UPDATE OF LAVEEN FLOODPLAIN DELINEATION STUDY

FCD Contract No. 1999C048 - Assignment # 4

DRAFT

TECHNICAL DATA NOTEBOOK

Prepared for:

Flood Control District of Maricopa County

Prepared by:

WEST Consultants, Inc

September 8, 2000

Michael Duncan - FCDX

From: Michael Duncan - FCDX
Sent: Friday, February 09, 2001 10:10 AM
To: Tim Phillips - FCDX
Cc: Joe Tram - FCDX
Subject: Laveen study surface areas

From the Hydraulics Update study by West Consultants, 2000,
for the "No Levee" scenario,

from Salt River floodplain to 43rd Ave.,

Floodplain = 1300 acres

Floodway = 450 acres

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Flood Control District of MC Library
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Phoenix, AZ 85009

UPDATE OF LAVEEN FLOODPLAIN DELINEATION STUDY

FCD Contract No. 1999C048 - Assignment # 4

DRAFT

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CONTRACTS |
ROUTING

Prepared for:

Flood Control District of Maricopa County

2801 West Durango Street

Phoenix, AZ 85009-6399

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REG | P & PM
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CONTRACTS |
ROUTING

Prepared by:

WEST CONSULTANTS, INC.

WEST Consultants, Inc

2151 East Broadway Road, Suite 116

Tempe, AZ 85282

September 8, 2000

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1. Introduction

The Flood Control District of Maricopa County contracted WEST Consultants, Inc. to conduct a hydraulic analysis on 5.1 linear miles along the Maricopa Drain located within Maricopa County's community of Laveen, Arizona. The purpose of this hydraulic study is to update the 100-year floodplain and floodway delineation originally performed by Cella Barr Associates (CBA) in June 1992 (see Appendix A.1). Since the CBA analysis, various alterations in the hydrology and hydraulics of the watershed have occurred, necessitating an update of the analysis. The contract number within the Flood Control District of Maricopa County (hereafter referred to as the District) is 1999C048 – Assignment Number 4. The study area extends along the Maricopa Drain (formerly known as the Champion Drain) from its intersection with 43rd Avenue downstream to its confluence with the Salt River. A map of the project area is provided in Figure 1.1 following page 1. All aspects of this analysis other than the hydraulics were provided by the District; including hydrology, topographic mapping, field survey data, and aerial photography. The hydraulic analysis was conduced using the Army Corps of Engineers' HEC-2 and HEC-RAS computer modeling software. An original HEC-2 model developed by CBA in their 1992 study was used as the base for the hydraulic model. The hydraulic analysis resulted in an less extensive floodplain and an updated floodway for the 5.1 mile reach.

2. ADWR/FEMA Forms

2.1 Study Documentation Abstracts for ADWR Submittals

(To be included at a later date.)

2.2 FEMA Forms

(To be included at a later date.)

3. Surveying and Mapping Information

3.1 Field Survey Information

The original survey data and pictures of the Maricopa Drain cross sections, produced by Morrison Maierle, Inc., were provided by the District and were used in this study to establish the channel geometry of the Maricopa Drain cross sections. A copy of the field notes as delivered to WEST are provided in Appendix C.

3.2 Mapping

All mapping and aerial photographs utilized in this study were provided by the District. Primary digital topography came from the *Laveen Area Master Drainage Study* (AMDS) completed by Cella Barr Associates in 1992. (See Appendix A.1.) The topography, in two-foot contour intervals, was provided in DXF file format. A secondary source for digital topography was the *Delineation Study of Salt and Gila Rivers*, originally obtained from a 1993 Salt River floodplain delineation work map produced by Michael Baker Jr., Inc. This file, also in DXF format, provided four-foot contour topography of the confluence of the Maricopa Drain and Salt River.

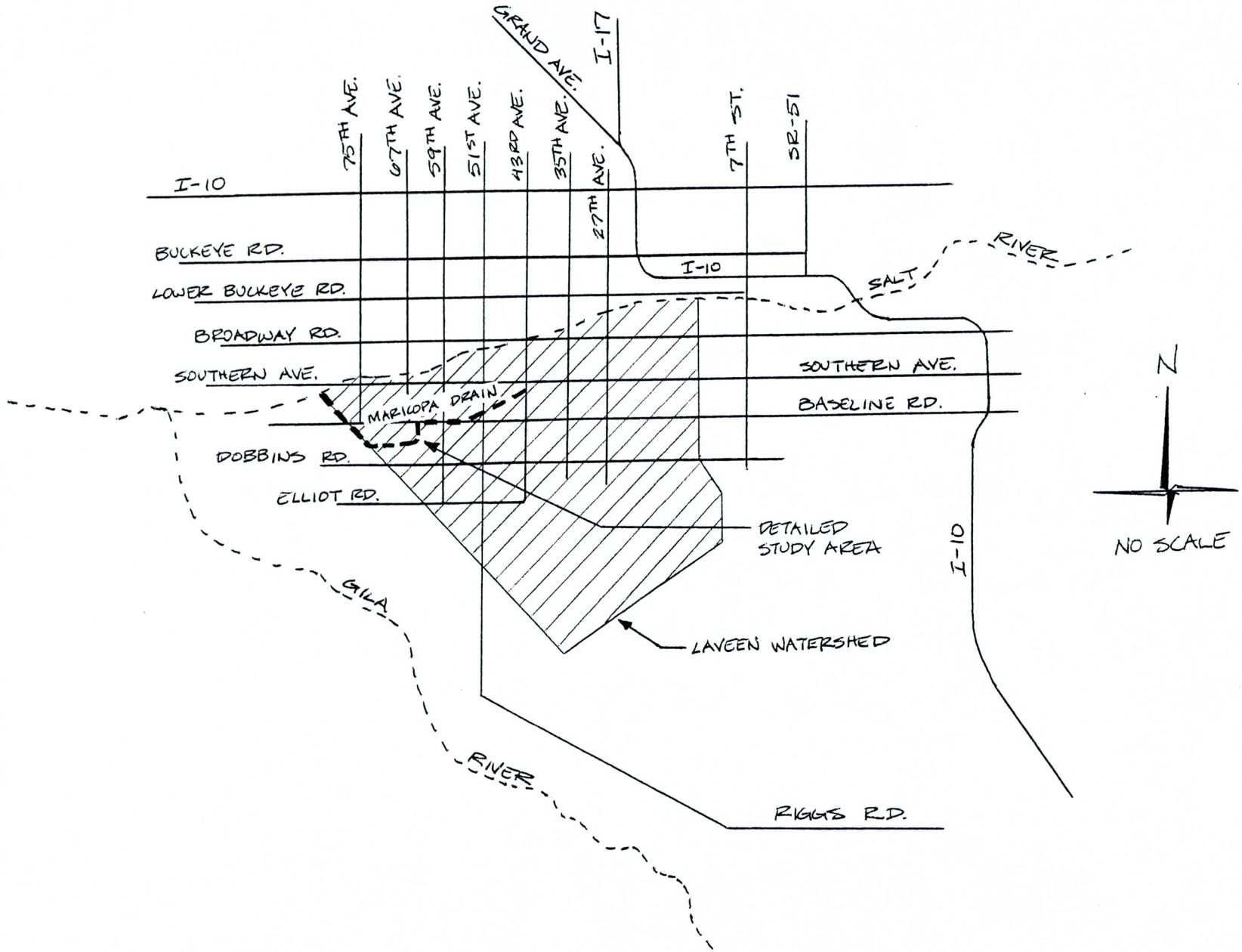

FIGURE 1.1 - PROJECT AREA

The digital files from the 1993 work map also allowed the tie-in of this study with the existing Salt River floodplain.

Digital aerial photographs of the Laveen area taken in 1999 were also provided by the District in TIF image format. They covered the entire study area and were used in estimating various hydraulic parameters as described in Section 5.3.

4. Hydrology

4.1 Method Description

4.2 Parameter Estimation

4.2.1 Drainage Area Boundaries

4.2.2 Watershed Work Maps

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4.2.4 Statistical Parameters

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4.2.6 Physical Parameters

4.3 Problems Encountered During Study

4.3.1 Special Problems and Solutions

4.3.2 Modeling Warning and Error Messages

4.4 Calibration

4.5 Final Results

4.5.1 Hydrologic Analysis Results

4.5.2 Verification of Results

5. Hydraulics

5.1 Method Description

5.1.1 General Methods

The study area consists of the region surrounding the Maricopa Drain, as bounded by the Gila River Indian Reservation to the west, South Mountains to the south, 43rd Avenue to the east, and the Salt River to the north. See Figure 5.1 on the following page. The Maricopa Drain is a man-made irrigation channel located in a naturally depressed area of the watershed and is designed to convey water for agriculture. It varies in dimension from approximately fifteen to twenty feet wide and five to ten feet deep, with an average slope of about 0.15 percent. The 100-year floodplain associated with the Maricopa Drain is wide and shallow, covering mostly agricultural areas and some pockets of residential development. The floodplain reaches a maximum width of about 1500 feet, yet depths never exceed three feet.

The hydraulic modeling was performed using the U.S. Army Corps of Engineers' HEC-2 and HEC-RAS computer models; specifically, HEC-2 Version 4.6.0, released February 1991, and HEC-RAS Version 2.2, released September 1998. The model produced by CBA in 1992 was used as the basis for this analysis. Several alterations were made on a variety of aspects in the model, which will be discussed in further detail.

The hydraulic analyses in this study consisted of two sets of simulations performed using HEC-2. The first set simulated lateral weir flow phenomenon and was performed to estimate the spillover amounts crossing the Maricopa Drain (see Section 5.5.4 for details). Once the spillover amounts were determined, the flow rates along the Maricopa Drain were adjusted and the second set of simulations were performed. These simulations consisted of floodplain and floodway runs for two scenarios: "with-levee" and "no-levee". The "with-levee" scenario was based on the assumption that the Maricopa Drain levees, located between cross sections 1.924 and 2.303 (see Figure 5.1), would hold during 100-year flooding event. Conversely, the "no-levee" condition assumed that levees would fail during the same event. Therefore, a total of four runs were performed: two for the weir flow analysis and two for the floodplain/floodway analysis. The HEC-2 files associated with these analyses are "lav-nl-split.dat" and "lav-nl.dat" for the "no-levee" condition; with "lav-wl-split.dat" and "lav-wl.dat" for the "with levee" condition. These files are provided on diskettes following the appendices.

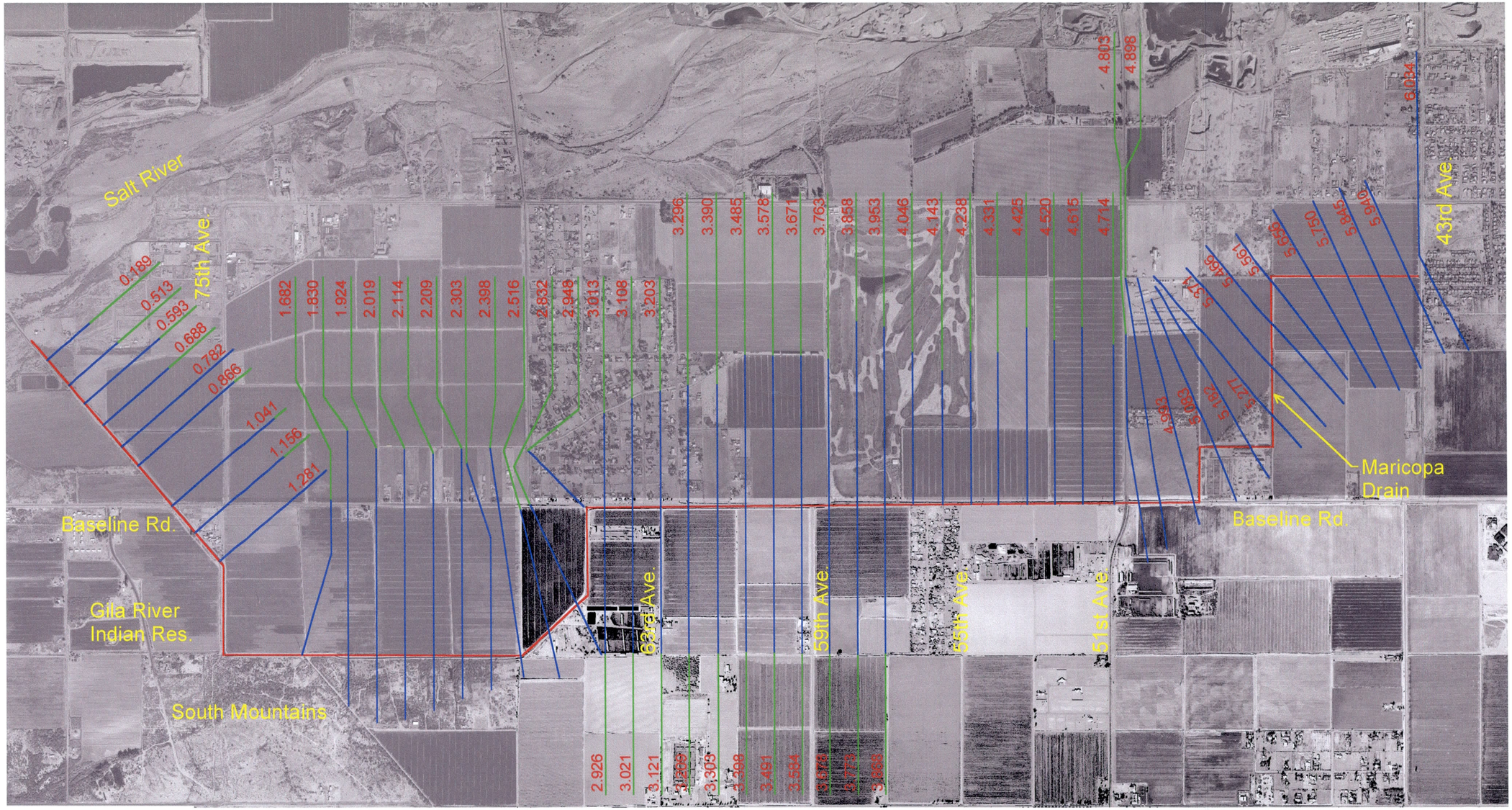


FIGURE 5.1
PROJECT AREA AND CROSS SECTION LOCATIONS

2000 0 2000 4000 Feet

700 0 700 Meters

N

LEGEND

Stationing Text

Text Station Number

Cross Sections

Cross Sections

Cross Section Leaders

Channel

5.1.2 Sensitivity Analyses

As a part of the hydraulic study, sensitivity analyses were performed to analyze the effects of various parameters prior to developing a final hydraulic model. The results of these sensitivity analyses had a bearing on some of the approaches used in the final model. Descriptions and details of these analyses are explained below.

5.1.2.1 Flow Rates

The sensitivity of the model with respect to flow rates was analyzed using two scenarios: the original values from the 1992 CBA model, and the existing values as determined by Maricopa County FCD in 2000. In both cases, the original 1992 geometry was used. The existing 2000 flow rates were generally between 20% and 50% lower than the original flow rates used in 1992 CBA model, as shown in Table 5.1. The results indicated that the model is sensitive to changes in flow rates. See also Figure 5.2 for a profile plot illustrating the model response to the two different flow rates. The water surface elevations resulting from the existing flow rates are between 0.2 ft and 0.5 ft lower than those from the original 1992 flow rates.

Table 5.1 - 100-Year Flow Rates (cfs)

HEC-1 Control Point	HEC-2 Cross Section	Location	1992 HEC-1 Model	1992 HEC-2 Model	2000 HEC-1 Model	2000 [(a)] HEC-2 Model
CAV43C	6.034	Maricopa Drain d/s of 43rd Avenue	1910	2175	1745	1801
CVR47C	5.561	Maricopa Drain @ 47th Avenue	2830	3089	1801	1801
CB51C	4.898	Maricopa Drain @ 51st Avenue	2730	2976	1710	1710
CB159C	3.858	Maricopa Drain @ 59th Avenue North of Baseline Road	2570	2795	1598	1899
CB163C	3.296	Maricopa Drain @ 63rd Avenue South of Baseline Road	2950	1833	1899	1899
CPCD1C	2.398	Maricopa Drain @ 67th Avenue	2881	3104	1869	1876
CCD2C	1.682	Maricopa Drain @ 75th Avenue	2850	2960	1876	1876
CPCD3C	0.866	Outfall to Salt River	1060	1159	674	1876
CB259C	3.868	Maricopa Drain @ 59th Avenue South of Baseline Road	702	868	765	765

Note: (a) The higher flow rate of two neighboring reaches is applied for both reaches.

5.1.2.2 Inclusion of Maricopa Drain Conveyance

To evaluate the model's sensitivity to the inclusion of the Maricopa Drain conveyance, two scenarios were considered. First, the drain was assumed to be empty, and second, it was assumed to be filled with water to a level one foot below the top of the lower levee. The same flow rate was applied for both cases. Water surface elevations for the scenario with the drain empty were about 1.5 feet lower than in the original model

without including the conveyance of the drain. The second scenario, in which the drain was almost full of water, resulted in water surface elevations about 1 foot lower than without the conveyance of the drain. These results indicated that it was necessary to include the conveyance of the Maricopa Drain in the hydraulic model.

5.1.2.3 Combined Effect

In this simulation, both previous factors were analyzed together by including the year 2000 flow rates as well as the added conveyance of the drain. The results of this simulation were lower compared with those of the scenario using the original 1992 flow rates without inclusion of the drain conveyance. Several local exceptions occurred in areas where the runoff flow crosses Baseline Road. In these areas, the combination scenario water surface elevations were slightly higher than those of the 1992 original scenario due to weir flow effects crossing Baseline Road.

5.1.2.4 Spillover Toward Gila River Indian Reservation

The flow toward Gila River Indian Reservation was modeled using the "normal depth" option for weir flow in the HEC-2 program. Usually, this method is sensitive to the inputs of energy slope and Manning's "n" roughness coefficient. Therefore, WEST performed a sensitivity analysis and the results confirmed that the model is sensitive to the both factors, as shown in Table 5.2. Particular care was used in selecting the appropriate values in the revised model. Based on the detailed field investigation and the results of this sensitivity analysis, WEST selected the Manning's "n" value of 0.03 and an energy slope of 0.01 as appropriate. The resulting lateral weir flow onto the Gila River Indian Reservation is estimated to be 750 cubic feet per second.

Table 5.2 - Results of "Normal Depth" Split Flow Option Sensitivity Analysis

Manning's "n" Coefficient	Energy Slope	Weir Flow (cfs)
0.03	0.01	750.95
0.03	0.001	372.34
0.03	0.0001	134.98
0.04	0.01	657.06
0.04	0.0001	102.71
0.02	0.01	867.29

5.2 Work Study Maps

A set of four work study maps were produced for this re-study. Even though three maps were sufficient to cover the entire study area, in order to display the two different scenarios described in Section 5.1.1 ("with-levee" and "no-levee"), it was necessary to have Sheets 1A and 1B. The difference in the water surface elevations between the two scenarios does not propagate far enough upstream to affect Sheet 2. 11" by 17" prints of the work maps are included following

page 6. The full size 24" by 36" plots are included in the Exhibit Maps section of this TDN following the Appendices.

In the work study maps, the 100-year floodplain boundary is shown as a heavy solid line, and the 100-year floodway boundary is shown as a heavy dashed line. While most cross sections in the Laveen floodplain are without a pronounced channel, a line connecting the low points of along the watercourse is shown as a thin dashed line. Each cross section is drawn in its true location and is labeled to match the cross sections in the HEC-2 model. The final computed water surface elevation is also displayed next to the cross section number. Major features, such as the Maricopa Drain, Gila River Indian Reservation, and major streets, are also shown. The 11" by 17" prints are in color, with the features of 100-year floodplain, 100-year floodway, and thalweg shown in blue, red, and magenta, respectively (with the same line types as described above).

5.3 Parameter Estimation

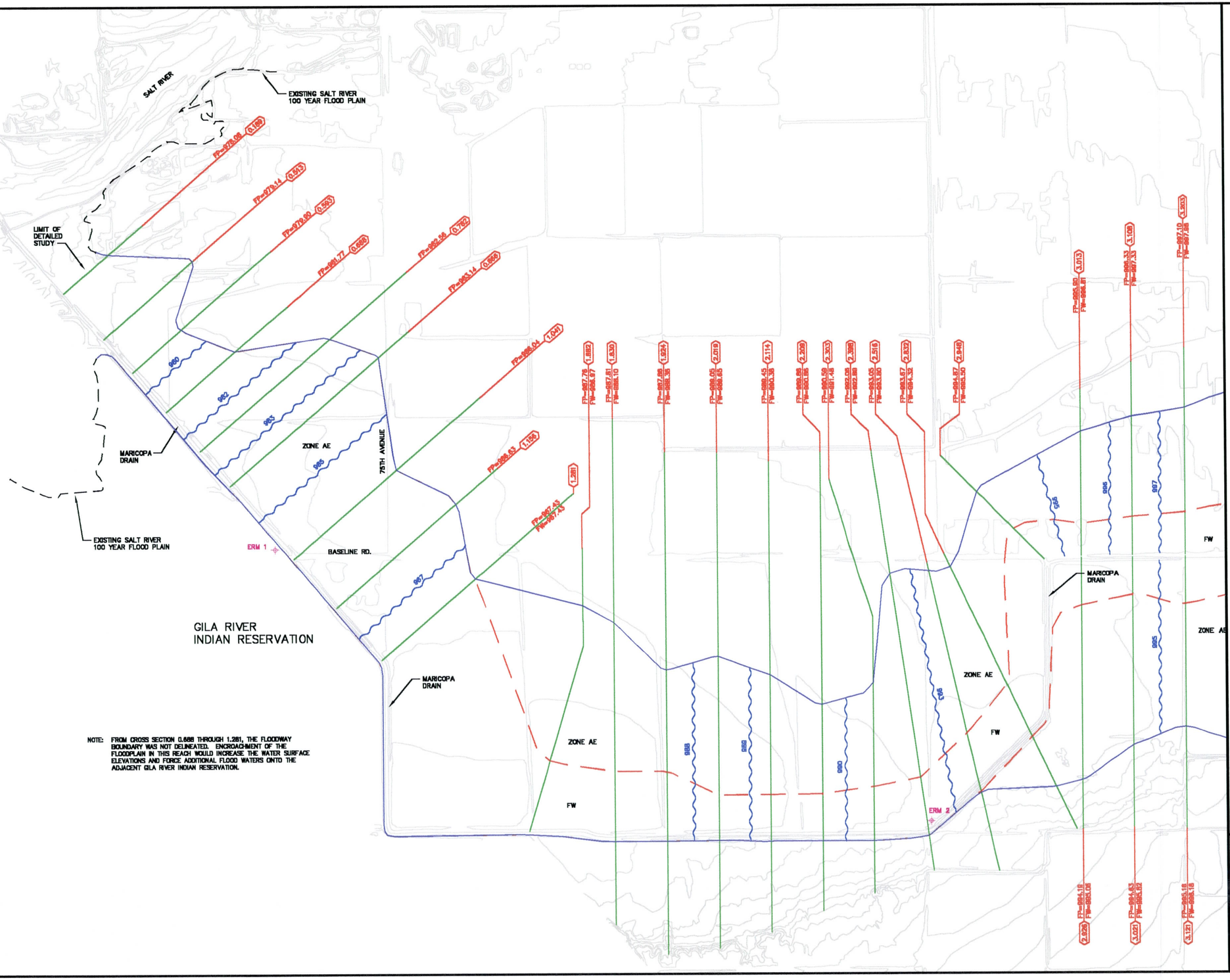
5.3.1 Roughness Coefficients

The assigning of revised Manning's "n" roughness coefficient values utilized both aerial photographs and ground proofing from a field visit on April 17, 2000. The aerial photographs were provided by the Flood Control District of Maricopa County in digital format and reflect the 1999 conditions. These digital photographs were first imported into ArcView GIS software. Cross section lines, as defined in the hydraulic model, were then overlaid to create a digital map illustrating the location of each cross section relative to the various land uses in the study area. It was then possible to use the ArcView GIS software to measure the length of each portion of cross section within a given area of land use.

Ground proofing was used to assign a Manning's "n" roughness coefficient to the various land uses in the model. In addition, it also provided confirmation that no changes in field size or use had taken place since the date of the aerial photographs. The primary land use in the area of study is agriculture. Photographs of the crops were taken during the site visit for later reference. By consulting various publications (References 4, 5, and 7, Appendix A.2), appropriate roughness coefficients were assigned for each crop that a cross section passed through. These values were then applied to the hydraulic model. Table 5.3 on the following page summarizes the applied values.

5.3.2 Expansion and Contraction Coefficients

There were no bridges or culverts in this analysis. Therefore, expansion and contraction coefficients were not necessary.



NOTE: FROM CROSS SECTION 0.688 THROUGH 1.281, THE FLOODWAY BOUNDARY WAS NOT DELINEATED. ENCROACHMENT OF THE FLOODPLAIN IN THIS REACH WOULD INCREASE THE WATER SURFACE ELEVATIONS AND FORCE ADDITIONAL FLOOD WATERS ONTO THE ADJACENT GILA RIVER INDIAN RESERVATION.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

PRELIMINARY

LAVEEN HYDRAULIC UPDATE
WORK MAP

F.C.D. CONTRACT NO. 1999C048
ASSIGNMENT NO. 4

LEGEND

REVISED 100-YR FLOODPLAIN BOUNDARY

EXISTING 100-YR FLOODPLAIN BOUNDARY

CROSS SECTION — FP = 100 YR WSE, FW = FLOODWAY WSE

BASE FLOOD ELEVATIONS — 1224

ZONE DESIGNATIONS — ZONE AE (2)

ELEVATION REFERENCE MARKS

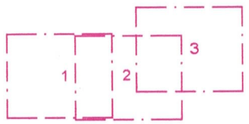
ERM 1 [ELEVATION = 984.13]
ALUMINUM CAP IN CONCRETE AT THE N.W. FENCE CORNER OF S.R.P. WELL SITE LOCATED AT THE N.W. CORNER OF BASELINE ROAD AND MARICOPA DRAIN.

ERM 2 [ELEVATION = 993.27]
ALUMINUM CAP IN CONCRETE AT SOUTH END OF CONCRETE IRRIGATION CANAL LOCATED 0.5 MILES SOUTH OF BASELINE ROAD AND ROUGHLY 175 FEET WEST OF 67TH AVENUE EXTENDED.

NOTES

ALL ELEVATIONS BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

INDEX MAP



N

100' 0' 100' 200'
SCALE: 1" = 200'
N.T.S.

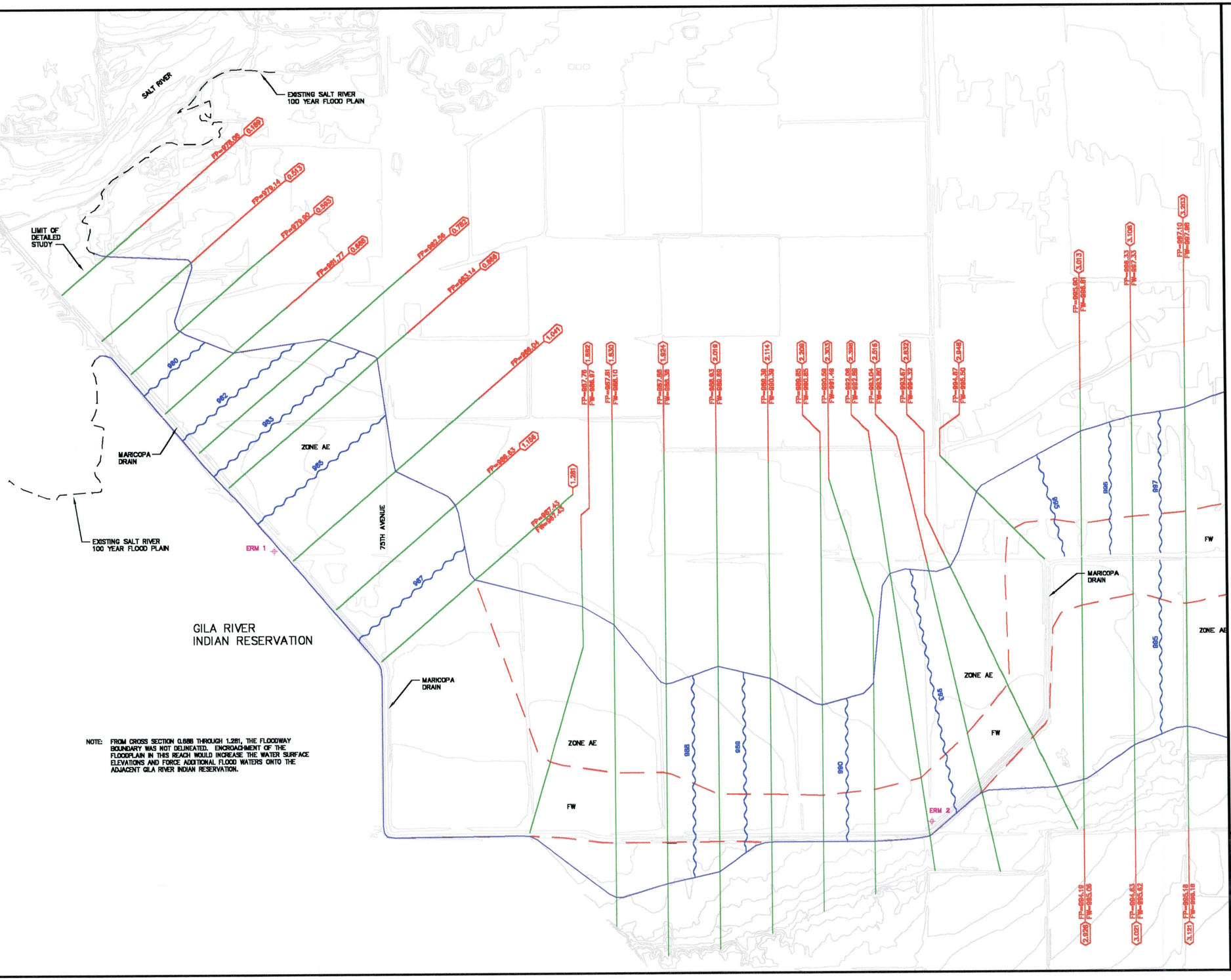
VERTICAL CONTOUR INTERVAL = 2 FEET

WEST Consultants, Inc.

	BY	DATE
DESIGN	---	---
DESIGN CHECK	---	---
PLANS	JEH	09/00
DESIGN CHECK	DLR	09/00

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
RECOMMENDED BY: DATE
APPROVED BY: DATE
CHIEF ENGINEER AND GENERAL MANAGER DATE

SHEET 1A OF 3



NOTE: FROM CROSS SECTION 0.988 THROUGH 1.281, THE FLOODWAY BOUNDARY WAS NOT DELINEATED. ENCROACHMENT OF THE FLOODPLAIN IN THIS REACH WOULD INCREASE THE WATER SURFACE ELEVATIONS AND FORCE ADDITIONAL FLOOD WATERS ONTO THE ADJACENT GILA RIVER INDIAN RESERVATION.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

PRELIMINARY

LAVEEN HYDRAULIC UPDATE
WORK MAP

F.C.D. CONTRACT NO. 1999C048
ASSIGNMENT NO. 4

LEGEND

REVISED 100-YR FLOODPLAIN BOUNDARY

EXISTING 100-YR FLOODPLAIN BOUNDARY

CROSS SECTION — FP = 100 YR WSE, FW = FLOODWAY WSE

BASE FLOOD ELEVATIONS — 1224

ZONE DESIGNATIONS — ZONE AE (2)

ELEVATION REFERENCE MARKS

ERM 1 [ELEVATION = 984.13]
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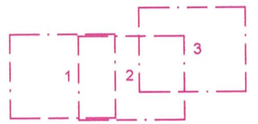
ALUMINUM CAP IN CONCRETE AT SOUTH END OF CONCRETE IRRIGATION CANAL LOCATED 0.5 MILES SOUTH OF BASELINE ROAD AND ROUGHLY 175 FEET WEST OF 67TH AVENUE EXTENDED.

NOTES

ALL ELEVATIONS BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

INDEX MAP



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SCALE: 1" = 200'
N.T.S.

VERTICAL CONTOUR INTERVAL = 2 FEET

WEST Consultants, Inc.

	BY	DATE
DESIGN	---	---
DESIGN CHECK	---	---
PLANS	JEH	09/00
DESIGN CHECK	DLR	09/00

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY _____ DATE _____

APPROVED BY _____ DATE _____

CHIEF ENGINEER AND GENERAL MANAGER

SHEET 1B OF 3

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

PRELIMINARY

LAVEEN HYDRAULIC UPDATE
WORK MAP

F.C.D. CONTRACT NO. 1999C048
ASSIGNMENT NO. 4

LEGEND

REVISED 100-YR FLOODPLAIN BOUNDARY

EXISTING 100-YR FLOODPLAIN BOUNDARY

CROSS SECTION — FP = 100 YR WSE, FW = FLOODWAY WSE

BASE FLOOD ELEVATIONS — 1224

ZONE DESIGNATIONS — ZONE AE (2)

ELEVATION REFERENCE MARKS

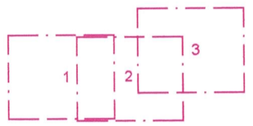
ERM 2 [ELEVATION = 993.27]
ALUMINUM CAP IN CONCRETE AT SOUTH END OF CONCRETE IRRIGATION CANAL LOCATED 0.5 MILES SOUTH OF BASELINE ROAD AND ROUGHLY 175 FEET WEST OF 67TH AVENUE EXTENDED.

ERM 3 [ELEVATION = 1001.25]
A.D.O.T. ALUMINUM CAP IN CONCRETE ROUGHLY 60 FEET EAST ADN 60 FEET SOUTH OF THE EASTERLY INTERSECTION OF 59TH AVENUE AND BASELINE ROAD BY TRANSMISSION POLE #25. CAP IS STAMPED "BM SWL NO.25 1986".

NOTES

ALL ELEVATIONS BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

INDEX MAP



N

100' 0' 100' 200'
SCALE: 1" = 200'

N.T.S.

VERTICAL CONTOUR INTERVAL = 2 FEET

WEST Consultants, Inc.

	BY	DATE
DESIGN	---	---
DESIGN CHECK	---	---
PLANS	JEH	09/00
DESIGN CHECK	DLR	09/00

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
RECOMMENDED BY: DATE
APPROVED BY: DATE
CHIEF ENGINEER AND GENERAL MANAGER

SHEET 2 OF 3

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

PRELIMINARY

LAVEEN HYDRAULIC UPDATE
WORK MAP

F.C.D. CONTRACT NO. 1999C048
ASSIGNMENT NO. 4

LEGEND

REVISED 100-YR FLOODPLAIN BOUNDARY

EXISTING 100-YR FLOODPLAIN BOUNDARY

CROSS SECTION — FP = 100 YR WSE, FW = FLOODWAY WSE

BASE FLOOD ELEVATIONS — 1224

ZONE DESIGNATIONS — ZONE AE (2)

ELEVATION REFERENCE MARKS

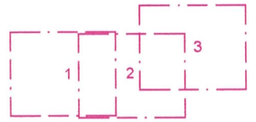
ERM 3 [ELEVATION = 1001.25]
A.D.O.T. ALUMINUM CAP IN CONCRETE ROUGHLY 60 FEET EAST ADN 60 FEET SOUTH OF THE EASTERLY INTERSECTION OF 59TH AVENUE AND BASELINE ROAD BY TRANSMISSION POLE #25. CAP IS STAMPED "BM SWL NO.25 1986".

ERM 4 [ELEVATION = 1010.26]
BRASS CAP IN HANDHOLE AT INTERSECTION OF BASELINE ROAD AND 51ST AVENUE.

NOTES

ALL ELEVATIONS BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

INDEX MAP



N

100' 0' 100' 200'
SCALE: 1" = 200'
N.T.S.

VERTICAL CONTOUR INTERVAL = 2 FEET

WEST Consultants, Inc.

	BY	DATE
DESIGN	---	---
DESIGN CHECK	---	---
PLANS	JEH	09/00
DESIGN CHECK	DLR	09/00

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
RECOMMENDED BY: DATE
APPROVED BY: DATE
CHIEF ENGINEER AND GENERAL MANAGER: DATE

SHEET 3 OF 3

Table 5.3: Typical Manning's "n" Roughness Coefficients

Field Type	Field Description	Manning's "n" coefficient
Earth	Maricopa Drain	0.028
Earth	Packed earth – empty lot with trucks, etc.	0.03
Golf	Golf course, or field w/o crop	0.04
Crops	Row crops	0.045
Crops	Field crops or scattered brush	0.05
Residential	Rural residential – medium development	0.052
Residential	Rural residential – developed with trees	0.058

5.4 Cross Section Descriptions

This analysis used 64 cross sections along two reaches to model the Laveen floodplain. One reach extends from the upstream boundary of the project at 43rd Avenue along the north side of the Maricopa Drain down to the confluence with the Salt River. The Second reach follows along the south side of the Maricopa Drain for approximately 1.1 miles before it joins the north reach at cross section 2.832. Out of the 64 total cross sections in the model, 11 were used to describe the south reach. The remaining 53 cross sections were used to describe the north reach.

The majority of the cross section data was unchanged from the 1992 CBA model, which utilized 1" = 400' scale, 2-foot contour interval topographic mapping dated July 1990. The data were manually extracted from the topographic maps. The geometry from the original HEC-2 model was extended 1000 feet downstream in order to tie the Maricopa Drain floodplain into the existing Salt River floodplain. This extension consists of two additional cross sections located at river miles 0.513 and 0.189, which lie about 520 and 1000 feet, respectfully, beyond the downstream end of the original model. Also, four additional cross sections were inserted to facilitate modeling Baseline Road as a normal weir: two between cross sections 0.866 and 1.156, and another two between sections 2.832 and 3.013. Finally, three other cross sections (2.398, 2.516 and 2.832) were reoriented to ensure that the flow direction remained normal to the cross sections.

The typical cross section in the Laveen floodplain is very broad and shallow. The terrain surrounding the Maricopa Drain is almost exclusively developed for agricultural use, and is therefore very flat. The geometry of the Maricopa Drain appears near the edge of most cross sections. In the portion of the model where the two reaches were necessary, cross section geometry was split between the north and south reach. Wherever this is the case, the drain only appears in one of the cross sections, which is usually on the north side. The actual dimensions of the Maricopa Drain were entered using survey data collected by Morrison Maierle, Inc. in May 1999 (See Appendices A.1 and C.3).

5.5 Modeling Considerations

5.5.1 Hydraulic Jump and Drop Analysis

None identified.

5.5.2 Bridges and Culverts

None identified.

5.5.3 Levees and Dikes

None identified.

5.5.4 Islands and Split Flows

Split flows occur at three locations in this model:

1. Immediately upstream and downstream of the intersection of Baseline Road and the Maricopa Drain, near 75th Avenue (between cross sections 0.866 and 1.156)
2. Between cross sections 1.281 and 1.682
3. Upstream of the intersection of Baseline Road and the Maricopa Drain, near 65th Avenue (between cross sections 3.013 and 3.296)

At each location, the phenomena were modeled using a lateral weir. The analysis was performed for both the "no-levee" and "with-levee" conditions and the resulting weir-flow rates are shown in Table 5.4.

Table 5.4 - Weir-Flow Analysis Spillover Amounts

Location Number	Cross Section Location (from Sta. No. to Sta. No.)	"No-Levee" Condition (cfs)	"With-Levee" Condition (cfs)
1	0.866 – 1.156	571.6	571.6
2	1.281 – 1.682	66.4	66.4
	3.013 – 3.108	43.5	52.0
3	3.108 – 3.203	217.5	220.8
	3.203 – 3.296	414.2	413.8
	3.296 – 3.390	106.6	106.7

Flows exiting the model at locations No. 1 and No. 2 leave the study area to the west and do not return. However, at location No. 3 the 100-year peak discharge flowing along the north side of Baseline Road crosses the roadway and spills onto the south side where it continues to flow along the edge of the drain. The flow at this weir remains in the model and continues downstream. The spillover amount was not directly added to the south side discharge due to the fact that the time-to-peak (T_p) of the two watersheds do not coincide. The 100-year peak discharge along the south side of Baseline Road is 765 cfs. The peak of

the flood hydrograph on the south side of Baseline Road occurs 2½ hours prior to the peak flow for the flood hydrograph on the north side. Therefore, the amount of spillover from the north side of Baseline Road was added to the receding limb of the south side hydrograph at a time when the north side hydrograph was at its peak. If the resulting cumulative peak discharge was greater than 765 cfs, the combined discharge was utilized to determine 100-year base flood elevations and floodplain limits for the south side of the model. When the resulting cumulative peak discharge is less than 765 cfs, a minimum values of 765 cfs was instead used to determine 100-year base flood elevations and floodplain limits. The flow rates used for the north and south sides of Baseline Road for "no-levee" and "with-levee" scenarios are shown in Tables 5.5 and 5.6, respectively. Very little difference was found between the two scenarios.

Table 5.5 - Flows Used for North and South Sides of Baseline Road "No-Levee" Condition

Cross Section Location (from station - to station)	North-Side of Baseline Road		Spillover from North-Side to South-Side of Baseline Road (cfs)	South-Side of Baseline Road	
	Flow Before Split Runs (cfs)	Flow After Split Runs (cfs)		Total Flow Including Added Spillovers (cfs)	Total Flow Used for Hydraulic Analysis (cfs)
Upstream	1899.0	1899.0	0.0	188.0	765.0
3.296 – 3.390	1899.0	1792.4	106.6	294.6	765.0
3.203 – 3.296	1899.0	1378.2	414.2	708.8	765.0
3.108 – 3.203	1899.0	1160.7	217.5	926.3	926.3
3.013 – 3.108	1899.0	1117.3	43.5	969.8	969.8

Note: A peak flow for the south side hydrograph of 765 cfs is used as a minimum flow for south side.

Table 5.6 - Flows Used for North and South Sides of Baseline Road "With-Levee" Condition

Cross Section Location (from station - to station)	North-Side of Baseline Road		Spillover from North-Side to South-Side of Baseline Road (cfs)	South-Side of Baseline Road	
	Flow Before Split Runs (cfs)	Flow After Split Runs (cfs)		Total Flow Including Added Spillovers (cfs)	Total Flow Used for Hydraulic Analysis (cfs)
Upstream	1899.0	1899.0	0.0	188.0	765.0
3.296 – 3.390	1899.0	1792.4	106.7	294.7	765.0
3.203 – 3.296	1899.0	1378.1	414.2	708.9	765.0
3.108 – 3.203	1899.0	1160.7	217.4	926.3	926.3
3.013 – 3.108	1899.0	1117.3	43.4	969.7	969.7

Note: A peak flow for the south side hydrograph of 765 cfs is used as a minimum flow for south side.

The original CBA analysis used the Manning's equation and a field surveyed cross section to obtain a flow-elevation rating curve for the intersection of Baseline Road and the Maricopa Drain (split flow location No. 1). Based on the approximate location for the flow division, it then estimated the amount of spillover into the Gila River Indian Reservation. At the location No. 2, between cross sections 1.281 and 1.682, the original CBA analysis did not model the spillover across the Maricopa Drain.

The original CBA analysis used the Manning's equation and a field surveyed cross section to obtain a flow-elevation rating curve for the intersection of Baseline Road and the Maricopa Drain (split flow location No. 1). Based on the approximate location for the flow division, it then estimated the amount of spillover into the Gila River Indian Reservation. At the location No. 2, between cross sections 1.281 and 1.682, the original CBA analysis did not model the spillover across the Maricopa Drain.

The present analysis applied a more accurate method to model the split flow at the intersections of Baseline Road and the Maricopa drain. Instead of using Manning's equation, WEST used the HEC-2 "normal depth" option. This option estimates the lateral weir flow based on actual geometry of the Baseline Road cross section and the geometry of the top of Maricopa Drain levees. A similar approach was used in modeling the split-flow across the drain between cross sections 1.281 and 1.682.

5.5.5 Ineffective Flow Areas

None identified.

5.5.6 Supercritical Flow

None identified.

5.5.7 Normal Weir Flow

The left overbank flow along the Maricopa Drain crosses over Baseline Road at two locations: near 75th Avenue, and again near 65th Avenue. At these two locations, Baseline Road is approximately 1.5 to 2.5 feet higher than the adjacent ground, resulting in the potential for weir flow and local affects on the water surface elevations.

The CBA study did not treat Baseline Road as a normal weir, neglecting a likely hydraulic control which could affect water surface elevations. Instead, WEST modeled Baseline Road as a broad-crested weir oriented normal to the flow at both locations using the "special bridge" routine in HEC-2. The skew of Baseline road relative to the flow direction was accounted for by projecting the effective weir length normal to flow.

5.6 Floodway Modeling

The overall goal of the floodway encroachment analysis was to identify the channel that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation by more than one foot.

5.6.1 Analysis Approach

The initial encroachment analysis for this model was performed using the Army Corps of Engineers' HEC-RAS computer model. The analysis consisted of an initial run using Encroachment Method 4, the results of which were later fine tuned in the HEC-2 computer program using Encroachment Method 1. The Method 4 analysis specifies a target surcharge and incrementally removes an equal amount of conveyance from either overbank until the target surcharge is achieved. This procedure is performed at each cross section, beginning at the downstream end of the reach and working upstream. In order to expedite the process, three identical flow profiles were executed, each with a different target surcharge close to the desired value. The most effective target was then fixed at successive cross sections and the analysis moved upstream. Once Method 4 yielded encroachment stations close enough to the desired surcharge – within 0.2 feet – the results were then exported into an HEC-2 input file for further analysis with Method 1. In Method 1, the user fixes the bank stations manually, allowing for fine-tuning to achieve the desired results.

5.6.2 Special Considerations

The fine-tuning using HEC-2 took into consideration, and attempted to balance, four different but interdependent factors:

1. maximizing the encroachment while staying under a one-foot surcharge
2. avoiding critical depth assumptions by the model
3. maintaining a reasonably smooth floodway in plan view
4. protecting the conveyance in the Maricopa Drain and in the thalweg

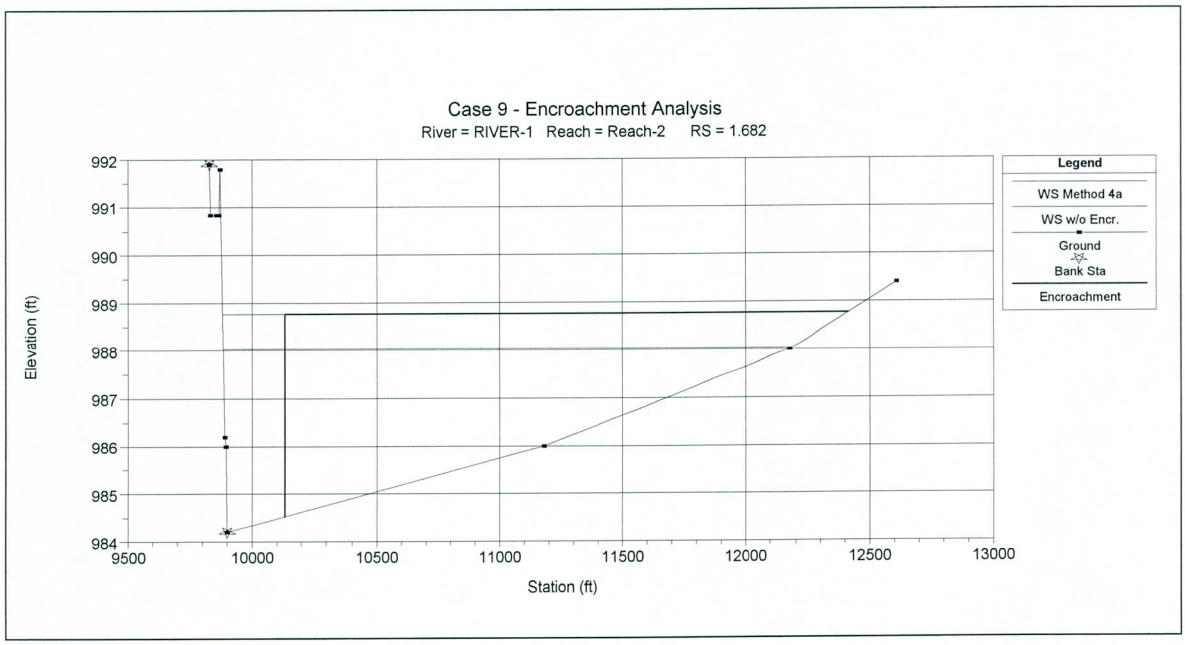
With the interdependency of the four factors listed above, the process of identifying a floodway for this watercourse was necessarily iterative in nature.

The first three factors are standard to any floodway analysis using Method 1 encroachment. As the encroachment stations are adjusted on either side of the channel, proper care must be taken to ensure that the encroachments are reasonable. The top width is monitored to ensure that large fluctuations are avoided; i.e. a wide-narrow-wide-narrow, etc. pattern in the plan view of the floodway. Numerically, this may satisfy the encroachment criteria, but such a result is not realistic. Caution must also be taken to ensure that the numerical analysis used by HEC-2 is able to solve for a real answer to the energy equation, and that it does not merely default to critical depth. A critical depth result would also be unrealistic in this watercourse.

The fourth factor considered was the protection of the Maricopa Drain conveyance. At the majority of the cross sections in the model, the geometry that defines the drain lies at the extreme edge of the cross section (see Figure 5.2). Therefore, with a normal encroachment analysis that removes conveyance equally from each overbank, the Maricopa Drain's conveyance would be removed almost immediately. In order to prevent this, the encroachment station on the side with the drain was adjusted such that it stopped short of the drain, maintaining its conveyance. Since the drain is located at the edge of most cross

sections, the conveyance was therefore removed primarily from one side of the cross section. Figure 5.2 shows a typical cross section with the drain located near the edge.

Figure 5.2 - Typical Cross Section with Maricopa Drain



The Maricopa Drain is generally at an elevation above the thalweg for a given cross section (when a thalweg is present), resulting in the primary conveyance being located somewhere other than the drain. This area of primary conveyance was also preserved by adjusting the location of the other encroachment station to the lowest geometry point in the cross section. With careful placement of the two encroachment stations, both the Maricopa Drain and the thalweg for a cross section were preserved.

5.7 Problems Encountered During the Study

5.7.1 Special Problems and Solutions

Initial runs of the HEC-2 model by WEST did not include all of the split flow and normal weir controls. After reviewing output from these runs, it was decided that a more detailed approach to these hydraulic controls was necessary. The alterations to the model were described in Sections 5.5.4 and 5.5.7.

5.7.2 Modeling Warning and Error Messages

The majority of cross sections had a warning indicating that the conveyance change was outside the acceptable range. Detailed review of the model indicated that this warning was not indicative of a problem with the analysis results and it was therefore neglected. No other warnings or errors were listed.

5.8 Calibration

The Laveen watershed is ungaged, therefore calibration to historic events is not possible.

5.9 Final Results

5.9.1 Hydraulic Analysis Results

Summaries of hydraulic model results are presented in Tables 5.7A and 5.7B on pages 14 through 17. Table 5.7A applies to the "With-Levee" scenario, whereas 5.7B represents the "No-Levee" case. The tables summarize the following variables by cross section: peak discharge, floodplain water surface elevation, critical water surface elevation, average channel velocity, top width, depth of flow, Froude number, and stations for left and right edges of water surface. Detailed model output can be reviewed in Appendix E.5.

5.9.2 Verification of Results

The results generated by this hydraulic model are reasonable and within expected parameters.

Comparison of results with floodplain and floodway water surface elevations from the 1992 CBA study are shown in Table 5.8 on pages 18 and 19. The elevations calculated by the WEST analysis are generally 0.2 feet to 0.9 feet lower than the 1992 values with the exception of two locations. At river stations 1.041 and 3.013, the elevations are approximately 0.5 feet higher than the 1992 values. This increase in elevations is likely due to the effects of modeling Baseline Road as a weir, which was not done in the 1992 study.

6. Erosion and Sediment Transport

Sediment transport is beyond the scope of this analysis.

Table 5.7A - Summary of Hydraulic Results - "With Levee" Scenario (1 of 2)									
Cross Section	Discharge (cfs)	Water Surface Elev. (ft)		Average Velocity (ft/s)	Topwidth (ft)	Depth (ft)	Froude Number	Station WS	
		Computed	Critical					Left	Right
0.189	1237.9	978.08	977.51	2.3	564	2.08	0.41	10000	10564
0.513	1237.9	979.14	978.60	1.3	1037	1.14	0.25	10026	11063
0.593	1237.9	979.90	979.49	3.1	397	1.50	0.54	9934	10331
0.688	1237.9	981.77	981.15	2.2	813	1.57	0.32	9950	10763
0.782	1237.9	982.56	981.90	1.0	1549	2.76	0.17	10002	11552
0.866	1237.9	983.14	982.59	1.3	1878	2.34	0.23	9911	11809
1.035	1296.5	984.70	984.36	1.8	472	2.30	0.26	9000	9472
1.041	1296.5	986.04	984.97	1.0	655	3.64	0.11	9000	9655
1.156	1809.6	986.63	986.23	2.1	1515	2.53	0.35	9847	11362
1.281	1809.6	987.43	986.78	2.3	1188	2.43	0.34	9901	11089
1.682	1876.0	987.76	985.31	0.5	2231	3.56	0.05	9830	12060
1.830	1876.0	987.81	985.91	0.6	2086	2.81	0.07	9740	11832
1.924	1876.0	987.86	987.80	3.1	1460	1.16	0.76	9787	11247
2.019	1876.0	989.05	988.22	1.1	1753	1.45	0.17	9742	11502
2.114	1876.0	989.45	988.51	0.0	1534	1.45	0.00	9800	11334
2.209	1876.0	989.86	988.79	1.3	1248	1.86	0.16	9788	11037
2.303	1876.0	990.59	990.07	1.9	1397	1.49	0.33	9849	11246
2.398	1899.0	992.06	991.82	1.0	2510	1.06	0.23	9745	12255
2.516	1899.0	993.05	992.57	1.4	1368	1.35	0.22	10198	11566
2.832	1899.0	993.67	993.12	0.8	2334	2.67	0.12	7658	10090
2.948	1106.5	994.87	994.63	2.7	802	1.27	0.56	10105	10907
2.949	1106.5	994.87	994.63	2.7	810	1.27	0.54	10102	10912
3.013	1158.3	995.90	994.65	0.8	1187	1.90	0.11	9775	10962
3.108	1378.9	996.33	995.49	1.4	1327	2.93	0.19	9805	11132
3.203	1792.4	997.10	996.29	1.3	1402	2.50	0.18	9847	11249
3.296	1899.0	997.73	996.70	1.4	1571	2.73	0.17	9840	11411
3.390	1899.0	998.07	996.89	1.0	1821	3.67	0.12	9858	11679
3.485	1899.0	998.49	997.83	1.8	1307	1.59	0.27	9884	11191
3.578	1899.0	999.52	998.61	1.9	1175	2.12	0.24	9925	11101
3.671	1899.0	1000.55	1000.03	1.9	1200	1.45	0.34	9962	11162
3.763	1899.0	1001.09	1000.85	1.2	1475	2.69	0.18	9898	11372
3.858	1710.0	1001.45	1001.35	1.5	1222	2.30	0.23	9922	11144
3.953	1710.0	1002.02	1000.72	1.1	1895	2.52	0.15	9932	11827
4.046	1710.0	1002.34	1001.41	1.9	1552	2.54	0.26	9960	11669
4.143	1710.0	1003.36	1003.11	1.9	1538	1.86	0.27	9955	11848
4.238	1710.0	1004.30	1003.72	1.6	1800	2.30	0.21	9958	11809
4.331	1710.0	1005.12	1004.87	1.6	1636	1.22	0.26	9971	11606
4.425	1710.0	1006.00	1005.14	1.5	1266	2.00	0.20	9973	11239
4.520	1710.0	1006.68	1005.86	1.1	1797	1.68	0.18	9975	11784
4.615	1710.0	1007.51	1006.96	1.9	1564	1.51	0.29	9935	11499
4.714	1710.0	1008.70	1008.14	1.3	2157	1.20	0.23	9756	11913
4.803	1801.0	1009.53	1008.96	1.3	2211	1.33	0.26	9372	11691
4.898	1801.0	1010.16	1009.16	1.1	2692	1.96	0.16	9025	11717
4.993	1801.0	1010.67	1010.09	1.1	2466	1.17	0.20	9186	11652

Table 5.7A - Summary of Hydraulic Results - "With Levee" Scenario (2 of 2)									
Cross Section	Discharge (cfs)	Water Surface Elev. (ft)		Average Velocity (ft/s)	Topwidth (ft)	Depth (ft)	Froude Number	Station WS	
		Computed	Critical					Left	Right
5.087	1801.0	1011.54	1011.15	1.2	2235	1.04	0.27	9496	11732
5.182	1801.0	1012.37	1011.69	0.9	2519	1.37	0.17	9288	11807
5.277	1801.0	1012.72	1012.10	0.8	2471	1.22	0.14	9413	11884
5.371	1801.0	1013.11	1012.26	1.0	1951	1.31	0.15	9653	11604
5.466	1801.0	1014.21	1014.17	3.0	1925	0.81	0.86	9520	11445
5.561	1801.0	1015.12	1014.18	0.8	2413	1.62	0.12	9553	11967
5.656	1801.0	1015.57	1014.83	1.7	1118	1.57	0.27	9659	10777
5.750	1801.0	1017.12	1016.62	2.0	2536	1.22	0.34	9429	11966
5.845	1801.0	1018.56	1018.08	1.3	2421	1.36	0.23	9412	11832
5.940	1801.0	1019.48	1018.76	1.4	1643	1.48	0.22	9686	11329
6.034	1801.0	1021.05	1020.62	2.3	1323	1.35	0.44	9269	10593
-2.832	1899.0	993.67		0.8	2332	2.67	0.12	7659	10089
2.926	1017.3	994.19	993.73	0.6	2127	0.97	0.11	8237	10364
3.021	965.3	994.63	994.13	0.6	1795	1.13	0.13	8572	10368
3.121	765.0	995.18	994.67	0.8	1593	0.98	0.17	8787	10380
3.209	765.0	995.70	995.17	0.7	1741	1.10	0.15	8629	10370
3.303	765.0	996.54	996.30	1.1	1766	0.54	0.29	8569	10335
3.398	765.0	997.21	996.51	0.8	1165	1.21	0.13	9156	10322
3.491	765.0	997.69	996.93	1.4	788	1.69	0.22	9503	10293
3.584	765.0	998.85	998.44	1.7	932	1.05	0.31	9278	10210
3.678	765.0	1000.61	1000.26	1.2	1087	0.61	0.28	9106	10193
3.773	765.0	1001.26	1000.38	0.9	975	1.26	0.14	9157	10133
3.868	765.0	1001.58	1000.70	0.9	967	1.28	0.13	9063	10030

Table 5.7B - Summary of Hydraulic Results - "No Levee" Scenario (1 of 2)									
Cross Section	Discharge (cfs)	Water Surface Elev. (ft)		Average Velocity (ft/s)	Topwidth (ft)	Depth (ft)	Froude Number	Station WS	
		Computed	Critical					Left	Right
0.189	1237.9	978.08	977.51	2.3	564	2.08	0.41	10000	10564
0.513	1237.9	979.14	978.60	1.3	1037	1.14	0.25	10026	11063
0.593	1237.9	979.90	979.49	3.1	397	1.50	0.54	9934	10331
0.688	1237.9	981.77	981.15	2.2	813	1.57	0.32	9950	10763
0.782	1237.9	982.56	981.90	1.0	1549	2.76	0.17	10002	11552
0.866	1237.9	983.14	982.59	1.3	1878	2.34	0.23	9911	11809
1.035	1296.5	984.70	984.36	1.8	472	2.30	0.26	9000	9472
1.041	1296.5	986.04	984.97	1.0	655	3.64	0.11	9000	9655
1.156	1809.6	986.63	986.23	2.1	1515	2.53	0.35	9847	11362
1.281	1809.6	987.43	986.78	2.3	1188	2.43	0.34	9901	11089
1.682	1876.0	987.76	985.31	0.5	2231	3.56	0.05	9830	12060
1.830	1876.0	987.81	985.91	0.5	2608	2.81	0.06	9214	11829
1.924	1876.0	987.86	987.49	2.2	1761	1.86	0.47	9355	11171
2.019	1876.0	988.93	988.20	1.1	1962	1.63	0.18	9452	11449
2.114	1876.0	989.39	988.52	1.3	1506	1.39	0.19	9800	11306
2.209	1876.0	989.85	988.77	1.1	1247	1.85	0.16	9788	11036
2.303	1876.0	990.59	990.07	1.9	1395	1.49	0.33	9849	11244
2.398	1899.0	992.06	991.82	1.0	2511	1.06	0.23	9745	12256
2.516	1899.0	993.04	992.57	1.4	1368	1.34	0.22	10198	11566
2.832	1899.0	993.67	993.12	0.8	2334	2.67	0.12	7658	10090
2.948	1106.5	994.87	994.63	2.7	803	1.27	0.56	10104	10908
2.949	1106.5	994.87	994.63	2.7	810	1.27	0.54	10102	10912
3.013	1158.3	995.90	994.65	0.8	1187	1.90	0.11	9775	10962
3.108	1378.9	996.33	995.49	1.4	1327	2.93	0.19	9805	11132
3.203	1792.4	997.10	996.29	1.3	1402	2.50	0.18	9847	11249
3.296	1899.0	997.73	996.70	1.4	1571	2.73	0.17	9840	11411
3.390	1899.0	998.07	996.89	1.0	1821	3.67	0.12	9858	11679
3.485	1899.0	998.49	997.83	1.8	1307	1.59	0.27	9884	11191
3.578	1899.0	999.52	998.61	1.9	1175	2.12	0.24	9925	11101
3.671	1899.0	1000.55	1000.03	1.9	1200	1.45	0.34	9962	11162
3.763	1899.0	1001.09	1000.85	1.2	1475	2.69	0.18	9898	11372
3.858	1710.0	1001.45	1001.35	1.5	1222	2.30	0.23	9922	11144
3.953	1710.0	1002.02	1000.72	1.1	1895	2.52	0.15	9932	11827
4.046	1710.0	1002.34	1001.41	1.9	1552	2.54	0.26	9960	11669
4.143	1710.0	1003.36	1003.11	1.9	1538	1.86	0.27	9955	11848
4.238	1710.0	1004.30	1003.72	1.6	1800	2.30	0.21	9958	11809
4.331	1710.0	1005.12	1004.87	1.6	1636	1.22	0.26	9971	11606
4.425	1710.0	1006.00	1005.14	1.5	1266	2.00	0.20	9973	11239
4.520	1710.0	1006.68	1005.86	1.1	1797	1.68	0.18	9975	11784
4.615	1710.0	1007.51	1006.96	1.9	1564	1.51	0.29	9935	11499
4.714	1710.0	1008.70	1008.14	1.3	2157	1.20	0.23	9756	11913
4.803	1801.0	1009.53	1008.96	1.3	2211	1.33	0.26	9372	11691
4.898	1801.0	1010.16	1009.16	1.1	2692	1.96	0.16	9025	11717
4.993	1801.0	1010.67	1010.09	1.1	2466	1.17	0.20	9186	11652

Table 5.7B - Summary of Hydraulic Results - "No Levee" Scenario (2 of 2)									
Cross Section	Discharge (cfs)	Water Surface Elev. (ft)		Average Velocity (ft/s)	Topwidth (ft)	Depth (ft)	Froude Number	Station WS	
		Computed	Critical					Left	Right
5.087	1801.0	1011.54	1011.15	1.2	2235	1.04	0.27	9496	11732
5.182	1801.0	1012.37	1011.69	0.9	2519	1.37	0.17	9288	11807
5.277	1801.0	1012.72	1012.10	0.8	2471	1.22	0.14	9413	11884
5.371	1801.0	1013.11	1012.26	1.0	1951	1.31	0.15	9653	11604
5.466	1801.0	1014.21	1014.17	3.0	1925	0.81	0.86	9520	11445
5.561	1801.0	1015.12	1014.18	0.8	2413	1.62	0.12	9553	11967
5.656	1801.0	1015.57	1014.83	1.7	1118	1.57	0.27	9659	10777
5.750	1801.0	1017.12	1016.62	2.0	2536	1.22	0.34	9429	11966
5.845	1801.0	1018.56	1018.08	1.3	2421	1.36	0.23	9412	11832
5.940	1801.0	1019.48	1018.76	1.4	1643	1.48	0.22	9686	11329
6.034	1801.0	1021.05	1020.62	2.3	1323	1.35	0.44	9269	10593
-2.832	1899.0	993.67		0.8	2332	2.67	0.12	7659	10089
2.926	1017.3	994.19	993.73	0.6	2127	0.97	0.11	8237	10364
3.021	965.3	994.63	994.13	0.6	1795	1.13	0.13	8572	10368
3.121	765.0	995.18	994.67	0.8	1593	0.98	0.17	8787	10380
3.209	765.0	995.70	995.17	0.7	1741	1.10	0.15	8629	10370
3.303	765.0	996.54	996.30	1.1	1766	0.54	0.29	8569	10335
3.398	765.0	997.21	996.51	0.8	1165	1.21	0.13	9156	10322
3.491	765.0	997.69	996.93	1.4	788	1.69	0.22	9503	10293
3.584	765.0	998.85	998.44	1.7	932	1.05	0.31	9278	10210
3.678	765.0	1000.61	1000.26	1.2	1087	0.61	0.28	9106	10193
3.773	765.0	1001.26	1000.38	0.9	975	1.26	0.14	9157	10133
3.868	765.0	1001.58	1000.70	0.9	967	1.28	0.13	9063	10030

Table 5.8 - Comparison of Results with 1992 CBA Model (1 of 2)						
Cross Section	Floodplain Water Surface Elevation (ft)			Floodway Water Surface Elevation (ft)		
	WEST Model[1]	CBA Model	Difference	WEST Model[1]	CBA Model	Difference
0.189	978.08	na[2]		978.08	na[2]	
0.513	979.14	na[2]		979.14	na[2]	
0.593	979.90	980.44	-0.54	979.90	980.44	-0.54
0.688	981.77	982.14	-0.37	981.77	982.14	-0.37
0.782	982.56	982.87	-0.31	982.56	982.87	-0.31
0.866	983.14	983.29	-0.15	983.14	983.29	-0.15
1.035	984.70	na[2]		984.70	na[2]	
1.041	986.04	na[2]		986.04	na[2]	
1.156	986.63	987.37	-0.74	986.63	987.37	-0.74
1.281	987.43	988.37	-0.94	987.43	988.37	-0.94
1.682	987.76	988.65	-0.89	987.97	988.70	-0.73
1.830	987.81	988.69	-0.88	988.10	988.76	-0.66
1.924	987.86	988.76	-0.90	988.36	988.85	-0.49
2.019	989.05	989.31	-0.26	989.65	989.64	0.01
2.114	989.45	989.77	-0.32	990.38	990.05	0.33
2.209	989.86	990.21	-0.35	990.86	990.38	0.48
2.303	990.59	990.90	-0.31	991.48	990.95	0.53
2.398	992.06	993.06	-1.00	992.89	993.39	-0.50
2.516	993.05	994.07	-1.02	993.80	994.48	-0.68
2.832	993.67	994.84	-1.17	994.32	995.28	-0.96
2.948	994.87	na[2]		995.50	na[2]	
2.949	994.87	na[2]		995.47	na[2]	
3.013	995.90	995.37	0.53	996.81	995.81	1.00
3.108	996.33	996.56	-0.23	997.33	997.12	0.21
3.203	997.10	997.20	-0.10	997.98	997.94	0.04
3.296	997.73	997.82	-0.09	998.64	998.74	-0.10
3.390	998.07	998.36	-0.29	999.06	999.31	-0.25
3.485	998.49	999.00	-0.51	999.49	999.85	-0.36
3.578	999.52	999.86	-0.34	1000.12	1000.56	-0.44
3.671	1000.55	1000.96	-0.41	1001.33	1001.53	-0.20
3.763	1001.09	1001.80	-0.71	1002.08	1002.66	-0.58
3.858	1001.45	1002.28	-0.83	1002.37	1003.21	-0.84
3.953	1002.02	1002.67	-0.65	1002.57	1003.64	-1.07
4.046	1002.34	1003.03	-0.69	1002.65	1003.98	-1.33
4.143	1003.36	1003.83	-0.47	1003.55	1004.61	-1.06
4.238	1004.30	1004.78	-0.48	1004.94	1005.53	-0.59
4.331	1005.12	1005.60	-0.48	1005.50	1006.30	-0.80
4.425	1006.00	1006.43	-0.43	1006.74	1007.01	-0.27
4.520	1006.68	1007.11	-0.43	1007.30	1007.69	-0.39
4.615	1007.51	1007.91	-0.40	1008.38	1008.50	-0.12
4.714	1008.70	1009.03	-0.33	1009.27	1009.39	-0.12

[1]Relative to the "With-Levee" scenario

[2]Cross section did not appear in CBA analysis

Table 5.8 - Comparison of Results with 1992 CBA Model (2 of 2)						
Cross Section	Floodplain Water Surface Elevation (ft)			Floodway Water Surface Elevation (ft)		
	WEST Model[1]	CBA Model	Difference	WEST Model[1]	CBA Model	Difference
4.803	1009.53	1009.83	-0.30	1010.53	1010.21	0.32
4.898	1010.16	1010.61	-0.45	1011.02	1010.95	0.07
4.993	1010.67	1011.20	-0.53	1011.44	1011.63	-0.19
5.087	1011.54	1012.02	-0.48	1012.35	1012.59	-0.24
5.182	1012.37	1012.91	-0.54	1013.16	1013.56	-0.40
5.277	1012.72	1013.31	-0.59	1013.71	1014.18	-0.47
5.371	1013.11	1013.78	-0.67	1014.11	1014.72	-0.61
5.466	1014.21	1014.75	-0.54	1014.83	1015.66	-0.83
5.561	1015.12	1015.59	-0.47	1015.98	1016.54	-0.56
5.656	1015.57	1016.04	-0.47	1016.51	1016.98	-0.47
5.750	1017.12	1017.40	-0.28	1017.61	1017.94	-0.33
5.845	1018.56	1018.81	-0.25	1019.40	1019.56	-0.16
5.940	1019.48	1019.81	-0.33	1020.43	1020.77	-0.34
6.034	1021.05	1021.51	-0.46	1022.05	1022.01	0.04
-2.832	993.67	994.84	-1.17	994.32	995.28	-0.96
2.926	994.19	995.01	-0.82	995.06	995.47	-0.41
3.021	994.63	995.22	-0.59	995.62	995.78	-0.16
3.121	995.18	995.64	-0.46	996.18	996.37	-0.19
3.209	995.70	995.99	-0.29	996.66	996.78	-0.12
3.303	996.54	996.60	-0.06	997.53	997.29	0.24
3.398	997.21	997.65	-0.44	998.11	998.11	0.00
3.491	997.69	998.08	-0.39	998.68	998.50	0.18
3.584	998.85	998.94	-0.09	999.47	999.21	0.26
3.678	1000.61	1000.15	0.46	1001.56	1000.90	0.66
3.773	1001.26	1001.14	0.12	1002.26	1002.00	0.26
3.868	1001.58	1001.81	-0.23	1002.58	1002.22	0.36

[1]Relative to the "With-Levee" scenario

[2]Cross section did not appear in CBA analysis

7. Draft FIS Report Data

7.1 Summary of Discharges

Table 7.1 - Summary of Discharges		
Cross Section	**Location**	**Discharge (cfs)**
6.034	Maricopa Drain d/s of 43rd Avenue	1801
5.561	Maricopa Drain @ 47th Avenue	1801
4.898	Maricopa Drain @ 51st Avenue	1710
3.858	Maricopa Drain @ 59th Avenue North of Baseline Road	1899
3.296	Maricopa Drain @ 63rd Avenue South of Baseline Road	1899
2.398	Maricopa Drain @ 67th Avenue	1876
1.682	Maricopa Drain @ 75th Avenue	1876
0.866	Outfall to Salt River	1876
3.868	Maricopa Drain @ 59th Avenue South of Baseline Road	765

7.2 Floodway Data

Floodway data are presented in Tables 7.2 and 7.3 located on pages 21 through 24, one each for the "With-Levee" and "No-Levee" scenarios, respectively.

