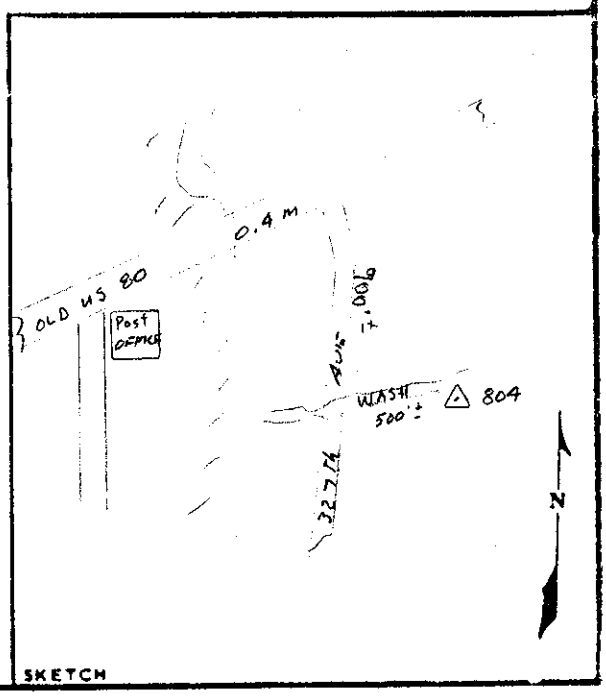
OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ' "	° ' "		

This station is located at (near) ARLINGTON (city), MARICOPA (county), ARIZONA (state)

To reach this station from the POST OFFICE IN ARLINGTON GO EAST 0.4 MI, ALONG OLD HWY 80 TO DIRT ROAD SOUTH, THEN 800'± TO WASH.

This station is located 500' EAST OF DIRT ROAD, ON SOUTH SIDE OF SMALL WASH IN NW¼ SEC 22 T1S,R5W

This station is a ½" RE BAR



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM8

COUNTRY	TYPE OF MARK	STATION	
USA	"+" ON CEMENT PAD	520	
LOCALITY: PHOENIX	STAMPING ON MARK: NONE	AGENCY (CAST IN MARKS): NONE	ELEVATION (FT) (M): 801.527
LATITUDE	LONGITUDE	DATUM	DATUM: MSL 1929
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY): AMCI
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE: OCT 91 / ORDER: 3

TO OBTAIN GRID AZIMUTH, ADD ° ' " TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ' " TO THE GEODETIC AZIMUTH

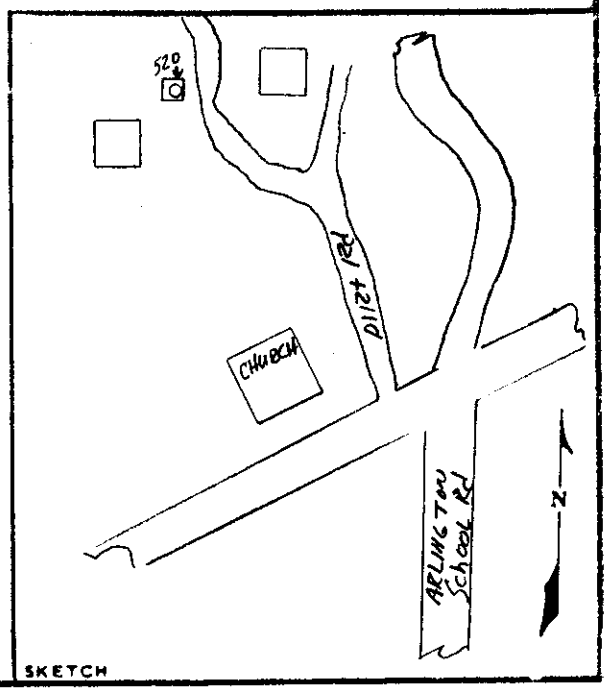
OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ' "	° ' "		

This station is located at (near) ARLINGTON (city), MARICOPA (county), ARIZONA (state)

To reach this station from the
POST OFFICE IN ARLINGTON GO WEST 1.25 MILES ALONG
OLD US 80 TO ENTRANCE TO CHURH HILL NW, THEN NW ALONG
DIRT ROAD EAST OF CHURCH BEARING LEFT AT FORK ROAD
0.2 MILES

This station is located
150' NE OF TRAILER HOUSE IN
BOTTOM OF DRAW

This station is a
"+" ON CEMENT PAD



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM9

COUNTRY	TYPE OF MARK	STATION	
USA	½" RE BAR	525	
LOCALITY	**STAMPING ON MARK**	**AGENCY (CAST IN MARKS)**	**ELEVATION** (FT) (M)
PHOENIX	NONE	NONE	824.462
LATITUDE	**LONGITUDE**	**DATUM**	**DATUM**
			MSL 1929
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**ESTABLISHED BY (AGENCY)**
			AMCI
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**DATE** OCT 91 / **ORDER** 3

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

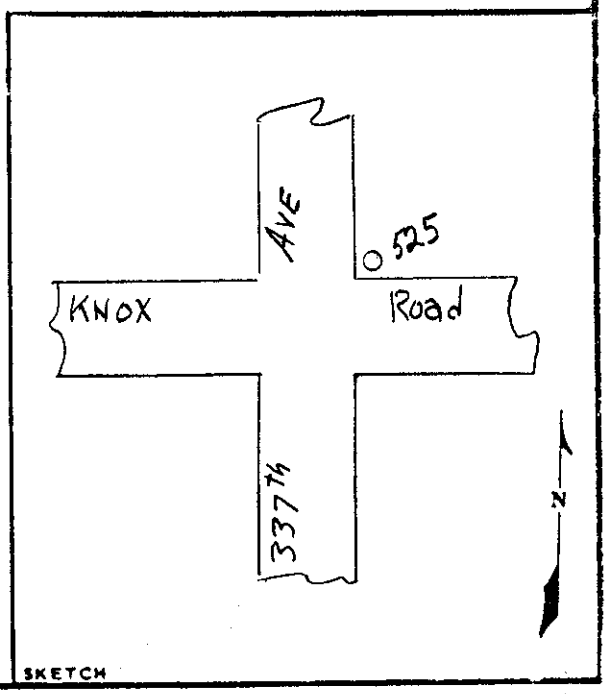
OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

This station is located at ~~near~~ ARLINGTON (city), MARICOPA (county), ARIZONA (state)

To reach this station from the
POST OFFICE IN ARLINGTON GO WEST 0.2 MILES ALONG OLD US 80 TO 333RD AVENUE, THEN NORTH 0.2 MILES TO KNOX ROAD, THEN WEST ON KNOX ROAD 0.5 MILES

This station is located
NE CORNER OF INTERSECTION APROX 30' N & 30' EAST OF EDGES OF ROAD

This station is a
½" RE BAR



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM10

COUNTRY	TYPE OF MARK	STATION	
USA	BRASS CAP	Z 361	
LOCALITY: PHOENIX	STAMPING ON MARK: Z 361	AGENCY (CAST IN MARKS): USC & GS SURVEY	ELEVATION: 803.072 (FT) (M)
LATITUDE	LONGITUDE	DATUM	DATUM: MSL 1929
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY): USC & GS
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE: OcT 91 / ORDER: /

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

This station is located at near ARLINGTON (city), MARICOPA (county), ARIZONA (state)

To reach this station from the

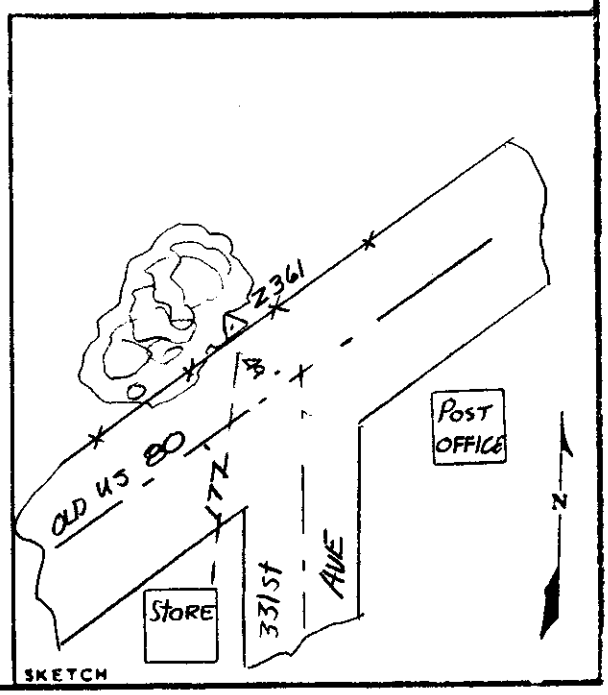
POST OFFICE IN ARLINGTON GO
WEST 150'±

This station is located

49' NNW OF THE CENTER LINE
OF OLD HIGHWAY 80 APROX 40'
WEST OF THE CENTER LINE OF
331ST AVENUE SOUTH.

This station is a

STANDARD BRASS DISK
SET IN CONCRETE POST.



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM11

COUNTRY	TYPE OF MARK	STATION	
USA	½"RE BAR	531	
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARKS)	ELEVATION (FT) (M)
PHOENIX	NONE	NONE	821.7211
LATITUDE	LONGITUDE	DATUM	DATUM
			MSL 1929
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
			AMCI
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE / ORDER
			OCT 91 / 3

TO OBTAIN GRID AZIMUTH, ADD ° ' " TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ' " TO THE GEODETIC AZIMUTH

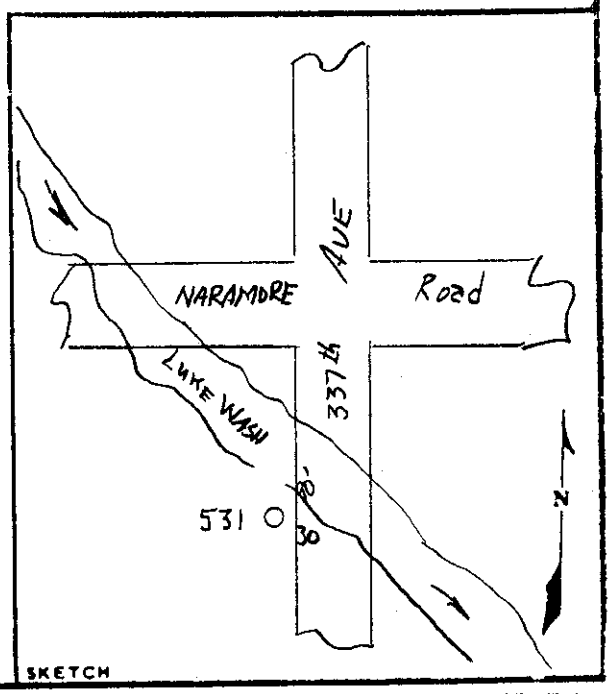
OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ' "	° ' "		

This station is located at / near ARLINGTON (city), MARICOPA (county), ARIZONA (state)

To reach this station from the
POST OFFICE IN ARLINGTON GO WEST 0.2 MILES TO 333RD AVENUE ALONG OLD U.S 80, THEN NORTH 0.2 MILES TO KNOX ROAD, THEN WEST ON KNOX ROAD 0.5 MILES TO 337TH AVENUE, THEN NORTH 0.45 MILES

This station is located
35' WEST OF WEST EDGE OF ROAD AND
90' SOUTH OF CENTER LINE LUKE WASH.

This station is a
½" RE BAR



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM12

COUNTRY	TYPE OF MARK	STATION	
USA	½" RE BAR	524	
LOCALITY	**STAMPING ON MARK**	**AGENCY (CAST IN MARKS)**	**ELEVATION** (FT) (M)
PHOENIX	NONE	NONE	809.570
LATITUDE	**LONGITUDE**	**DATUM**	**DATUM**
			MSL 1929
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**ESTABLISHED BY (AGENCY)**
			AMCI
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**DATE** / **ORDER**
			OCT 91 / 3

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

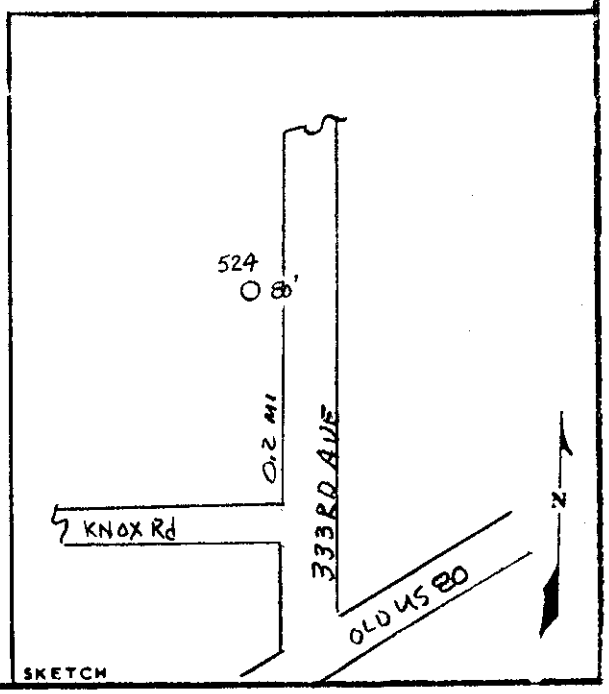
This station is located at near ARLINGTON (city), MARICOPA (county), ARIZONA (state)

To reach this station from the
POST OFFICE IN ARLINGTON GO WEST ALONG
OLD HWY 80 0.3 MILES TO 333RD AVENUE
THEN NORTH 0.2 MILES TO KNOX ROAD.

This station is located

0.2 MILES NORTH OF KNOX ROAD AND
333RD AVENUE 80'± WEST OF 333RD
AVENUE

This station is a
½" RE BAR



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM13

COUNTRY	TYPE OF MARK	STATION	
USA	BC	ERM LW NO. 2	
LOCALITY	**STAMPING ON MARK**	**AGENCY (CAST IN MARKS)**	**ELEVATION** (FT) (M)
PHOENIX	ERM LW 2	NONE	842.431
LATITUDE	**LONGITUDE**	**DATUM**	**DATUM**
			MSL 1929
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**ESTABLISHED BY (AGENCY)**
850,565.902	435,215.999		AMCI
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**DATE** / **ORDER**
			OCT 91 / 3

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

This station is located at/near ARLINGTON (city), MARICOPA (county), ARIZONA (state)

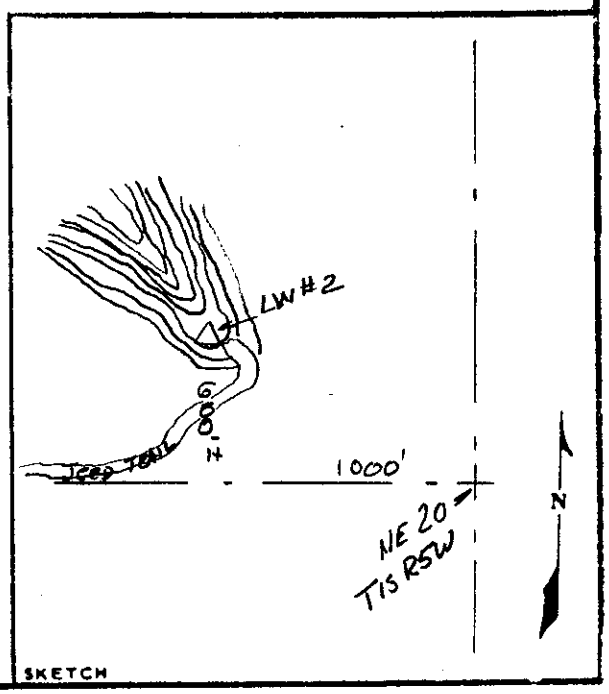
To reach this station from the POST OFFICE IN ARLINGTON GO WEST 1.2 MILES ALONG OLD HIGHWAY 80 TO PAVED ROAD NORTH, THEN NORTH ALONG PAVED ROAD 1.4 MILES TO NARRAMORE ROAD, EAST ALONG TRACK ROAD 0.3 MILES.

This station is located

IN MALAPAI BOULDER AT THE END OF TRACK ROAD. POINT IS IN SE$\frac{1}{4}$ SEC 17 T1S,R5W.

This station is a

B.C. SET IN MALAPAI BOULDER APROX 3' X 4' 2' OUT TO GROUND.



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1958 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM14

COUNTRY	TYPE OF MARK	STATION	
USA	DRILL HOLE	807	
LOCALITY	**STAMPING ON MARK**	**AGENCY (CAST IN MARKS)**	**ELEVATION** (FT) (M)
PHOENIX	NONE	NONE	1140.5 VABM
LATITUDE	**LONGITUDE**	**DATUM**	**DATUM**
		NAD 1983	MSL 1929
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**ESTABLISHED BY (AGENCY)**
851,395.220 (M)	433,524.688 (M)	AZ T.M. CENTRAL	AMCI
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**DATE** / **ORDER**
			OCT 91 / 4

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

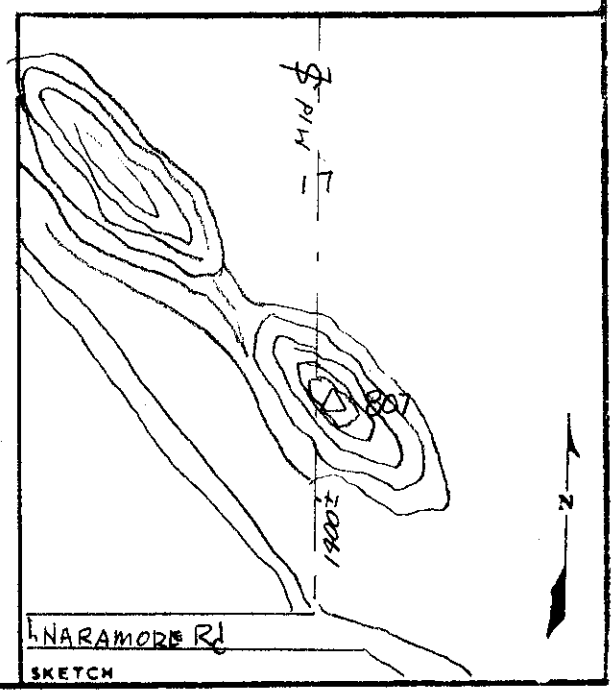
OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

This station is located (near) at ARLINGTON (city), MARICOPA (county), ARIZONA (state)

To reach this station from the
POST OFFICE IN ARLINGTON GO WEST
1.2 MI ALONG OLD HWY 80 TO PAVED
ROAD NORTH, THEN 1.4 MI TO NARRAMORE
ROAD, THEN NW ALONG ABANDONED DIRT
ROAD TO SADDLE BETWEEN TWO HILL TO NE

This station is located
ON TOP OF HILL LOCATED NEAR
MID SECTION LINE OF SEC 17 TIS
R5W APROX 1400 NORTH OF S¼ SEC 17
ON HIGH POINT OF HILL. 25 MIN PACK

This station is a
DRILL HOLE IN MALAPAI BOULDER.



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM15

COUNTRY	TYPE OF MARK	STATION	
USA	B.C.	ERM LW NO. 1	
LOCALITY	**STAMPING ON MARK**	**AGENCY (CAST IN MARKS)**	**ELEVATION**
PHOENIX	NONE	NONE	854.509 (FT) (M)
LATITUDE	**LONGITUDE**	**DATUM**	**DATUM**
			MSL 1929
(NORTHING)(EASTING)	**(EASTING)(NORTHING)**	**GRID AND ZONE**	**ESTABLISHED BY (AGENCY)**
851,609.184 (FT) (M)	440,282.678 (FT) (M)		AMCI
(NORTHING)(EASTING)	**(EASTING)(NORTHING)**	**GRID AND ZONE**	**DATE** / **ORDER**
(FT) (M)	(FT) (M)		OCT 91 / 3

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

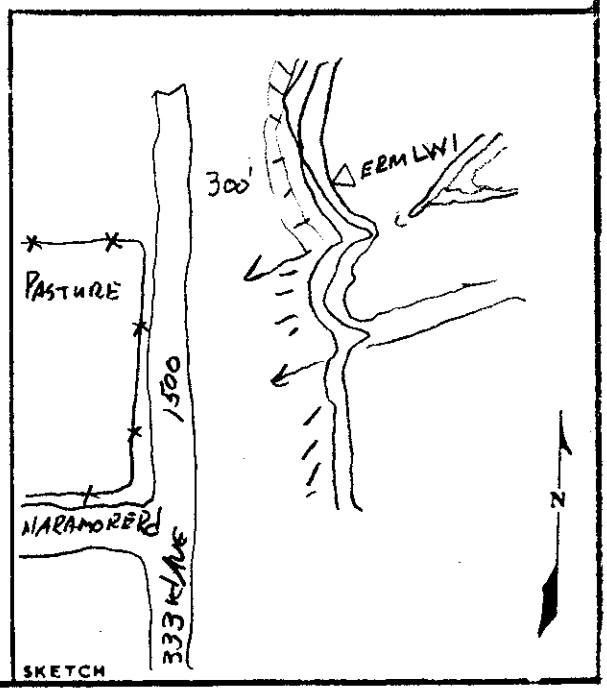
This station is located at near ARLINGTON (city), MARICOPA (county), ARIZONA (state)

To reach this station from the POST OFFICE IN ARLINGTON GO WEST 0.3 MILES ALONG OLD HIGHWAY 80 TO 333RD AVENUE, THEN NORTH 1.0 MILES.

This station is located 300' EAST OF 333RD AVENUE ON BANK OF FLOOD PLANE 0.3 MILES NORTH OF NARAMORE ROAD. POINT IS IN SE $\frac{1}{4}$ SEC 16 T1S,R5W.

This station is a

BC SET IN MALAPAI BOULDER



DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM16

COUNTRY	TYPE OF MARK	STATION	
USA	½" RE BAR	527	
LOCALITY	**STAMPING ON MARK**	**AGENCY (CAST IN MARKS)**	**ELEVATION** (FT) (M)
PHOENIX	NONE	NONE	828.611
LATITUDE	**LONGITUDE**	**DATUM**	**DATUM**
			MSL 1929
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**ESTABLISHED BY (AGENCY)**
			AMCI
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**DATE** / **ORDER**
			OCT 91 / 3

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

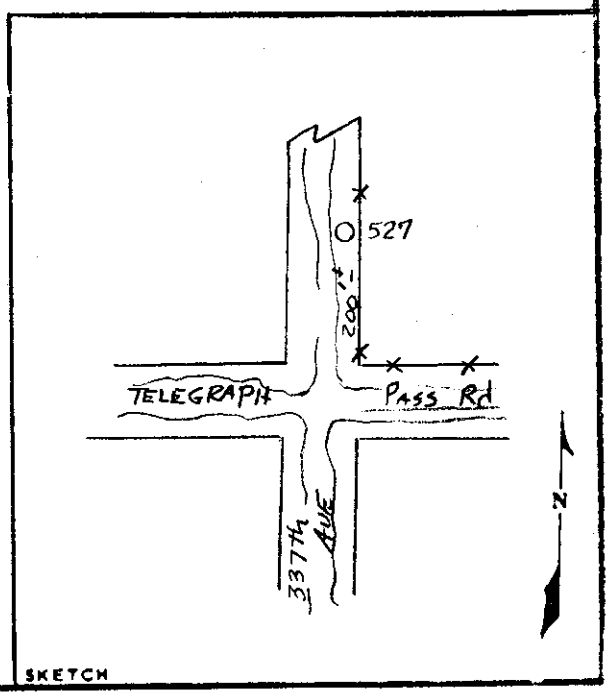
OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

This station is located at ~~near~~ ARLINGTON (city), MARICOPA (county), ARIZONA (state)

To reach this station from the
POST OFFICE IN ARLINGTON GO WEST 0.2 MILES
ALONG OLD US 80 TO 333RD, THEN NORTH 0.2 MILES
TO KNOX ROAD, THEN WEST ALONG KNOX ROAD 0.5
MILES TO 337TH AVENUE, THEN NORTH 8.0 MILES

This station is located
APPROX 1500' NORTH NARRAMORE ROAD
AND 337TH AVENUE ON EAST SIDE OF
DIRT ROAD

This station is a
½" RE BAR



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1958 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM17

COUNTRY	TYPE OF MARK	STATION	
USA	½" RE BAR	810	
LOCALITY	**STAMPING ON MARK**	**AGENCY (CAST IN MARKS)**	**ELEVATION** (FT) (M)
PHOENIX	NONE	NONE	865.328
LATITUDE	**LONGITUDE**	**DATUM**	**DATUM**
		NAD 1983	MSL 1929
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**ESTABLISHED BY (AGENCY)**
854,955.071	440,337.073	AZ T.M. CENTRAL	AMCI
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**DATE** / **ORDER**
			OCT 91 / 3

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

This station is located at/near ARLINGTON (city), MARICOPA (county), ARIZONA (state)

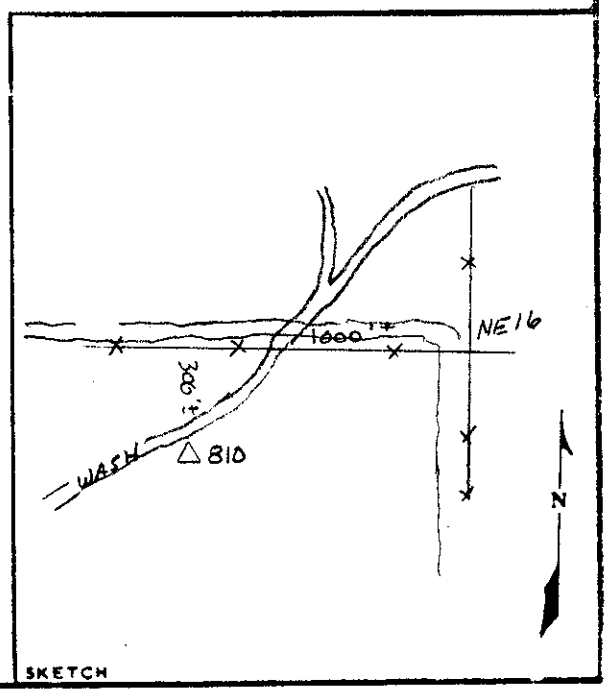
To reach this station from the

POST OFFICE IN ARLINGTON GO WEST 0.3 MILES ALONG OLD HW 80 TO 333RD AVENUE, THEN NORTH 0.7 MILES TO ROAD EAST, THEN EAST ALONG PWER LINE 0.25 MILES TO ROAD AND FENCE WEST, THEN WEST 0.2 MILES.

This station is located

900'± WEST & 300'± SOUTH OF THE NE CORNER OF SEC 16 T1S,R5W.

This station is a
½" RE BAR



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM18

COUNTRY	TYPE OF MARK	STATION	
USA	BRASS CAP	M 10	
LOCALITY	**STAMPING ON MARK**	**AGENCY (CAST IN MARKS)**	**ELEVATION** (FT) (M)
PHOENIX	M 10	USC & GS SURVEY	857.600
LATITUDE	**LONGITUDE**	**DATUM**	**DATUM**
			MSL 1929
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**ESTABLISHED BY (AGENCY)**
			USC & GS
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**DATE** / **ORDER**
			OCT 91 /

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

This station is located at near ARLINGTON (city), MARICOPA (county), ARIZONA (state)

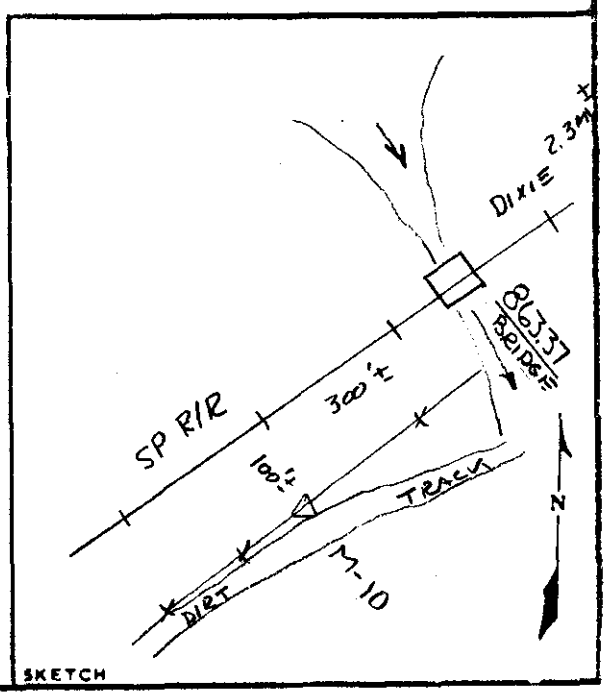
To reach this station from the

HASSAYAMPA STORE ON OLD HIGHWAY 80, GO NW ALONG THE SALOME ROAD 1.8 MILES TO THE NORTH SIDE OF SP R/R, THEN WEST ALONG R/R TRACK 2.8 MILES TO SP R/R BRIDGE NO. 863.37 (R/R MILE POST).
This station is located

APROX 300' WEST OF BRIDGE NO. 863.37 (R/R MILE POST) AND 100± SOUTH OF R/R TRACK.

This station is a

STANDARD DISK ON CEMENT POST 2.1 FT OUT OF GROUND.



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM19

COUNTRY	TYPE OF MARK	STATION	
USA	½" RE BAR	811	
LOCALITY	**STAMPING ON MARK**	**AGENCY (CAST IN MARKS)**	**ELEVATION**
PHOENIX	NONE	NONE	872.020 (FT) (M)
LATITUDE	**LONGITUDE**	**DATUM**	**DATUM**
		NAD 1983	MSL 1929
(NORTHING)(EASTING)	**(EASTING)(NORTHING)**	**GRID AND ZONE**	**ESTABLISHED BY (AGENCY)**
854,987.557 (FT) (M)	429,957.586 (FT) (M)	AZ T.M. CENTRAL	AMCI
(NORTHING)(EASTING)	**(EASTING)(NORTHING)**	**GRID AND ZONE**	**DATE** / **ORDER**
(FT) (M)	(FT) (M)		OCT 91 / 3

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

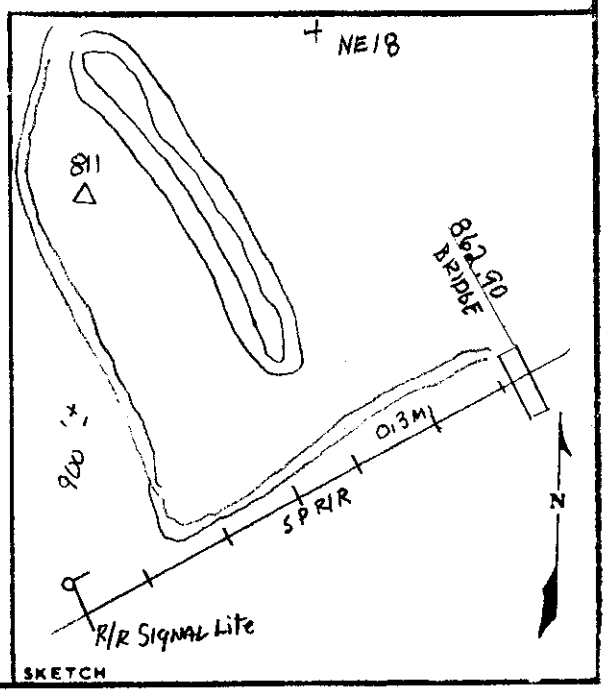
This station is located at (near) ARLINGTON (city), MARICOPA (county), ARIZONA (state)

To reach this station from the POST OFFICE IN ARLINGTON GO WEST 1.2 MILES ALONG OLD HWY 80 TO PAVED ROAD NORTH, THEN NORTH 1.4 MILES TO NARRAMORE ROAD, WEST ON NARRAMORE 1.2 MILES THEN NORTH 0.3 MILES TO RR TRACK, THEN EAST ALONG RR TRACK 0.9 MILES

This station is located

900' NORTH R/R SIGNAL LITE ON THE EAST SIDE OF SMALL WASH IN THE NE¼ SEC 18 T1S, R5W.