7.3 Annotated Flood Insurance Rate Maps

A draft Flood Insurance Rate Map is provided in the Exhibit Maps section following the Appendices.

7.4 Flood Profiles

A draft Flood Profile Map is provided in the Exhibit Maps section following the Appendices. Only one map was produced to represent both the "With-Levee" and "No-Levee" scenarios. The difference in water surface elevations between the two would not be visually distinguishable.

Table 7.2 - Floodway Data - "With-Levee" Scenario (1 of 2)							
Flooding Source		**Floodway**			**Base Flood Water Surface Elevation[1]**		
Cross Section	Distance[2] (ft)	Width (ft)	Section Area (sq ft)	Mean Velocity (ft/s)	Floodway (ft)	Floodplain (ft)	Increase (ft)
0.189	0	564	543	2.3	978.08	978.08	0.00
0.513	580	1037	927	1.3	979.14	979.14	0.00
0.593	1000	397	402	3.1	979.90	979.90	0.00
0.688	1500	813	731	2.2	981.77	981.77	0.00
0.782	2000	1549	1303	1.0	982.56	982.56	0.00
0.866	2440	1878	1136	1.3	983.14	983.14	0.00
1.035	3331	472	577	1.8	984.70	984.70	0.00
1.041	3361	655	1244	1.0	986.04	986.04	0.00
1.156	3981	1515	1025	2.1	986.63	986.63	0.00
1.281	4641	1188	1069	2.3	987.43	987.43	0.00
1.682	6756	700	2194	0.8	987.97	987.76	0.21
1.830	7536	668	1750	1.1	988.10	987.81	0.29
1.924	8036	653	780	2.4	988.36	987.86	0.50
2.019	8536	433	759	2.2	989.65	989.05	0.60
2.114	9036	432	952	0.0	990.38	989.45	0.93
2.209	9536	436	1119	1.7	990.86	989.86	1.00
2.303	10036	484	803	2.3	991.48	990.59	0.89
2.398	10536	540	676	2.1	992.89	992.06	0.83
2.516	11161	542	1019	1.4	993.80	993.05	0.75
2.832	11826	562	1341	1.1	994.32	993.67	0.65
2.948	13256	410	430	2.6	995.50	994.87	0.63
2.949	13286	390	383	2.9	995.47	994.87	0.60
3.013	13786	305	788	1.5	996.81	995.90	0.91
3.108	14286	365	925	1.5	997.33	996.33	1.00
3.203	14786	403	999	1.8	997.98	997.10	0.88
3.296	15276	490	1220	1.7	998.64	997.73	0.91
3.390	15776	500	1227	1.5	999.06	998.07	0.99
3.485	16276	475	1128	1.6	999.49	998.49	1.00
3.578	16776	360	873	2.2	1000.12	999.52	0.60
3.671	17276	264	418	4.5	1001.33	1000.55	0.78
3.763	17776	374	970	1.5	1002.08	1001.09	0.99
3.858	18276	549	1275	1.1	1002.37	1001.45	0.92
3.953	18776	769	1723	0.9	1002.57	1002.02	0.55
4.046	19266	390	761	2.0	1002.65	1002.34	0.31
4.143	19781	285	502	2.7	1003.55	1003.36	0.19
4.238	20281	344	813	1.8	1004.94	1004.30	0.64
4.331	20781	304	472	2.8	1005.50	1005.12	0.38
4.425	21281	478	1128	1.3	1006.74	1006.00	0.74
4.520	21781	377	575	2.7	1007.30	1006.68	0.62

[1] Vertical Datum: NAVD88

[2] Feet upstream of confluence with Salt River

[3] Feet upstream of junction of north and south reaches

Table 7.2 - Floodway Data - "With-Levee" Scenario (2 of 2)							
Flooding Source		**Floodway**			**Base Flood Water Surface Elevation[1]**		
Cross Section	Distance[2] (ft)	Width (ft)	Section Area (sq ft)	Mean Velocity (ft/s)	Floodway (ft)	Floodplain (ft)	Increase (ft)
4.615	22281	542	1089	1.6	1008.38	1007.51	0.87
4.714	22806	467	689	2.5	1009.27	1008.70	0.57
4.803	23276	520	954	1.9	1010.53	1009.53	1.00
4.898	23776	530	1375	1.3	1011.02	1010.16	0.86
4.993	24276	545	996	1.8	1011.44	1010.67	0.77
5.087	24776	635	1003	1.8	1012.35	1011.54	0.81
5.182	25276	695	1185	1.5	1013.16	1012.37	0.79
5.277	25776	660	1284	1.4	1013.71	1012.72	0.99
5.371	26276	605	1362	1.3	1014.11	1013.11	1.00
5.466	26776	510	558	3.2	1014.83	1014.21	0.62
5.561	27276	495	1177	1.5	1015.98	1015.12	0.86
5.656	27776	425	941	1.9	1016.51	1015.57	0.94
5.750	28276	440	700	2.6	1017.61	1017.12	0.49
5.845	28776	425	747	2.4	1019.40	1018.56	0.84
5.940	29276	410	943	1.9	1020.43	1019.48	0.95
6.034	29776	399	463	4.3	1022.05	1021.05	1.00
-2.832		562	1341	1.1	994.32	993.67	0.65
2.926	1450[3]	455	692	1.0	995.06	994.19	0.87
3.021	1950	360	557	1.3	995.62	994.63	0.99
3.121	2450	452	688	1.1	996.18	995.18	1.00
3.209	2940	352	510	1.5	996.66	995.70	0.96
3.303	3440	308	396	0.0	997.53	996.54	0.99
3.398	3940	203	409	1.5	998.11	997.21	0.90
3.491	4440	194	446	1.6	998.68	997.69	0.99
3.584	4940	204	276	2.7	999.47	998.85	0.62
3.678	5440	214	327	2.4	1001.56	1000.61	0.95
3.773	5940	265	592	1.3	1002.26	1001.26	1.00
3.868	6440	357	670	1.3	1002.58	1001.58	1.00

[1] Vertical Datum: NAVD88

[2] Feet upstream of confluence with Salt River

[3] Feet upstream of junction of north and south reaches

Table 7.3 - Floodway Data - "No-Levee" Scenario (1 of 2)							
Flooding Source		Floodway			Base Flood Water Surface Elevation[1]		
Cross Section	Distance[2] (ft)	Width (ft)	Section Area (sq ft)	Mean Velocity (ft/s)	Floodway (ft)	Floodplain (ft)	Increase (ft)
0.189	0	564	543	2.3	978.08	978.08	0.00
0.513	580	1037	927	1.3	979.14	979.14	0.00
0.593	1000	397	402	3.1	979.9	979.90	0.00
0.688	1500	813	731	2.2	981.77	981.77	0.00
0.782	2000	1549	1303	1.0	982.56	982.56	0.00
0.866	2440	1878	1136	1.3	983.14	983.14	0.00
1.035	3331	472	577	1.8	984.7	984.70	0.00
1.041	3361	655	1244	1.0	986.04	986.04	0.00
1.156	3981	1515	1025	2.1	986.63	986.63	0.00
1.281	4641	1188	1069	2.3	987.43	987.43	0.00
1.682	6756	700	2194	0.8	987.97	987.76	0.21
1.830	7536	668	1750	1.1	988.1	987.81	0.29
1.924	8036	654	753	2.5	988.36	987.86	0.50
2.019	8536	423	757	2.2	989.69	988.93	0.76
2.114	9036	444	986	1.9	990.39	989.39	1.00
2.209	9536	431	1102	1.7	990.85	989.85	1.00
2.303	10036	484	806	2.4	991.49	990.59	0.90
2.398	10536	540	675	2.1	992.89	992.06	0.83
2.516	11161	542	1019	1.4	993.8	993.04	0.76
2.832	11826	562	1341	1.1	994.32	993.67	0.65
2.948	13256	410	430	2.6	995.5	994.87	0.63
2.949	13286	390	383	2.9	995.47	994.87	0.60
3.013	13786	305	788	1.5	996.81	995.90	0.91
3.108	14286	365	925	1.5	997.33	996.33	1.00
3.203	14786	403	999	1.8	997.98	997.10	0.88
3.296	15276	490	1220	1.7	998.64	997.73	0.91
3.390	15776	500	1227	1.5	999.06	998.07	0.99
3.485	16276	475	1128	1.6	999.49	998.49	1.00
3.578	16776	360	873	2.2	1000.12	999.52	0.60
3.671	17276	264	418	4.5	1001.33	1000.55	0.78
3.763	17776	374	970	1.5	1002.08	1001.09	0.99
3.858	18276	549	1275	1.1	1002.37	1001.45	0.92
3.953	18776	769	1723	0.9	1002.57	1002.02	0.55
4.046	19266	390	761	2.0	1002.65	1002.34	0.31
4.143	19781	285	502	2.7	1003.55	1003.36	0.19
4.238	20281	344	813	1.8	1004.94	1004.30	0.64
4.331	20781	304	472	2.8	1005.5	1005.12	0.38
4.425	21281	478	1128	1.3	1006.74	1006.00	0.74
4.520	21781	377	575	2.7	1007.3	1006.68	0.62

[1] Vertical Datum: NAVD88

[2] Feet upstream of confluence with Salt River

[3] Feet upstream of junction of north and south reaches

Table 7.3 - Floodway Data - "No-Levee" Scenario (2 of 2)							
Flooding Source		**Floodway**			**Base Flood Water Surface Elevation[1]**		
Cross Section	Distance[2] (ft)	Width (ft)	Section Area (sq ft)	Mean Velocity (ft/s)	Floodway (ft)	Floodplain (ft)	Increase (ft)
4.615	22281	542	1089	1.6	1008.38	1007.51	0.87
4.714	22806	467	689	2.5	1009.27	1008.70	0.57
4.803	23276	520	954	1.9	1010.53	1009.53	1.00
4.898	23776	530	1375	1.3	1011.02	1010.16	0.86
4.993	24276	545	996	1.8	1011.44	1010.67	0.77
5.087	24776	635	1003	1.8	1012.35	1011.54	0.81
5.182	25276	695	1185	1.5	1013.16	1012.37	0.79
5.277	25776	660	1284	1.4	1013.71	1012.72	0.99
5.371	26276	605	1362	1.3	1014.11	1013.11	1.00
5.466	26776	510	558	3.2	1014.83	1014.21	0.62
5.561	27276	495	1177	1.5	1015.98	1015.12	0.86
5.656	27776	425	941	1.9	1016.51	1015.57	0.94
5.750	28276	440	700	2.6	1017.61	1017.12	0.49
5.845	28776	425	747	2.4	1019.4	1018.56	0.84
5.940	29276	410	943	1.9	1020.43	1019.48	0.95
6.034	29776	399	463	4.3	1022.05	1021.05	1.00
-2.832		562	1341	1.1	994.32	993.67	0.65
2.926	1450[3]	455	692	1.0	995.06	994.19	0.87
3.021	1950	360	557	1.3	995.62	994.63	0.99
3.121	2450	452	688	1.1	996.18	995.18	1.00
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3.303	3440	308	396	0.0	997.53	996.54	0.99
3.398	3940	203	409	1.5	998.11	997.21	0.90
3.491	4440	194	446	1.6	998.68	997.69	0.99
3.584	4940	204	276	2.7	999.47	998.85	0.62
3.678	5440	214	327	2.4	1001.56	1000.61	0.95
3.773	5940	265	592	1.3	1002.26	1001.26	1.00
3.868	6440	357	670	1.3	1002.58	1001.58	1.00

[1] Vertical Datum: NAVD88

[2] Feet upstream of confluence with Salt River

[3] Feet upstream of junction of north and south reaches

APPENDIX A.1

DATA COLLECTION SUMMARY

Data Collection Summary

1. Cella Barr Associates, "Laveen Area Master Drainage Study - Phase 1," Hydraulic Report, June 1992.

2. Flood Control District of Maricopa County, "Laveen Area Hydrology," Preliminary Report, Watershed Management Branch, June 2000.

3. Morrison Maierle, Inc., "Maricopa Drain Survey Data", Workbook of Sections, May 1999.

APPENDIX A.2

REFERENCED DOCUMENTS

Referenced Documents

1. U.S. Army Corps of Engineers, "HEC-2, Water Surface Profiles," User's Manual, September 1990.

2. U.S. Army Corps of Engineers, "Application of the HEC-2 Split Flow Option," April 1982.

3. U.S. Army Corps of Engineers, "HEC-RAS Hydraulic Reference Manual," Version 2.2, September 1998.

4. U.S. Geological Survey, Water Resources Division, "Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona," April 1991.

5. Ven Te Chow, "Open-Channel Hydraulics," 1st Edition, The McGraw-Hill Companies, 1959.

6. M. Hanif Chaudhry, "Open-Channel Flow," Prentice-Hall, Inc., 1993.

7. James M. Montgomery, Consulting Engineers, Inc., "Las Vegas Wash and Tributaries - Overflow Study," September 1987.

8. Arizona Department of Water Resources, Flood Mitigation Section, "Requirements for Flood Study Technical Documentation," State Standard SS1-97, November 1997.

9. Federal Emergency Management Agency, "Flood Insurance Study Guidelines and Specifications for Study Contractors," March 1993.

APPENDIX B.1

SPECIAL PROBLEM REPORTS

(NOT APPLICABLE)

APPENDIX B.2

CONTACT (TELEPHONE) REPORTS

(NOT APPLICABLE)

APPENDIX B.3

MEETING MINUTES OR REPORTS

PROJECT KICKOFF MEETING OUTLINE

March

Laveen Floodplain Delineation Study

Kickoff meeting on Monday 27, 2000, at 3 pm

Contract No. FCD 1999C048 - Assignment # 4
West Consultants, Inc.

FROM FLOOD CONTROL DISTRICT

1 - Hydrology

A - Overview

B - Unusual or difficult points

FROM CONSULTANT

2 - Schedule

3 - Projected monthly billings (to be done)

ITEMS TO DISCUSS

4 - 1937 Aerial Photo with superimposed approximate floodplain

5 - Materials still needed from FCD

6 - Deadlines

7 - First public open house ; April 13 ?

A - Set date

B - Advertising by consultant Flood Control

8 - Method for status updates

9 - Weekly visits to consultant for status and guidance

APPENDIX B.4

GENERAL CORRESPONDENCE

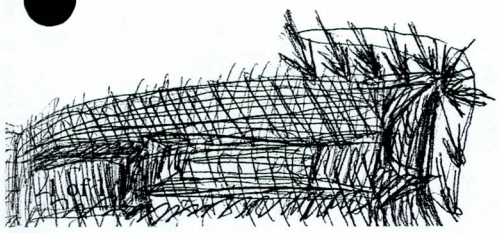
Subject: Laveen update study -- Irrigation flow
Date: Mon, 15 May 2000 15:30:43 -0700
From: Michael Duncan - FCDX <mwd@mail.maricopa.gov>
To: "'zlakicevic@westconsultants.com'" <zlakicevic@westconsultants.com>

I got some ranges of flow for Maricopa Drain from SRP (David Bass)
based on their gage near 75th Avenue.
June '99 11 to 14 cfs
Oct '99 6 to 13
Jan '00 1 to 7
first week of Mar '00 -- rainy -- peak of 17 cfs
rest of Mar '00 2 to 9 cfs
Apr '00 8 to 15

So, if it makes sense to assign (reserve) a Q to irrigation runoff,
I would think 15 cfs would be a good number.
Please call me to discuss.

Subject: Laveen Update Study
Date: Wed, 12 Apr 2000 07:47:11 -0700
From: Michael Duncan - FCDX <mwd@mail.maricopa.gov>
To: "'zlakicevic@westconsultants.com'" <zlakicevic@westconsultants.com>

The "Figure 6 HEC-1 Subarea Boundary Map" that I gave you yesterday is from a 1997 ADMS phase I report. There is nothing like that for the area west of 43rd Ave. The only subarea exhibit we have for the whole area is taped-together and is 4ft x 5ft.



Subject: **LAVEEN UPDATE STUDY**
Date: Fri, 7 Apr 2000 15:00:45 -0700
From: Michael Duncan - FCDX <mwd@mail.maricopa.gov>
To: "'zlakicevic@westconsultants.com'" <zlakicevic@westconsultants.com>

Here are 4 DRAFT hydrology models.
Concerning digital Watershed Boundary, our GIS manager (Marta) is out, I sent a request to her.

-----Original Message-----
From: Amir Motamedi - FCDX
Sent: Thursday, April 06, 2000 1:41 PM
To: Michael Duncan - FCDX
Subject: Laveen

Michael, attached are the HEC-1 files for the Laveen FIS and conversion.
Please note they are still Draft.

Thanks

Amir
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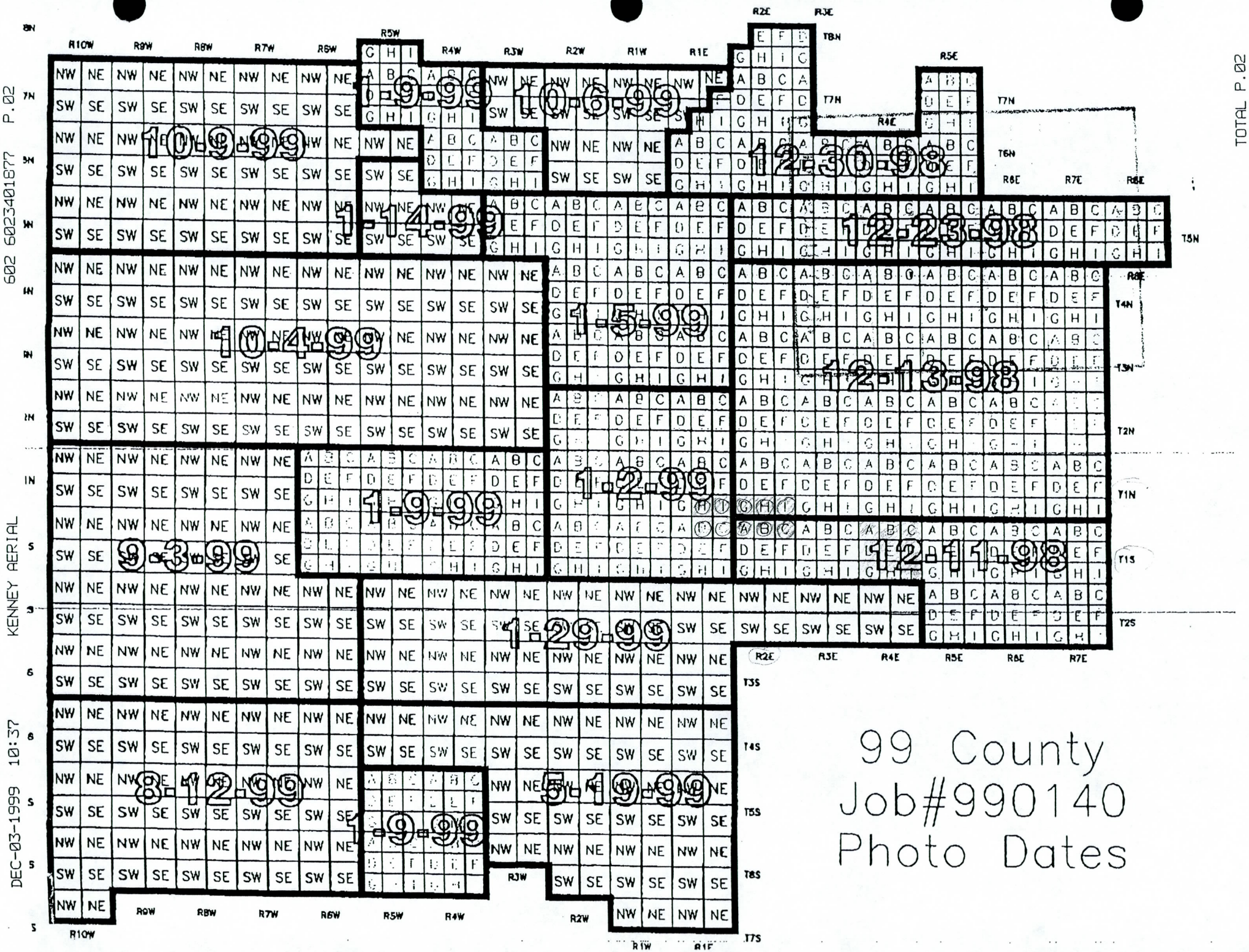
CHMP24C.DAT	**Name:** CHMP24C.DAT **Type:** DAT File (application/x-unknown-content-type-DAT_auto_file) **Encoding:** quoted-printable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KENNEY AERIAL
TOTAL P.02
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12-13-98
1-9-99
1-2-99
9-3-99
12-11-98
1-29-99
8-12-99
5-19-99
1-9-99
99 County
Job#990140
Photo Dates

75th Ave.
67th Ave.
59th Ave.
51st Av
43rd Av
Broadway Rd.
Southern Ave
Baseline Rd.
Dobbins Rd.

Subject: Laveen Area Hydrology - Preliminary Flows
Date: Tue, 28 Mar 2000 11:58:45 -0700
From: Tim Phillips - FCDX <tsp@mail.maricopa.gov>
To: "'tcoppin@kimley-horn.com'" <tcoppin@kimley-horn.com>,
"'tkeenan@carefreepartners.com'" <tkeenan@carefreepartners.com>,
"'bpl@deainc.com'" <bpl@deainc.com>,
"'shakirg@skgenterprises.com'" <shakirg@skgenterprises.com>,
"'rpschloss@aol.com'" <rpschloss@aol.com>,
"'dbrennan@ci.phoenix.az.us'" <dbrennan@ci.phoenix.az.us>,
"'matt@polarisre.com'" <matt@polarisre.com>,
"'pacherrington@srpnet.com'" <pacherrington@srpnet.com>,
"'drichards@westconsultants.com'" <drichards@westconsultants.com>
CC: Amir Motamedi - FCDX <amm@mail.maricopa.gov>,
Mike Ellegood - FCDX <mse@mail.maricopa.gov>,
Joe Tram - FCDX <jjt@mail.maricopa.gov>,
Michael Duncan - FCDX <mwd@mail.maricopa.gov>

The District has completed the first phase analysis as to the potential runoff flows entering the Maricopa Drain. For ease of communication I am forwarding this to you via email for your information and consideration.

This information is marked PRELIMINARY and subject to revision and future updates.

Assumptions:

These flow rates are based on analysis of current day (existing conditions). The most important assumption reflects inclusion of drainage features east of 43rd Avenue. This analysis assumes that only existing features or those currently in construction have been included. Specifically, mitigation of flows due to the construction of the 43rd Avenue Storm Drain (which diverts 165 cfs) and retention within the Cezar Chavez Golf Course (135 af of storage) are the only features currently modeled. The remaining features are subject to construction, cost sharing and the future City of Phoenix Bond Election.

Caution/Limitations:

These flows only reflect current conditions thus the impacts of future condition as one moves downstream may be significantly impacted as existing condition take advantage of on-site retention associated with farmland. Whereas future conditions with development on-site retention will likely retain less than current existing agricultural land uses.

Further, this analysis has indicated a great sensitivity to the timing of peak flows. Flows reaching the Maricopa Drain west of 43rd will be combined more rapidly once channelized and may significantly increase the peak flow particularily as one move downstream.

Additional Work being Done:

The District is furthering the analysis by evaluating the impact of future landuse, the effects of reducing on-site retention requirements for sub-basins adjacent to the Maricopa Drain, and differing channel configurations (cross-sections). We will make this information available all or in part as soon as possible, within the next two to three weeks.

RESULTS:

Hydrology

	Original Cella Barr (1991)	FCD (2000)
Maricopa Drain d/s 43rd Ave	1910 cfs	1745 cfs

(see Note 1)		
Maricopa Drain @ 47th Ave	2830 cfs	1800 cfs
Maricopa Drain @ 51st Ave	2730 cfs	1710 cfs
Maricopa Drain @ 59th Ave n/o Baseline	2570 cfs	1600 cfs
Maricopa Drain @ 59th Ave s/o Baseline	800 cfs	800 cfs
Maricopa Drain @ 63rd Ave s/o Baseline	2950 cfs	1900 cfs
(see Note 2)		
Maricopa Drain @ 75th Ave	2850 cfs	1880 cfs
Outfall to Salt River	1060 cfs	670 cfs

Note 1: Flow crossing 43rd Ave south of Southern
Note 2: Flow @ 63rd Avenue south of Baseline after combining flows from 59th Avenue north and south of Baseline.

Hydraulics

For background purposes, the District evaluated channelization to approximate a channel width based on the current (existing conditions) runoff.

Based on Mannings equation assuming no restrictions at crossing etc, using an average slope of 0.0014, straight-lined from the Maricopa Drain at 43rd Ave to the outfall at the Salt River, n=0.035, side/slope of 4:1, with 1' of freeboard, the approximated channel bottom width is 100 feet east of 63rd Ave and 125' west of 63rd Ave. Channel flows begin with 1745 cfs @ 43rd Avenue, 2280 cfs at 59th Avenue and 3440 cfs @ the outfall to the Salt River.

Again, this information is marked PRELIMINARY and subject to revision and future updates.

If you have any questions, please do not hesitate to contact me at 602-506-4718. I will follow-up with updates as soon as they are available. I will also be forwarding this information to others not with email.

Tim Phillips, P.E.
Project Manager
Laveen Area Drainage Master Plan

Telephone Conversation with STANTEC

On 03/17/2000, I spoke to PAT ELLISON from STANTEC regarding any available data for Lawson Hydraulic data.
He indicated that no data are available and that all the they have were given to District.

- Ros Croft - FCDMC - (602) 506-0282 - HEC-RAS model
-
- Stats used from Roland:
  - oral photos
  - hydrology
  - current and future projects which undertook.

42-182 100 SHEETS Made in U.S.A. National®Brand

APPENDIX B.5

CONTRACT DOCUMENTS

SCOPE OF WORK
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
UPDATE OF LAVEEN FLOODPLAIN DELINEATION STUDY
1999C048 - ASSIGNMENT NUMBER 4

GENERAL

There are two phases to this assignment. **Phase I** will be to update the hydraulics for the Laveen floodplain delineation that was conducted under FCD 89-70. The limits of the project are as shown on attached Exhibit 1. The hydrology will be revised by the District and given to the consultant. The hydraulics will be presented in a floodplain delineation format to indicate the lateral extent of flooding and depths. It would also include already existing structures as well as those that have been authorized for construction. **Phase II** will be to modify the study to a point where it would be ready to submit to FEMA and have the Federal Emergency Management Agency (FEMA) incorporate the delineation of approximately 5.1 linear miles of floodplain and floodway delineations within the Laveen area onto the Flood Insurance Rate Maps (FIRM**). Phase II will not occur without written direction from the District.** For this study the District will supply the topographic mapping, aerial photographs, field survey data, hydrologic data, and hydraulic model. The consultant will delineate the floodplains and floodways, prepare the Technical Data Notebooks, participate in public meetings, and respond to comments from FEMA. The consultant will develop the floodplain and floodway delineations using the U.S. Army Corps of Engineer's HEC-2 computer model. The consultant must use sound engineering judgement in the development of the hydraulic models. The consultant must analyze the results of the models carefully and make refinements to the input parameters in order to obtain the most realistic results. All work must meet Arizona Department of Water Resources (ADWR) and Federal Emergency Management Agency (FEMA) requirements for floodplain delineations. Prior to the finalization of this contract, FEMA and the District must review and accept the results of this study, and all items called for in this Scope of Work must be delivered to the District. The District's **Consultant Guideline** establishes the specifications for performing this work.

All work must be completed within 300 days from the notice to proceed. Phase I must be completed within 120 days, (which includes at least 30 days for District reviews). The remaining 180 days is allotted for Phase II.

PHASE I

TASK 1 - COORDINATION

1.1 The coordination efforts will be performed as specified in Sections 2.0 and 11.1 of the District's Consultant Guidelines with the exception of sections 2.3. Since this is Floodplain Delineation Study there will be no partnering or value engineering activities, and therefore section 2.3 does not apply to this scope.

1.2 The District shall plan and conduct two public meetings in conjunction with this study as specified in Section 11.1.4. The Consultant shall be responsible for advertising these meetings and providing four copies of the deliverables for the meetings.

TASK 2 - DATA COLLECTION

2.1 Data collection shall be as called for in section 11.2 of the Consultant Guideline

TASK 3 - TOPOGRAPHIC MAPPING

3.1 The District will supply the aerial photos and topographic mapping to be used for this study. The topographic mapping was developed as part of District Contract FCD 89-70. The aerial photographs will be 1999. Since the consultant will not be developing any topographic mapping for this study Sections 3 and 11.3 of the Consultant Guideline do not apply to this scope.

TASK 4 - FIELD SURVEY

4.1 Field surveys will be necessary for this study. The District will supply the field survey data that was developed for the topographic mapping study (FCD 89-70). Additional survey data will have to be collected to augment the existing data where development has occurred. Sections 3 and 11.3 of the Consultant Guideline will apply for the additional data collected. The survey data will not be collected until a scope and cost is reviewed and approved by the District.

TASK 5 - HYDROLOGY

5.1 The District will supply the hydrology for this study. Therefore, Sections 9 and 11.4 of the Consultant Guideline do not apply to this study. The District developed the hydrology for this area as an in-house project and the District will be responsible for making changes to the hydrology. The consultant will review the hydrology provided by the District and during the course of this study the consultant may request the District to revise the hydrology as needed.

5.2 For the watercourse that is being delineated using detailed methodologies the consultant will use the discharges from the District developed hydrology. If the concentration points within the hydrology model are not sufficient for the hydraulic modeling purposes, the consultant must request the District to revise the hydrology model.

TASK 6 – HYDRAULIC STUDY

6.1 The detailed hydraulic study, applying procedures consistent with floodplain delineations, will be performed using the procedures called for in Section 11.5 of the Consultant Guideline. The floodplain will use the floodway district of the current Salt River Floodplain as the initial starting point. The consultant will use the previous hydraulic model as the base model and will update it with respect to new development. The consultant will also verify the assumptions and parameters used within the model.

6.1 The consultant will assess the sensitivity of the floodplain with the inclusion of the Maricopa Drain and its conveyance within or deleted from the model.

6.2 A floodplain will also be modeled based upon the completion of all the projects within the watershed as defined by the District.

TASK 7 - PUBLIC INVOLVEMENT

7.1 The CONSULTANT shall plan, recommend and conduct two public open houses to inform the public and obtain public input. The first public meeting will be held within the first six weeks of the notice to proceed and the second public meeting will be held upon completion of the technical work under this Work Assignment Number.

7.2 The CONSULTANT shall be responsible to prepare approximately 6 exhibits/graphic displays for each of the two public meeting. The public meetings will be in an open house format. The CONSULTANT will provide, in digital and printed format, an exhibit showing the general project features or project impact area, suitable for reproduction or publication, for each public meeting.

7.3 The CONSULTANT shall participate in up to six (6) other undefined information presentations as necessary with other interested parties. Authorization must be obtained in writing from the District before participation based upon submittal of a scope and cost.

TASK 8 – PROJECT ADMINISTRATION

8.1 The consultant shall prepare a project schedule consistent with the numbering and tasks defined in this scope of work.

8.2 The CONSULTANT shall prepare and maintain a significant event calendar that shows, at a minimum, general timeframes for participant, agency and public meetings, and submittal milestones.

8.3 The CONSULTANT will submit a projection of monthly project billings within 14 days of Notice to Proceed. The projected billing will be consistent with the tasking of the scope of work, the project schedule and the fee proposal.

PHASE II

TASK 9 - HIS DATA

9.1 The consultant will deliver the digital data that they develop in accordance with Sections 4 and 11.5.16 of the Consultant Guideline. The themes will only be those that are necessary to generate the data requested in this scope. (NDXPRJ, PRJ, CORNERS, CTRL, DQ, PRJ, REL, FPBLN, FPCTLFCD, FPSRFFCD, PFXFCD, PFZNFCD, FPZNHZ, CNL, STRTCLN, ELV, BRIDGE, CULVERT)

TASK 10 – DELIVERABLES

10.1 The consultant will furnish the deliverables according to Section 12.0 of the Consultant Guideline. The consultant only needs to make copies of the data that they develop. The District will make the copies of Hydrology Report.

10.2 The Consultant shall fill out the forms required by FEMA for the submittal of a Floodplain Delineation Study.

10.3 The deliverables will include the HIS data.

APPENDIX C.1

SURVEY FIELD NOTES FOR AERIAL MAPPING CONTROL

(NOT APPLICABLE)

APPENDIX C.2

SURVEY FIELD NOTES FOR HYDROLOGIC MODELING

(NOT APPLICABLE)

APPENDIX C.3

SURVEY FIELD NOTES FOR HYDRAULIC MODELING

MORRISON MAIERLE, INC.
An Arizona Corporation

ENGINEERS
SCIENTISTS
SURVEYORS
PLANNERS

120 N 44th STREET, STE 410 • PHOENIX, AZ 85034-1822 • 602-244-9662 • FAX: 602-244-9472

May 3, 1999

Mr. John Rose, P.L.S.
Transportation Survey Chief
McDot
2901 West Durango Street
Phoenix, AZ 85009

RE: CY # 1997 - 47E # 68914
Channel Survey
MMI No. 8222.001.05

Dear Mr. Rose:

Please find attached with this letter, Morrison-Maierle, Inc's. survey results performed on the above project.

Survey control was tied to existing horizontal and vertical state plane coordination system provided by McDot. Section lines were established from the west to east, utilizing the existing channel for center of section, then extended left or right of channel approximately 100 feet +/-. Photos were taken at each section line, along with as-builting all structures at the location represented in the plans submitted by the designer.

Should you have any questions or comments regarding this issue, please contact us.

Sincerely,

MORRISON-MAIERLE, INC.

James G. Spring
Vice President
Survey Operations

JGS/lml

Attachment

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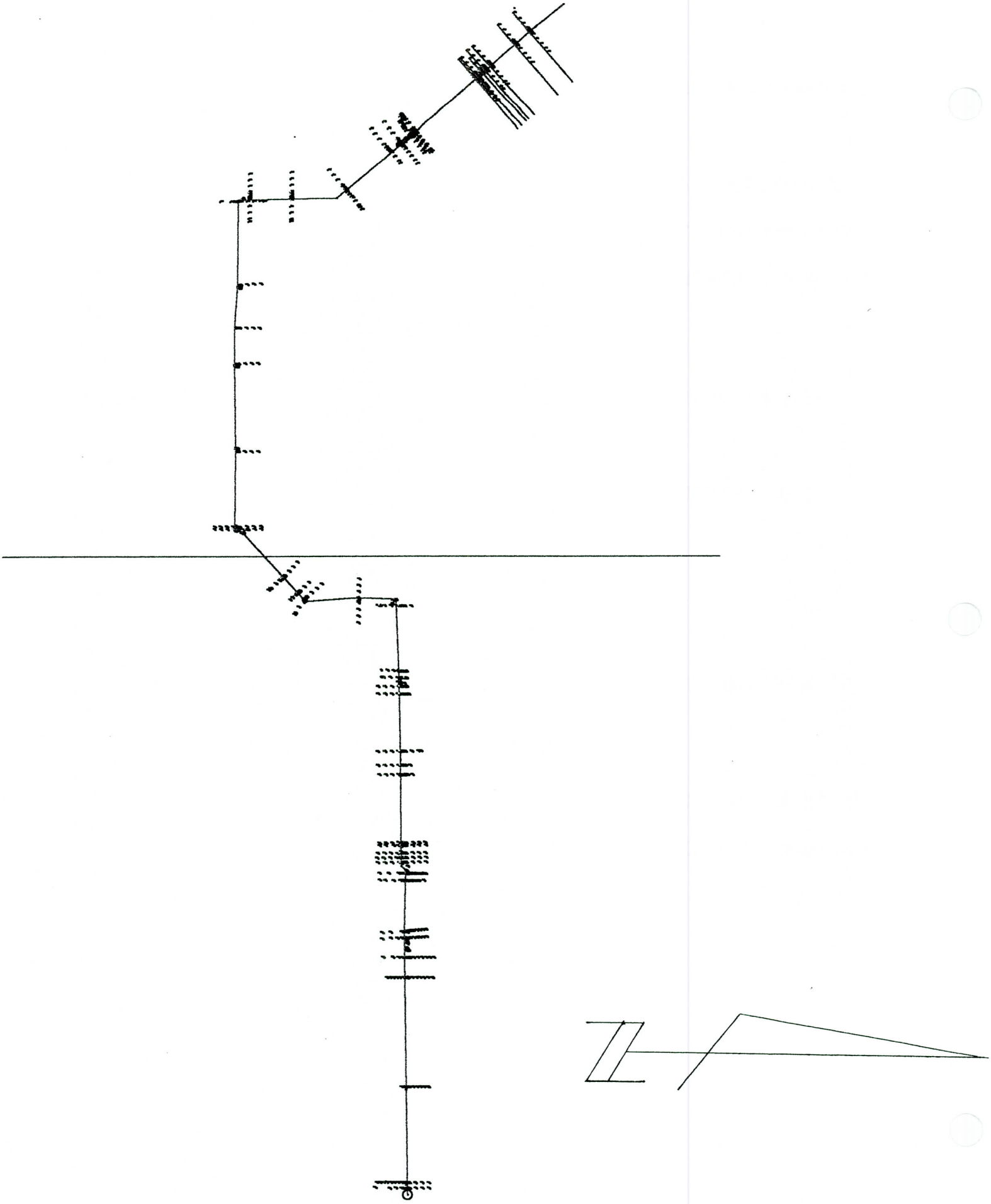


SECTION 1

S.W – N.E

SECTION 1

N.E – S.W.

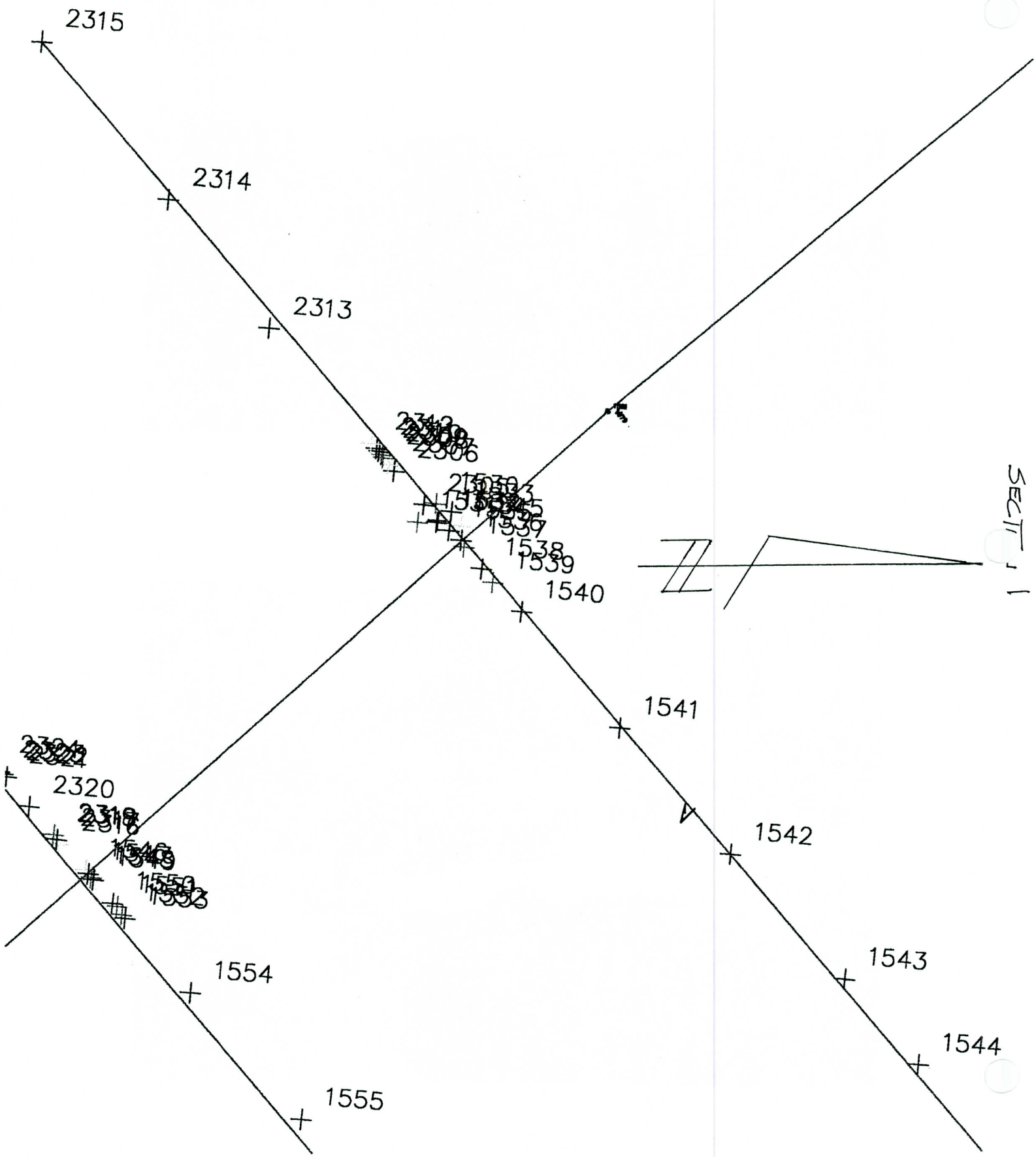
SECTION 1

S.W — N.E.

SECTION 1
WEST – EAST

40" PIPE

SECTION 1
EAST – WEST


2315
2314
2313
2320
1540
1541
1542
1543
1544
1554
1555
SECTION 1

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
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2313	866849.3452	604672.9524	978.83	EG
2312	866910.9353	604742.5296	979.66	TOE
2311	866914.1086	604745.6770	980.51	CONC TOPDITCH
2310	866915.7612	604747.4775	978.55	CL 16"CONC.DITC
2309	866917.4238	604749.5060	980.27	TOP CONOC.DITCH
2308	866918.2600	604751.2702	981.24	TOP
2307	866921.5573	604755.5246	980.26	TOE
2306	866924.7027	604759.4317	980.17	EG
2305	866942.8298	604779.7074	980.87	EG
1531	866939.0398	604790.2690	980.84	TOP
1530	866950.3358	604779.0308	980.70	TOP
1534	866950.6758	604790.3952	978.01	EOW
1532	866951.4993	604789.1953	978.54	CONC.DIKE TOP
1533	866959.5860	604783.8904	975.32	EOW
1535	866958.1531	604795.3279	978.70	TP 48"PIPE
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1536	866965.4443	604801.2057	978.75	CONC TOP
1537	866967.1046	604805.4396	980.36	TOP-EOR
1538	866977.7252	604818.6280	979.92	EOR
1539	866984.4155	604826.8801	979.70	FENCE LINE
1540	867001.9722	604844.5527	979.29	EG
1541	867061.3582	604914.8012	978.59	EG
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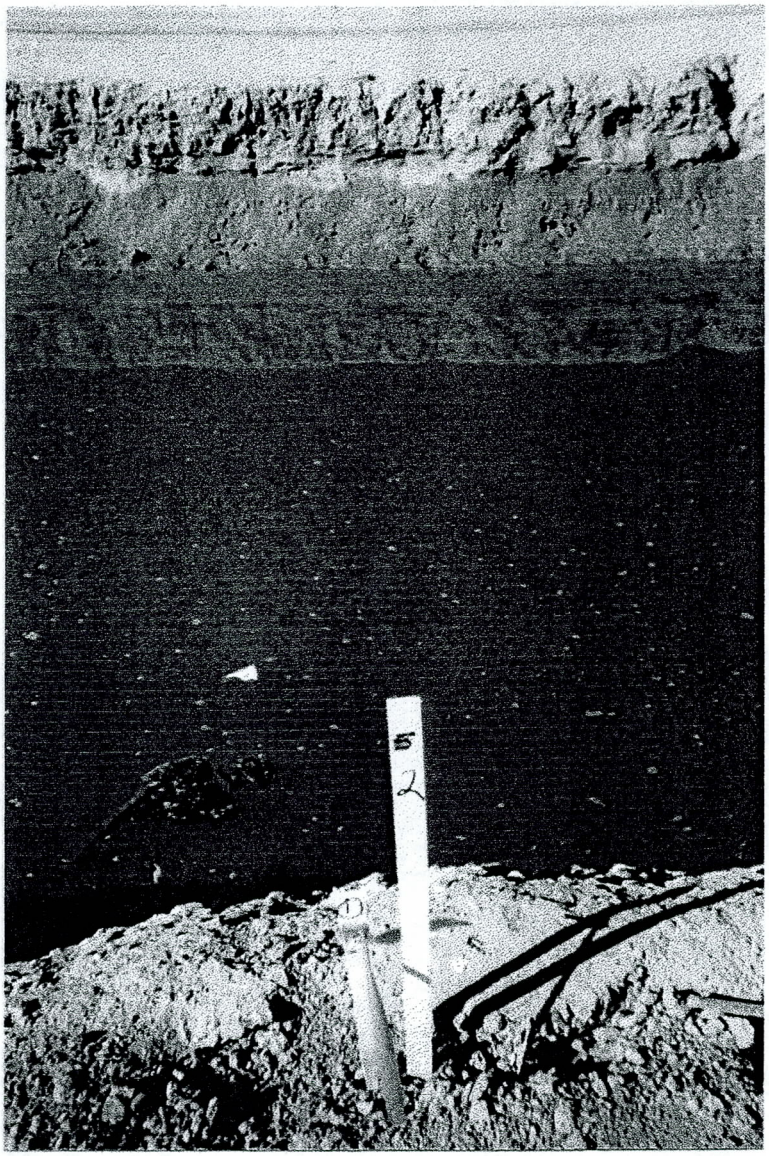
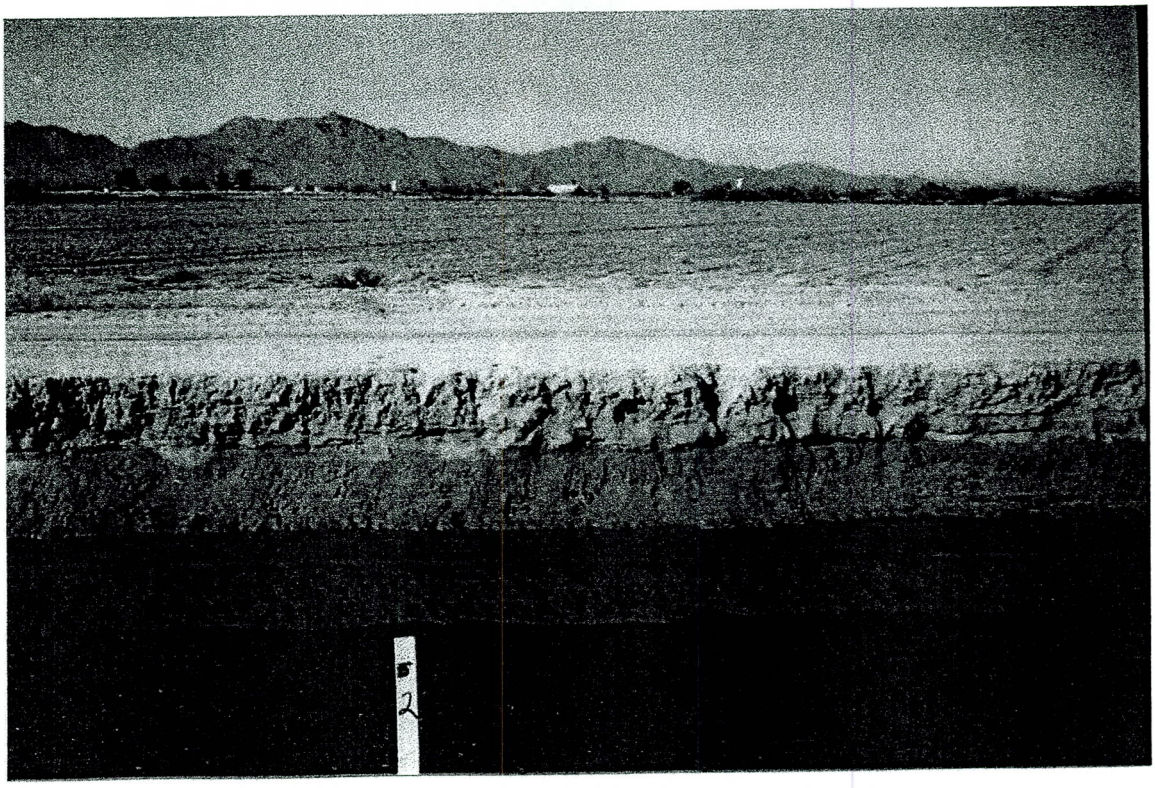


SECTION 2

H.E – S.W

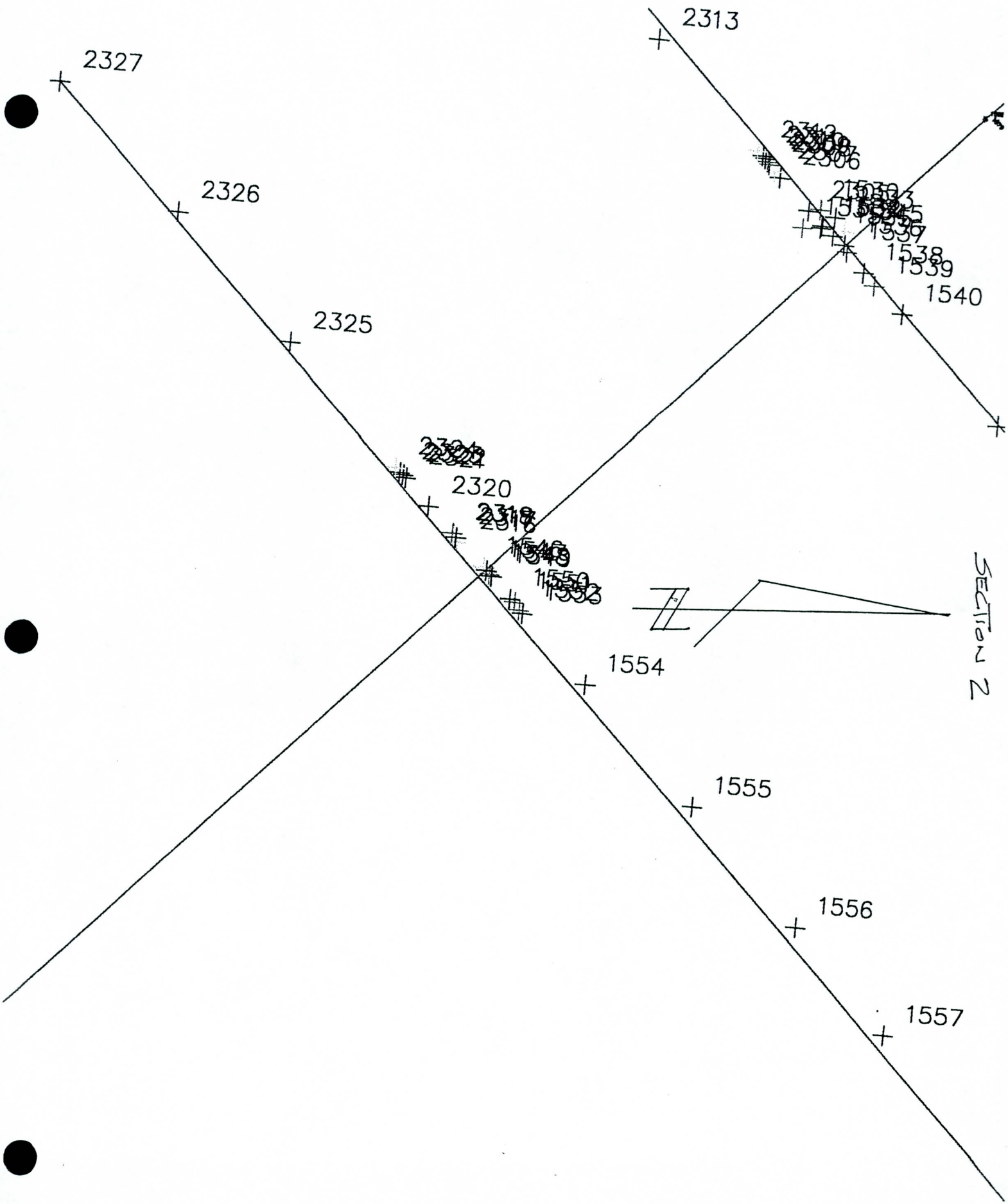
SECTION 2

S.W - N.E



SECTION 2

N.E - S.W.


2313
2327
2326
2325
2320
1540
1554
1555
1556
1557
SECTION 2

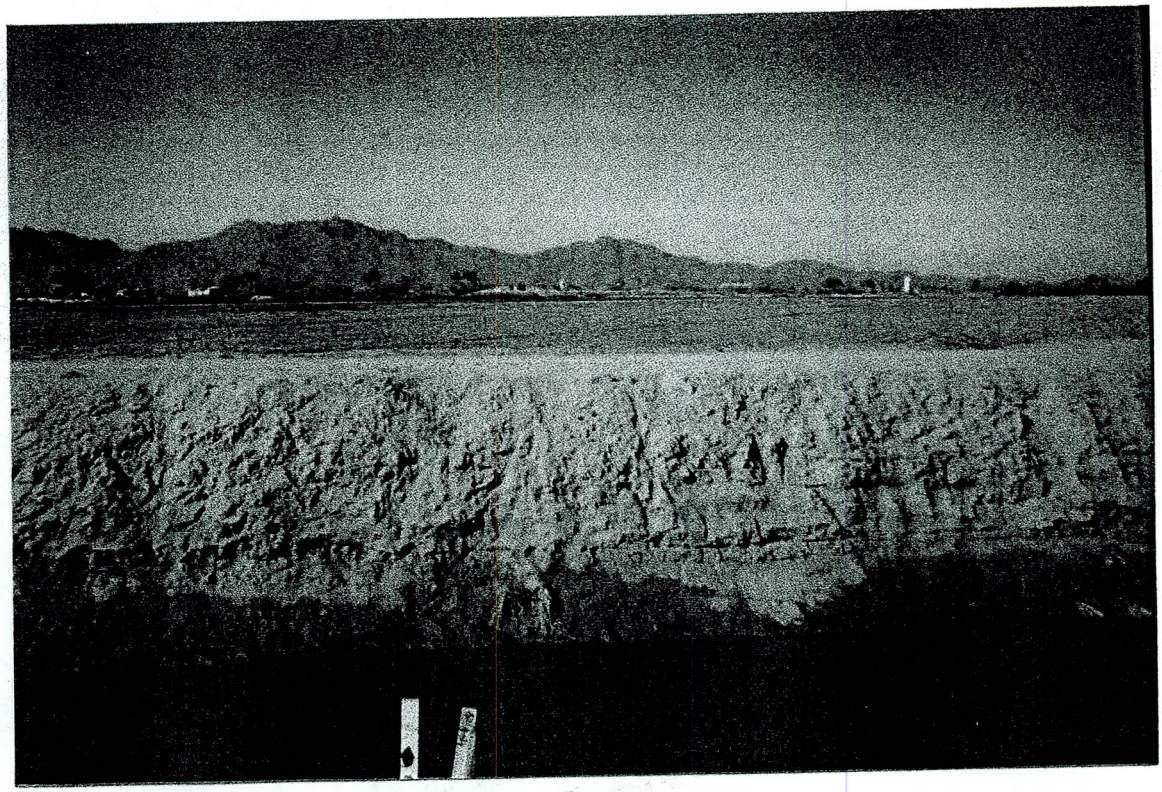
SECTION 3A

S.W - N.E

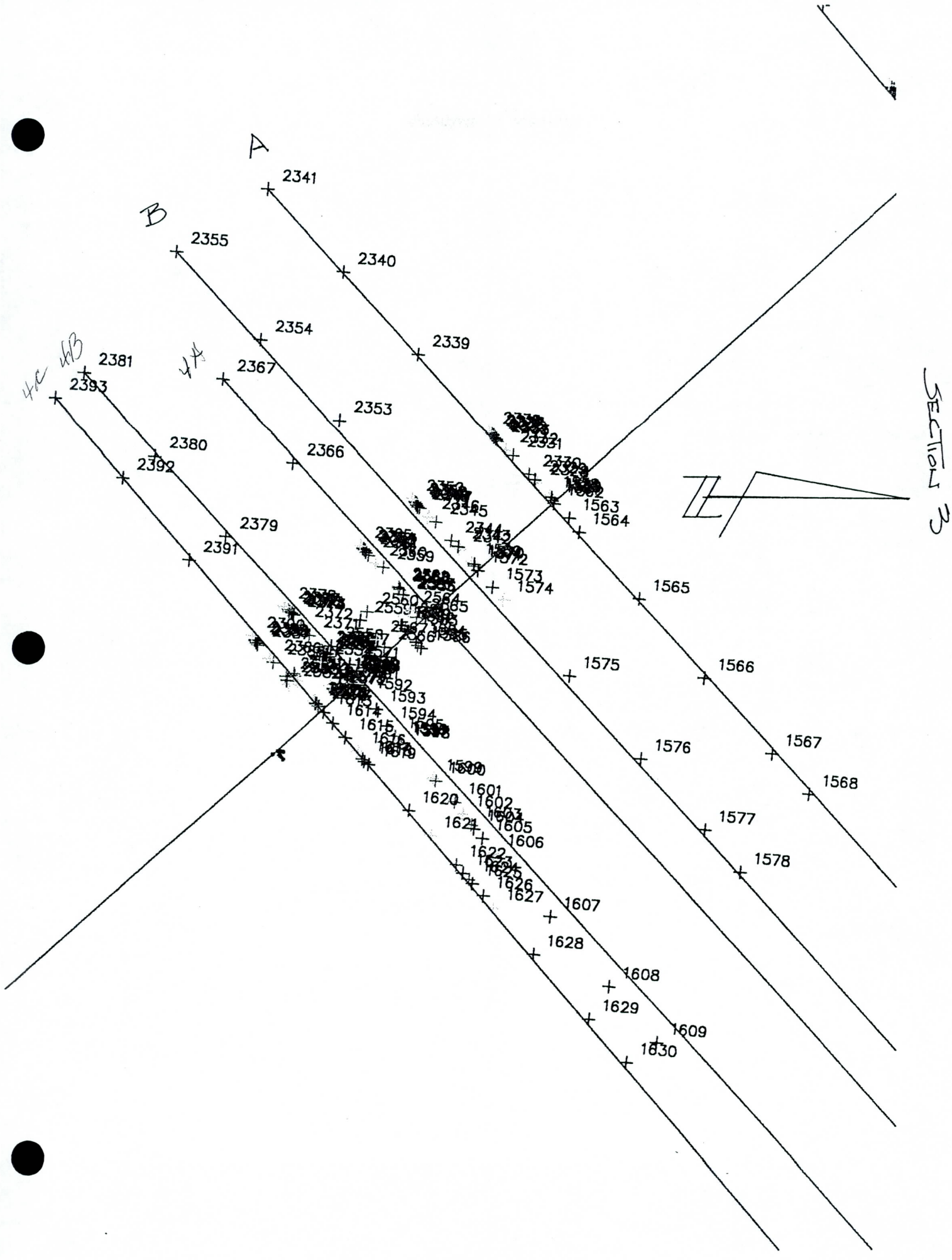
SECTION 3A

N.E — S.W

SECTION 3B
S.W → N.E



SECTION 3B
N.E - S.W.


A
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4A
4B
4C
2341
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SECTION 2

2#

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2327	866474.2180	604696.2115	978.52	EG
2326	866547.9207	604777.5745	978.76	EG
2325	866617.9335	604859.1431	978.79	EG
2324	866684.0780	604937.1650	979.62	TOE
2323	866686.4493	604940.1466	980.46	CONC TOPDITCH
2322	866688.5954	604941.6280	978.41	CL 16"BOTTOM
2321	866690.5473	604943.4751	980.39	CONC TOPDITCH
2320	866704.6526	604961.4759	981.41	EOR
2319	866719.5035	604978.2807	981.51	TOP BANK
2318	866719.9903	604978.7874	978.57	TOE
2317	866721.5851	604981.1100	976.67	EOW
2316	866722.3552	604984.0574	974.53	TOE BOTTOM
1546	866738.9161	604999.6057	975.95	TOE
1547	866740.5442	605001.8310	977.74	EOW
1548	866742.4065	605004.0878	983.22	TOP
1549	866743.6943	605005.3998	983.25	EOR
1550	866755.2339	605019.6538	982.51	EOR
1551	866758.1500	605021.6154	982.73	TOP
1552	866760.9170	605026.5214	980.00	FENCE LINE
1553	866763.0119	605028.6911	979.13	EG
1554	866802.0502	605073.4897	978.45	EG
1555	866869.0147	605150.4748	978.41	EG
1556	866933.9176	605226.1040	978.50	EG
1557	866989.6628	605293.8770	978.67	EG

~500' ~500'

707'

SECTION 3A

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2341	866062.3758	605037.2902	978.82	EG
2340	866137.7113	605119.1544	978.93	EG
2339	866212.5965	605201.5450	979.06	EG
2338	866283.2428	605277.8633	979.63	TOE
2337	866286.1283	605280.2396	981.43	TOP BANK
2336	866287.4682	605281.5479	980.50	CONC TOPDITCH
2335	866288.8393	605283.9839	978.46	CL DITCH
2334	866290.6860	605285.5205	980.39	CONC TOPDITCH
2333	866291.9384	605287.2788	981.16	TOP BANK
2332	866300.5215	605296.7839	981.61	TOE
2331	866307.6184	605301.7848	984.50	TOP BANK
2330	866323.3723	605320.3263	984.91	TOP BANK
2329	866329.2874	605325.7605	976.81	EOW
2328	866331.0654	605328.6946	974.96	TOE BOTTOM
1558	866343.5550	605341.5606	975.74	TOE
1560	866345.7708	605344.3459	978.72	TOE
1559	866345.4315	605343.5443	977.68	EOW
1561	866346.3519	605346.6475	982.78	TOP
1562	866348.3657	605349.5726	983.06	EOR
1563	866363.4027	605364.1502	982.45	EOR
1564	866373.4510	605378.1822	980.33	EG
1565	866433.2351	605445.2340	980.18	EG
1566	866497.6703	605524.4029	980.35	EG
1567	866565.0920	605599.9417	980.42	EG
1568	866602.3207	605640.7761	980.61	EG

SECTION 3B

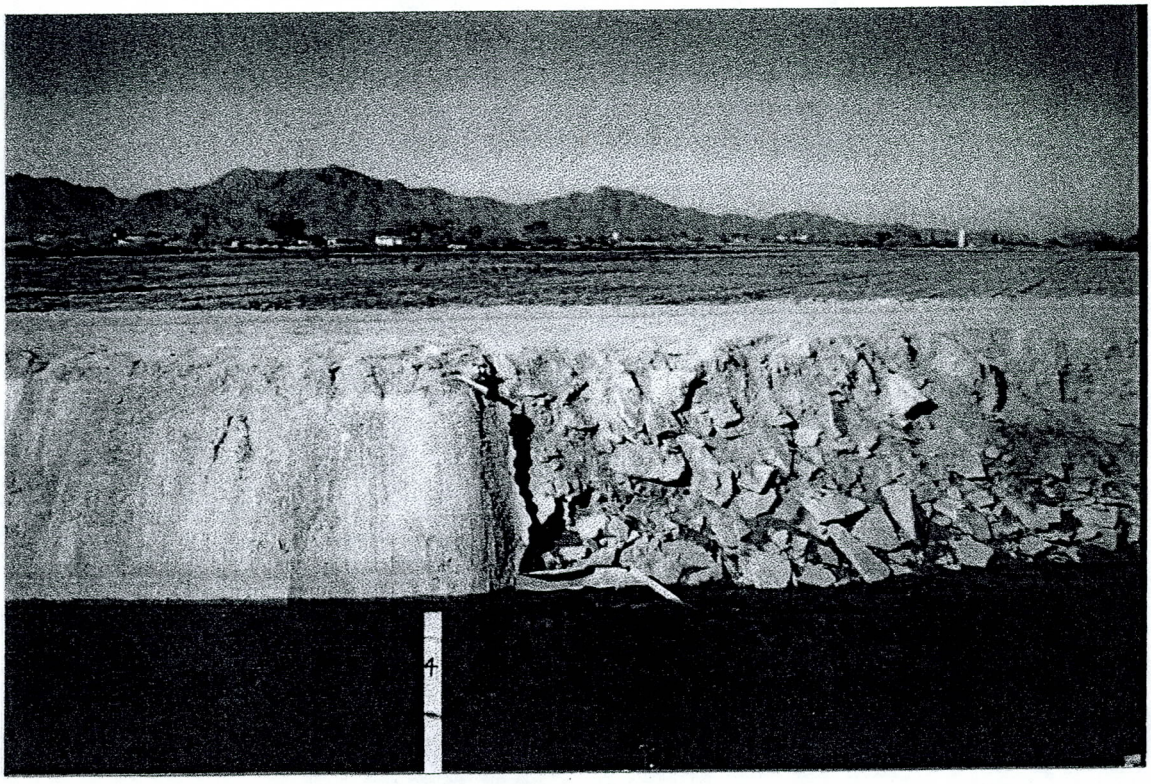
Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2355	865971.2153	605098.2882	978.59	EG
2354	866055.0891	605186.3828	978.82	EG
2353	866133.7463	605266.2345	979.00	EG
2350	866209.8340	605348.2508	980.47	CONC TOPDITCH
2349	866210.8423	605350.3627	978.69	CL DITCH
2348	866212.1009	605352.4138	980.40	CONC TOPDITCH
2352	866206.3829	605344.0842	979.39	TOE
2351	866209.0372	605347.1653	980.95	TOP BANK
2347	866214.2266	605353.0930	981.07	TOP BANK
2346	866222.1897	605362.1929	981.33	TOE
2345	866230.1692	605367.2128	984.49	TOP BANK
2344	866245.5305	605385.8832	985.20	TOP BANK
2343	866252.6966	605391.8290	976.71	EOW
2342	866253.5504	605394.6539	974.67	TOE BOTTOM
1569	866265.8575	605407.6039	976.00	TOE
1570	866268.4106	605409.5584	977.63	EOW
1571	866268.5858	605411.5375	982.76	TOP
1572	866272.2681	605415.9536	982.85	EOR
1573	866286.8661	605432.6473	982.59	EOR
1574	866297.6941	605445.1312	980.45	TOE
1575	866363.9196	605521.4236	979.98	EG
1576	866434.8659	605604.1665	980.37	EG
1577	866498.3673	605675.7031	980.44	EG
1578	866533.4746	605717.9074	980.60	EG

~560' 700'

SECTION 4A WEIR

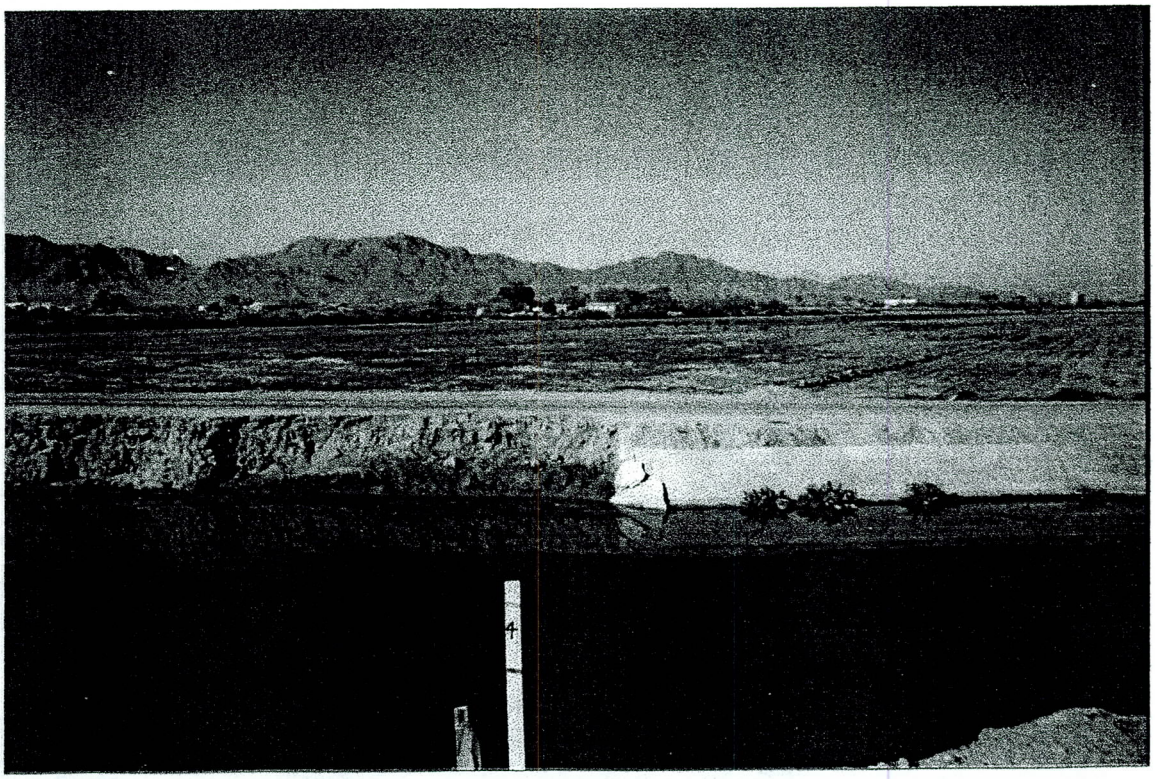
S.W. — N.E.



SECTION 4A WEIR

SECTION 4B WEIR

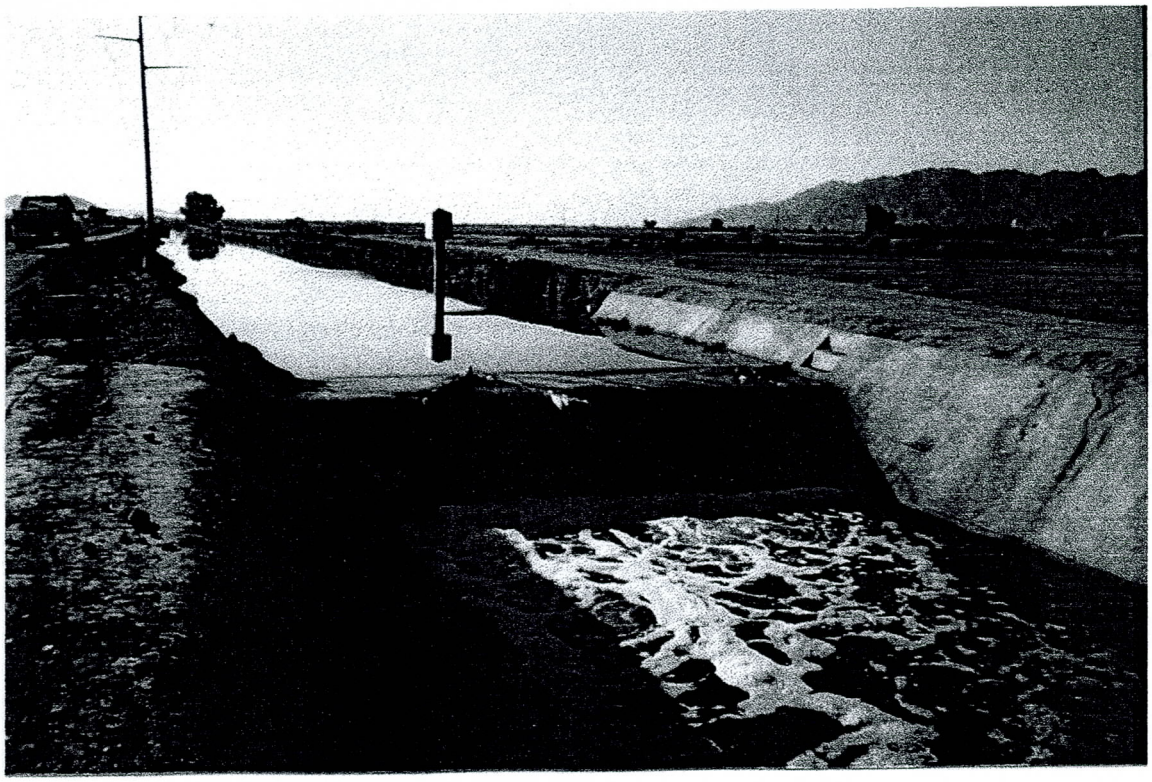
S.W.— N.E



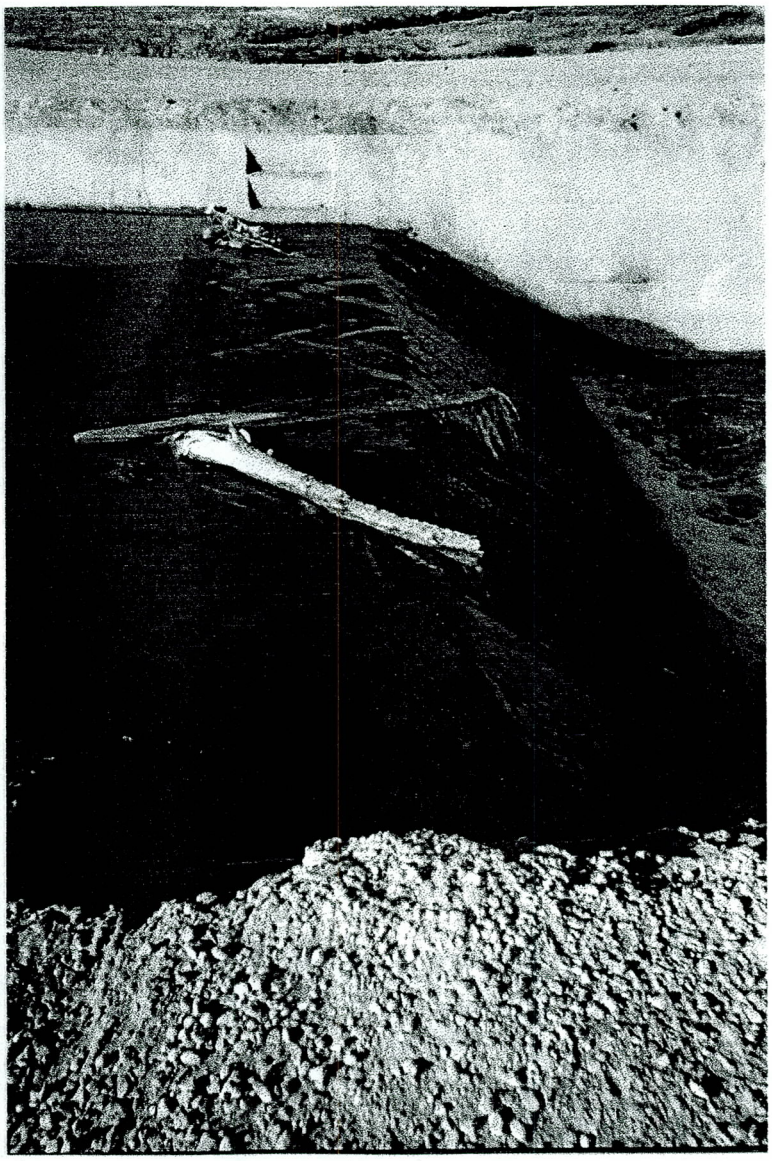
SECTION 4B

N.E — S.W

SECTION 4 WEIR
EAST - WEST

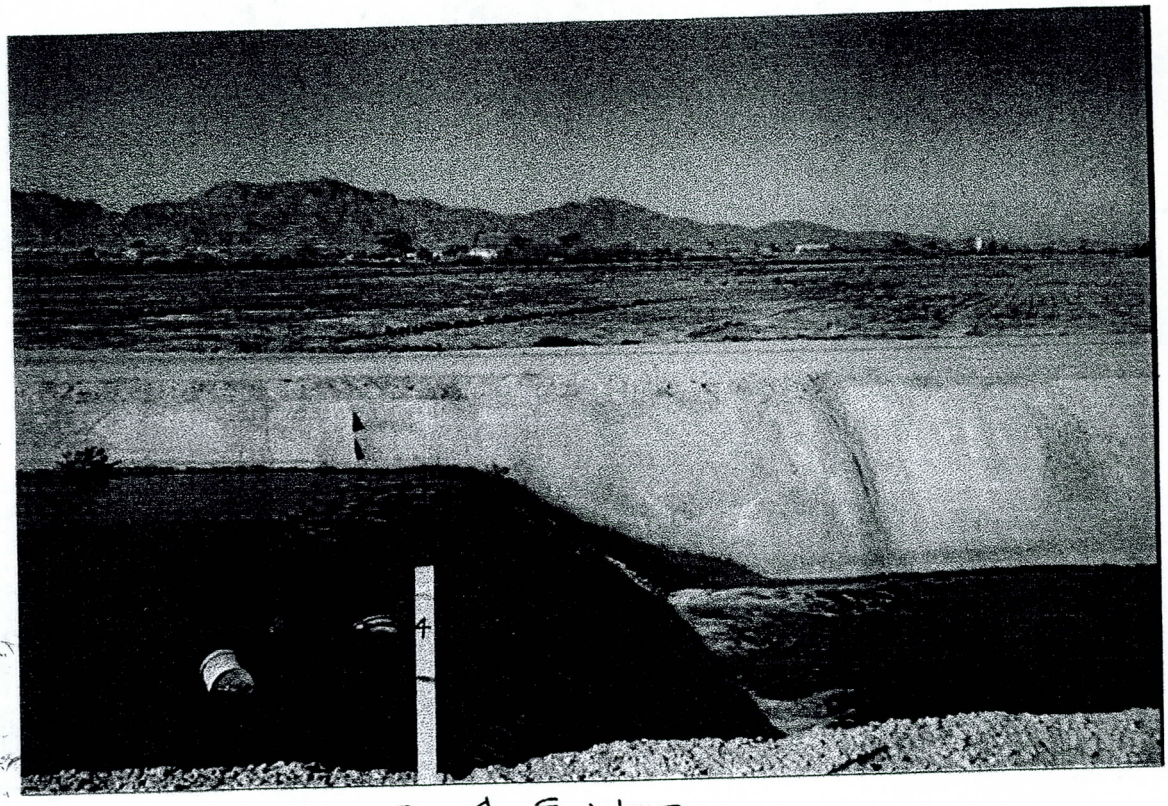


SECTION 4 WEIR
WEST - EAST



SECTION 4 WEIR.

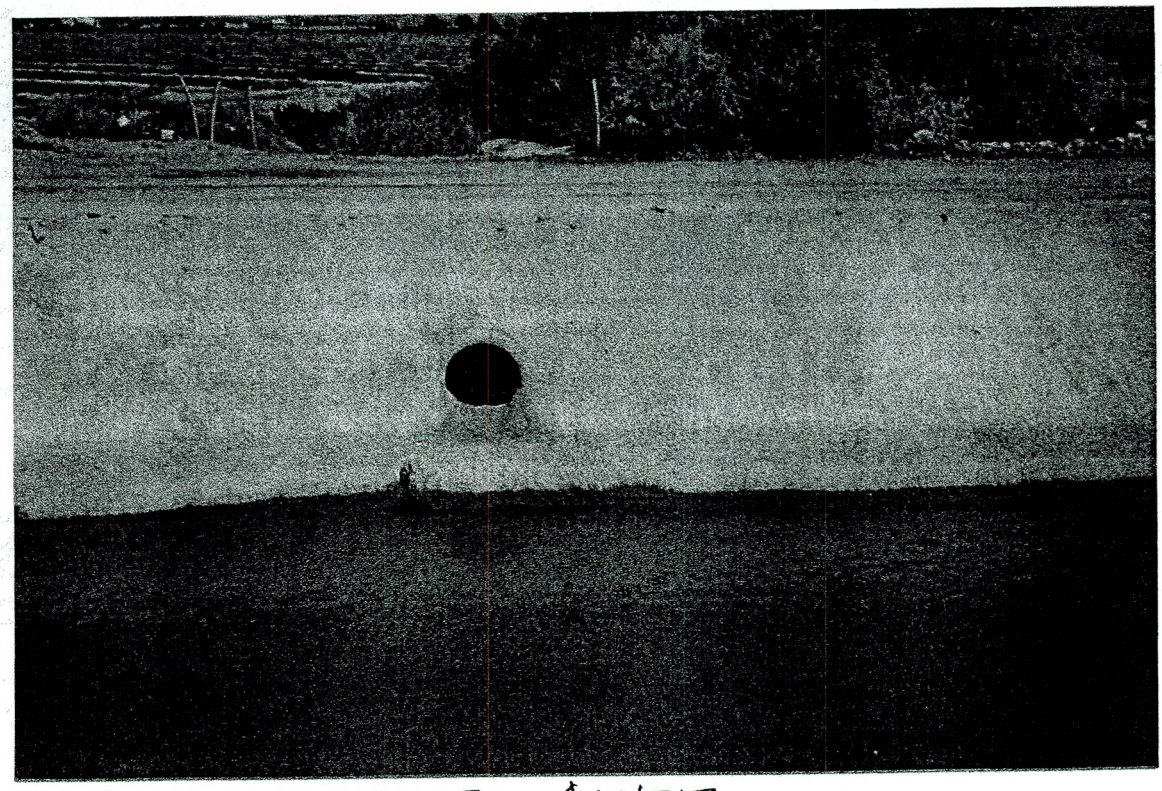
N.E. - S.W.



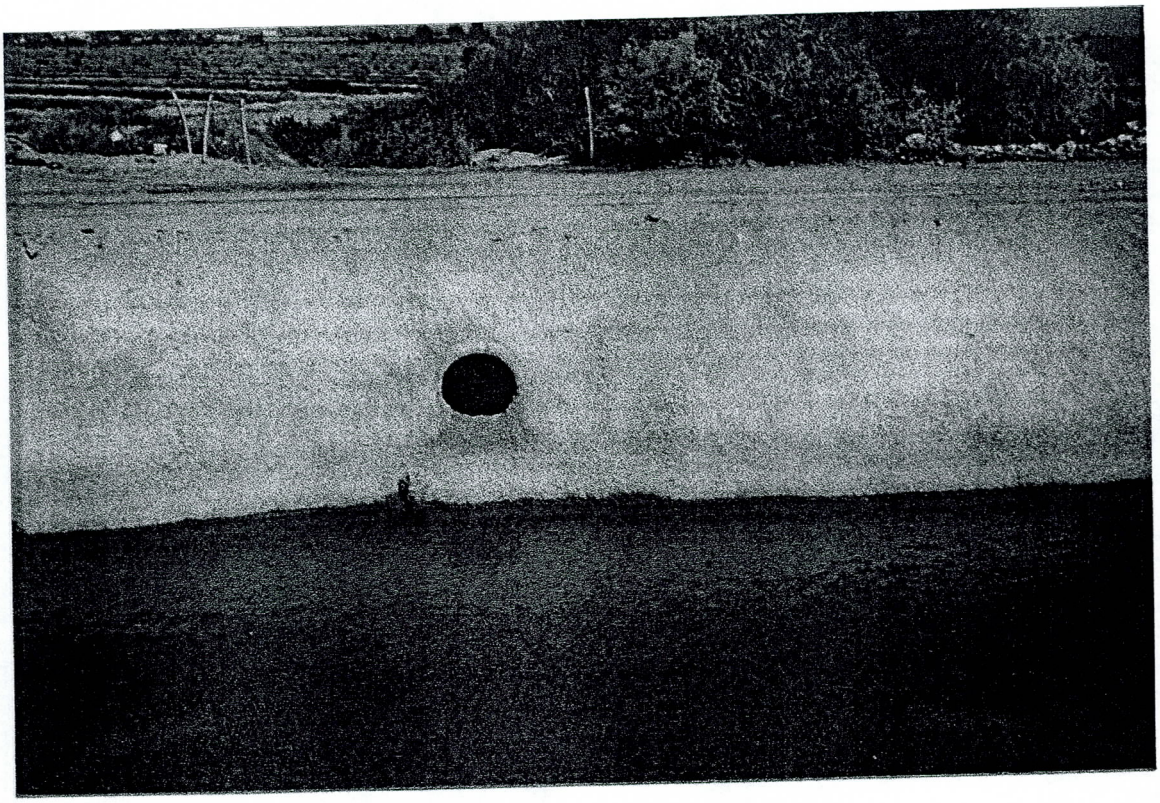
SECTION 4 E. WEIR

N.E. – S.W.

SECTION 4 WEIR
N.E - S.W
30" CONC.

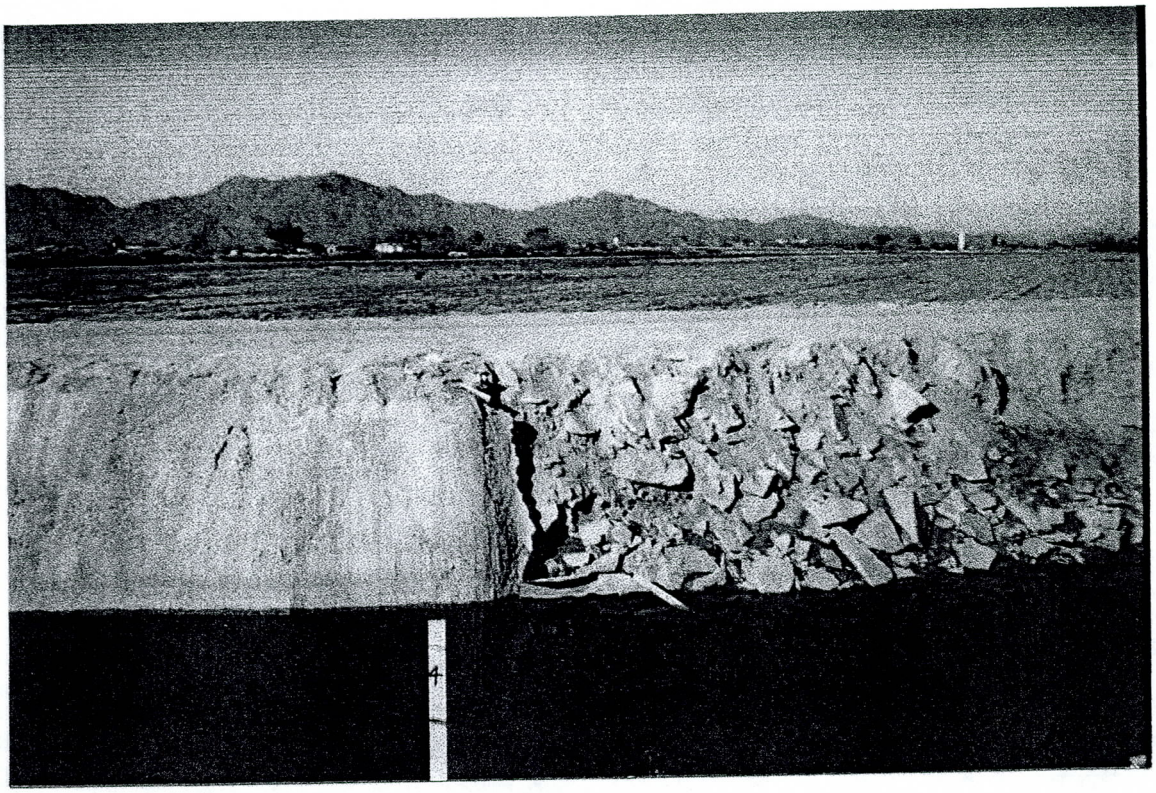


SECTION 4 WEIR
S.W - N.E
30" CONC.



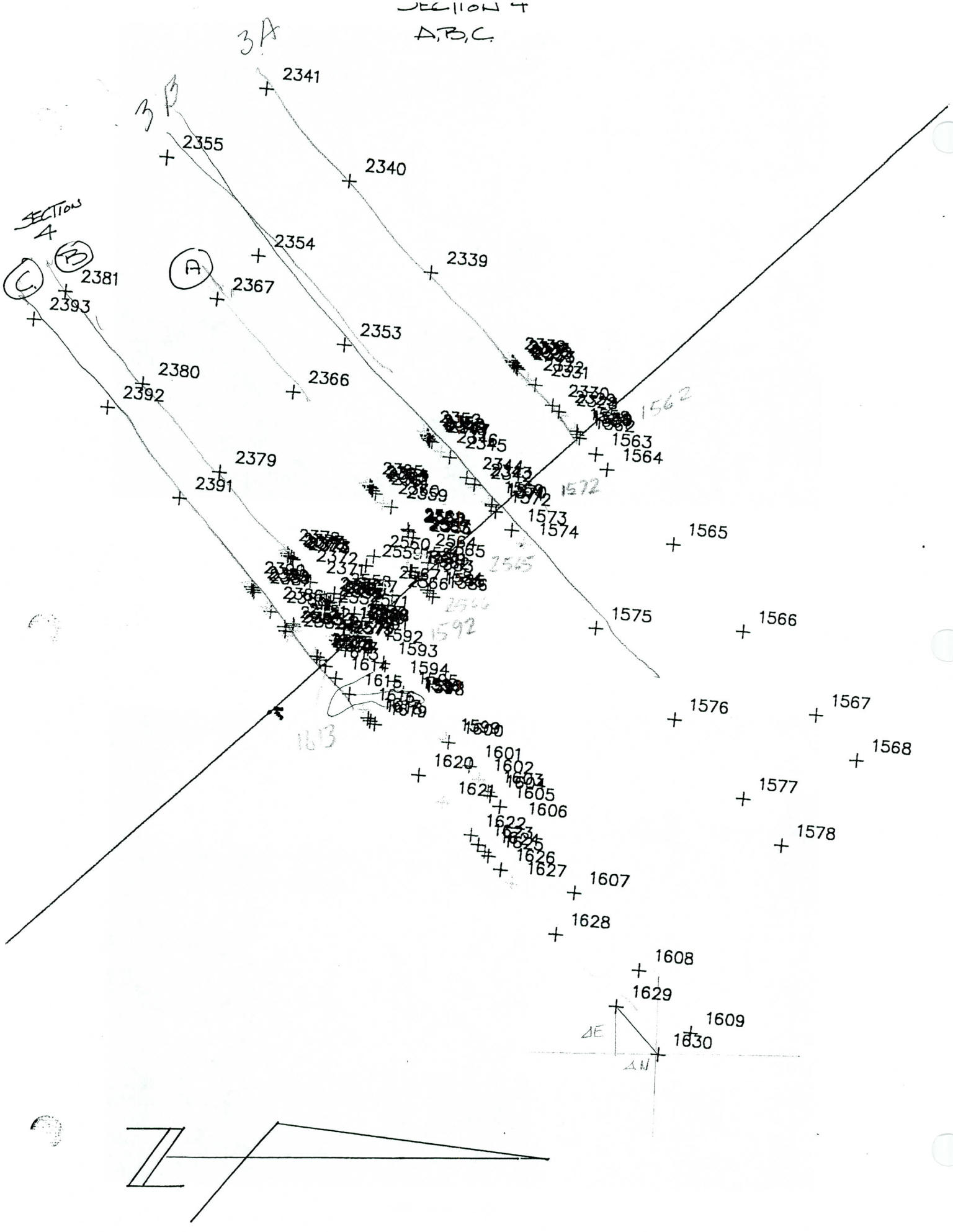
SECTION 4A WEIR

S.W. — N.E.



SECTION 4A WEIR

N.E. - S.W.


SECTION 4
A,B,C.
3A
3B
SECTION 4
A
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2341
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ΔN

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2393	865849.6068	605242.7855	978.52	EG
2392	865917.5123	605322.1751	978.66	EG
2391	865983.4241	605404.2065	978.69	EG
2390	866046.6794	605479.8534	979.52	TOE
2389	866049.5876	605484.2849	980.74	CONC TOPDITCH
2388	866050.9943	605486.5870	978.77	CL DITCH
2387	866052.2181	605488.8335	980.73	TOP.CONC.DITCH
2386	866063.7060	605502.8136	980.70	TOE
2385	866067.1929	605506.4941	984.22	TOP BANK
2384	866079.5829	605520.4973	984.65	TOP BANK
2383	866080.7881	605524.3489	980.98	EOW
2382	866083.0791	605528.0350	979.19	TOE BOTTOM
2551	866087.3594	605517.5730	984.39	TOP BANK
2552	866088.1750	605519.5728	983.50	TOP-END CONC.
2553	866091.2373	605524.4481	978.48	TOE
1610	866107.2609	605544.9245	977.95	TOE CONC.
2575	866108.0424	605545.1414	978.19	TOE-END CONC.
2576	866109.5168	605547.3302	982.73	CONC TOP
1611	866110.0700	605547.5843	982.90	CONC TOP
2577	866112.1646	605550.2541	984.98	TOP BANK
1612	866112.6319	605550.0241	984.81	TOP BANK
1614	866126.7410	605567.1041	984.42	EOR
1615	866139.1516	605581.4466	983.72	GB
1616	866151.6261	605595.0659	980.27	TOE
1617	866156.0773	605603.1292	979.90	EDGE DITCH
1618	866158.1208	605605.5205	979.37	FLOW LINE
1619	866162.2069	605608.2697	979.72	EDGE DITCH
1620	866202.8537	605654.5079	980.58	EG
1621	866224.9055	605679.5839	980.69	TOE
1622	866250.6597	605708.9564	981.86	TOP
1623	866257.1066	605717.4575	978.12	CL V-DITCH
1624	866263.2435	605723.6969	981.98	TOP
1625	866266.7138	605727.8172	982.20	EOR
1626	866277.7323	605739.8363	981.68	EOR
1627	866287.7885	605751.8750	980.29	TOE
1628	866327.9896	605797.9622	979.97	EG
1629	866383.4809	605862.6199	980.17	EG
1630	866420.7552	605906.0306	980.17	EG

18'

44'

4 C

WHY ARE THESE NOT DISPLAYED?

FROM DWG N-145N16

1089

~700' ~700

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2381	865878.7654	605218.1059	978.49	EG
2392	865917.5123	605322.1751	978.66	EG
2379	866020.2176	605380.7328	978.92	EG
2378	866078.1631	605450.7566	979.19	TOE
2377	866081.7815	605454.0896	981.27	TOP BANK
2376	866083.1657	605455.9844	980.43	CONC TOPDITCH
2375	866085.4281	605457.0935	978.75	CL DITCH
2374	866087.1690	605458.6775	980.48	CONC TOPDITCH
2373	866087.5888	605459.0772	980.74	TOP BANK
2372	866094.6147	605469.1454	980.84	TOP BANK
2371	866103.4337	605479.6496	983.34	TOP BANK
2370	866115.7686	605494.3051	984.05	TOP BANK
2554	866114.6701	605506.1013	978.07	TOE
2568	866142.0493	605520.7092	984.25	TOP BANK
1590	866139.6863	605523.5115	984.23	TOP
2573	866127.0847	605532.8882	983.16	CONC TOP
2569	866141.4275	605520.0982	983.11	CONC TOP
1595	866188.2275	605580.3165	980.32	TOP
1596	866191.8267	605584.7176	979.19	TOE
1597	866193.2792	605586.2996	979.26	TOE
1616	866151.6261	605595.0659	980.27	TOE
1599	866227.0546	605622.7071	980.65	TOE
1600	866229.9061	605625.2035	981.60	TOP
1601	866249.1868	605646.4018	982.03	TOP DITCH
1602	866257.4150	605658.5348	977.97	TOE V-DITCH
1603	866266.0116	605669.4049	981.62	TOP
1604	866268.3446	605673.4013	981.91	EOR
1605	866276.8763	605682.9864	981.82	EOR
1606	866288.7643	605698.0703	980.13	TOE RD.
1607	866344.8577	605760.6527	980.13	EG
1608	866403.5864	605830.2752	980.33	EG
1609	866450.6998	605886.6085	980.32	EG

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2367	866017.5881	605225.0749	978.89	EG
2366	866086.8455	605308.2121	978.92	EG
2365	866154.0625	605390.6437	979.67	TOE
2364	866156.9234	605393.3939	980.54	CONC TOPDITCH
2363	866158.4683	605394.8992	978.72	CL DITCH
2362	866159.7444	605397.2417	980.42	CONC TOPDITCH
2361	866162.2126	605400.1795	981.31	TOP BANK
2360	866168.9980	605408.4285	981.38	TOE
2359	866176.7363	605412.2298	984.14	TOP BANK
2358	866191.9370	605432.9045	983.61	TOP BANK
2561	866191.9726	605432.0154	983.67	TOP BANK
2563	866197.1499	605441.4165	974.02	TOE-END CONC.
2562	866193.1549	605434.2753	982.71	TOP-END CONC.
2357	866197.0599	605439.6151	976.85	EOW
2356	866198.7687	605442.0967	974.02	TOE BOTTOM
2560	866160.8027	605456.3531	983.86	TOP BANK
2564	866203.0384	605454.9258	974.01	TOE-END CONC.
2565	866210.7694	605462.3969	983.02	TOP-END CONC.

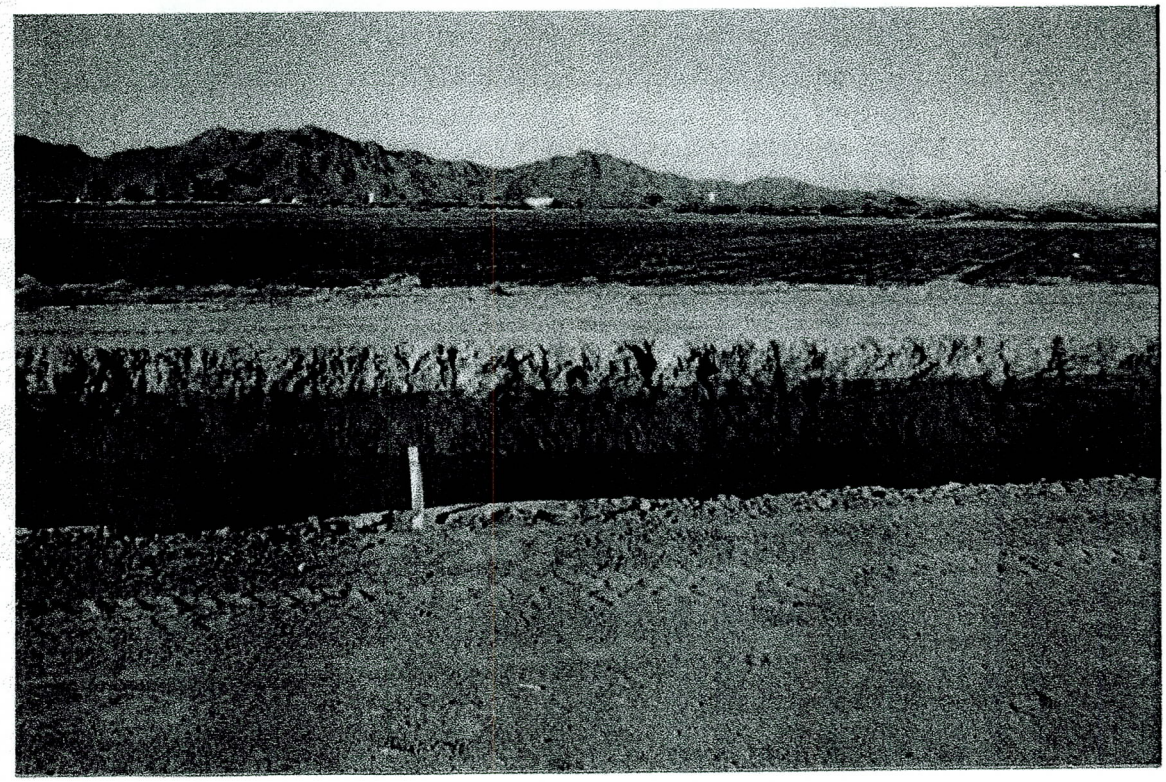
3B

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2355	865971.2153	605098.2882	978.59	EG
2354	866055.0891	605186.3828	978.82	EG
2353	866133.7463	605266.2345	979.00	EG
2352	866206.3829	605344.0842	979.39	TOE
2351	866209.0372	605347.1653	980.95	TOP BANK
2350	866209.8340	605348.2508	980.47	CONC TOPDITCH
2349	866210.8423	605350.3627	978.69	CL DITCH
2348	866212.1009	605352.4138	980.40	CONC TOPDITCH
2347	866214.2266	605353.0930	981.07	TOP BANK
2346	866222.1897	605362.1929	981.33	TOE
2345	866230.1692	605367.2128	984.49	TOP BANK
2344	866245.5305	605385.8832	985.20	TOP BANK
2343	866252.6966	605391.8290	976.71	EOW
2342	866253.5504	605394.6539	974.67	TOE BOTTOM
1569	866265.8575	605407.6039	976.00	TOE
1570	866268.4106	605409.5584	977.63	EOW
1571	866268.5858	605411.5375	982.76	TOP
1572	866272.2681	605415.9536	982.85	EOR
1573	866286.8661	605432.6473	982.59	EOR
1574	866297.6941	605445.1312	980.45	TOE
1575	866363.9196	605521.4236	979.98	EG
1576	866434.8659	605604.1665	980.37	EG
1577	866498.3673	605675.7031	980.44	EG
1578	866533.4746	605717.9074	980.60	EG

SECTION 5
NO-50.

SECTION 5
50 — NO.

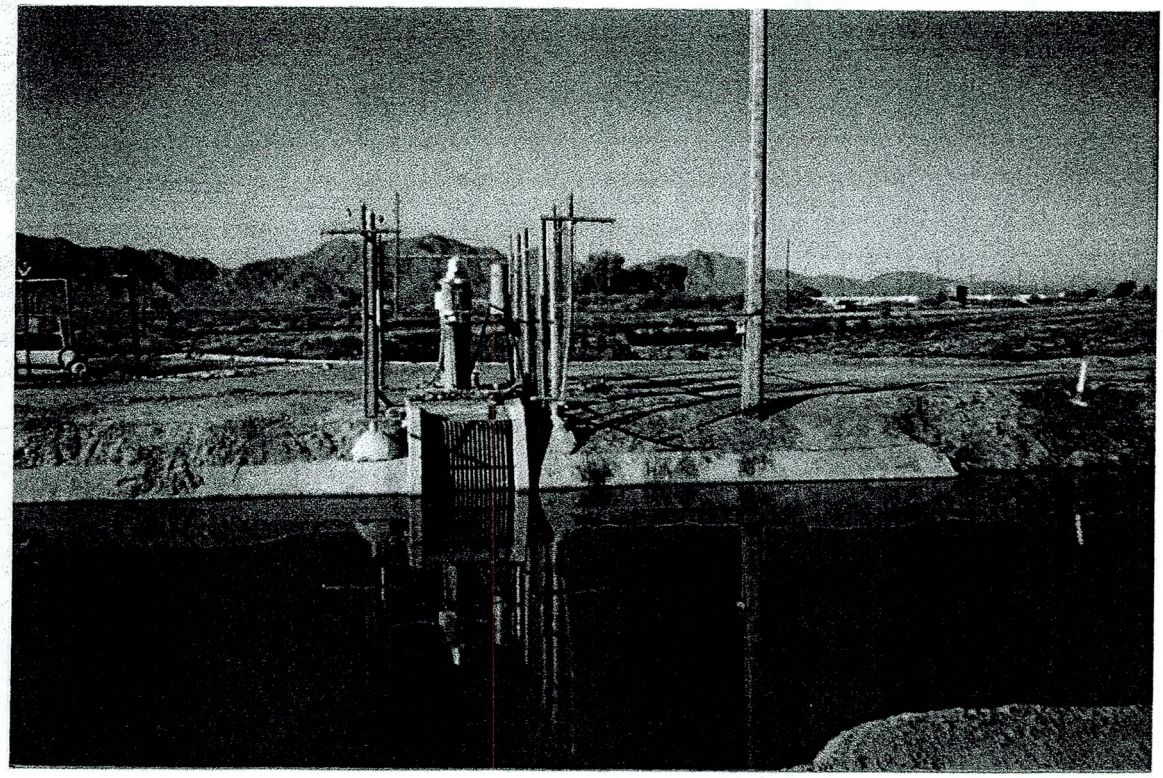


SECTION 5
NO — 50.

SECTION 5A
So—No

SECTION 5A
No—So.

SECTION 5C
SO — NO



SECTION 5C
NO — SO.

SECTION 5B

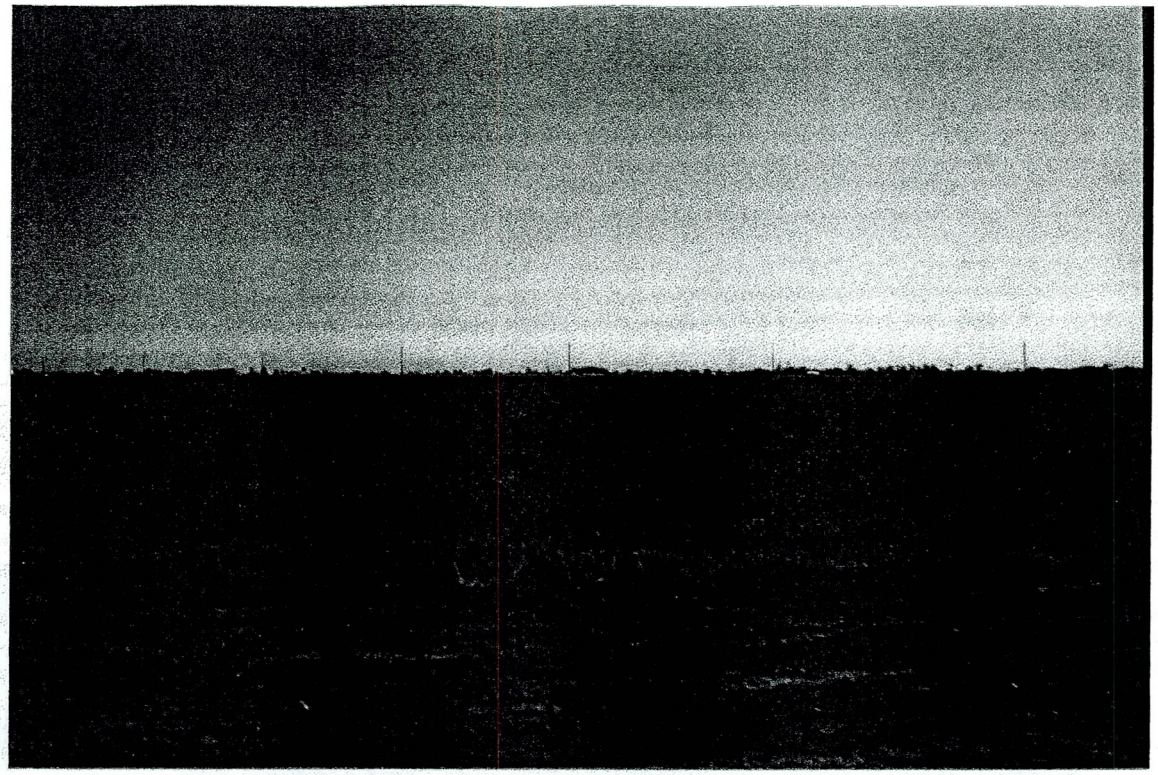
So — No.

SECTION 5B

No — So.

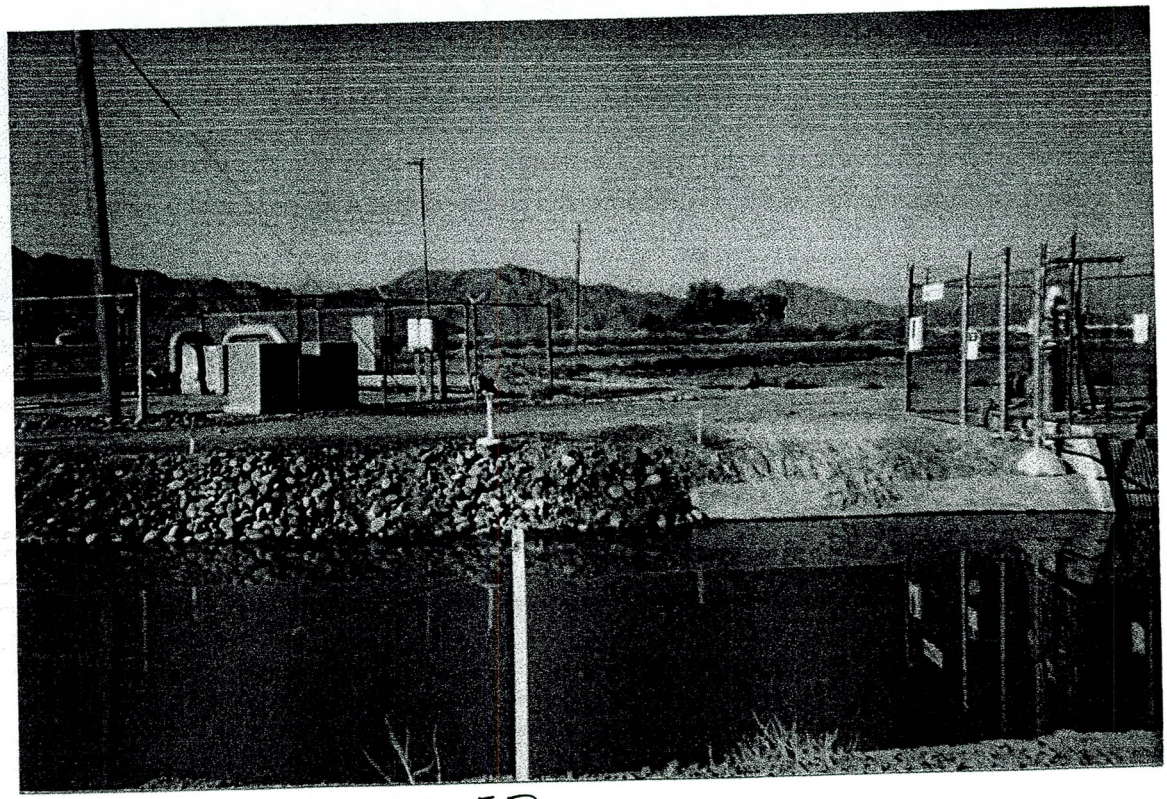
SECTION 5 C&D.

S.W. – N.E.



SECTION 5D

50 – No.



SECTION 5D

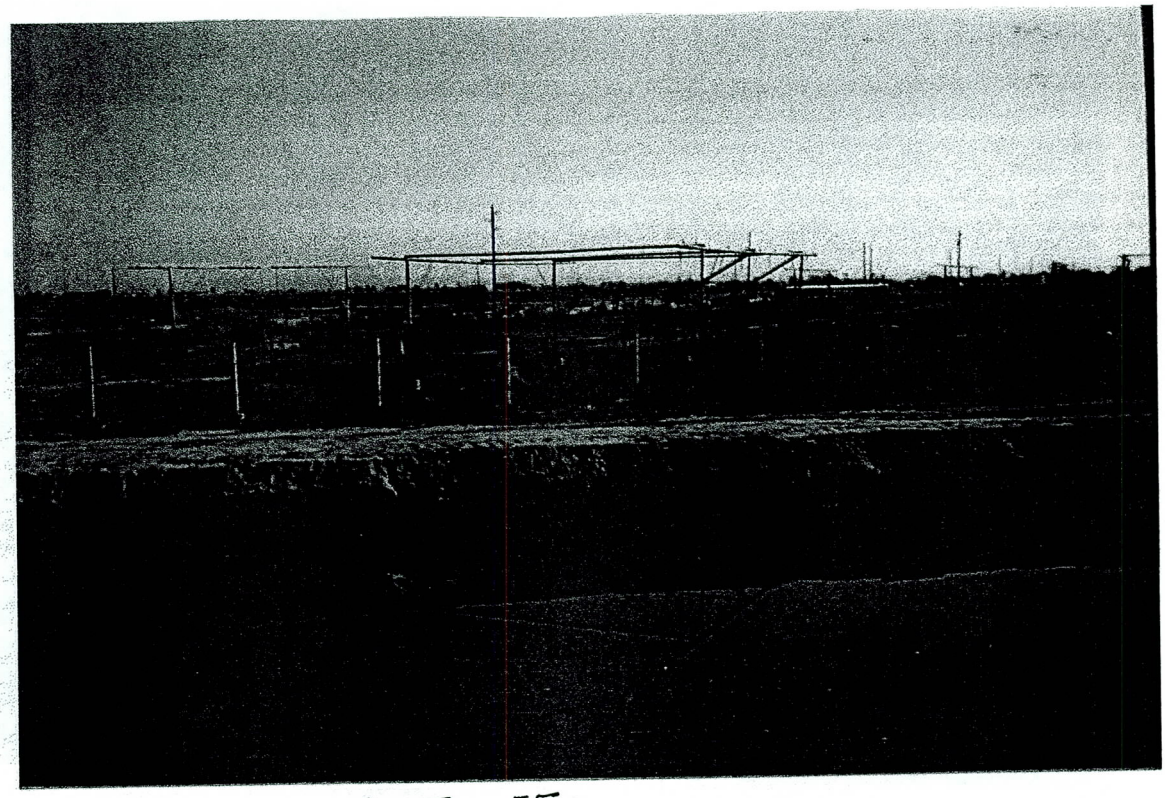
No – 50.

SECTION SE

So — No.

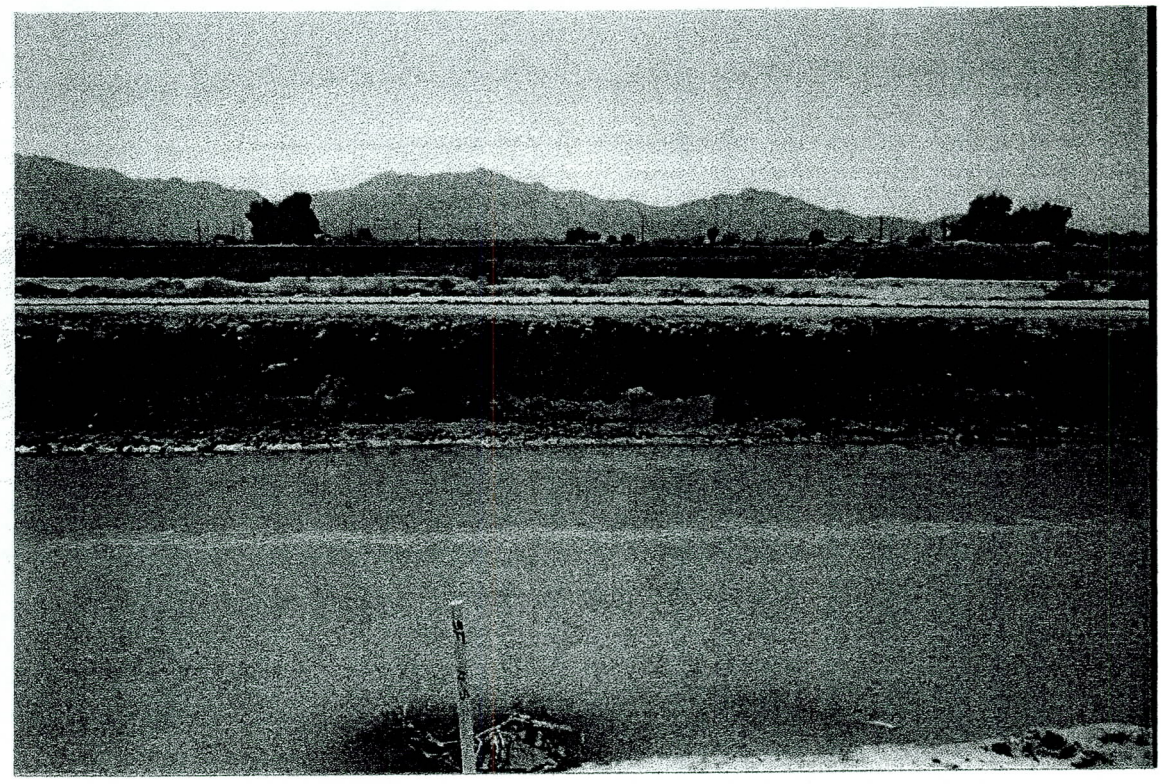
NB Lane SECTION SE

No — So.



SECTION 5F

SO — NO



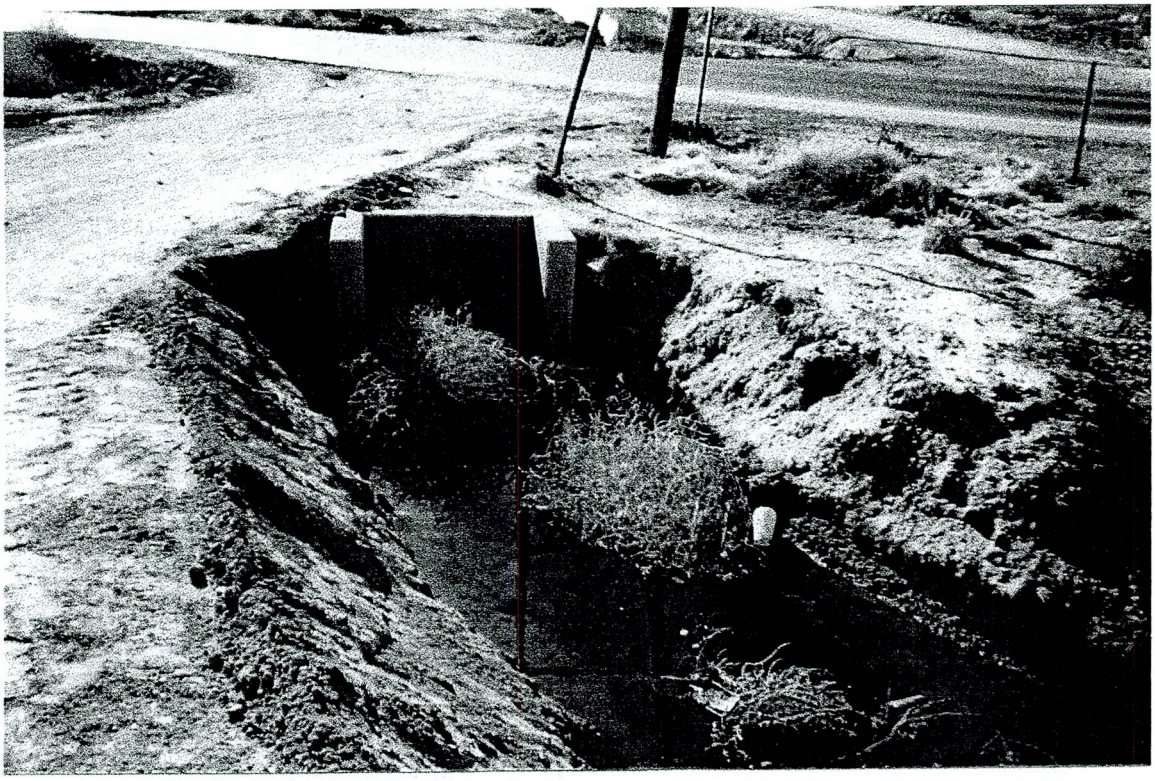
SECTION 5F

NO — SO.

SECTION 5 BASELINE RD CROSSING.
84" CONC.
N.E. — S.W.

SECTION 5 BASELINE ROAD CROSSING
S.W. — N.E.
84" CONC.

SECTION 5 BASELINE RD.
18" CONC. WEST
EAST - WEST



SECTION 5 BASELINE RD.
18" CONC. WEST
WEST - EAST

MORRISON MAIERLE, INC.
An Arizona Corporation
120 North 44th Street • Suite 410 • Phoenix, AZ 85034 • 602-244-9662 • Fax 602-244-9472

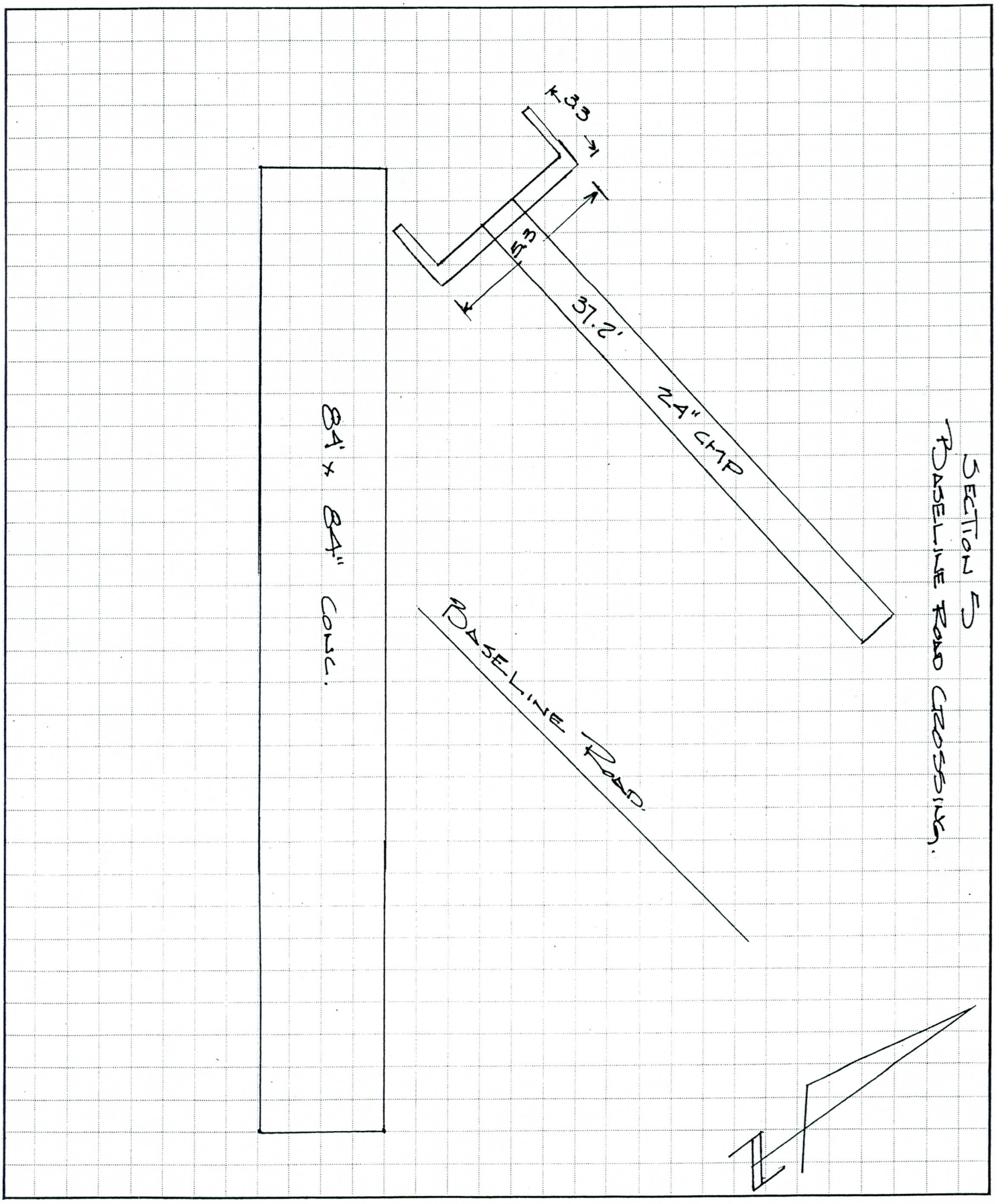
ENGINEERS
PLANNERS
SURVEYORS

PROJECT _____

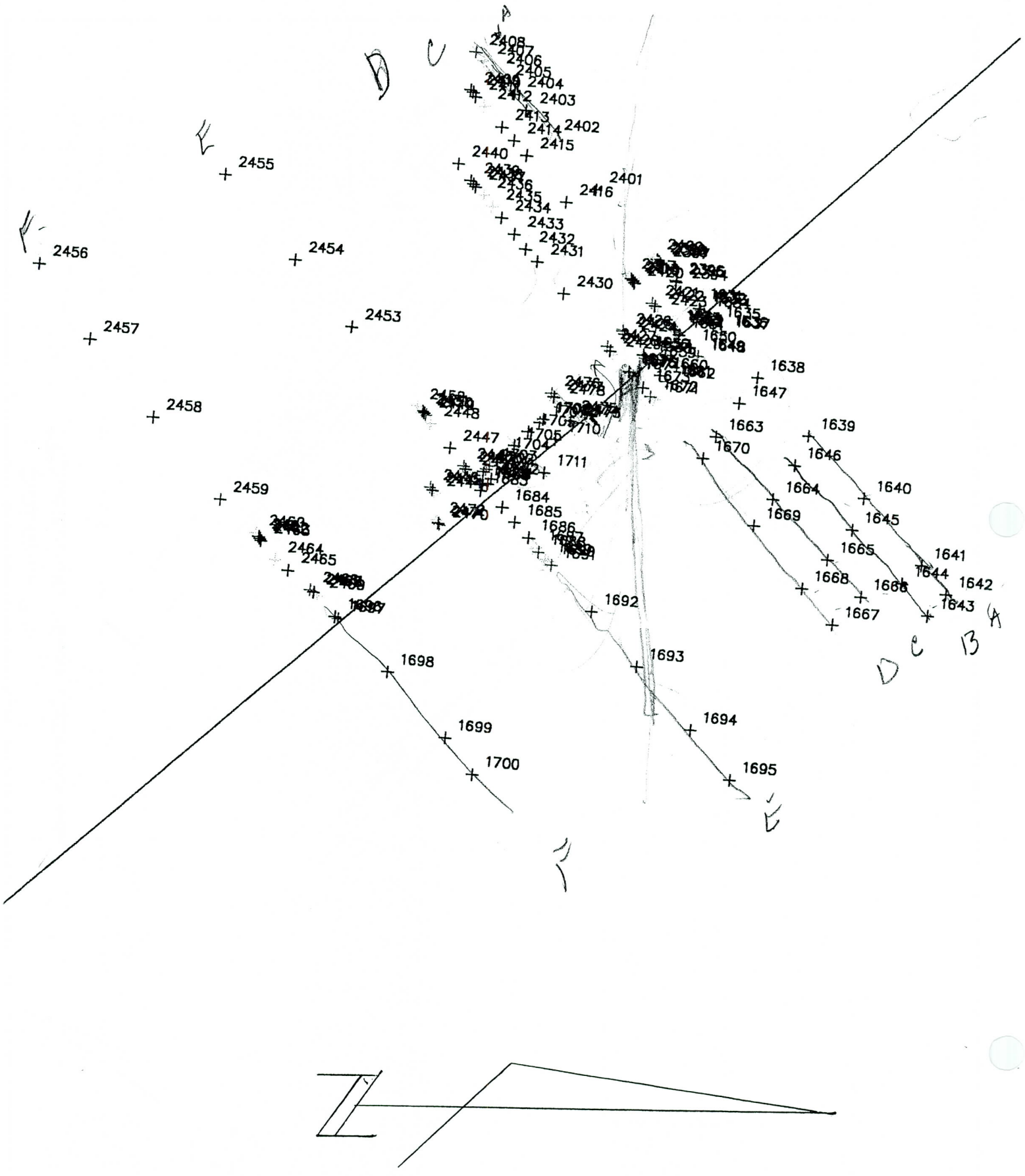
PROJECT NO. _____ SHEET ___ OF ___

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____



SECTION 5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Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

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Point	Northing	Easting	Elevation	Description
2408	864908.9748	606115.2338	984.56	TOP
2407	864917.4190	606124.7083	982.30	TOE
2406	864926.5396	606134.5851	982.40	TOE
2405	864936.4480	606146.8650	984.09	EP
2404	864949.0030	606159.2141	984.35	CL BASELINE RD.
2403	864961.7870	606176.4505	984.09	EP
2401	865035.5792	606260.1129	983.10	EG
2402	864987.6312	606204.7277	982.70	TOE
2416	865003.8390	606273.3311	983.20	EG
2400	865097.0291	606331.2102	983.11	TOE
2399	865100.2999	606333.9930	983.98	CONC TOP
2398	865102.0960	606336.1339	981.89	CL
2397	865103.5623	606338.3086	983.94	CONC TOP
2396	865119.7304	606356.3306	984.16	TOP BANK
2395	865120.7025	606357.7903	980.94	EOW
2394	865123.3743	606361.4239	978.06	TOE BOTTOM
1631	865142.8758	606383.4992	979.07	TOE
1632	865144.7869	606385.7744	980.95	EOW
1633	865146.1133	606387.5216	983.76	TOP
1634	865149.5843	606391.1661	983.74	EOR DIRT
1635	865160.1325	606402.2331	983.20	EOR DIRT
1636	865168.2904	606411.2029	982.93	TOP DITCH
1637	865169.9272	606412.9318	982.29	TOE
1638	865207.1906	606458.6355	982.38	EG
1639	865261.3735	606521.0086	982.79	EG
1640	865320.3824	606587.2950	982.94	EG
1641	865381.4987	606658.6359	983.16	EG
1642	865407.6819	606689.3942	983.22	EG

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2409	864903.3283	606154.9846	984.50	CONC TOPDITCH
2410	864905.9755	606157.4297	982.51	CL DITCH
2411	864908.4336	606162.2077	984.61	CONC TOPDITCH
2412	864917.6348	606172.0163	982.36	TOE
2413	864936.0787	606194.1660	983.95	EP
2414	864948.7711	606208.2666	984.16	CL BASELINE RD.
2415	864962.2808	606223.9370	983.99	EP
2416	865003.8390	606273.3311	983.20	EG
2417	865069.9734	606351.4664	982.96	TOE
2418	865073.0183	606354.4850	984.08	CONC TOP
2419	865074.7785	606356.3212	982.03	CL DITCH
2420	865076.4339	606358.7742	984.02	CONC TOP
2421	865095.0204	606379.8987	984.37	TOP BANK
2422	865098.2562	606383.0344	980.98	EOW
2423	865101.1313	606388.9595	978.16	TOE BOTTOM
1655	865117.3826	606405.8913	978.74	TOE
1654	865118.4700	606406.6486	983.07	GB
1653	865119.1928	606408.1012	981.15	EOW
1652	865121.0004	606410.3577	983.78	TOP BANK
1651	865123.7232	606413.5772	983.83	EOR
1650	865134.6076	606426.5148	983.24	EOR
1649	865143.4147	606435.5190	982.87	TOP
1648	865144.2878	606436.9890	982.21	TOE
1647	865187.7421	606485.7663	982.49	EG
1646	865246.6179	606552.1710	982.84	EG
1645	865307.9767	606620.5663	983.00	EG
1644	865360.5141	606677.8386	983.18	EG
1643	865388.0252	606712.1434	983.27	EG

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
1707	864975.8848	606505.7859	984.02	CONC. TOP BANK
1708	864978.6883	606503.4142	982.28	TOE
1709	864979.9110	606502.3457	982.28	TP 72"PIPE
2476	864988.3899	606474.7753	983.78	TOP BANK
2477	864990.9688	606478.8044	980.95	EOW
2478	864993.4846	606482.6592	978.61	TOE BOTTOM
2475	865005.8643	606501.3381	978.61	TOE BOTTOM
2474	865008.3775	606504.0817	980.86	EOW
2473	865010.2329	606506.1210	984.35	TOP BANK
2426	865063.8411	606409.3353	983.87	TOP BANK
2425	865065.9365	606412.8435	980.94	EOW
2424	865069.4517	606415.5110	978.82	TOE
1656	865084.4774	606433.4900	978.95	TOE
1657	865085.6919	606434.5726	980.98	EOW
1658	865087.6063	606437.9411	983.83	TOP
1676	865070.7796	606452.1586	981.11	EOW
1675	865071.9564	606453.8785	983.93	TOP BANK
1659	865091.6896	606442.7771	983.86	EOR
1674	865074.5555	606456.6033	983.95	EOR
1660	865103.8601	606456.0232	983.29	EOR
1661	865110.1322	606462.7507	983.01	TOP
1672	865093.3302	606478.8116	983.23	TOP
1662	865111.9423	606464.6206	982.51	TOE

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
1666	865317.2812	606691.9722	983.19	EG
1665	865281.7417	606652.3439	983.14	EG
1664	865223.5132	606587.8776	982.84	EG
1663	865163.1604	606521.4705	982.55	EG
1662	865111.9423	606464.6206	982.51	TOE
1661	865110.1322	606462.7507	983.01	TOP
1660	865103.8601	606456.0232	983.29	EOR
1658	865087.6063	606437.9411	983.83	TOP
1657	865085.6919	606434.5726	980.98	EOW
1656	865084.4774	606433.4900	978.95	TOE
2424	865069.4517	606415.5110	978.82	TOE
2425	865065.9365	606412.8435	980.94	EOW
2426	865063.8411	606409.3353	983.87	TOP BANK