This station is a ½" RE BAR



SKETCH

DA FORM 1 OCT 84 1959 REPLACES DA FORMS 1958 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM20

COUNTRY	TYPE OF MARK	STATION	
USA	3/4" IRON PIPE	740	
LOCALITY	**STAMPING ON MARK**	**AGENCY (CAST IN MARKS)**	**ELEVATION** (FT) (M)
PHOENIX	NONE	NONE	858.280
LATITUDE	**LONGITUDE**	**DATUM**	**DATUM**
			MSL 1929
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**ESTABLISHED BY (AGENCY)**
			AMCI
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**DATE** / **ORDER**
			OCT 91 / 3

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

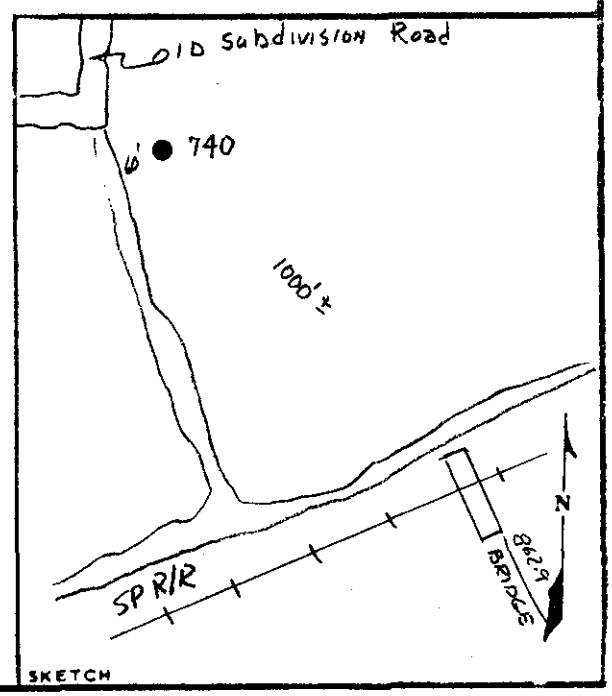
OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

This station is located at near ARLINGTON (city), MARICOPA (county), ARIZONA (state)

To reach this station from the
POST OFFICE IN ARLINGTON GO WEST 1.2 MILES ALONG OLD HIGHWAY 80 TO PAVED ROAD NORTH, THEN NORTH 1.4 MILES TO NARRAMORE ROAD, THEN WEST ON MARRAMORE ROAD 1.2 MILES, THEN NORTH 0.3 MILES TO R/R TRACKS, 1.2 MILES TO BRIDGE NO. 862.90.

This station is located
1000± NW OF BRIDGE NO. 862.90'
EAST OF TRACK DIRT TRAIL.

This station is a
3/4" IRON PIPE



SKETCH

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DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
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ERM21

COUNTRY	TYPE OF MARK	STATION	
USA	BRASS CAP	742	
LOCALITY: PHOENIX	STAMPING ON MARK: 8/9 17/16	AGENCY (CAST IN MARKS): EV MILLER PE 148	ELEVATION: 852.524 (FT) (M)
LATITUDE	LONGITUDE	DATUM	DATUM: MSL 1929
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY): AMCI
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE: OCT 91 ORDER: 3

TO OBTAIN GRID AZIMUTH, ADD ° ' " TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ' " TO THE GEODETIC AZIMUTH

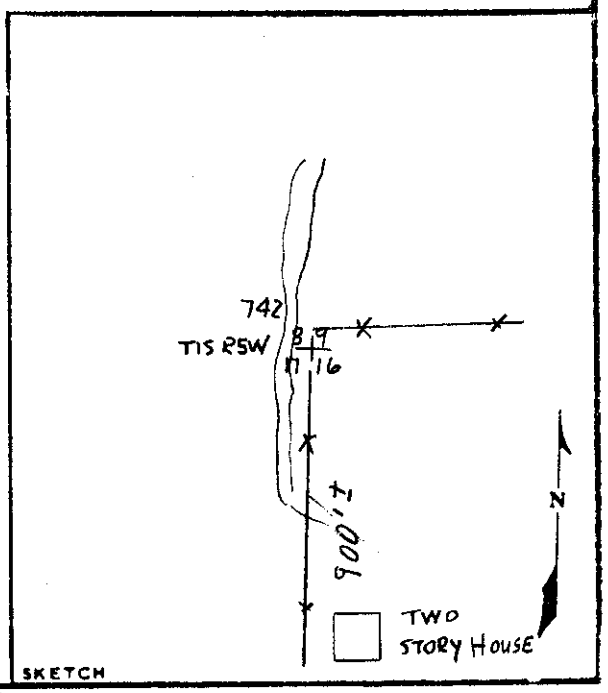
OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ' "	° ' "		

This station is located at/near ARLINGTON (city), MARICOPA (county), ARIZONA (state)

To reach this station from the
POST OFFICE IN ARLINGTON GO WEST 0.3
MILES ALONG OLD HWY 80, THEN NORTH
ON 333RD AVENUE TO KNOX ROAD, THEN WEST
ON KNOX ROAD TO 337TH AVENUE, THEN NORTH
ON 337TH AVENUE 1.5 MILES.

This station is located
¼ MILE WEST OF 337TH AVENUE
NEAR FENCE CORNER

This station is a
GALVANIZE PIPE WITH CAP
STAMPED 8/9 17/16 EV MILLER PE 148



DA FORM 1 OCT 84 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM22

COUNTRY	TYPE OF MARK	STATION	
USA	5/8" RB ALUM CAP	529	
LOCALITY	**STAMPING ON MARK**	**AGENCY (CAST IN MARKS)**	**ELEVATION** (FT) (M)
PHOENIX		EVMILLER PE 148	860.287
LATITUDE	**LONGITUDE**	**DATUM**	**DATUM**
			MSL 1929
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**ESTABLISHED BY (AGENCY)**
			EVMILLER PE 148
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**DATE** / **ORDER**
			OCT 91 / 3

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

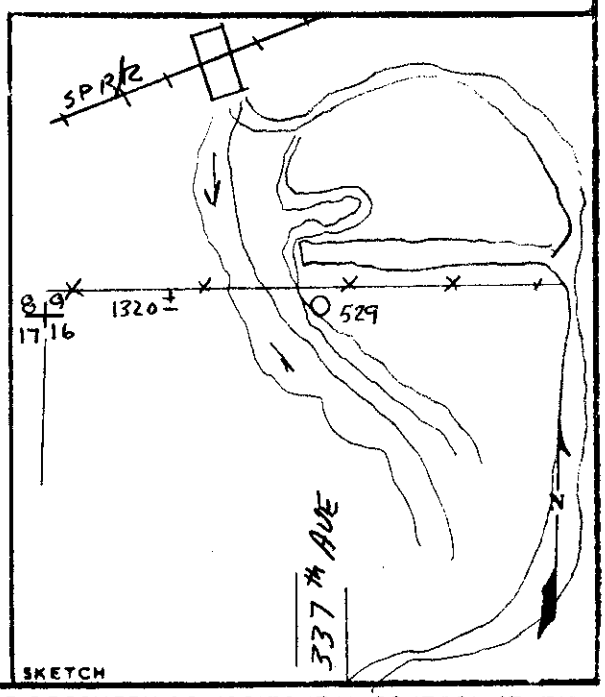
This station is located at (near) ARLINGTON (city), MARICOPA (county), ARIZONA (state)

To reach this station from the

POST OFFICE IN ARLINGTON GO WEST 0.3 MILE TO 333RD AVENUE, THEN NORTH TO KNOX ROAD, THEN WEST TO 337TH AVENUE, THEN NORTH 1.5 MILE.

This station is located
AT THE END OF 337TH AVENUE PROJECTED ON EAST BACK OF WASH, 12' SOUTH OF EAST AND EAST FENCE. POINT APPEARS TO BE 1/16 CORNER ¼ MILE EAST OF THE NW CONER OF SEC 16 T1S,R5W.

This station is a
5/8" RE BAR WITH ALUM CAP.



DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

ERM23

COUNTRY	TYPE OF MARK	STATION	
USA	½" RE BAR	528	
LOCALITY	**STAMPING ON MARK**	**AGENCY (CAST IN MARKS)**	**ELEVATION**
PHOENIX	NONE	NONE	869.3032 (FT) (M)
LATITUDE	**LONGITUDE**	**DATUM**	**DATUM**
			MSL 1929
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**ESTABLISHED BY (AGENCY)** AMCI
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**DATE** OCT 91 / **ORDER** 3

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

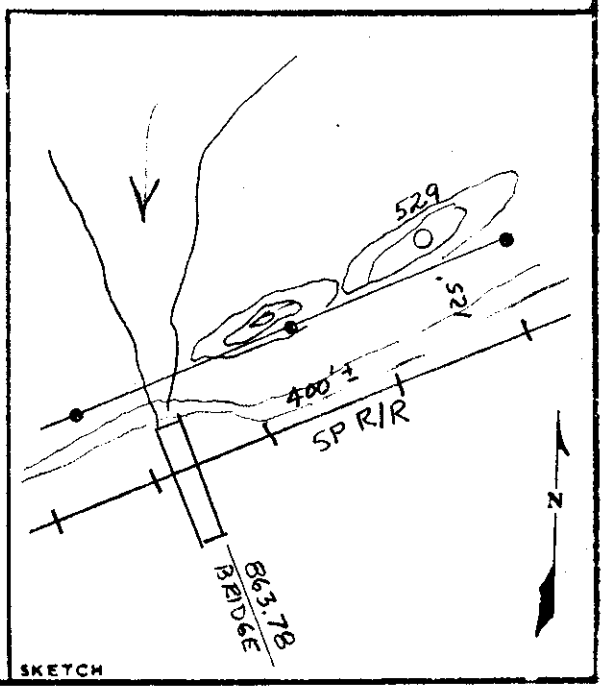
OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

This station is located at/near ARLINGTON (city), MARICOPA (county), ARIZONA (state)

To reach this station from the
POST OFFICE IN ARLINGTON GO WEST 1.2 MILES
TO PAVED ROAD NORTH, THEN 1.4 MILE TO NARRAMORE
ROAD, WEST ON NARRAMORE ROAD 1.2 MILES THEN
NORTH 3.0 MILES TO R/R TRACK, EAST ALONG
R/R TRACK 1.8 MILES TO R/R BRIDGE NO. 863.78

This station is located
400' EAST OF R/R BRIDGE 863.78
125' NORTH OF CENTER LINE R/R
TRACKS ON BANK

This station is a
½" RE BAR



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1958 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

Note: This report contains the results of Aero-Triangulation. The values shown pertain to aerial target and not necessarily the monument.

SMALL BLOCK ADJUSTMENT

PROBLEM 6 AERIAL MAPPING COMPANY INC JN 91122 10/23/91

POINT INDEX	POINT NO.	POINT NAME	NO. OF IMAGES	X	Y	Z	DX	DY	DZ
CONTROL POINTS									
28	22361	X-361	2	432523.915	840189.131	803.356			0.054
45	22516	516	2	430362.044	840797.072	820.451			0.126
46	22517	517	4	439980.642	846172.937	804.221			-0.174
47	22518	518	2	434060.955	841799.133	802.356			-0.280
48	22519	519	2	436288.250	843771.410	795.068			-0.238
49	22520	520	4	435025.439	844346.067	801.527			-0.057
50	22521	521	4	435842.259	844730.957	817.305			0.230
51	22523	523	6	441270.390	847088.755	803.022			0.098
52	22524	524	2	439940.765	848339.413	809.570			-0.053
53	22525	525	2	437402.556	847407.388	824.462			-0.385
54	22526	526	2	441280.458	844708.562	786.163			0.012
55	22527	527	2	437402.313	851682.938	828.611			-0.498
56	22528	528	3	434713.290	855944.609	869.303			-0.143
57	22529	529	3	437397.206	855470.664	859.087			0.164
58	22530	530	2	435958.629	842122.551	779.878			-0.189
59	22531	531	6	437364.512	849456.365	821.721			-0.060
61	22740	740	2	430710.905	855431.660	858.170			-0.179
62	22742	742	2	436086.975	855494.353	851.164			0.108
63	22804	804	4	443759.956	847550.362	850.001	-0.029	0.009	-0.045
64	22805	805	4	433339.081	847877.656	830.802	0.087	0.034	0.016
65	22806	806	4	431203.959	851314.843	838.711	0.105	0.141	0.140
66	22807	807	5	433524.688	851395.220	1140.533	-0.143	-0.194	0.095
67	22808	808	4	441929.881	851425.822	877.619	0.029	0.031	0.141
68	22810	810	4	440337.073	854955.071	865.328	-0.089	0.047	-0.179
69	22811	811	2	429957.586	854987.557	872.020	-0.084	0.278	-0.435
70	22812	812	2	439001.510	858463.782	876.061	0.228	0.151	-0.056
71	22813	813	2	444774.744	844710.760	781.014	-0.097	-0.035	-0.019
72	22814	814	2	432552.366	839166.525	801.867	-0.030	0.058	0.281
73	22815	815	2	430960.173	842164.373	810.950	-0.073	0.249	-0.561
74	22822	822	3	438667.745	842129.151	778.407	0.044	-0.069	-0.068
						RMSE	0.102	0.140	0.220
							0.173		

ADJUSTED POINTS

1	22101		2	429609.982	854471.005	871.156
2	22102		2	430721.195	852850.122	1224.542
3	22103		3	431996.979	855583.182	863.527
4	22104		3	432709.598	853831.525	853.303
5	22105		6	433120.110	852408.244	844.913
6	22106		3	434219.888	856561.164	863.888
7	22107		3	435061.544	854743.673	853.626
8	22108		6	435509.791	853365.809	854.365
9	22109		3	436496.672	857616.587	887.951
10	22110		6	438202.703	854047.007	833.432
11	22111		2	439570.901	856808.081	874.440
12	22201		2	431608.101	849455.127	833.572
13	22202		2	432227.744	847652.657	820.992
14	22203		3	433958.179	850320.875	841.714
15	22204		6	434865.395	848804.954	841.400
16	22205		3	435999.069	851595.201	833.185
17	22206		3	438622.672	852345.027	824.017

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
11890
RICHARD D.
COOK
Date Signed 11/6/91
ARIZONA, U.S.A.

18	22207	6	439547.942	850711.299	815.772
19	22208	2	440982.737	853359.436	872.708
20	22301	2	433323.391	846058.330	831.653
21	22302	5	434102.276	844018.822	817.516
22	22303	3	435837.617	847011.971	829.438
23	22304	6	436575.217	844817.632	816.518
24	22305	3	438242.784	847888.064	819.918
25	22306	6	438999.729	846042.341	813.473
26	22307	3	440853.672	848951.111	846.689
27	22308	2	443088.883	849597.197	876.465
29	22401	2	429856.073	841985.454	817.155
30	22402	2	431174.883	838725.254	795.907
31	22403	3	432140.821	842812.950	801.741
32	22404	3	432731.550	841178.597	790.194
33	22405	3	433549.361	839575.778	782.011
34	22406	3	435478.235	842036.217	777.939
35	22407	3	435989.999	840202.371	774.979
36	22408	3	437674.170	843112.972	779.433
37	22409	3	438507.936	840986.512	775.868
38	22410	3	440116.556	843787.449	786.778
39	22411	3	440633.694	842055.248	775.582
40	22412	3	442575.143	844996.589	786.069
41	22413	3	443163.400	843283.923	779.433
42	22414	2	444660.828	846232.128	850.494
43	22415	2	445483.863	844184.341	779.299
44	22510	3	432265.317	854645.231	855.384
60	22601	2	435970.488	843561.552	794.337

END OF PROBLEM
END OF SMALL BLOCK ADJUSTMENT

SMALL BLOCK ADJUSTMENT

PROBLEM 6 AERIAL MAPPING COMPANY INC JN 91122 10/23/91

CONVERGENCE LIMIT 0.001
GOOD SOLUTION LIMIT 0.020

FOCAL LENGTH 153.4500
XP 0.0000
YP 0.0000

22 PHOTOS
74 POINTS
232 IMAGES

164.DEGREES OF FREEDOM

ITERATION 1
STD. DEV. OF UNIT WT. 0.2138

ITERATION 2
STD. DEV. OF UNIT WT. 0.0074

ITERATION 3
STD. DEV. OF UNIT WT. 0.0071

SMALL BLOCK ADJUSTMENT

PROBLEM 6 AERIAL MAPPING COMPANY INC JN 91122 10/23/91

FINAL RESULTS

PHOTO* INDEX*	PHOTO* NO. *	EXTERIOR ORIENTATION XC	YC	ZC	OMEGA	PHI	KAPPA
1	1001	430272.2350	852716.6145	5039.1933	2.6065	0.0536	26.5326
2	1002	432746.0887	853779.5630	5038.6552	2.6078	0.8699	26.1512
3	1003	435062.3488	854707.9491	5002.6703	1.9280	0.2474	27.1659
4	1004	437286.8388	855663.1288	4975.5264	2.8262	-0.5789	28.3707
5	1005	439548.0517	856698.7127	4971.5971	2.7041	-1.6568	28.1029
6	2001	431529.2451	849409.9520	4985.9822	0.1803	0.2431	24.4744
7	2002	433874.3250	850467.1377	5013.6965	-0.2084	0.1756	24.2441
8	2003	436276.4824	851531.3153	5007.4475	-0.4642	0.6195	23.3695
9	2004	438729.6282	852534.2554	4967.0397	0.0036	1.9758	21.4774
10	2005	440998.1098	853453.9291	4933.8124	1.2055	0.7731	21.5686
11	3001	433444.6940	846053.1356	4977.9770	-0.8759	0.0683	22.1414
12	3002	435938.5957	846996.6618	4936.8945	-0.1048	1.4177	20.2689
13	3003	438235.6895	847885.8965	4926.9233	0.5359	0.0202	19.0245
14	3004	440630.0139	848751.2165	4959.4915	0.4921	-0.1366	20.1269
15	3005	443098.5102	849629.0881	4951.7959	0.6635	0.9477	21.7415
16	4001	430623.2114	840228.6325	4882.3051	0.3642	0.8909	25.3482
17	4002	432845.0903	841144.2277	4925.9255	1.2748	-0.1575	24.1143
18	4003	435250.3308	842090.5096	4931.2161	0.1740	-0.8330	25.5556
19	4004	437626.1714	843059.3428	4961.5468	-1.3041	-0.1739	25.8583
20	4005	440071.4265	844050.7567	4962.7532	-0.1308	0.7317	26.0630
21	4006	442434.3233	844960.9869	4931.2221	0.6717	1.0558	24.2495
22	4007	444776.9979	845862.2461	4909.9841	1.8776	0.5035	24.0911

COUNTRY	TYPE OF MARK	STATION	
USA	BRASS CAP	W-361	
LOCALITY: PHOENIX	STAMPING ON MARK: W361 1967	AGENCY (CAST IN MARKS): USC & GS	ELEVATION: 776.215 (FT) (M)
LATITUDE	LONGITUDE	DATUM	DATUM: MSL 1929
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY): USC & GS
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE: 1967 / ORDER: 1

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

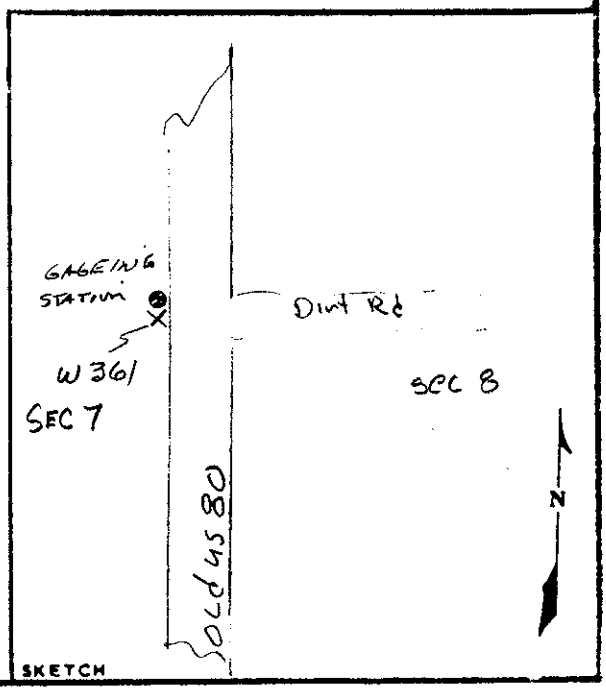
OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

This station is located near ARLINGTON (city), MARICOPA (county), ARIZONA (state)

To reach this station from the
POST OFFICE IN ARLINGTON GO SOUTHWEST ALONG
OLD HIGHWAY 80 4.6 MILES, IN SECTION 7 T1S, R5W
TO US GEOLOGICAL SURVEY STREAM FLOW MEASURING
STATION.

This station is located

49' WEST OF CENTER LINE OF HIGHWAY
34.5' SOUTH OF THE SOUTH WALL OF A
4' X 4' CINDER BLOCK BUILDING, 2.5'
WEST OF FENCE, 1.4' SOUTH WEST OF
WITNESS POST.
This station is a
STANDARD BRASS DISK SET IN
CONCRETE POST 6' OUT OF
GROUND.



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1958 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

COUNTRY	TYPE OF MARK	STATION	
USA	BRASS CAP	M 13	
LOCALITY: PHOENIX	STAMPING ON MARK: M-13 1927 800.678	AGENCY (CAST IN MARKS): USC & GS	ELEVATION: 800.649 (FT) (M)
LATITUDE	LONGITUDE	DATUM	DATUM: MSL 1929
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY): USC & GS
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE: 1927 / ORDER: 1

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

This station is located near ARLINGTON (city), MARICOPA (county), ARIZONA (state)

To reach this station from the

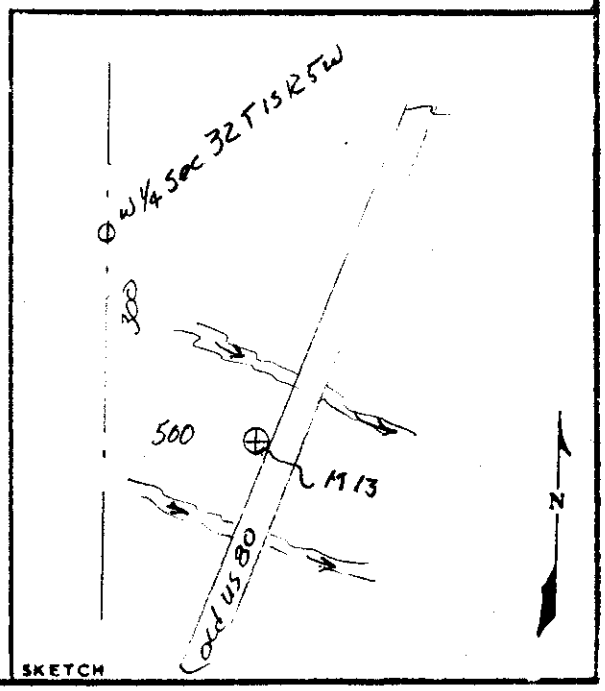
POST OFFICE IN ARLINGTON GO SOUTHWEST ALONG OLD US 80 2.8 MILES, IN SEC 32 T1S, R5W.

This station is located

ABOUT MIDWAY BETWEEN TWO WASHES 55' WEST OF THE CENTER LINE OF HWY 3.5 ' WEST OF FENCE, 5.3' SOUTH WEST OF WITNESS POST.

This station is a

STANDARD BRASS DISK SET IN CONCRETE POST.



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

For use of this form, see TM 5-237; the proponent agency is TRADOC.

COUNTRY	TYPE OF MARK	STATION	
USA	BRASS CAP	ERM	
LOCALITY	**STAMPING ON MARK**	**AGENCY (CAST IN MARKS)**	**ELEVATION** (FT) (M)
PHOENIX	MCHD (791.63)	MARICOPA CT. HWY	791.619
LATITUDE	**LONGITUDE**	**DATUM**	**DATUM**
			MSL 1929
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**ESTABLISHED BY (AGENCY)**
			MARICOPA COUNTY
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**DATE** OCT 91 / **ORDER** 3

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

This station is located at / near ARLINGTON (city), MARICOPA (county), ARIZONA (state)

To reach this station from the

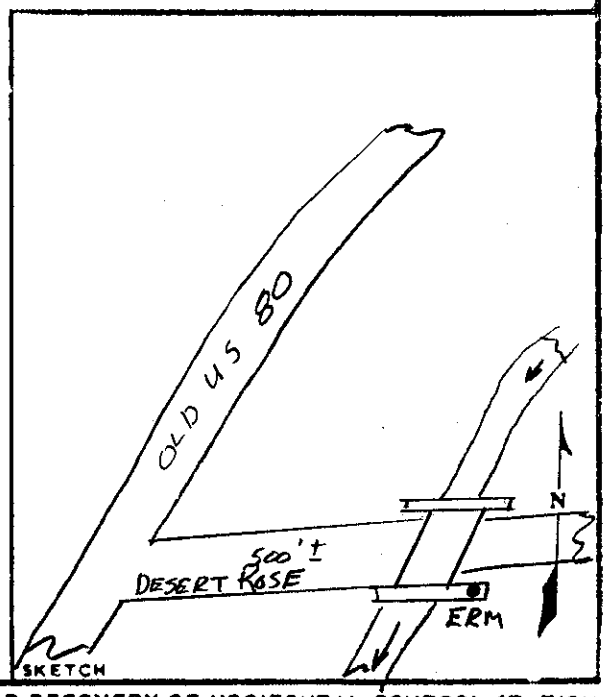
POST OFFICE IN ARLINGTON GO WEST
ALONG OLD HWY 80 2.3 MILES TO
DESERT ROSE.

This station is located

500' EAST OF OLD HWY 80 TO BRIDGE
OVER CANAL . CAP IN HEADWALL
SE COR OF BRIDGE.

This station is a

MARICOPA COUNTY HWY
DEPT. BRASS CAP.



DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

COUNTRY	TYPE OF MARK	STATION	
USA	BRASS CAP	N 10	
LOCALITY	**STAMPING ON MARK**	**AGENCY (CAST IN MARKS)**	**ELEVATION** (FT) (M)
PHOENIX	N 10	USC & GSurvey	900.264
LATITUDE	**LONGITUDE**	**DATUM**	**DATUM**
			MSL 1929
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**ESTABLISHED BY (AGENCY)**
			USC & GS
(NORTHING)(EASTING) (FT) (M)	**(EASTING)(NORTHING)** (FT) (M)	**GRID AND ZONE**	**DATE** / **ORDER**
			OCT 91 /

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

This station is located at / near ARLINGTON (city), MARICOPA (county), ARIZONA (state)

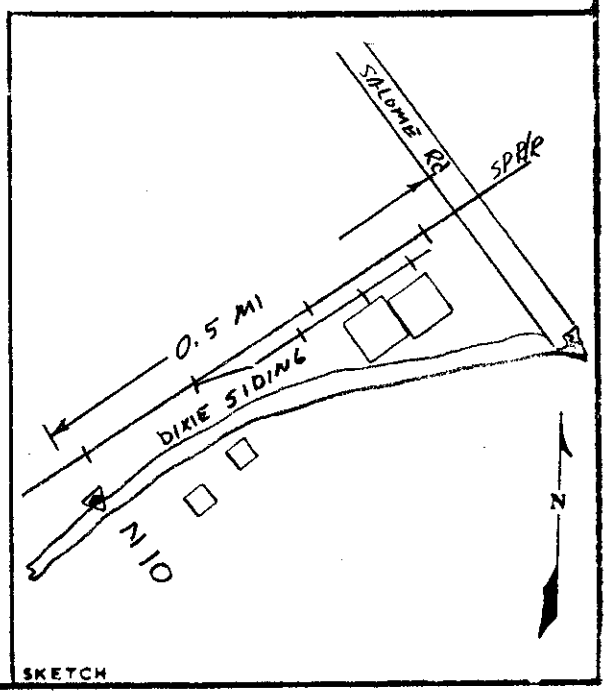
To reach this station from the HASSAYAMPA STORE ON OLD HIGHWAY 80 GO HW ALONG SALOME ROAD 1.8 MILE TO SOUTH SIDE OF SP R/R TRACK, THEN WEST ALONG R/R TRACKS 0.5 MILES.

This station is located

100' SOUTH OF RAILROAD TRACK CENTER LINE ON THE NORTH SIDE OF DIRT ROAD.

This station is a

STANDARD DISK SET IN CONCRETE POST.



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1958 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

For use of this form, see TM 5-237; the proponent agency is TRADOC.

COUNTRY	TYPE OF MARK	STATION	
USA	BRASS CAP	X 360	
LOCALITY: PHOENIX	STAMPING ON MARK: X 360	AGENCY (CAST IN MARKS): USC & GS SURVEY	ELEVATION: 893.592 (FT) (M)
LATITUDE	LONGITUDE	DATUM	DATUM: MSL 1929
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY): USC & GS
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE: OCT 91 / ORDER: /

TO OBTAIN GRID AZIMUTH, ADD ° ′ ″ TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ′ ″	° ′ ″		

This station is located at (near) ARLINGTON (city), MARICOPA (county), ARIZONA (state)

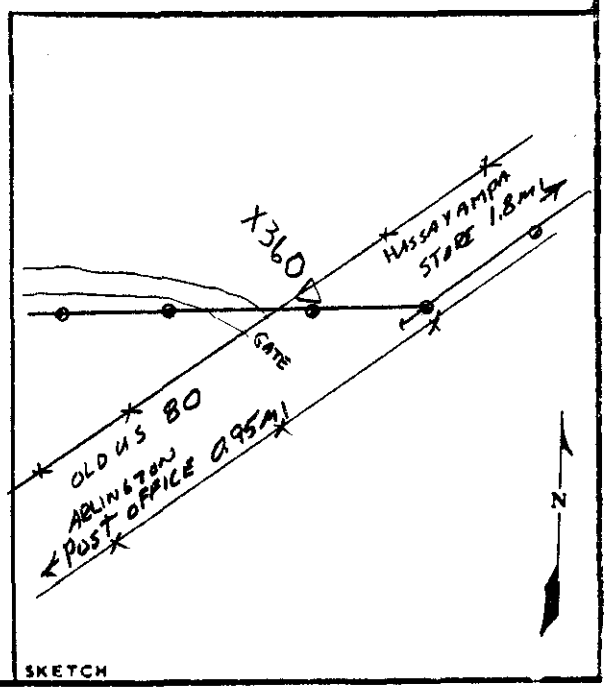
To reach this station from the

POST OFFICE IN ARLINGTON GO EAST ALONG OLD HIGHWAY 80 0.95 MILES IN SEC. 15 TIS, R5W AT A CROSSING OF HIGHWAY 80 A POWER LINE RUNNING WEST.
This station is located

49' NW OF THE CENTER LINE OF HIGHWAY 6' NORTH OF POWER POLE 35' NE OF GATE.

This station is a

STANDARD DISK SET IN CONCRETE POST.