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2440	864890.4240	606232.5878	983.86	EG
2439	864903.3615	606250.4846	984.48	CONC TOPDITCH
2438	864906.0743	606253.9760	982.73	CL DITCH
2437	864908.5067	606257.1585	984.81	CONC TOPDITCH
2436	864917.0564	606265.6319	982.74	TOE
2435	864926.1024	606278.3043	982.71	TOE
2434	864935.8465	606289.8052	983.93	EP
2433	864949.1171	606307.0414	984.23	CL BASELINE RD.
2432	864961.2708	606322.9416	983.87	EP
2431	864973.3514	606336.0656	983.22	EG
2430	865001.2538	606369.8537	984.25	EG
2427	865047.4208	606425.3698	983.90	TOP BANK
2428	865050.5896	606429.9662	980.97	EOW
2429	865053.1978	606433.3629	979.14	TOE BOTTOM
1677	865069.0368	606450.7056	978.88	TOE
1676	865070.7796	606452.1586	981.11	EOW
1675	865071.9564	606453.8785	983.93	TOP BANK
1674	865074.5555	606456.6033	983.95	EOR
1673	865085.3634	606468.9993	983.50	EOR
1672	865093.3302	606478.8116	983.23	TOP
1671	865097.2703	606481.1771	982.38	TOE
1670	865148.8582	606544.2390	982.64	EG
1669	865203.2919	606615.7839	982.99	EG
1668	865254.5191	606682.8517	983.40	EG
1667	865286.9059	606721.3751	983.31	EG

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Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2455	864642.0255	606243.1853	983.34	EG
2454	864716.2156	606333.5924	983.62	EG
2453	864776.4876	606404.6705	983.76	EG
2452	864845.6174	606488.9673	984.12	TOE
2451	864851.8532	606493.6861	985.66	CONC TOP
2450	864853.6894	606495.6367	983.34	CL DITCH
2449	864855.5299	606497.7530	985.68	TOP
2448	864860.8168	606506.8385	984.16	TOE
2447	864881.4291	606533.0084	983.66	EG
2443	864895.9031	606552.1519	984.05	TOP BANK
2442	864897.8482	606555.4902	981.05	EOW
2441	864900.9841	606558.8199	977.69	TOE BOTTOM
1678	864912.8923	606568.3085	978.36	TOE CONC.
1683	864913.9712	606578.0605	984.55	CONC TOP
1684	864936.5837	606595.8297	984.45	EP BASELINE RD.
1685	864949.6421	606611.7794	985.11	CL BASELINE RD.
1686	864964.4501	606628.0934	984.76	EP BASELINE RD.
1687	864972.0963	606638.3934	983.90	TOE
1688	864974.8413	606643.2536	985.03	TOP DITCH
1689	864981.5022	606651.0285	981.38	TOE
1690	864984.7263	606653.2037	981.32	TOE
1691	864988.3232	606657.2526	983.73	TOP DITCH
1692	865031.1779	606706.7178	983.27	EG
1693	865079.2587	606765.0824	983.51	EG
1694	865135.8995	606832.6560	983.61	EG
1695	865177.9831	606885.6686	983.62	EG

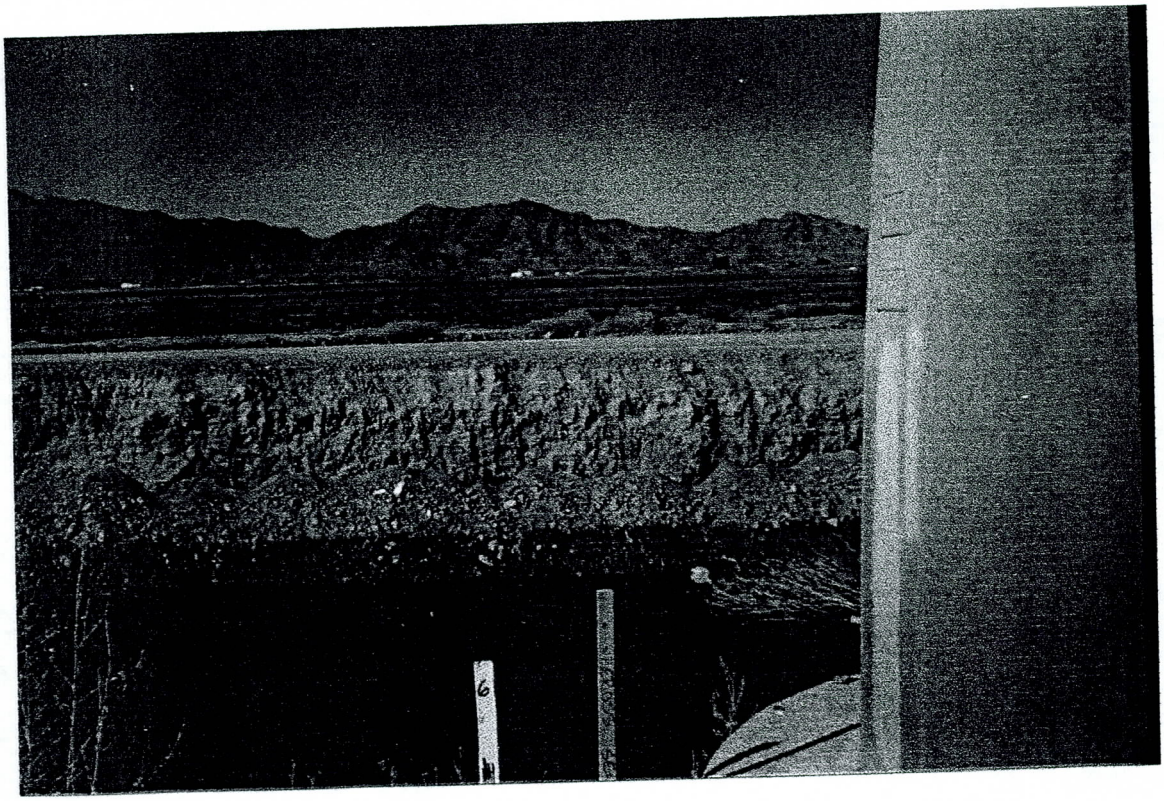
Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2456	864444.0273	606336.6954	983.45	EG
2457	864497.5662	606416.5874	983.55	EG
2458	864564.6887	606499.2108	983.71	EG
2459	864636.4530	606586.6313	983.93	EG
2460	864674.5595	606622.2271	984.32	TOE
2461	864677.4490	606626.0754	985.66	CONC TOP
2462	864678.6737	606628.1186	983.65	CL DITCH
2463	864679.9099	606630.4887	985.60	CONC TOP
2464	864694.4456	606650.7773	984.58	TOE
2465	864708.5514	606662.2198	985.78	GB
2466	864731.9012	606683.0075	986.54	TOP
2467	864735.1701	606684.8339	981.71	TOE
2468	864735.7495	606685.4396	980.90	EOW
2469	864739.0886	606688.7584	978.24	TOE BOTTOM
1696	864758.8317	606711.7573	980.86	EOW
1697	864761.9839	606713.9868	984.55	TOP
1698	864814.6079	606770.6063	983.94	EG
1699	864876.5632	606840.5785	984.10	EG
1700	864905.3496	606879.3476	983.70	EG

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

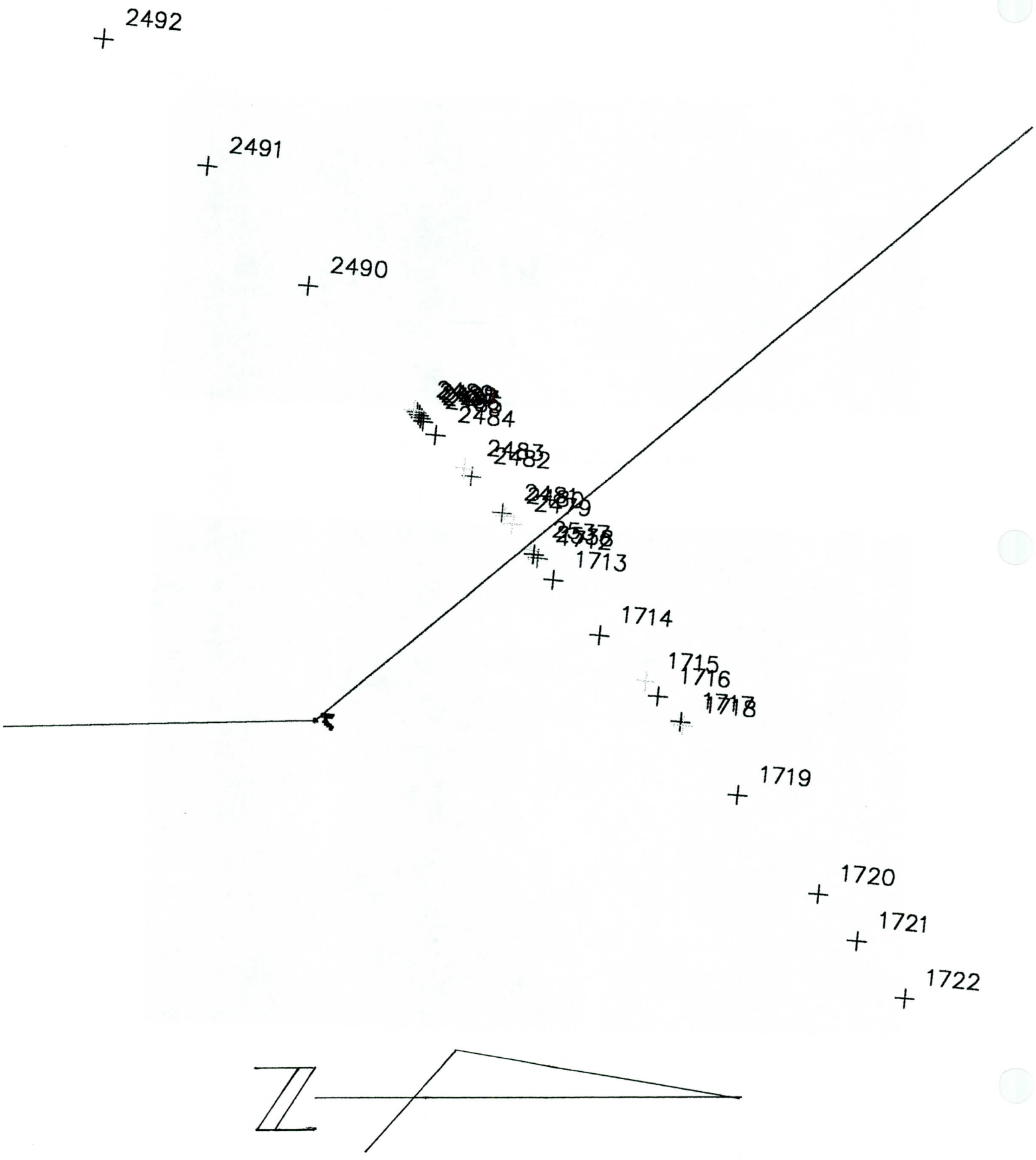
Point	Northing	Easting	Elevation	Description
1679	864915.1188	606571.4274	981.11	EOW
1680	864915.8511	606572.2289	981.73	CONC TOPCL DRAI
1681	864921.3223	606570.7406	983.91	CONC TOP
1682	864924.9740	606565.8747	984.09	CONC TOP
1701	864916.7826	606557.8275	982.50	TP CL 72"PIPE
1702	864919.7241	606555.3708	982.48	TOP CL TOE
1703	864923.2098	606552.1099	984.09	TOP BANK
1705	864949.2559	606530.3575	985.01	CL BASELINE RD.
1707	864975.8848	606505.7859	984.02	CONC. TOP BANK
1708	864978.6883	606503.4142	982.28	TOE
1709	864979.9110	606502.3457	982.28	TP 72"PIPE
1706	864963.9302	606515.7352	984.54	EP BASELINE RD.
1711	864980.7575	606559.1397	983.09	TP 24"CMP
1710	864992.5377	606523.7986	982.42	TP 24"CMP
2476	864988.3899	606474.7753	983.78	TOP BANK
2477	864990.9688	606478.8044	980.95	EOW
2478	864993.4846	606482.6592	978.61	TOE BOTTOM
2475	865005.8643	606501.3381	978.61	TOE BOTTOM
2474	865008.3775	606504.0817	980.86	EOW
2473	865010.2329	606506.1210	984.35	TOP BANK

SECTION 6
S.W. — N.E.



SECTION 6
N.E. — S.W.

SECTION 6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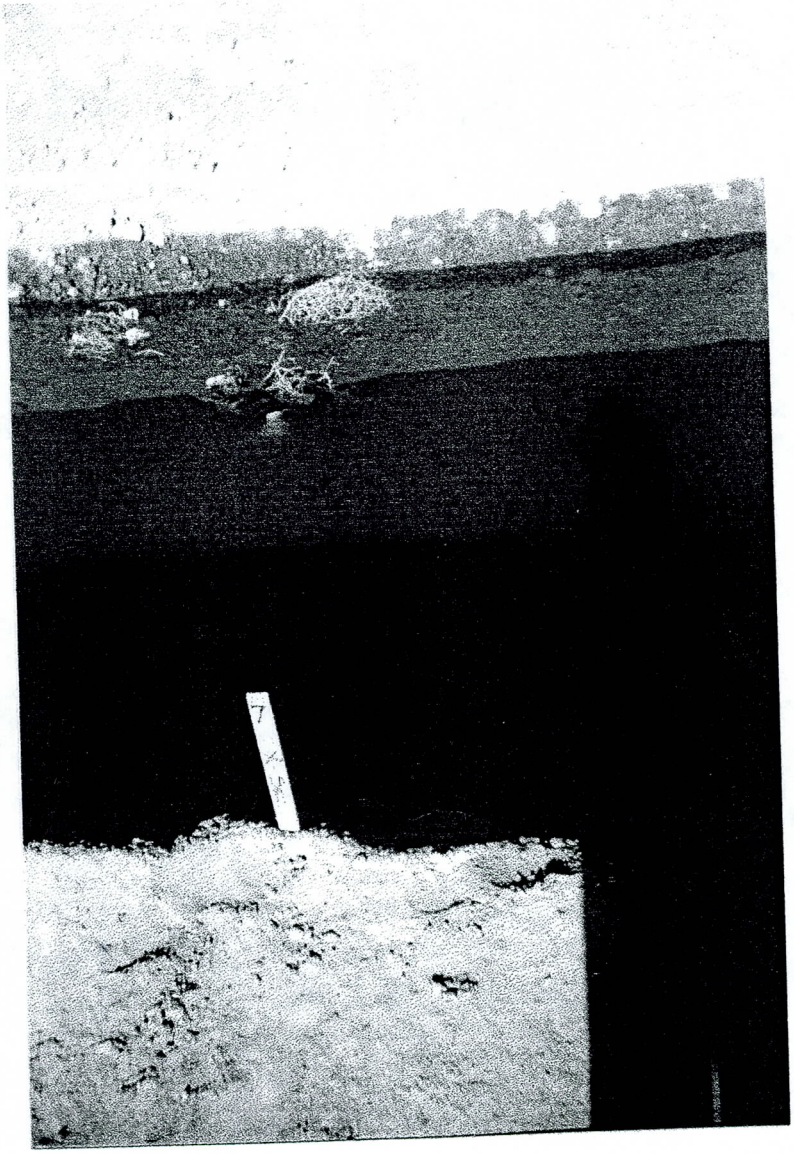
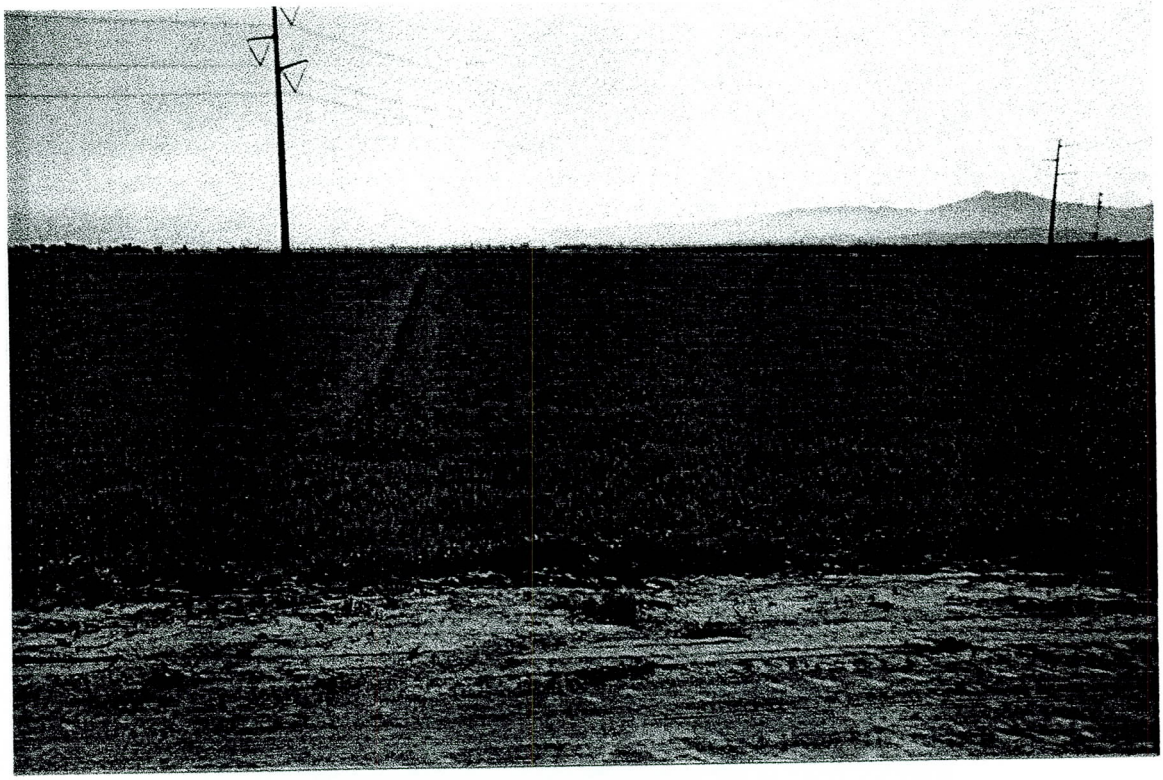
Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2492	863770.7727	606979.9661	983.98	EG
2491	863839.1736	607062.8481	984.23	EG
2490	863904.9891	607140.9041	984.44	EG
2489	863973.7239	607221.8287	984.78	TOE
2488	863975.4438	607223.2533	986.01	TOP BANK
2487	863976.9222	607225.0584	985.54	CONC TOPDITCH
2486	863978.2188	607227.0766	983.49	CL
2485	863979.7525	607229.2535	985.51	CONC TOPDITCH
2484	863987.8032	607238.1342	984.75	EG
2483	864006.8156	607260.1098	985.36	TOE
2482	864011.2370	607265.0206	987.26	TOP BANK
2481	864031.2495	607289.0232	988.37	TOP BANK
2480	864032.9756	607291.2070	983.50	TOE
2479	864037.9508	607296.3898	978.14	TOE BOTTOM
2537	864049.7506	607313.2174	979.29	TOE BOTTOM
2538	864052.1479	607316.2495	981.05	EOW
1712	864054.7895	607318.7488	986.32	TOP
1713	864064.9120	607332.9269	985.89	EG
1714	864095.0318	607368.9388	985.07	EG
1715	864125.6272	607399.0959	985.06	TOE
1716	864133.5088	607408.8295	986.99	EOR
1717	864148.3349	607425.5452	986.55	EOR
1718	864149.9150	607428.1693	985.84	TOE
1719	864185.9102	607473.5209	985.61	EG
1720	864238.5290	607538.2510	985.94	EG
1721	864263.5653	607569.0187	986.94	EG
1722	864294.9714	607606.3905	986.52	EG



SECTION 7

EAST - WEST

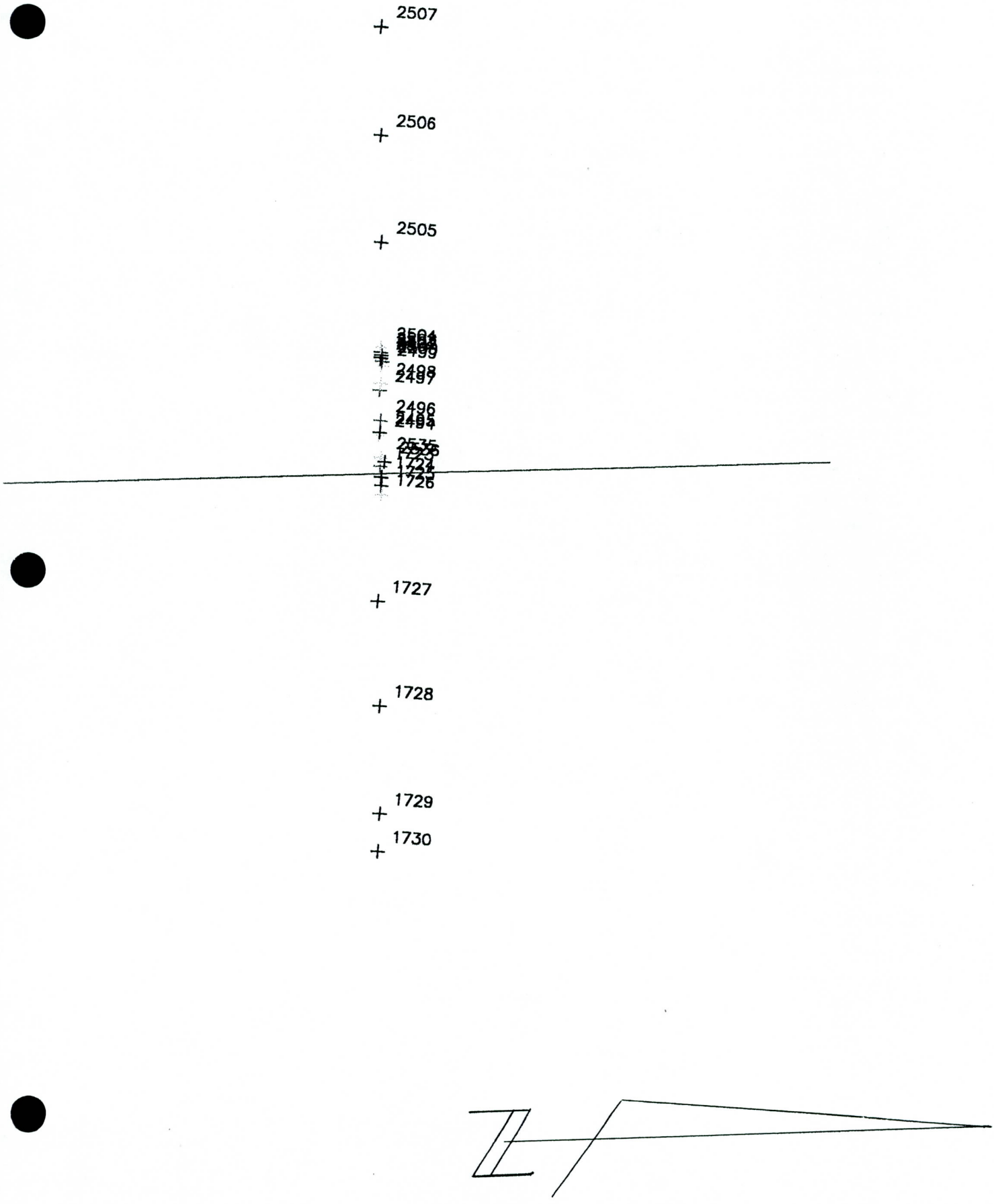


SECTION 7

WEST - EAST

SECTION 7

EAST - WEST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SECTION 1

SECTION 7

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

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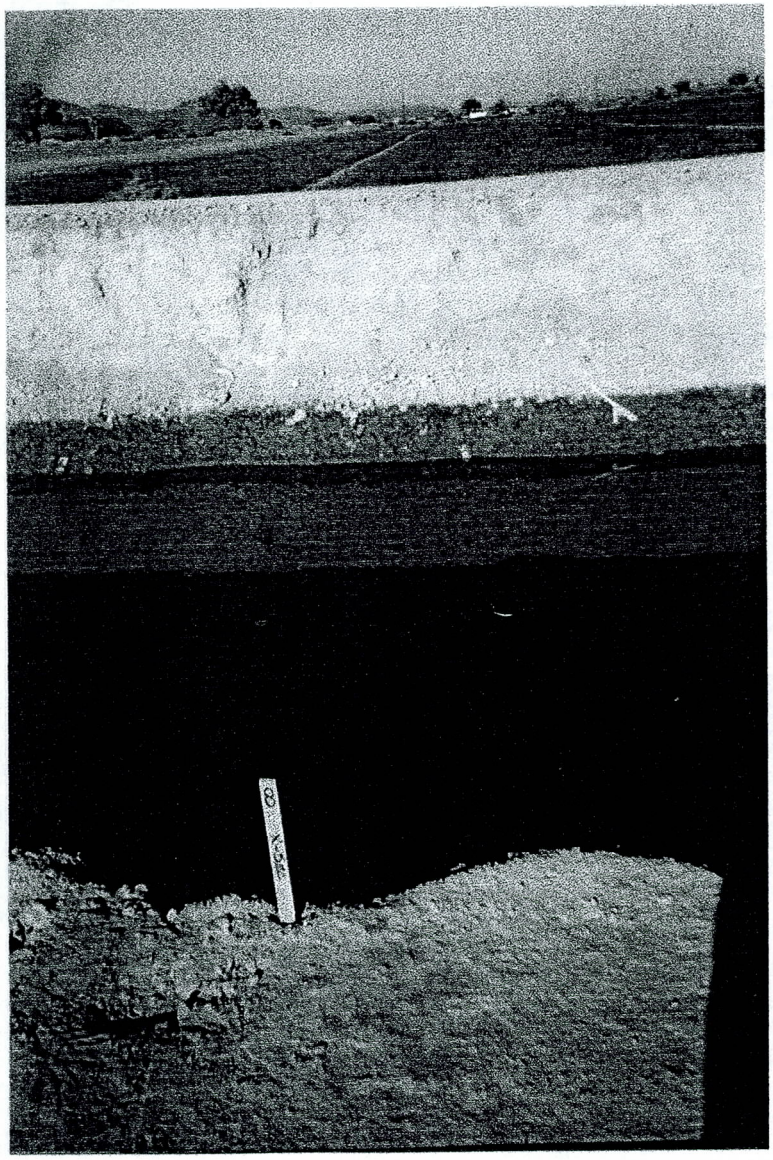
Point	Northing	Easting	Elevation	Description
2507	863175.0886	607017.9024	982.64	EG
2506	863174.4189	607119.8657	982.65	EG
2505	863174.3639	607220.3830	982.71	EG
2504	863173.8894	607319.1499	983.16	TOE
2503	863173.6613	607323.8447	984.43	CONC TOPDITCH
2502	863174.0977	607326.6170	982.46	CL DITCH
2501	863173.7065	607329.2145	984.54	CONC TOPDITCH
2500	863175.0729	607331.9692	985.57	TOP BANK
2499	863174.5682	607335.4459	984.87	TOE
2498	863173.3409	607352.3394	985.52	TOE
2497	863172.6619	607358.8294	987.66	TOP BANK
2496	863173.2168	607387.3350	988.97	TOP BANK
2495	863172.4983	607398.5160	980.79	EOW
2494	863172.2723	607401.2385	978.03	TOE BOTTOM
2535	863173.8307	607422.4707	979.37	TOE BOTTOM
2536	863176.8357	607426.4718	980.66	EOW
1723	863172.9267	607430.4298	987.33	TOP BANK
1724	863173.6585	607440.6520	987.17	CL RD.
1725	863173.9269	607448.8232	986.70	EOR
1726	863173.9086	607457.1040	985.05	TOE
1727	863170.3056	607557.0122	985.03	EG
1728	863171.8967	607656.2747	985.09	EG
1729	863171.7431	607757.2291	984.85	EG
1730	863169.7962	607792.8189	985.19	EG

Press ENTER or spacebar to continue...



SECTION 8

EAST - WEST.

SECTION 8

WEST - EAST

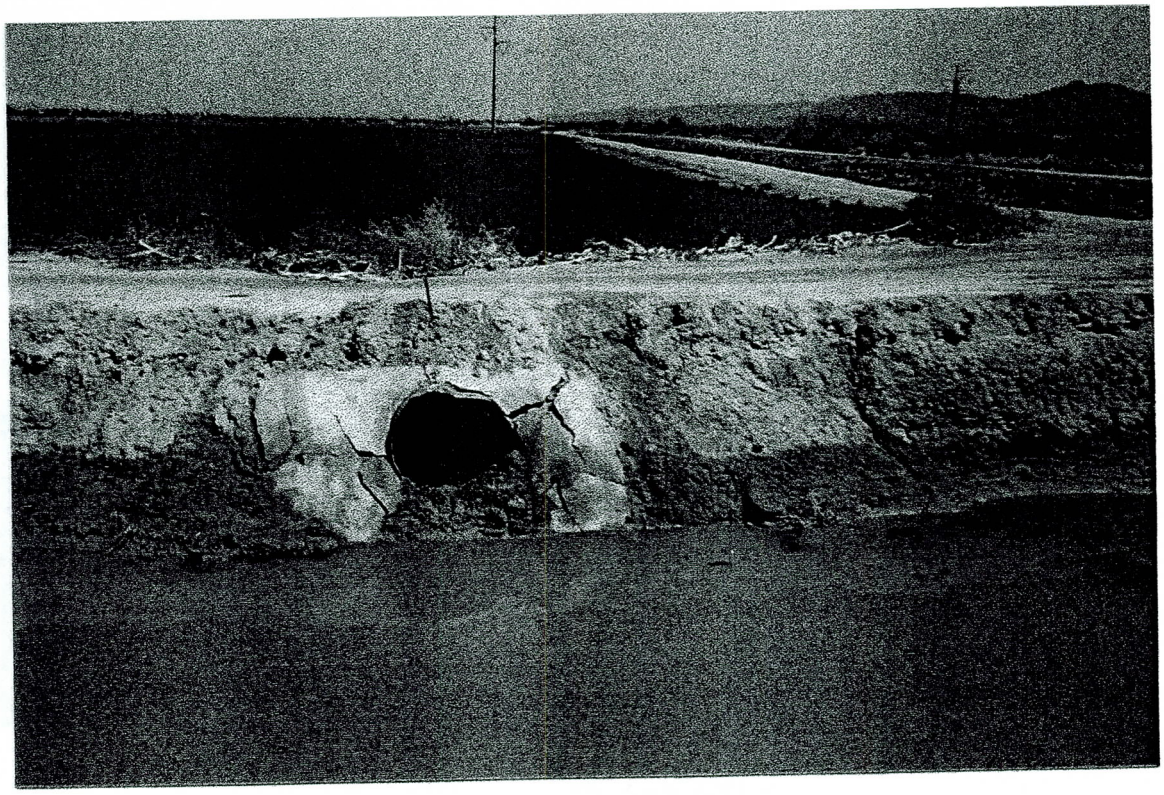
SECTION 8

EAST - WEST

SECTION 8

EAST - WEST.

48" CMP.



SECTION 8
WEST END (CANAL)
48" CMP

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PROJECT NO. _____ SHEET ___ OF ___
CALCULATED BY _____ DATE _____
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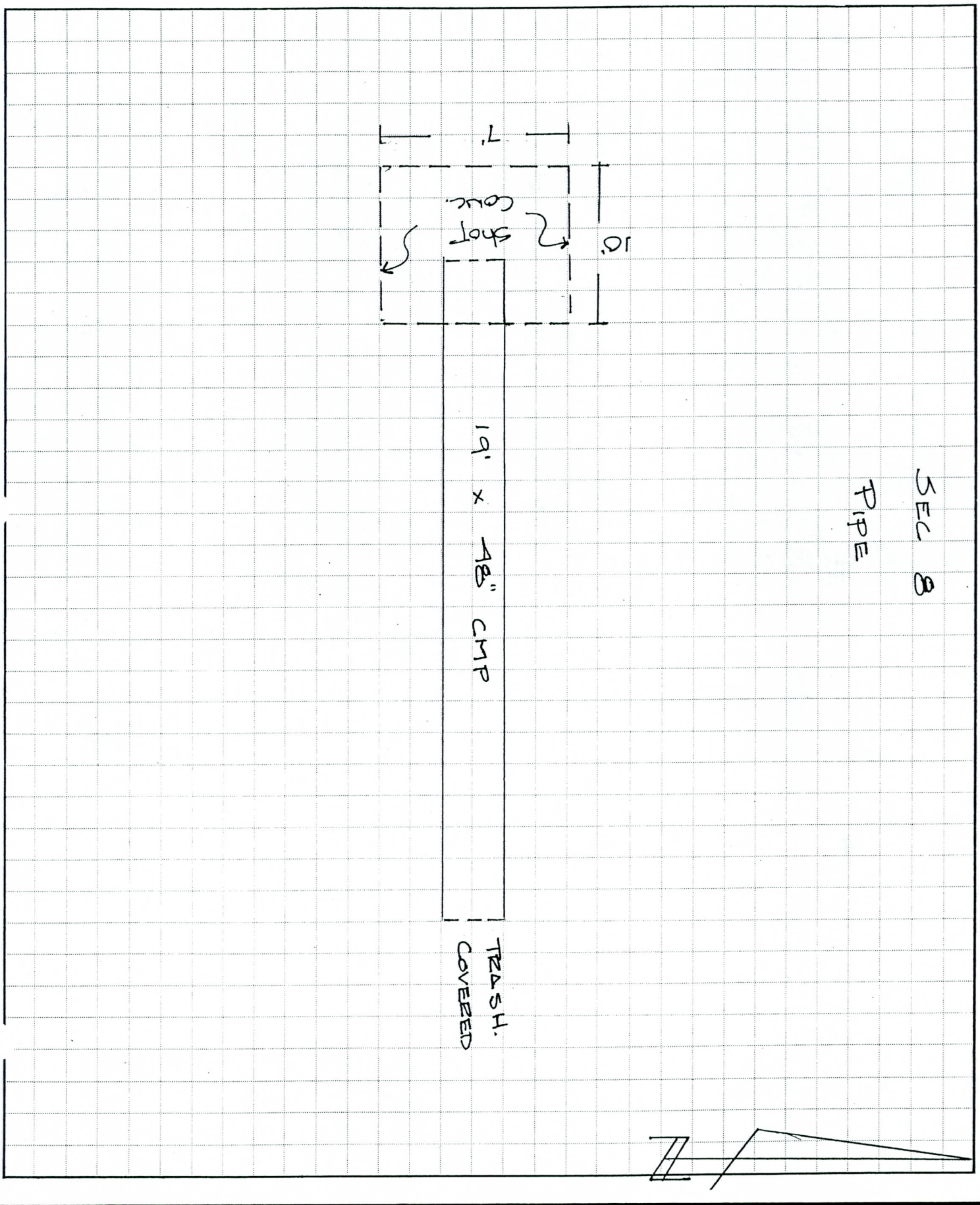

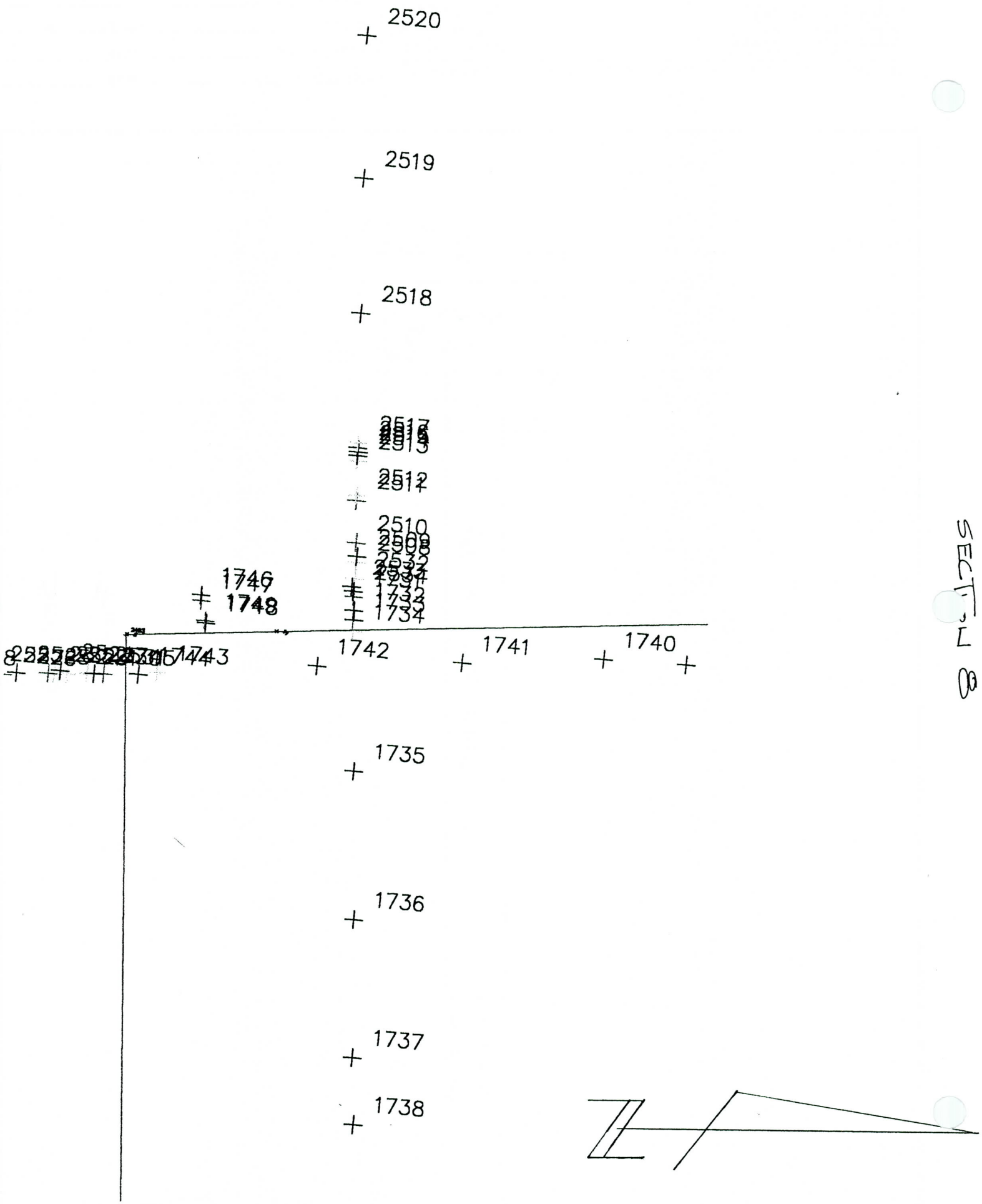
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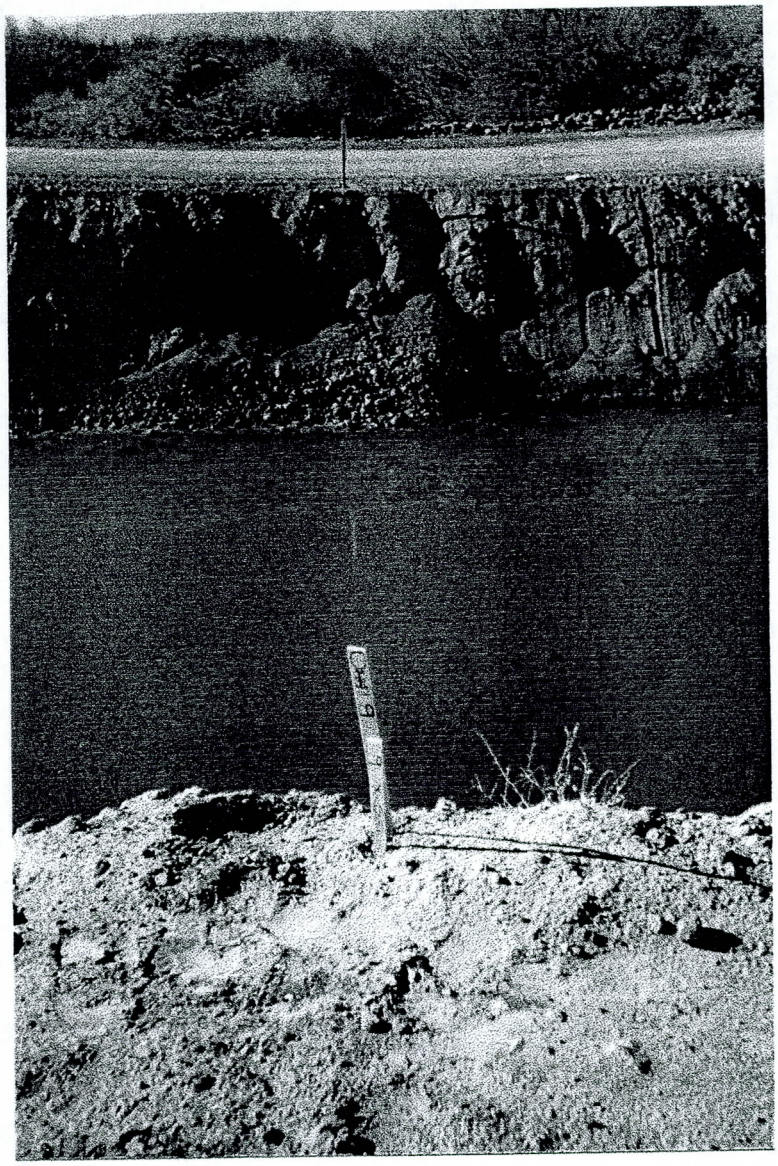
SECT. 8

SECTION 8

8P

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2520	862525.5164	607037.7502	981.92	EG
2519	862523.3321	607135.7982	981.99	EG
2518	862521.3443	607229.2688	981.97	EG
2517	862519.6140	607318.7241	982.63	TOE
2516	862519.3337	607322.2405	984.39	CONC TOPDITCH
2515	862519.6726	607325.1424	982.48	CL
2514	862519.4276	607327.6867	984.40	CONC TOPDITCH
2513	862519.1715	607331.3818	984.29	TOE
2512	862518.5872	607355.3807	984.54	TOE
2511	862518.6221	607358.9359	986.98	TOP BANK
2510	862518.4026	607387.8301	988.34	TOP BANK
2509	862518.8785	607397.4670	980.50	EOW
2508	862518.8274	607401.5471	978.09	TOE BOTTOM
2532	862517.6629	607412.8410	978.42	TOE BOTTOM
2533	862515.3867	607418.4019	980.62	EOW
2534	862516.5482	607421.6379	982.62	GB
1731	862516.8176	607425.5555	986.22	TOP BANK
1732	862516.8032	607434.9937	986.30	CL RD.
1733	862516.8640	607441.5910	985.94	EOR
1734	862516.3391	607449.4456	984.03	TOE
1735	862517.0652	607546.8932	984.09	EG
1736	862517.2966	607649.4318	984.11	EG
1737	862516.4042	607744.9741	983.95	EG
1738	862517.1124	607791.2864	984.04	EG

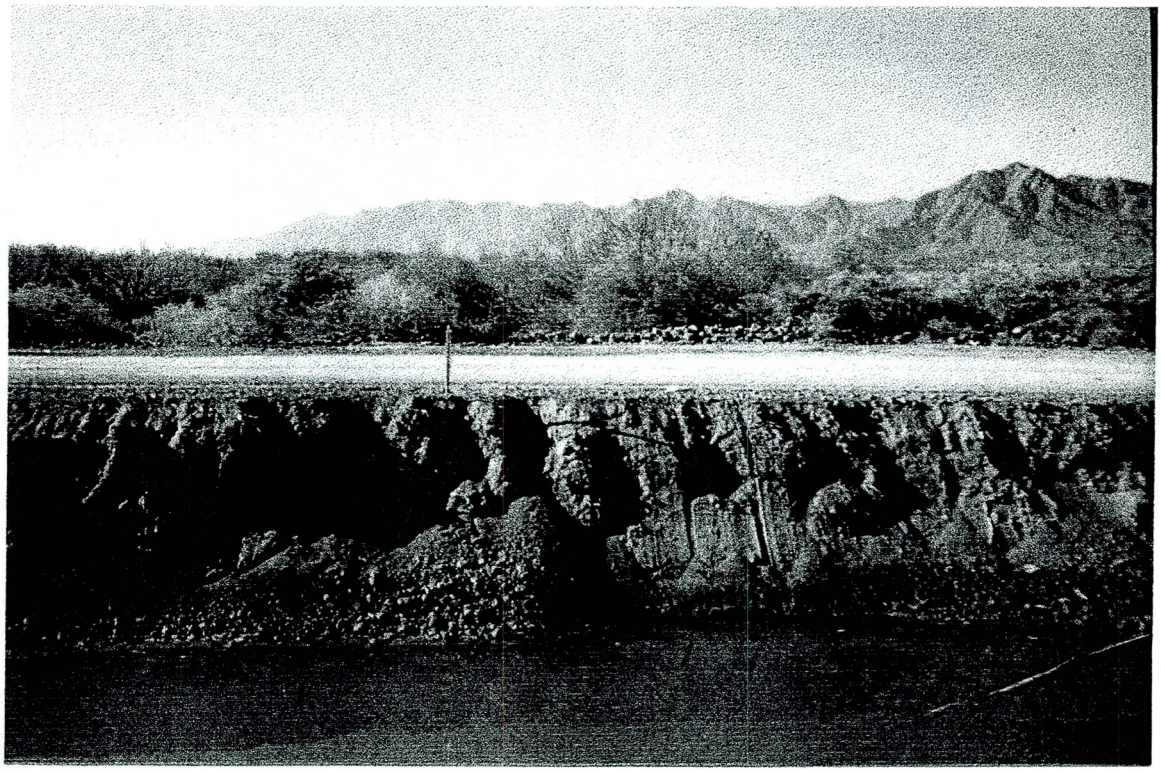


SECTION 9

NORTH – SOUTH.

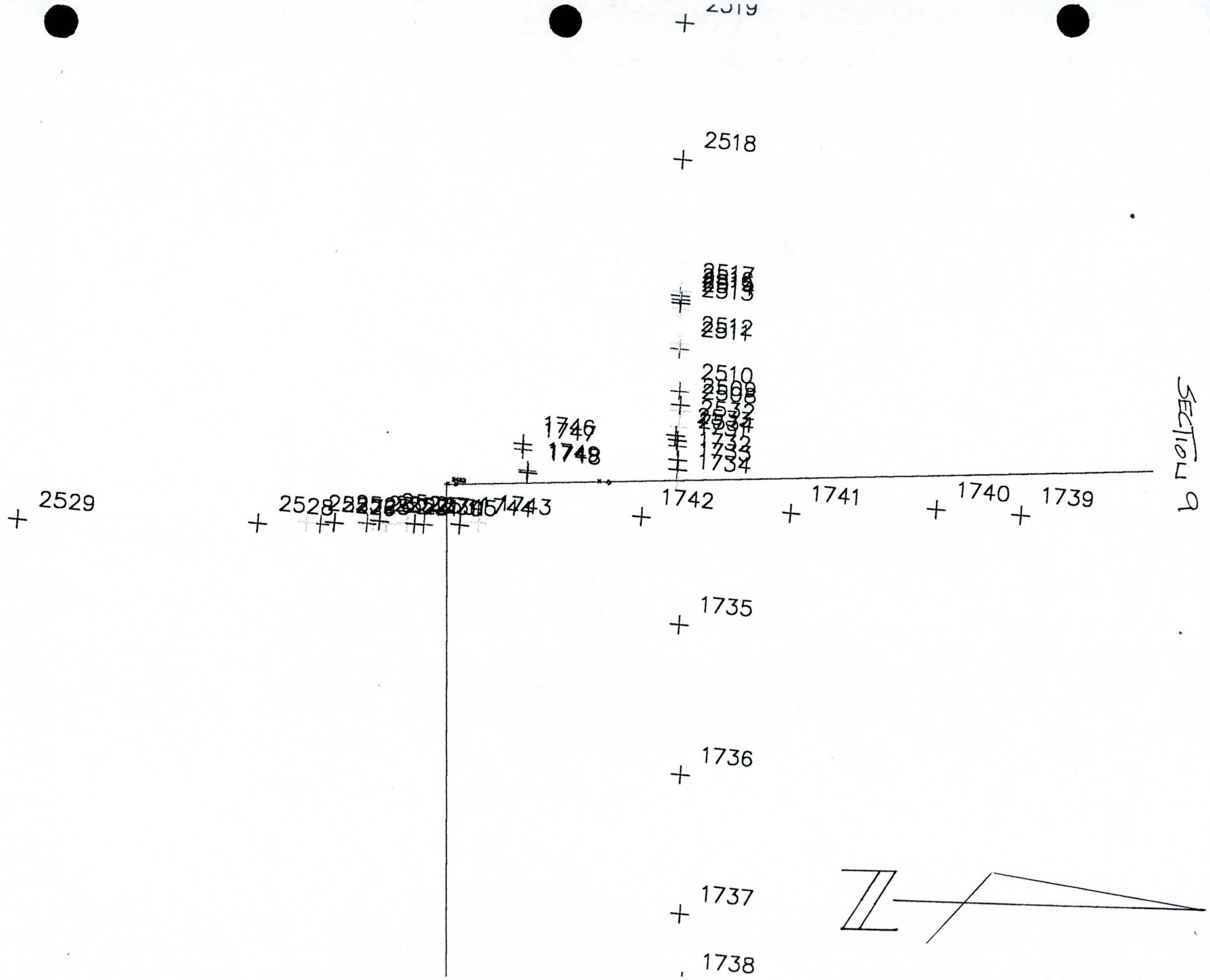
SECTION 9

SOUTH – NORTH



SECTION 9

NORTH – SOUTH.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SECTION 9

SECTION 9

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

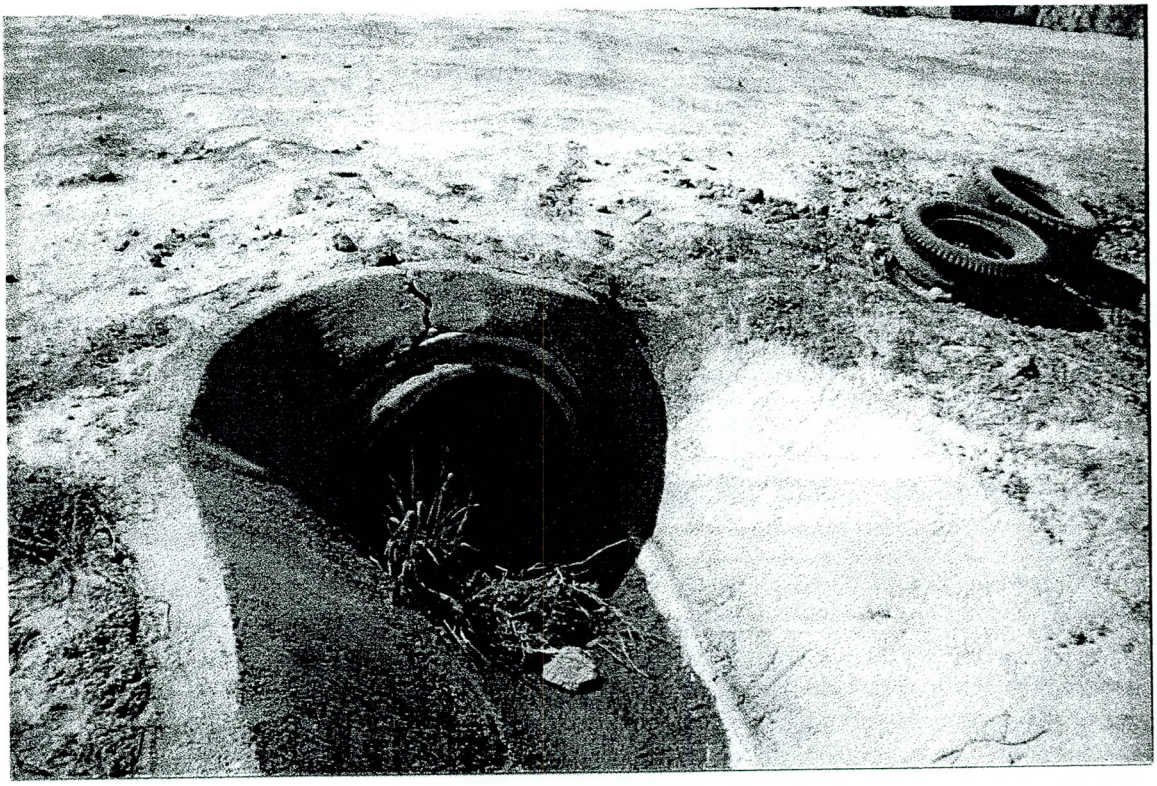
Point	Northing	Easting	Elevation	Description
2529	862068.0299	607475.4759	992.36	EG
2528	862229.9968	607478.2390	982.96	EG
2527	862263.3709	607477.9308	983.13	TOE
2526	862272.7211	607478.7661	987.82	TOP BANK
2525	862282.0946	607477.9084	987.44	EOR
2524	862304.4740	607478.3772	987.59	TOP BANK
2523	862308.9867	607478.3815	983.29	TOE
2522	862313.0173	607476.6125	980.77	EOW
2521	862317.7431	607478.6118	978.03	TOE BOTTOM
2530	862331.6700	607478.7757	978.76	TOE BOTTOM
2531	862336.5174	607478.7071	980.61	EOW
1745	862343.2046	607478.8650	987.29	TOP BANK
1744	862367.6125	607479.2967	986.76	EOR
1743	862380.5551	607478.1160	984.33	TOE
1748	862414.3896	607443.5044	984.54	TP 48"CMP
1749	862413.7492	607441.9140	986.06	TOP BANK
1747	862411.1307	607427.8849	987.40	TOP BANK
1746	862410.9150	607423.9801	985.39	TP 48"CMP
1742	862491.4929	607473.7366	983.90	EG
1741	862592.7982	607471.5679	983.79	EG
1740	862691.6690	607469.0786	983.96	EG
1739	862748.7951	607473.0123	984.06	EG

SECTION 10

SOUTH – NORTH

SECTION 10

SOUTH – NORTH.



SECTION 10

NORTH – SOUTH.

36" CONC.

WEST.

SECTION 10

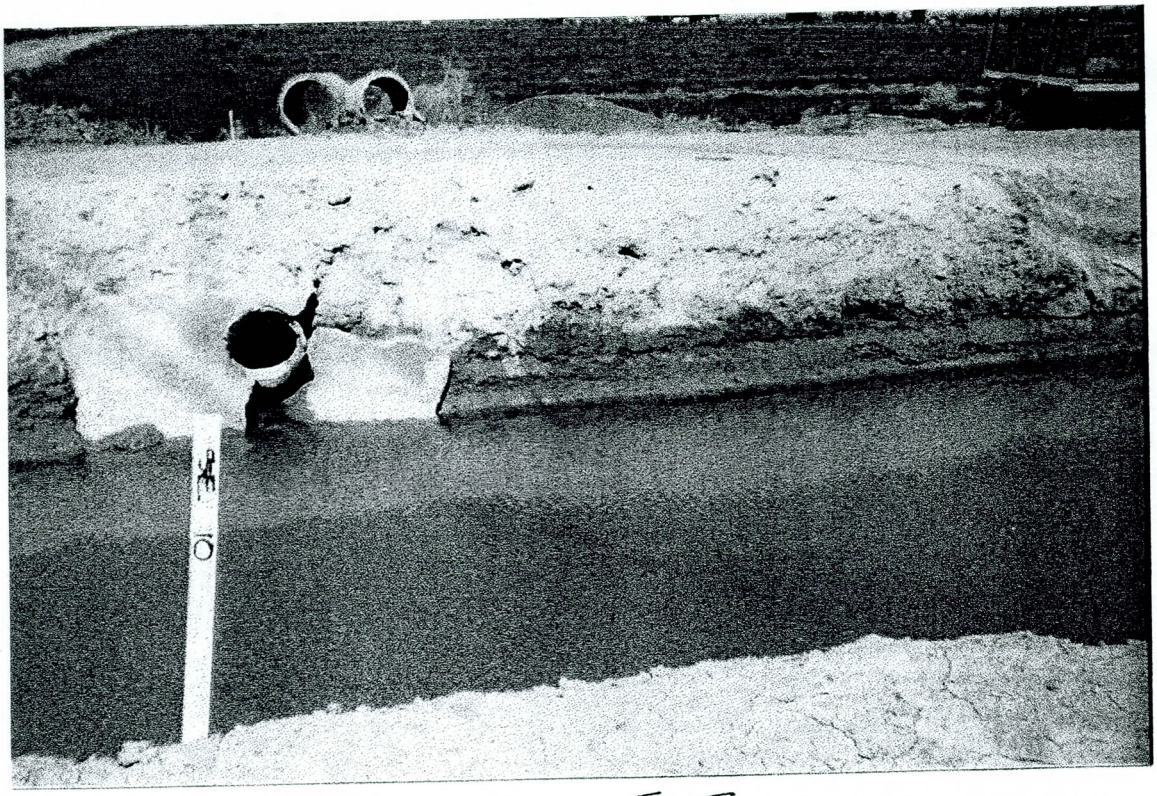
SOUTH – NORTH

30" CONC

SECTION 10 EAST.

NO—SO.

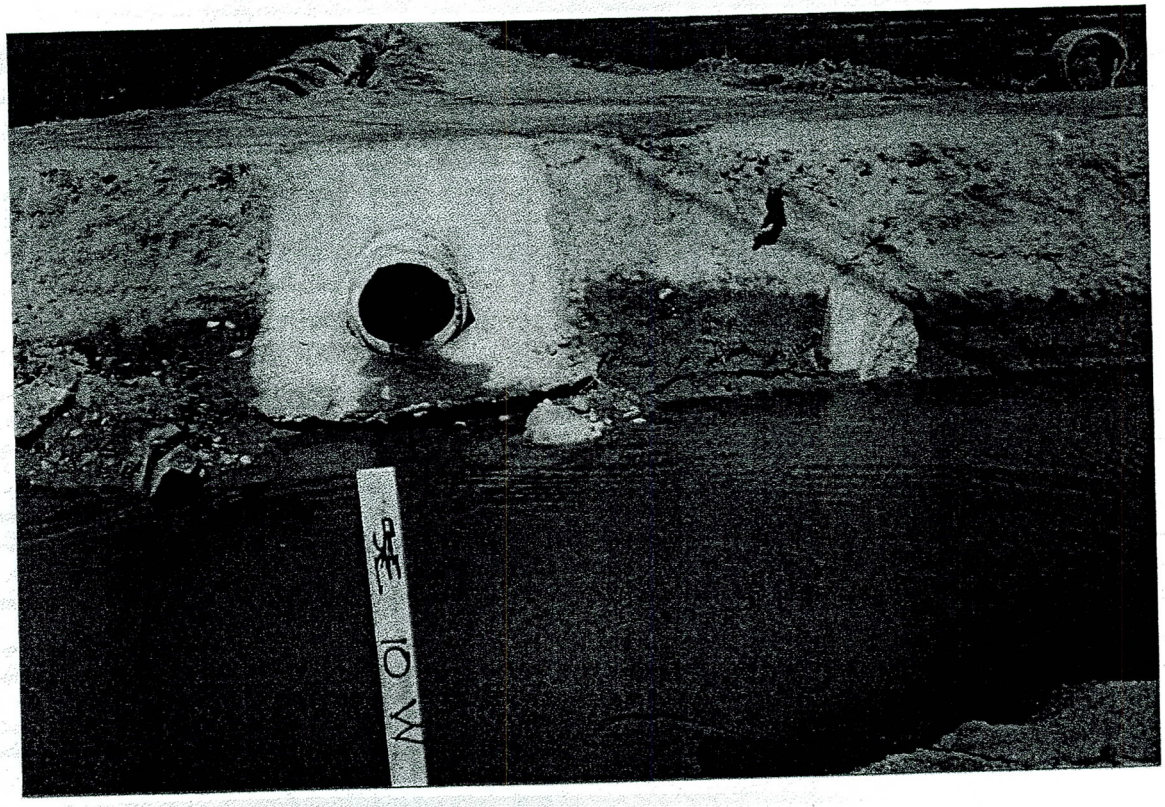
18" CONC



SECTION 10 EAST.

SO—NO.

18" CONC.



SECTION 10
50 – No
30" CONC
WEST.

SECTION 10
SOUTH BANK
30" CONC WEST

SECTION 10
SOUTH BANK
30" CONC EAST.

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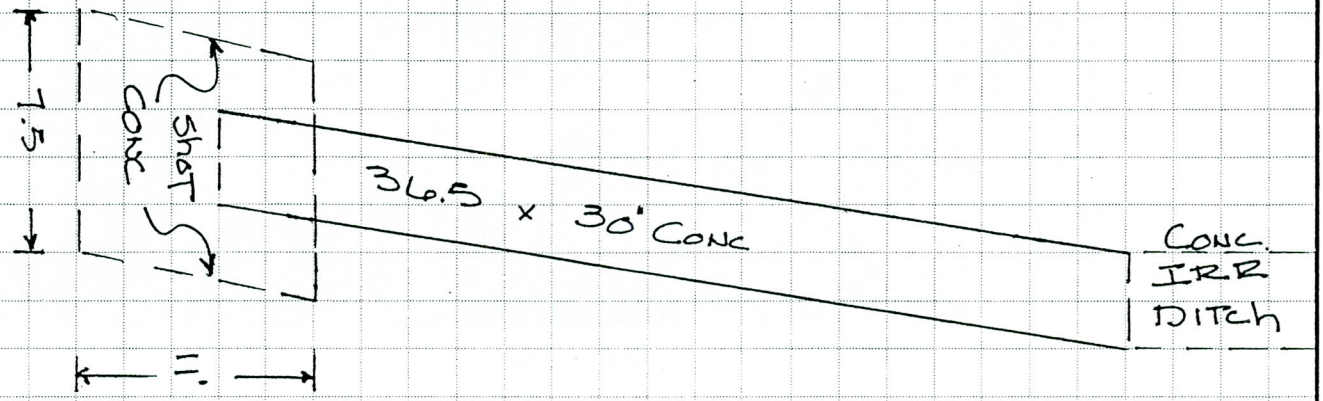
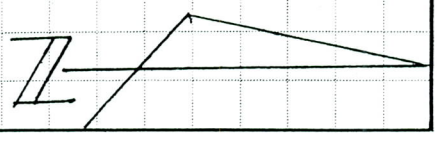


SECTION 10

PIPE

29' x 18" CONC.



SECTION 10

SECTION 10

10A

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
1813	862348.7254	608802.5832	991.83	BS CHK.
1812	862369.2061	608836.2748	985.10	TP 24"PIPE
1811	862341.4007	608836.6579	983.94	TP 24"PIPE
1810	862340.7738	608802.7463	984.63	TP 30"PIPE
1809	862376.4793	608796.9738	986.02	TP 30"PIPE
1808	862696.3984	608767.5044	984.38	EG
1807	862586.4321	608770.7679	984.46	EG
1806	862479.9222	608778.3099	984.60	EG
1805	862380.4939	608782.7582	984.47	TOE
1804	862369.0637	608784.3460	986.17	EOR
1802	862337.5338	608786.4352	981.16	EOW
1803	862345.7433	608786.1884	986.63	TOP BANK
1801	862335.2630	608785.6439	979.77	TOE

SECTION 11

SOUTH – NORTH.

SECTION 11

SECTION 11

11A

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
1821	862675.5724	609467.8077	985.97	EG
1820	862574.1984	609463.2850	985.83	EG
1819	862468.2262	609464.6490	985.74	EG
1818	862364.4795	609463.2821	985.81	EG
1817	862321.0201	609462.1162	986.25	EOR
1816	862295.9142	609461.3693	987.06	TOP BANK
1815	862288.7679	609461.3371	981.24	EOW
1814	862287.0382	609460.9604	979.96	TOE

SECTION 12

SOUTH — NORTH.

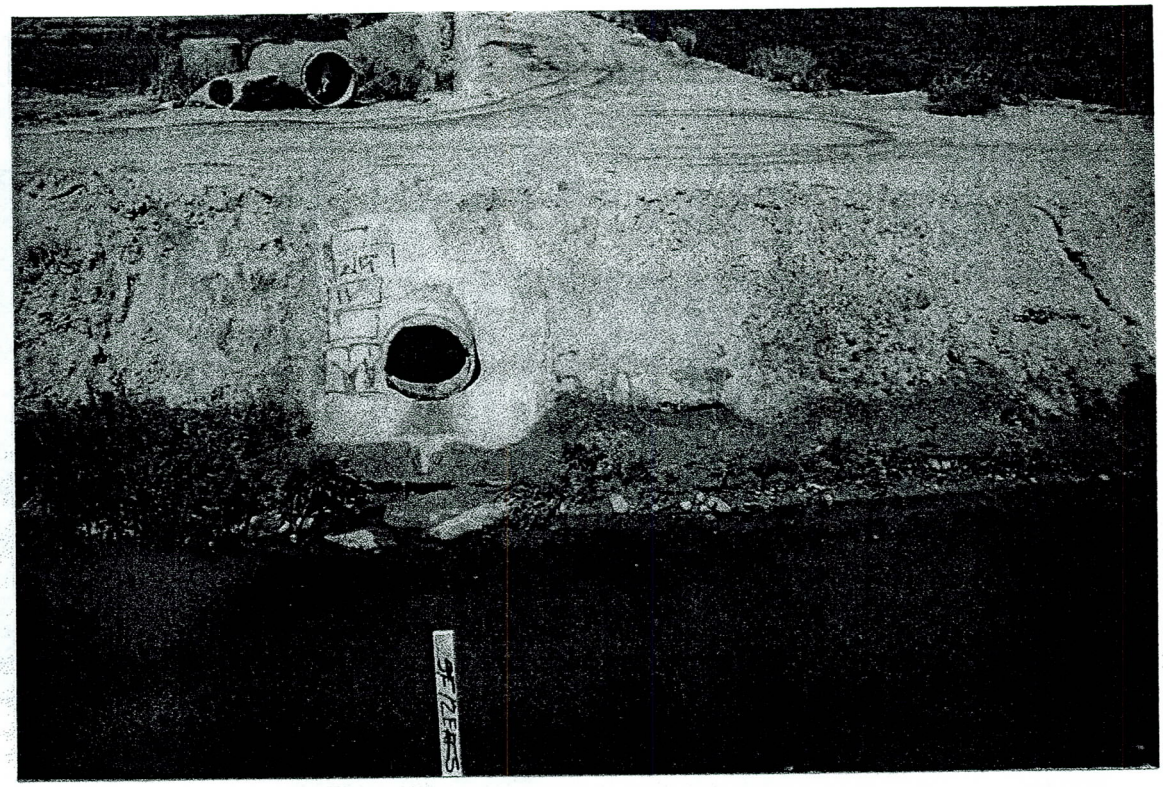
SECTION 12

NORTH – SOUTH

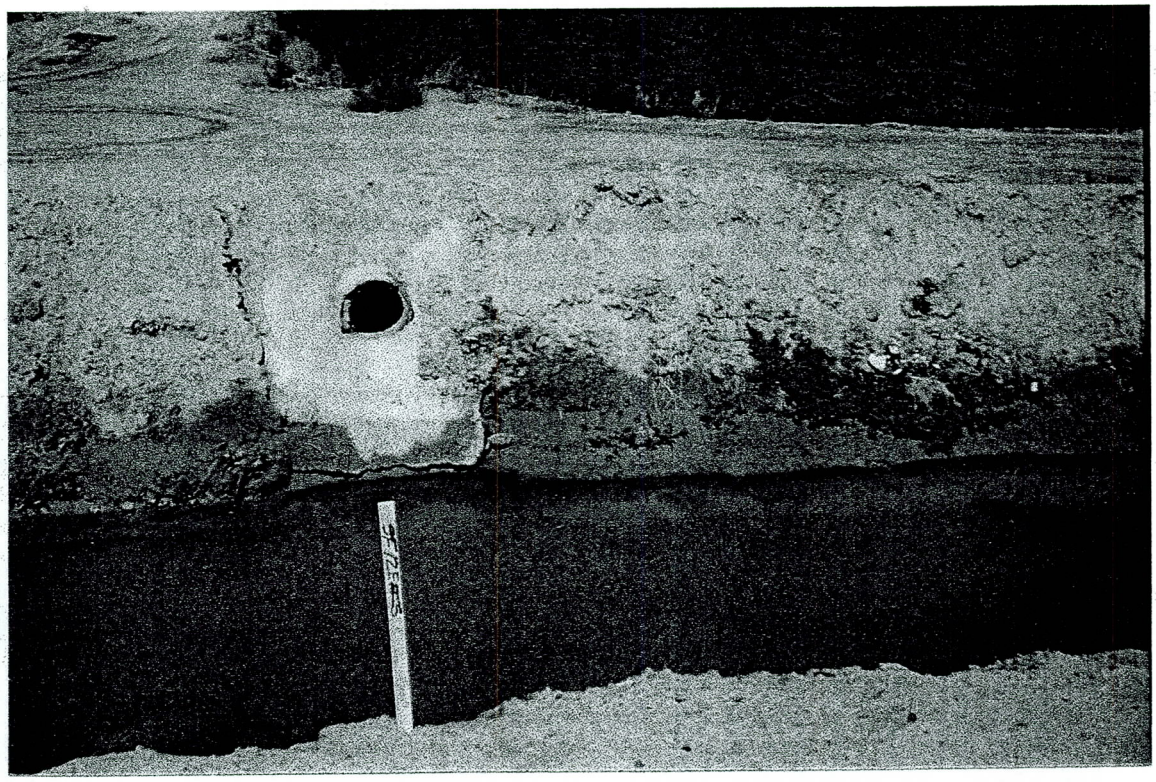
24" METAL EAST.

SECTION 12
NORTH-SOUTH
30" CONC. WEST

SECTION 12
SOUTH-NORTH
30" CONC. WEST



SECTION 12
SO – NO
30" CONC
WEST



SECTION 12
SO – NO
24" CONC
EAST.

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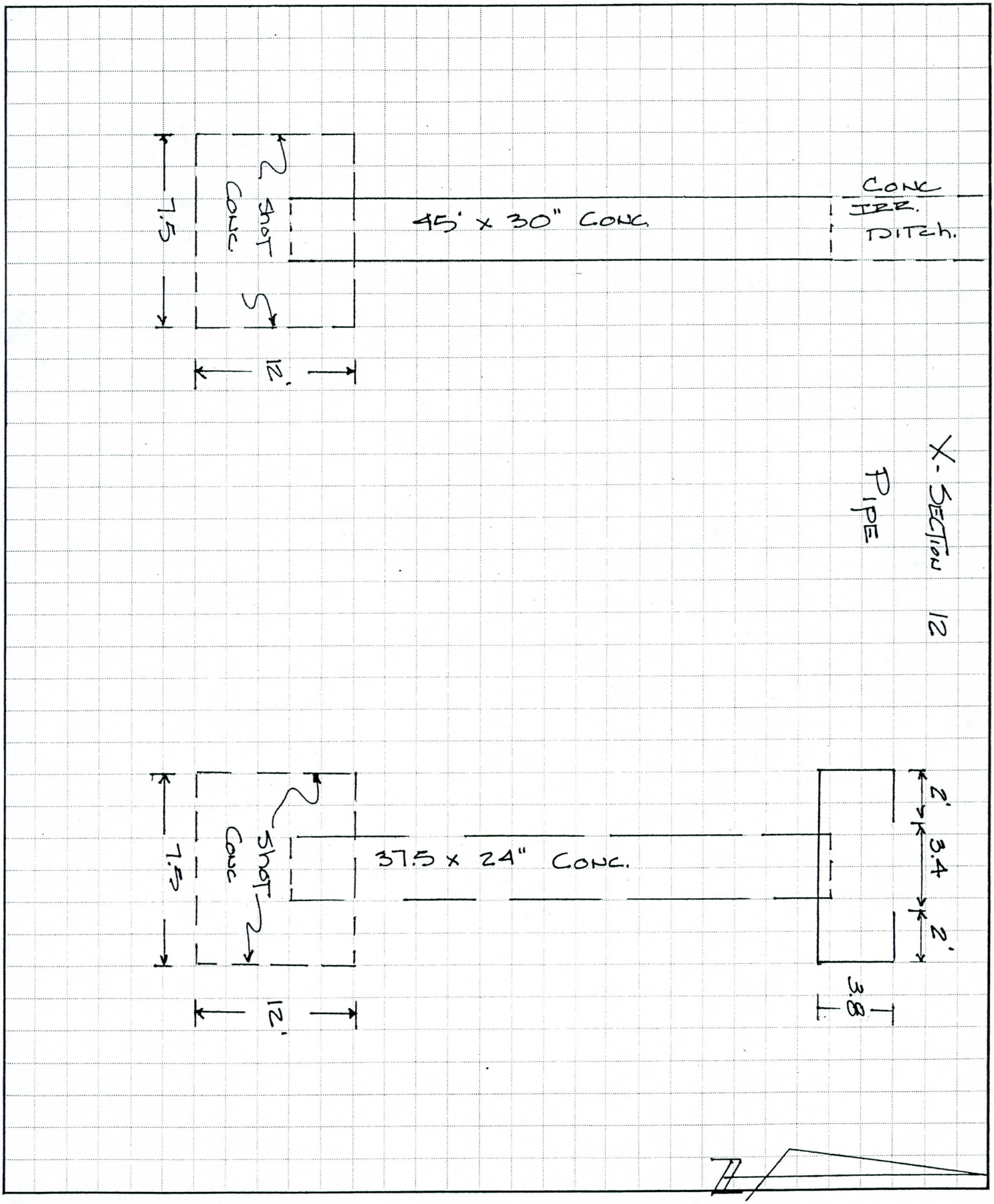

SECTION 12

SECTION 12

12A

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
1833	862290.6573	610079.8691	986.55	TP 24"PIPE
1832	862327.7491	610079.4362	986.99	TP 24"PIPE
1831	862288.1157	610051.3837	985.93	TP 30"PIPE
1830	862332.7003	610050.7216	986.96	TP 30"PIPE
1829	862648.5340	610023.9423	986.56	EG
1828	862552.1717	610025.5391	986.39	EG
1827	862449.0676	610029.0023	986.41	EG
1826	862345.7302	610029.7746	986.56	TOE
1825	862312.4981	610032.0128	988.33	EOR
1824	862294.0198	610032.0113	988.97	TOP BANK
1823	862283.8863	610032.7839	981.27	EOW
1822	862282.0256	610032.5941	979.77	TOE

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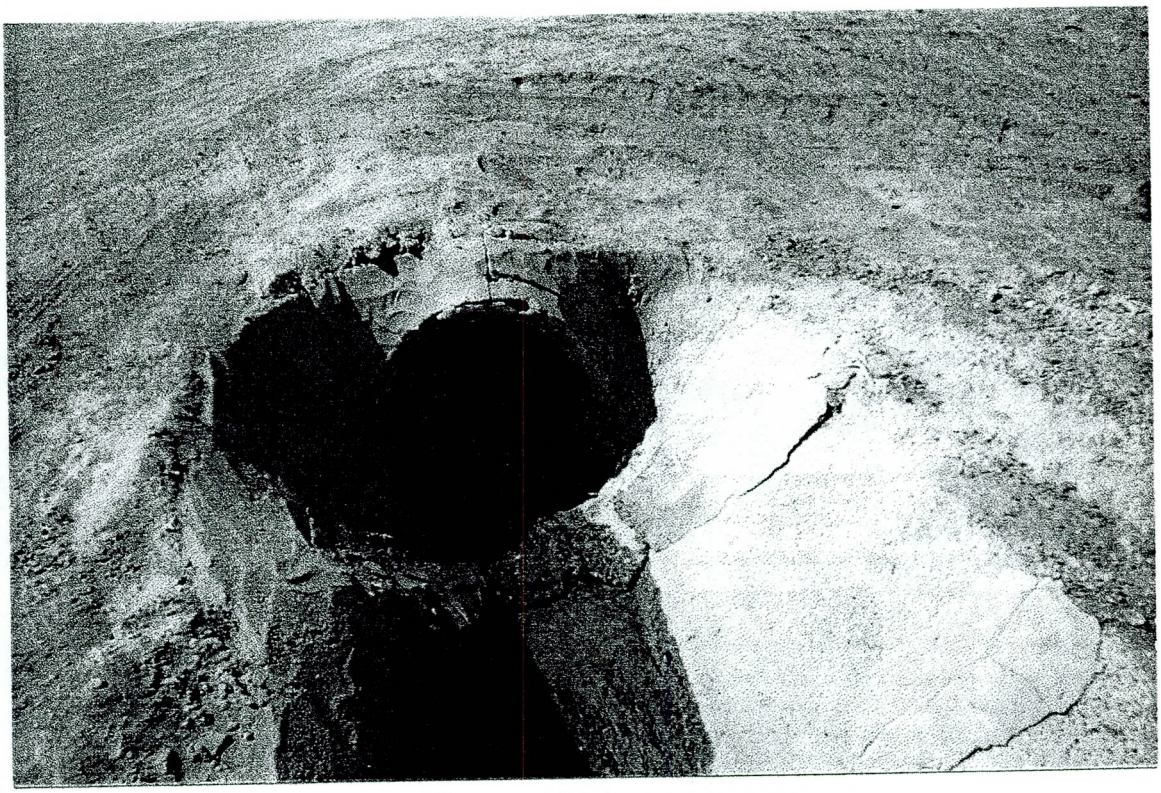
SECTION 13

SOUTH — NORTH

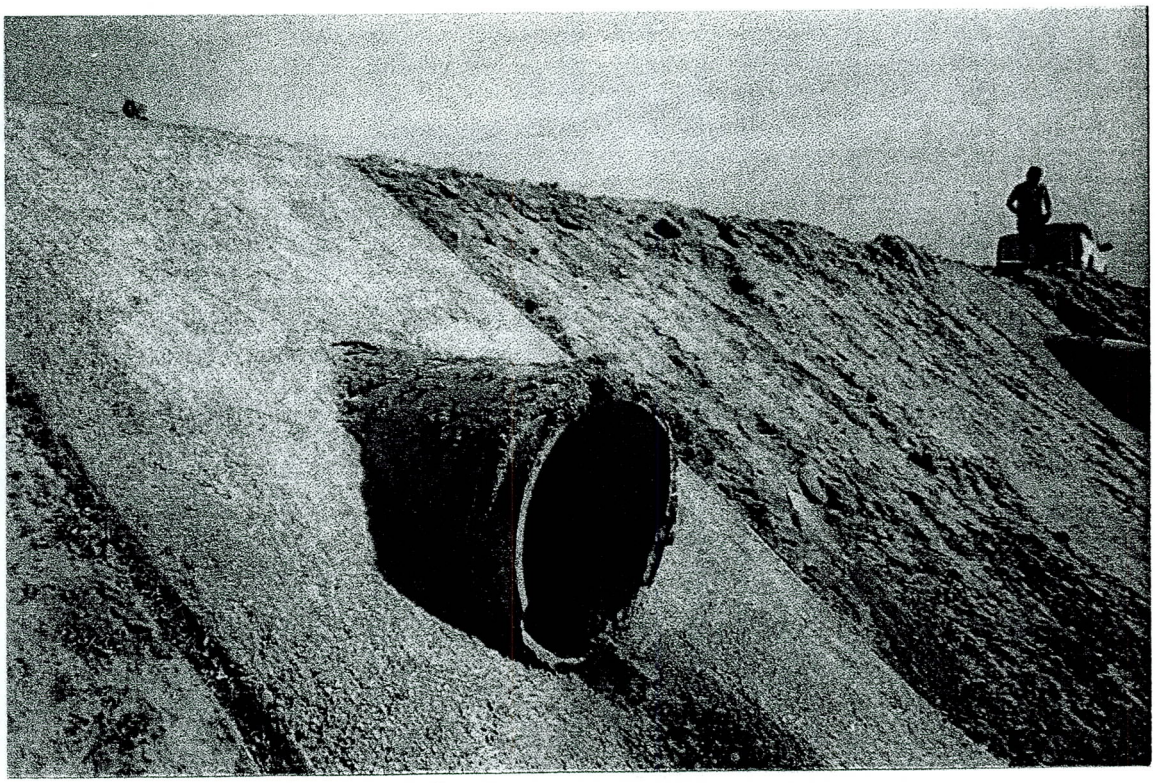
SECTION 13

SOUTH BANK

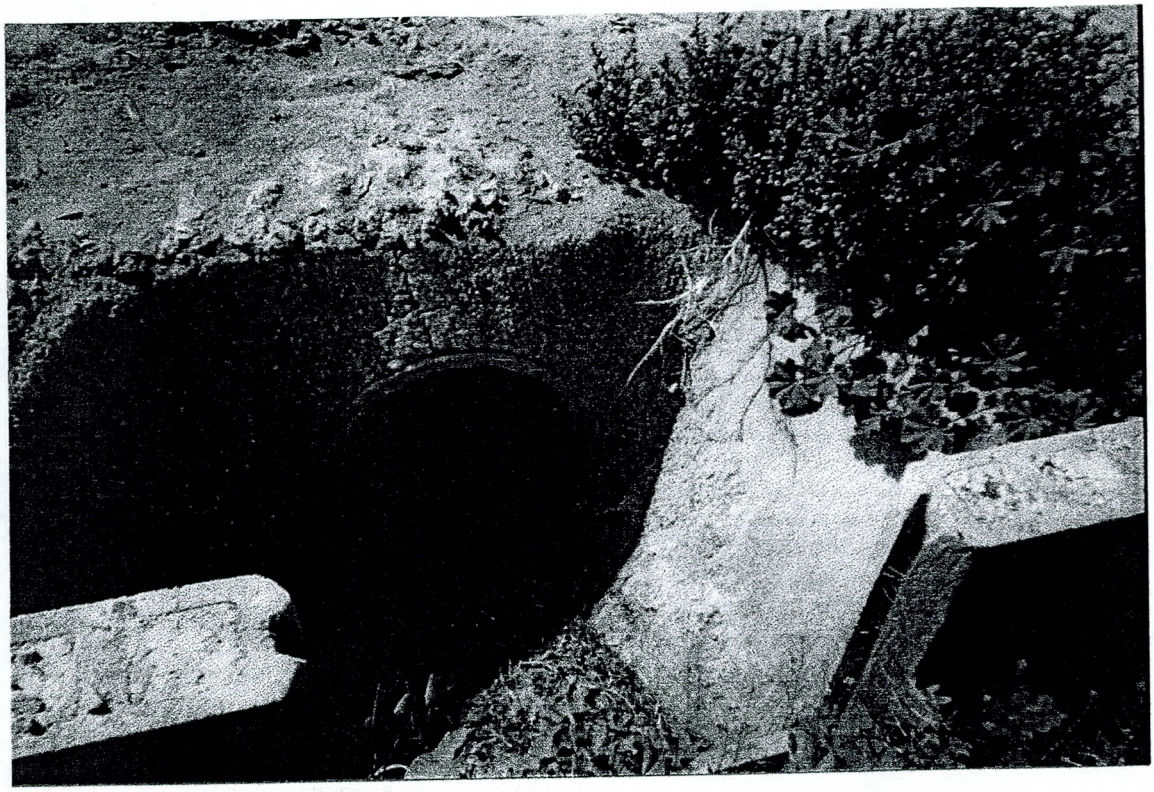
30" CONC.



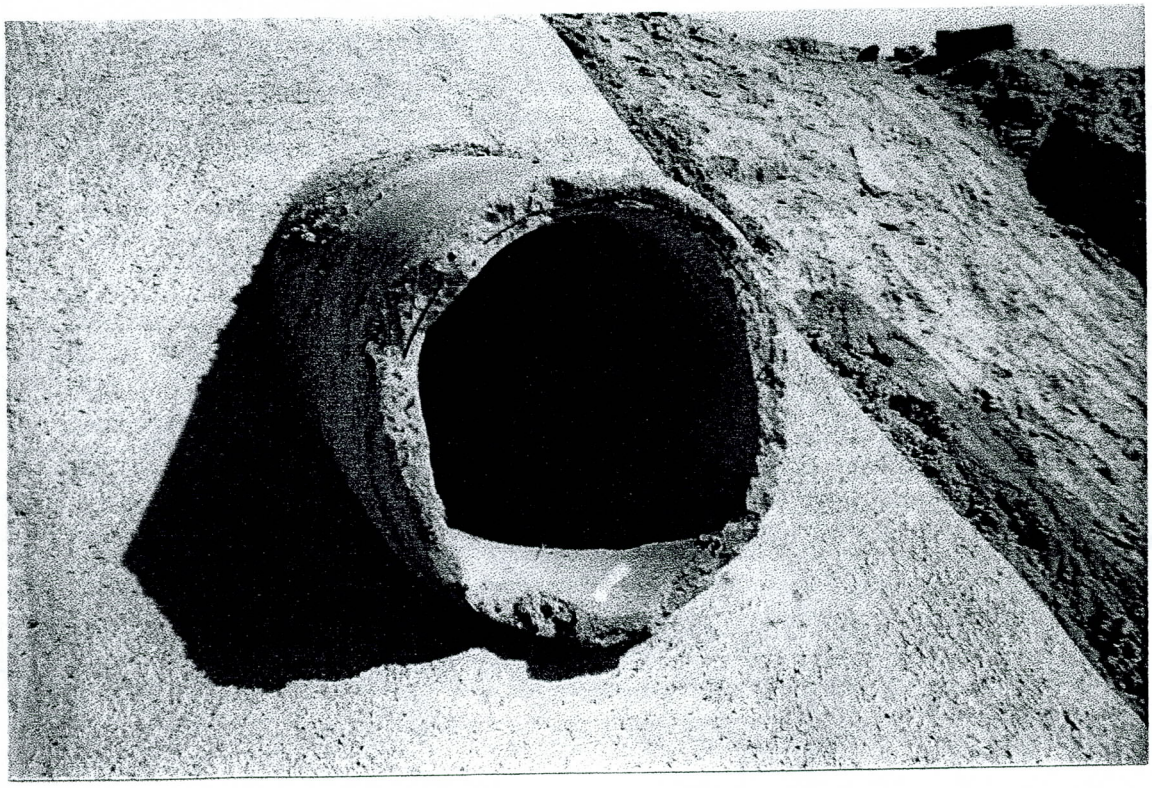
SECTION 13
NORTH – SOUTH
30" CONC. WEST



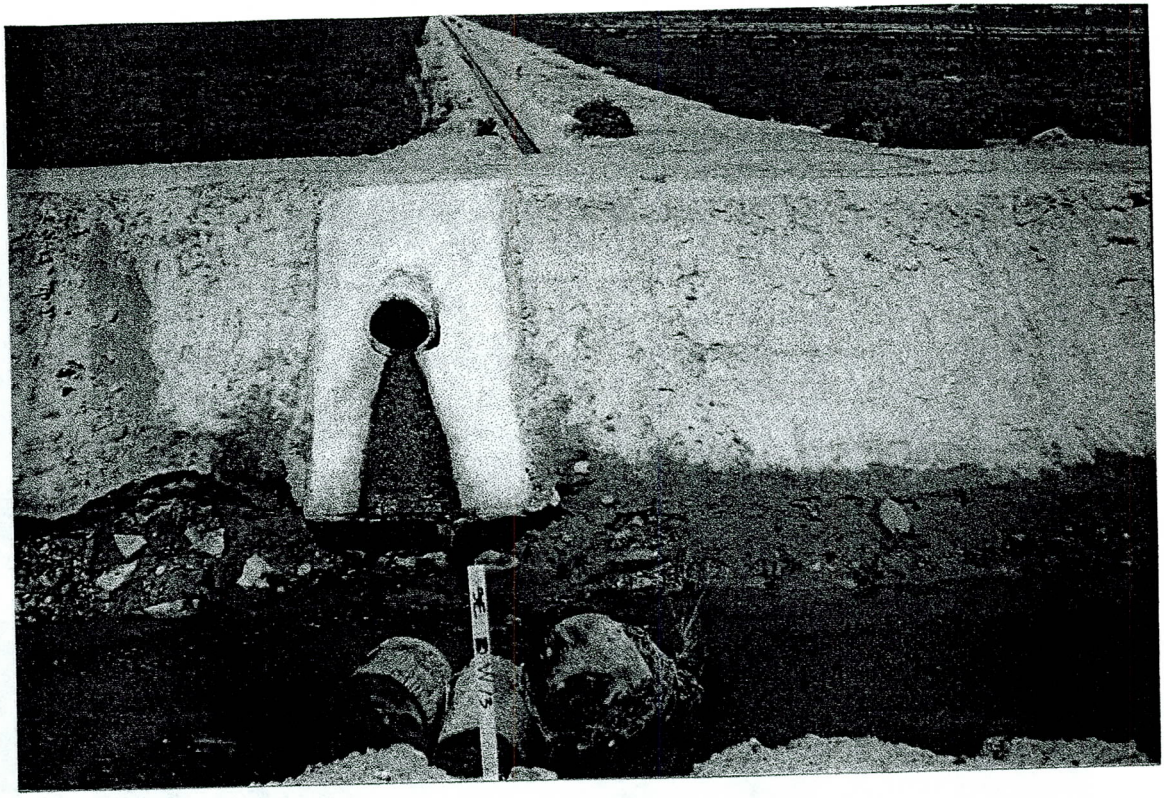
SECTION 13
SOUTH – NORTH
30" CONC. WEST



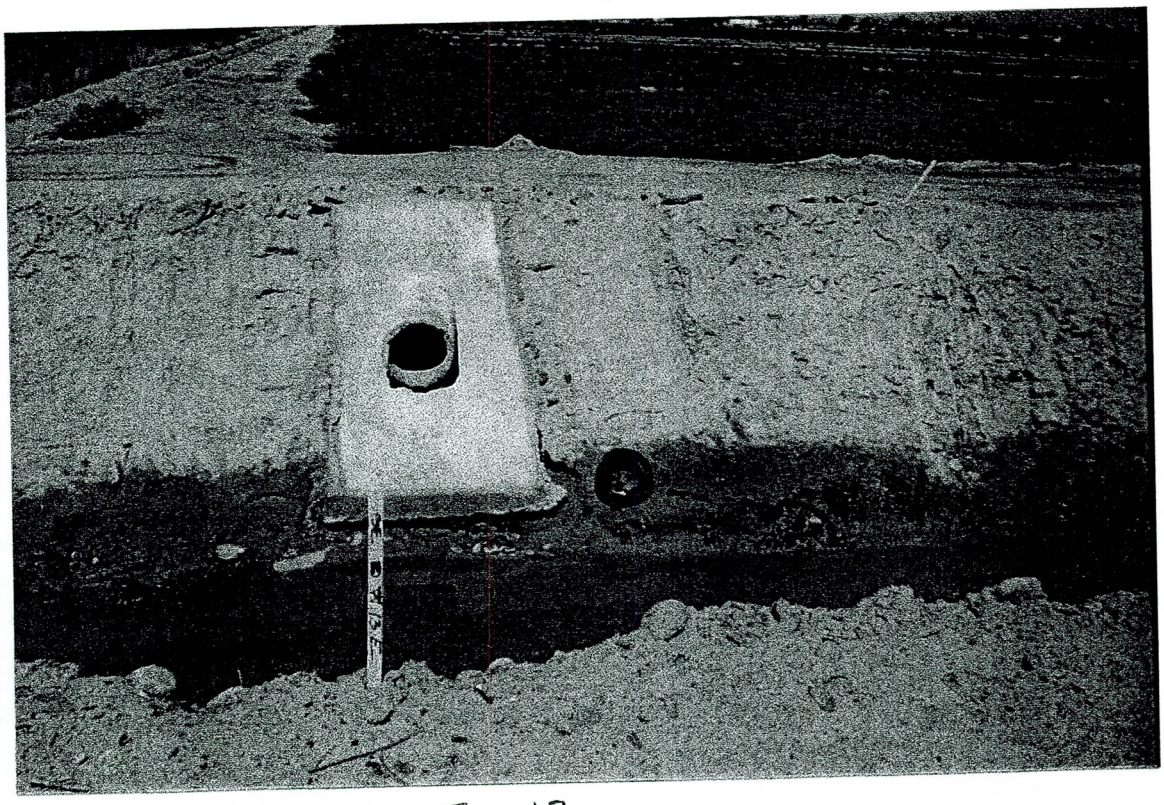
SECTION 13
NORTH - SOUTH.
24" CONC. EAST.



SECTION 13
SOUTH - NORTH.
24" CONC. —



SECTION 13
SO – NO
30" CONC
WEST.



SECTION 13
SO – NO
30" CONC
EAST.

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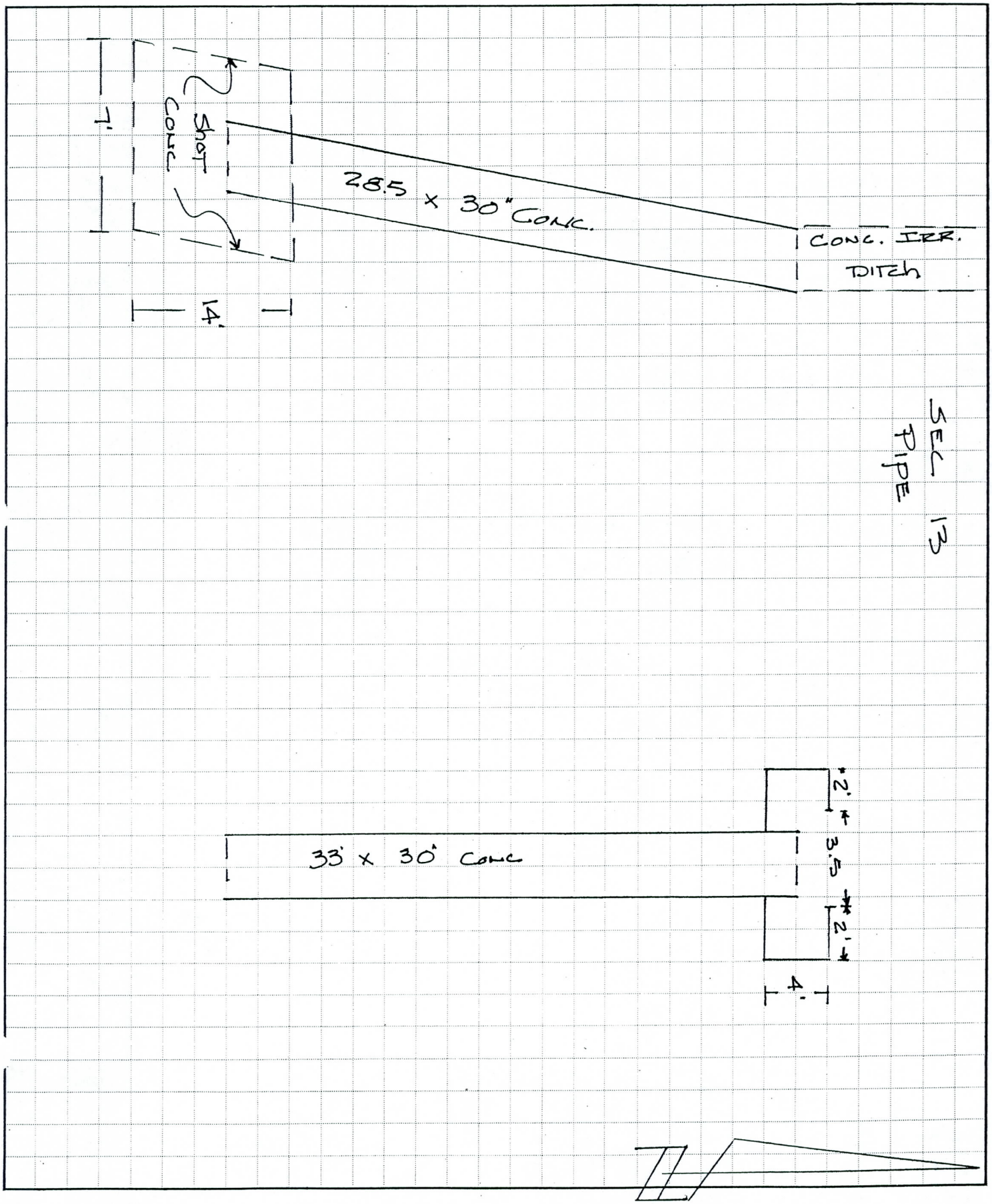


SECTION 13

SECTION 13

13A

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
1845	862304.9152	611388.0010	988.28	TP 24"PIPE
1844	862337.3255	611389.3779	989.25	TP 24"PIPE
1843	862305.4195	611355.5448	989.11	TP 30"PIPE
1842	862332.5957	611359.5511	989.96	TP 30"PIPE
1841	862652.1737	611411.2328	988.83	EG
1840	862545.5678	611411.5076	988.75	EG
1839	862441.0575	611409.6952	988.55	EG
1838	862340.4459	611406.6189	989.13	TOE
1837	862332.0135	611406.7510	990.47	EOR
1836	862310.9038	611407.4749	991.29	TOP BANK
1835	862298.4962	611407.4671	981.48	EOW
1834	862296.1006	611407.7075	980.60	TOE

SECTION 14A

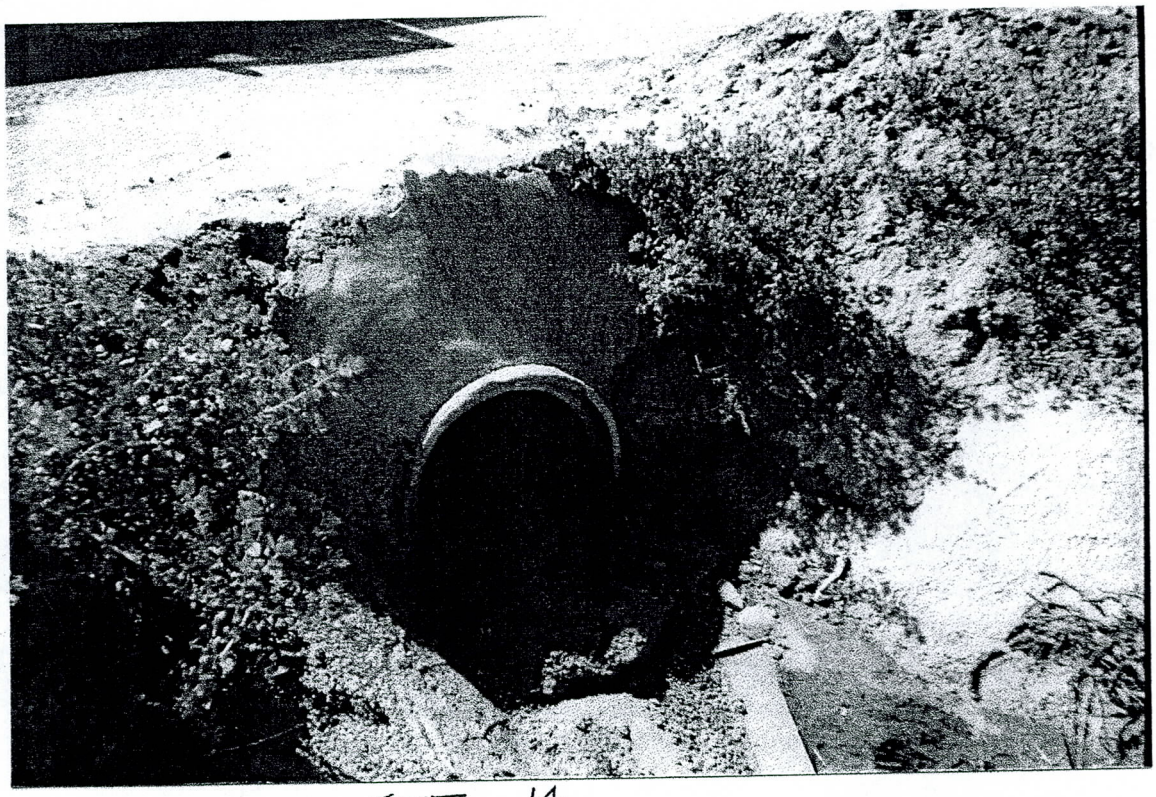
SOUTH – NORTH

SECTION 14A

NORTH – SOUTH.

SECTION 14B
SOUTH – NORTH.

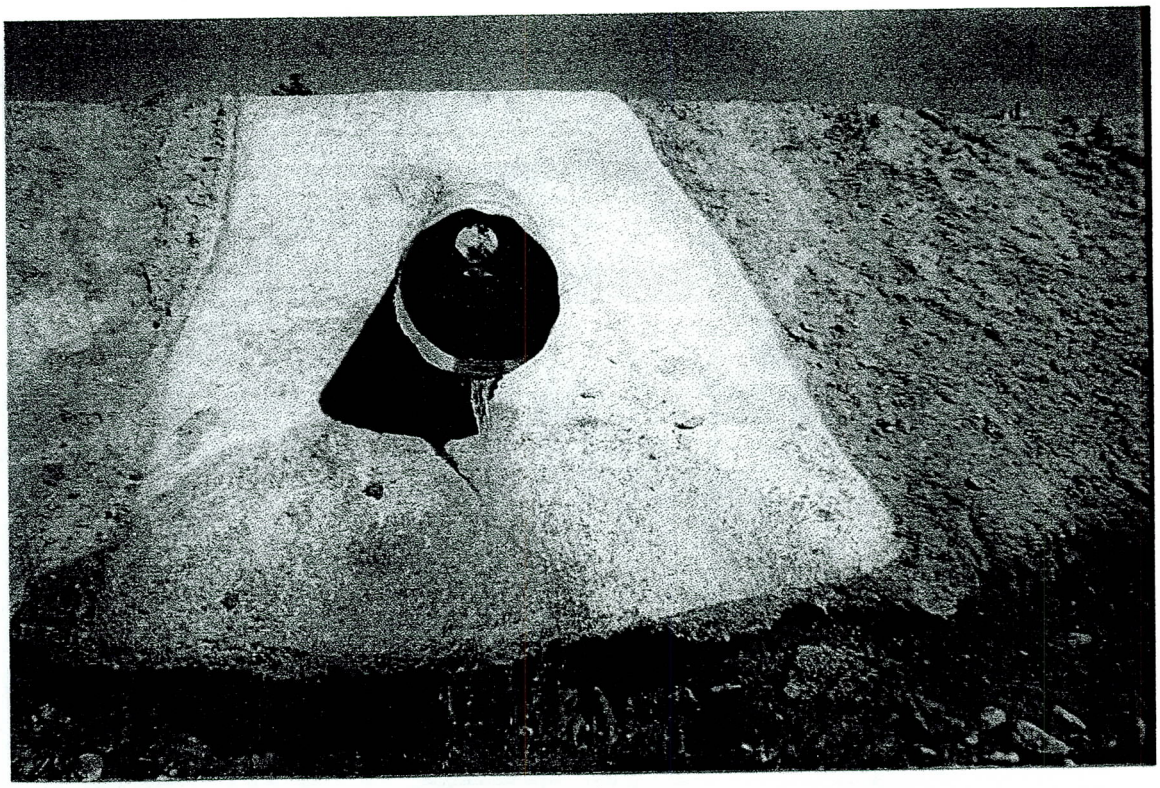
SECTION 14B
NORTH – SOUTH.



SECTION 14
NORTH - SOUTH.
24" CONC.
EAST.

SECTION 14
SOUTH - NORTH
24" CMP
EAST

SECTION 14
24" CONC.
NORTH – SOUTH.
WEST.



SECTION 14
SOUTH – NORTH
24" CMP
WEST.

SECTION 14 SO. BANK.

SOUTH — NORTH.

24" CONC

WEST.

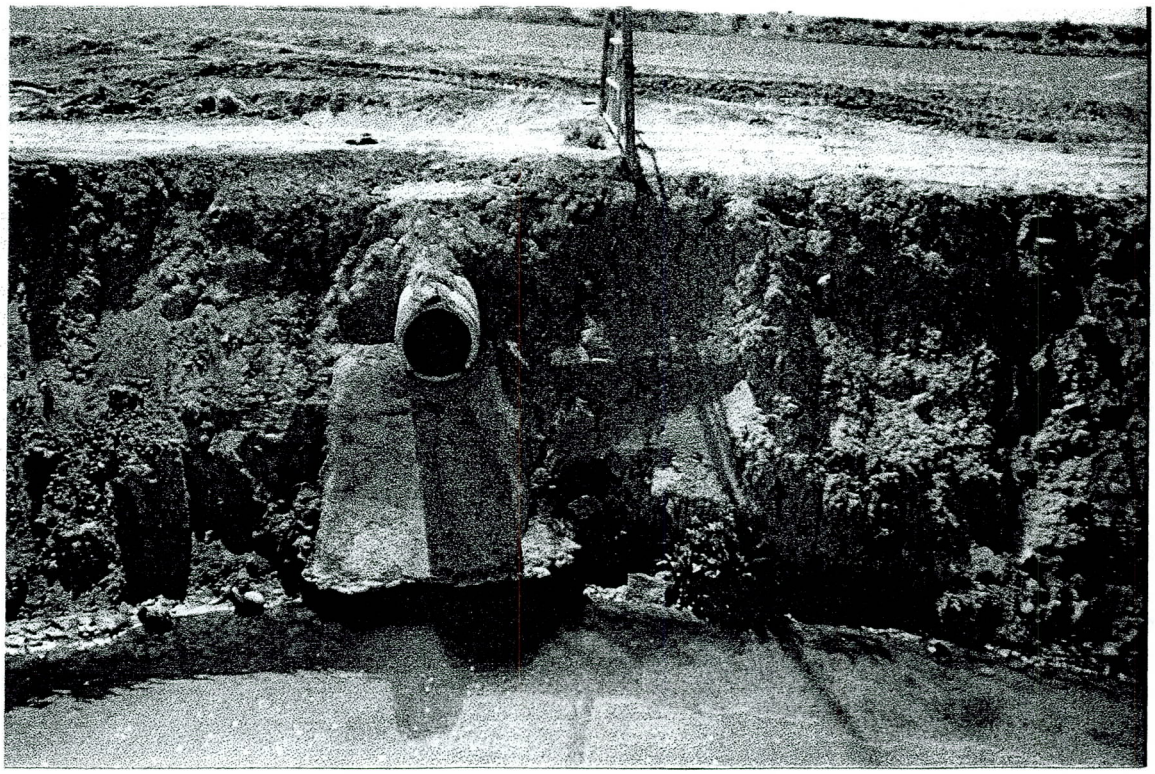
SECTION 14 SO. BANK

NORTH — SOUTH

24" CMP

WEST

SECTION 14 SO. BANK
SOUTH — NORTH
30" CONC
EAST

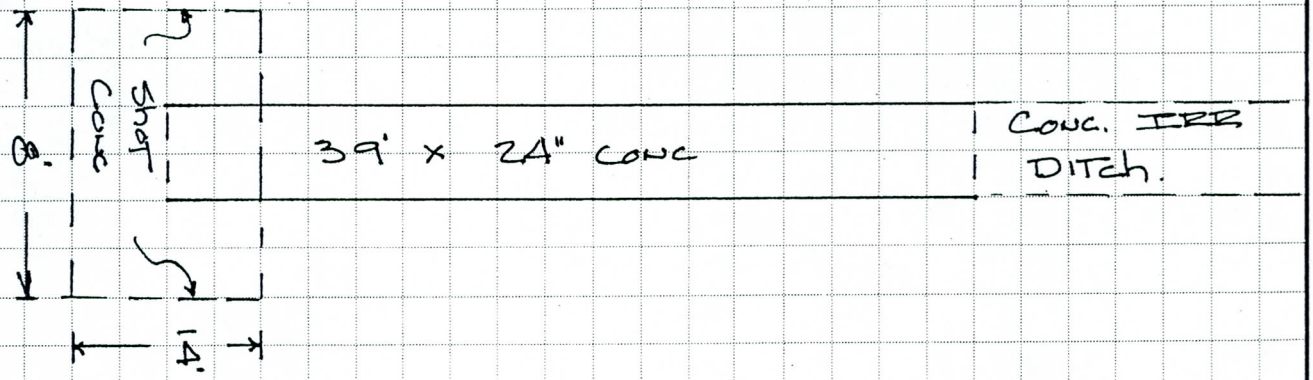


SECTION 14 SO. BANK
NORTH — SOUTH
30" CONC

MORRISON MAIERLE, INC.
An Arizona Corporation
120 North 44th Street • Suite 410 • Phoenix, AZ 85034 • 602-244-9662 • Fax 602-244-9472

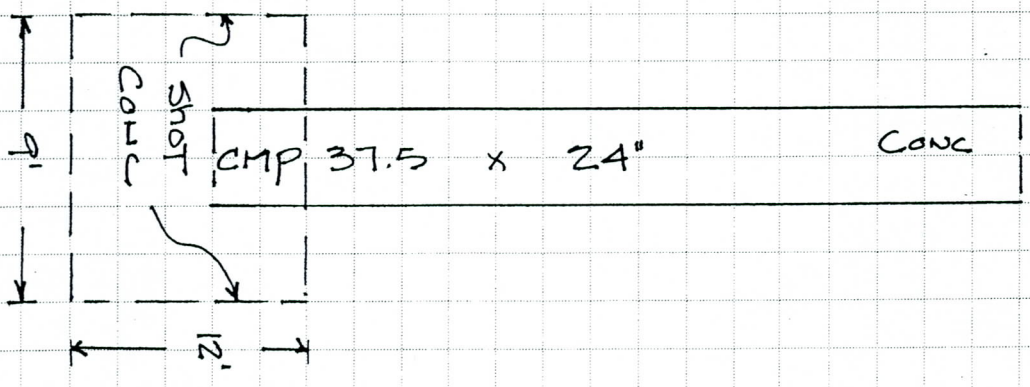
ENGINEERS
PLANNERS
SURVEYORS

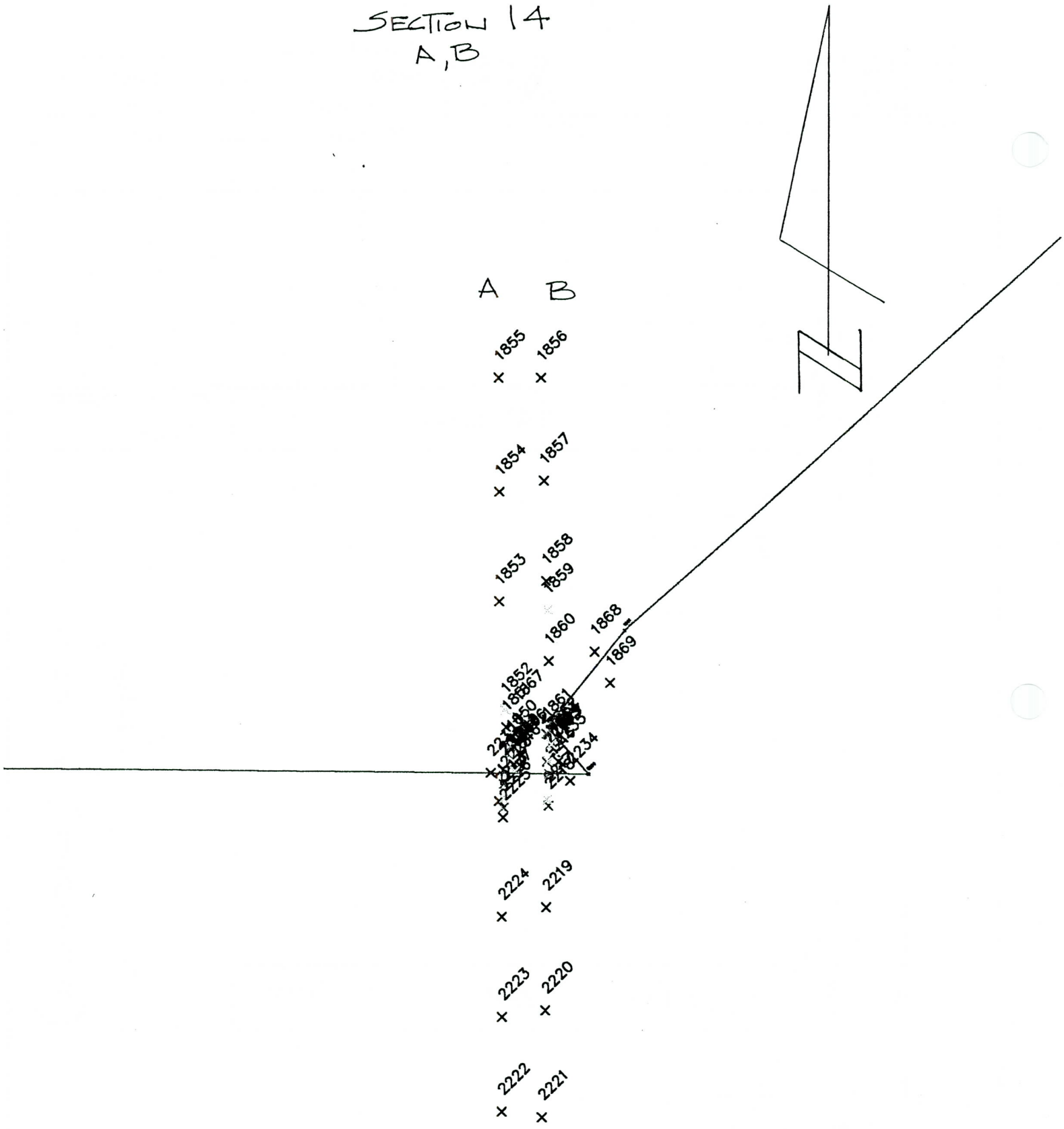
PROJECT _____
PROJECT NO. _____ SHEET ___ OF ___
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____



SEC 14 (North Bank)

PIPE




SECTION 14
A, B
A
B
1855
1856
1854
1857
1853
1858
1859
1860
1868
1869
1852
1867
1850
1861
1234
2224
2219
2223
2220
2222
2221

14A

Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2222	861965.0287	612602.8521	996.82	EG
2223	862059.8422	612602.6657	995.89	EG
2224	862159.8336	612602.2052	996.02	EG
2225	862259.5191	612603.0178	995.82	EG
2226	862269.0851	612603.4846	996.60	TOP BANK
2227	862278.6625	612604.0316	994.76	TOE BANK
2228	862292.8424	612603.6753	994.66	TOP BANK
2229	862304.7676	612602.4327	984.19	TOE
2230	862307.1624	612602.4780	983.57	EOW
2231	862307.8774	612602.7193	983.38	BOTTOM
1847	862312.7614	612613.5353	983.32	CL CHANNEL
1848	862315.8346	612612.9548	983.41	TOE
1849	862317.0002	612612.8372	983.71	EOW
1850	862330.1759	612610.1203	992.76	TOP BANK
1851	862350.0699	612605.7817	992.00	EOR
1852	862367.5457	612604.9347	990.66	TOE
1853	862475.8838	612598.4207	990.36	EG
1854	862585.6583	612598.4778	990.36	EG
1855	862699.0488	612597.2389	990.44	EG

Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2221	861959.6813	612643.3577	996.43	EG
2220	862066.5939	612646.3604	996.48	EG
2219	862169.2133	612646.8108	996.42	EG
2216	862302.9734	612649.5075	994.65	TOP BANK
2215	862315.3016	612647.2600	983.71	EOW
2214	862315.9685	612648.3348	983.20	TOE
1864	862326.3737	612653.7310	983.10	TOE
1863	862328.7013	612653.5550	983.76	EOW
1862	862332.9955	612651.6808	984.02	TOE
1861	862343.4052	612646.5294	993.47	TOP BANK
1860	862416.8285	612648.6612	992.11	EOR
1859	862467.2926	612647.2931	990.71	TOE
1858	862496.6416	612645.7354	990.66	EG
1857	862597.0239	612643.2482	990.69	EG
1856	862699.2175	612640.0498	990.86	EG

14C

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

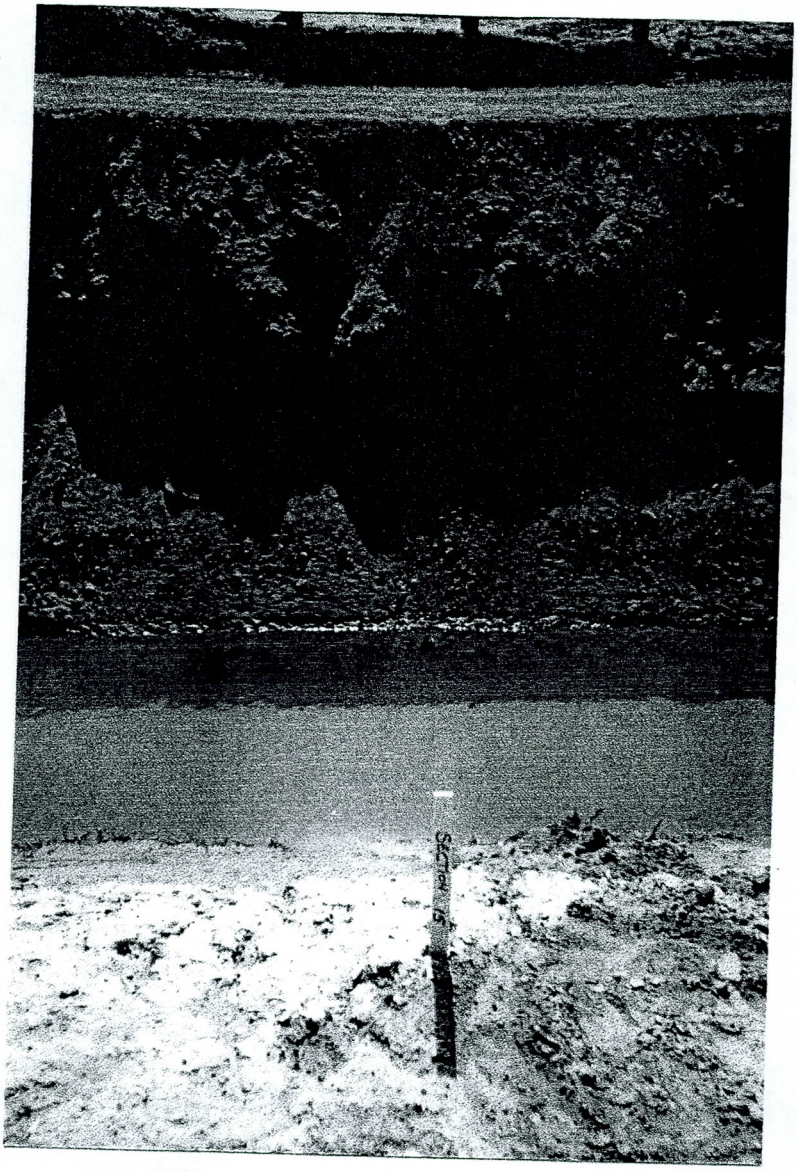
Point	Northing	Easting	Elevation	Description
1869	862394.7485	612710.0009	987.99	TP 24"CMP
1868	862425.9917	612694.4889	991.41	TP 24"PIPE
1867	862359.8247	612617.3963	991.30	TP 24"CMP
1866	862321.5417	612621.0525	990.15	TP 24"CMP

Point statistics:

Starting point number: 1

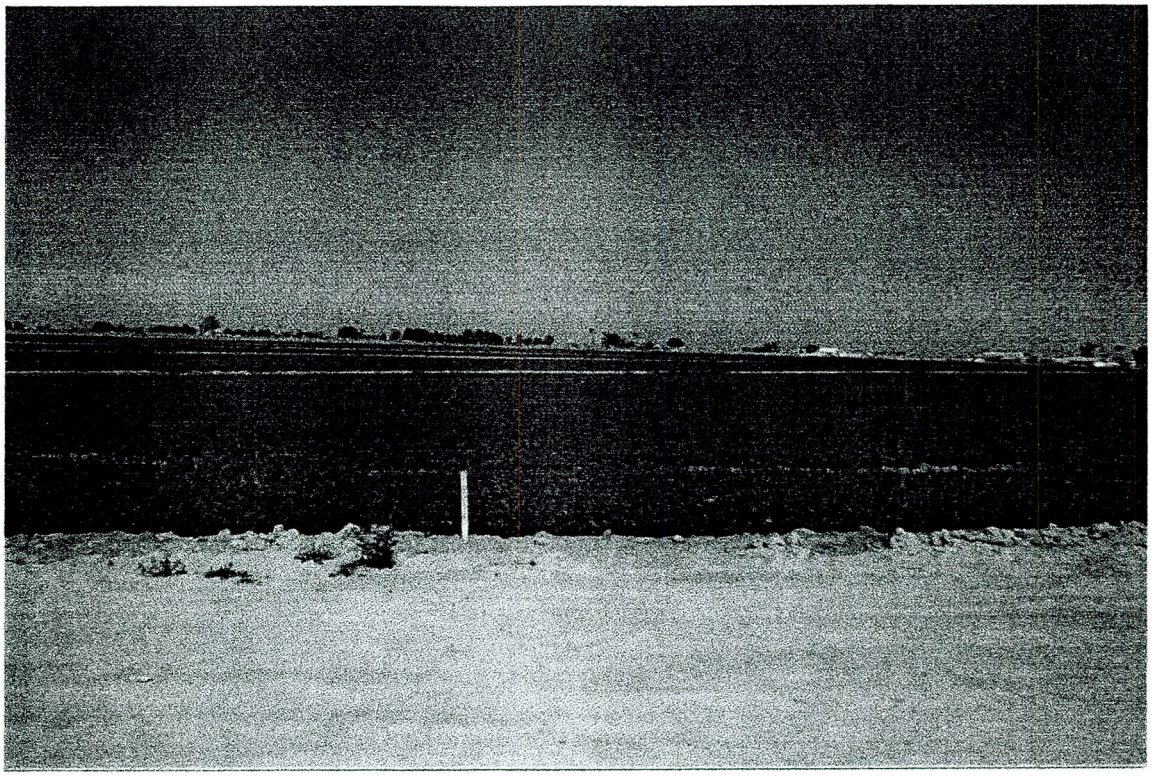
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2235	862315.5368	612658.5667	991.22	TP 24"PIPE
2234	862296.2126	612670.5150	990.47	INV. 24"PIPE
2233	862275.7759	612598.9069	993.04	TP 24"PIPE
2232	862304.1686	612590.4791	989.67	TP 24"CMP



SECTION 15A

N.W. — S.E.

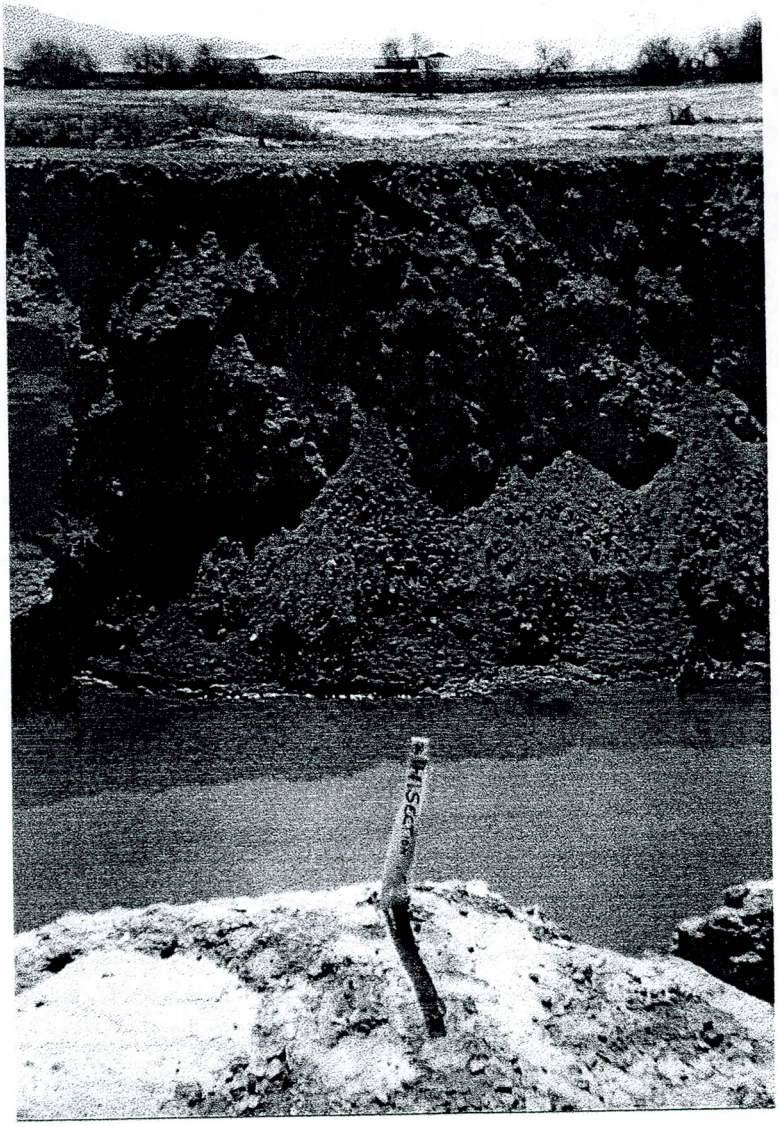


SECTION 15A

S.E. — N.W.

SECTION 15A

N.W. — S.E.



SECTION 15B

N.W. — S.E.

SECTION 15B

S.E. — N.W.

SECTION 15B

N.W — S.E.

SECTION 15C

N.W — S.E.

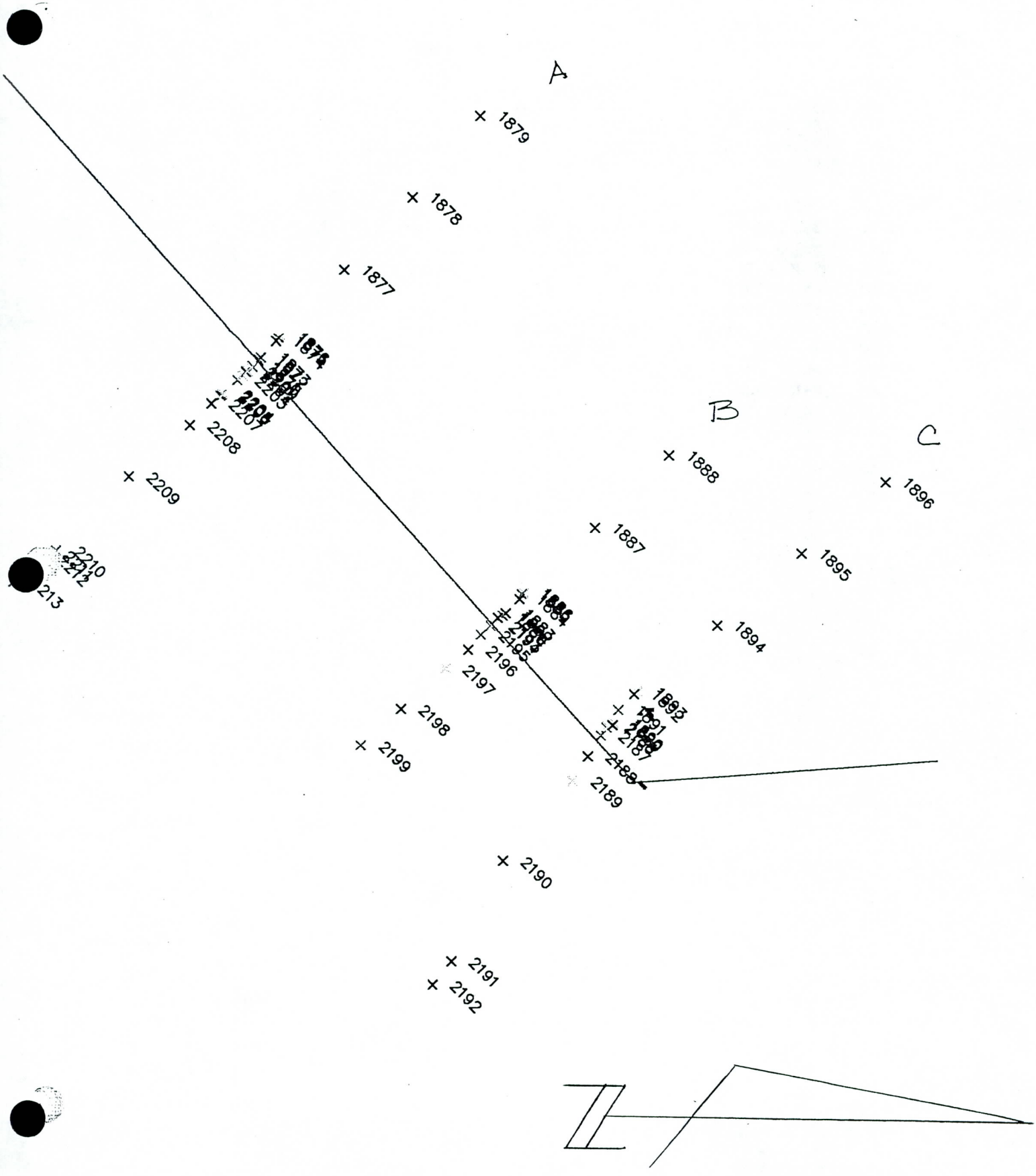
SECTION 15C

S.E. — N.W.

SECTION 15C

N.W. — S.E.

SECTION 15
A, B, C



A

Starting point number: 1
Current point number: 15 ('L' indicates locked point)

15A

Point	Northing	Easting	Elevation	Description
2213	862819.5216	613606.8245	993.09	EG
2212	862844.7211	613585.2796	993.36	TOP BANK
2211	862850.2640	613581.5857	992.45	CL V-DITCH
2210	862860.5665	613577.1266	994.89	TOP BANK
2209	862930.4296	613506.3547	993.91	EG
2208	862988.7738	613457.7189	992.28	EG
2207	863009.3508	613437.2599	993.55	GB
2206	863018.1940	613430.3351	996.11	FENCE LINE
2205	863019.7362	613429.1635	996.29	TOP
2204	863021.0009	613428.3925	994.26	TOE
2203	863034.6542	613415.3148	994.38	TOP
2202	863039.6173	613410.7009	986.64	TOE
2201	863042.9412	613407.3386	984.18	EOW
2200	863044.5483	613406.5511	983.14	TOE
1870	863048.2745	613403.7926	983.49	TOE
1871	863049.1706	613403.1900	983.89	EOW
1872	863055.2330	613396.9932	991.21	TOP BANK
1873	863057.3208	613394.9061	991.93	TOP BANK
1874	863071.9373	613379.3020	991.67	EOR
1875	863074.1825	613376.1306	991.90	TOP
1876	863075.6221	613375.0676	991.28	TOE
1877	863137.1687	613310.7306	991.15	EG
1878	863202.3471	613242.3479	991.22	EG
1879	863267.7090	613165.4784	991.34	EG

B

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2199	863154.3770	613764.2618	994.90	TOP
2198	863192.4094	613729.2401	994.17	EG
2197	863235.3219	613691.0380	992.97	TOE
2196	863257.2919	613672.7772	994.41	EOR
2195	863269.4882	613658.5495	995.09	TOP
2194	863279.0934	613650.1391	984.59	EOW
2193	863280.2755	613649.9898	983.43	TOE
1880	863285.8250	613642.7328	983.75	EOW
1881	863286.5804	613641.7813	984.99	TOE
1882	863290.4045	613640.4047	991.17	TOP BANK
1883	863293.2221	613638.3084	991.74	GB
1884	863306.3700	613624.9223	991.62	EOR
1885	863308.5856	613620.0552	992.24	TOP
1886	863310.4600	613618.8261	991.38	TOE
1887	863378.6581	613556.8243	991.52	EG
1888	863449.4992	613487.7616	991.56	EG

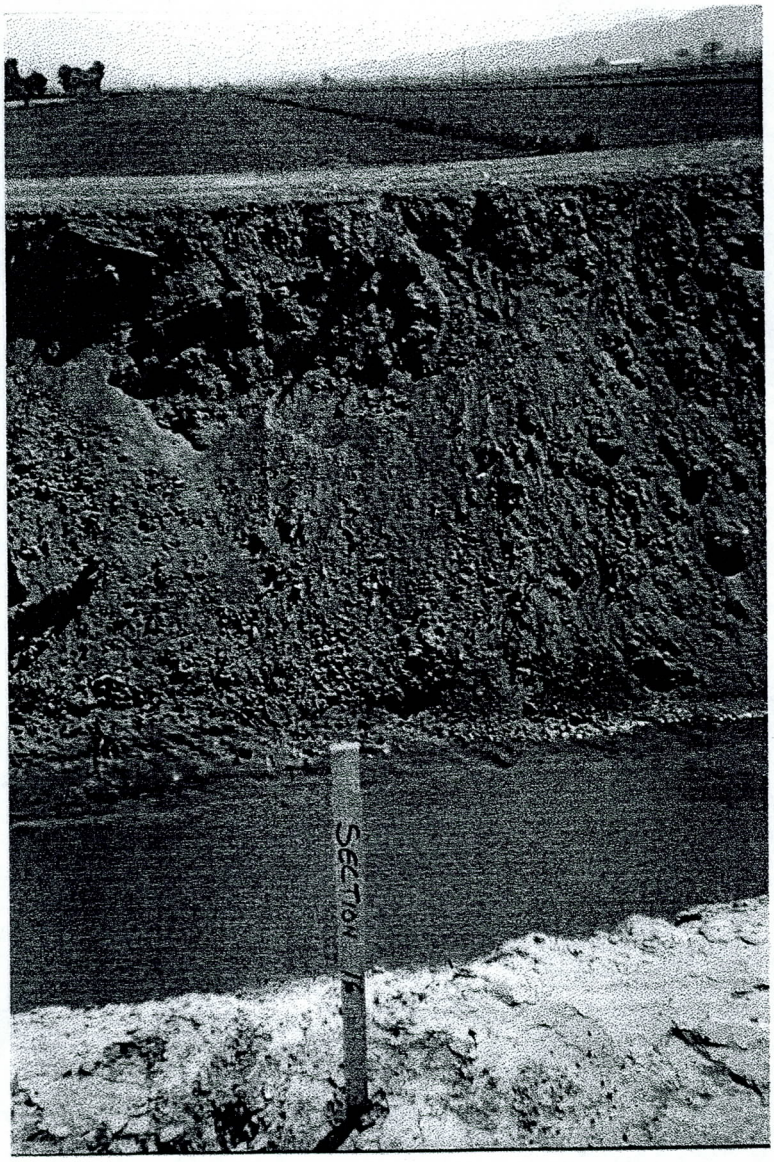
C

Point statistics:

Starting point number: 1

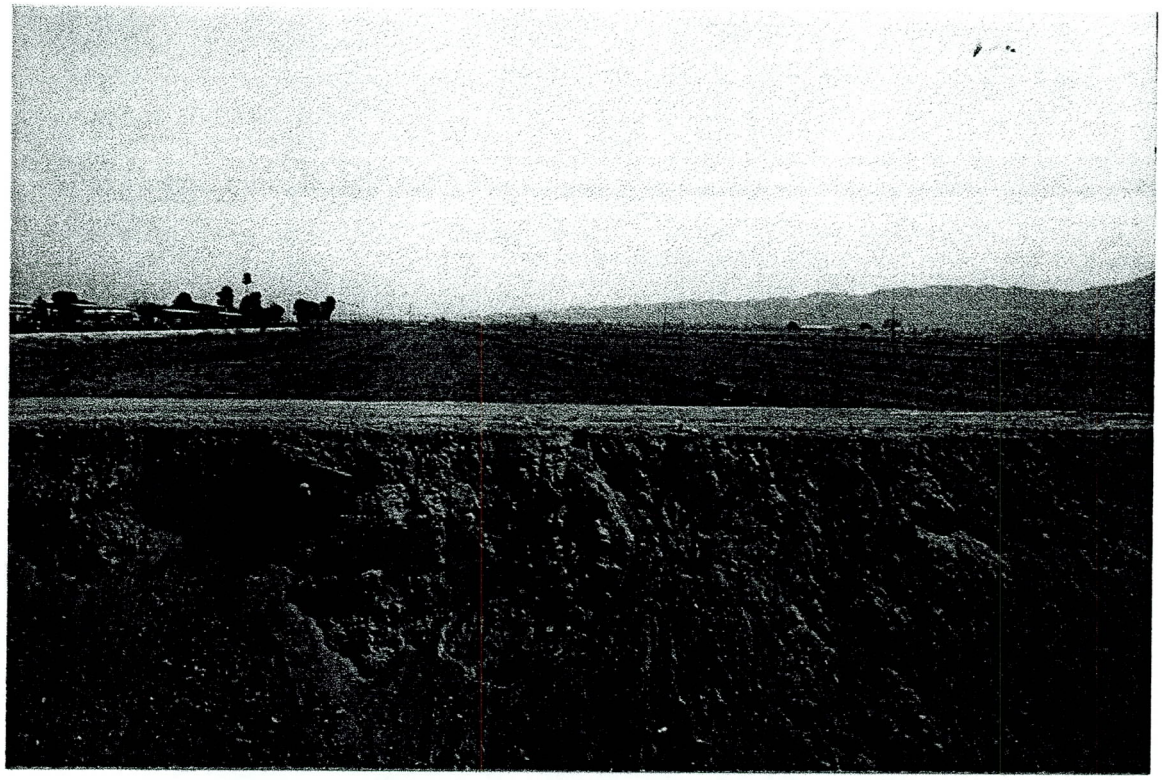
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2192	863223.9445	613991.8660	992.76	EG
2191	863241.9924	613969.4927	992.49	EG
2190	863291.4988	613874.4279	992.13	EG
2189	863358.3291	613798.4411	991.24	TOE
2188	863372.3828	613775.4219	993.82	EOR
2187	863384.6828	613755.2327	993.96	TOP
2186	863390.4467	613747.5173	984.40	EOW
2185	863391.1865	613746.6320	983.56	TOE
1889	863395.9090	613745.3515	983.49	CL CHANNEL
1890	863397.3007	613743.5855	984.15	TOE/EOW
1891	863401.4502	613730.7229	992.54	TOP BANK
1892	863416.6274	613715.8281	992.41	EOR
1893	863419.4074	613713.4915	991.92	TOE
1894	863495.9321	613650.3722	991.59	EG
1895	863577.8880	613582.4194	991.62	EG
1896	863658.7120	613514.2360	991.75	EG



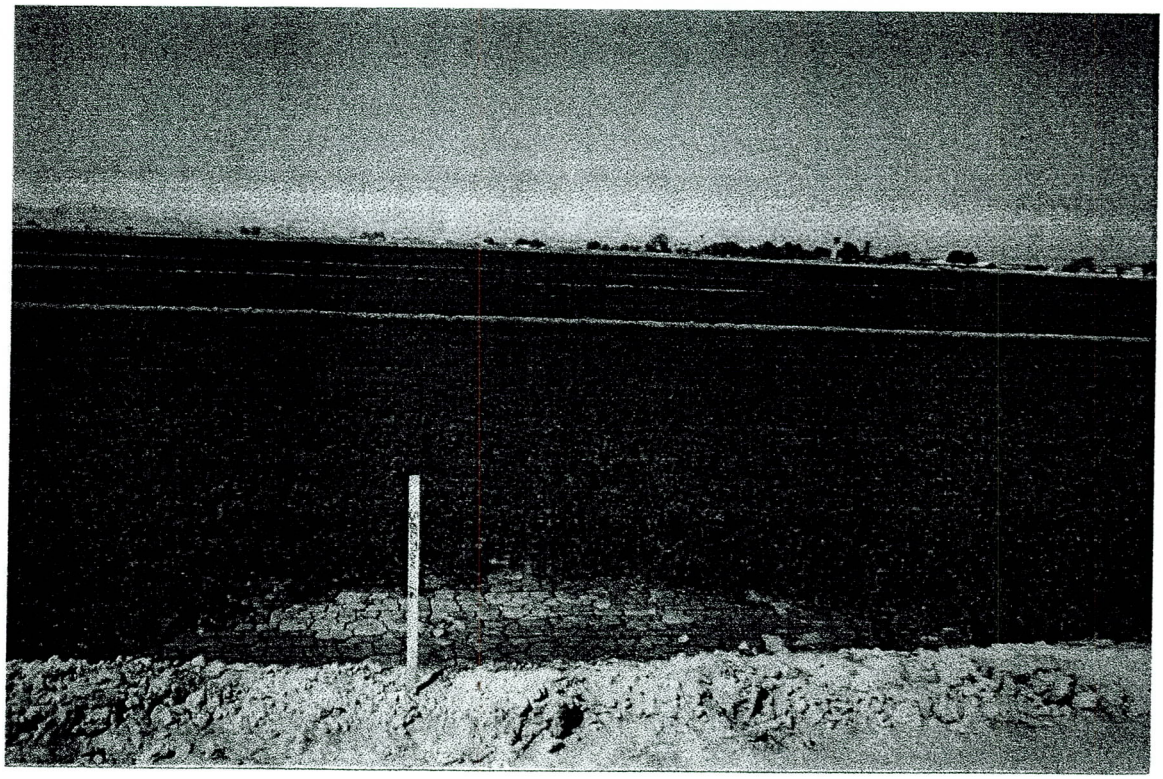
SECTION 16

EAST - WEST



SECTION 16

EAST – WEST



SECTION 16

EAST - WEST.