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1958 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

FORMULAE FOR SOLVING RIGHT TRIANGLES

$\text{Sin } A = \frac{a}{c} = \text{Cos } B \quad \text{Cot } A = \frac{b}{a} = \text{Tan } B$

$\text{Cos } A = \frac{b}{c} = \text{Sin } B \quad \text{Sec } A = \frac{c}{b} = \text{Cosec } B$

$\text{Tan } A = \frac{a}{b} = \text{Cot } B \quad \text{Cosec } A = \frac{c}{a} = \text{Sec } B$

Given	Required	Solution
A, c	B, a, b	$B = 90° - A,\ a = c \sin A,\ b = c \cos A$
A, b	B, a, c	$B = 90° - A,\ a = b \tan A,\ c = \frac{b}{\cos A}$
A, a	B, b, c	$B = 90° - A,\ b = a \cot A,\ c = \frac{a}{\sin A}$
a, c	A, B, b	$\sin A = \frac{a}{c},\ \cos B = \frac{a}{c},\ b = \sqrt{(c+a)(c-a)}$
a, b	A, B, c	$\tan A = \frac{a}{b},\ \cot B = \frac{a}{b},\ c = \sqrt{a^2+b^2}$

FORMULAE FOR SOLVING OBLIQUE TRIANGLES

Given	Required	Solution
A, a, b	B, c	$\sin B = \frac{b \sin A}{a},\ c = \frac{a \sin C}{\sin A}$
A, B, a	b	$b = \frac{a \sin B}{\sin A}$
a, b, C	A, c	$A + B = 180° - C,\ c = \frac{a \sin C}{\sin A}$
a, b, c	Area	side $\frac{a+b+c}{2} = s$, area $= \sqrt{s(s-a)(s-b)(s-c)}$
a, b, c	Area	area $= \frac{bc \sin A}{2}$
B, C, a	Area	area $= \frac{a^2 \sin B \sin C}{2 \sin A}$

MADE IN U.S.A.

JOB NO. 91122
LUKE WASH FCDMC
ARLINGTON ARIZONA

CREW BILL BARBEE
NANCY PARKS
DATE SEPT - OCT 1991

BOOK 1

REGISTERED LAND SURVEYOR
CERTIFICATE
1317
William
Nov 4 91

INDEX

Book 1

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1	Meas.	809 To GLOC-2
1	"	GLOC-2 To 807
1	Vert ∡	GLOC-2 To Rocky
1	Reciprocal	811 To 807
2	"	812 To 807
2	"	810 To 807
2	"	808 To 807
3	Dist	804 To 807
3	"	815 To 807
3	"	805 To 807
4	Reciprocal	807 - 811
4	"	807 - 812
4	"	807 - 810
4	"	807 - 808
5	Horiz ∡	
	π	GLOC-2 BS Rocky FS 807
6 To 9	Horz ∡	π @ 807 BS GLOC-2 FS 812, 810, 808, 804, 815
10	Horz ∡	π @ 807 BS 811 FS 812
11	Reciprocal ∡	807 - 804
		807 - 815
		807 - GLOC-2
		807 - Gillespie
	Horz ∡	
	π @ 807	BS GLOC-2 FS Gillespie

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Book 1

13	Dist	Powers Butte To 807
"	"	" " To 809
"	"	809 To 807
	"	Gillespie to 807
14&15	Horz &	T@ Powers Butte BS 807 FS809-GLOC-2
16	Horz &	T@ 809 BS 807 FS GLOC-2
17	Horz &	T@ 807 BS GLOC-2 FS 809
18	FS Powers Butte	
19 -	Horz &	T@ GLOC 2 BS Powers
20	Butte FS 807	
21	Horz &	T@ GLOC-2 BS 809 FS 807
22	Horz &	T@ 809 BS Powers Butte FS 807
23	Recipral &	809 to Powers Butte
23	Dist	822 To 807
23	"	814 to 807
23	"	950 to 807
24	Recipral &	807 - 822
	" "	807 - 814
		807 - 505
		807 - 950
5-28	Horz &	T 807 BS Powers Butte 822 - 505 - 814 - 950

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29	Dist	951 To 822
		951 To 813
		952 To 813
		952 To 804
30	Horz ∡	π 951 BS 822 FS 813
31	Horz ∡	π 822 BS 807 FS 851
32	Horz ∡	π 813 BS 951 FS 952

Book 1 (1)

STA	HI	RG	RH	T/P	PPM/P
80A	4.47	GD2-C	5.57	68/29.7	5/45
D	90	11	14		
R	220	27	34		
S	000	10	26		
M	90	10	50	✓	
160C-2	4.63	807	5.60	93/32.7	
D	89	56	01		
R	270	04	08		
S	00	03	59		
M	89	55	5605	✓	
160C2	4.63	Rocky			
D	00	23	14		
R	270	27	07		
S	0	36	46		
M	89	23	035	✓	
[illegible]	[illegible]	307	4.90	104/302	20/60
[illegible]	26	[illegible]	47		
[illegible]	[illegible]	[illegible]	33		
[illegible]	3	23	13		
[illegible]	86	57	37	✓	

.14 M 11,744.093
.033 M [illegible]
.056 F 3453.3.12

.0966 M 11,744.0363

.101 M 12545.505
.045 M 12545.534 .5251 M 12545.5164
.112 F 41159.743

.014 M 1545.325
.012 M 1545.332 .7288 1543.1545
.020 F 5069.947

STA	HI	RD	RH	T/P	PPM/%
812	520	[illegible]	5.35	94/[illegible]	3/[illegible]
D	83	18	55		
R	271	41	27		
To 600 S	1	41	05		
H	88°	18'	44" ✓		
		CH			
810	515	307	5.35	90/30.2	5/60
L	31	[illegible]	24		
To 600 R	[illegible]	[illegible]	[illegible]		
	2	32	[illegible]		
	87	57	12 ✓		
		CH			
1822	514	307	5.35	94/30.[illegible]	15/60
L	33	[illegible]	11		
To 600 R	[illegible]	[illegible]	27		
S	[illegible]	46	49		
M	33	12	52		
		H[illegible]			

[illegible]	M	2726.331	.9224	
[illegible]	M	[illegible]		2725.7394
[illegible]	F	3442.579		

[illegible]	M	2344.481	.4908	
[illegible]	M	2344.475		2342.9952
[illegible]	F	2691.864		

.026	M	2563.412	.4150	
.024	M	2563.417		2562.1703
.023	F	2410.130		

STA	HI	R.Q	RH	T/P	PPM/%
804	536	807	5.35	97/30.2	11/40
U	83	29	43		
R	271	31	06		
6 6.00 S	1	30	17		
M	33	29	18		
315	5.20	807	4.90	104/30.2	20/70
D	88	02	34		
6.00 R	271	53	07		
S	1	57	26		
M	33	02	13.5		
8 S	5.23	807	4.90	104/30.2	24/70
U	34	53	23		
600 R	275	32	20		
S	5	01	37		
	84	58	01.5		

013	M	3333.941		
021	M	3333.971	.9530	3332.7927
039	F	12938.176		

002	M	2922.055		
004	M	2922.059	.0530	29203417
597	F	9586.778		

002	M	1077.852		
003	M	1077.855	.8532	10736975
013	F	3536.249		

STA		H1	R@	RH	T/P	PPM/%
807		4.50	811			
	D	93	01	38		
	R	266	58	49		
TG 6.0	S	003	01	11		
	M	93	01	24.5	Recipric	
807		4.50	812			
	D	91	41	53		
	R	268	18	25		
TG 6.0	S	001	41	35		
	M	91	41	46.5	Recipric	
807		4.50	810			
	D	92	03	09		
	R	267	57	24		
TG 6.0	S	002	02	36		
	M	92	02	52.5	Recipric	
807		4.50	808			
	D	91	47	45		
	R	268	12	55		
TG 6.0	S	001	47	05		
	M	91	47	25	Recipric	

T @ GLOC-2

Rocky	D	000	00	30	25.5
	R	180	0	21	
807	D	170	40	54	51
	R	350	40	52	
			CH		
	D	045	02	30	31
	R	225	02	32	
	D	215	42	56	57.5
	R	35	42	59	
			CH		
	D	090	05	30	32.5
	R	270	05	35	
	D	260	45	56	57
	R	80	45	58	
			CH		
	D	135	07	30	30
	R	315	07	30	
	D	305	47	52	52.5
	R	125	47	53	

25.5

26.5

M 170° 40 24.75

24.5

22.5

		T @ 2.07				
G102-C D	00	00	30	33		
R	180	00	36			
812 D	34	05	11	18		45.0
R	214	05	25			
810 D	58	43	39	46		13.0
R	238	43	53			
808 D	86	06	25	33		00.0
R	226	06	41			
804 D	106	54	23	30		57.0
R	246	54	37			
G 2 D						
R						
815 D	171	50	42	44		11.0
R	11	50	46			
[illegible]	283	19	53	51.5		18.5
R	103	19	50			

812 M = 34° 04' 43.625"

810 M = 58° 43' 12.625"

808 M = 86° 06' 04.125"

804 M = 106° 53' 57.875"

815 M = 191° 50' 10.00"

T D 807 cont.

Glass C	45	02	30	35 ✓		
R	225	02	40			
812 O	79	07	12	18.5 ✓	43.5 ✓	
R	259	07	25 / 37			
810 O	103	45	42	48 ✓	13.0 ✓	
R	283	53	54 / 96			
808 O	131	08	32	40 ✓	05.0 ✓	
R	311	08	48 / 80			
804 O	151	56	29	33.5 ✓	58.5 ✓	
R	331	56	38 / 67			
815 O	236	52	43	48 ✓	13.0 ✓	
R	56	52	53 / 96			
Pyrex K						
R						

			807 cont		
540-2-1.0	90	35	30	36.5	
R	270	05	43		
812 0	124	10	19	23.5	47.0
R	304	10	28		
			47		
810 0	148	48	42	49	12.5
R	328	48	56		
			98		
802 0	170	11	38	44.5	08.0
R	356	11	51		
			89		
[illegible]	196	57	34	37.0	00.5
R	16	59	40		
			74		
3	281	55	47	47.0	10.5
R	101	55	47		

207 cont

[illegible]	135	07	30	35 ✓		
R	315	07	40			
212	167	12	15	14		39.0
R	349	12	13			
210	193	50	41	47 ✓		12.0 ✓
R	13	50	53			
			94			
[illegible]	221	13	34	38.5 ✓		03.5 ✓
	41	13	43			
			77			
[illegible]	242	01	23	30.5 ✓		55.5 ✓
	62	01	39			
3[illegible]	326	57	37	40.5 ✓		05.5 ✓
R	146	57	44			
			81			

			TO 807			
811	D		00	30	31.5	
	R	180	00	33		
812	D	82	34	26	30.5	59.0
	R	262	34	35		
			Cm			
811	D	45	02	30	32	
	R	225	02	34		
812	D	127	36	30	33.5	01.5
	R	307	36	37		
			Cm			
811	D	90	05	30	32	
	R	270	05	34		
812	D	172	39	34	34	02.0
	R	352	39	34		
			Cm			
811	D	135	07	30	30.5	
	R	315	07	31		
812	D	217	41	32	34	03.5
	R	37	41	36		
			Cm			

M1 = 82° 34' 01.5"

307	4.50	30[illegible]			
D	91	31	[illegible]		
15[illegible] R	268	23	46		
S	001	31	14		
M	91	31	35	Recipient	
307	4.50	815			
D	91	58	38		
1610 R	268	01	56		
S	001	58	04		
M	91	58	21	Recipient	
307	4.50	6[illegible]2.6	600		
D	90	09	10		
16 600 R	269	51	31		
S		09	29		
M	90	08	49.5	Recipient	
307	4.5	6[illegible]			
D	90	33	25		
6[illegible] R	269	37	13		
S		22	47		
M	90	23	06		
				Recipient	

		T (2) 307				
Geo-2-C						
D	10	00	30		36 ✓	
R	180	00	42			
Geo-2-C D	169	34	03		18 ✓	42.0
R	349	33	33			
		(M)				
Geo-2-C D	45	02	30		32.5	
R	225	02	35			
Geo-2-C D	214	35	09		13.5 ✓	41.0 ✓
R	34	35	18			
		(M)				
Geo-2-C D	90	05	30	30	37.0	
R	270	05	44	40	35	
Geo-2-C D	359	38	33	18	32.5	45.0 ✓
R	179	33	57	22	20.0 ✓	57.5
		(M)				
Geo-2-C D	135	07	30		32.5 ✓	
R	315	07	35			
Geo-2-C D	[illegible]	42	00		13.5	41.0 ✓
R	124	42	21			

M = 169° 33' 42.25"

Sta	F1	F2	RH	F/L	Rod/Rk
Buyers Box	90	807	4.90	84/29.8	13 / 40
D	90	23	11		
R	269	32	23		
S		21	37		
M	90	27	54		
		(4 Hr)			
Buck Box	4.96	809	4.35	90/22.1	1 / 40
D	90	29	07		
R	261	31	28		
S		28	32		
M	90	28	49.5"		
		(4 Hr)			
809	4.60	807	4.90	86/29.9	11 / 45
D	90	08	24		
R	269	52	04		
S	00	07	56		
M	90	08	10		
		(4 Hr)			
807	5.20	Gillespie			
D					
R					
M					

.011	M	6084.330	.824	
.024	M	6084.825		6084.758'
.015	F	19,963.259		
.055	M	4754.492	.497	
.007	M	4754.510		4754.3324
.035	F	15,598.734		
.056	M	3967.100	.102	
.055	M	3967.102		3967.0898
.023	F	13,015.373		
.013	M	12,163.254	.252	
.010	M	12,163.249		
.065	F	39,905.576		

TO Powers Butte

807	D	00	00	30	32 ✓	
	R	180	07	34		
809	D	40	40	12	16 ✓	44.0 ✓
	R	220	40	20		
802-C	D	40	52	33	39 ✓	07.0 ✓
	R	220	52	40		
						M = 40° 39' 43.50"
	D	45	02	30	30 ✓	
	R	225	02	30		M = 40° 52' 07.5"
	D	85	42	12	11 ✓	41.0 ✓
	R	265	42	10		
	D	85	54	37	37 ✓	07.0 ✓
	R	265	54	37		

T @ Pow: Butte cont.

D	90	05	30	34	
R	270	05	32		
D	130	45	14	16	42.0
R	310	45	18		
D	130	57	36	38.5	04.5
R	310	57	41		
D	135	07	30	32	
R	315	07	34		
D	175	47	17	19	47.0
R	355	47	21		
D	175	59	42	43.5	11.5
R	355	59	45		

		T (2) 9.7			
807 D	00	00	30	29.5	
R	180	00	29		
40-2-CD	92	18	07	11.5	42.0
R	272	18	16		
		C H	2		
D	45	02	30	28.5	
R	225	02	27		
D	137	20	06	9.	40.5
R	317	20	12		
		C H	1		
D	90	05	30	30.5	
R	270	05	31		
D	180	23	14	16	45.5
R	2	23	18		
		C H	3		
D	135	07	30	29.5	
R	315	07	29		
D	227	25	10	11.5	42.0
R	47	25	13		

W 92° 17' 42.50"

T @ 807

G02					
O	000	00	30	33.5	
R	180	00	37		
809 O	69	17	44	45	11.5
R	249	17	46		
Pwrs Point					
O	120	38	14	14	40.5
R	300	38	14		
		11			
O	45	02	30	31	
R	225	02	32		
O	114	19	36	40	09.0
R	294	19	44		
O	165	40	14	15.5	44.5
R	345	40	17		
		11			

M = 69° 17' 14.00"

M = 120° 37' 42.875"

↑ @ 807 cont.

GWD-2-C	D	90	05	30	34	
	R	270	05	38		
809	D	159	22	49	51	17.0
	R	339	22	53		
Bauers Butte	D	210	43	15	16.5	42.5
	R	30	43	18		
	D	135	07	30	34	
	R	315	07	38		
	D	204	24	49	52.5	18.5
	R	24	24	56		
	D	255	45	17	17	44.0
	R	75	45	19		

TQ GLO 2-C

Powers Butte	D	00	00	30	30.5
	R	180	00	31	
809	D	X			
	R				
807	D	18	30	35	40
	R	198	30	45	
	D	45	02	30	40
	R	225	02	50	
	D	X			
	R				
	D	63	32	47	46.5
	R	243	32	50	
	D	90	0		
	R				
	D	X			
	R				

09.5

$TM = 18^\circ\ 30'\ 06.125''$

08.5

TO 6102-C (Cont)

Book 1 (21)

D	90	05	30	37.5		
R	270	05	45			
D	X					
R						
D	108	35	40	43.5		06.0
R	288	35	47			
D	135	07	30	33.5		
R	315	07	37			
D	X					
R						
D	153	37	30	34		005
R	333	37	38			

TA 66 2-C

804	D	000	00	30	32.5	
	R	180	00	35		
707	D	18	25	35	39.0	06.5
	R	198	25	43		
	D	45	02	30	34.0	
	R	225	02	38		
	D	63	27	45	45.5	11.5
	R	243	27	46		
	D	90	05	30	32.0	M = 18° 25' 08.125"
	R	270	05	34		
	D	108	30	38	39.5	07.5
	R	288	30	41		
	D	[illegible]	07	30	32.0	
	R	315	07	34		
	D	153	32	35	39.0	07.0
	R	333	32	43		

			Π @ 809			
Powers Butte	D	00	00	30	34	
	R	120	00	38		
807	D	83	00	12	14	40
	R	268	00	16		
	D	45	02	30	35.5	
	R	225	02	41		
	D	133	02	14	19	43.5
	R	313	02	24		
	D	90	05	30	33	M = 87° 59' 44.5"
	R	270	05	36		
	D	178	05	17	20.5	47.5
	R	358	05	24		
	D	135	07	30	34.0	
	R	315	07	38		
	D	223	07	23	21	
	R	43	07	19		47.0

STA	HI	RO	RH	T/P	PPM/%
809	4.60	Power Batt			
D	89	33	22		
6.00 R	270	27	23		
S					
M	89	32	59.5		
		Reciprocal			
		CH			
822	5.31	807	4.90	100/30.3	18/65
D	88	03	43		
R	271	56	59		
5.35 S	1	56	17		
M	88	03	22		
		CH			
814	5.09	807	4.9	100/30.3	18/60
D	88	26	24		
R	271	34	21		
5.35 S	1	23	36		
M	88	26	015		
		CH			
950	5.17	807	4.9	104	
D	83	06	58		
R	276	53	58		
5.35	6	53	02		
M	83	06	30		

006 M 3232.296
006 M 3232.305 .3005 3230.4404
026 F 10604.630

007 F 12272.769
003 M 3748.748 .7480 3739.3504
024 M 3740.743

006 M 773.107
006 M 773.106 .1065 767.5207
010 F 2536.422

STA		HI	RQ	RH	T/P	ppm/%
807		4.50	822			
	D	91	57	30		
Tg 6.50	R	268	02	45		
	S					
	M	91°	57	22.5	Recipial	
			CH			
807		4.50	814			
	D	91	35	30		
Tg 5.40	R	268	24	48		
	S					
	M	91°	35	21	Recipial	
			CH			
807		4.50	805			
	D	95	00	27		
Tg 6.0	R	264	59	55		
	S					
	M	95°	00	16	Recipial	
			CH			
807		4.50	950			
	D	96	51	50		
Tg 6.0	R	263	08	32		
	S					
	M	96	51	39	Recipial	

T @ 807

Powers	D	00	00	30	34.0
Butte	R	180	00	38	
822	D	26	39	26	28.0
	R	206	39	30	
805	D	58	42	31	36.5
	R	238	42	42	
814	D	60	14	06	10.0
	R	240	14	14	
950	D	115	37	55	57.0
	R	95	37	59	

822 M = 26° 38' 55.0" 54.0

805 M = 58° 42' 03.875" 02.5

814 M = 60° 13' 36.25" 36.0

950 M = 115° 37' 26.00" 23.0

Tr 807 Cont

Book 1 (26)

Power o Butte	D	45	02	30	33	
	R	225	02	36		
822	D	71	41	25	28.5	55.5
	R	251	41	32		
805	D	103	44	29	34.0	01.0
	R	283	44	39		
814	D	105	16	01	04.5	31.5
	R	285	16	03		
950	D	160	39	56	00.0	27.0
	R	340	40	04		

TQ 807 Cont

Powers Butte	D	90	05	30	33.5	
	R	270	05	37		
822	D	116	44	22	26.5	53.0
	R	296	44	31		
805	D	148	47	34	38.0	64.5
	R	328	47	42		
814	D	150	19	06	07.5	34.0
	R	330	19	09		
952	D	225	42	58	59.5	260
	R	25	43	01		

		No807	Cont			
Powers Butte	D	135	07	30	32.0	
	R	315	07	34		
822	D	161	46	27	29.5	57.5
	R	341	46	31		
814	D	193	49	35	39.5	07.5
	R	13	49	44		
805	D	195	21	15	15.5	43.5
	R	15	21	16		
950	D	250	44	59	00.0	28.0
	R	70	45	01		

Book 1 (21)

STA	HI	RO	RH	T/P	PPM/%					
951	5.25	822	5.10	84/30.2	10/75					
D	90	01	25			.002	M	828.285		
Fa 7.00° R	269	59	15			.004	M	828.288	.2860	828.2860
S	00	00	45			.007	F	2717.465		
M	90	01	05							
951	5.25	813	5.3	84/30.2	10/75	.006	M	1202.439		
D	90	00	03			.004	M	1202.439	.4390	1202.4390
R	270	00	56			.013	F	3944.992		
Fa 5.95 S										
M	89	59	43.5							
952	5.13	813	5.10	96/30.2	17/65	.002	M	600.753		
D	91	43	59			.002	M	600.753	.7530	600.4806
R	268	16	55			.010	F	1970.970		
S	1	43	05							
M	91	43	32							
952	5.13	804	9.12	96/30.2	17/75	.005	M	646.635		
D	89	38	53			.005	M	646.634	.6345	646.6218
R	270	22	04			.007	F	2121.505		
S	0	21	07							
M	89	38	14.5							

A @ 951

822	D	05	00	30	30	
	R	180	00	30		
813	D	162	36	12	20.5	50.5
	R	348	36	23		
			(H)			
	D	45	02	30	36.5	
	R	225	02	43		
	D	213	38	31	32.0	55.5
	R	33	38	33		
			(H)			
	D	90	05	30	33.5	M = 168° 35' 53.5"
	R	270	05	37		
	D	253	41	21	34.5	51.0
	R	78	41	28		
			(H)			
	D	135	07	30	34.0	
	R	315	07	38		
	D	303	43	26	31.0	57.0
	R	123	43	36		

			T @ 822		
807	D	00	00	30	31.0
	R	180	00	32	
951	D	102	52	44	46.5
	R	282	52	49	
			Cut		
	D	45	02	30	33.5
	R	225	02	37	
	D	147	54	54	54.5
	R	327	54	55	
			Cut		
	D	90	05	30	32.5
	R	270	05	35	
	D	192	57	53	55.0
	R	12	57	57	
			Cut		
	D	135	07	30	30.5
	R	315	07	31	
	D	237	59	45	46.0
	R	57	59	47	
			Cut		

Boom 1 (31)

15.5

21.0

M = 102° 52' 18.625"

22.5

15.5

		T @ 813				
951	D	00	00	30	33	
	R	180	00	36		
						49.0
952	D	53	24	17	22	
	R	233	24	27		
	D	45	02	30	31	
	R	225	02	32		
	D	93	26	13	16.5	
	R	273	26	20		
						45.5
	D	90	05	30	30	
	R	270	05	30		
						M = 53° 23' 46.75'
	D	143	29	12	16.0	
	R	323	29	20		
						46.0
	D	135	07	30	31.0	
	R	315	07	32		
	D	188	31	15	17.5	
	R	8	31	20		
						46.5

FORMULAE FOR SOLVING RIGHT TRIANGLES

$\sin A = \frac{a}{c} = \cos B$ $\quad \cot A = \frac{b}{a} = \tan B$

$\cos A = \frac{b}{c} = \sin B$ $\quad \sec A = \frac{c}{b} = \csc B$

$\tan A = \frac{a}{b} = \cot B$ $\quad \csc A = \frac{c}{a} = \sec B$

Given	Required	Solution
A, c	B, a, b	$B = 90° - A$; $a = c \sin A$; $b = c \cos A$
A, b	B, a, c	$B = 90° - A$; $a = b \tan A$; $c = \frac{b}{\cos A}$
A, a	B, b, c	$B = 90° - A$; $b = a \cot A$; $c = \frac{a}{\sin A}$
a, c	A, B, b	$\sin A = \frac{a}{c}$; $\cos B = \frac{a}{c}$; $b = \sqrt{(c+a)(c-a)}$
a, b	A, B, c	$\tan A = \frac{a}{b}$; $\cot B = \frac{a}{b}$; $c = \sqrt{a^2+b^2}$

FORMULAE FOR SOLVING OBLIQUE TRIANGLES

Given	Required	Solution
A, a, b	B, c	$\sin B = \frac{b \sin A}{a}$; $c = \frac{a \sin(A+B)}{\sin A}$
A, B, a	b	$b = \frac{a \sin B}{\sin A}$
A, b, C	B, c	$A + B = 180° - C$; $c = \frac{b \sin C}{\sin B}$
a, b, c	Area	side $\frac{a+b+c}{2} = s$; Area $= \sqrt{s(s-a)(s-b)(s-c)}$
A, b, c	Area	area $= \frac{bc \sin A}{2}$
B, C, a	Area	area $= \frac{a^2 \sin B \sin C}{2 \sin A}$

MADE IN U.S.A.

JOB NO. 91122
LUKE WASH FCDMC
APLINGTON ARIZONA

CREW BILL BARBEE
NANCY PARKS
DATE SEPT–OCT 1991

BOOK 2

REGISTERED LAND SURVEYOR
CERTIFICATE
13171
William Francis
Barbee
ARIZONA, U.S.A.

Book 2

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	- 516 - 815 - ERM AHD 352+1666 (794.09)
	- TBM 13 - TBM 12 - TBM 11 - ERM AHD
	386+75 (794.11) — Point not - TBM 10 - 519
5	ERM Y-361
5	ERM Y-361 - TBM 9 - TBM 8 - TBM 7 -
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28	Nozz X π 950 BS 806 FS 807
29-30	" " π 804 BS 807 FS 809 - 952
	" " π 952 BS 804 FS 813
	Dist 950 To 806

(ERM)	1.67			803 726	BM X 361 (ERM)
X-361-PMK		PMK	2.04	803 356	New Guard Sr 1361
			5.05		③ -1.70
	6.14				
PMK			4.62		
814			4.46	802 027 ADJ	½" RB on Bank East Barrow Pit
	4.05				
			11.33		
	2.09				② -10.41
ERM			5.22	791 619 ADJ	MCBC South Hdwk Bridge over
	4.88				canal (791.63 stamped)
			0.73		
	9.32				
			4.23		
	7.61				
			9.43		
	4.59				
			2.765		
	10.80				
			5.185		
	4.58				
			3.22		

	7.77			
		1.75		
	6.08			
		3.925		
	6.45			
		5.06		
	5.27			
				⑩ +28.98
PMK		2.20	820 451	
(516 ERM)		2.045	820 606 ADJ	USCE CAP ON 2" ip. CO-15
	3.00			
		5.68		
	4.21			
		6.15		
	6.27			
		3.34		
	4.21			
		4.09		
	2.78			
		7.87		
	3.30			
				⑥ -9.525
10 PK		6.30	810 950	
815		6.165	811 085 ADJ	1/2" RB Aprox 200' SSE W 1/4 cor Sec 29

	5.20			
		3.65		
	2.11			
		3.41		
	2.27			
		3.19		
	4.53			
		6.60		
	0.17			
		0.80		
	5.85			
		6.91		
	1.33			
		7.95		
	4.11			
		1.27		
	6.50			
		5.62		
	2.43			
		7.18		
	1.34			
ERM		6.48	793 873 ADJ	
	5.12			
		3.20		

-7.83
-9.67

(11) -17.22

ARIZ Hwy Dept BC West HWL
STA 352+16.66 (EL 794.04 STAMPED)

	8.42			
		1.42		
	6.85			
		5.06		
	4.29			
TBM 13		7.96	800 916 ADJ	
	6.90			
518		5.46	802 356 ADJ	
	3.93			
		5.64		
	5.34			
TBM 12		4.845	801 143 ADJ	
	4.96			
TBM 11		6.85	799 253 ADJ	
	6.66			
		5.92		
	2.69			
		7.96		
	4.60			
ERM		5.44	793 885 ADJ	
	5.20			
		4.48		
	4.96			
Dot 32)		4.78	794 787 ADJ	

④ +7.04

CPS West Nd WL

① +1.44

PK & Skinner & Black Top PANEL

② -1.215

CPS West Nd WL

① -1.89

CPS West Nd WL

③ -5.37

AZ Hwy Dept BC West Nd WL
STA 386+15 El 794.11 1934

② +0.90

Point Dot Nail & Skinner ARLington School Rd
& OLD Hwy

	4.66					①	+0.07
TBM 10		4.59	794 858 ADJ	CPS	SE NW WL		
	4.16			Alington Sch. Rd & OK Hwy			
						①	+0.21
519		3.95	795 068	PK Shinner & Ole Hwy Panel			
	3.93					①	-1.43
ERM		5.36	793 639 Pb	ERM Y 361			
	5.98					①	+1.38
TBM 9		4.60	795 019 ADJ	CPS			
	6.97						
		3.67					
	5.85					②	+3.85
TBM 8		5.30	798 870 ADJ	CPS			
	5.35						
		6.22					
	3.12					②	-3.27
TBM 7		5.52	795 600 ADJ	CPS			
	4.95						
		4.19					
	6.72					②	+2.62
TBM 6		4.86	798 220 ADJ	CPS			
	5.00						
		2.16					
	9.04						

	3.58				
		6.11			
	5.20				
		5.27			
	3.91				
		6.23			
	3.03				
		6.84			
	4.71				
		6.34			
	2.56				
PMK		6.72	786	163	
526		7.18	785	703	105
	6.82				
		4.70			
	5.00				
		4.09			
	3.22				
		6.87			
	2.16				
		6.20			
	4.83				
		5.21			

⑧ -18.37

North Leg
BC HH 331 AVC & Arlington Pl

	5.21				
		5.04			
	4.82				
		4.96			
	5.31				
8/3		4.99	781 014 ADJ		
	5.11				
		5.42			
	5.05				
		5.04			
	5.21				
		5.33			
	5.70				
		3.96			
	8.34				
		2.26			
	4.85				
		5.56			
	4.86				
		6.87			
	7.72				
		4.58			
	7.46				
		4.62			

(8) — 4.69

CPS MID Black Top Panel

	4.60				
		6.26			
	3.55				
		6.26			
	4.38				
		5.11			
	4.63				
		5.25			
	5.12				
		5.74			
	3.25				
		5.52			(17) -2.61
	3.02				
		6.10			
	4.39				
822		5.97	778 407 ADJ		½" RB. SE COR DIRT RD INTERSECTION
	6.26				
		4.52			
	6.27				
		5.41			
	4.36				
		5.80			
	4.71				
		3.91			

	6.24				
		4.33			
	5.88				
		2.45			
	5.35				
		4.80			
	6.19				
		5.43			
	3.95				
		5.45			
	2.98				
		7.16			
	3.61				
PMK		5.07	779 878		
530(86)		5.66	779 288 ADJ	MCBC Pot Hole	
	6.41				
		4.32			
	7.03				
		2.97			
	9.69				
		0.27			
	4.16				
		3.95			

(11) +0.88

						(5)	+14.35
	3.93						
ERM			5.36	793	639 Pub	BC Y 361	
		H					
ERM	4.60			803	072 Pub	Z 361	
			4.65				
	4.83						
			3.78				
	4.30						
			1.21				
	10.41						
			0.59				
	10.94						
			0.65				
	10.61						
			0.29				
	10.46						
			0.41				
	8.12						
			6.50				
	4.33					(10)	+46.94
			5.12				
	5.34						
24			3.80	850	001 ADJ	1/2" RB	

Go to Next Page

Go to Next Page

Bent 2 (13)

	4.39			
		3.64		
	6.38			
		0.59		
	10.74			
		0.61		
	9.75			
		1.68		
	6.65			
		2.74		
	4.86			
		3.80		
	9.99			
		1.06		
	8.95			
ERM		3.99	893 592 Pub	X 360 BM
	4.49			
		8.25		
	2.26			
		8.68		
	2.56			
		5.02		
	6.09			
		2.40		

(8) +43.60

	7.15				
		4.64			
	3.97				
		7.31			
	1.87				
		9.81			
	1.48				
		7.64			
	8.55				
		2.81			
	5.47				
		6.72			
	2.08				
		8.47			
	2.78				
		8.95			
	3.18				
TBM #15		6.99	857	8378 ADJ	Rock on ledge South of Power Line
	0.88				
		11.07			
	1.46				
		11.43			
	1.61				
		11.17			

(13) -35.76

	0.93					
		9.74				
	1.13					
		8.73				
	4.92					
		6.42				
	2.55				(8)	-48.27
		5.26				
	5.57					
524		3.56	809	570 ADJ		
ERM	4.45		900	264 Pob	USC&GS BC N-10	
		8.63				
	4.25					
		7.31				
	4.42					
		6.82				
	4.61				(5)	-13.46
		4.17				
	5.22					
TBM 16		9.48	886	302 ADJ	Deck Spike 3' South Telegraph	
	4.50				Pole. Second Pole West of	
		10.06			Mile Post 865 SP R/R	

	4.57					② -10.74
812		9.75	876 061 ADJ		1/2" RB By STOCK Tank	
	9.93					
		9.22				
	2.66					
		7.51				
	9.93					
		9.37				
	5.03					
		4.69				
	3.38					
		2.83				
	4.44					
		6.36				⑦ -8.42
	4.15					
TBM #17		7.96	867 639 ADJ		STONE with "+" Approx 1/4 Cor	
	3.31					
		7.98				
	3.88					
		5.89				
	6.13					③ -7.35
TMK		8.00	859 087			
29		6.80	860 287 ADJ		Alum cap & RB PE 148	

1.54	
	11.42
2.89	
	8.36
6.11	
	3.54
6.81	
	4.83
9.03	
	8.40
6.24	
	2.98
11.86	
	0.24
11.18	
	0.09
3.59	
	3.67
4.14	
	4.07
5.64	
	11.06
1.86	
	7.42

	1.96				
		8.30			
	0.47				(14) − 7.76
PMK		8.06	851	164	
742		6.70	852	524 ADJ	Sec Cor Pipe Galv 3/4 in EV MILLER DE148
	9.76				
		1.33			
	10.30				
		1.63			
	10.73				
		8.10			
	4.48				(5) +16.78
		4.56			
	3.00				
528		5.87	869	3032 ADJ	1/2" I.B North Side Railroad Tracks
	4.69				
		8.51			
	1.76				
		2.75			
	2.56				
		5.20			
	3.08				
		3.68			

	3.52				
PMK		9.30	855	470	
M-10		7.17	857	600 Pub	USC&GS BC Cement Block sulo/gr
	7.47				
		3.74			
	3.74				
		10.04			
	7.40				
		5.51			
	5.19				
		4.61			
	5.59				
PMK		4.92	858	170	
740		4.81	858	280 ADJ	3/4" Rod Pipe
	9.58				
		1.14			
	10.83				
		1.29			
	9.56				
		7.80			
	3.76				
811		9.76	872	020 ADJ	1/2" RB
	3.86				
		8.18			

⑤ +11.70 ✓

⑤ +0.68 ✓

④ +13.74 ✓

	6.36				
		6.54			
	3.47				
		6.32			
	2.81				
		5.15			
	3.17				
		4.49			⑥ -14.42
	3.90				
M-10		7.28	857 600 Pub		ERM M-10
TBM #17	6.94		867 6379 ADJ		X on stone 1/4 cor. South Fence
		5.55			
	1.73				
		6.84			
	6.82				
		1.01			④ -2.31
	3.37				
810		7.77	865 328 ADJ		1/2" RS Sw Sec cor
	8.32				
		2.15			
	6.16				
		1.69			

	9.34					
		2.61				
	2.42					
		6.49				
	3.36					
		1.18				
	10.41					
		4.01				
	2.10					
		8.36				
	4.23					
		5.05				
	4.59				⑨	+12.52 ✓
PMK		7.10	877 619			
808		6.87	877 849 ADJ	½" RB		
	2.91					
		7.49				
	3.51				②	−7.20 ✓
TBM		6.13	870 649 ADJ			
#18	1.82			5/8 RB Alum Cap 1/16 cal		PE 148
		8.03				EV Miller
	1.60					
		6.47				

	5.80			
		7.07		
	2.48			
ERM		6.27	854 5088 ADS	
	1.43			
		11.84		
	1.78			
		11.41		
	1.46			
		11.30		
	2.49			
		8.80		
	4.30			
		3.49		
	6.18			
		5.52		
	5.82			
		6.12		
	4.71			
		4.40		
	5.25			
		4.80		
	6.95			
		1.78		

④ -16.14

BC Set on Rock 30' ABOVE FLOOR
Luke Washburn Plane

					(11) −25.90
	6.03				
527		2.84	828 611 ADJ		1/2" RB 250' North of Telegraph Pass Rd & 337 Ave
	2.42				
		2.76			
	3.82				
		3.06			
	2.00				
		7.16			(4) − 6.89
	4.49				
531		6.64	821 7211 ADJ		1/2" R B. South of Narramore & 337 Ave South of Wash west Side of Rd
	2.76				
		4.12			
	3.25				
		5.83			
	6.27				
		0.93			(4) +2.74
	5.54				
525		4.20	824 462 ADJ		1/2 RB NE Cor Knox Rd & 337 Ave
	4.24				
		3.41			
	6.87				
		3.76			(3) +8.16
	7.75				
M		3.53	832 6227 ADJ		PK & Shrader West Side Hatto Rd & KNOX
19					

531	5.88		821	7211	½ RS S. Wash 337 AVE & NAKAMORE)
		4.16			
	4.97				
		4.60			
	5.05				
		3.96			
	5.88				
		4.20			
	5.98				
		4.09			
	5.82				
		4.06			
	5.82				
		4.47			
	6.36				
		3.51			(9) +20.71
	9.70				
ERM		1.70	842	4305 ADJ	Set BC 3X4 Mahapai boulder
LW#2					SE Tip of MT
TBM	3.58				TSM PK & Shimmer
#(19)		6.39	832	6227 ADJ	
	4.16				
		5.94			
	3.74				
		5.83			

	3.91			
		5.40		
	3.92			
		5.84		
	4.00			
		5.83		
	4.67			
		5.69		
	3.73			
521		6.11	817 305 ADJ	CPS Set in ℄ Hwy
	3.56			
		8.10		
	1.14			
		2.79		
	2.10			
		9.91		
	4.78			
		5.01		
	5.43			
520		6.98	801 527 ADJ	"+" on concrete Pad
	4.06			
		9.32		
	10.59			
		1.60		

(7) – 15.32 ✓

(5) – 15.78 ✓

	x2.78			
		8.68		
	1.45			
		5.95		
	4.16			
		3.95		
	3.93			
ERM		5.36	793 639 P.6	Y 361 USC&GS B.C.

(6) - 7.89

		T @ 9:00			
8060	[illegible]	00	00	28.0	
R	180	00	26		
8070	66	46	37	36.0	08.0
R	246	46	35		
		C			
D	45	02	30	29.5	
R	225	02	29		
D	111	48	39	38.5	09.0
R	291	48	38		
		C			
D	90	05	30	27.5	M = 66° 46' 10.75"
R	270	05	25		
D	156	51	41	41.5	14.0
R	336	51	42		
D	135	07	30	28.5	
R	315	07	27		
D	201	53	41	40.5	12.0
R	21	53	40		
		C			

				A @ 804			
807	D	[illegible]	[illegible]	[illegible]	28.0		
	R	1[illegible]	[illegible]	16			
809	D	85	30	56	56.5		28.5
	R	265	30	57			
952	D	270	21	51	49.5		21.5
	R	90	21	48			
			✓				
807	D	45	[illegible]	30	30.0	M: 85° 30' 29.75"	
	R	225	32	30			
						M: 270° 21' 21.375"	
809	D	130	33	02	01.0		31.0
	R	310	33	00			
952	D	315	23	53	55.0		25.0
	R	135	23	52			
			✓				

Book 2 (?)

TQ 804 (cont

D	40	05	30	28.5	
R	270	05	27		
D	175	36	03	59.5	31.0
R	355	35	56		
D	00	26	45	45.5	17.0
R	180	26	46		
D	135	07	30	30.5	
R	315	07	31		
D	220	38	02	59.5	29.0
R	40	37	57		
D	45	28	47	52.5	22.0
R	228	28	58		

			No 952			
804	D	00	00	00	28.0	
	R	180	00	26		
813	D	94	53	43	47.5	19.5
	R	274	53	52		
	D	45	02	30	26.0	
	R	225	02	22		20.0
	D	139	55	44	46.0	
	R	319	55	48		
						M = 94° 53' 21.75"
	D	90	05	30	34.0	
	R	270	05	38		24.0
	D	184	58	58	58.0	
	R	4	58	58		
	D	135	07	30	32.0	
	R	315	07	34		
	D	230	00	55	55.5	23.5
	R	50	00	56		

STA	HI	RO	RH	T/P	PPM/%
950	5.10	806	4.60	100/30.2	18/96
D	3[illegible]	53	52		
R	270	07	00		
S	00	06	08		
M	89°	53'	26"		
		↓			

[illegible]	M	362.487		
[illegible]	M	362.492	.4919	362.4903
1037	F	1189.279		

TBM #10 CPS South Hdwall Arlington
School & ole Hwy 80
CM

TBM #11 CPS North Hdwl ole US 80
CM

TBM #12 CPS North Hdwl ole US 80
CM

TBM #13 CPS North Hdwall ole US 80
CM

TBM #14 CPS North Hdwall ole US 80
CM

TBM #1 ⊗ (SW COR Bridge)
East Arlington P.O. Hd WL

TBM #2 ⊗ NW COR Bridge Hd WL
West Arlington Post Office

TBM #3 CPS North Hd WL 2nd wash
West Arlington P.O.

TBM #4 CPS North Hd WL First wash
West 333 Ave & Ole US 80

TBM #5 CPS N. Hd WL 2nd wash
West 333 Ave & Ole US 80

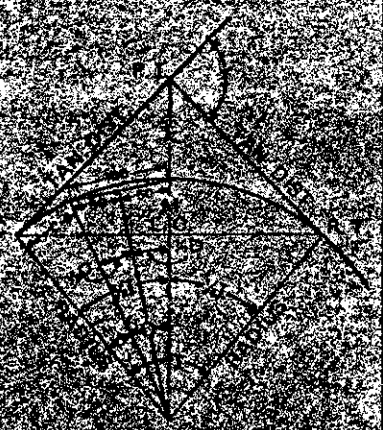
TBM #6 CPS N Hd WL 1st wash West
335 Ave & Ole US 80

TBM #7 CPS N Hd WL 2nd wash West
335 Ave & Ole US 80

TBM #9 CPS N Hd WL 4th 3rd wash West
335 Ave & Ole US 80

CURVE FORMULAE

D = Degree of Curve
d = 1st Degree of Curve
2d = 2 Degree of Curve
P.C. = Point of Curve
P.T. = Point of Tangent
P.I. = Point of Intersection
I = Intersection of Angle, Angle Between Two Tangents
L = Length of Curve from P.C. to P.T.
T = Tangent Distance
E = External Distance
R = Radius
L.C. = Length of Chord
M = Length of Mid Ordinate
c = Length of Sub Chord
d = Angle of Sub Chord



$T = R \tan \frac{I}{2}$ $\quad I = R/100$

$\frac{LC}{2} = R \sin \frac{I}{2}$ $\quad D = \frac{5729.58}{R}$

$M = R(1 - \cos \frac{I}{2}) = R$

$\frac{E}{R} = \sec \frac{I}{2} - 1$ $\quad \frac{M}{R} = 1 - \cos \frac{I}{2}$

$c = 2R \sin d = \frac{2R}{\ }$

$L.C. = 2R \sin \frac{I}{2} = R(\sin \frac{I}{2}) \div 2 = R$

Minutes in Decimals of a Degree

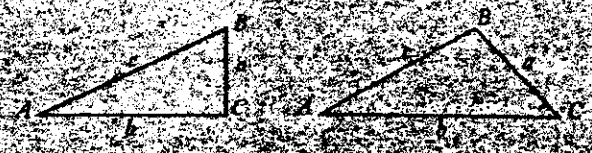
1'	.0167	11'	.1833	21'	.3500	31'	.5167	41'	.6833	51'	.8500
2'	.0333	12'	.2000	22'	.3667	32'	.5333	42'	.7000	52'	.8667
3'	.0500	13'	.2167	23'	.3833	33'	.5500	43'	.7167	53'	.8833
4'	.0667	14'	.2333	24'	.4000	34'	.5667	44'	.7333	54'	.9000
5'	.0833	15'	.2500	25'	.4167	35'	.5833	45'	.7500	55'	.9167
6'	.1000	16'	.2667	26'	.4333	36'	.6000	46'	.7667	56'	.9333
7'	.1167	17'	.2833	27'	.4500	37'	.6167	47'	.7833	57'	.9500
8'	.1333	18'	.3000	28'	.4667	38'	.6333	48'	.8000	58'	.9667
9'	.1500	19'	.3167	29'	.4833	39'	.6500	49'	.8167	59'	.9833
10'	.1667	20'	.3333	30'	.5000	40'	.6667	50'	.8333	60'	1.0000

Inches in Decimals of a Foot

1/16	1/12	1/8	3/16	1/4	5/16	1/3	3/8	7/16	1/2	9/16	5/8
.0052	.0078	.0104	.0156	.0208	.0260	.0313	.0417	.0521	.0625	.0729	

1	2	3	4	5	6	7	8	9	10	11
.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167

FORMULAE FOR SOLVING RIGHT TRIANGLES



$\text{Sin } A = \frac{a}{c} = \text{Cos } B \quad \text{Cot } A = \frac{b}{a} = \text{Tan } B$

$\text{Cos } A = \frac{b}{c} = \text{Sin } B \quad \text{Sec } A = \frac{c}{b} = \text{Cosec } B$

$\text{Tan } A = \frac{a}{b} = \text{Cot } B \quad \text{Cosec } A = \frac{c}{a} = \text{Sec } B$

Given	Required	Solution
A, c	B, a, b	$B = 90° - A,\ a = c \sin A,\ b = c \cos A$
A, b	B, a, c	$B = 90° - A,\ a = b \tan A,\ c = \frac{b}{\cos A}$
A, a	B, b, c	$B = 90° - A,\ b = a \cot A,\ c = \frac{a}{\sin A}$
a, c	A, B, b	$\sin A = \frac{a}{c},\ \sin B = \frac{a}{c},\ b = \sqrt{(c+a)(c-a)}$
a, b	A, B, c	$\tan A = \frac{a}{b},\ \sin B = \frac{a}{b},\ c = \sqrt{a^2 + b^2}$

FORMULAE FOR SOLVING OBLIQUE TRIANGLES

Given	Required	Solution
A, a, b	B, c	$\sin B = \frac{b \sin A}{a},\ c = \frac{a \sin C}{\sin A}$
A, B, a	b	$b = \frac{a \sin B}{\sin A}$
a, b, C	A, c	$A + B = 180° - C,\ c = \frac{a \sin C}{\sin A}$
a, b, c	Area	side $\frac{a+b+c}{2}$, area $= \sqrt{s(s-a)(s-b)(s-c)}$
A, b, c	Area	area $= \frac{bc \sin A}{2}$
B, C, a	Area	area $= \frac{a^2 \sin B \sin C}{2 \sin A}$

MADE IN U.S.A.

JOB NO. 91122
LUKE WASH FCDMC
ARLINGTON ARIZONA

CREW BILL BARBEE
NANCY PARKS

DATE SEPT-OCT 1991

BOOK 3

REGISTERED LAND SURVEYOR
CERTIFICATE
13171
William Francis
Barbee
Date Signed Nov 4 91
ARIZONA, U.S.A.

Page #	Index
1-2	ERM LW 2 - 806 - 805 - TBM #19
3-	524 - Z 361
4	ERM X 361 - TBM #14 - X-361
5	529 - TBM #20 - 528 - TBM #21 -
6	TBM #22 TBM #23 ERM M-10
6-7	811 - 806
7-8	ERM LW1 - TBM #15
8	524 - ERM Z-361
9	ERM X361 - TBM #14 - X361
10	Meas. 809 to 804
11	Recipr. & 804-809
11	Horz ∡ ⊼ 809 BS 804 FS 807

Book 3

ERM	6.83		842	4305 ADJ
		9.16		
	7.60			
		6.77		
	6.75			
		4.63		
	6.06			
		10.79		
	4.57			
		6.23		
	5.48			
		6.17		
	5.35			
		4.87		
	5.85			
Pmk		3.59	838	711
806		3.16	839	141 ADJ
	2.86			
		6.75		
	3.87			
		6.16		
	4.18			
		5.85		
	4.13			
		5.42		

BC LW #2

½"23

(B) -3.29

	4.86			
		4.84		
	5.45			
		4.59		
	5.08			(8) -8.34
		2.96		
	3.55			
805		5.80	830 802 ADJ	1/2" R.B. in Gill Prop.
	9.68			
		2.28		
	5.34			
		3.48		
	3.20			
		6.27		
	4.80			
		7.61		
	4.22			(6) +1.82
		5.37		
	6.11			
TBM 19		6.52	832 6227 ADJ	PK & Shinner Knox Rd

524	6.75		809 570 ADJ
		7.32	
	5.12		
		6.80	
	4.25		
		6.36	
	5.05		
		6.10	
	5.45		
		6.02	
	5.43		
		6.23	
	5.47		
		6.28	
	4.52		
ERM		3.43	803 012 Pub

(8)
-6.50

Z-561 USC&GS BC

ERM	1.56		803 726 Pub	X 361 USC&GS Bench Mark
		5.12		
	4.10			−5.62
T.B.M #14		6.16	798 106 NJ	CPS. N West Headwall
	5.74			
		3.68		
	5.33			+5.62
ERM		1.77	803 726 Pub	X-361

529	6.64		860 287 ADJ	1/2" RB 1/16 core Rock mark South of Bridge 864.32
		5.64		
	4.49			
		1.56		
	7.31			
		4.80		(4) +15.31
	10.02			
TBM 20		1.15	857 595 ADJ	R/R Spike in Top of 4"x6" Post NE COR Bridge # 864.32 SP R/R
	3.82			
		3.33		
	4.04			
		4.34		
	2.49			
		6.66		
	3.43			(4) -6.29
528		5.74	869 3032 ADJ	1/2" RB
	5.18			(1) -0.52
TBM 21		5.70	868 783 ADJ	Bolt painted white NE COR Bridge # 863.78
	3.29			
		6.20		
	0.60			
		4.13		(3) -7.61
	2.81			
M 2		3.98	861 171 ADJ	Bolt Painted white NE COR Bridge # 863.37

	4.14			
TBM 23		4.58	860 731 ADJ	
	4.54			
ERM		7.67	857.600 Pub	
	Cut			
811	3.49		872 020 ADJ	
		9.05		
	6.14			
		8.47		
	2.79			
		6.36		
	9.01			
		2.55		
	8.86			
		5.89		
	3.69			
		8.96		
	2.64			
		8.80		
	3.23			
		6.63		
	3.03			
		7.50		

(1) +0.44

Bolt Painted White NE COR Br Abut # 863.20

(1) -3.13

M-10 - USC&GS BC South R/R

	4.83			
		7.10		
	3.19			
		7.14		
	3.27			
		7.07		
	4.10			
806		5.63	839 14 ADJ	Y2' RB
FRM	8.20		854 5088 ADJ	LWI
	8.20			
		3.65		
		4.53		
	6.13			
	7.01			
		6.60		
		7.09		
	5.23			
	5.77			
		6.40		
		6.82		

(13)
-32.88

	6.17				
	6.59				
		4.68			
		5.36			
	6.06				
	6.74				
TBM 15		7.18		+ Rock	
TBM 15		7.18	857 8378 ADJ	+ Rock	
	(H)				
524	3.22		809 570 ADJ	1/2 183	Bryceys Dam Hanna
		8.27			
	7.67				
		5.86			
	4.98				
		3.61			
	2.71				
		6.17			☆
	5.67				
		5.38			
	3.94				
		4.62			
	3.63				
		4.44			
	4.98				
ERM1		4.93	803 072 Pub	Z 361	
	(H)				

(D) + 3.33
(D) + 3.33
(B) - 6.48

ERM	1.67		803 726 Pub	X-361	
		5.05			
	6.14				⊕ +2.20
		4.46			
	7.88				
TBM 14		3.98	802 027 ADJ	COS	
	4.32				
		8.22			
	4.46				⊖ -2.20
		6.14			
	5.05				
ERM		1.67	803 726 Pub	X-361	
529	5.36		860 287 ADJ		
		4.85			
	6.24				
		3.61			+7.35
	6.07				
TBM 17		1.86	867 6379 ADJ		
	CH				

T	HI	Ra	RH	T/P	RPM/%
809	4.79	804	5.4	64/29.8	+5/70
D	92	16	58		
Est 665 R	267	43	09		
S	2	16	51		
M	92	16	54.5		
		Recipcan			
804	5.34	809			
D	87	43	06		
Est 600 R	272	17	07		
S					
M	87	42	59.5		

002 M 2430.502
002 M 2430.507
010 F 7974.084

			$\bar{\Lambda}$ 809			
804	D	00	00	30	30	
	R	180	00	30		
807	D	56	53	15	16	460
	R	236	53	17		
	D	45	02	30	33	
	R	225	02	36		
	D	101	55	21	22.5	49.5
	R	281	55	24		
	D	90	05	30	33.5	
	R	270	05	37		
	D	146	58	26	26.5	53.0
	R	326	58	27		
	D	135	07	30	34	
	R	315	07	38		
	D	192	00	25	26.5	525
	R	12	00	28		

$M = 56° 52' 50.25''$

			T @ LW1		
808	D	00	00	30	36
	R	180	00	42	
P.B.H.	D	43	21	14	21
	R	223	21	28	
LW2	D	162	01	22	26
	R	342	01	30	
807	D	171	50	42	48.5
	R	351	50	55	
			↓		
	D	90	05	30	34.5
	R	270	05	39	
	D	133	26	19	21.5
	R	313	26	24	
	D	252	06	20	22.5
	R	72	06	25	
	D	261	55	47	47
	R	81	55	47	

45.0

M 43° 20' 46.0"

50.0

M 162° 00 49.00"

12.5

M 171° 50' 12.5

47.00

48.00

12.5

STA	HI	RO	EH	T/P	PPM/%
LW1	520	808	490	54/30.3	-6/57
D	89	03	30		
R	270	56	10		
S					
M	270°	56	20		
LW1	5.20	LW2	4.15	54/30.3	-6/57
D	90	06	19		
R	269	53	34		
S					
M	90°	06'	22.5		
LW2	4.15	LW2A	5.45	56/30.3	-5/60%
D	89° 56	06"			
R	270° 03'52"				
S					
M	89°	56	07		
805	5.25	LW2A	5.45	54/30.3	-5/
D	89	26	18		
R	270	33	44		
S					
M	89	26	17		

8.90

Tg 8.15

015 F 1652.703	.7016		
016 F 1657.700		1657.4790	
016 M 505.268			
010 F 5173.359	.3570		
010 F 5173.355		5173.3481	
004 M 1576.837			
007 F 1970.189	.1925		
007 F 1970.196		1970.1912	
004 M 600.517			
003 F 1309.773	.7742		
007 F 1308.777		1308.7113	
022 M 398.920			

			T	808			
807	D	00	00	30	35		
	R	180	00	40			
LW1	D	6	34	08	13.5		38.5
	R	186	34	19			
			CH				
	D	90	05	30	37	M 60 33" 37.75"	
	R	270	05	38			
	D	96	39	03	11		37.00
	R	276	39	19			

		1 LW 2			
LW 1	D	00	00	30	31
	R	~~136~~	~~00~~	~~06~~	
		180	00	32	
605	D	~~136~~	34	~~06~~	07
	R	~~180~~ 316	~~30~~ 34	~~32~~ 08	
	D	90	05	30	31.5
	R	~~226~~	39	08	
		270	05	33	08.0
	D	~~226~~	39	08	
	R	~~270~~ 46	~~05~~ 39	~~33~~ 08	

36.0

136° 33' 36.25"

36.5

		1 805		
LW 2-A D	00	00	30	32
R	180	00	34	
D	79	59	00	01.5
R	259	59	03	
D	90	05	30	31.0
R	270	05	32	
D	170	03	56	58.0
R	350	04	00	

29.5

M = 79° 58' 28.00"

27.0

STRUCTURAL SURVEY NOTES

for the

LUKE WASH

FLOOD INSURANCE STUDY

FCDMC CONTRACT #90-68

Prepared for:

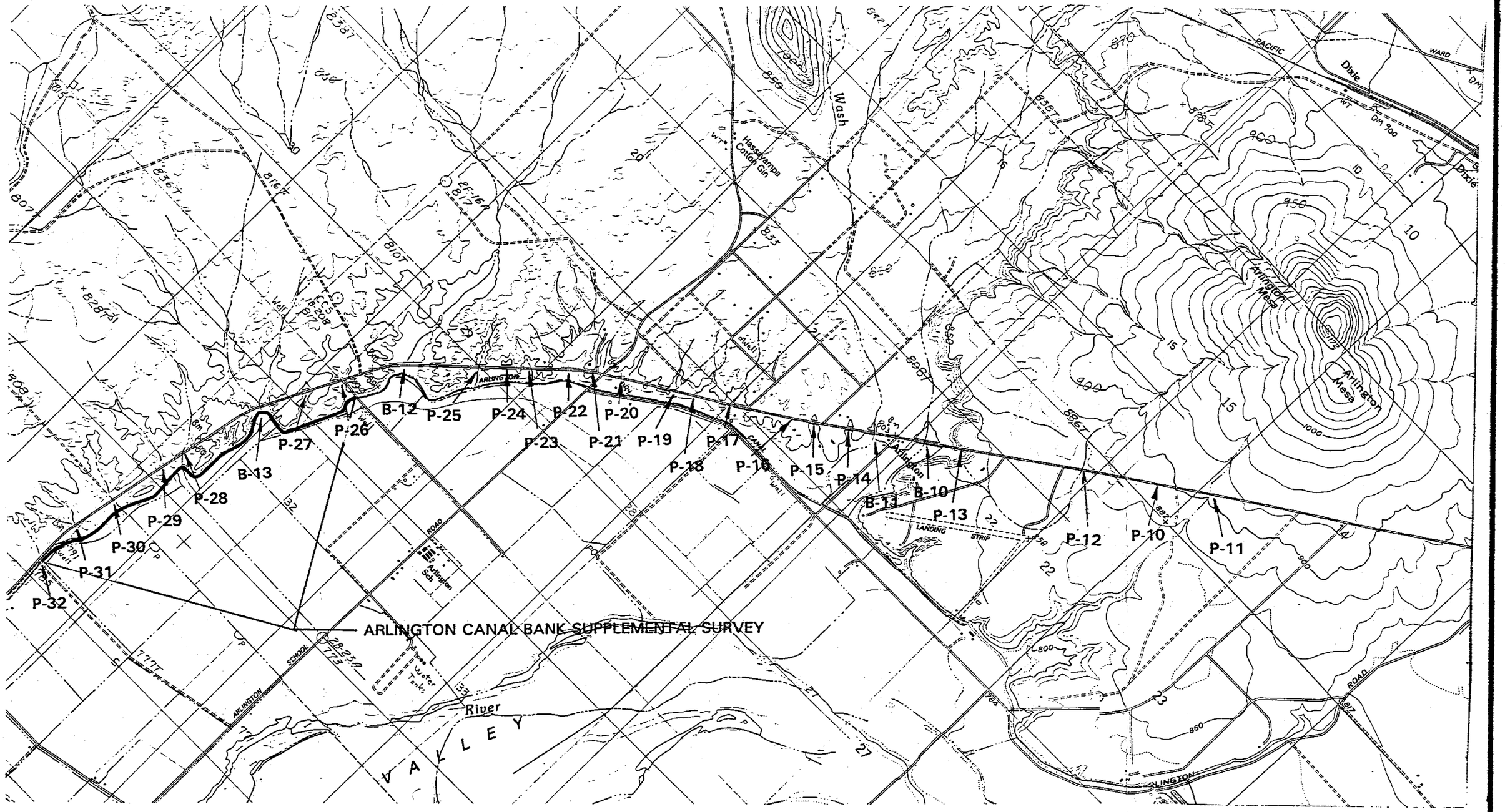
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009
(602) 506-1501

Prepared by:

Coe & Van Loo Consultants, Inc.
4550 N. 12th Street
Phoenix, AZ 85014
(602) 264-6831

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
22782
LARRY E.
SULLIVAN
Date Signed 12/1/92
ARIZONA, U.S.A.

CVL



1" = 2000'

LUKE WASH F.I.S.