SECTION 16

× 1904

× 1903

× 1902

× 2182

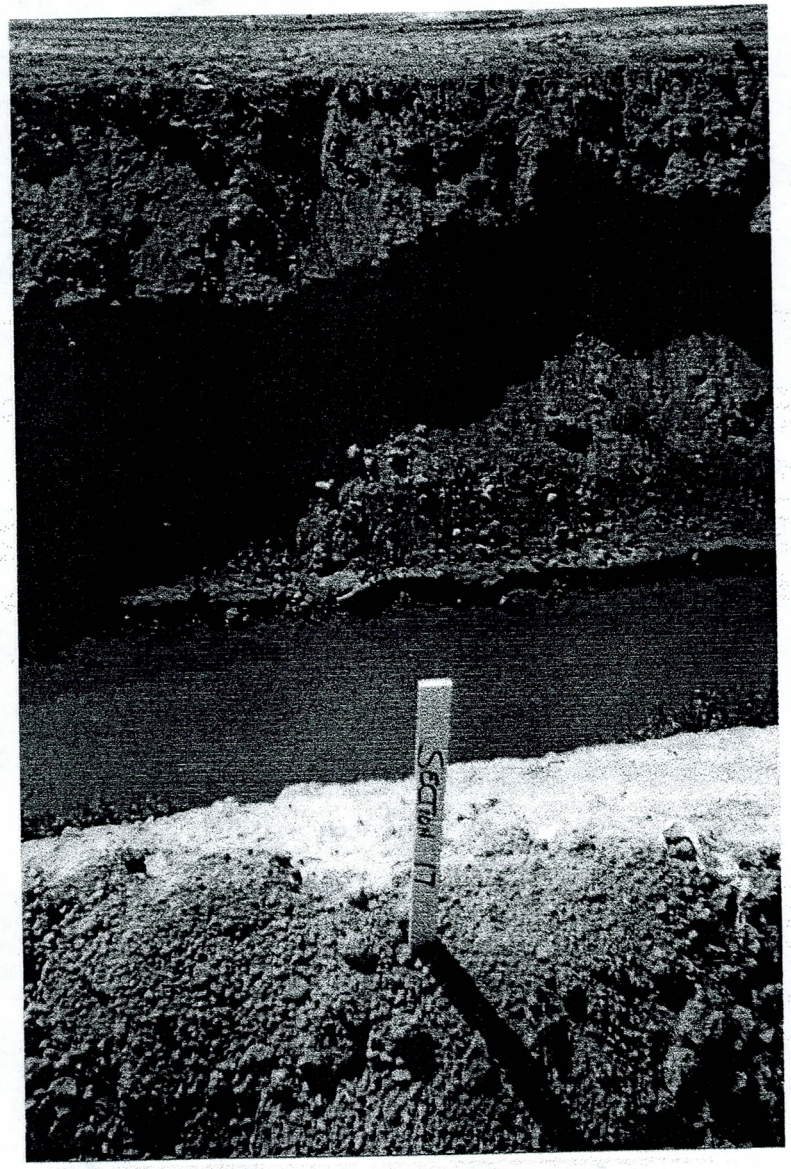
× 2183

× 2184

16A

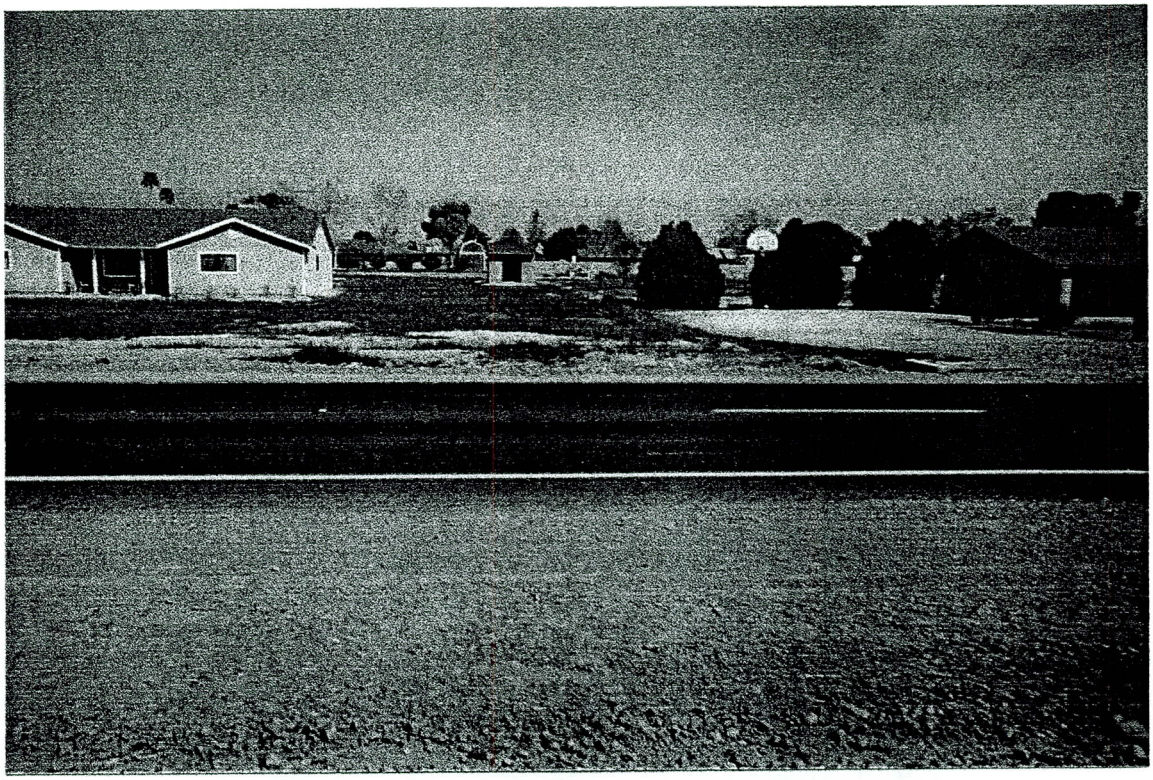
Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2184	864237.5773	614129.3620	993.29	EG
2183	864238.5793	614022.8307	993.18	EG
2182	864238.5872	613916.8697	992.85	EG
2181	864237.9316	613810.6184	992.85	TOE
2180	864238.1443	613798.6401	995.28	EOR
2179	864237.7990	613781.0330	995.47	TOP
2178	864238.8935	613767.7621	984.76	EOW
2177	864239.0110	613764.9054	983.93	TOE
1897	864238.6773	613760.9989	983.64	TOE
1898	864239.5971	613759.4952	984.66	EOW
1899	864239.7107	613750.3563	993.55	TOP BANK
1900	864239.8620	613736.7224	993.06	EOR
1901	864240.0674	613733.4886	992.51	TOE
1902	864243.0139	613637.3637	992.40	EG
1903	864245.5977	613536.8813	992.37	EG
1904	864248.7668	613434.5451	992.31	EG



SECTION 17

NORTH – SOUTH.



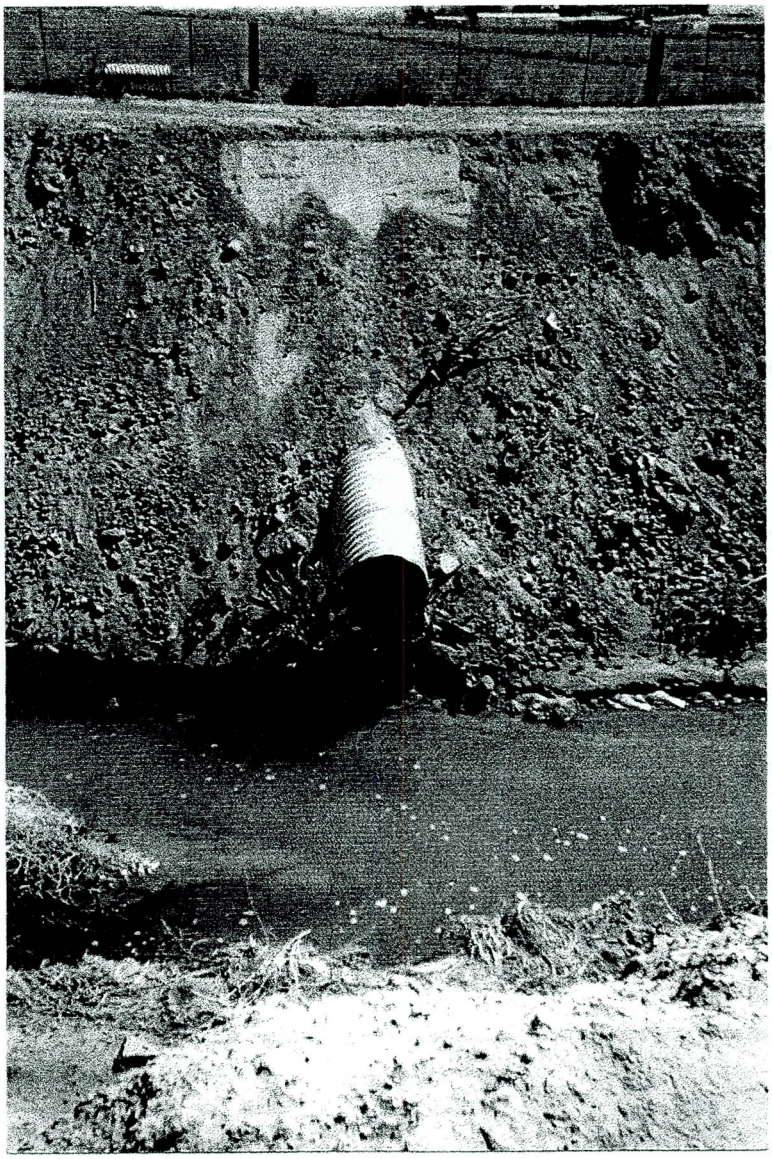
SECTION 17

SOUTH — NORTH

SECTION 17

NORTH — SOUTH.

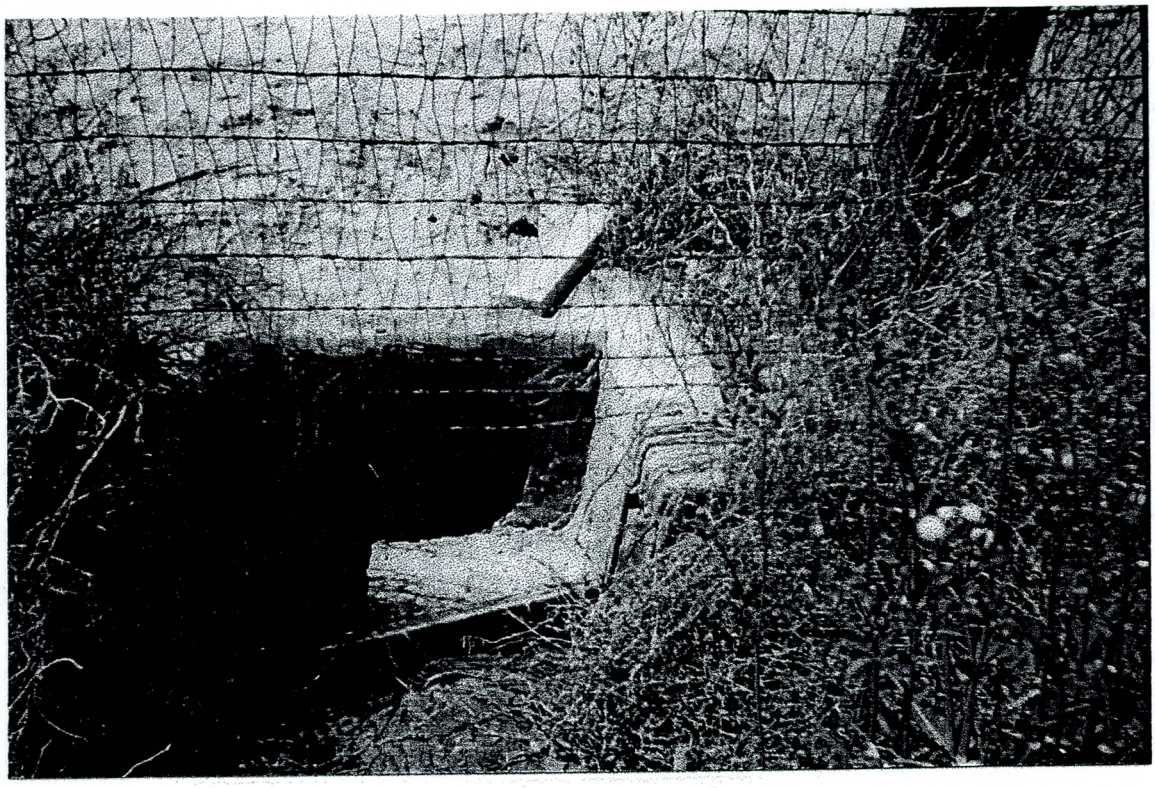
SECTION 17
NORTH.
24" CONC



SECTION 17

WEST - EAST

24" CMP



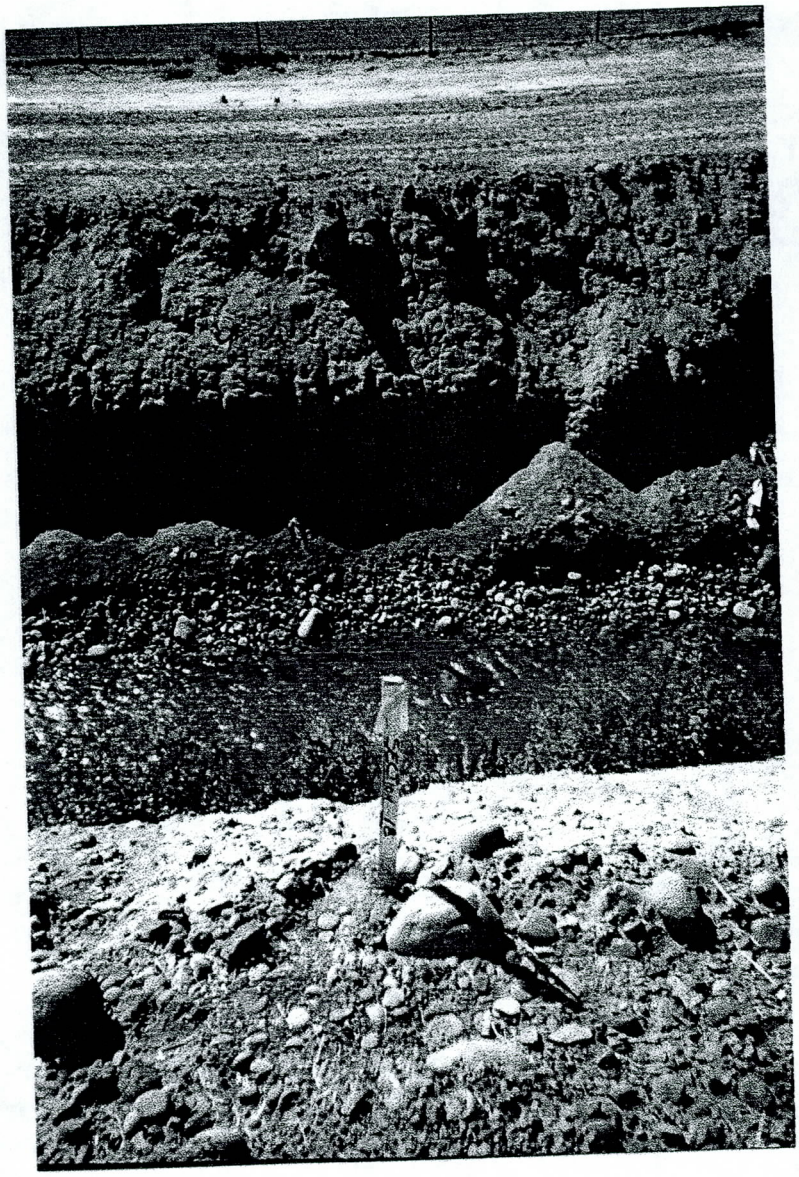
SECTION 17
EAST - WEST.
24" CONC.

SECTION 17

17A

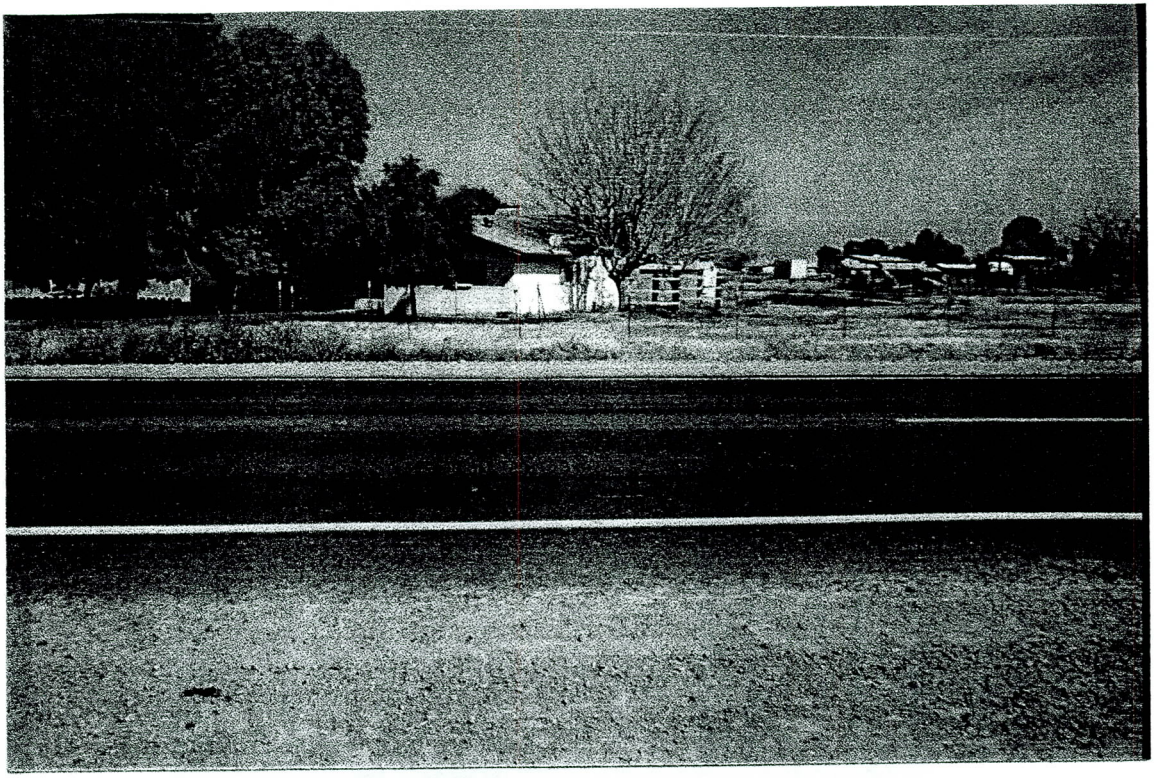
Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2579	864778.3626	613822.8589	993.52	TP 24"CMP
2578	864782.0787	613770.3242	988.38	TP 24"CMP
2176	864548.7271	613851.0697	992.87	EG
2175	864581.9298	613852.9598	993.58	FENCE LINE
2174	864584.7713	613851.7056	992.98	TOE
2173	864650.9087	613853.2692	992.79	EG
2172	864755.5488	613855.3418	992.74	EG
2171	864853.1041	613858.3285	993.52	EG AT FENCE
2170	864875.8102	613859.0737	994.22	TOP
2168	864881.3728	613858.1835	987.70	TOE
2169	864884.4128	613857.1598	985.37	EOW
2167	864886.8499	613857.6672	984.28	TOE
1916	864836.6714	613765.9461	991.18	TP 24"PIPE
1915	865076.6067	613859.7263	993.41	EG
1914	864982.0975	613860.4386	993.43	TOP BANK
1913	864976.6454	613860.4497	992.37	TOE
1912	864973.7628	613860.5014	992.42	TOE
1911	864971.6143	613860.8797	994.17	TOP BANK
1910	864957.9996	613860.1418	994.85	EP BASELINE RD.
1909	864943.9862	613858.4893	995.27	CL BASELINE RD.
1908	864929.4503	613858.9716	995.00	EP BASELINE RD.
1907	864902.0392	613859.0350	995.21	TOP
1906	864892.0624	613858.5807	985.38	EOW
1905	864891.0363	613858.9239	984.34	TOE



SECTION 18A

NORTH — SOUTH.

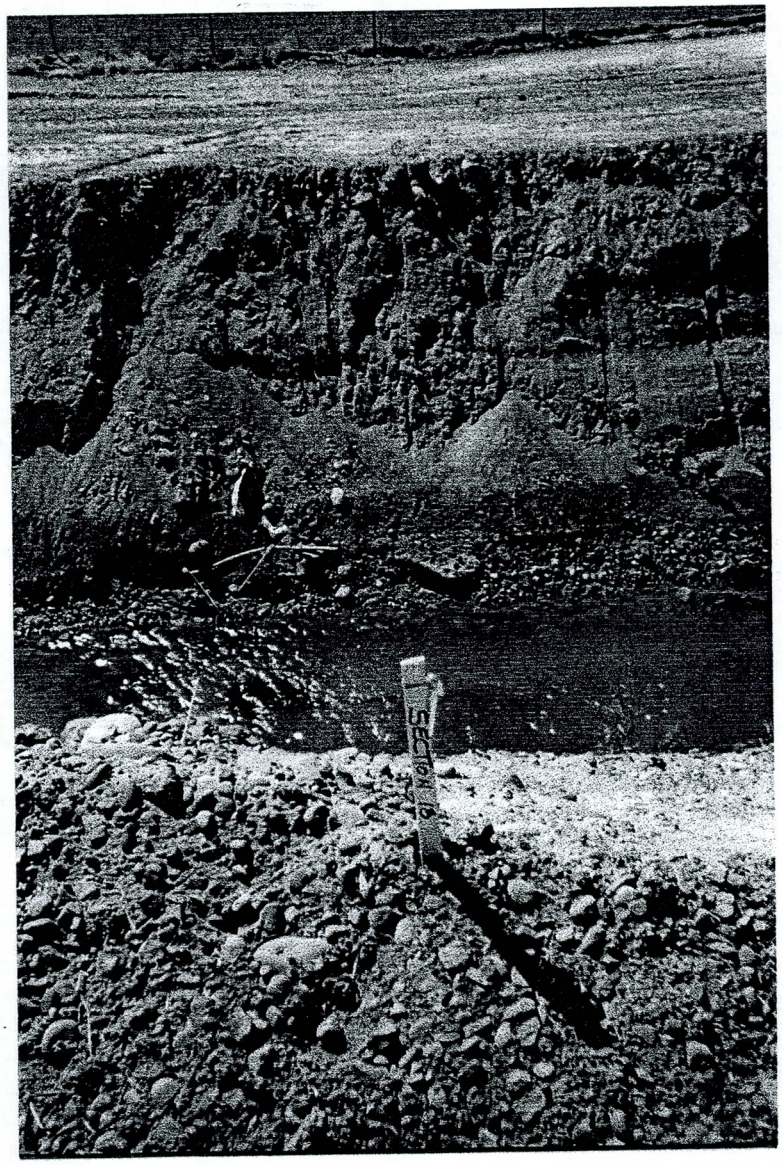


SECTION 18A

SOUTH – NORTH.

SECTION 18A

NORTH – SOUTH.



SECTION 18B

NORTH – SOUTH.

SECTION 18B

SOUTH — NORTH

SECTION 18B

NORTH — SOUTH

SECTION 18

EAST — WEST.

36" CMP — PS

84" ELLIP.

SF 30'

→ SEE # 1995
& 1997

SECTION 18 DS

WEST — EAST.

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ENGINEERS
PLANNERS
SURVEYORS

PROJECT _____
PROJECT NO. _____ SHEET___ OF___
CALCULATED BY _____ DATE _____
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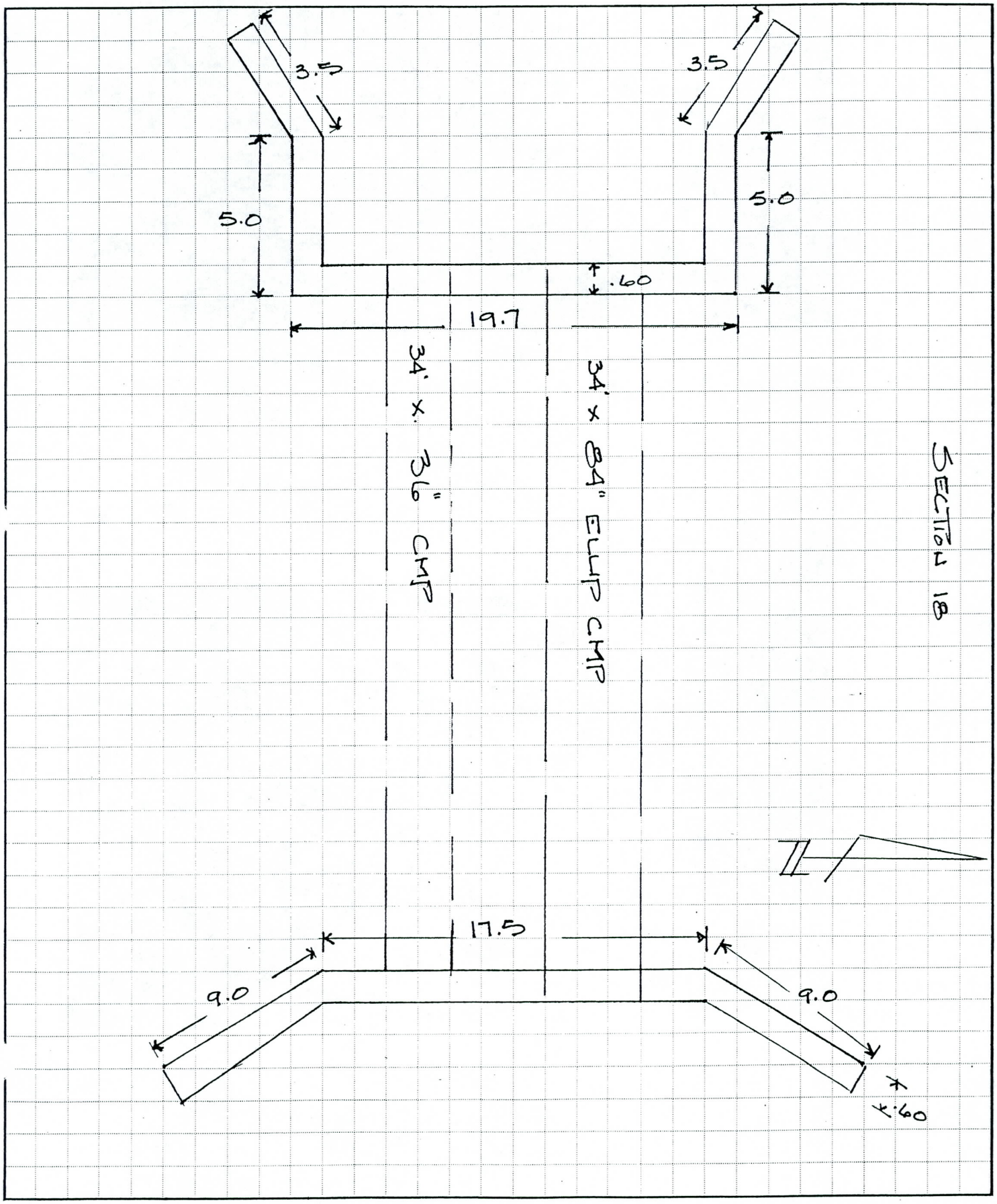
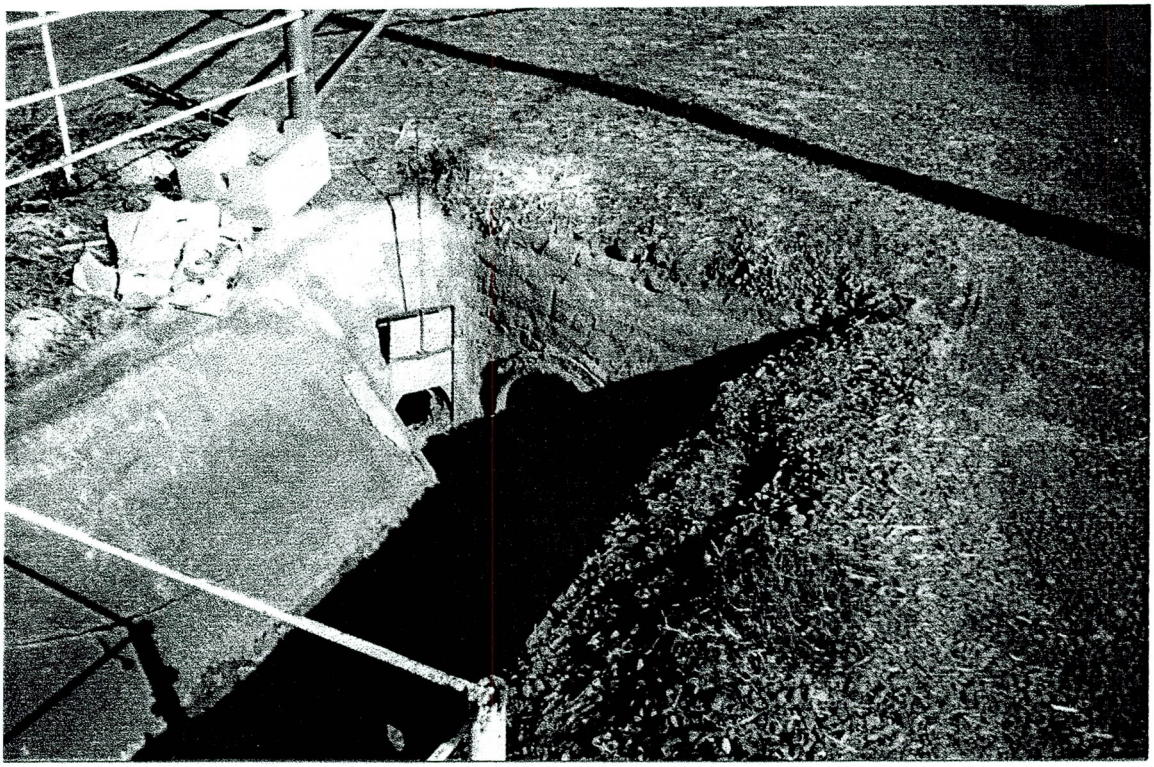




SECTION 18

SOUTH — NORTH.

12" CONC WEST

30" CONC. NORTH.

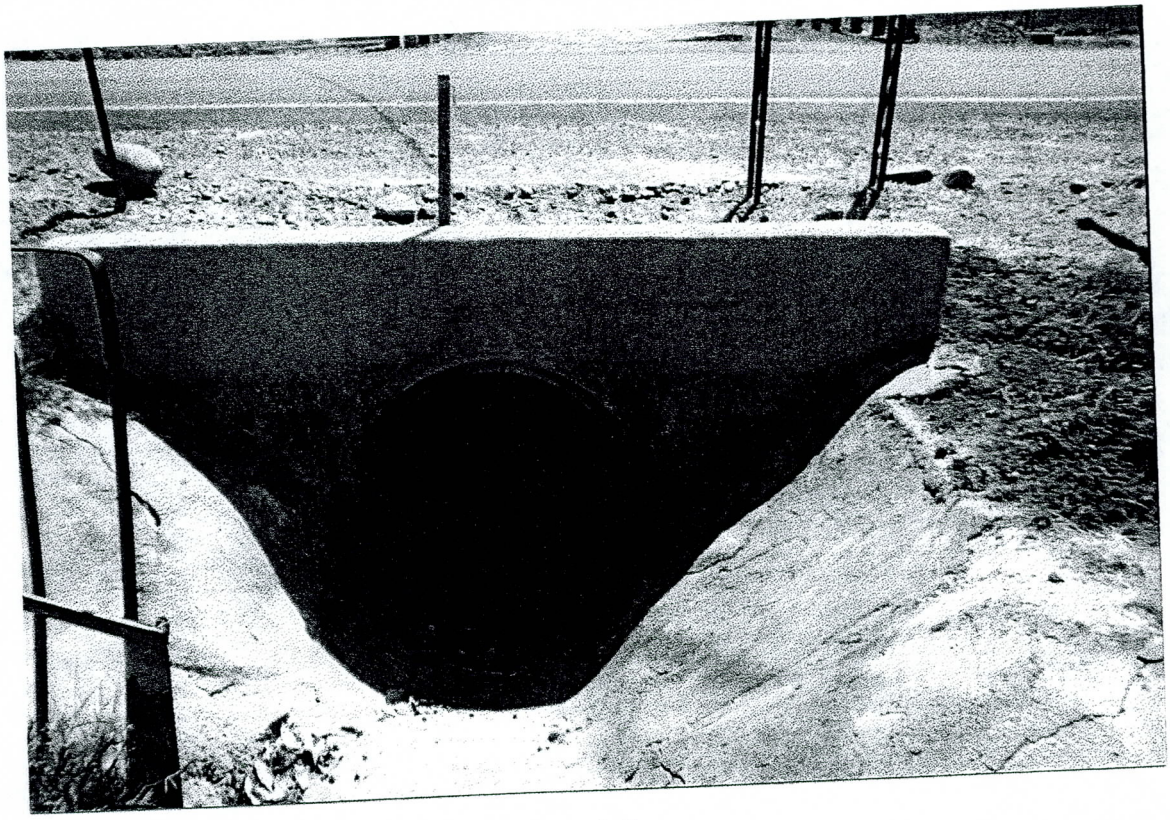
WEST

SECTION 18

WEST-EAST

18" CONC.

WEST



SECTION 18

30" CONC

NO-50.

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ENGINEERS
PLANNERS
SURVEYORS

PROJECT _____

PROJECT NO. _____ SHEET ___ OF ___

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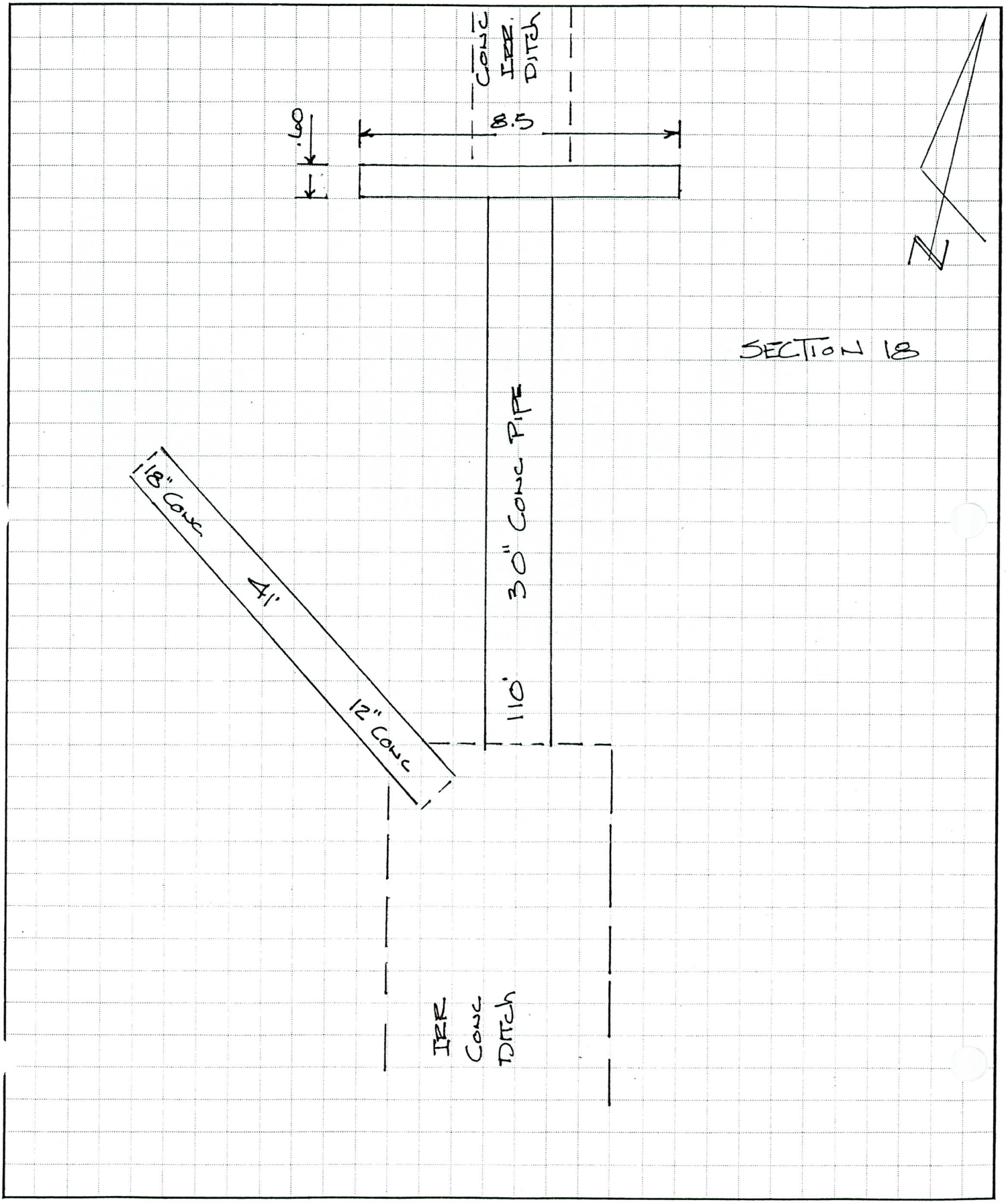

SECTION 18
SOUTH - NORTH
18" CONC.
EAST.

SECTION 18
NORTH - SOUTH
18" CONC
EAST.

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ENGINEERS
PLANNERS
SURVEYORS

PROJECT _____

PROJECT NO. _____ SHEET ___ OF ___

CALCULATED BY _____ DATE _____

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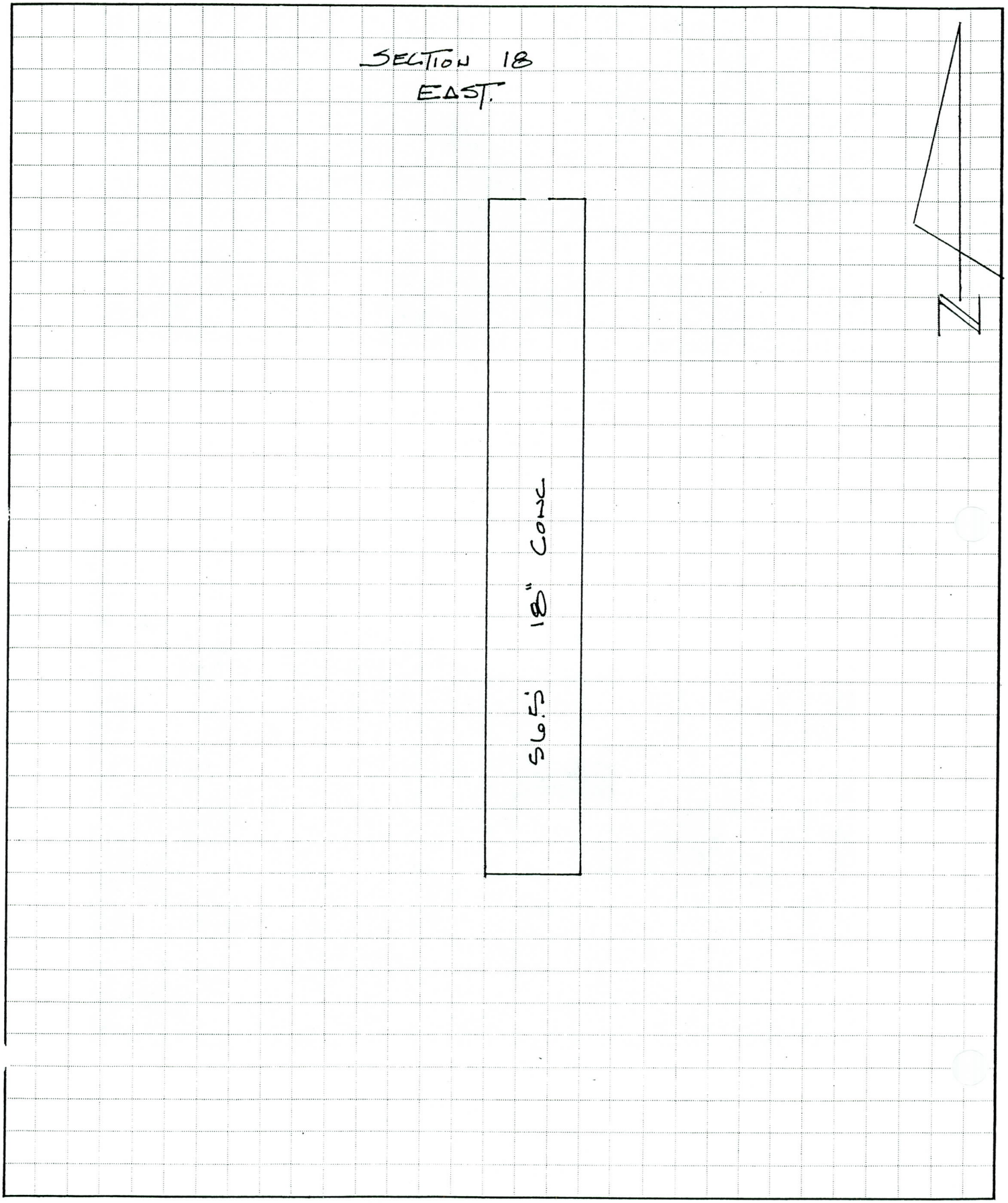
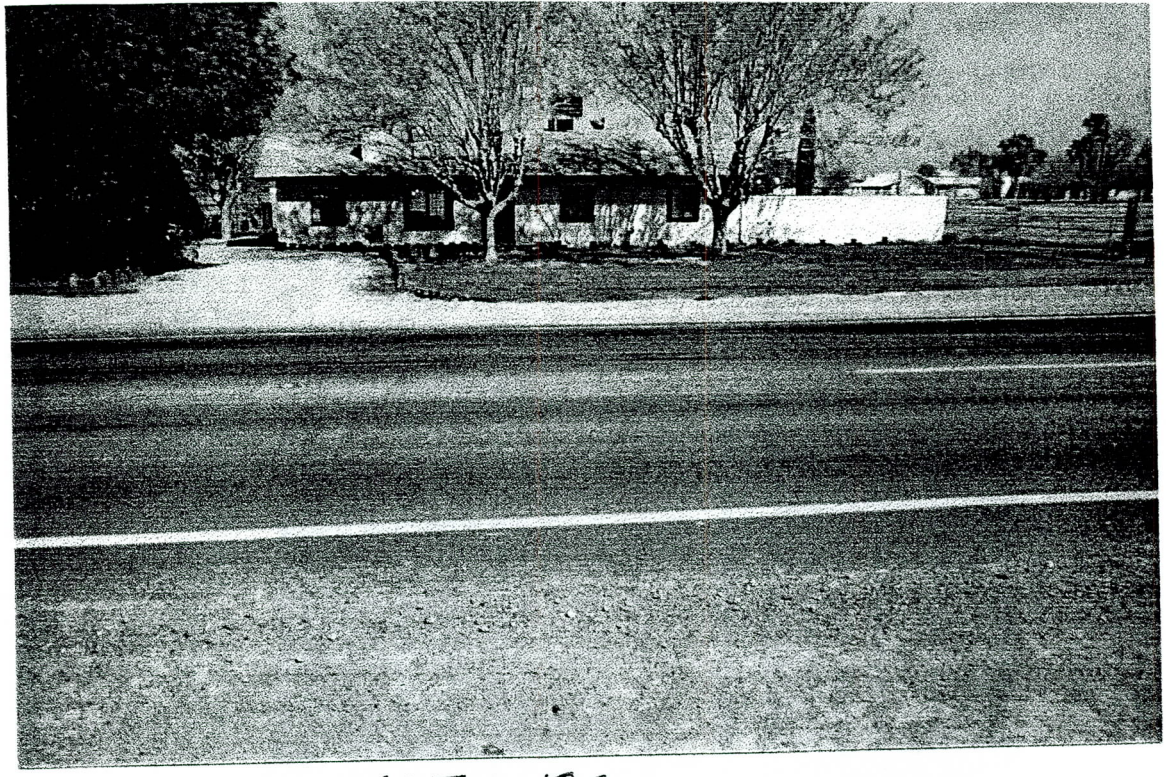


SECTION 18C

NORTH - SOUTH.



SECTION 18C

SOUTH – NORTH

SECTION 18C

NORTH – SOUTH.

SECTION 18D

NORTH – SOUTH.

SECTION 18D

SOUTH — NORTH.

SECTION 18D

NORTH — SOUTH.

SECTION 10
A–D

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
1986	864590.9739	614872.7736	994.59	TOE
1987	864698.1668	614878.8893	994.48	EG
1988	864793.8563	614885.2054	994.57	EG
1989	864853.5048	614886.8976	994.71	TOE
1979	864857.9007	614895.5894	995.54	EG AT FENCELINE
1978	864891.0329	614895.6108	996.12	TOP BANK
1977	864899.0577	614896.1897	988.22	EOW
1976	864900.0793	614895.8899	987.83	TOE
1917	864903.5825	614894.6373	987.75	TOE
1918	864905.1361	614894.6709	988.59	EOW
1919	864913.8095	614895.1974	995.99	TOP BANK
1920	864930.1431	614894.5635	996.76	EP BASELINE RD.
1921	864944.5418	614894.9420	997.14	CL BASELINE RD.
1922	864960.3369	614895.5003	996.95	EP BASELINE RD.
1923	864979.8716	614894.6923	995.90	TOP BANK
1924	864985.8478	614893.9468	993.32	TOE
1925	864990.1005	614893.5186	993.32	TOE
1926	864994.2576	614893.8239	995.04	TOP BANK
1927	865006.3005	614893.5145	995.24	EG AT FENCELINE

-100.194
-10.839
-1.765
1.74
12.01
28.4
42.911
58.7
88.45
88.46
92.619

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

16 B

Point	Northing	Easting	Elevation	Description
1985	864592.4916	614987.4151	994.67	TOE
1984	864634.4766	614988.2980	994.64	EG
1983	864743.6220	614991.8667	994.73	EG
1982	864854.3336	614995.9850	994.93	TOE
1981	864858.0125	614998.6099	995.60	EG AT FENCELINE
1980	864892.3187	614997.2502	996.41	TOP BANK
1975	864900.7765	614998.0152	988.67	EOW
1974	864903.0827	614997.7410	987.90	TOE
1936	864906.4033	614998.7439	988.08	TOE
1937	864907.8558	614998.6732	988.75	EOW
1935	864917.4951	614998.0326	996.91	TOP BANK
1934	864930.6477	615001.2652	996.76	EP BASELINE RD.
1933	864960.2880	615000.9118	996.88	EP BASELINE RD.
1932	864979.8856	615000.3511	996.11	TOP BANK
1931	864988.5703	615000.9451	993.18	TOE
1930	864992.9727	615001.8129	993.64	TOE
1929	864999.1887	615001.0883	995.79	TOP BANK
1928	865007.1219	615001.2953	995.47	EG AT FENCELINE

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
1968	864551.9319	615137.4577	994.73	EG
1969	864658.7214	615137.3668	994.61	EG
1970	864772.6088	615138.3498	994.65	EG
1971	864859.7352	615138.3680	994.96	TOE
1972	864865.5387	615137.6397	995.47	EOR
1973	864889.7275	615135.9072	996.72	TOP BANK
1959	864898.0299	615135.7892	989.09	EOW
1958	864899.2166	615135.8034	988.40	TOE
1938	864904.4006	615135.5513	988.65	TOE
1939	864905.4494	615138.0813	989.34	EOW
1951	864913.6612	615136.1062	997.09	TOP BANK
1952	864931.3430	615136.1344	997.10	EP BASELINE RD.
1953	864945.3760	615136.2537	997.63	CL BASELINE RD.
1954	864960.8399	615135.6400	997.30	EP BASELINE RD.
1955	864971.3449	615136.7830	997.01	EG
1956	864991.9744	615137.1722	995.26	EG
1957	865008.2148	615136.8363	995.36	EG

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

18 D

Point	Northing	Easting	Elevation	Description
1967	864553.3559	615254.9314	994.90	EG
1966	864664.5500	615254.8889	994.89	EG
1965	864769.2012	615255.9297	994.92	EG
1964	864861.6198	615256.6581	995.07	TOE
1963	864866.1178	615256.1436	995.54	EOR
1962	864890.9338	615256.6123	996.72	TOP BANK
1960	864899.5067	615257.0395	988.65	TOE
1940	864905.2029	615257.5244	989.04	TOE
1941	864905.8675	615257.6647	989.48	EOW
1942	864914.1912	615257.4654	997.40	TOP BANK
1943	864931.7678	615257.5217	997.52	EP BASELINE RD.
1944	864946.1099	615258.4394	998.02	CL BASELINE RD.
1945	864960.8872	615258.1363	997.74	EP BASELINE RD.
1946	864974.7559	615259.0325	997.30	TOP BANK
1947	864980.3275	615258.8277	996.10	TOE
1948	864992.2332	615258.5996	995.29	EG
1949	865008.8464	615257.9256	995.82	EG
1950	865044.0843	615257.5302	994.96	EG

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
1997	864901.0281	615062.9425	991.68	TP 30"PIPE
1996	864909.5064	615063.3568	992.15	TP 5'X 7'CMP
1995	864900.4463	615097.3753	991.50	TP 30"PIPE
1994	864909.1473	615097.1762	992.80	TP 5'X 7'CMP
1993	864975.6836	615089.1983	993.68	INV.30"PIPE
1992	864896.3592	615114.0343	991.93	INV.18"PIPE
1991	864896.5966	615036.8863	992.56	TP 18"PIPE
1990	864867.2793	615068.4919	994.58	TP 30"PIPE

SECTION 19A

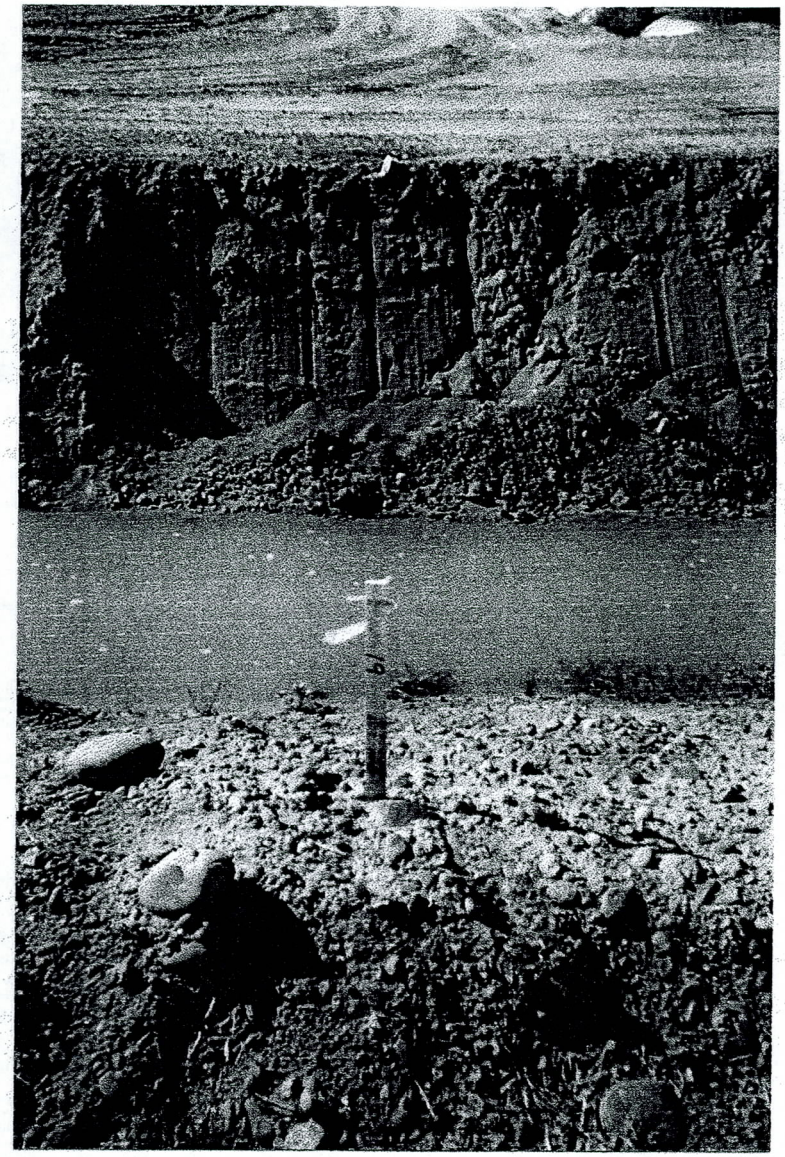
NORTH — SOUTH.

SECTION 19A

SOUTH — NORTH

SECTION 19A

NORTH — SOUTH.



SECTION 19B

NORTH — SOUTH.

SECTION 19B

SOUTH — NORTH.

SECTION 19B

NORTH — SOUTH

SECTION 19C

NORTH — SOUTH.

SECTION 19C

SOUTH — NORTH.

SECTION 19C

NORTH — SOUTH.

SECTION 19
A-C

19A

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2057	864547.2891	616171.1515	996.70	EG
2056	864659.8001	616169.1130	996.49	EG
2055	864768.8726	616169.0505	996.51	EG
2054	864870.3782	616165.7412	997.01	EOR
2053	864894.9669	616166.2637	997.71	TOP
2052	864904.0982	616167.1905	990.84	EOW
2051	864905.0394	616166.5447	990.02	TOE
1998	864909.3717	616165.4972	990.12	TOE
1999	864910.4862	616166.1513	990.66	EOW
2000	864919.4864	616166.2148	998.59	TOP
2001	864936.1568	616165.6924	999.08	EP
2002	864950.2493	616165.0056	999.55	CL
2003	864965.9439	616165.1477	999.17	EP
2004	864977.8636	616166.0478	998.44	TOP
2005	864981.1010	616165.2565	996.70	TOP
2006	864981.5352	616165.5958	995.33	TOE
2007	864983.7070	616164.8307	994.41	CL
2008	864985.2563	616164.5117	994.79	TOE
2009	864988.3251	616165.4480	997.17	TOP
2010	865090.5436	616165.1141	996.41	EG
2011	865193.8616	616161.0412	996.57	EG
2012	865238.1771	616160.6479	996.61	EG

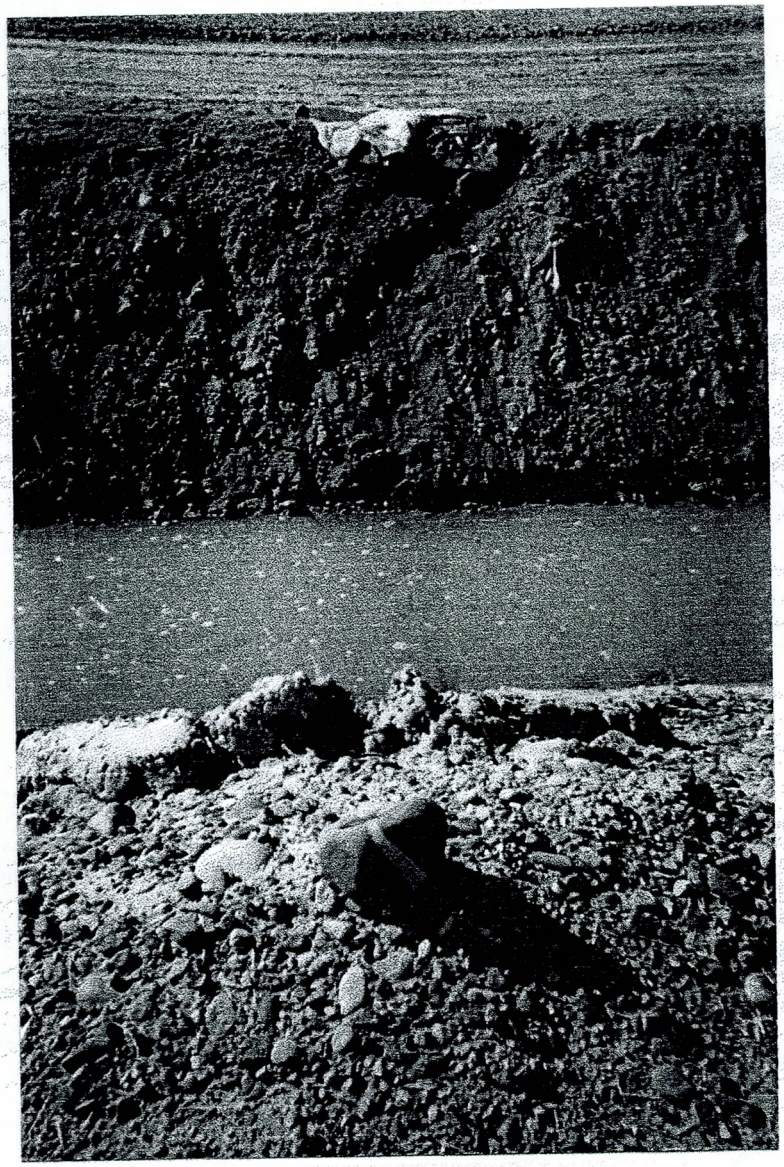
19B

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2044	864550.2901	616390.1454	996.05	EG
2045	864657.6702	616389.6990	995.83	EG
2046	864769.2216	616388.9821	995.62	EG
2047	864874.2242	616390.6855	997.17	EOR
2048	864897.3931	616387.0777	998.00	TOP
2049	864905.6732	616385.2823	991.15	EOW
2050	864906.9847	616385.6380	990.46	TOE
2013	864910.4749	616386.5900	990.39	TOE
2014	864911.1054	616386.6152	990.96	EOW
2015	864922.3328	616387.0026	999.03	TOP
2016	864937.7422	616386.7872	999.41	EP
2017	864951.8394	616387.2100	999.85	CL
2018	864967.3972	616388.3241	999.38	EP
2019	864978.2438	616388.8752	999.05	TOE
2020	864979.9723	616389.1619	999.65	TOP
2021	864985.6373	616387.4663	995.87	TOE
2022	864987.8350	616386.6330	995.68	TOE
2023	864991.2902	616386.5437	997.07	TOP
2024	865064.0567	616385.5909	996.82	EG

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2043	864570.5421	616538.4508	996.42	EG
2042	864676.6157	616538.5161	996.54	EG
2041	864777.5278	616537.7734	996.46	EG
2040	864878.0984	616536.6451	996.73	EOR
2039	864898.5988	616536.8020	997.42	TOP
2037	864908.0426	616538.4275	990.64	TOE
2036	864911.4446	616539.8872	990.48	TOE
2035	864912.6542	616539.7433	991.21	EOW
2034	864922.8081	616537.7415	999.26	TOP
2033	864938.3942	616539.4942	999.82	EP
2032	864952.7714	616539.4992	1000.17	CL
2031	864968.0142	616539.2220	999.75	EP
2030	864981.4725	616538.9714	999.35	TOP
2029	864986.6906	616538.4687	996.15	CL
2028	864991.1841	616537.7164	997.60	TOP
2027	865000.9024	616537.5323	996.93	EG
2026	865027.0889	616536.3587	997.15	EG
2025	865100.1464	616535.6085	997.02	EG



SECTION 20A

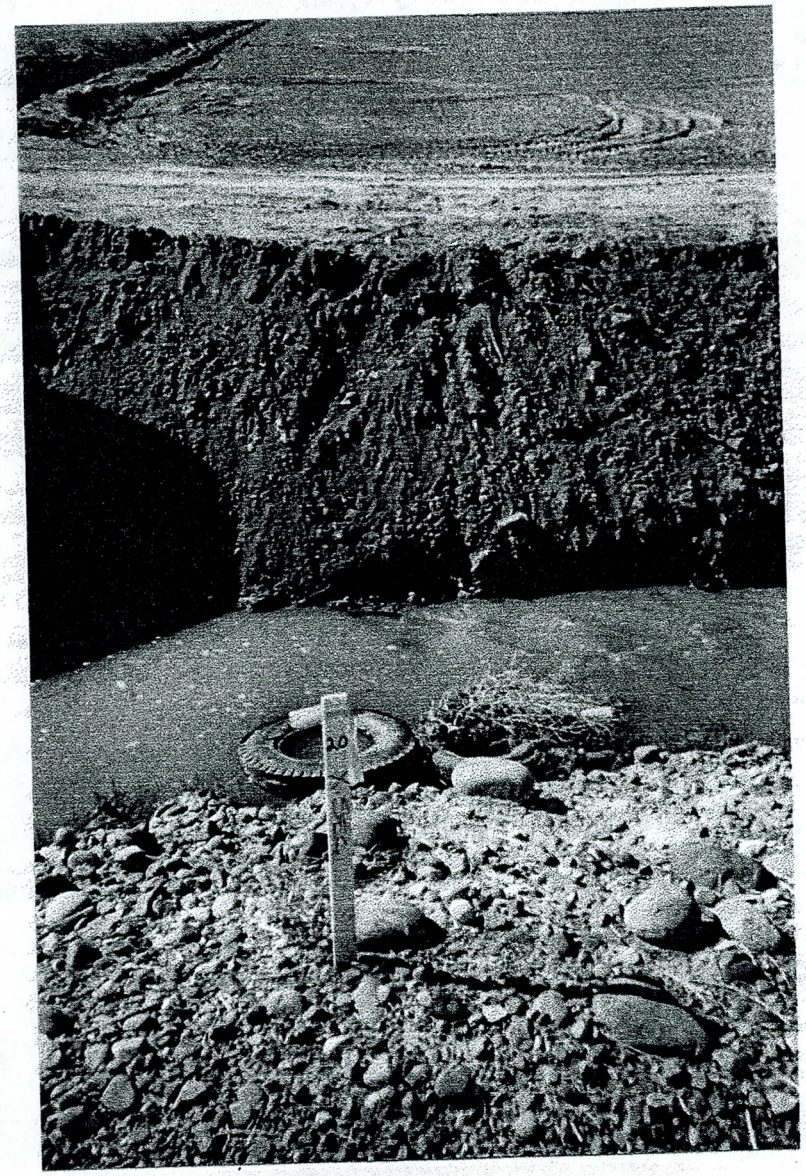
NORTH – SOUTH.

SECTION 20A

SOUTH – NORTH

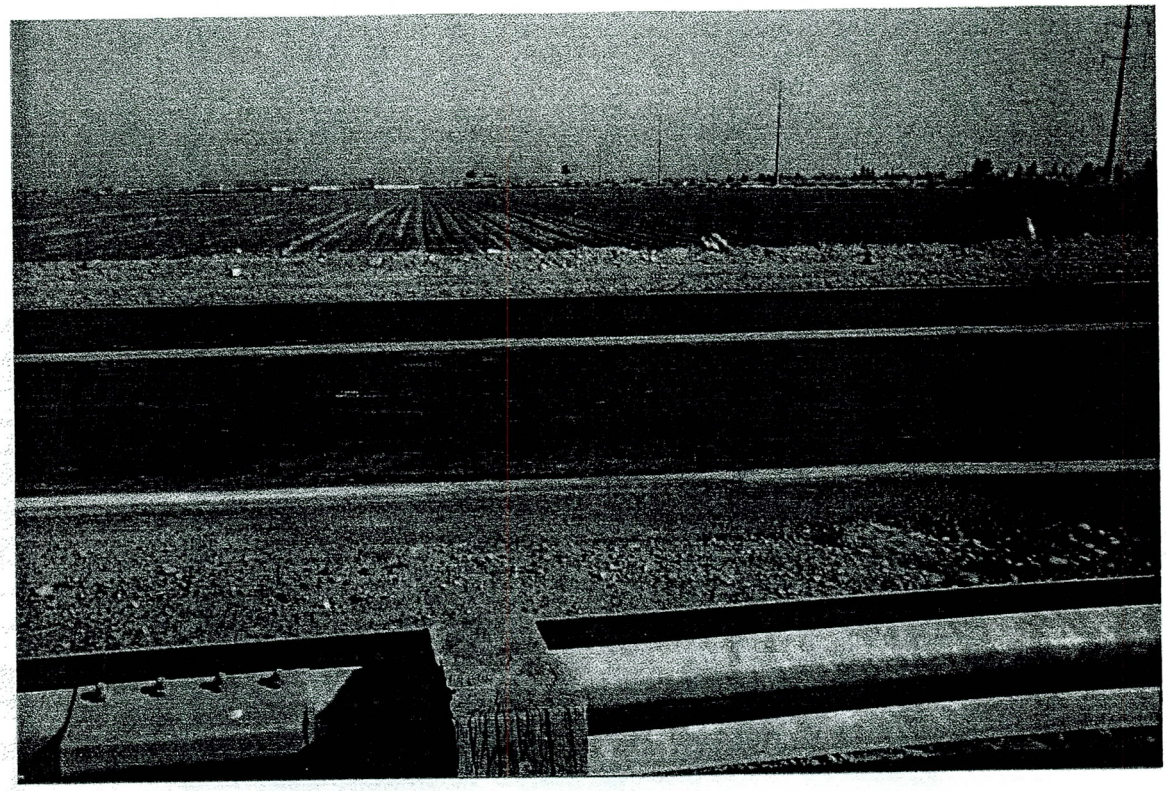
SECTION 20A

NORTH – SOUTH.



SECTION 20 B

NORTH – SOUTH.



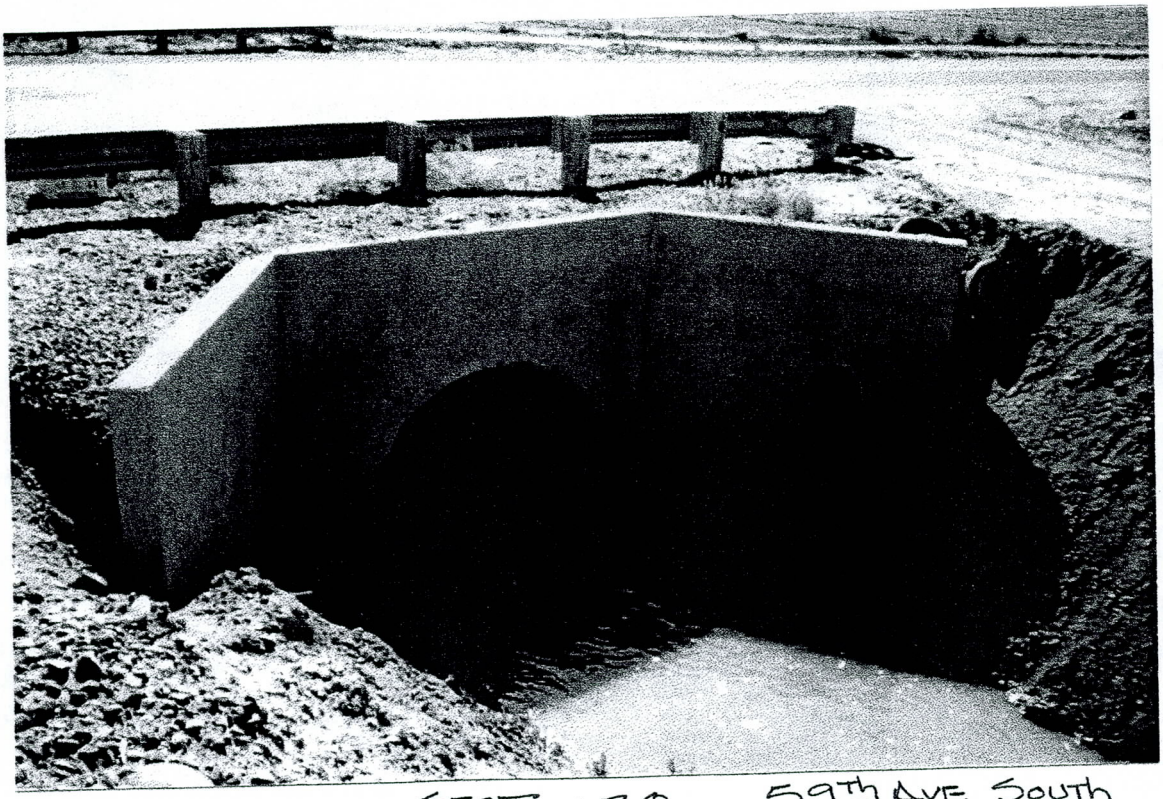
SECTION 20B

SOUTH — NORTH

SECTION 20B 59th AVE South.
WEST.

NORTH — SOUTH

SECTION 20 59th AVE SOUTH.
EAST — WEST.
84" ELLIP. CMP.



SECTION 20 59th AVE SOUTH
WEST — EAST.
84" ELLIP
18" CONC

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PLANNERS
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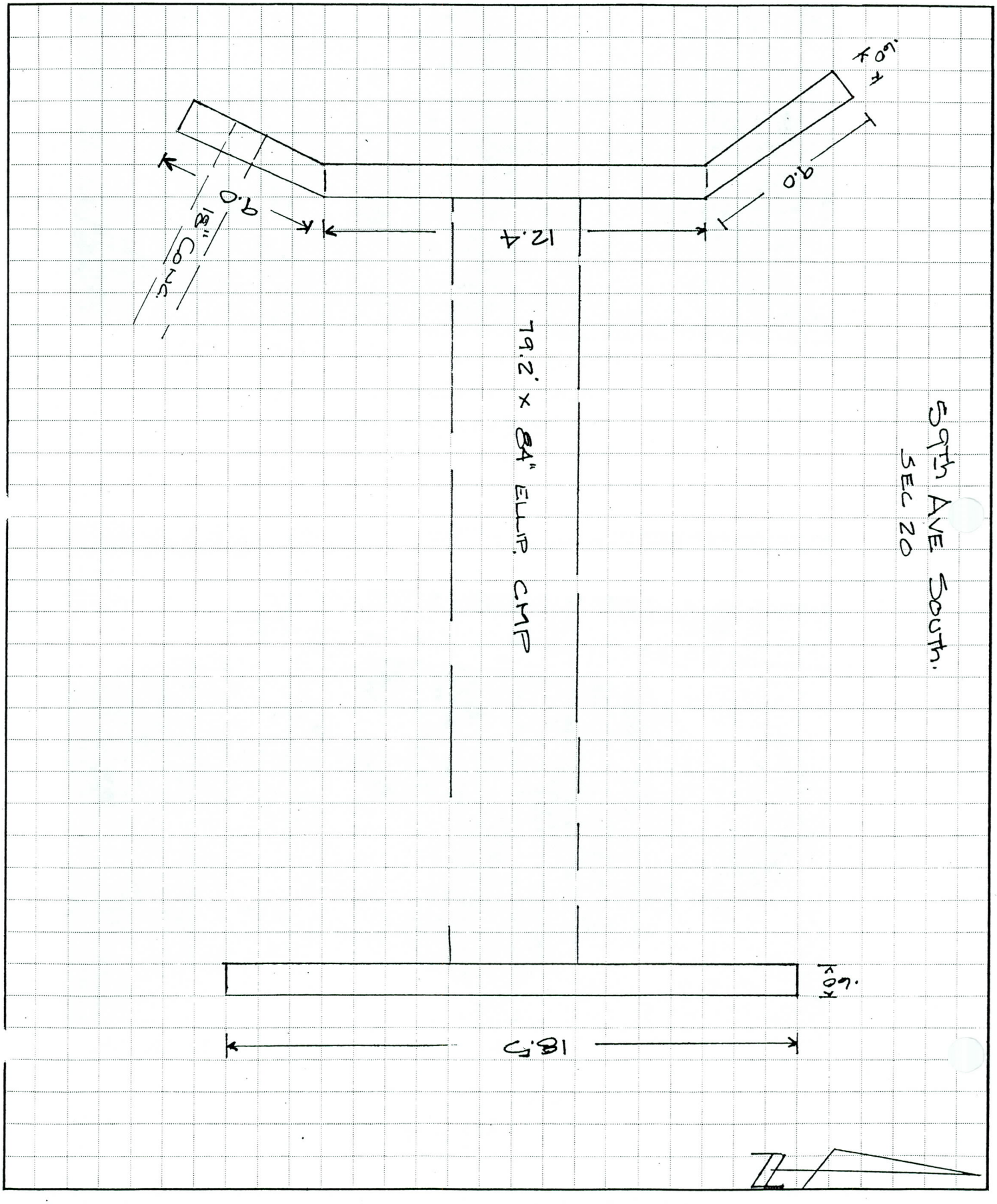
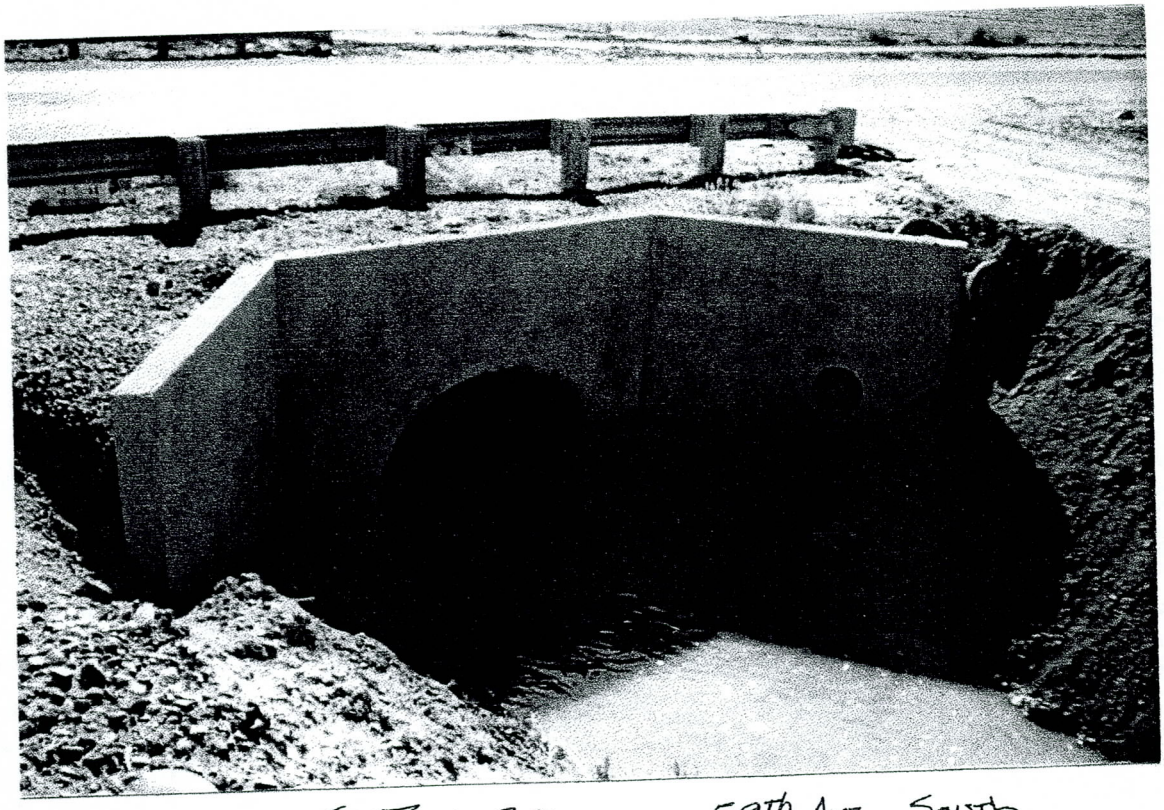


SECTION 20
SOUTH – NORTH

59th AVE SOUTH
WEST.



SECTION 20
WEST - EAST.
18" CONC.

59th AVE. SOUTH

NORTH – SOUTH.

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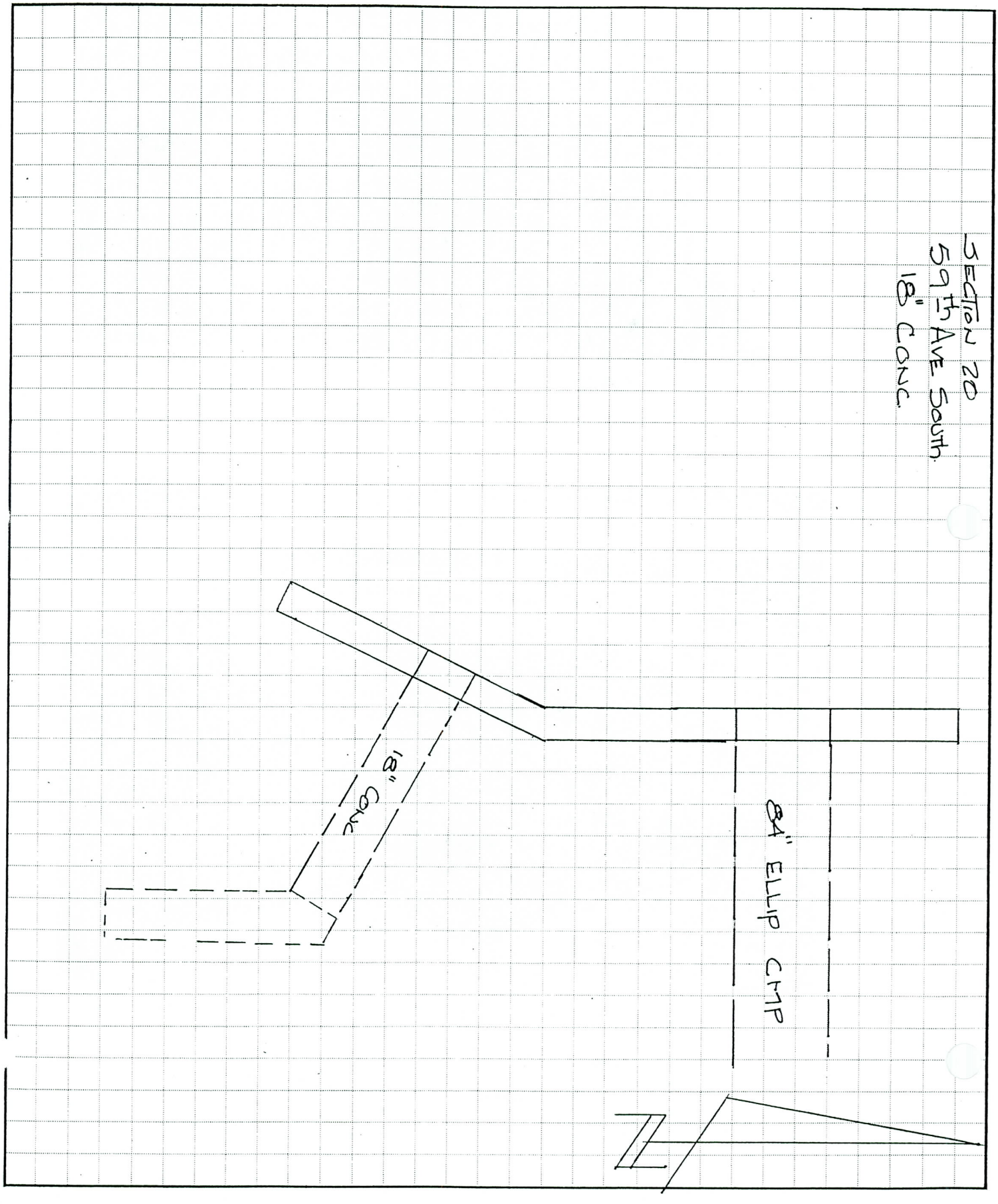


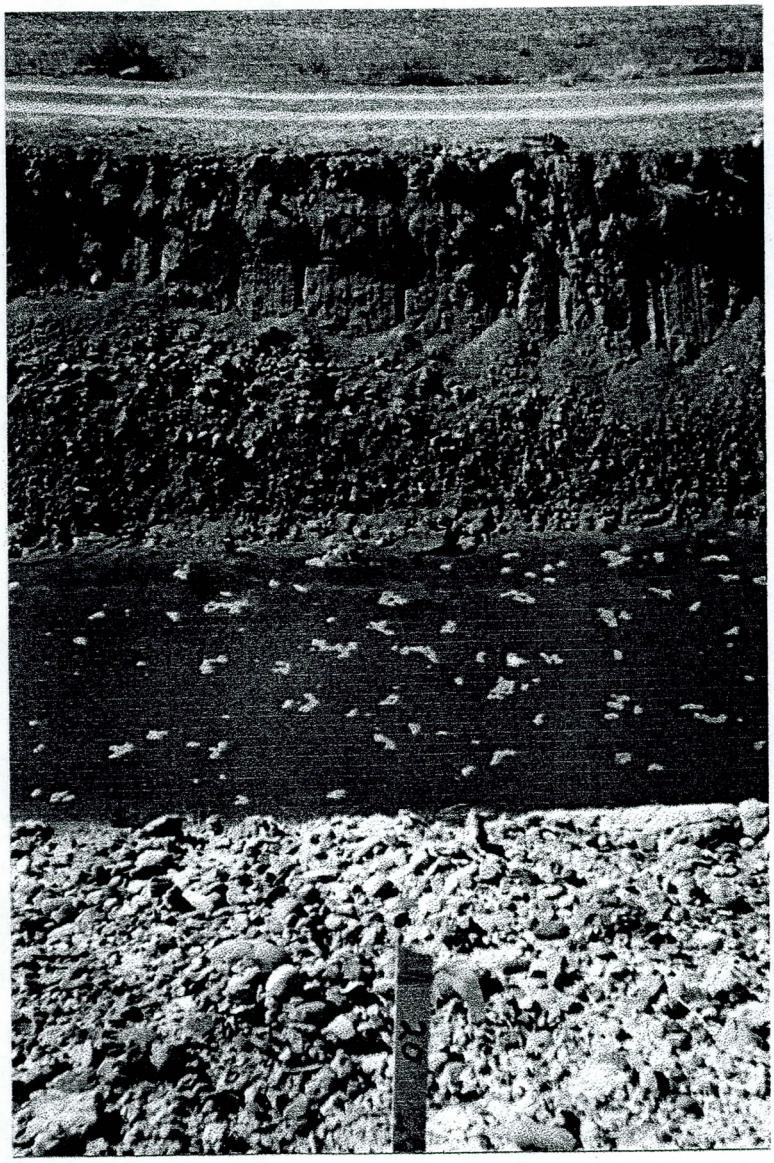
SECTION 20C.

NORTH — SOUTH.

SECTION 20C
SOUTH – NORTH.

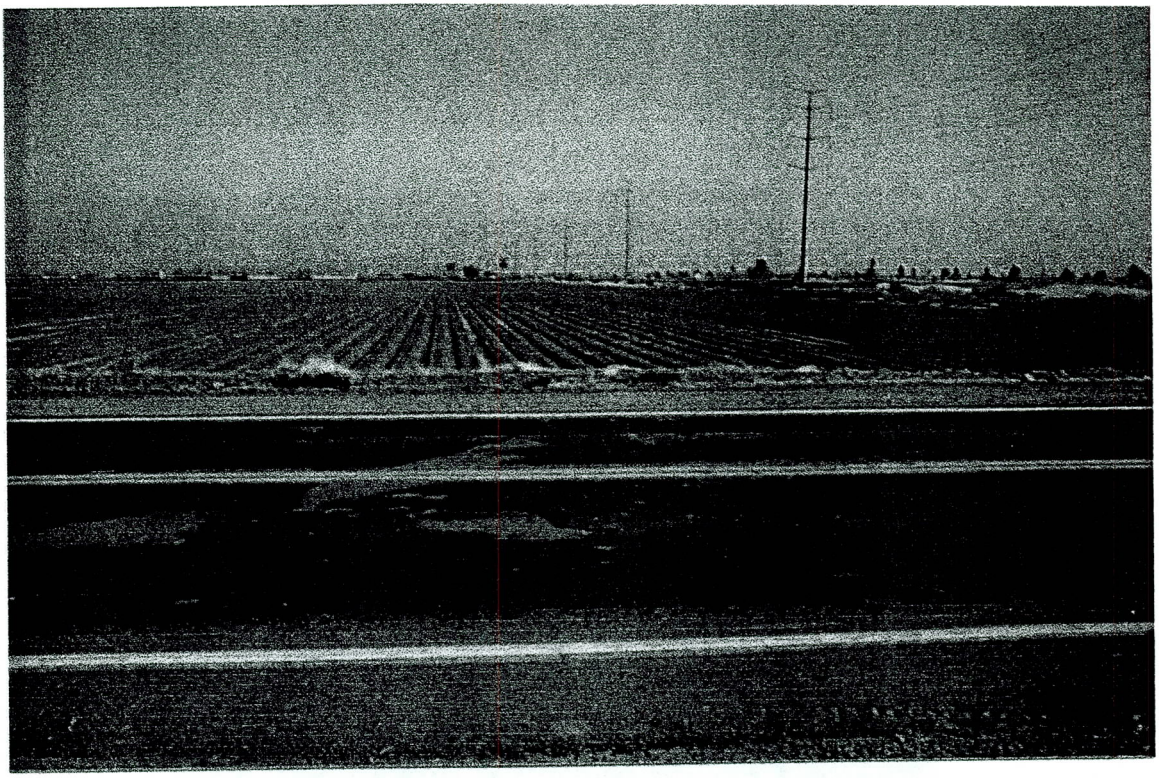
SECTION 20C
NORTH – SOUTH

59TH AVE SOUTH
EAST



SECTION 20D

NORTH — SOUTH.

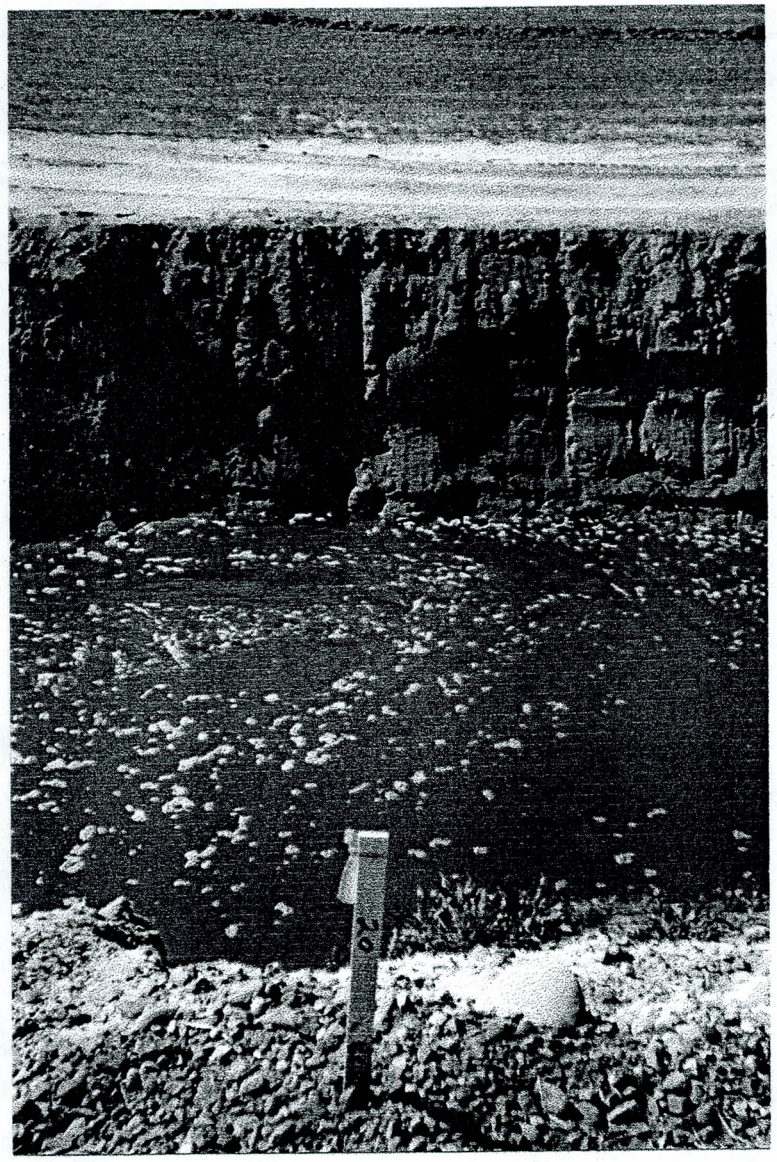


SECTION 20D

SOUTH — NORTH.

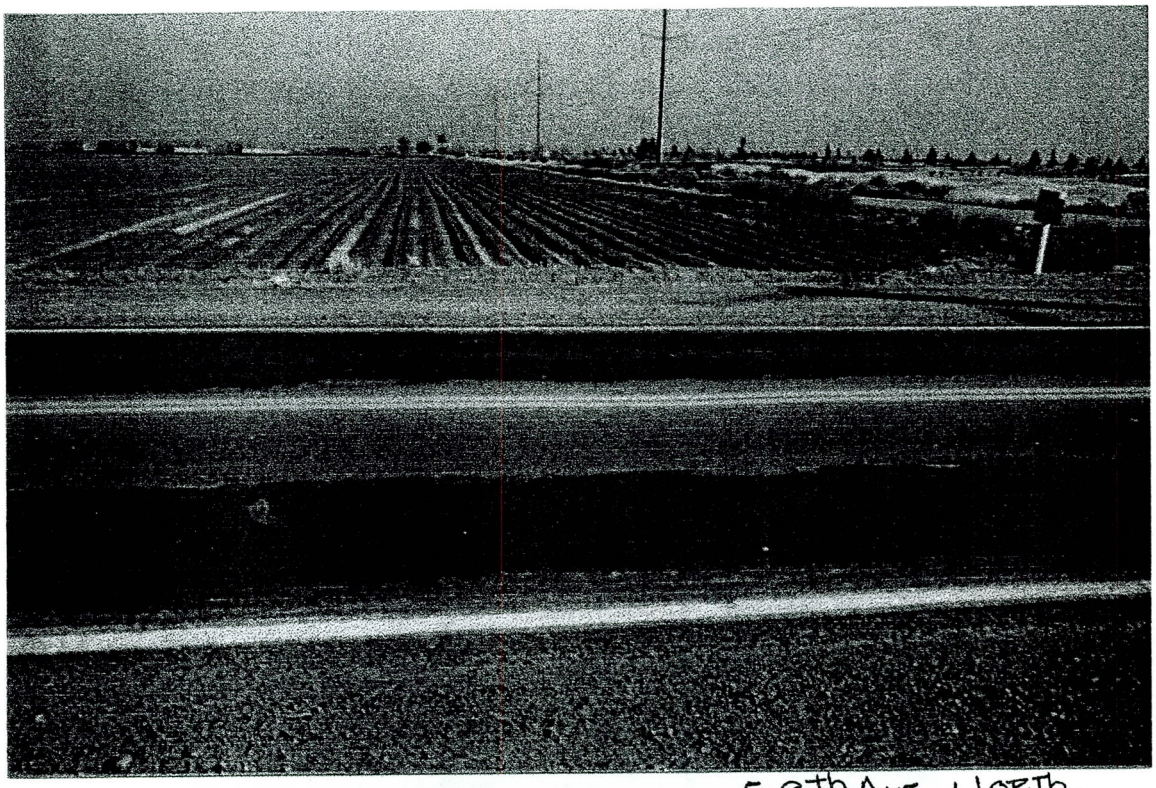
SECTION 20D

NORTH — SOUTH.



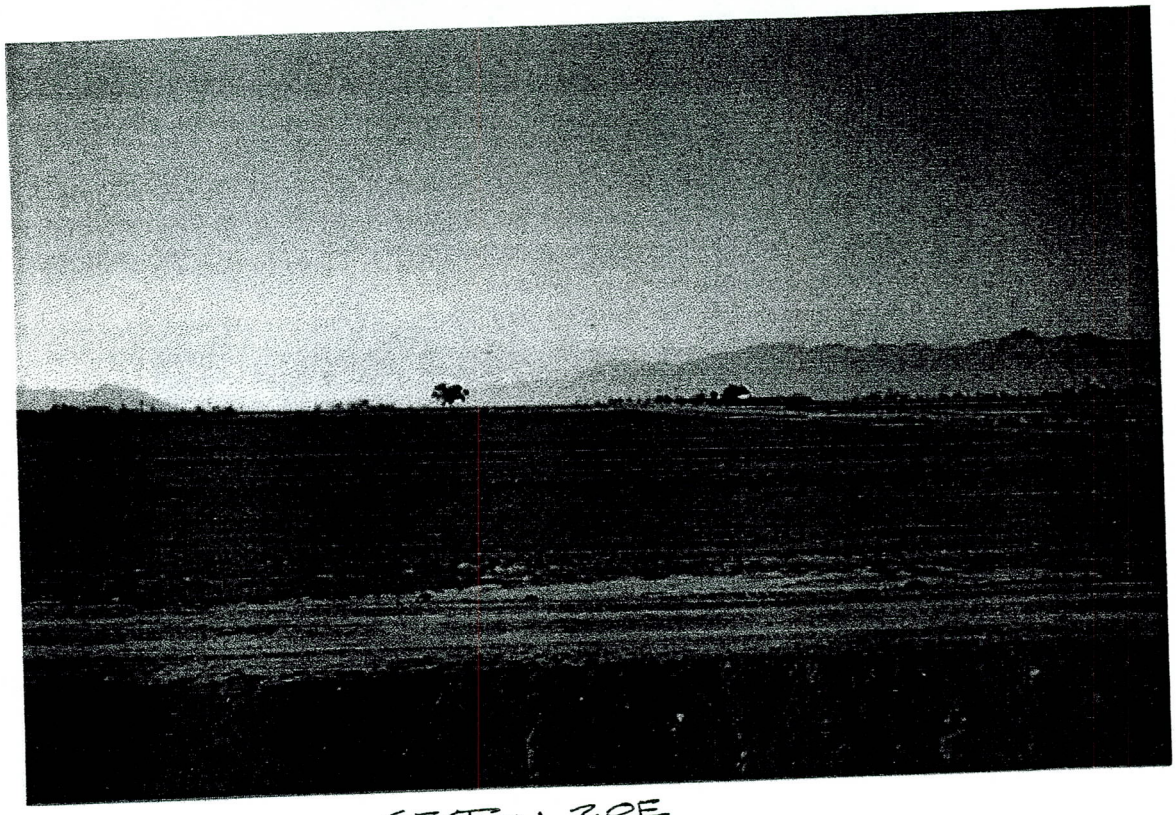
SECTION 20E

NORTH – SOUTH.



SECTION 20E
SOUTH – NORTH

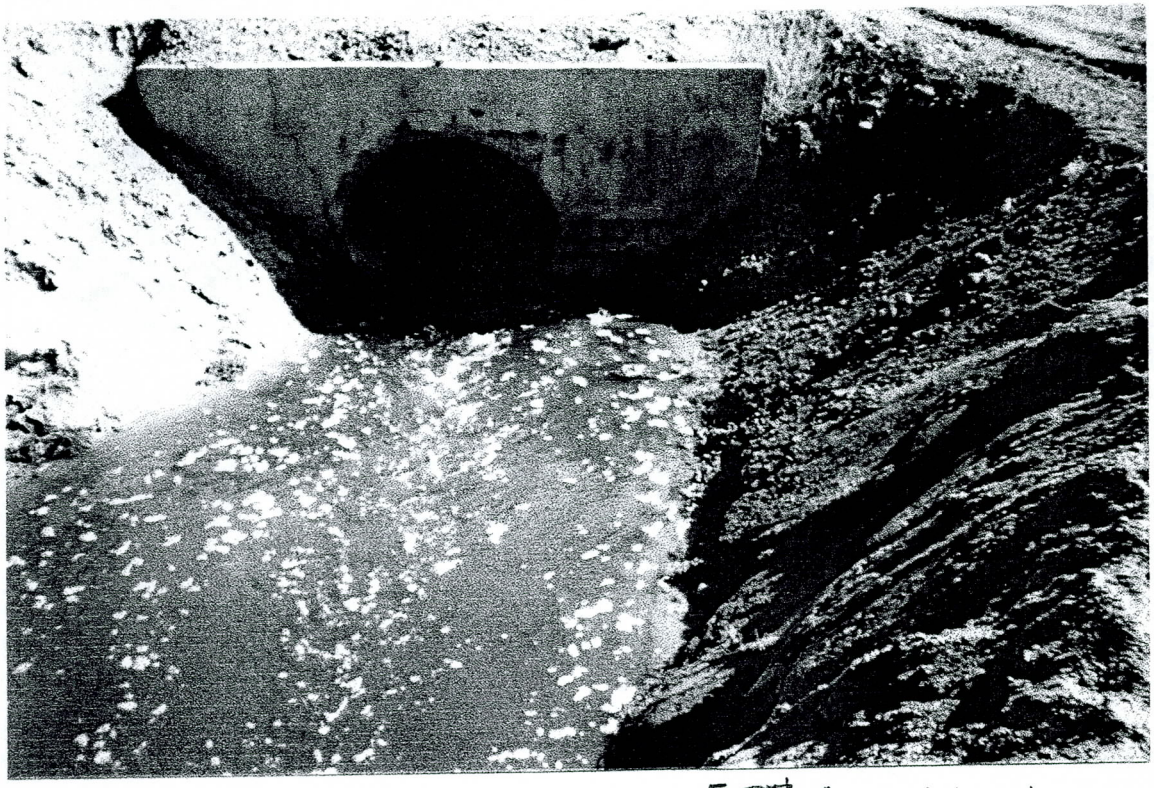
59th AVE NORTH.
WEST



SECTION 20E
NORTH – SOUTH.

SECTION 20 59th AVE NORTH

EAST - WEST.



SECTION 20 59th AVE. NORTH.

WEST - EAST

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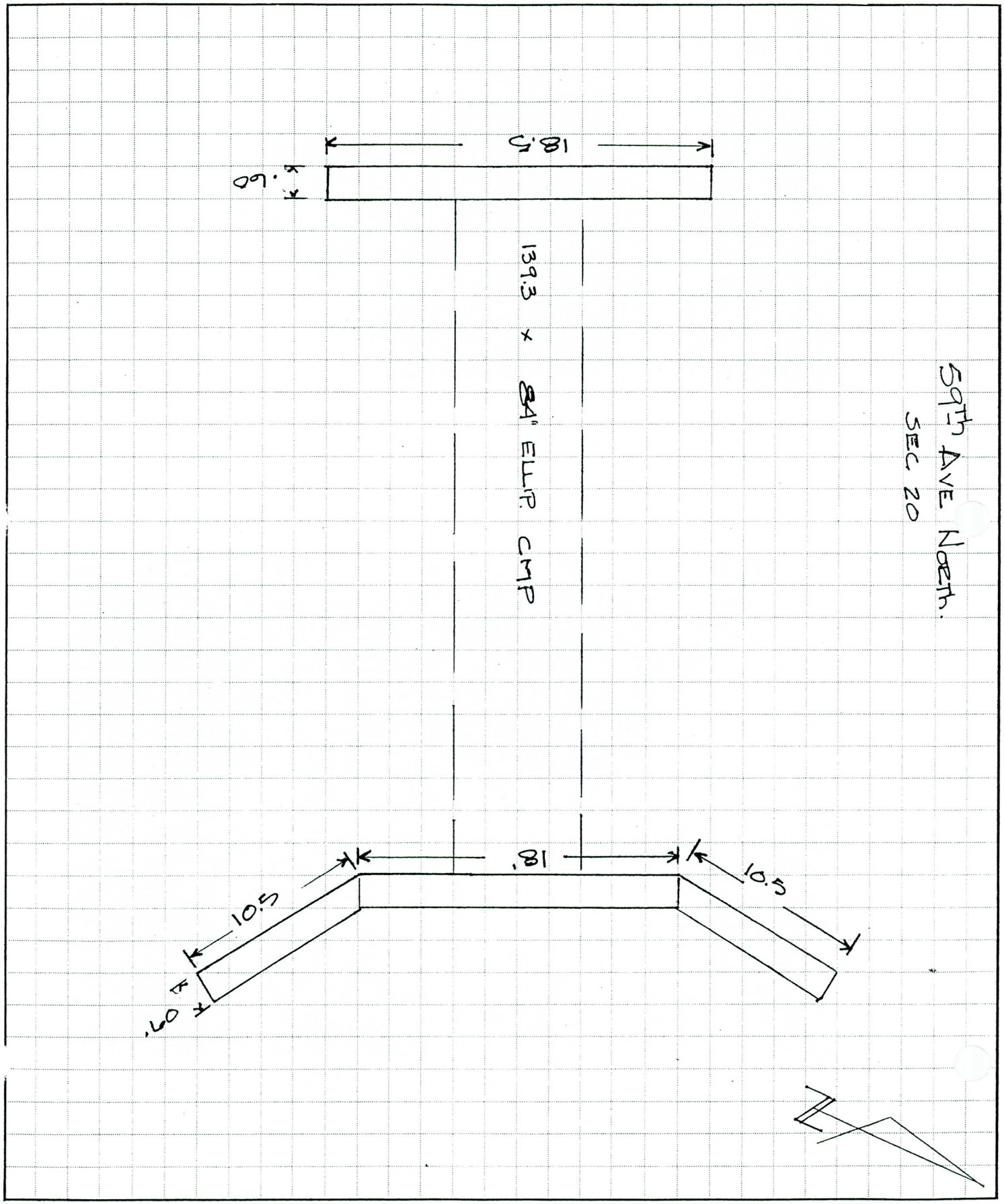
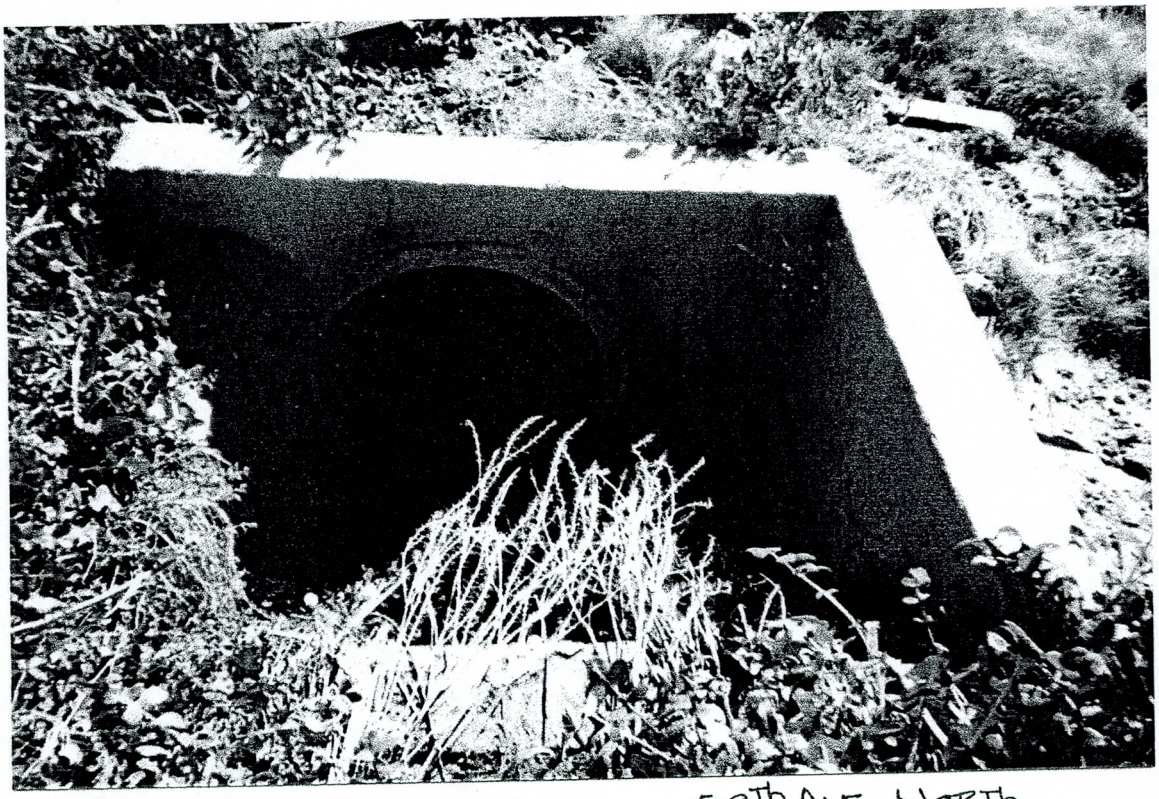




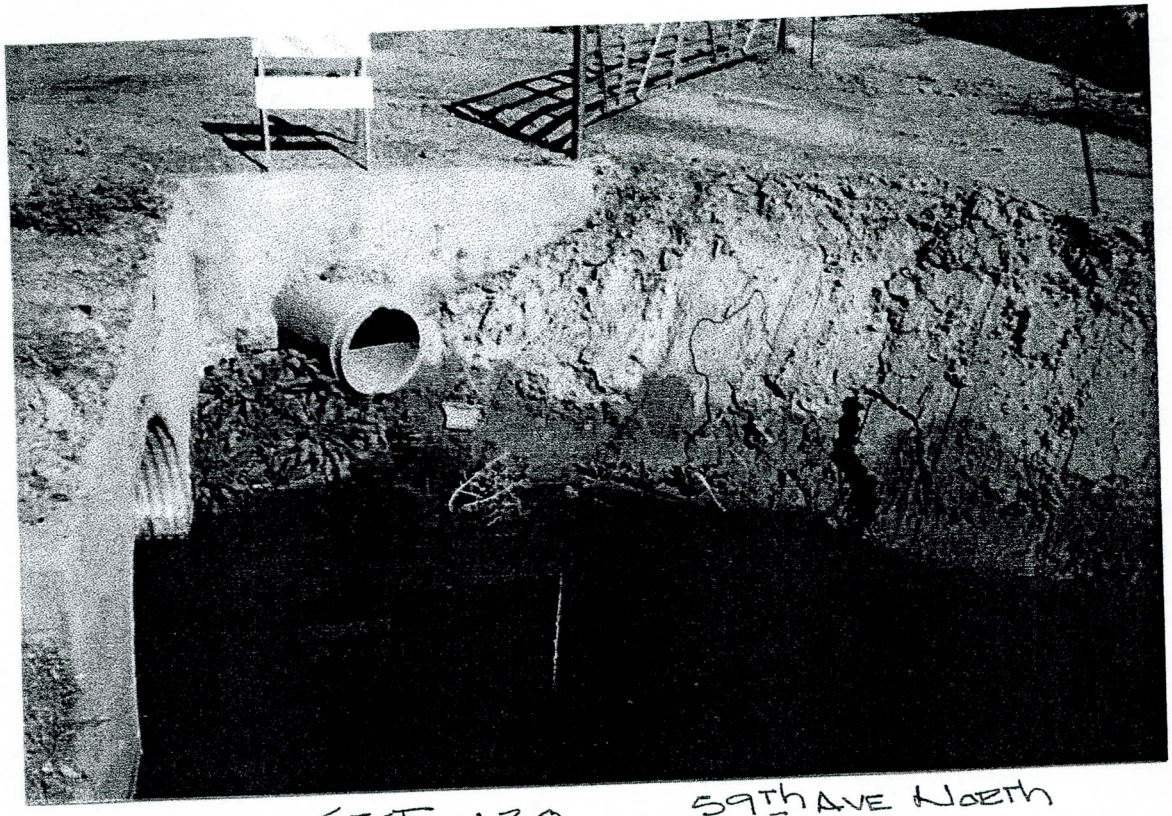
SECTION 20

WEST – EAST

24" CONC.

59th AVE NORTH

WEST.



SECTION 20

EAST – WEST.

24" CONC.

59th AVE NORTH

EAST.

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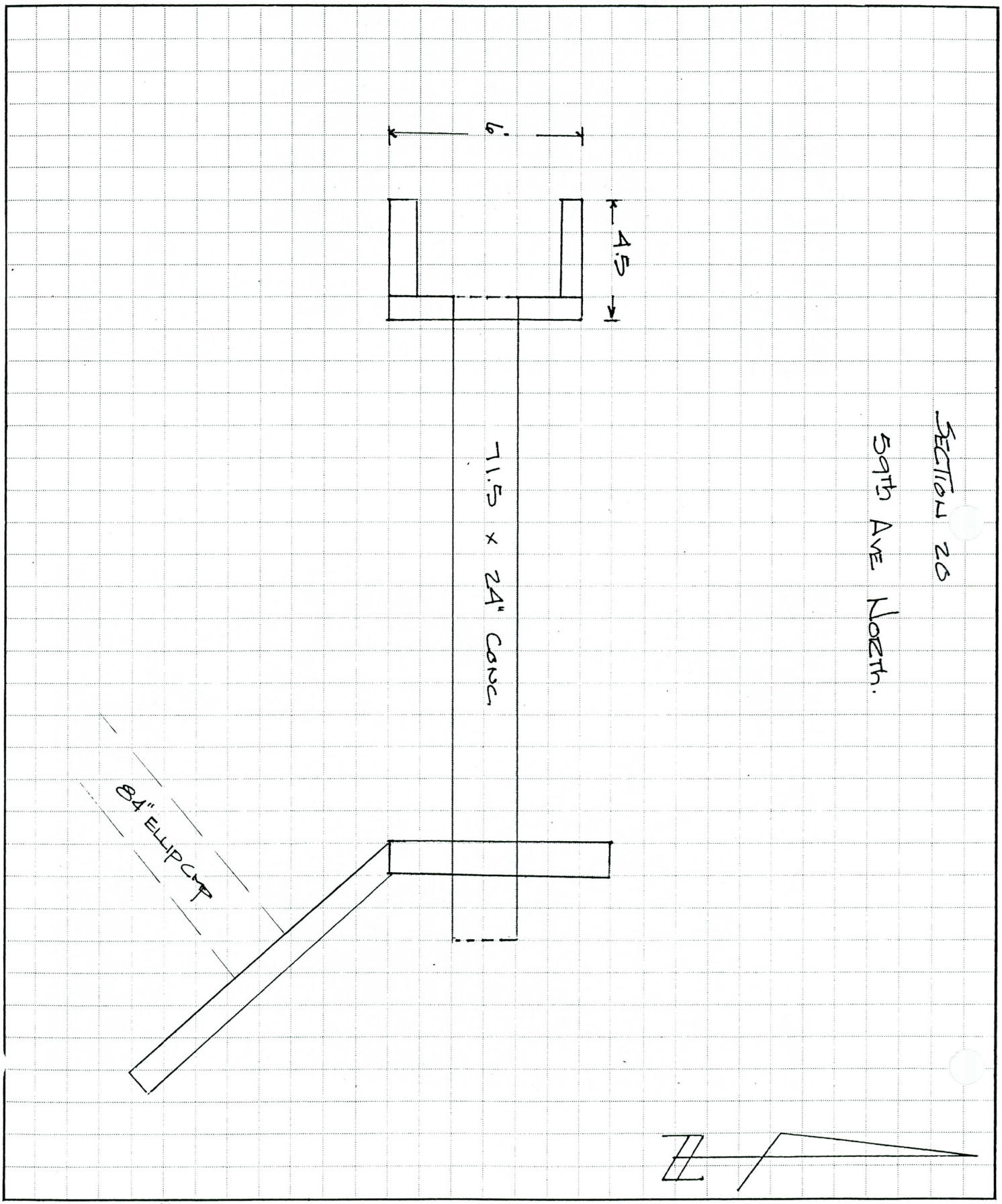
PROJECT _____
PROJECT NO. _____ SHEET ___ OF ___
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____



59th Ave North
East

Section 20
North – South.
18" CMP.

59th Ave North
East

Section 20
South – North
18" CMP

SECTION 20F

NORTH – SOUTH.

SECTION 20F 59th AVE NORTH
SOUTH – NORTH EAST.

SECTION 20F
NORTH – SOUTH.

SECTION 209

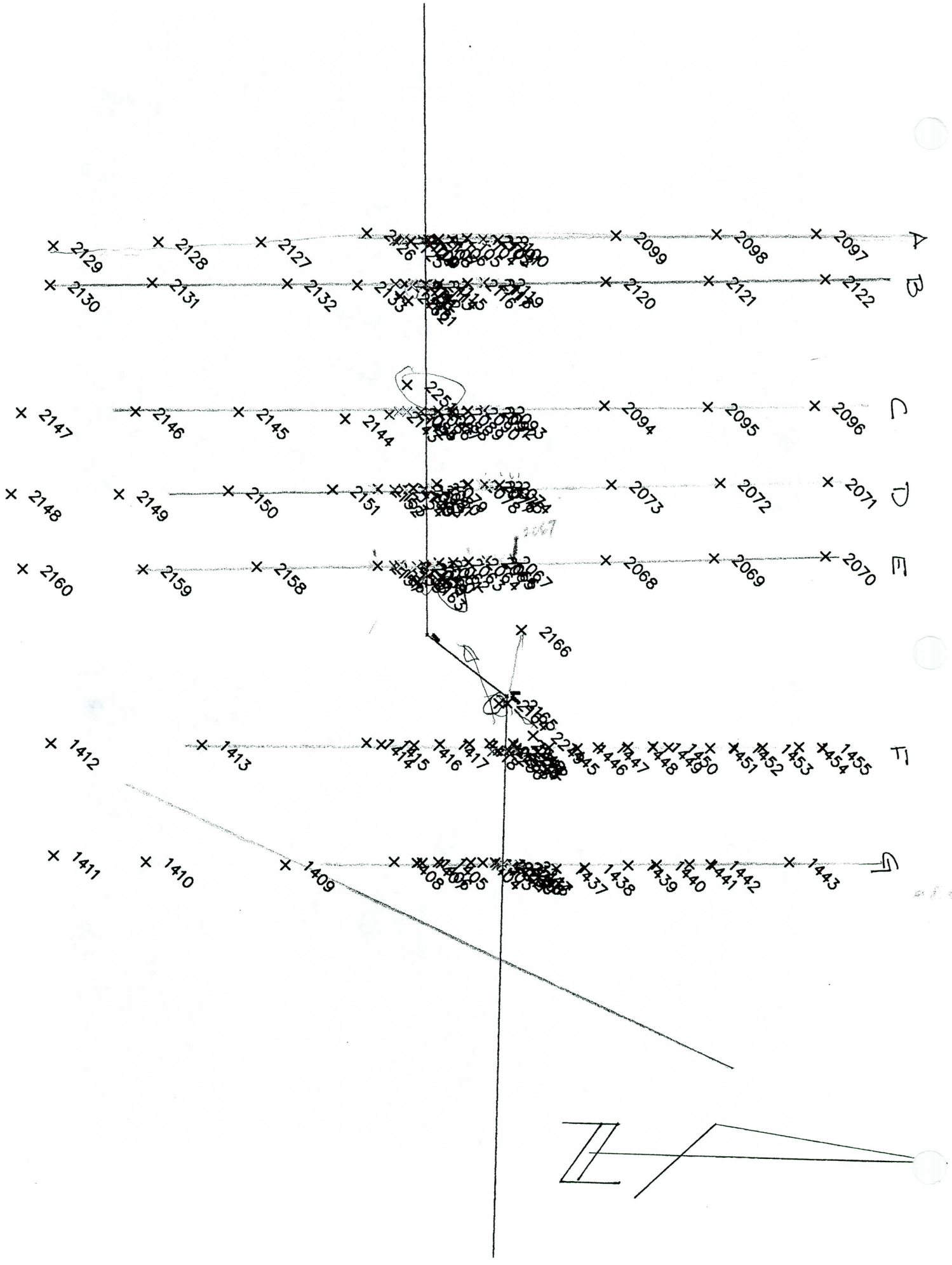
SOUTH — NORTH.

SECTION 209

SOUTH — NORTH.

SECTION 209

NORTH — SOUTH.


A
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Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

20 A

Point	Northing	Easting	Elevation	Description
2129	864579.5697	617622.6668	998.23	EG
2128	864679.9674	617619.3299	998.13	EG
2127	864778.1735	617619.7281	998.17	EG
2126	864879.5580	617611.0575	998.41	EOR
2125	864906.6866	617617.9402	1000.03	TOP
2124	864916.5431	617616.5759	992.71	EOW
2123	864917.5162	617616.2455	991.89	TOE
2110	864921.7423	617617.8484	992.01	TOE
2109	864922.2011	617618.5517	992.77	EOW
2108	864934.0982	617617.2051	1001.87	TOP
2107	864938.8822	617616.9135	1001.23	UOE
2106	864948.9444	617616.3486	1000.96	EP
2105	864961.9610	617616.9902	1001.61	CL
2104	864976.2099	617615.7504	1001.49	EP
2103	864989.4551	617616.5878	1001.18	TOE
2102	864991.5845	617616.3671	1002.13	TOP
2101	865000.0369	617617.0752	999.17	TOE
2100	865005.6565	617617.0303	998.41	EG
2099	865116.8733	617612.9584	998.31	EG
2098	865213.1277	617611.6802	998.45	EG
2097	865308.1206	617610.7405	998.55	EG

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

B

Point	Northing	Easting	Elevation	Description
2130	864576.8010	617660.1930	998.24	EG
2131	864674.0297	617658.2239	998.18	EG
2132	864803.5732	617659.2183	998.38	EG
2133	864870.4743	617660.2773	998.77	EG
2134	864907.6841	617659.2107	1000.16	TOP
2135	864916.5368	617659.1101	993.00	EOW
2136	864917.6028	617658.4551	992.52	TOE
2111	864922.9807	617659.6652	992.67	TOE
2112	864924.1043	617660.6423	992.95	EOW
2113	864936.2418	617659.5563	1001.66	TOP
2114	864940.6343	617659.3757	1001.24	TOE
2115	864949.0612	617659.3785	1001.09	EP
2116	864976.7792	617658.1298	1001.57	EP
2117	864989.6604	617657.8686	1001.38	TOE
2118	864992.8567	617657.7108	1002.23	TOP
2119	865002.4908	617657.5272	998.74	TOE
2120	865107.2675	617657.0078	998.34	EG
2121	865205.6869	617655.6979	998.44	EG
2122	865316.9985	617654.0630	998.70	EG

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2147	864549.6407	617781.4815	998.30	EG
2146	864658.2707	617780.3029	998.18	EG
2145	864757.5873	617780.7731	998.37	EG
2144	864859.2101	617787.2878	998.77	EG
2143	864902.0952	617783.3448	1000.70	TOP
2142	864911.6306	617780.3133	993.46	EOW
2141	864912.1753	617780.3705	993.14	TOE
2084	864918.1834	617780.3945	993.03	TOE
2085	864918.6189	617780.4094	993.49	EOW
2086	864932.4513	617780.1398	1002.23	TOP
2087	864940.4567	617780.3492	1001.09	TOE
2088	864948.9444	617779.7946	1001.29	EP
2089	864962.5677	617780.0533	1001.82	CL
2090	864977.4443	617779.4756	1001.56	EP
2091	864990.0442	617779.4556	1001.36	TOE
2092	864993.3135	617778.8951	1002.03	TOP
2093	865002.1626	617778.6795	999.03	TOE
2094	865106.2873	617774.3719	998.76	EG
2095	865205.0838	617775.5362	998.97	EG
2096	865307.1294	617774.0485	999.04	EG

30 C

Point statistics:

Starting point number: 1

Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2148	864540.1562	617858.4335	998.46	EG
2149	864642.7387	617858.8467	998.46	EG
2150	864748.0588	617855.6111	998.42	EG
2151	864847.3704	617854.4736	998.58	EG
2153	864890.9772	617853.7927	999.75	EOR
2154	864907.3111	617854.4314	1000.52	TOP
2152	864886.7115	617854.0979	998.85	TOE
2140	864915.8862	617853.8575	993.62	EOW
2139	864917.5484	617854.5703	992.71	TOE
2083	864924.3718	617852.9690	992.77	TOE
2082	864925.2681	617852.8362	993.74	EOW
2081	864935.6221	617853.6879	1002.55	TOP
2080	864940.7641	617851.4156	1001.09	TOE
2079	864947.6693	617849.0176	1001.27	EP
2078	864977.9050	617849.1917	1001.76	EP
2077	864990.6509	617849.9327	1001.35	TOE
2076	864993.9372	617849.1256	1001.77	TOP
2075	865000.7357	617849.4784	999.48	TOE
2074	865007.5901	617849.8252	998.87	EG
2073	865113.0514	617849.3427	998.69	EG
2072	865217.1012	617847.7741	998.83	EG
2071	865319.8813	617846.4412	998.95	EG

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2160	864551.3487	617929.8081	998.72	EG
2159	864665.9369	617930.5277	998.55	EG
2158	864774.9742	617928.1111	998.50	EG
2157	864886.4514	617927.3504	998.67	TOE
2156	864891.0663	617927.3853	999.30	EOR
2155	864906.8299	617927.1503	1000.07	TOP
2138	864912.2657	617927.0813	993.66	EOW
2137	864914.0729	617926.3358	992.59	TOE
2058	864927.2662	617927.7457	992.86	TOE
2059	864928.9575	617928.0397	993.61	EOW
2060	864935.5625	617926.1629	1002.44	TOP
2061	864944.1825	617925.3335	1001.44	TOE
2062	864949.8476	617924.2890	1001.58	EP
2063	864963.5592	617923.7819	1002.08	CL
2064	864978.4533	617923.2775	1001.86	EP
2065	864992.7200	617922.2853	1001.61	TOE
2066	864995.8141	617922.0271	1002.06	TOP
2067	865007.9395	617921.5592	999.20	TOE
2068	865108.0874	617921.4914	999.01	EG
2069	865211.4614	617919.6459	999.24	EG
2070	865317.6828	617917.7461	999.49	EG

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

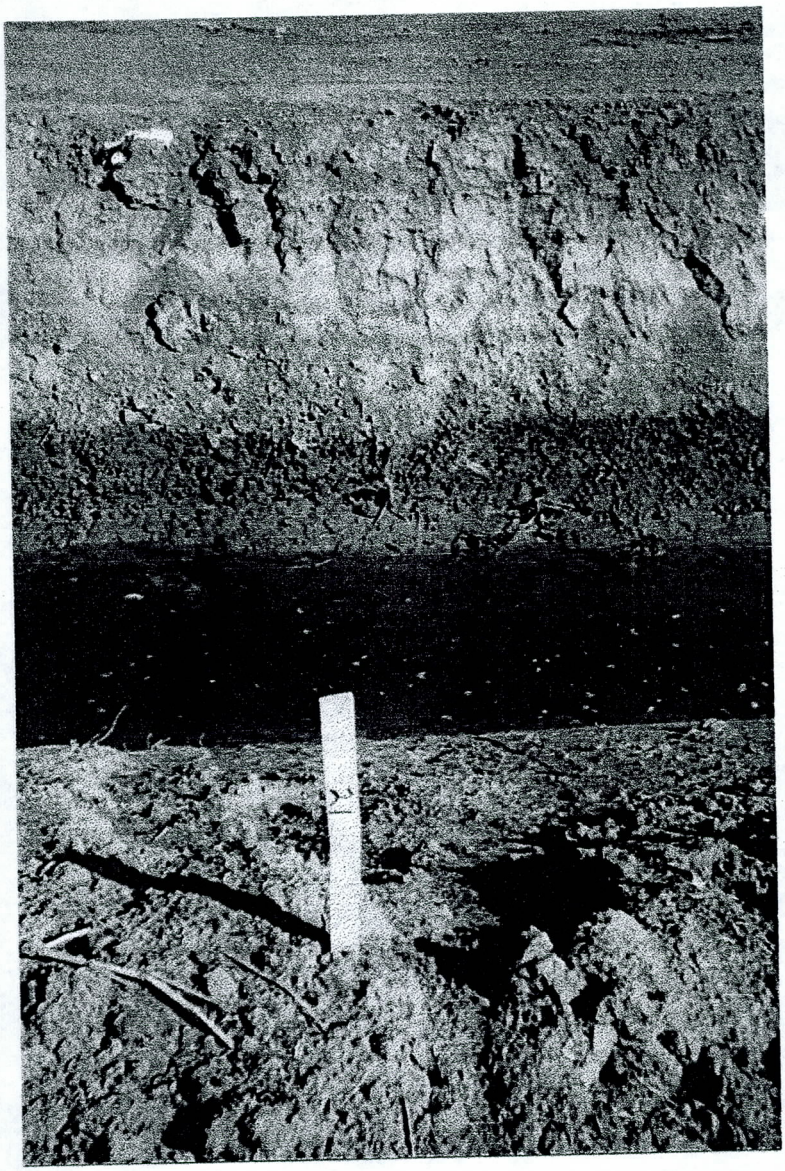
Point	Northing	Easting	Elevation	Description
1412	864578.5458	618096.3309	999.00	EG
1413	864723.4891	618097.7865	998.93	EG
1414	864880.6969	618096.1329	998.76	EG
1415	864895.1992	618097.7978	999.05	GB
1416	864926.7133	618098.4126	1000.54	GB
1417	864951.3169	618097.4780	1001.25	ER
1418	864980.0624	618097.0526	1001.72	ER
1419	864999.1518	618096.6304	1001.26	TOP
2236	865001.7885	618104.1474	1001.19	TOP BANK
2237	865007.0666	618103.4074	994.39	EOW
2238	865007.9929	618103.0015	993.37	TOE
2244	865016.1572	618104.1033	993.24	TOE
2243	865017.1832	618103.6331	994.14	EOW
1444	865023.9852	618101.2557	999.20	TOP
2242	865024.0242	618103.3592	999.39	TOP BANK
1445	865054.8445	618100.4642	998.35	EG
1446	865081.9065	618101.1816	999.42	EG
1447	865101.3529	618100.2080	1000.48	EG
1448	865129.6671	618099.8864	1004.04	EG
1449	865153.2575	618099.2779	1001.41	EG
1450	865168.4469	618100.1554	1000.72	EG
1451	865208.2653	618100.8972	1001.40	EG
1452	865230.9154	618100.3800	1002.94	EG
1453	865258.5544	618100.5170	1001.68	EG
1454	865293.4082	618099.7896	1000.92	EG
1455	865315.2375	618100.3176	1003.02	EG

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
1411	864581.4362	618203.3542	999.12	EG
1410	864669.6713	618209.4802	999.28	EG
1409	864803.4074	618212.7290	999.15	EG
1408	864908.0050	618210.0047	999.02	EG
1407	864929.7529	618210.9760	999.59	GB
1406	864935.0008	618210.8396	1000.82	GB
1405	864950.2558	618210.1664	1001.19	ER
1404	864981.6541	618210.2473	1001.44	ER
1403	864993.1055	618210.5267	1000.94	GB
1402	865004.9001	618210.4672	1001.50	TOP
2241	865006.2199	618213.2233	1001.39	TOP BANK
2240	865011.3149	618213.2801	994.12	EOW
2239	865012.0380	618213.5884	993.26	TOE
2245	865019.7059	618213.3637	993.22	TOE
2246	865021.3140	618214.2476	994.26	EOW
2247	865028.1035	618212.4911	999.28	TOP BANK
1436	865028.4942	618216.2157	999.17	TOP
1437	865062.6170	618216.0287	998.69	EG
1438	865089.2201	618215.3416	999.97	EG
1439	865130.0693	618212.7999	999.59	EG
1440	865157.1629	618212.3619	997.40	EG
1441	865188.8154	618211.9487	997.95	EG
1442	865209.2999	618212.1031	996.80	EG
1443	865284.4654	618209.8883	996.22	EG

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
2251	864918.9044	617755.1385	992.51	INV 84"CMP
2166	865028.5023	617988.0687	999.31	TP 24"PIPE
2165	865015.3665	618058.2598	998.27	TP 24"PIPE
2164	865007.5964	618058.4024	993.58	INV. 84"CMP
2163	864928.1135	617943.5777	993.52	INV. 84"CMP
2162	864911.9189	617670.7335	995.38	INV. 18"CMP
2161	864920.1523	617675.4573	997.03	TP 84"CMP



SECTION 21A

SOUTH — NORTH.

SECTION 21 A

SOUTH — NORTH.

SECTION 21 A

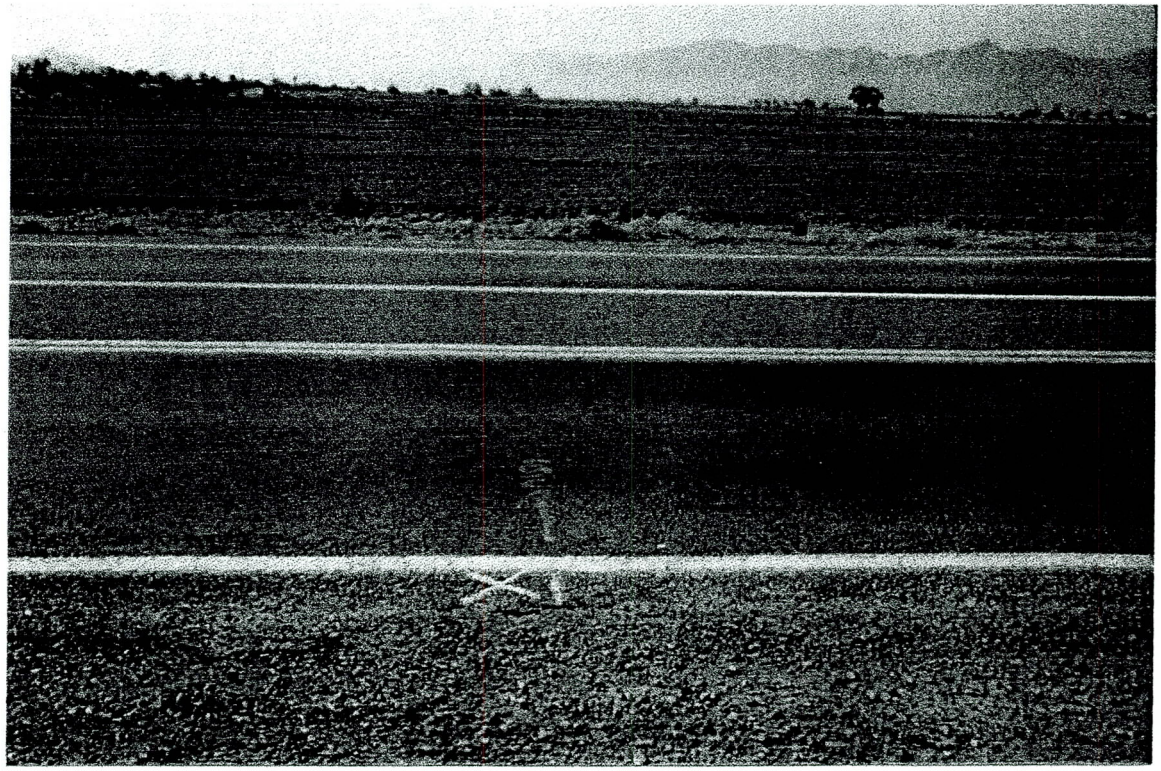
NORTH — SOUTH.

SECTION 21B

SOUTH — NORTH.

SECTION 21B

SOUTH – NORTH.



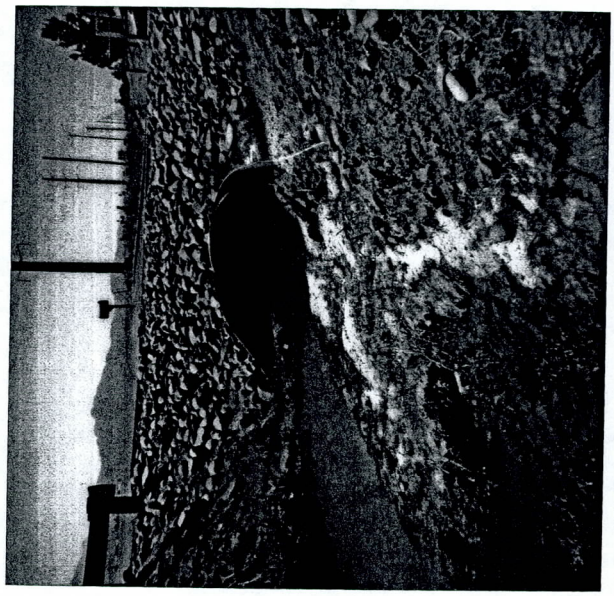
SECTION 21B

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

PROJECT LAVEEN UPDATE PAGE ____ OF ____

DETAIL ____ COMPUTED ____ DATE ____

M. Duncan CHECKED BY ____ DATE 4-4-00



5740 W. Baseline Rd. LOOKING WEST 4-4-00

5740 W. Baseline Rd. LOOKING EAST 4-4-00

SECTION 21

EAST – WEST

84" ELLIP CMP

SECTION 21

WEST – EAST

84" ELLIP CMP

SECTION 21

NORTH - SOUTH

30" CONC

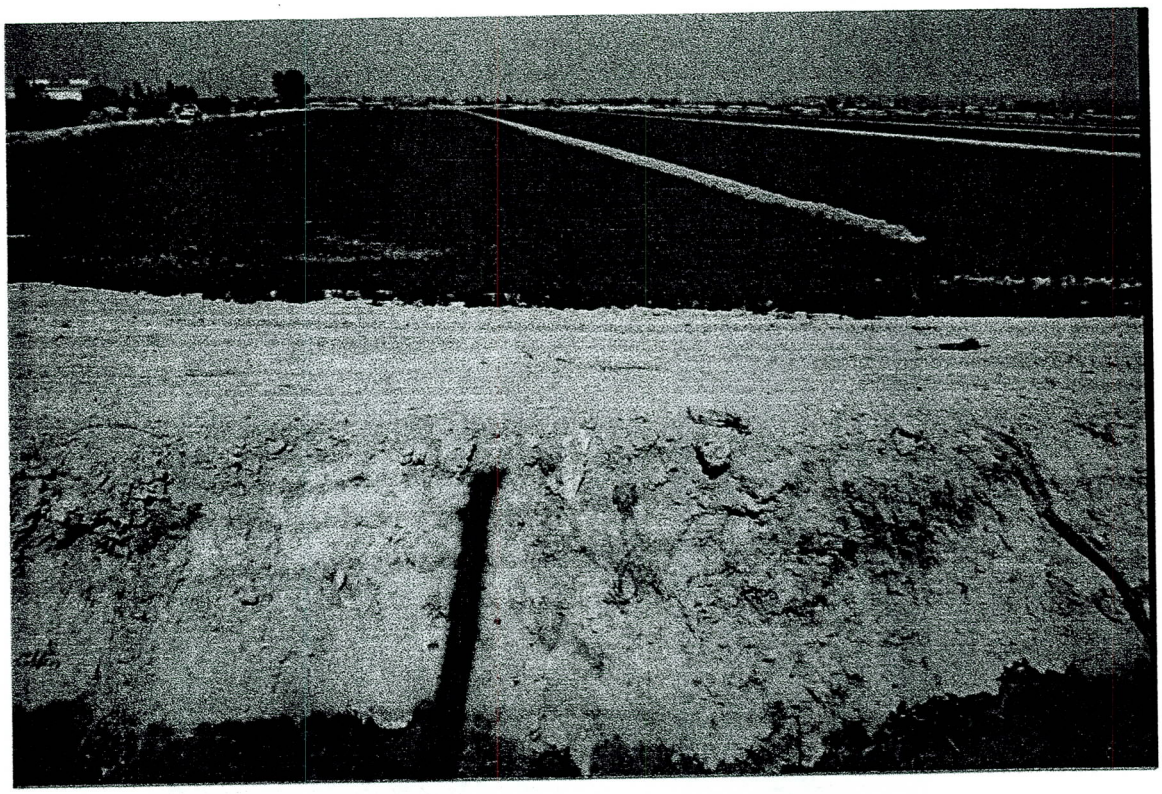
SECTION 21

SOUTH — NORTH

30 " - CONC.