STRUCTURAL SURVEY LOCATION MAP

COE & VAN LOO
PLANNING • ENGINEERING
LANDSCAPE ARCHITECTURE

ARLINGTON CANAL BANK

SUPPLEMENTAL SURVEY

Q:\1090\07\ADMIN\015RP.WP5

CVL

SDR2 V02-085	Copyright 1985-90 by Datacom Group Ltd. All rights reserved.		
	Serial no 6841	22-Mar-92 00:44	
	Angle : Degrees	Dist : Feet	Press : Inch Hg
	Temp : Fahrenht	Coord : N-E-Elv	H.obs : Right
JOB	Job ID LUKECANAL		
SCALE	S.F. 1.000000000		
NOTE CP	Sea level crn:N		
NOTE CP	C and R crn : N		
NOTE CP	Atmos crn : N		
NOTE TS	21-Mar-92 01:35		
INSTR	Manual	EDM (No text)	Serial no 000000
	Theo (No text)	Serial no 000000	Mount: Telescope
	V.obs : Zenith	Edm o/s (Null)	Refl o/s (Null)
	P.C. mm 0.000		
POS KI 0814	Nrth 432552.366	East 839166.525	Elv 802.030
	Code PANAL		
POS KI 0361	Nrth 432523.915	East 804189.131	Elv 803.730
	Code R2		
POS KI 9999	Nrth 433077.250	East 837994.096	Elv 801.880
	Code TRAV		
STN TP 0814	Nrth 432552.366	East 839166.525	Elv 802.030
	Theo ht 5.320	Code TRAV	
BKB TP 0814-9999	Dircn 294-07'03"	H.obs 294-07'04"	
OBS F1 0814-9999	Dist 1284.560	V.obs 90-18'29"	H.obs 294-07'04"
	Code BS		
TRGET	Target ht 4.920		
POS TP 7000	Nrth 432523.902	East 840189.258	Elv 803.769
	Code C5		
TRGET	Target ht 5.960		
POS TP 7001	Nrth 432348.436	East 839460.586	Elv 789.248
	Code I5		
TRGET	Target ht 10.620		
POS TP 7002	Nrth 432439.023	East 839289.803	Elv 790.758
	Code I5		
TRGET	Target ht 15.450		
POS TP 7003	Nrth 432379.734	East 839177.565	Elv 787.508
	Code I5		
POS TP 7004	Nrth 432376.448	East 839138.055	Elv 787.549
	Code I5		

TRGET	Target ht 5.960		
POS TP 7005	Nrth 432602.249 Code IS	East 838642.266	Elv 789.526
TRGET	Target ht 25.120		
POS TP 7006	Nrth 432836.053 Code IS	East 838164.093	Elv 786.695
POS TP 7007	Nrth 432921.288 Code IS	East 838003.128	Elv 787.135
TRGET	Target ht 4.920		
POS TP 7008	Nrth 432523.896 Code C5	East 840189.268	Elv 803.759
STN TP 9999	Nrth 433077.250 Theo ht 5.540	East 837994.096 Code TRAV	Elv 801.880
BKB TP 9999-0814	Dircn 114-07'03"	H.obs 114-07'05"	
OBS F1 9999-0814	Dist 1284.550 Code B5	V.obs 90-01'52"	H.obs 114-07'05"
POS TP 7009	Nrth 432552.370 Code C5	East 839166.516	Elv 801.803
TRGET	Target ht 5.960		
POS TP 7010	Nrth 432935.672 Code IS	East 837972.204	Elv 786.792
POS TP 7011	Nrth 432966.955 Code IS	East 837932.864	Elv 787.426
POS TP 7012	Nrth 433011.170 Code IS	East 837921.547	Elv 787.643
POS TP 7013	Nrth 433291.479 Code IS	East 837967.628	Elv 787.332
POS TP 7014	Nrth 433472.982 Code IS	East 838027.688	Elv 789.010
TRGET	Target ht 4.920		
POS TP 7015	Nrth 433769.220 Code C5	East 836125.217	Elv 803.109
TRGET	Target ht 15.450		
POS TP 7016	Nrth 433585.697 Code IS	East 837966.038	Elv 787.469
POS TP 7017	Nrth 433639.662 Code IS	East 837838.505	Elv 786.795
POS TP 7018	Nrth 433586.507 Code IS	East 837622.392	Elv 787.131
POS TP 7019	Nrth 433445.792 Code IS	East 837435.916	Elv 786.888
TRGET	Target ht 5.960		

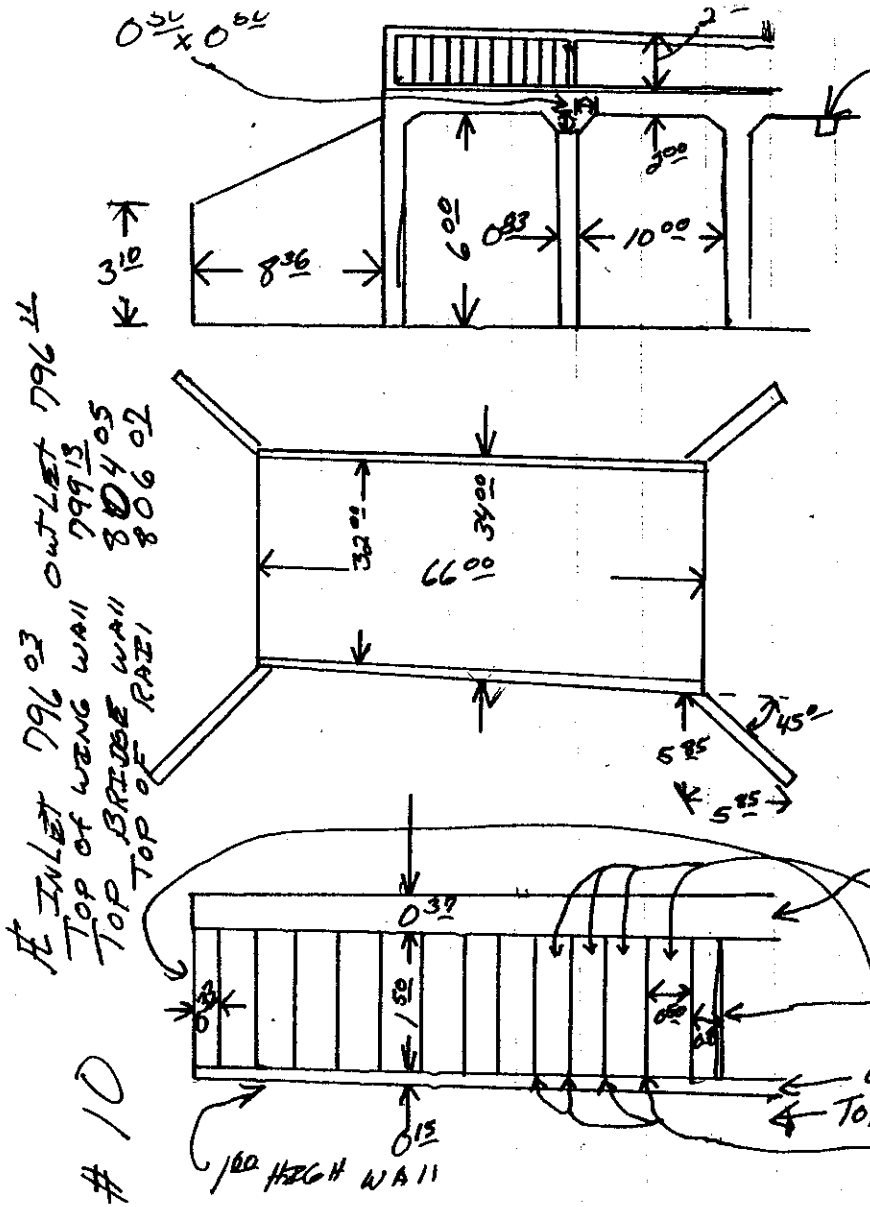
POS TP 7020	Nrth 433431.216 Code IS	East 837394.334	Elv 786.733
POS TP 7021	Nrth 433431.582 Code IS	East 837356.587	Elv 786.790
POS TP 7022	Nrth 433512.205 Code IS	East 836947.343	Elv 788.375
TRGET	Target ht 10.450		
POS TP 7023	Nrth 433575.873 Code IS	East 836825.313	Elv 786.879
TRGET	Target ht 4.920		
POS TP 7024	Nrth 432552.385 Code C5	East 839166.545	Elv 801.796
POS TP 7025	Nrth 432552.332 Code C5	East 839166.510	Elv 801.765
POS KT 9998	Nrth 433077.250 Code TRAV	East 836125.212	Elv 803.410
POS KT 9992	Nrth 433769.151 Code TRAV	East 836125.212	Elv 803.410
STN TP 9992	Nrth 433769.151 Theo ht 5.490	East 836125.212 Code TRAV	Elv 803.410
BKB TP 9992=9999	Dircn 110=18'56"	H.obs 110=18'58"	
OBS F1 9992-9999	Dist 1992.860 Code B5	V.obs 90-03'28"	H.obs 110-18'58"
POS TP 7026	Nrth 433077.247 Code C5	East 837994.104	Elv 801.912
TRGET	Target ht 25.120		
POS TP 7027	Nrth 433659.385 Code IS	East 836727.301	Elv 786.806
POS TP 7028	Nrth 433663.188 Code IS	East 836678.716	Elv 785.936
TRGET	Target ht 15.450		
POS TP 7029	Nrth 433650.034 Code IS	East 836621.304	Elv 785.796
TRGET	Target ht 5.960		
POS TP 7030	Nrth 433688.448 Code IS	East 836087.934	Elv 787.547
POS TP 7031	Nrth 433711.267 Code IS	East 836010.413	Elv 787.093
POS TP 7032	Nrth 433772.057 Code IS	East 835932.700	Elv 786.911
TRGET	Target ht 10.620		

POS TP 7033	Nrth 433863.717	East 835933.557	Elv 787.455
	Code IS		
POS TP 7034	Nrth 434032.565	East 835993.218	Elv 788.108
	Code IS		
POS TP 7035	Nrth 434100.792	East 835955.921	Elv 787.749
	Code IS		
POS TP 7036	Nrth 434112.499	East 835853.734	Elv 787.128
	Code IS		
TRGET	Target ht 15.450		
POS TP 7037	Nrth 434097.816	East 835698.844	Elv 786.883
	Code IS		
TRGET	Target ht 10.620		
POS TP 7038	Nrth 434105.377	East 835512.722	Elv 794.056
	Code IS		
POS TP 7039	Nrth 434069.393	East 835361.236	Elv 790.802
	Code IS		
POS TP 7040	Nrth 434058.823	East 835230.290	Elv 795.494
	Code IS		
TRGET	Target ht 15.450		
POS TP 7041	Nrth 434062.705	East 835115.984	Elv 787.773
	Code IS		
POS TP 7042	Nrth 434117.697	East 834972.696	Elv 790.992
	Code IS		
POS TP 7043	Nrth 434213.172	East 834803.144	Elv 791.990
	Code IS		
TRGET	Target ht 6.680		
POS TP 7044	Nrth 434393.513	East 833912.472	Elv 802.387
	Code C5		
TRGET	Target ht 4.920		
POS TP 7045	Nrth 433077.272	East 837994.092	Elv 801.980
	Code C5		
POS KI 9997	Nrth 434393.447	East 833912.454	Elv 802.730
	Code TRAV		
STN TP 9997	Nrth 434393.447	East 833912.454	Elv 802.730
	Theo ht 5.480	Code TRAV	
BKB TP 9997-9992	Dircn 105-45'20"	H.obs 105-45'21"	
OBS F1 9997-9992	Dist 2299.130	V.obs 89-59'19"	H.obs 105-45'21"
	Code B5		
POS TP 7046	Nrth 433769.159	East 836125.225	Elv 803.190
	Code C5		
TRGET	Target ht 10.620		

POS TP 7064	Nrth 434868.935 Code IS	East 831494.930	Elv 789.290
POS TP 7065	Nrth 434886.294 Code IS	East 831173.080	Elv 786.439
TRGET	Target ht 15.450		
POS TP 7066	Nrth 434990.220 Code CS	East 832113.917	Elv 786.908

* END OF REPORT *

CULVERT SURVEY



2" VERT. DRAIN EACH END OPENING 0.50 BELOW TOP

All BARRELS ~~OPENINGS~~ OF BOX HAVE 0.08 x 0.08 ANGLES

6 ~~OPENINGS~~ BARRELS

DENSE BRUSH ON OUTLET

INLET WEST BARREL HAS 7" TREE GROWING

WEST TWO BARRELS 0.50 TO 2' SED. NORTH OF INLET

EAST TWO BARRELS 0.50 TO 1' SED NORTH OF INLET

3 STRAND BARBED WIRE ± 3' HIGH AT INLET

4 STRAND BARBED WIRE 4' HIGH 33' NORTH OF INLET

BRIDGE 90° TO ROAD

0.37 x 0.45 TOP RAIL

17 SPACES (OPENINGS) BETWEEN 0.33 x 0.45 sq. TUBES

0.33 x 0.45 sq. TUBE 10' ON CENTER EXCEPT WEST END

16 0.08 x 0.08 sq. TUBES 0.50 SPACEING

0.15 x 0.41 sq. TUBE

TOP CONCRETE

1.00 HIGH WALL

B # 10

INLET 796.03
TOP OF WING WALL 799.13
TOP BRIDGE WALL 804.05
TOP OF RAIL 806.02
OUTLET 796.11

#6 WEST BARREL	0.12 SED.	BOTH ENDS
#5 BARREL	0.08 SED.	BOTH ENDS
#4 "	0.04 SED. AT INLET	0.08 SED. OUTLET
#3 "	0.08 SED	BOTH ENDS
#2 "	0.05 SED. AT INLET	0.20 SED. OUTLET
#1 EAST BARREL	0.05 SED. BOTH ENDS	& 2'x2' ROCK

B# 11 THE SAME BRIDGE AS B#10
INLET # 795.84 OUTLET # 795.83
Top of WINGWALL 799.05
Top of RAIL 805.90
Top of CONCRETE WALL 803.85

OUTLET IS UNDER MINED

INLET 33'± UPSTREAM 3 STRAND BARBED WIRE

~~West~~ EAST BARREL #1 INLET SIDE HAS 0.50 SED. BARREL HAS 2'± WIDE # WITH 1.50 SAND SED. ON SIDE OUTLET HAS 5'x3' HIGH PILE LARGE ROCKS.

BARREL #2 INLET BLOCKED BY 2' WIDE 1' DEEP BRU BARREL HAS 0° TO 0.25 SED. OUTLET HAS 3'x2' HIG ROCK PILE

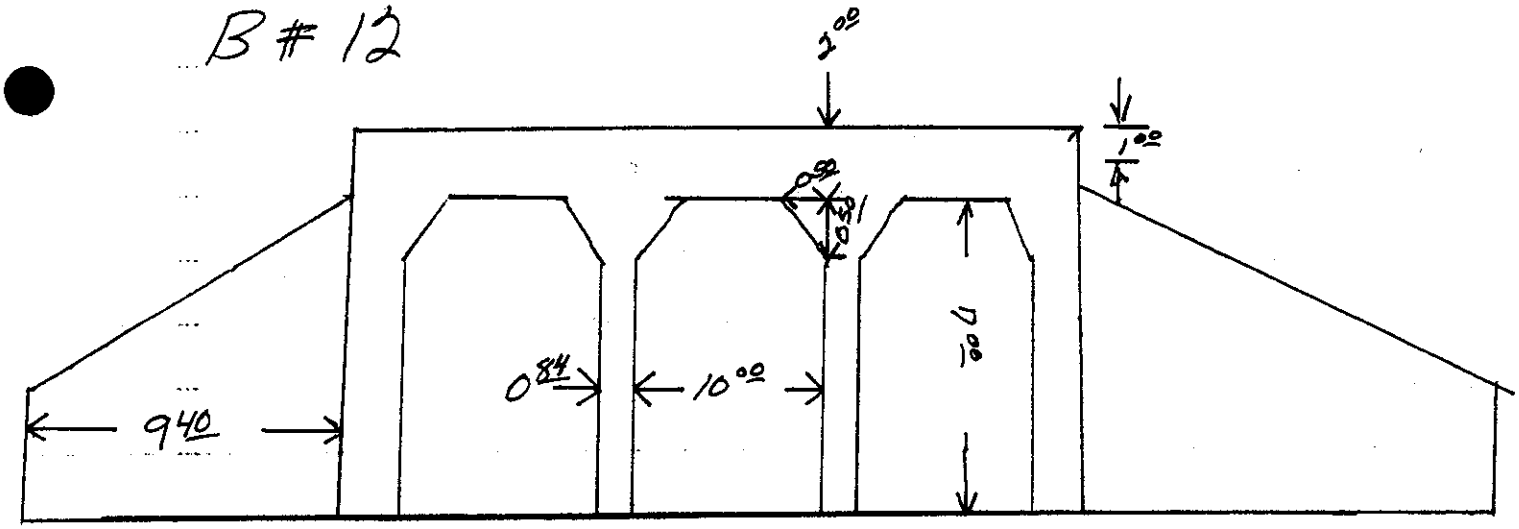
BARREL #3 INLET HAS 5'x2' BRUSH BLOCKING IT. 0° TO 0.50 SAND SED. OUTLET HAS 4'x2' HIGH BRUSH PILE

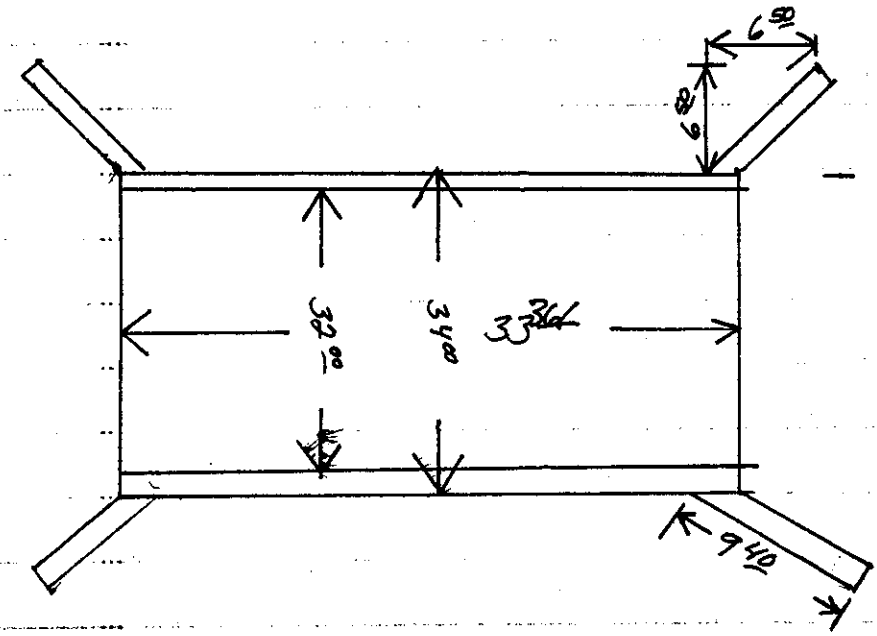
BARREL #4 INLET HAS 7'x2' BRUSH BLOCKING IT. BARREL? OUTL CLEA

BARREL #5 0° TO ½ SED. AT INLET 10' LONG 4' WIDE 2' HIGH BRUSH PILE IN BARREL WITH 2'x2' ROCK OUTLET CLEAN

WEST BARREL #6 0° TO 2' SED. AT INLET, 0.83 SED. IN BARREL OUTLET CLEAN ±

B # 12

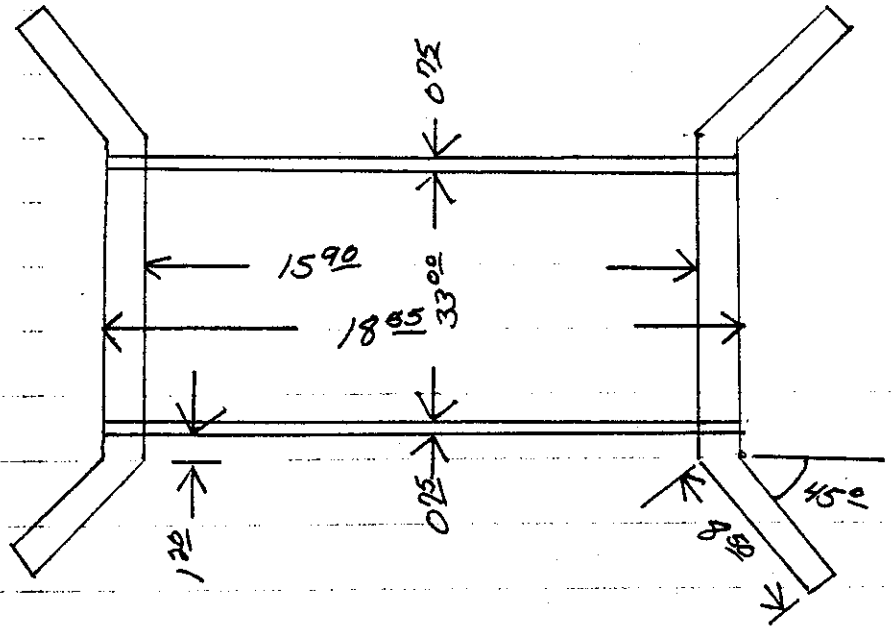


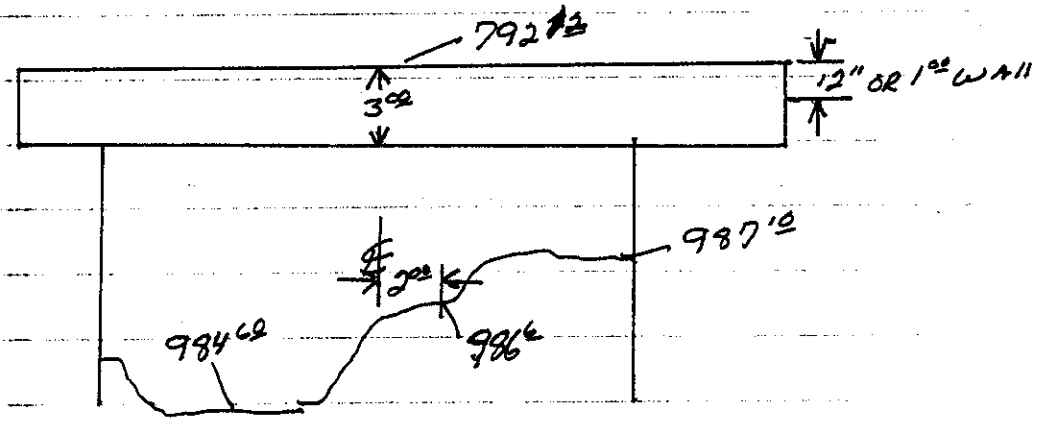


INLET ℄ 784.86
OUTLET ℄ 784.85
TOP OF WALL 793.87
TOP OF WING WALL 788.56
℄ BOX PAVMT. 793.88
NORTH END PAVMT 793.90
SOUTH END BOX PAVMT. 793.88

ALL CORNERS OF BARRELS ANGLED 0.08 X 0.08
INLET 33' UP STREAM 4 STRAND BARBED WIRE
INLET UP STREAM 1' HIGHER THEN BOX ℄
OUTLET ℄ 1' HIGHER THEN BOX ℄ IT ALSO HAS LOTS
OF TREES ± 30' DOWN STREAM
NORTH BARREL #1 CLEAN
BARREL #2 CLEAN
SOUTH BARREL #3 0'– 1' SED. SAND & DIRT

B # 13 BRIDGE AT 90°





INLET ELEV.

Top of WALL 792.42
Top of WING WALL 786.89
Top of ABUTMENT 790.43
℄ BOX PAVMT 792.42
NORTH END PAVMT 792.42
SOUTH END PAVMT. 792.51
OUTLET ℄ 795.38 DERT.

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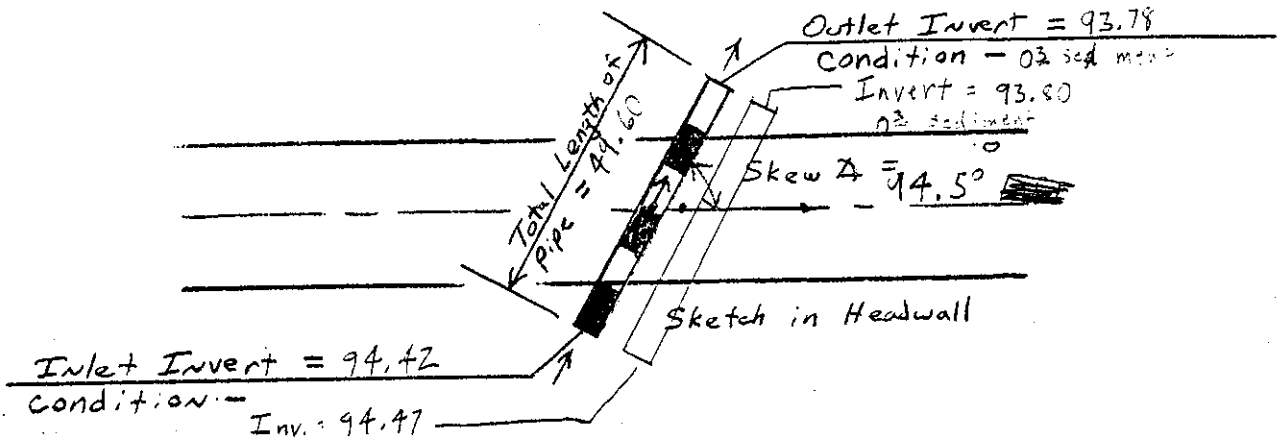
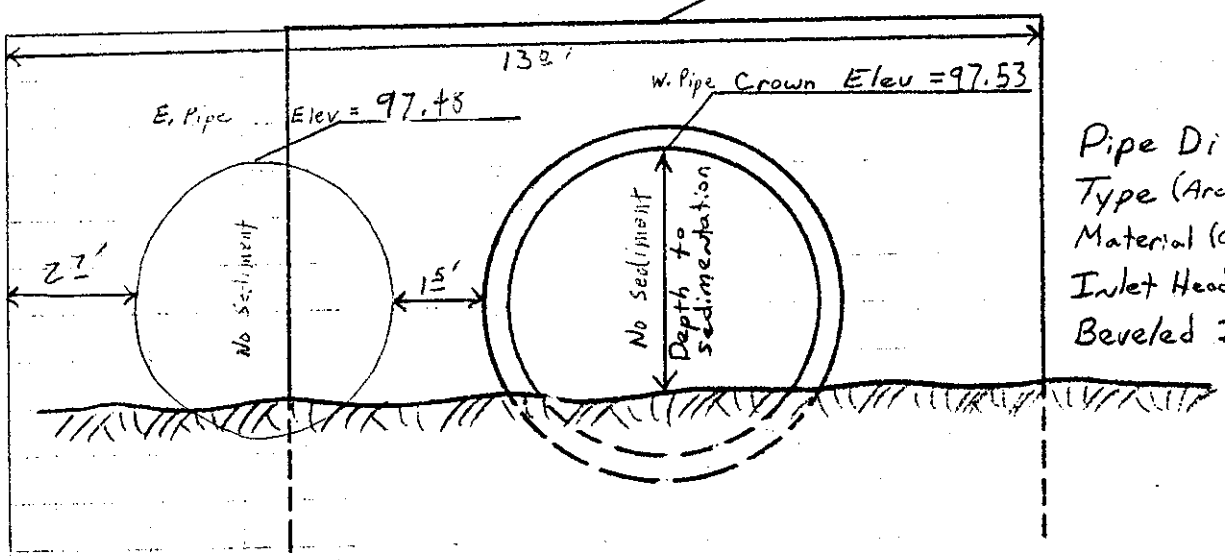
Checked by Date

Pipe Culvert Survey Data:



℄ Roadway Elev. = 99.07
(At sag point for overflow)

Top of Headwall Elev. = 898.34



Pipe Diameter = 36" E & W
Type (Arch, Circular) = Circular
Material (CMP, RCP) = CMP
Inlet Headwall (Y/N) = Y
Beveled INLET? = N

Pipe Inlet

Notes: E. Inlet Pipe is 0.3' out from face of headwall

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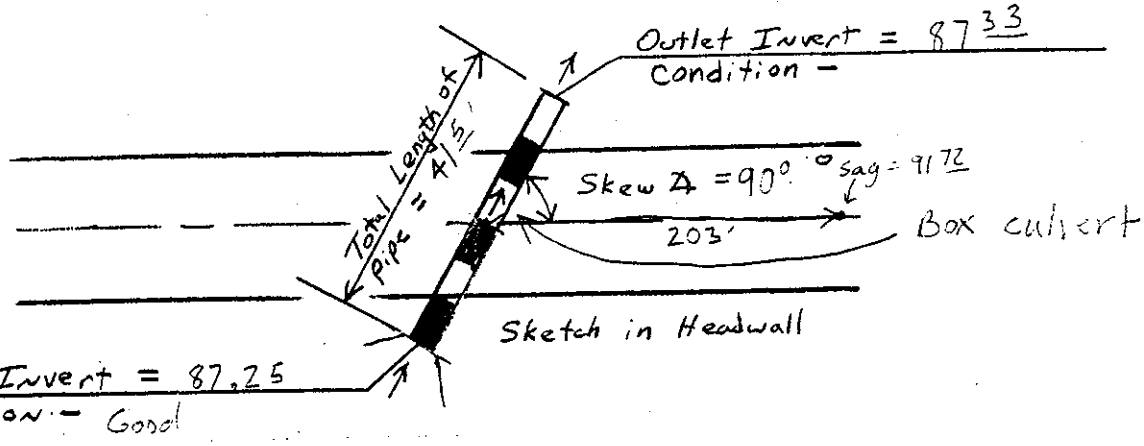
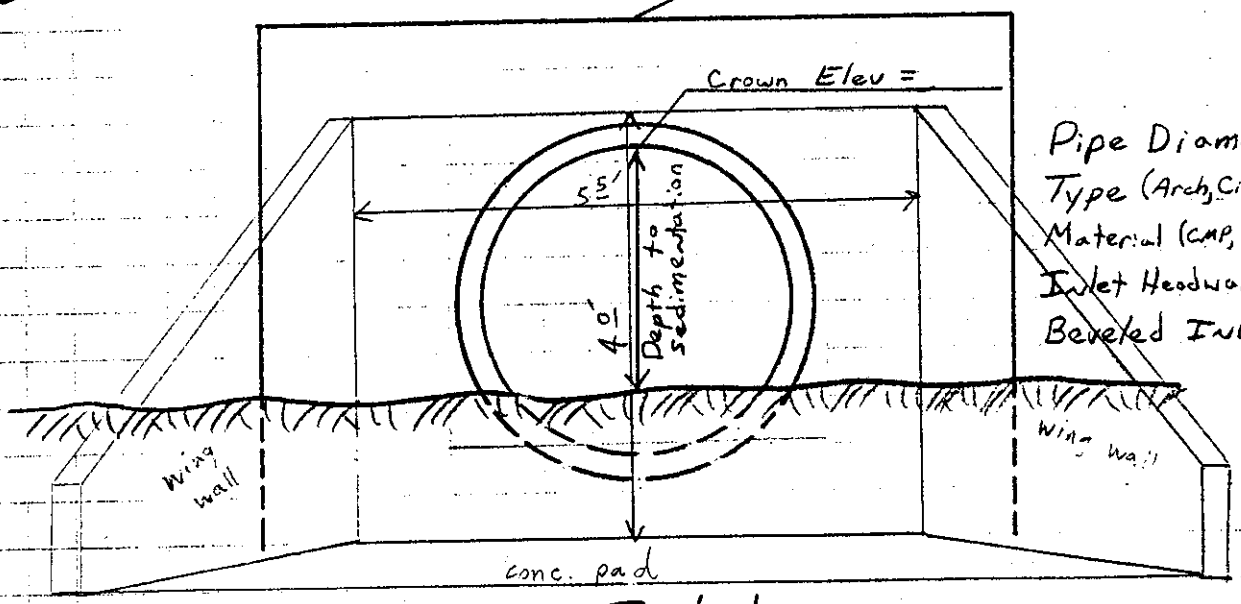
~~Pipe~~ Box Culvert Survey Data:



℄ Roadway Elev. = 93.00
(At sag point for overflow)

Top of Headwall Elev. = 92.90



Pipe Diameter = 4.0 x 5.5
Type (Arch, Circular) = Box
Material (CMP, RCP) = Conc.
Inlet Headwall (Y/N) = Y
Beveled INLET? = Y

Pipe Inlet

Notes: 0.5 of sediment @ Inlet
No sediment @ outlet
Box was extended 8' @ each end
3" bevel @ start of old box (where the 5' was added)

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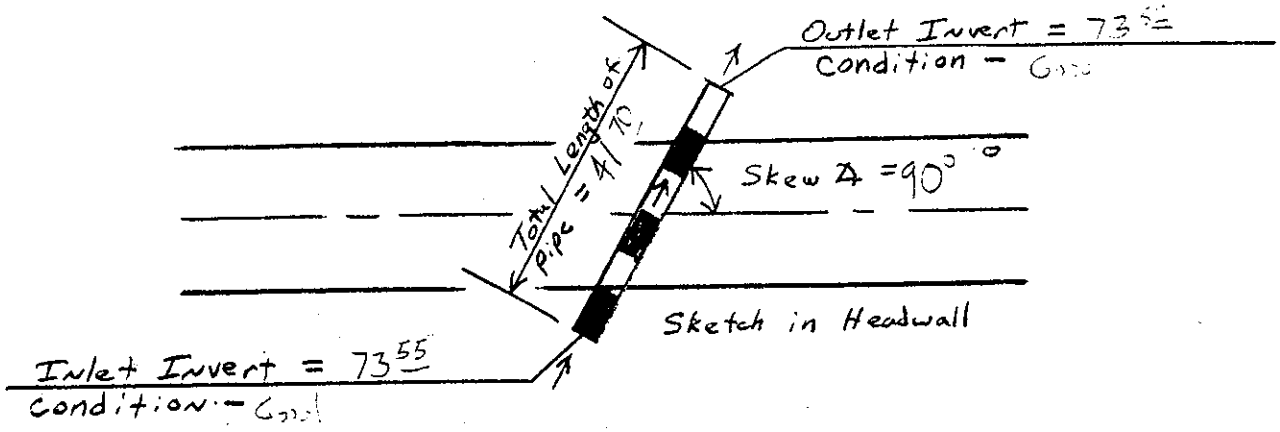
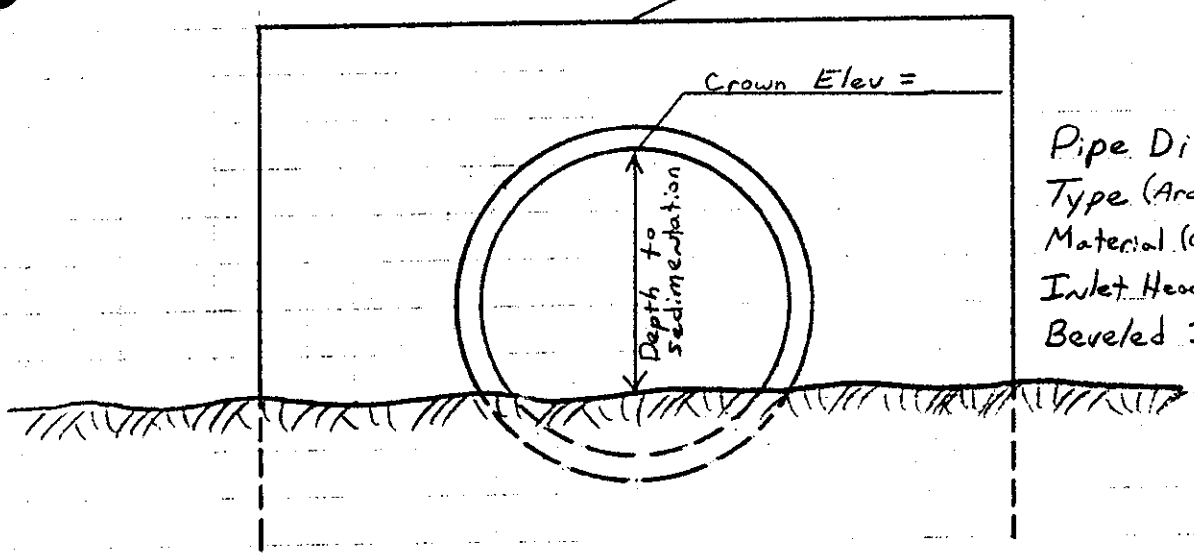
Box (See P-11 for detail)
~~Pipe~~ Culvert Survey Data:



℄ Roadway Elev. = 78.95
(At sag point for overflow)

Top of Headwall Elev. = 79.15



Pipe Diameter = 4'x 5' (h x W)
Type (Arch, Circular) = Box
Material (CMP, RCP) = conc
Inlet Headwall (Y/N) = Y
Beveled Inlet? = Y

Pipe Inlet

Notes: 0.5 of sedement @ inlet
No sedement @ outlet
Looks as if the Box was extended 8' on each end
A 3" bevel @ the start of old box (where 5' was added)

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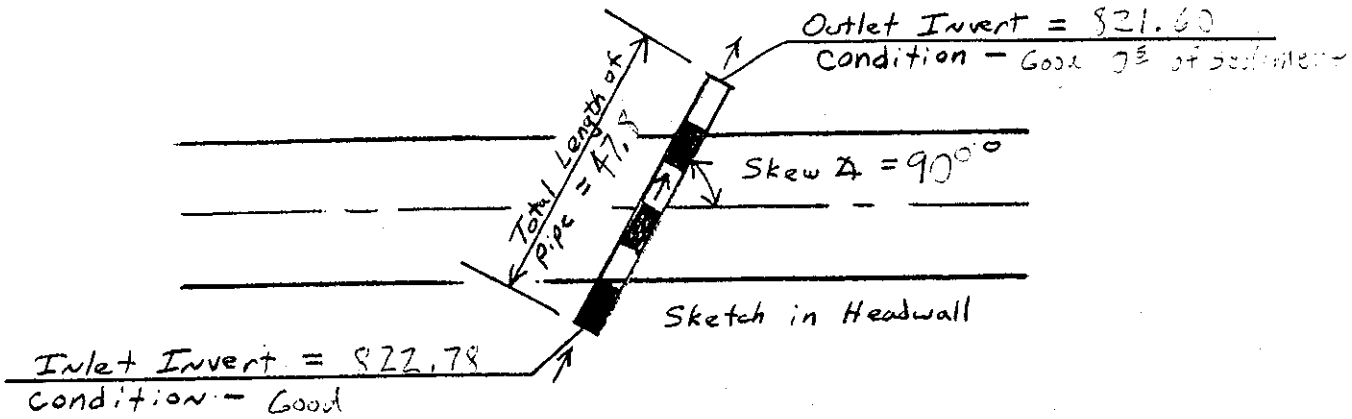
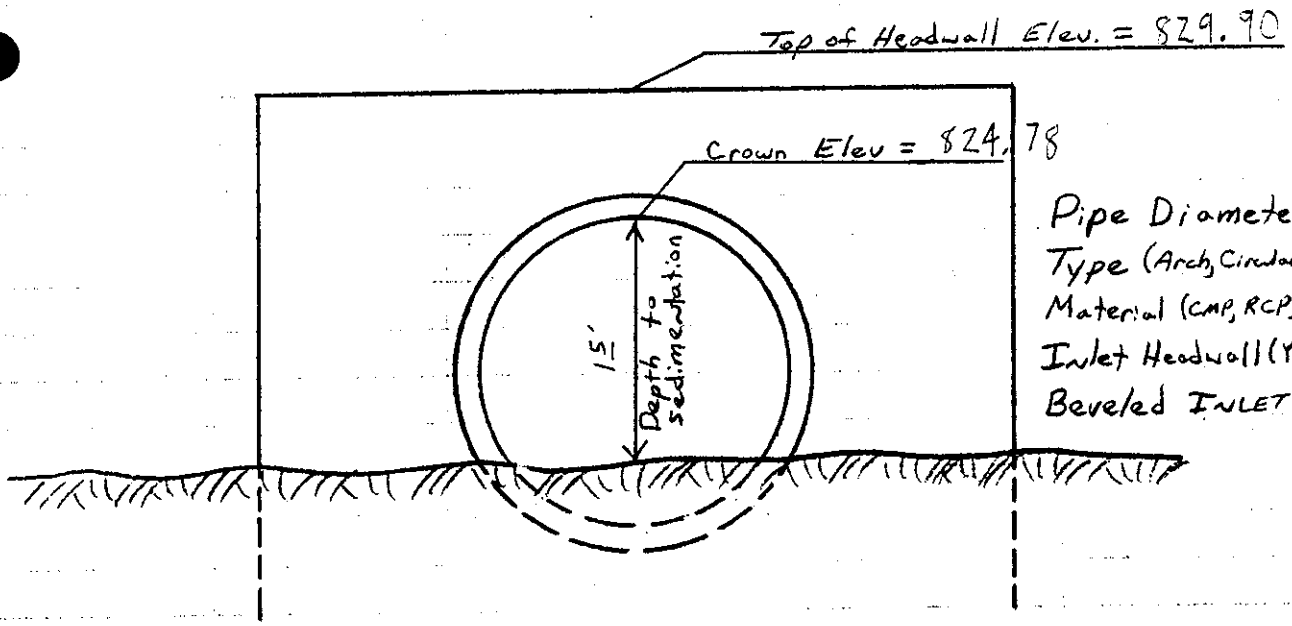
Pipe Culvert Survey Data:



℄ Roadway Elev. = 830.13
~~(At sag point for overflow)~~



Pipe Diameter = 24"
Type (Arch, Circular) = Circular
Material (CMP, RCP) = CMP
Inlet Headwall (Y/N) = Y
Beveled INLET? = N

Pipe Inlet

Notes: Pipe for ditch on N. Side of Rd.
No sag, Pipe is in the middle of hill

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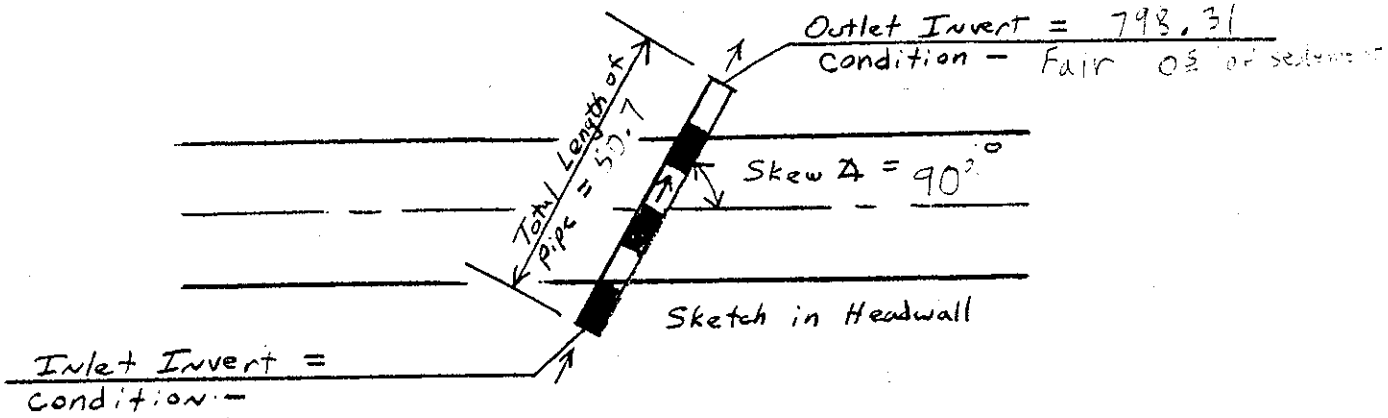
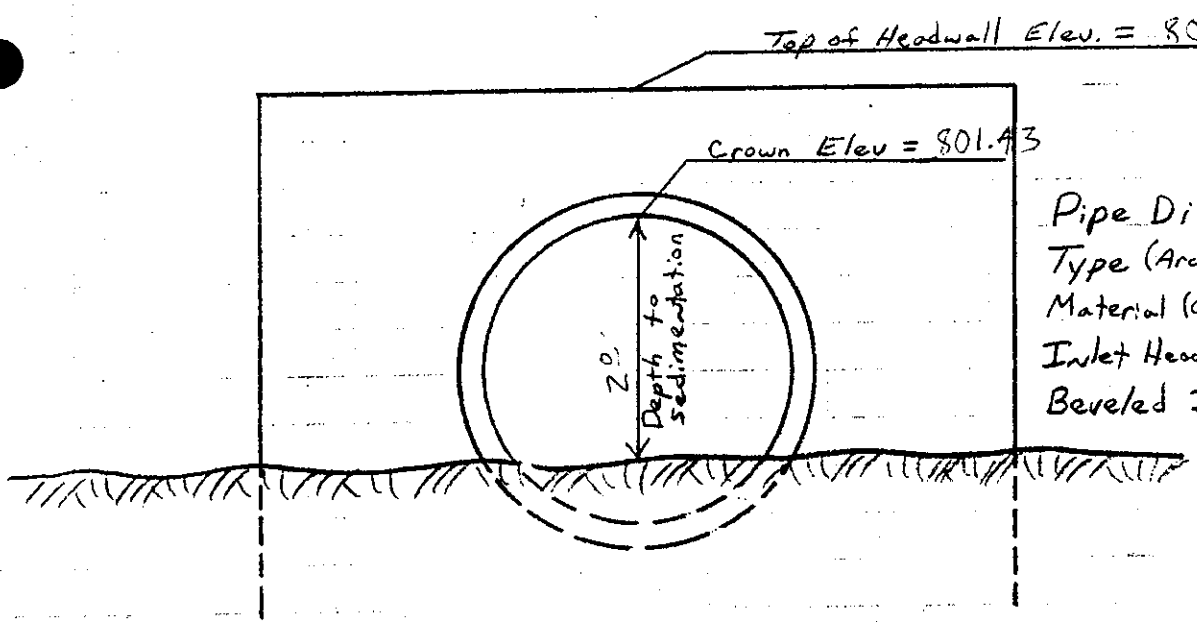
Pipe Culvert Survey Data:



℄ Roadway Elev. = 804.75
~~(At sag point for overflow)~~



Pipe Diameter = 30"
Type (Arch, Circular) = C
Material (CMP, RCP) = CMP
Inlet Headwall (Y/N) = Y
Beveled Inlet? = N

Pipe Inlet

Notes: ~~Sag~~ Sag point is @ Bridge to the ~~[illegible]~~ NE

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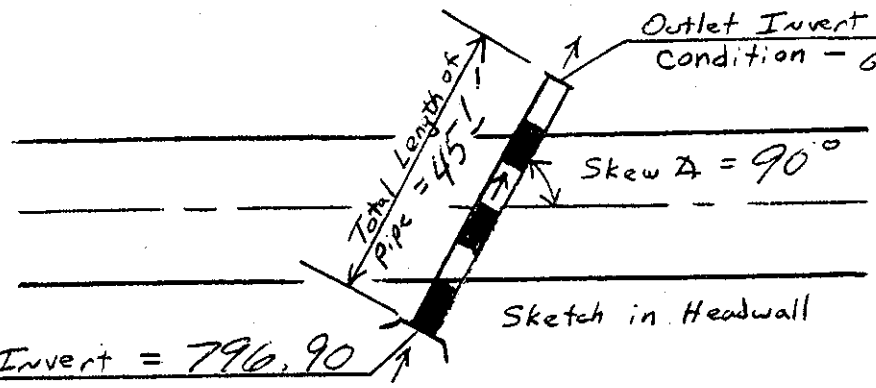
Box ~~Pipe~~ Culvert Survey Data:

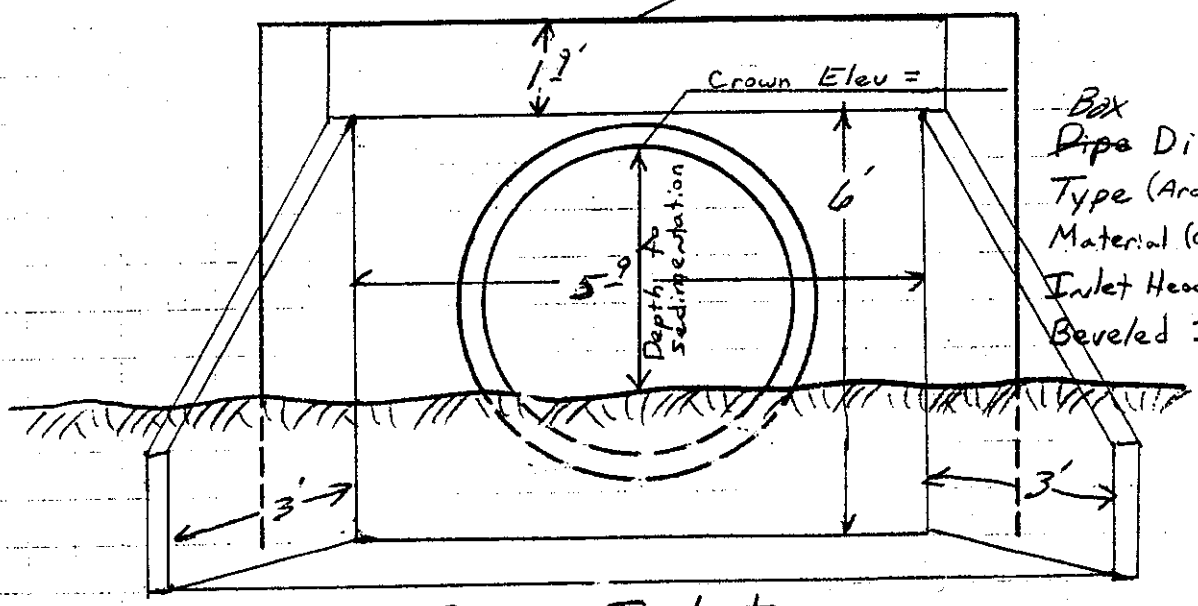


Outlet Invert = 796.77
Condition – GOOD 1' SEDIMENT

Inlet Invert = 796.90
Condition – 1' SEDIMENT
GOOD

℄ Roadway Elev. = 804.55 @ ℄ PIPE
(~~At sag point for overflow~~) SA6 15 NE @ BRIDGE

Top of Headwall Elev. = 804.81



~~Pipe~~ Box Diameter = 5'-9" x 6'
Type (Arch, Circular) = Box
Material (CMP, RCP) = CONC
Inlet Headwall (Y/N) = Y
Beveled Inlet? = N

Pipe Inlet

Notes: BOX EXTENDED 6' @ EACH END
OLD BOX HAS BEVELED TOP

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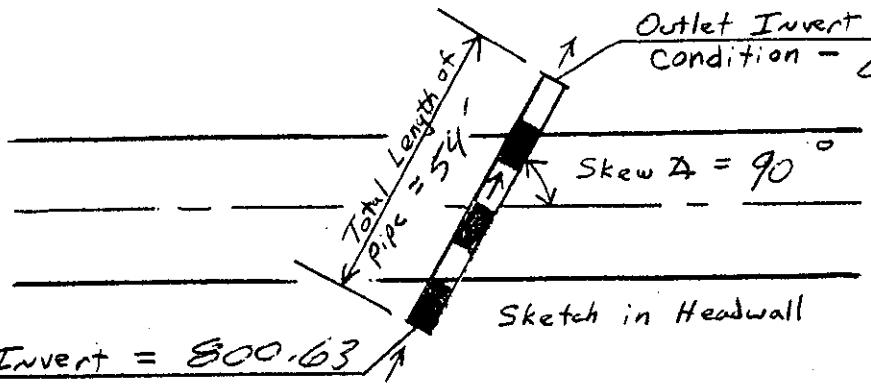
Pipe Culvert Survey Data:

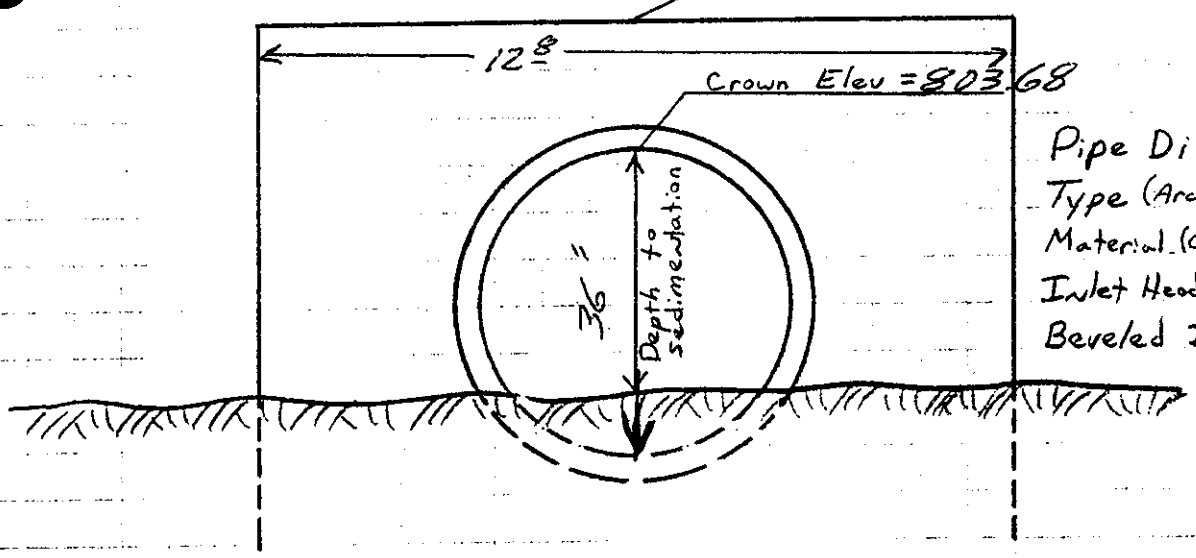


Outlet Invert = 799.49 ft PIPE
Condition - GOOD .3' SEDIMENT

Inlet Invert = 800.63
Condition - GOOD

℄ Roadway Elev. = 807.06 @ ℄ PIPE
~~(At sag point for overflow)~~ SA6 is South 100'+

Top of Headwall Elev. = 806.18



Pipe Diameter = 36"
Type (Arch, Circular) = C
Material (CMP, RCP) = CMP
Inlet Headwall (Y/N) = Y
Beveled INLET? = N

Pipe Inlet

Notes: ℄ ROAD 6' WEST of ℄ PIPE

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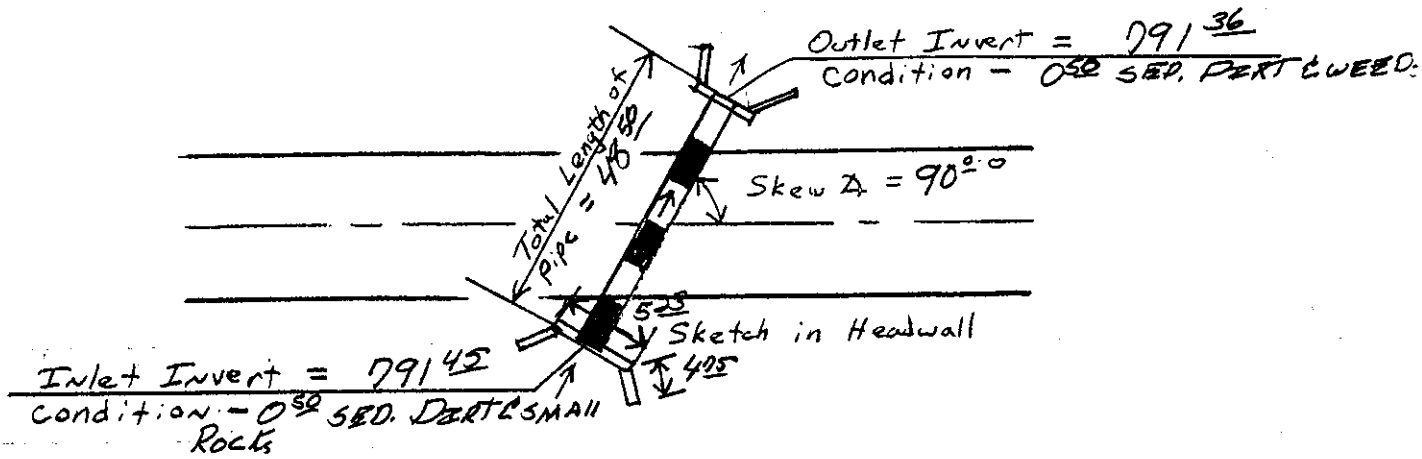
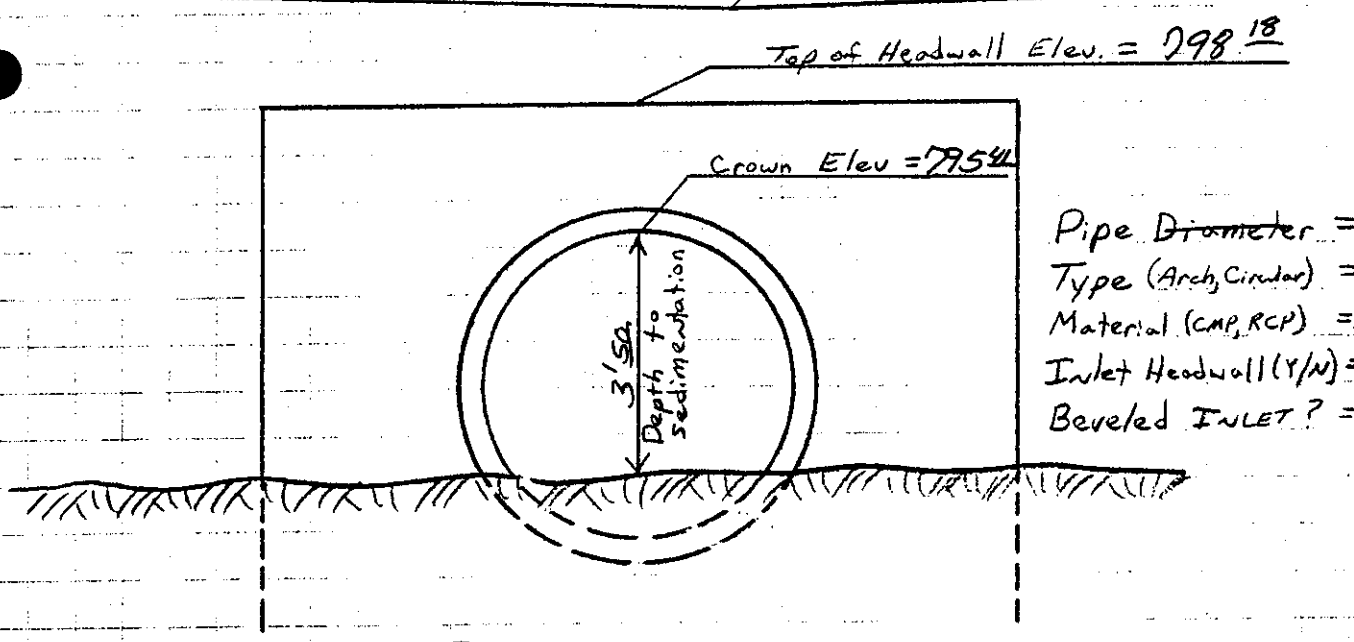
Pipe Culvert Survey Data:





Pipe ~~Diameter~~ = 4'x4' sq.
Type (Arch, Circular) = Sq.
Material (CMP, RCP) = CONCRETE
Inlet Headwall (Y/N) = YES
Beveled INLET? = NO

Box ~~Pipe~~ Inlet

Notes: 4.00 x 4.00 BOX 90° TO ROAD HAS 2" STEEL PIPE ON FLOOR OF BOX. 6.00 IN FROM INLET END BOX HAS 0.35 x 0.35 ANGLES ON TOP CORNERS.

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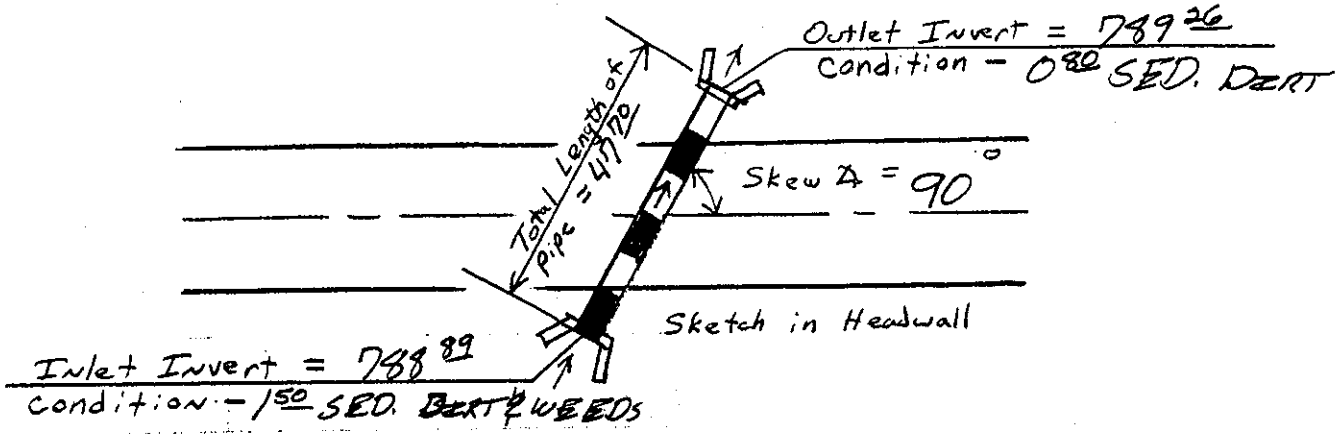
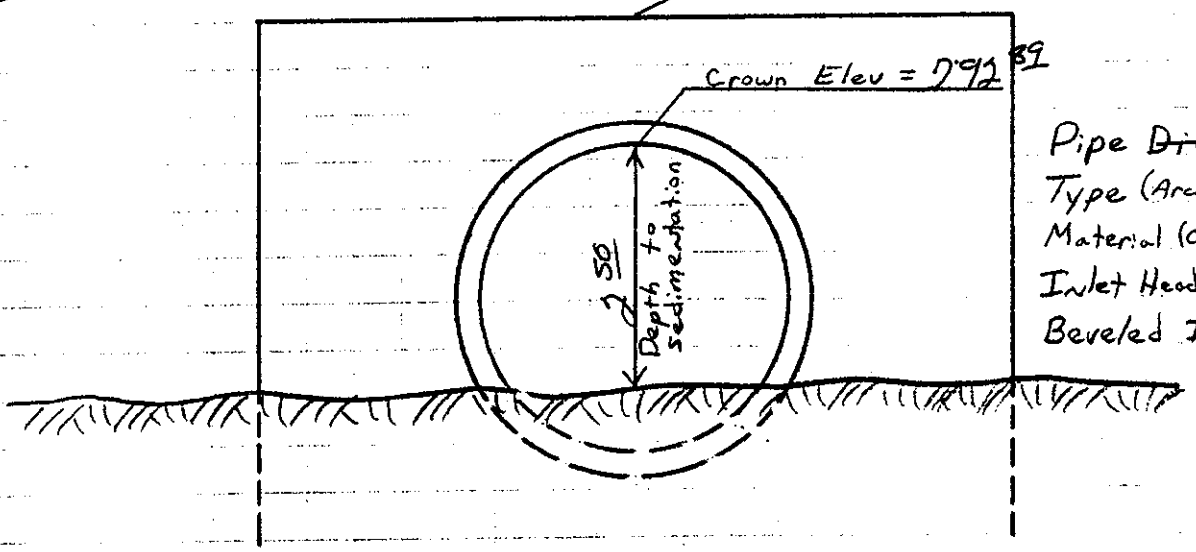
Pipe Culvert Survey Data:



℄ Roadway Elev. = 796.09
(At sag point for overflow)

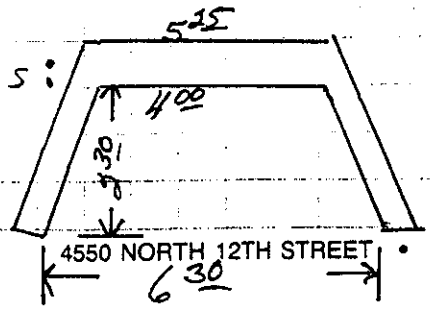
Top of Headwall Elev. = 795.58



Pipe ~~Diameter~~ = 4'x4' Sq
Type (Arch, Circular) = Sq.
Material (CMP, RCP) = CONCRETE
Inlet Headwall (Y/N) = YES
Beveled INLET? = NO

Pipe Inlet

Notes:



4'x4' BOX 90° TO ROAD.
6" IN FROM INLET END BOX HAS 0.35 x 0.35 ANGLES ON TOP.

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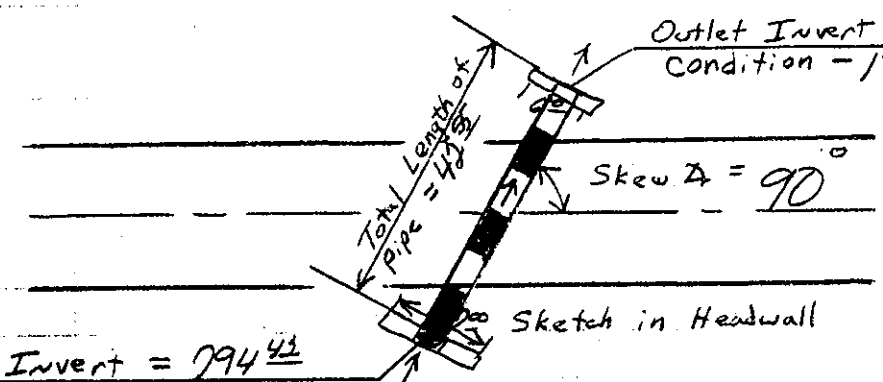
Pipe Culvert Survey Data:

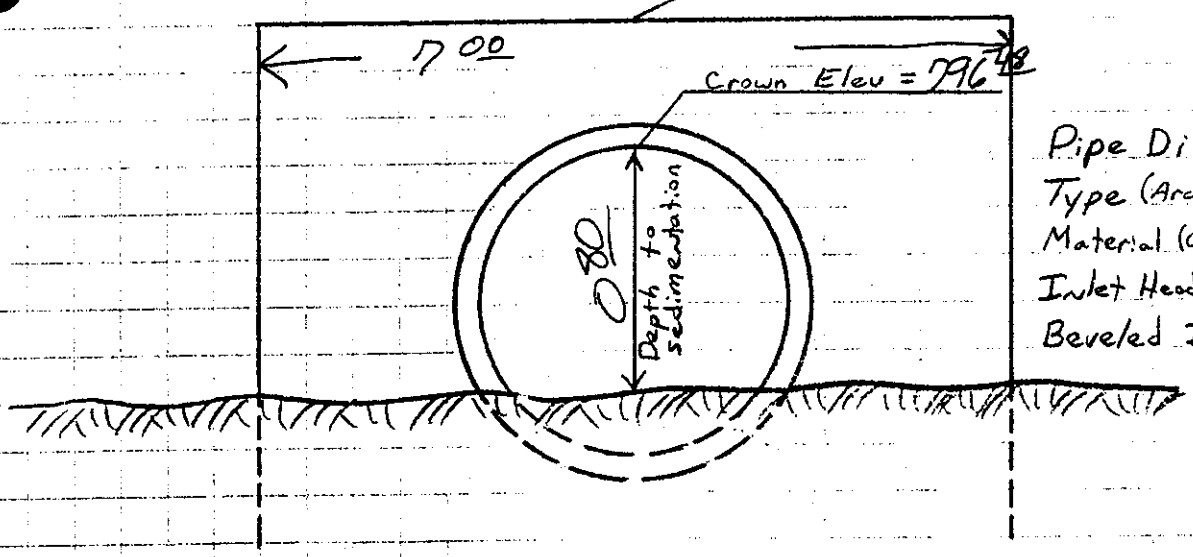


Outlet Invert = 794.08
Condition – 1% SED DIRT & WEED

Inlet Invert = 794.43
Condition – 1% SED DIRT

℄ Roadway Elev. = 799.00
(At sag point for overflow)

Top of Headwall Elev. = 798.95



Pipe Diameter = 24"
Type (Arch, Circular) = CIRCULAR
Material (CMP, RCP) = CMP
Inlet Headwall (Y/N) = YES
Beveled Inlet? = NO

Pipe Inlet

Notes: PIPE ALMOST FULL OF DIRT

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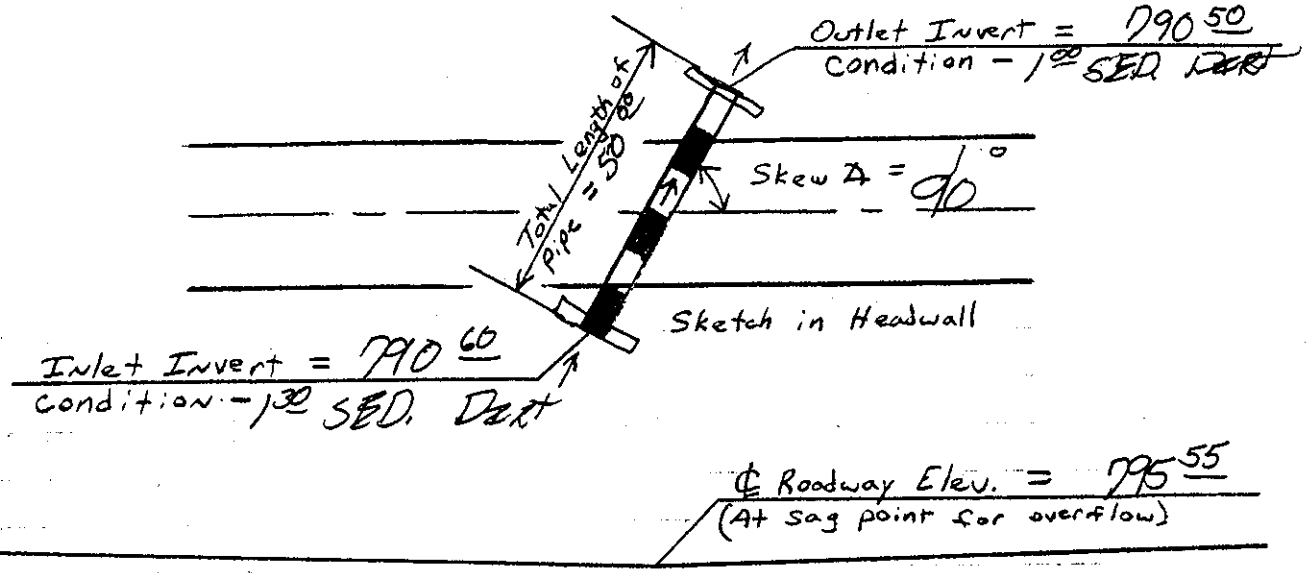
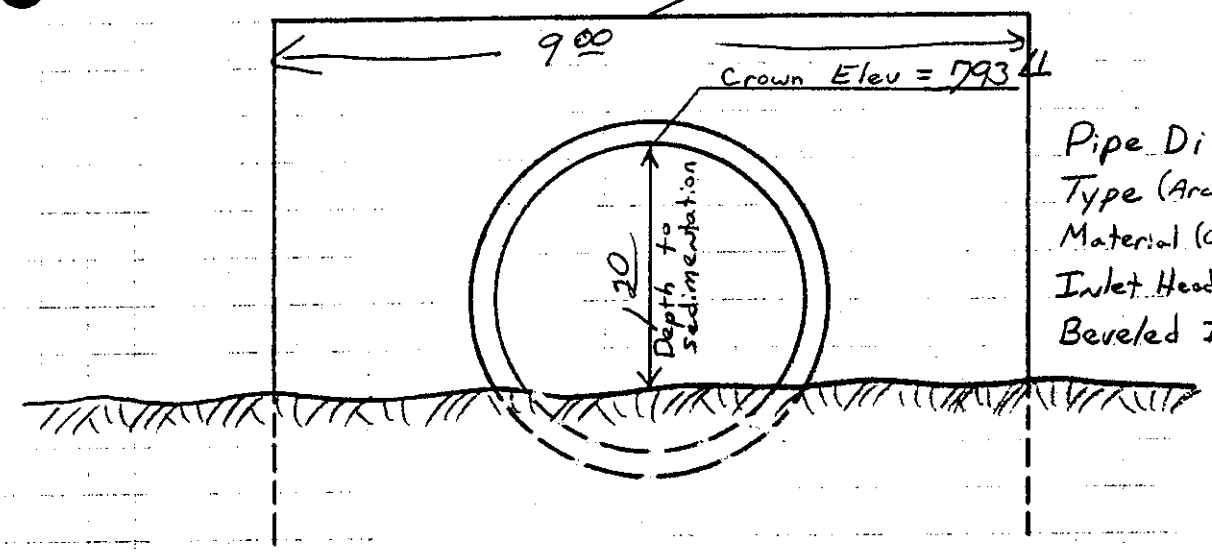
Pipe Culvert Survey Data:



℄ Roadway Elev. = 795.55
(At sag point for overflow)

Top of Headwall Elev. = 795.00



Pipe Diameter = 2.50 x 3.5
Type (Arch, Circular) = ARCH
Material (CMP, RCP) = C.M.P.
Inlet Headwall (Y/N) = YES
Beveled Inlet? = NO

Pipe Inlet

Notes: PIPE ½ FULL OF DIRT

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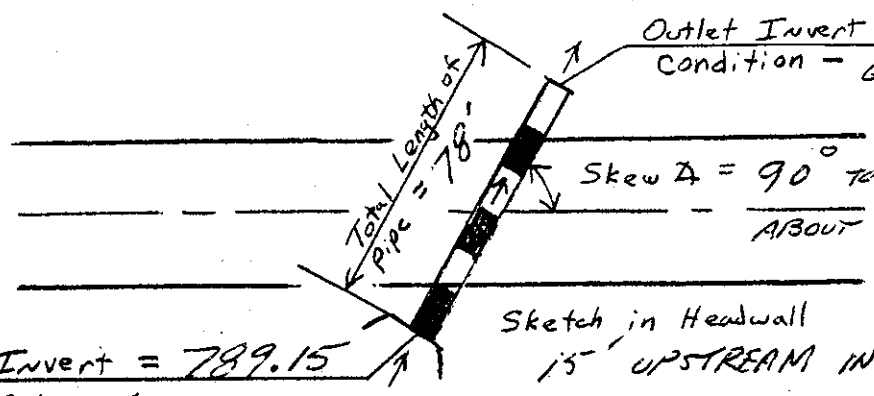
~~Pipe~~ Box Culvert Survey Data:



Outlet Invert = 789.15
Condition - GOOD 1' SEDIMENT

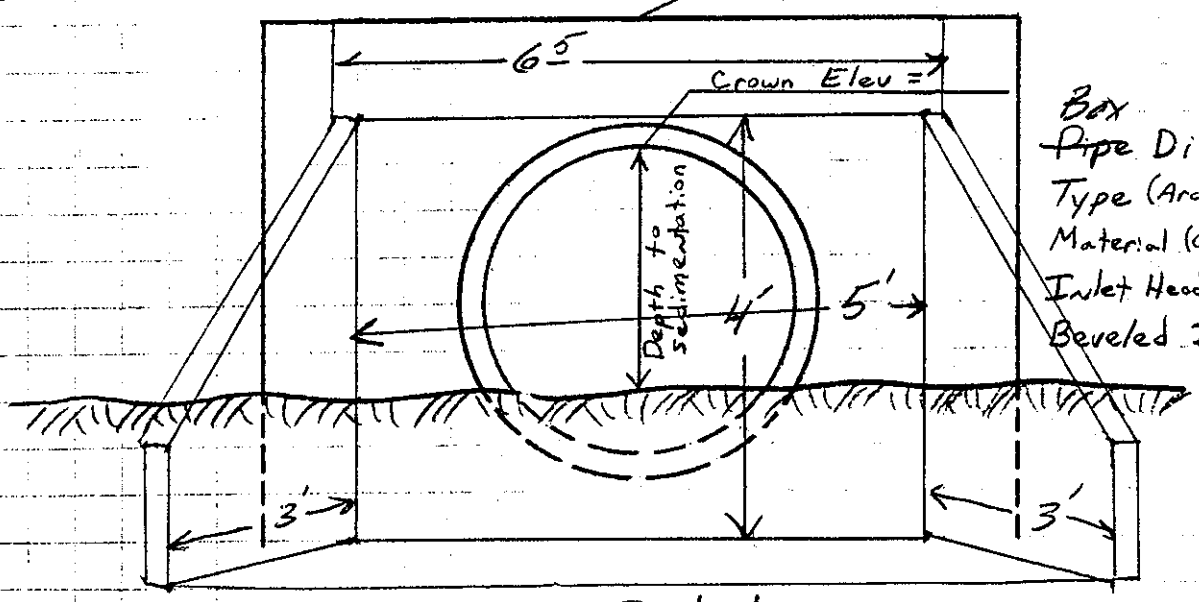
Skew ∠ = 90° TO OLD US 80
ABOUT 45° TO ARLINGTON SCHOOL RD.

Sketch in Headwall
15' UPSTREAM IN FL WASH IS 8" DIAM MESQUITE TREE

Inlet Invert = 789.15
Condition - GOOD
1.5' SEDIMENT

℄ Roadway Elev. = 794.75 ROAD FLAT 100' BOTH WAYS
~~(At sag point for overflow)~~

Top of Headwall Elev. = 794.82



~~Pipe~~ Box Diameter = 4'x5'
Type (Arch, Circular) = Box
Material (CMP, RCP) = CONC
Inlet Headwall (Y/N) = Y
Beveled INLET? = N

Pipe Inlet

Notes: INLET END EXTENDED 10'
OLD BOX TOP BEVELED 6" BUT NOT THE NEW
℄ ROAD IS 11' WEST ℄ PIPE

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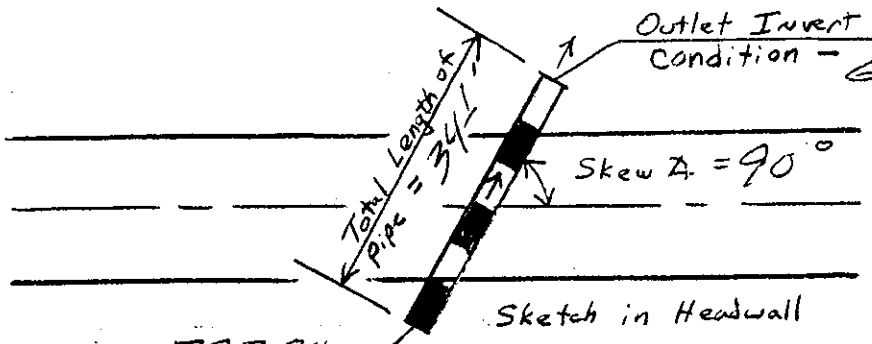
~~Pipe~~ Box Culvert Survey Data:

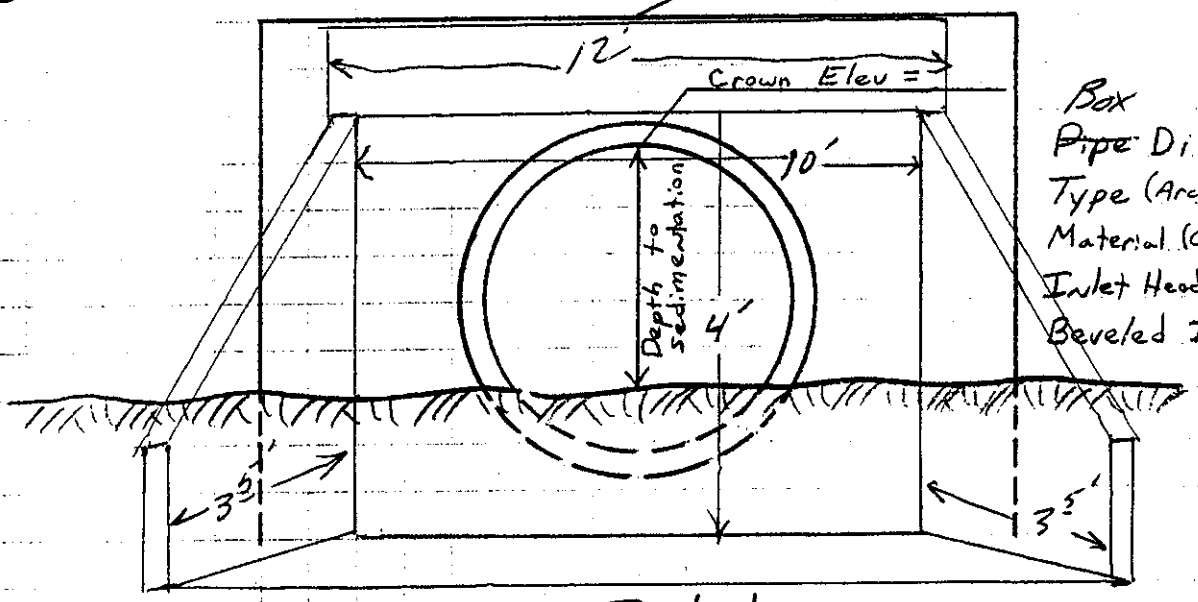


Outlet Invert = 787.83
Condition – GOOD 2' SEDIMENT

Inlet Invert = 787.84
Condition – GOOD 2' SEDIMENT

℄ Roadway Elev. = 794.13 GRADUAL SLOPING DOWN TO NORTH
~~(At sag point for overflow)~~

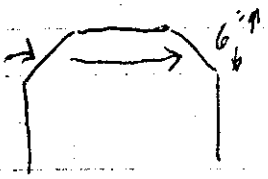
Top of Headwall Elev. = 793.89



~~Pipe~~ Box Diameter = 4'x10'
Type (Arch, Circular) = Box
Material (CMP, RCP) = CONC.
Inlet Headwall (Y/N) = Y
Beveled Inlet? = N

Pipe Inlet

Notes: BEVELED TOP



B.M. – ERM STA. 386+75 = 793.885

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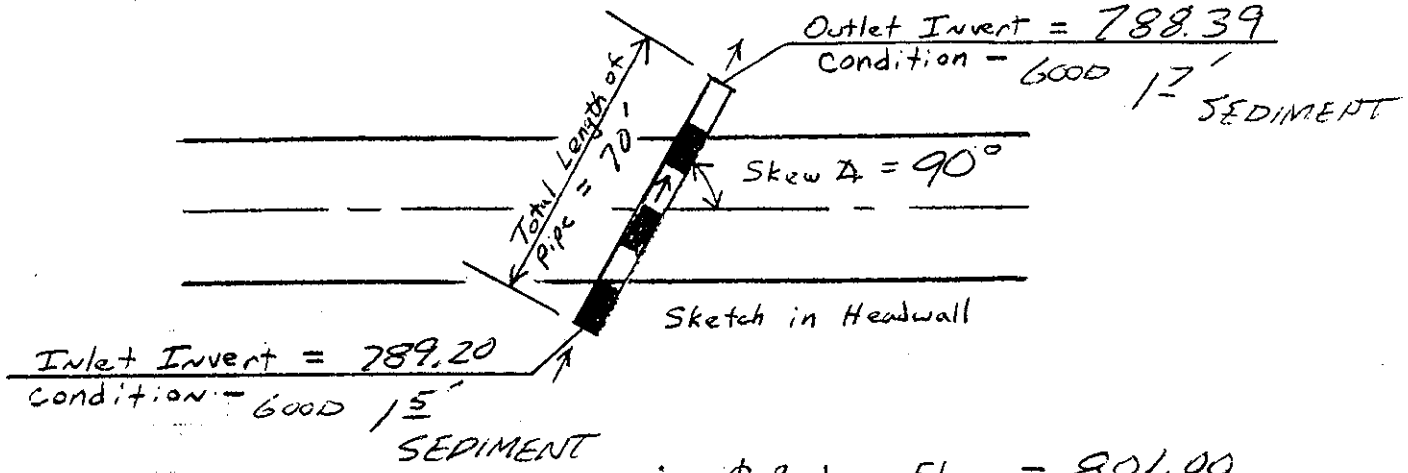
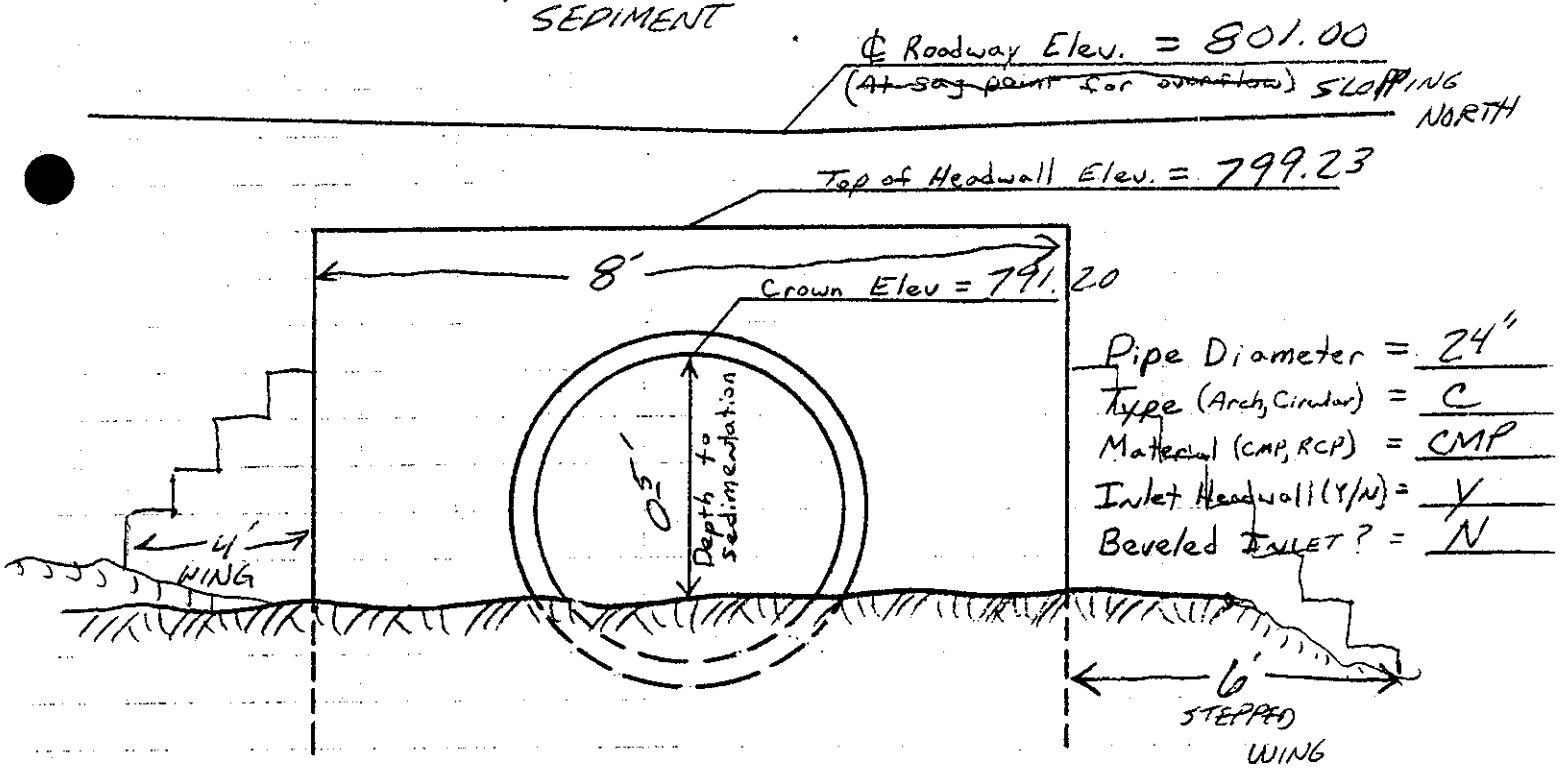
Pipe Culvert Survey Data:





Pipe Inlet

Notes: ℄ ROAD IS 4' WEST of ℄ PIPE
WING MEASURED TO EXIST DIRT @ 45° APPX.

BM #11 = 799.25

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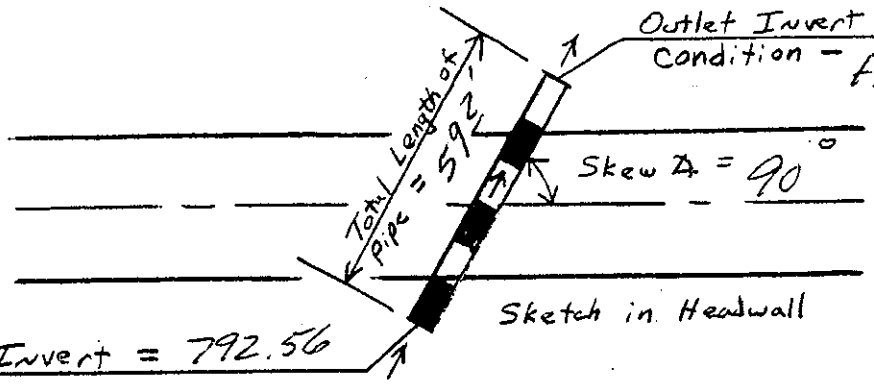
Pipe Culvert Survey Data:

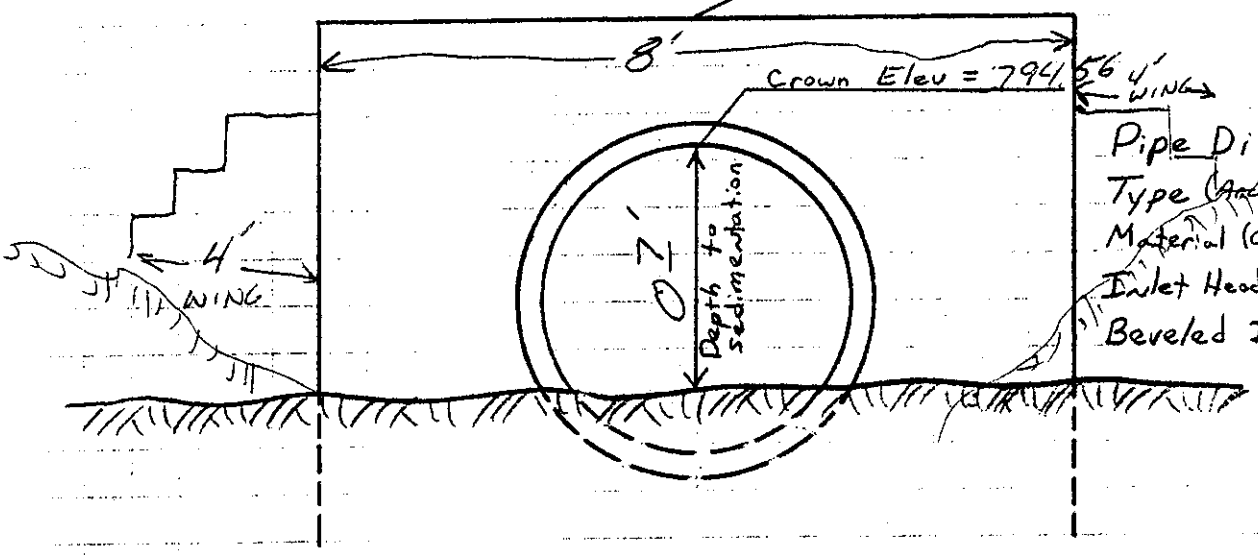


Outlet Invert = 791.74
Condition – FAIR (BENT 0.2' BUT NORUST)
HEADWALL BROKEN OFF COMPLETEL

Inlet Invert = 792.56
Condition – GOOD
1.3' SEDIMENT

℄ Roadway Elev. = 801.00
~~(At sag point for overflow)~~ FLAT

Top of Headwall Elev. = 801.12



Pipe Diameter = 24"
Type (Arch, Circular) = C
Material (CMP, RCP) = CMP
Inlet Headwall (Y/N) = Y
Beveled Inlet? = N

Pipe Inlet

Notes: WINGS MEASURED TO EXIST DIRT ⅌ @ APRX. 45° TO HDWL.

℄ ROAD IS 4' WEST of ℄ PIPE
BM #12 801.14

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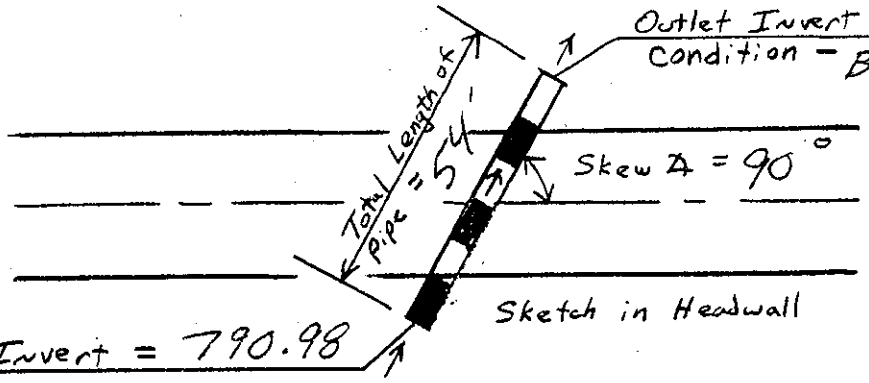
~~Pipe~~ BOX Culvert Survey Data:



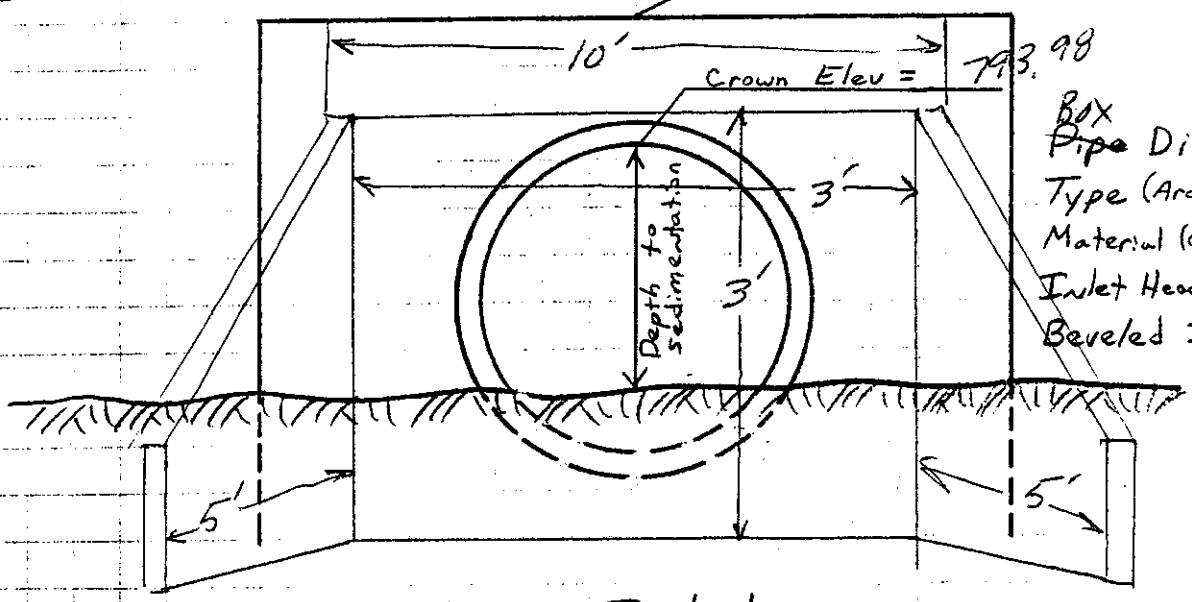
Outlet Invert = 790.98
Condition – Box is good
Wingwalls falling down
Headwall falling down

Sketch in Headwall

Inlet Invert = 790.98
Condition – Box is good
Wings seperated from HDWL
HDWL ok

℄ Roadway Elev. = 802.44
~~(At sag point for overflow)~~ No sag

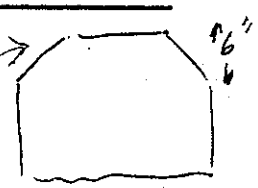
Top of Headwall Elev. = 800.89



~~Pipe~~ BOX Diameter = 3' x 3'
Type (Arch, Circular) = BOX
Material (CMP, RCP) = CONC.
Inlet Headwall (Y/N) = Y
Beveled Inlet? = N

Pipe Inlet

Notes: Beveled top



BM. #13 = 800.92

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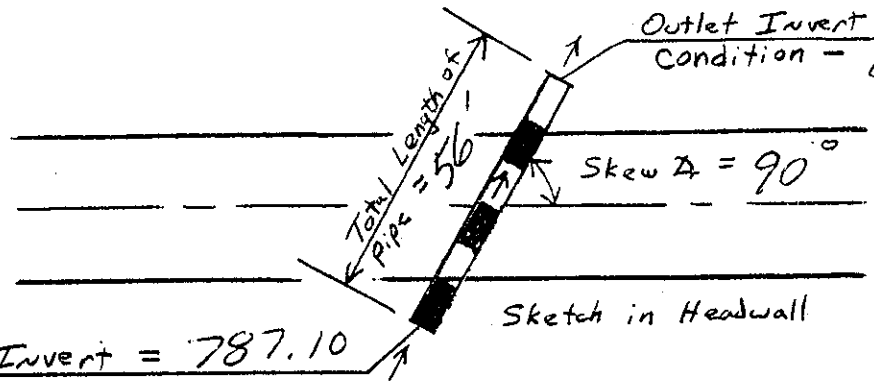
~~Pipe~~ Box Culvert Survey Data:

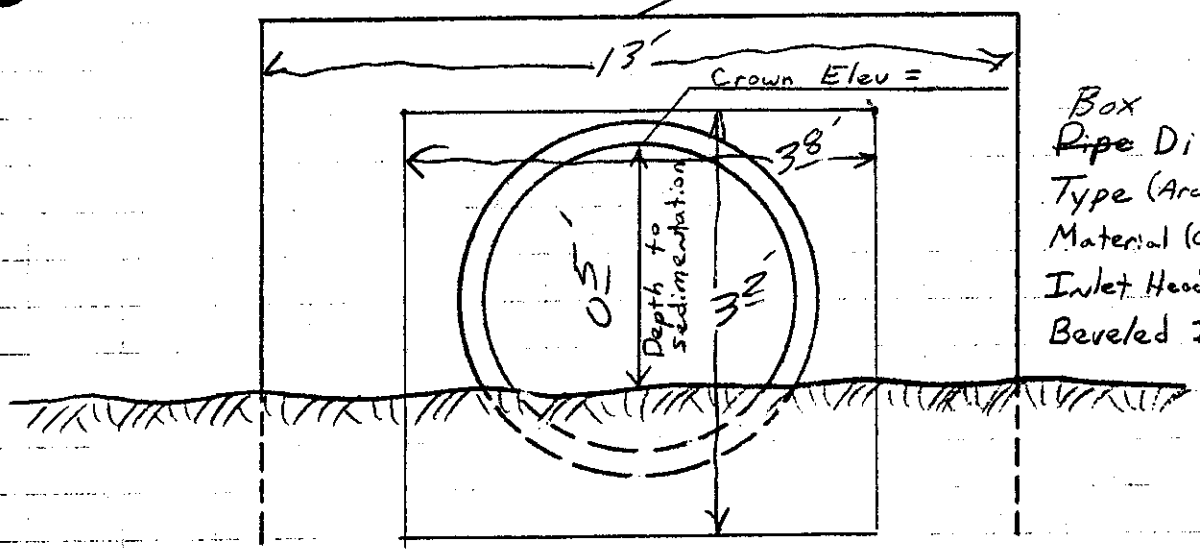


Outlet Invert = 787.37
Condition – GOOD
2.5' SEDIMENT

Inlet Invert = 787.10
Condition – GOOD
2.2' SEDIMENT

℄ Roadway Elev. = 800.13
~~(At sag point for overflow)~~ SLIGHTLY SLOPPING NORTH

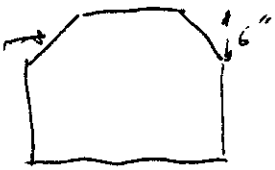
Top of Headwall Elev. = 798.09



~~Pipe~~ Box Diameter = 3.8' x 3.2'
Type (Arch, Circular) = Box
Material (CMP, RCP) = CONC
Inlet Headwall (Y/N) = Y
Beveled Inlet? = N

Pipe Inlet

Notes: BEVELED TOP



BM #14 = 798.11

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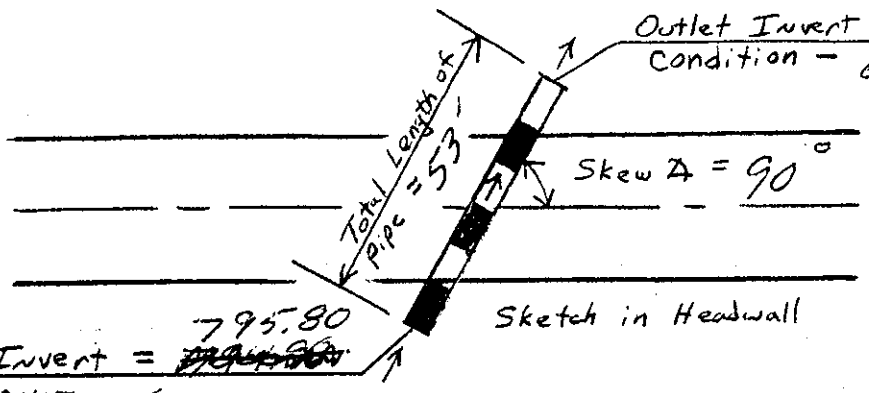
Pipe Culvert Survey Data:

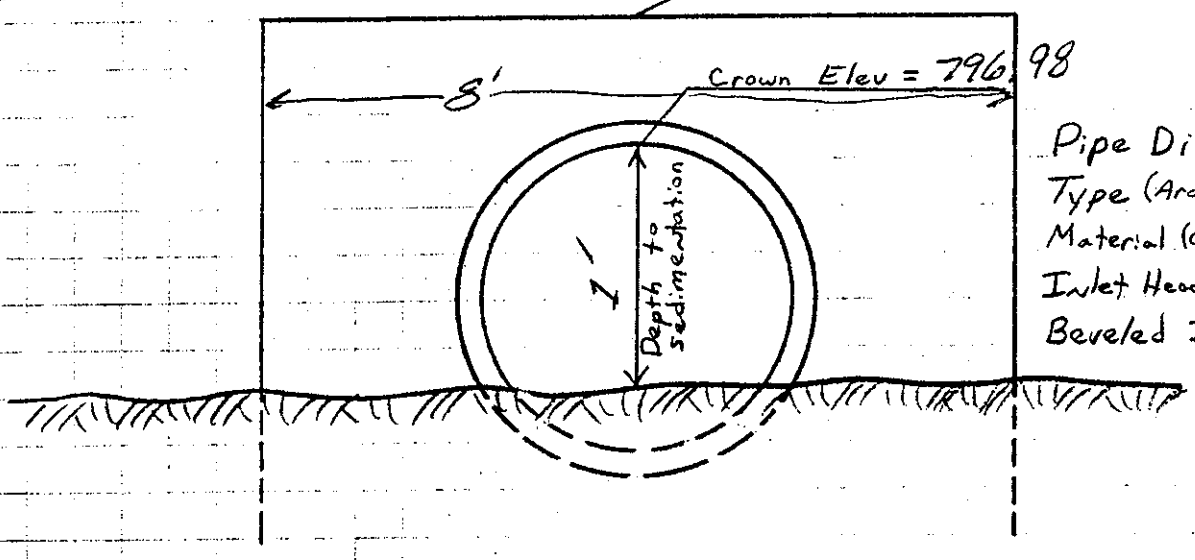


Outlet Invert = 793.45
Condition – GOOD
1' SEDIMENT

Inlet Invert = 795.80
Condition – 1' SEDIMENT
GOOD

℄ Roadway Elev. = 801.25
~~(At sag point for overflow)~~ SLOPPING NORTH

Top of Headwall Elev. = 801.02



Pipe Diameter = 24"
Type (Arch, Circular) = C
Material (CMP, RCP) = CMP
Inlet Headwall (Y/N) = Y
Beveled INLET? = N

Pipe Inlet

Notes: ℄ ROAD IS 5' WEST of ℄ PIPE

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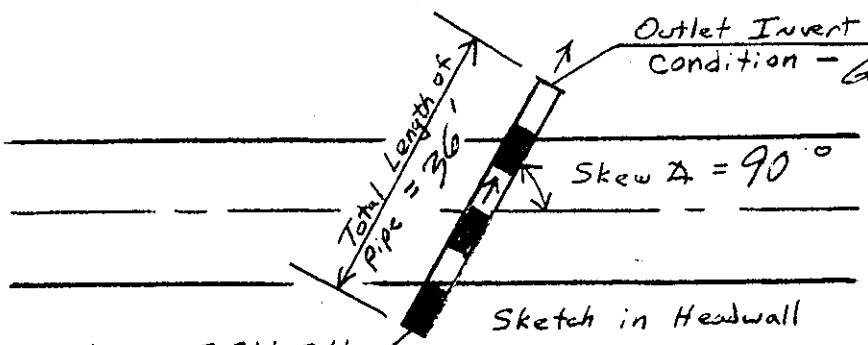
~~Pipe~~ Box Culvert Survey Data:

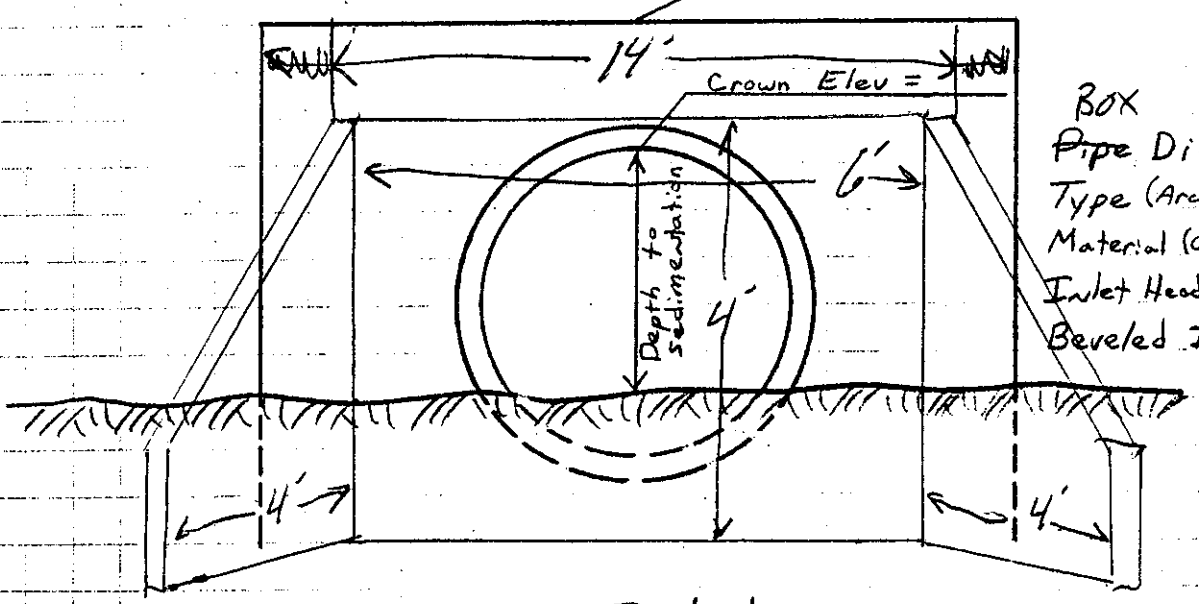


Outlet Invert = 784.73
Condition – GOOD 0.5' SEDIMENT

Inlet Invert = 784.84
Condition – GOOD
NO SEDIMENT

℄ Roadway Elev. = 791.78 @ ℄ PIPE
(At sag point for overflow)

Top of Headwall Elev. = 791.74



~~Pipe~~ BOX Diameter = 6' x 4'
Type (Arch, Circular) = BOX
Material (CMP, RCP) = CONC.
Inlet Headwall (Y/N) = Y
Beveled Inlet? = N

Pipe Inlet

Notes: 6" BEVELED TOP IN BOX

4' WINGS MEASURED TO WHERE THEY MET THE DIRT

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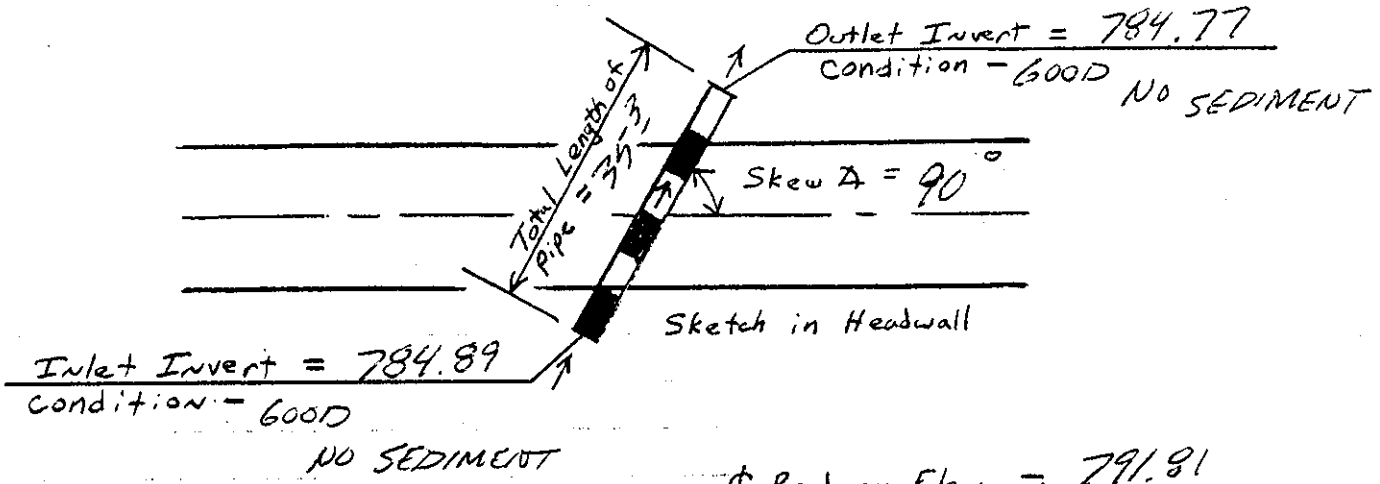
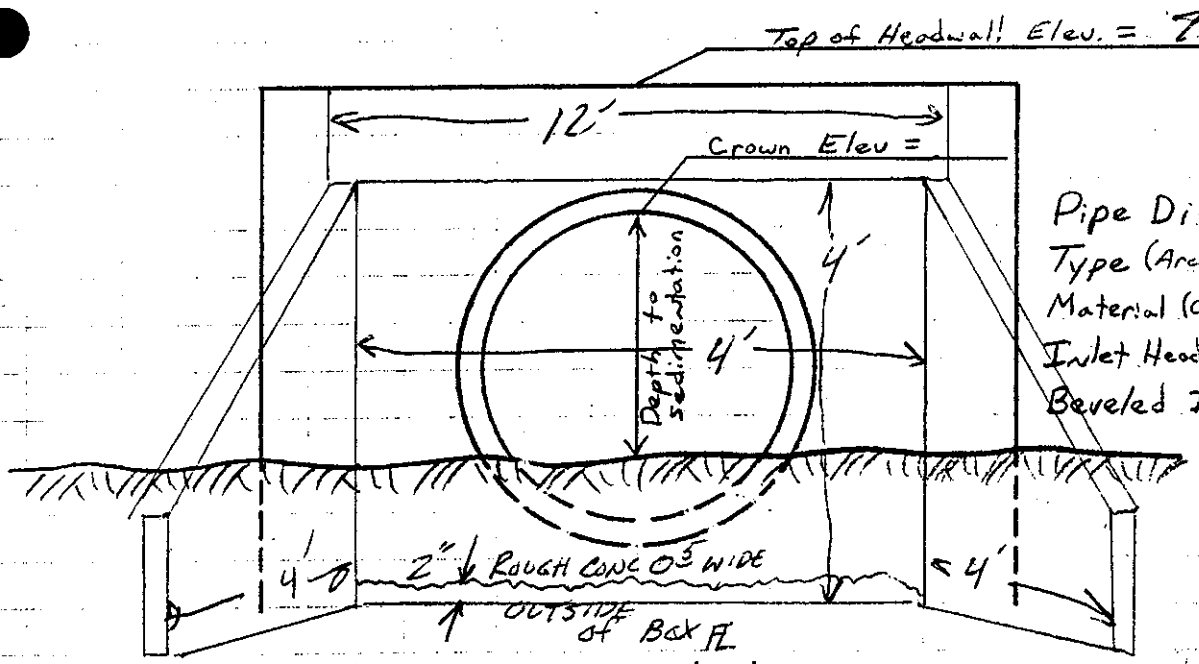
Pipe Culvert Survey Data:



℄ Roadway Elev. = 791.81
(At sag point for overflow)



Pipe Diameter = 4' x 4'
Type (Arch, Circular) = BOX
Material (CMP, RCP) = CONC.
Inlet Headwall (Y/N) = Y
Beveled INLET? = N

Pipe Inlet

Notes: WINGS MEASURED TO WHERE THEY MET DIRT

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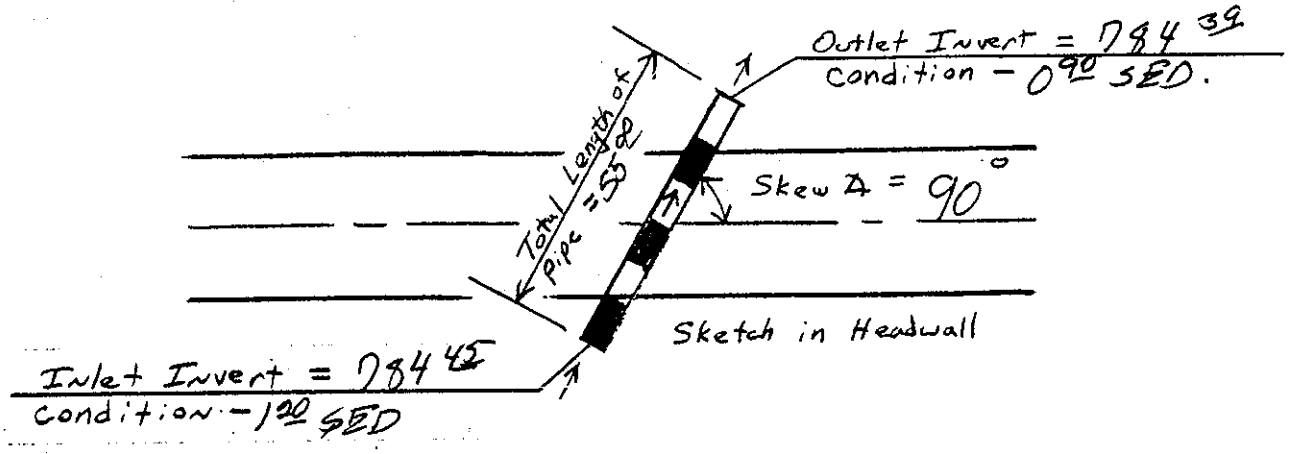
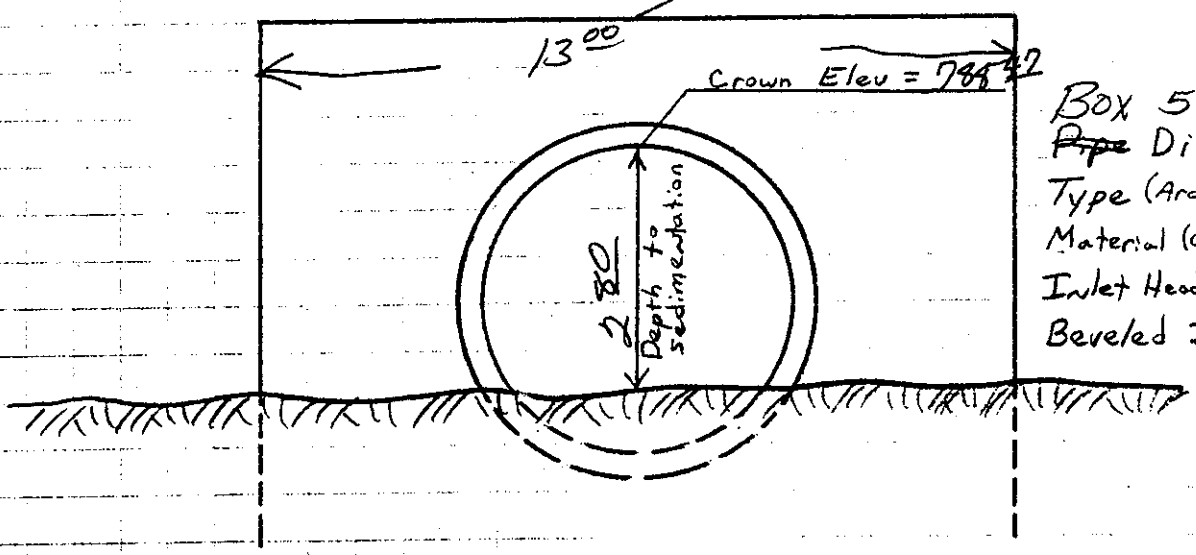
Pipe Culvert Survey Data:



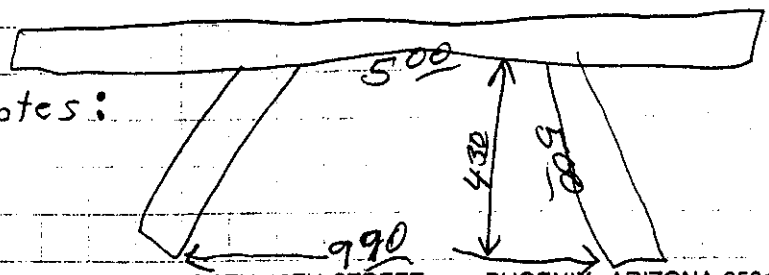
℄ Roadway Elev. = 797 70
(At sag point for overflow)

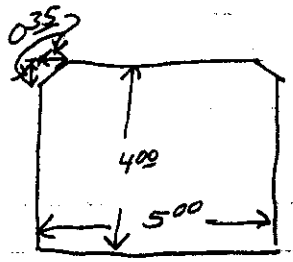
Top of Headwall Elev. = 796 53



Box 5' WIDE 4' HIGH
~~Pipe~~ Diameter =
Type (Arch, Circular) = Sq
Material (CMP, RCP) = CONCRETE
Inlet Headwall (Y/N) = YES
Beveled Inlet? = YES Top ONLY 0 08

Pipe Inlet





Notes:

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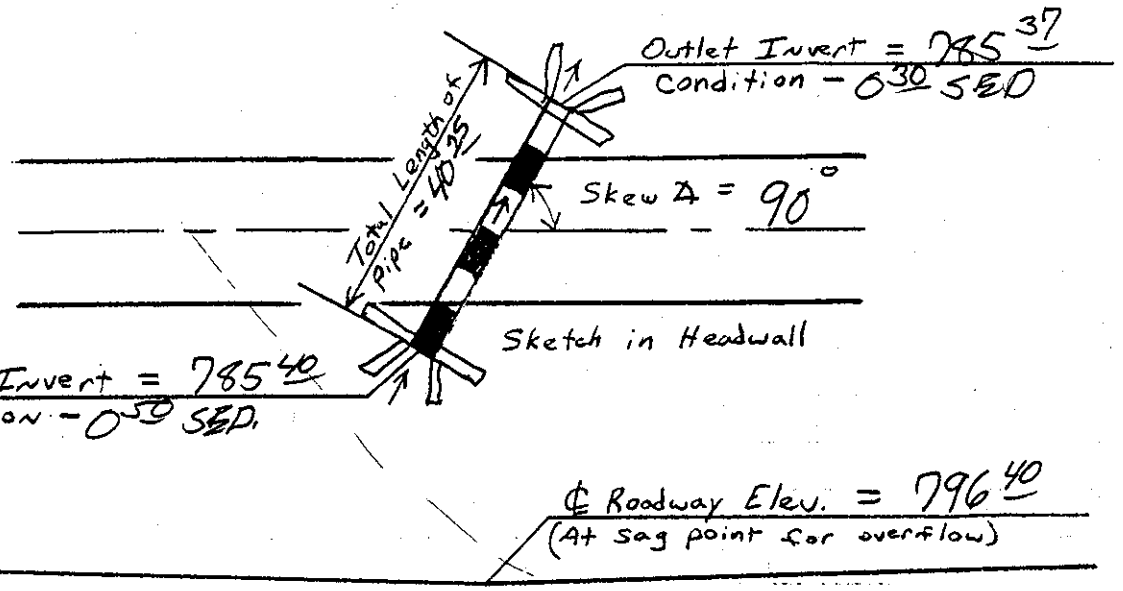
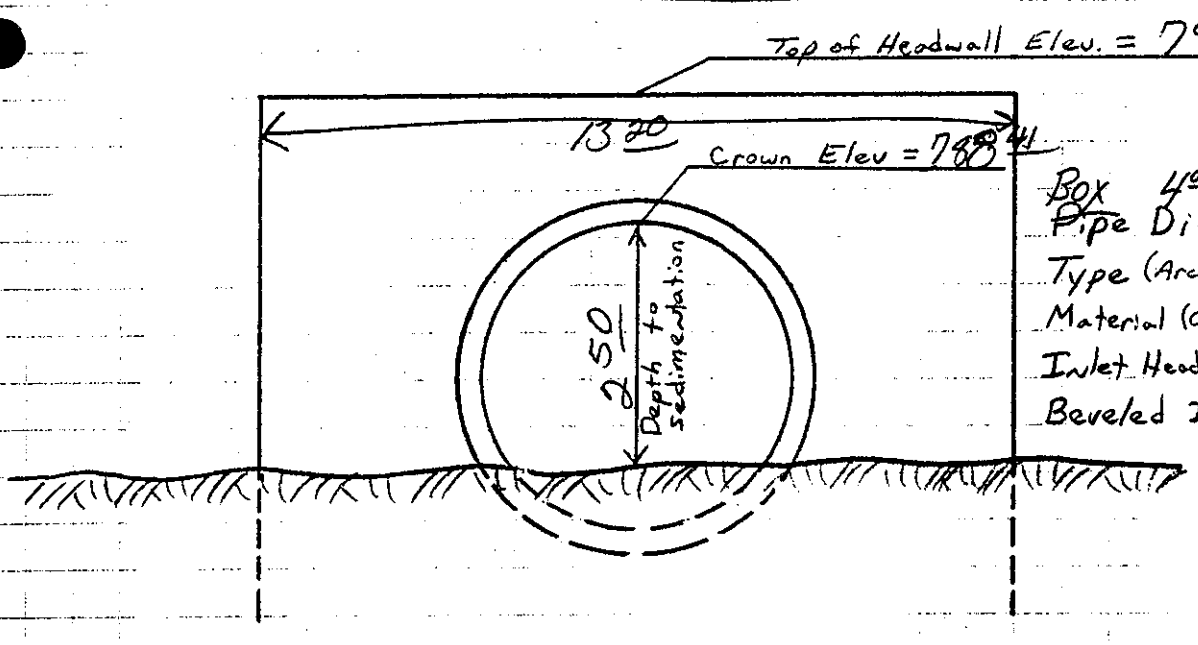
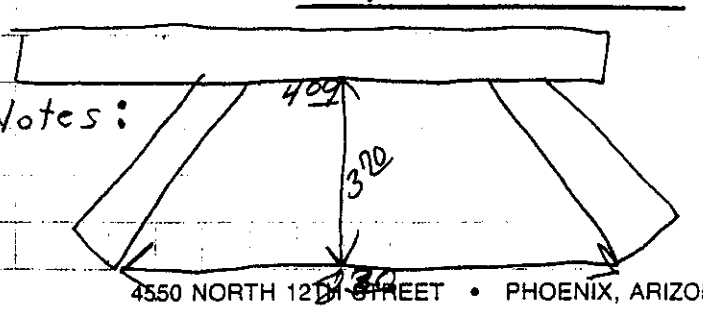
Pipe Culvert Survey Data:



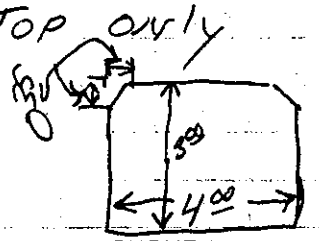


Box 4' WIDE 3' TALL
Pipe Diameter =
Type (Arch, Circular) = Sq.
Material (CMP, RCP) = CONCRETE
Inlet Headwall (Y/N) = YES
Beveled Inlet? = ONLY TOP 0 08

Pipe Inlet



Box HAS 0 35 x 0 35 ANGLES IN TOP ONLY

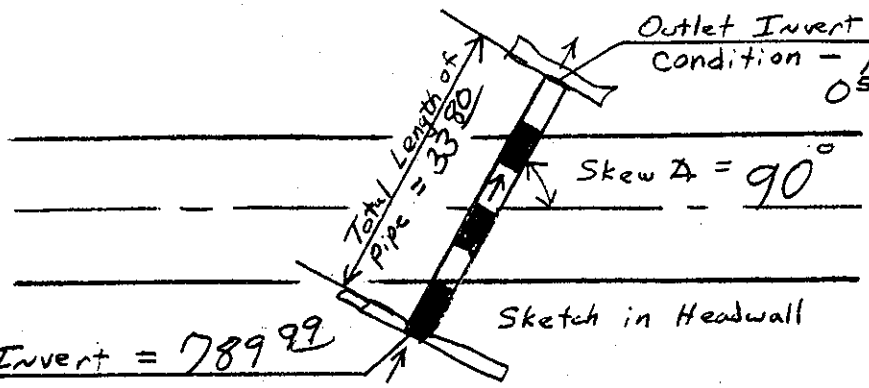


Notes:

CVL
E & VAN LOO
NING • ENGINEERING
CAPE ARCHITECTURE

Project Luke Wash FIS
Project No. 1090-070
Sheet No. P #32 of
Calculated by -10' Date
Checked by Date

Pipe Culvert Survey Data:

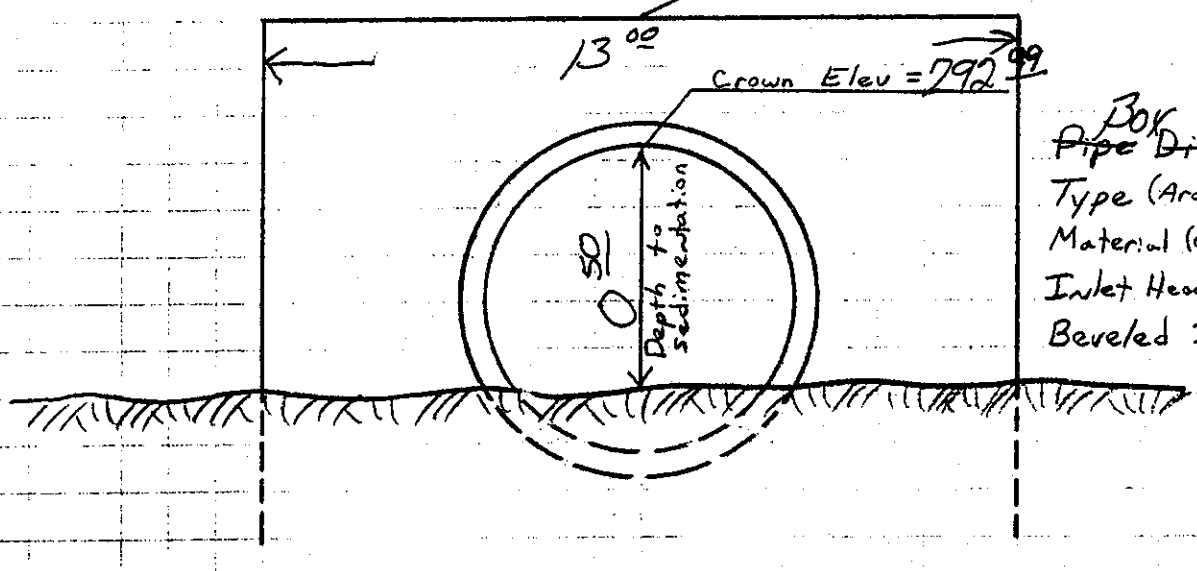


Outlet Invert = 790.05
Condition – 1.50 SED. ON END
0.50 SED IN 6' FROM OUTLET

Inlet Invert = 789.99
Condition –

℄ Roadway Elev. = 796.59
(At sag point for overflow)

Top of Headwall Elev. = 796.90



Box 4' WIDE 3' TALL
~~Pipe Diameter~~ =
Type (Arch, Circular) = Sq.
Material (CMP, RCP) = CONCRET
Inlet Headwall (Y/N) = YES
Beveled Inlet? = YES 0.01

Pipe Inlet

Notes: PIPE IS FULL of DIRT