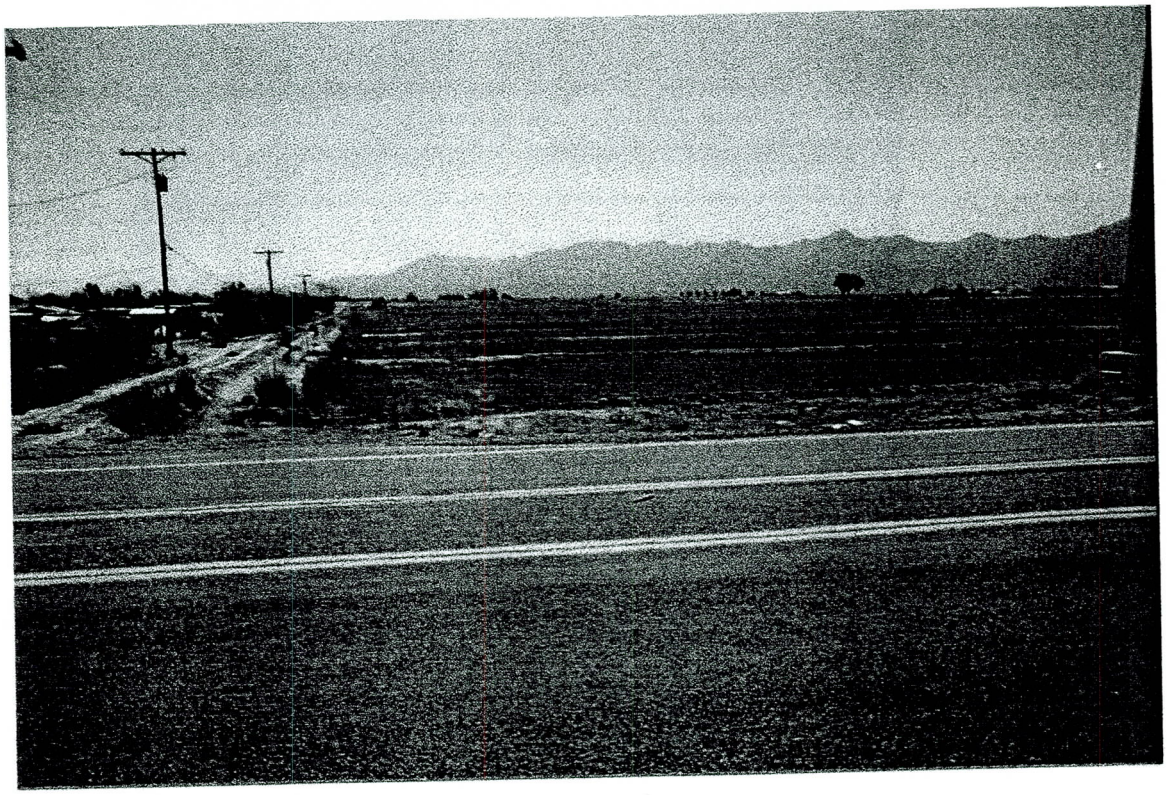
SECTION 21C

SOUTH – NORTH.



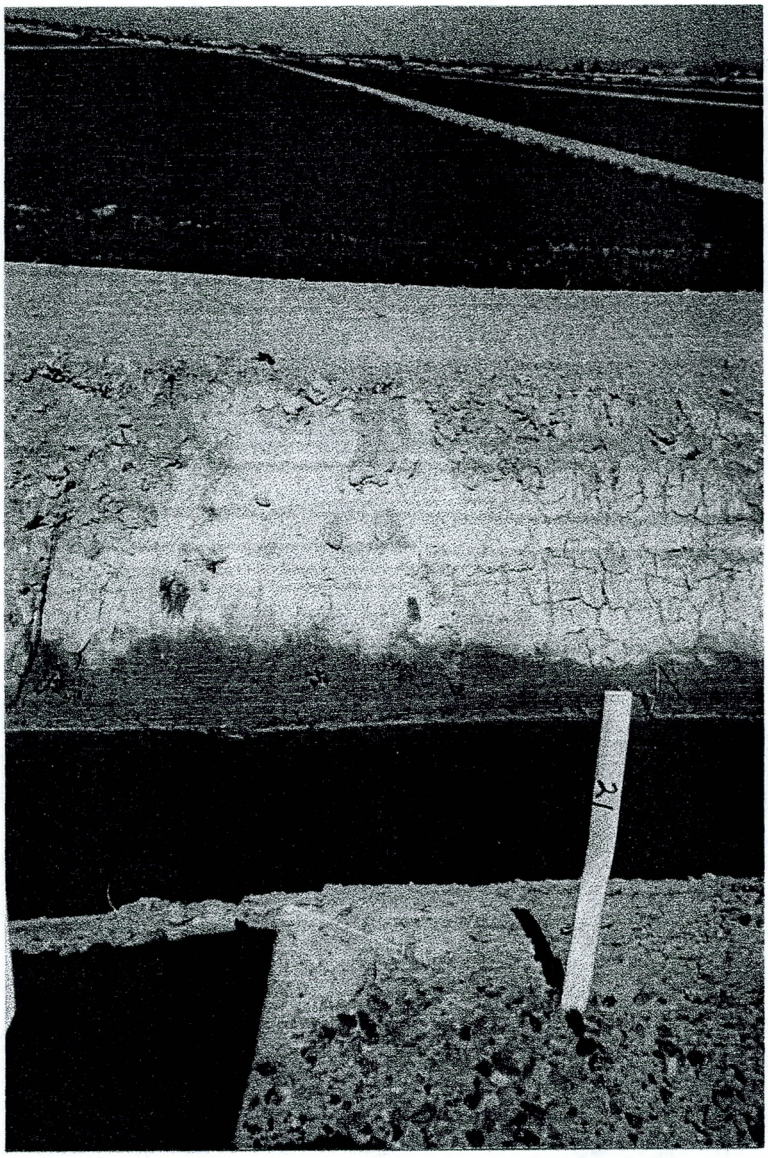
SECTION 21C

SOUTH – NORTH.



SECTION 21C

NORTH – SOUTH.



SECTION 21D

SOUTH — NORTH.

SECTION 21 D

SOUTH – NORTH

SECTION 21D

NORTH – SOUTH.

SECTION 21
A–D

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
1393	864623.1136	619136.5850	1000.66	EG
1391	864759.7873	619123.9230	1000.37	EG
1390	864860.5924	619123.6661	1000.29	EG
1389	864927.6602	619124.0028	1000.24	GB
1388	864934.1533	619123.7766	1002.20	GB
1387	864945.5386	619123.6963	1003.46	ER
1386	864986.2832	619124.5876	1004.05	ER
1385	864995.7909	619124.3363	1003.94	GB
1384	864998.6700	619124.2345	1004.42	TOP
2255	864999.6963	619124.1387	1004.10	TOP BANK
2256	865011.6992	619123.9289	994.75	EOW
2257	865012.0712	619123.2985	994.44	TOE
2272	865016.4578	619124.5371	994.53	TOE
2273	865017.4125	619124.5131	994.94	EOW
2274	865025.8378	619125.0372	1000.19	TOP BANK
1420	865025.9566	619120.5977	1000.61	TOP
1421	865078.1168	619118.5478	1000.24	EG
1422	865128.7469	619115.3778	1000.22	EG
1423	865178.8124	619112.1193	1000.04	EG
1424	865228.5315	619109.0741	1000.40	EG
1425	865278.6742	619106.7331	1001.00	EG
1426	865331.0393	619101.2018	1000.73	EG

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

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B

Point	Northing	Easting	Elevation	Description
1392	864636.5412	619425.7990	1001.09	EG
1383	864790.1671	619426.5696	1000.88	EG
1382	864877.0543	619429.8297	1000.95	EG
1381	864931.4535	619431.3563	1001.81	GB
1380	864949.7971	619433.3081	1004.17	ER
1379	864997.0848	619436.3853	1004.54	ER
2285	864999.9890	619433.4221	1004.11	TOP BANK
1378	864998.8510	619436.1222	1004.40	TOP
2286	865008.8867	619434.2450	995.50	EOW
2287	865010.0009	619434.7808	995.04	TOE
2299	865014.6405	619435.3652	995.05	TOE
2300	865015.3668	619435.3767	995.59	EOW
2301	865022.5902	619434.7283	1001.95	TOP BANK
1337	865024.1588	619433.1305	1002.10	TOP
1336	865049.9652	619433.3403	1000.76	GB
1335	865065.2336	619432.8820	1000.51	EG
1334	865122.4880	619432.0084	1000.69	EG
1333	865187.8220	619431.3249	1000.76	EG
1332	865254.5315	619430.8161	1000.86	EG
1331	865321.0506	619430.6346	1000.98	EG
1330	865379.0327	619430.4384	1001.12	EG
1329	865441.7239	619430.6730	1001.22	EG

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
1377	864694.6693	619749.9366	1001.00	CL ROADWAY
1376	864744.3024	619750.3199	1000.94	CL ROADWAY
1375	864795.5085	619751.3704	1001.23	CL ROADWAY
1374	864849.2673	619750.8096	1002.25	CL ROADWAY
1373	864901.2916	619751.1641	1003.35	CL ROADWAY
1372	864955.7384	619751.0963	1004.55	CL ROADWAY
1371	864988.6411	619749.8839	1005.23	ER
1370	864996.3359	619750.1362	1004.89	GB
1369	864999.5256	619750.2502	1006.09	TOP
2288	865000.8787	619751.4394	1005.27	TOP BANK
2289	865009.4758	619751.9442	995.66	EOW
2290	865011.3239	619752.6313	994.95	TOE
2302	865024.7574	619753.7726	1002.27	TOP BANK
1320	865026.1348	619748.6975	1002.33	TOP
1321	865045.2885	619747.3436	1001.05	GB
1322	865103.2527	619748.6920	1001.22	EG
1323	865163.6013	619749.4294	1001.34	EG
1324	865223.4085	619749.4737	1001.46	EG
1325	865284.5786	619750.5640	1001.61	EG
1326	865347.2221	619750.4108	1001.68	EG
1327	865410.3510	619750.1100	1001.78	EG
1328	865427.4157	619750.2878	1001.76	EG

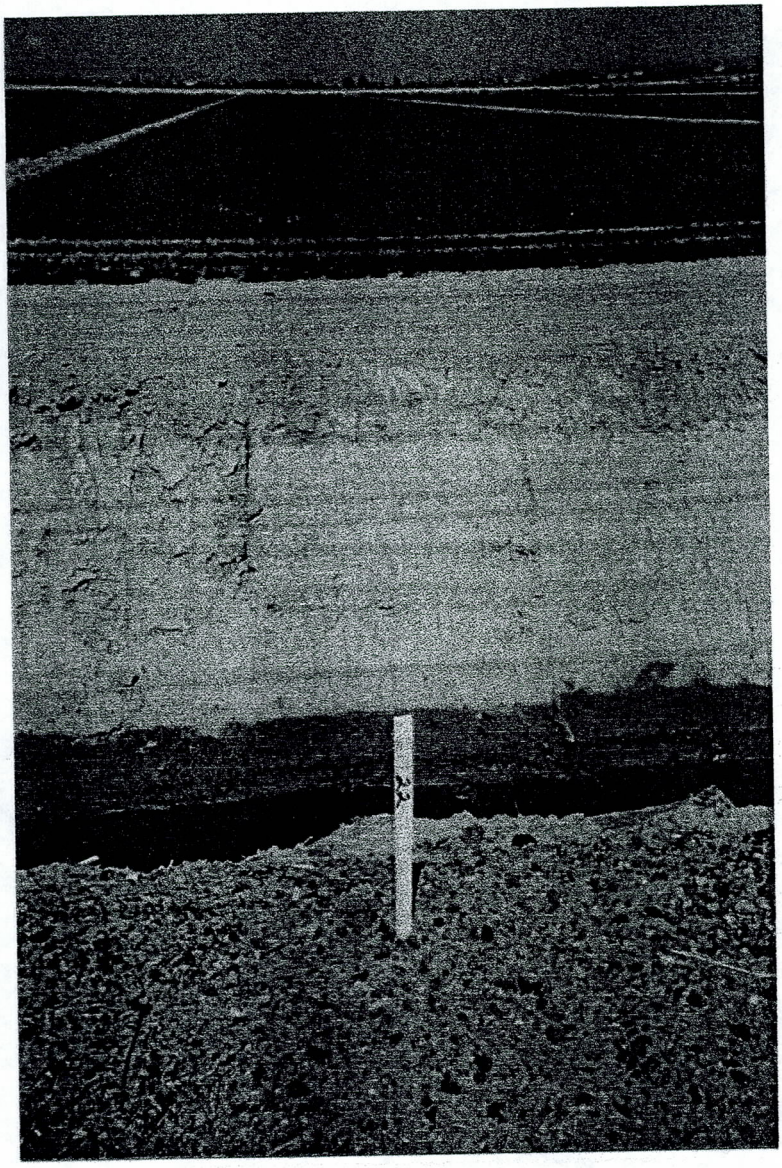
21 C

994.95

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

21
D

Point	Northing	Easting	Elevation	Description
1394	864620.5785	619035.7045	1000.36	EG
1395	864754.4617	619030.0013	1000.16	EG
1396	864929.6363	619022.6683	1000.61	GB
1397	864934.7762	619022.6640	1002.65	GB
1398	864945.1587	619022.4295	1003.68	ER
1399	864986.3727	619021.7733	1004.10	ER
1400	864997.3407	619021.5850	1003.45	GB
1401	864999.2154	619022.3193	1004.37	TOP
2252	865001.0094	619023.4139	1003.95	TOP BANK
2253	865011.4060	619024.5512	994.78	EOW
2254	865013.0208	619024.5472	993.98	TOE
2277	865016.7246	619026.5205	994.45	TOE
2276	865017.4029	619026.9074	994.81	EOW
2275	865026.8906	619026.8246	1001.57	TOP BANK
1435	865027.2060	619010.7593	1001.57	TOP
1434	865055.7369	619004.1260	1000.81	EG
1432	865099.4754	619003.8135	1002.75	GB
1431	865122.6955	619001.8684	1002.63	EG
1430	865174.5629	618998.0443	1002.08	EG
1429	865223.5884	618992.7716	1002.05	EG
1428	865271.3023	618989.2882	1001.84	EG
1427	865320.8856	618984.3459	1001.82	EG



SECTION 22

SOUTH — NORTH.

SECTION 22

SOUTH — NORTH

SECTION 22

NORTH — SOUTH

SECTION 22

1319
1318
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2548
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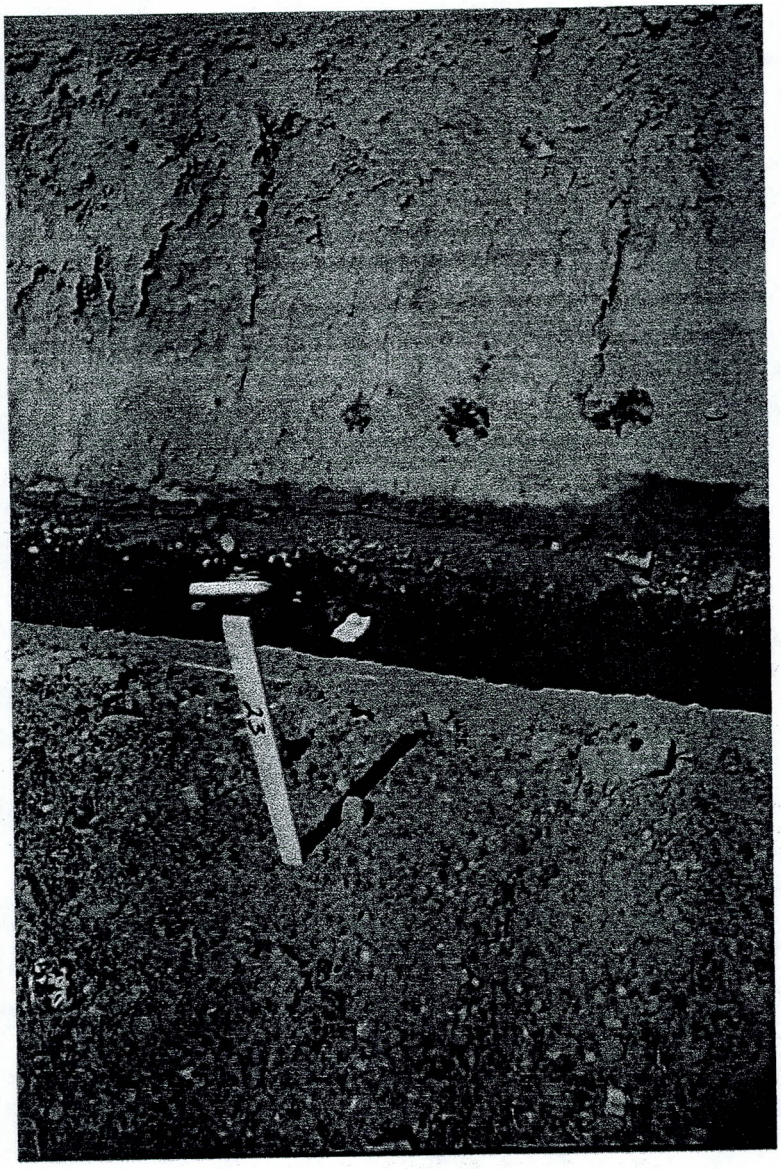
1368

Point statistics:

Starting point number: 1

Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
1368	864928.5781	621477.3471	1005.43	EG
1367	864938.2999	621477.7106	1005.37	GB
1366	864951.1338	621477.9518	1007.53	GB
1365	864963.5554	621477.5829	1008.32	ER
1364	864991.7928	621478.3920	1008.55	ER
1363	865000.4969	621478.5644	1007.86	GB
1362	865002.6969	621479.1641	1008.22	TOP
2547	865014.9823	621487.7779	994.81	EOW
2548	865016.0516	621488.0125	994.16	TOE
2549	865018.4814	621487.6637	994.27	TOE
2550	865019.7112	621487.6332	994.90	EOW
1312	865029.2308	621478.0418	1005.68	TOP
1313	865055.1264	621477.3143	1004.40	GB
1314	865115.2291	621477.8814	1004.46	EG
1315	865174.8981	621477.9985	1004.49	EG
1316	865233.8349	621478.2466	1004.52	EG
1317	865288.4060	621478.8134	1004.54	EG
1318	865344.6604	621478.9543	1004.58	EG
1319	865365.2501	621479.1672	1004.63	EG

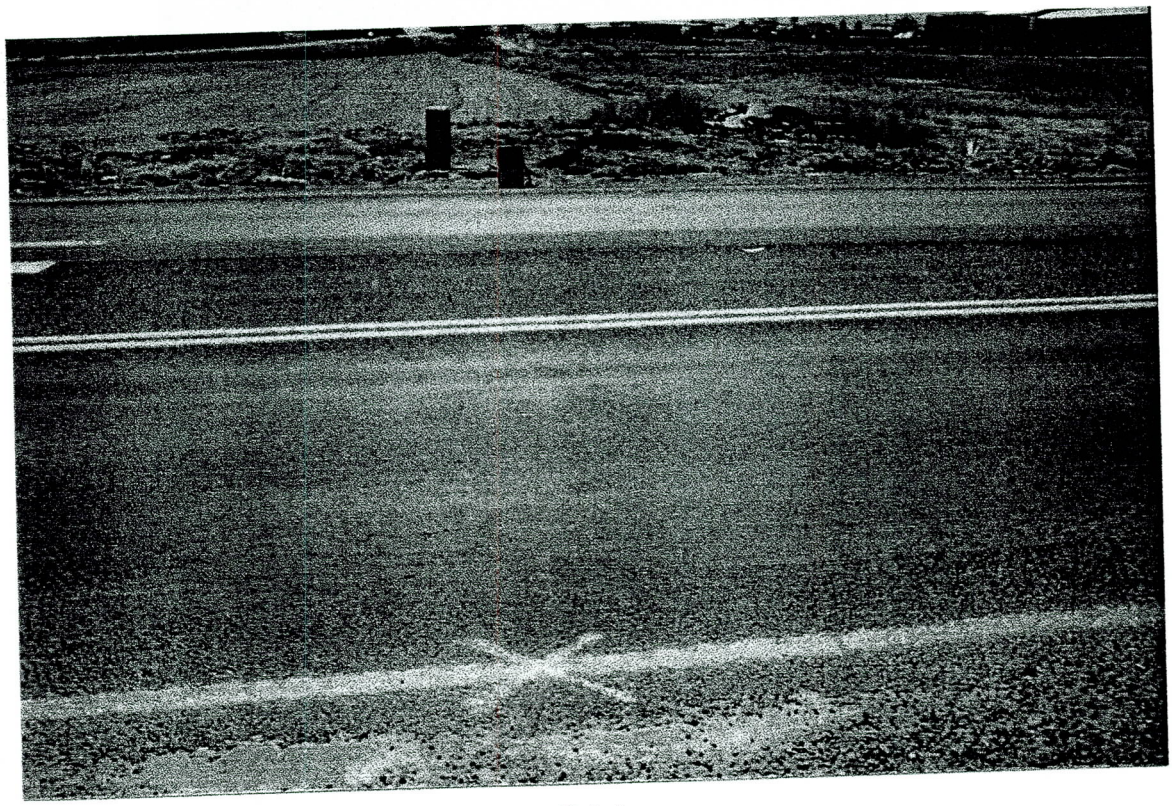


SECTION 23 A

SOUTH – NORTH.

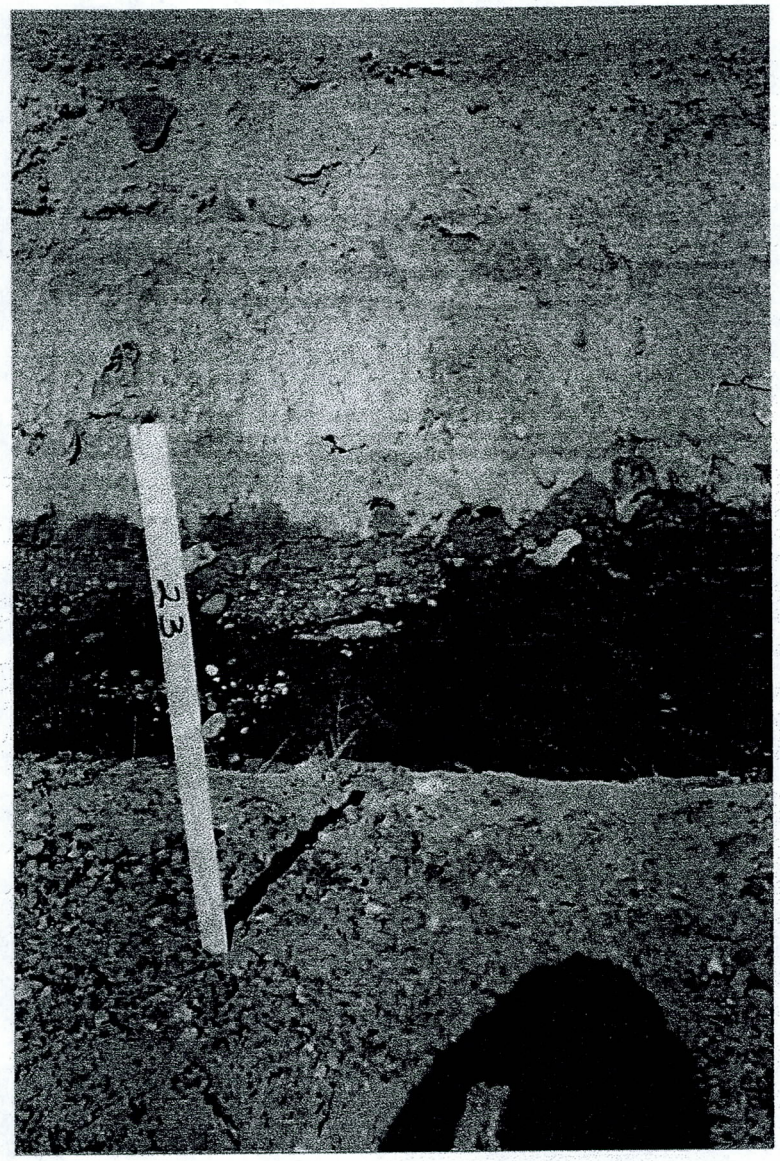
SECTION 23A

SOUTH — NORTH



SECTION 23A

NORTH — SOUTH.



SECTION 23B

SOUTH – NORTH.

SECTION 23B

SOUTH — NORTH

SECTION 23B

NORTH — SOUTH.

SECTION 23

A
B
1306
1305
1307
1304
1308
1303
1355
1356
1357
1358
1359
1360
1361
1345
1346
1347

Point statistics:
Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
1347	864513.3699	623064.8122	1011.33	EG
1346	864743.9947	623079.6396	1011.04	EG
1345	864840.3719	623074.9004	1010.76	EG
1344	864926.7445	623075.8975	1010.87	GB
1343	864939.8087	623077.9950	1011.32	GB
1342	864947.3147	623079.0027	1010.29	GB
1341	864957.2834	623081.4416	1010.99	ER
1340	864998.2505	623082.8359	1010.84	ER
1339	865005.2140	623083.3052	1010.82	GB
1338	865007.0246	623083.0702	1011.57	TOP
2539	865020.8248	623079.4009	998.54	EOW
2540	865021.6336	623079.7543	998.14	TOE
2541	865026.9754	623080.4792	998.15	TOE
2542	865027.5631	623079.5758	998.58	EOW
1300	865039.5374	623082.4608	1010.45	TOP
1301	865059.5107	623080.6908	1009.44	GB
1302	865066.2320	623079.9399	1007.91	GB
1303	865159.7758	623076.6229	1007.85	EG
1304	865264.1254	623076.6792	1007.74	EG
1305	865369.3679	623075.5192	1007.85	EG

Starting point number: 1
Current point number: 15 ('L' indicates locked point)

Point	Northing	Easting	Elevation	Description
1361	864539.2992	622986.6257	1010.82	EG
1360	864589.9528	622986.4798	1011.02	EG
1359	864646.2779	622986.3195	1010.90	EG
1358	864696.9851	622984.8139	1011.08	EG
1357	864758.8453	622986.4698	1011.07	EG
1356	864813.7332	622987.3233	1010.94	EG
1355	864873.9325	622987.4017	1010.54	EG
1354	864926.9733	622987.7929	1011.03	GB
1353	864941.8224	622986.8936	1011.79	GB
1352	864951.9593	622987.3689	1010.35	GB
1351	864957.8479	622987.8291	1010.72	ER
1350	864996.8557	622990.2869	1010.91	ER
1349	865004.4308	622990.3635	1010.87	GB
1348	865006.9774	622990.3633	1011.43	TOP
2543	865020.7435	622990.8149	998.03	EOW
2544	865021.0092	622990.9694	997.80	TOE
2545	865023.0218	622990.5579	997.77	TOE
2546	865023.8146	622990.7088	997.99	EOW
1310	865055.3168	622993.4897	1008.94	GB
1309	865059.1810	622993.3226	1007.85	GB
1308	865152.3745	622992.6750	1007.64	EG
1307	865259.9082	622992.0029	1007.65	EG
1306	865365.1950	622991.7503	1007.67	EG

APPENDIX D.1

PRECIPITATION DATA

(NOT APPLICABLE)

APPENDIX D.2

PHYSICAL PARAMETER CALCULATIONS

(NOT APPLICABLE)

APPENDIX D.3

HYDROGRAPH ROUTING DATA

(NOT APPLICABLE)

APPENDIX D.4

RESERVOIR ROUTING DATA

(NOT APPLICABLE)

APPENDIX D.5

FLOW SPLITS AND DIVERSIONS DATA

(NOT APPLICABLE)

APPENDIX D.6

HYDROLOGIC CALCULATIONS

(NOT APPLICABLE)

APPENDIX E.1

ROUGHNESS COEFFICIENT ESTIMATION

Photo 1. Region B (row crop)

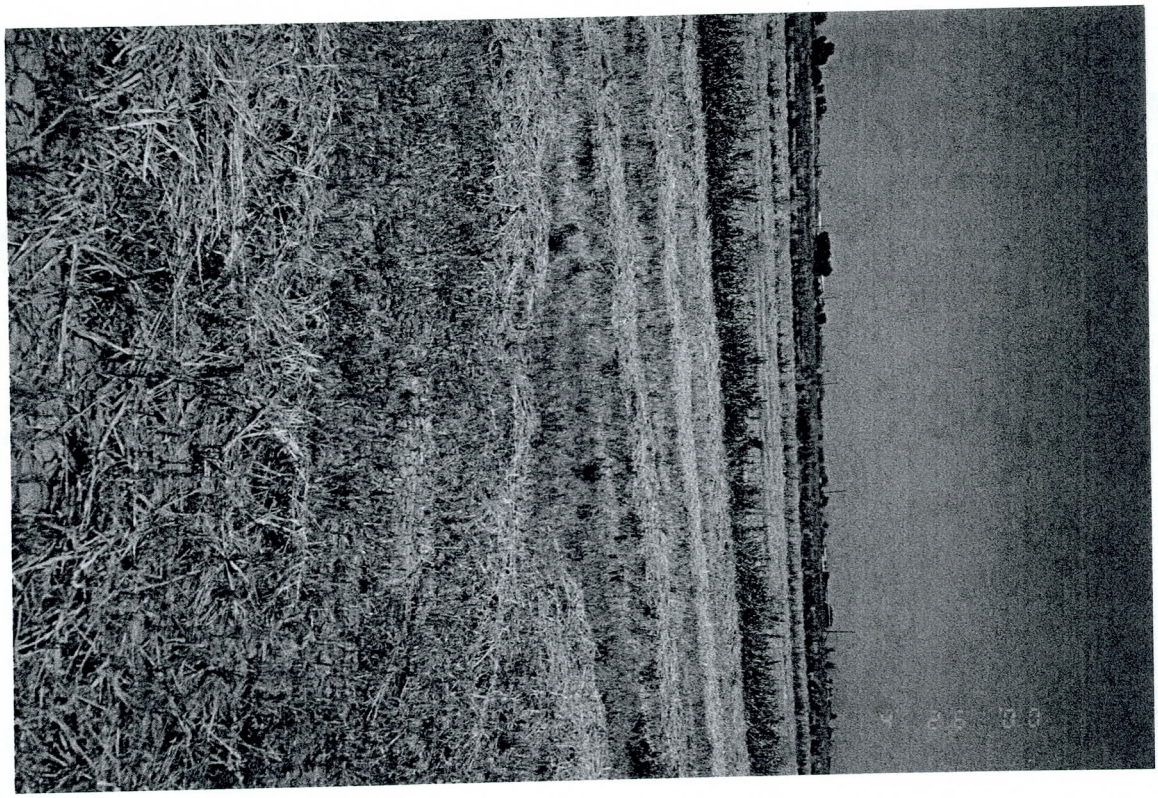


Photo 2. Region C (field crop)

Photo 3. Region E (row crop)

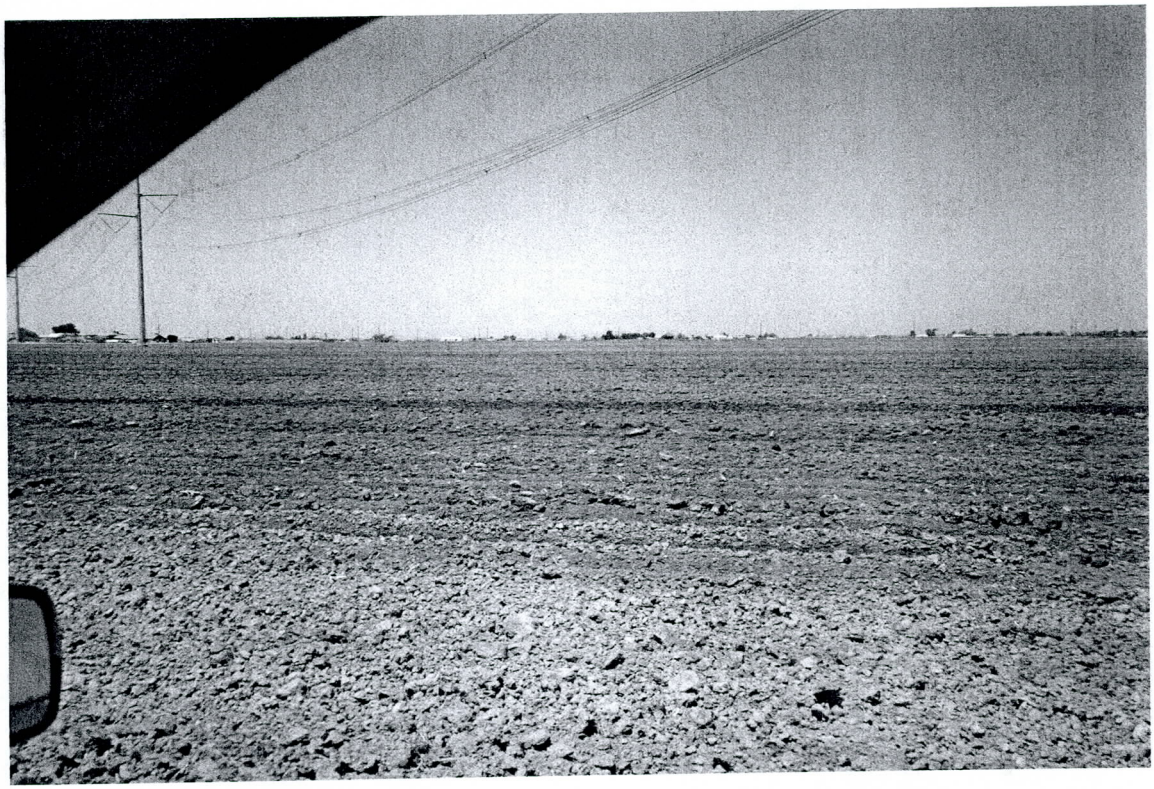


Photo 4. Region E (row crop)

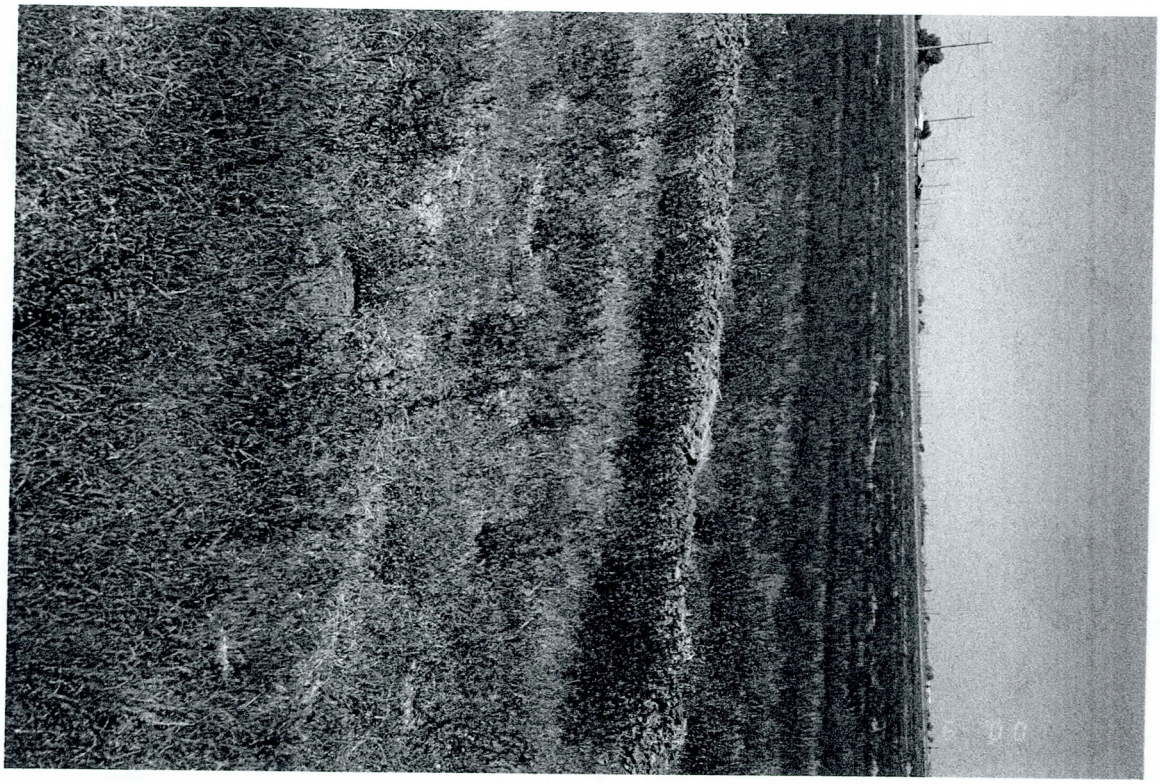


Photo 5. Region F (row crop)

Photo 6. Region F (row crop)

Photo 7. Region G (row crop)

Photo 8. Region G (row crop)

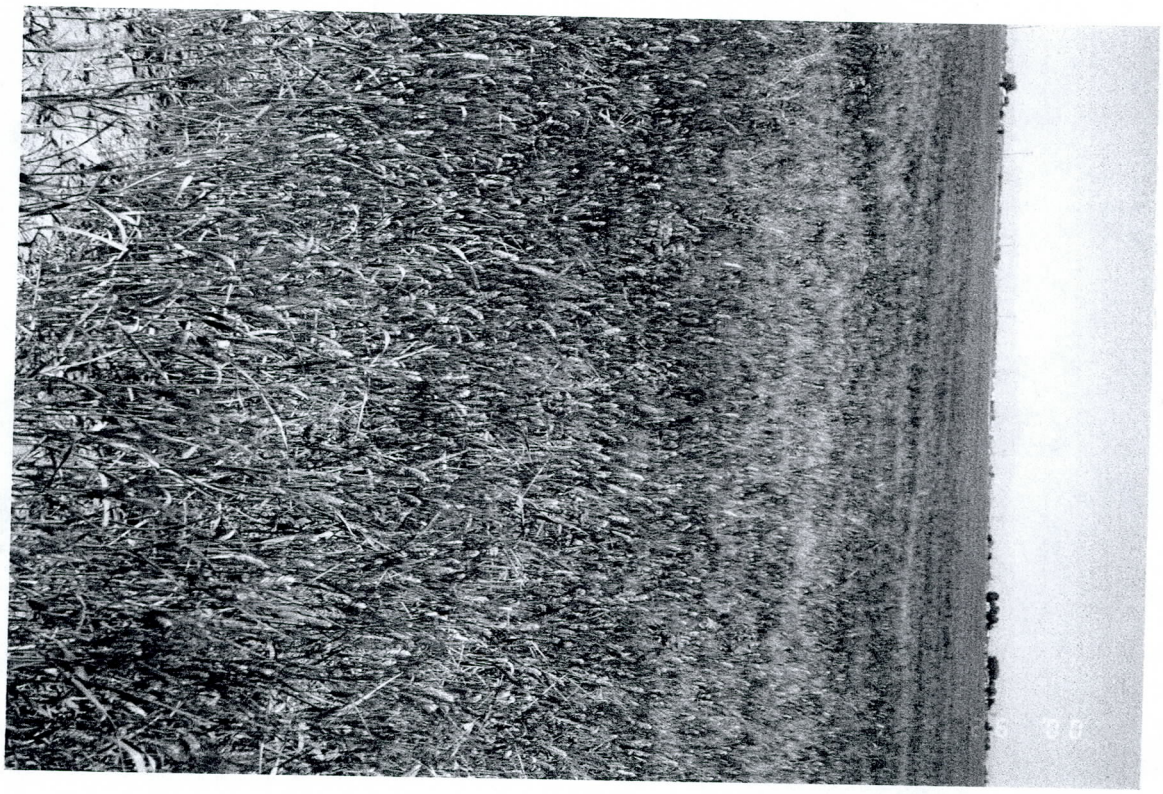


Photo 9. Region H (field crop)

Photo 10. Region H (field crop)

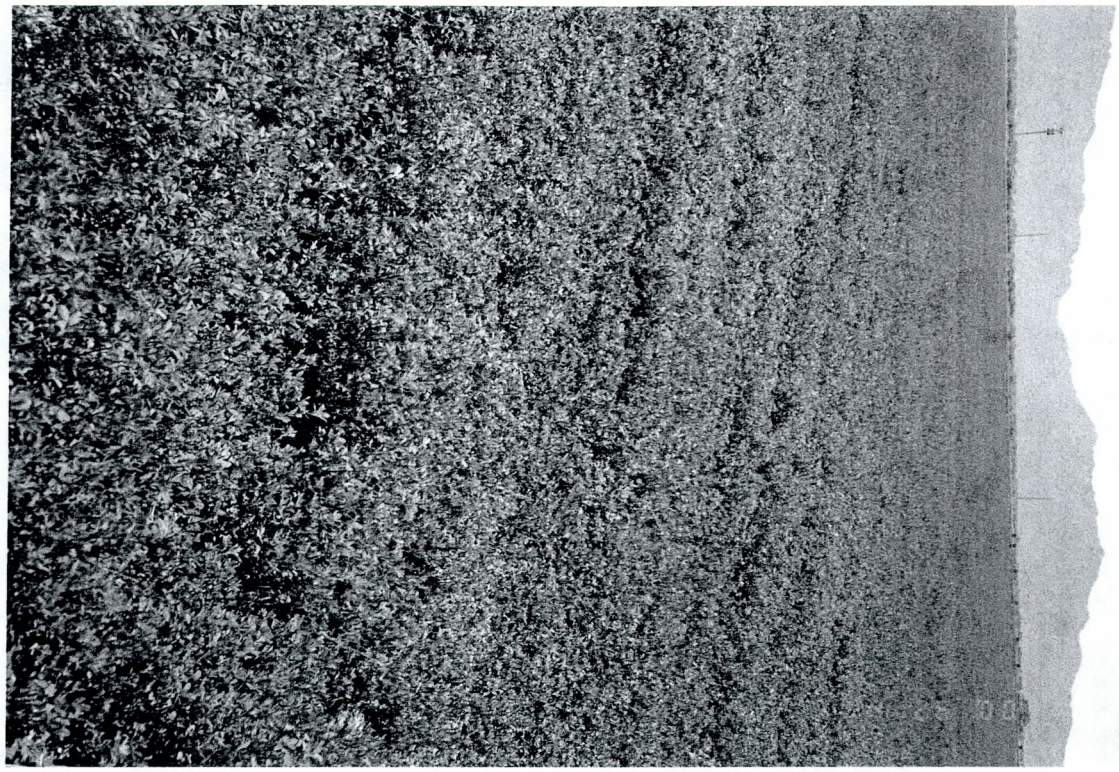


Photo 11. Region I (field crop)

Photo 12. Region I (field crop)

Photo 13. Region J (field crop)

Photo 14. Region J (field crop)

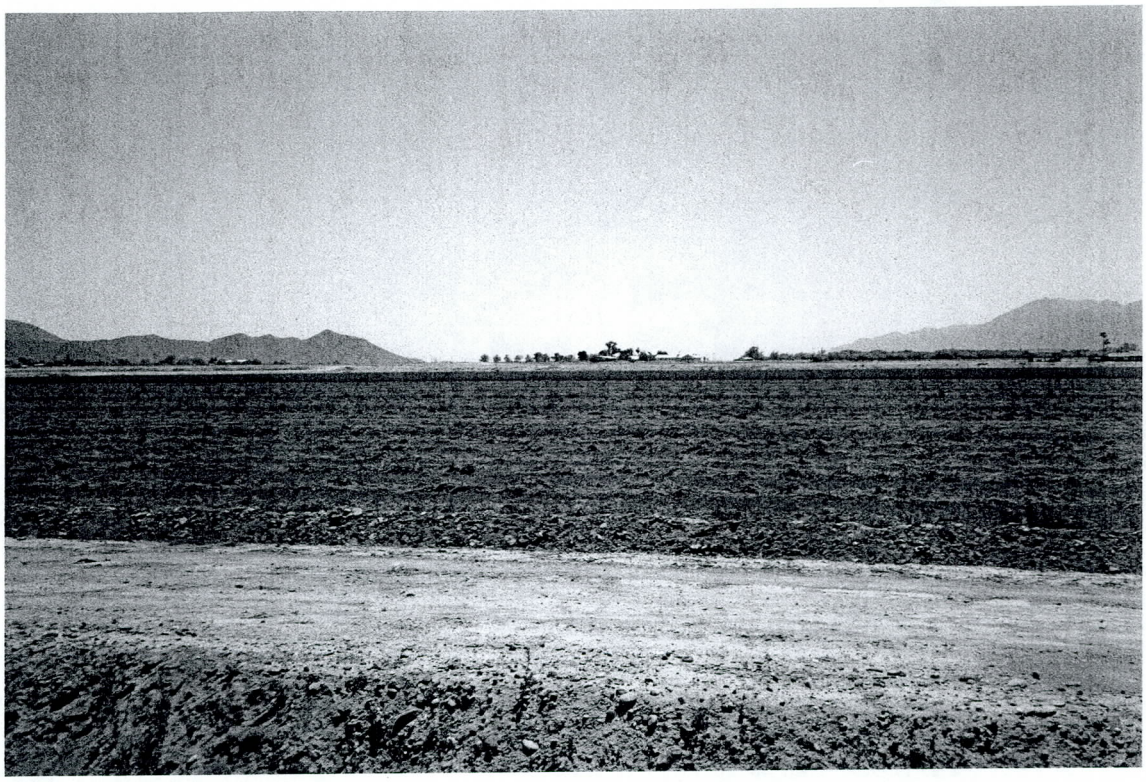


Photo 15. Region K (field crop)

Photo 16. Region M (row crop)

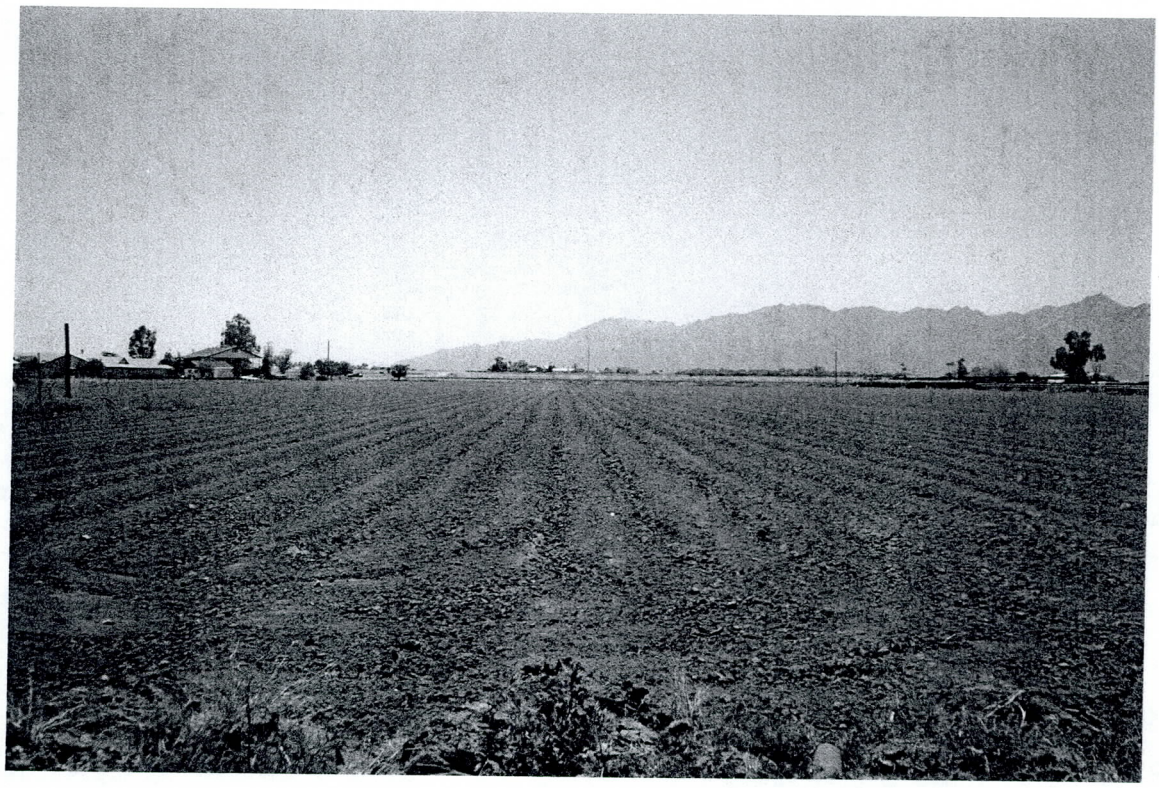


Photo 17. Region P (row crop)

Photo 18. Region Q (row crop)

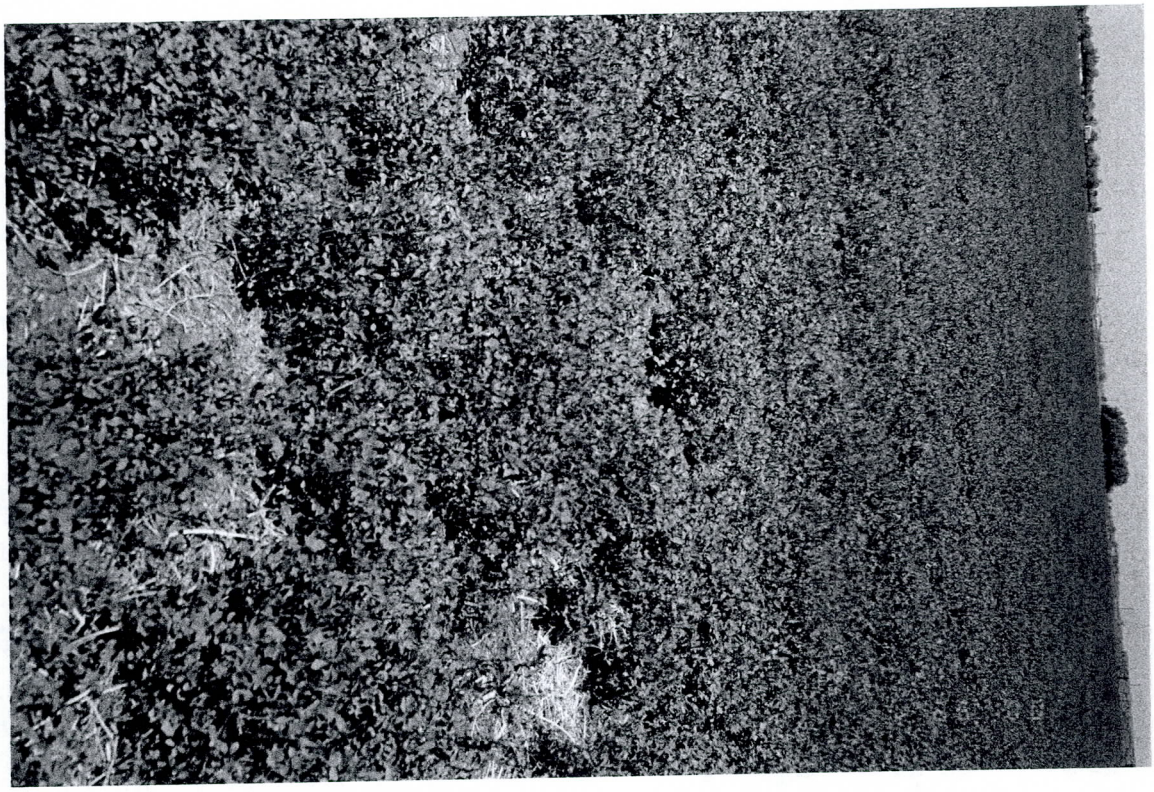


Photo 19. Region R (field crop)

Photo 20. Region R (field crop)

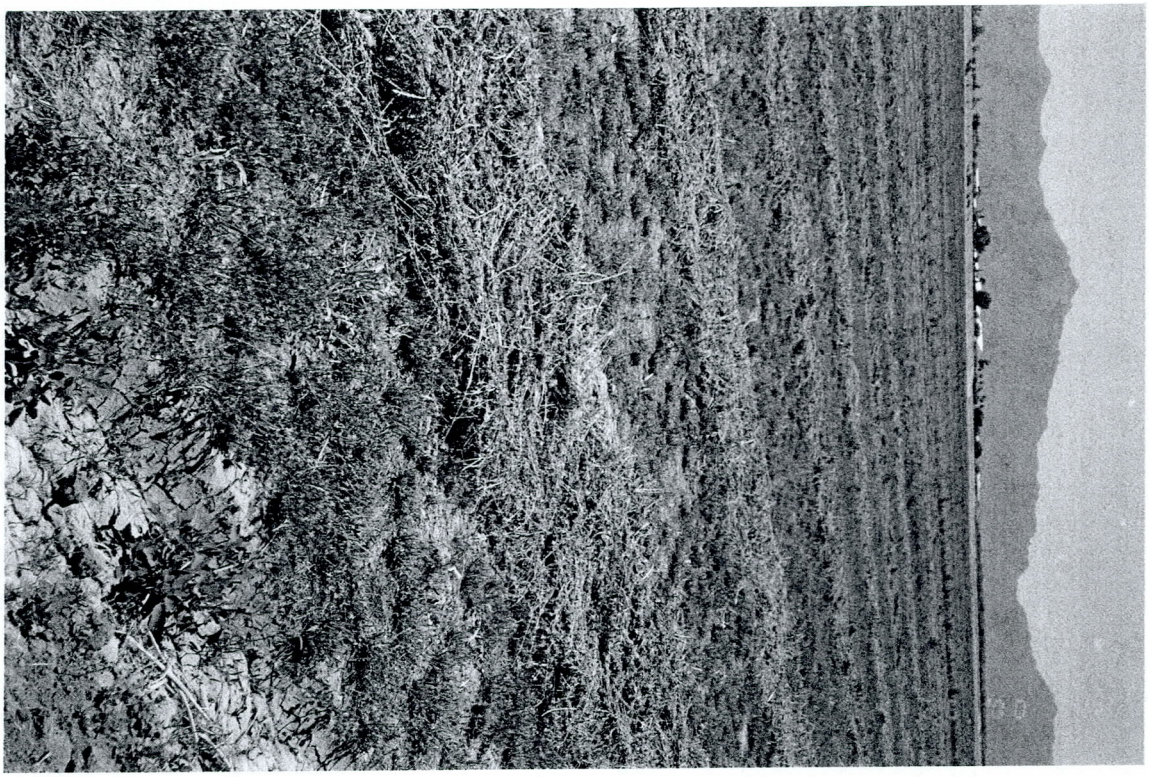


Photo 21. Region S (field crop)

Photo 22. Region S (field crop)

Photo 23. Region V (field crop)

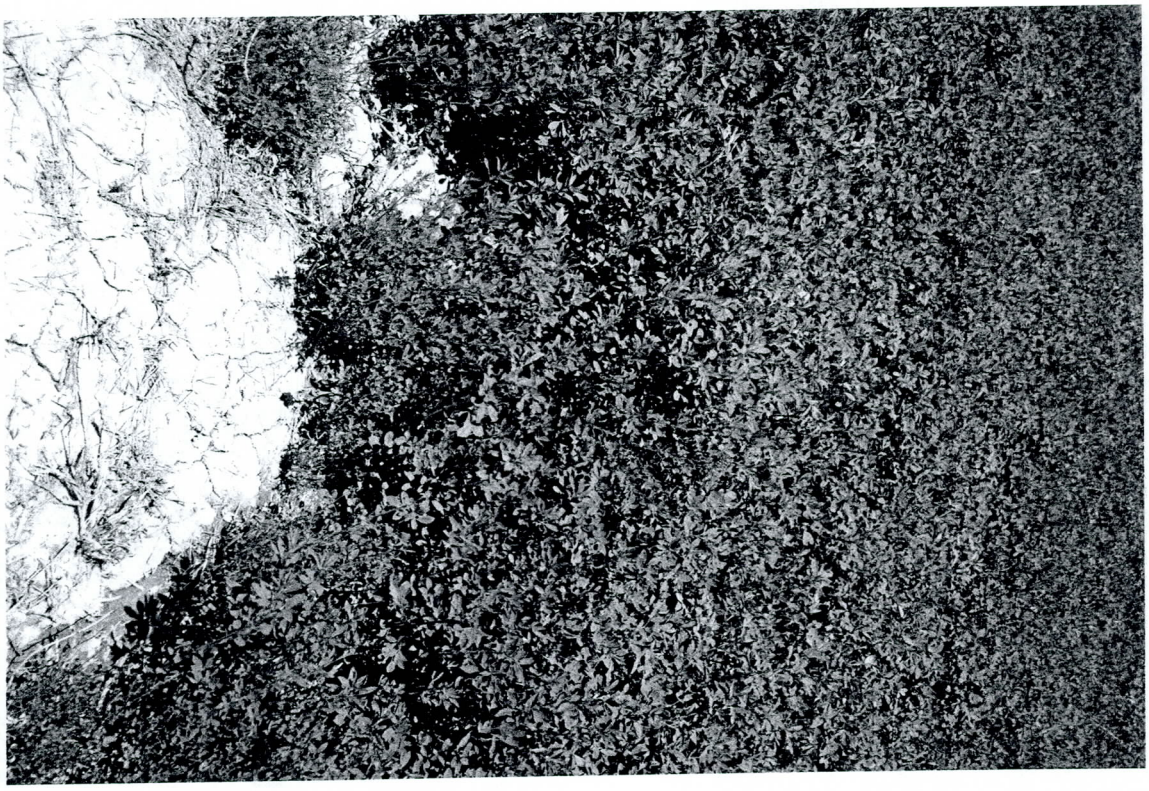


Photo 24. Region V (field crop)

Photo 25. Region W (row crop)

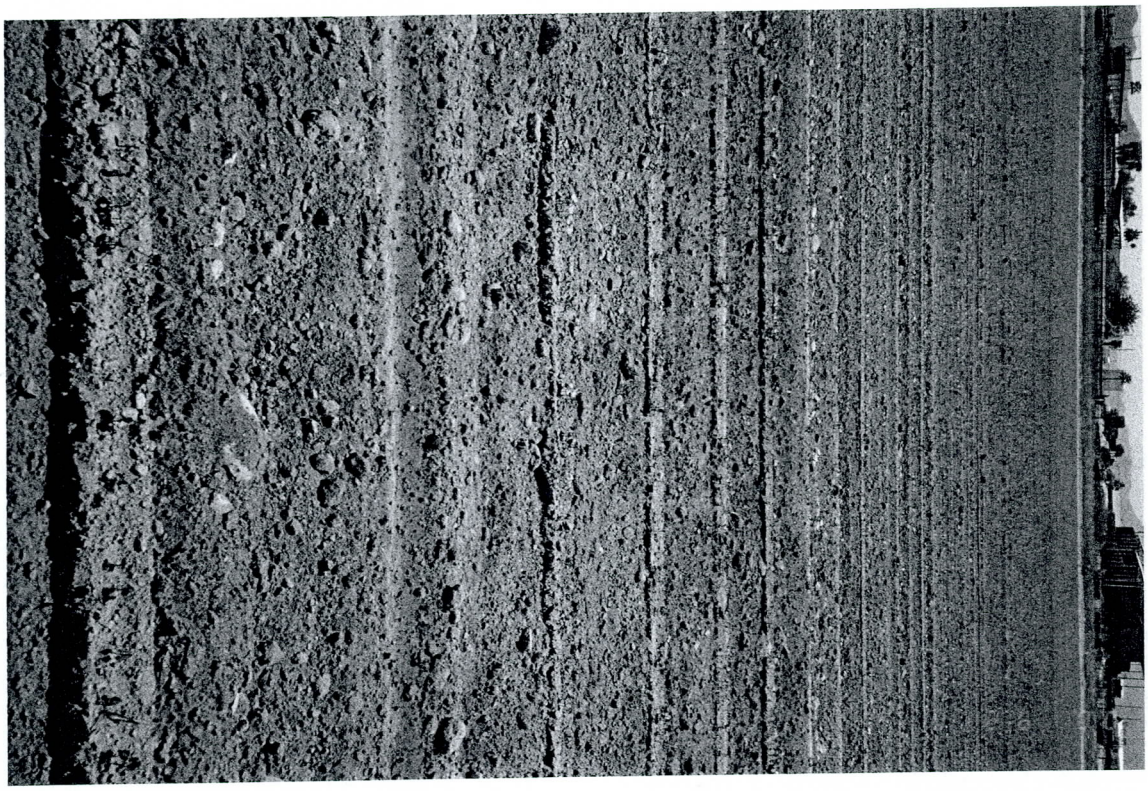


Photo 26. Region W (row crop)

Photo 27. Region Y (field crop)

Photo 28. Region Y (field crop)

Photo 29. Region BB (field crop)

Photo 30. Region BB (field crop)

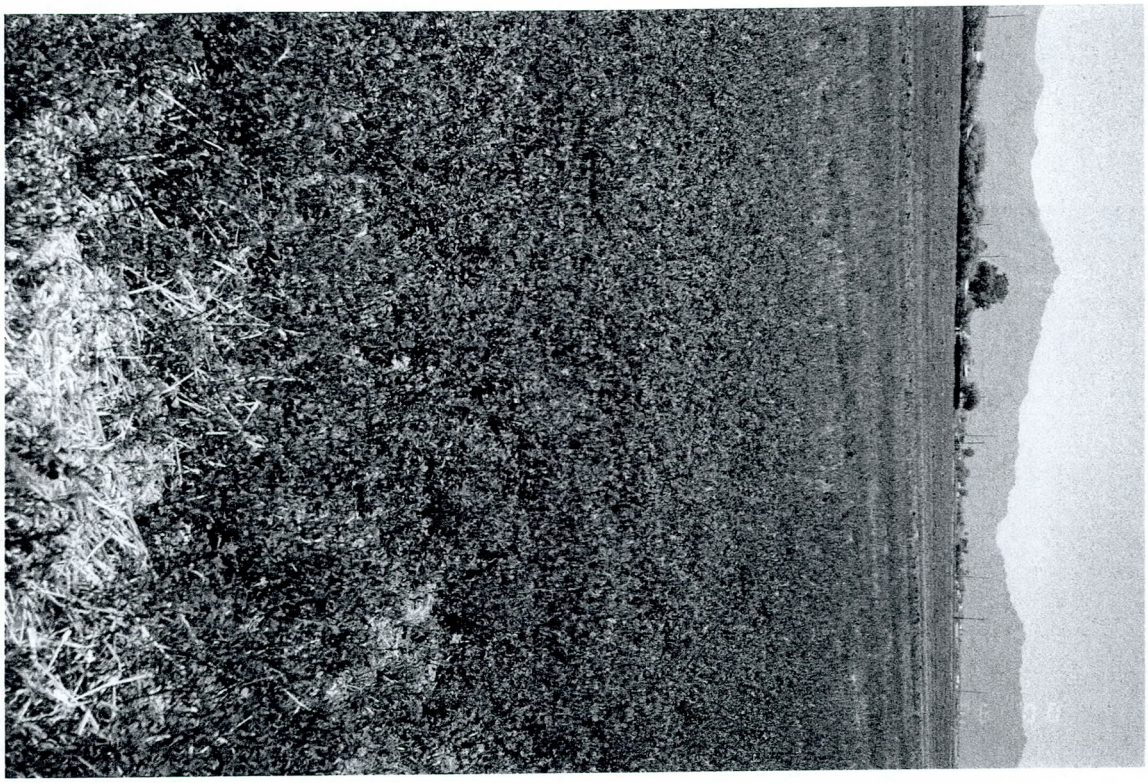


Photo 31. Region CC (field crop)

Photo 32. Region CC (field crop)

Photo 33. Region DD (field crop)

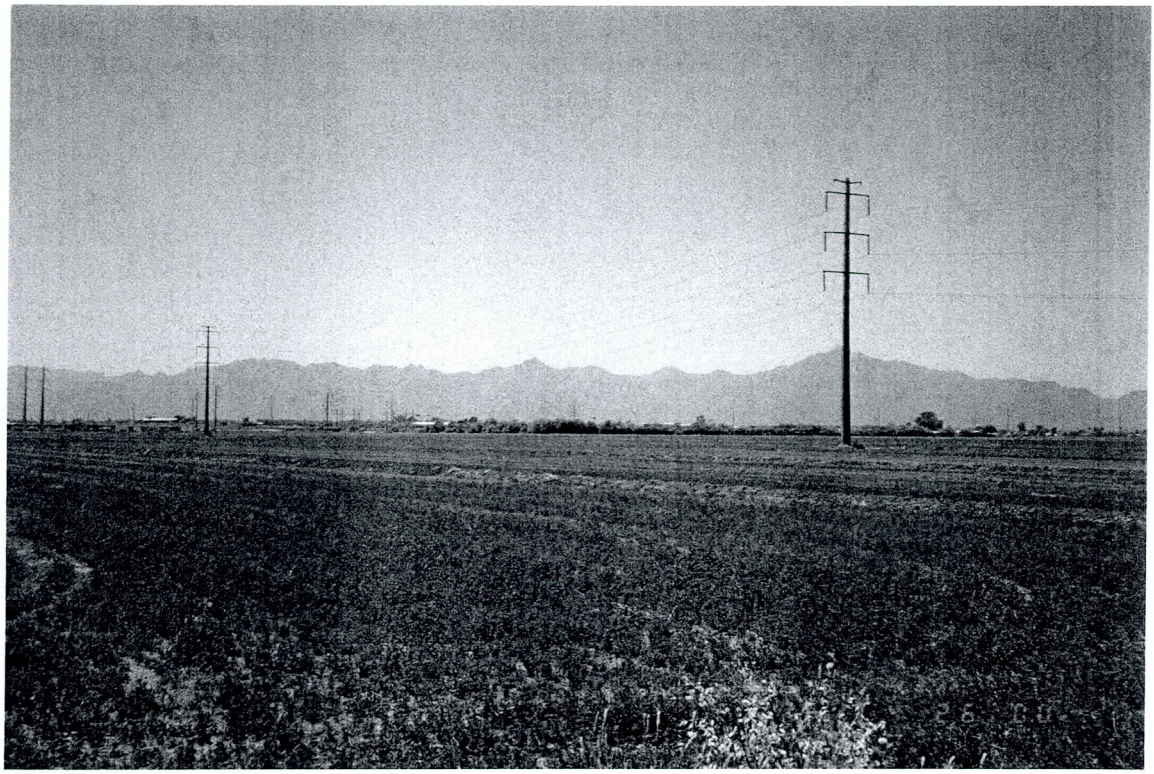


Photo 34. Region DD (field crop)

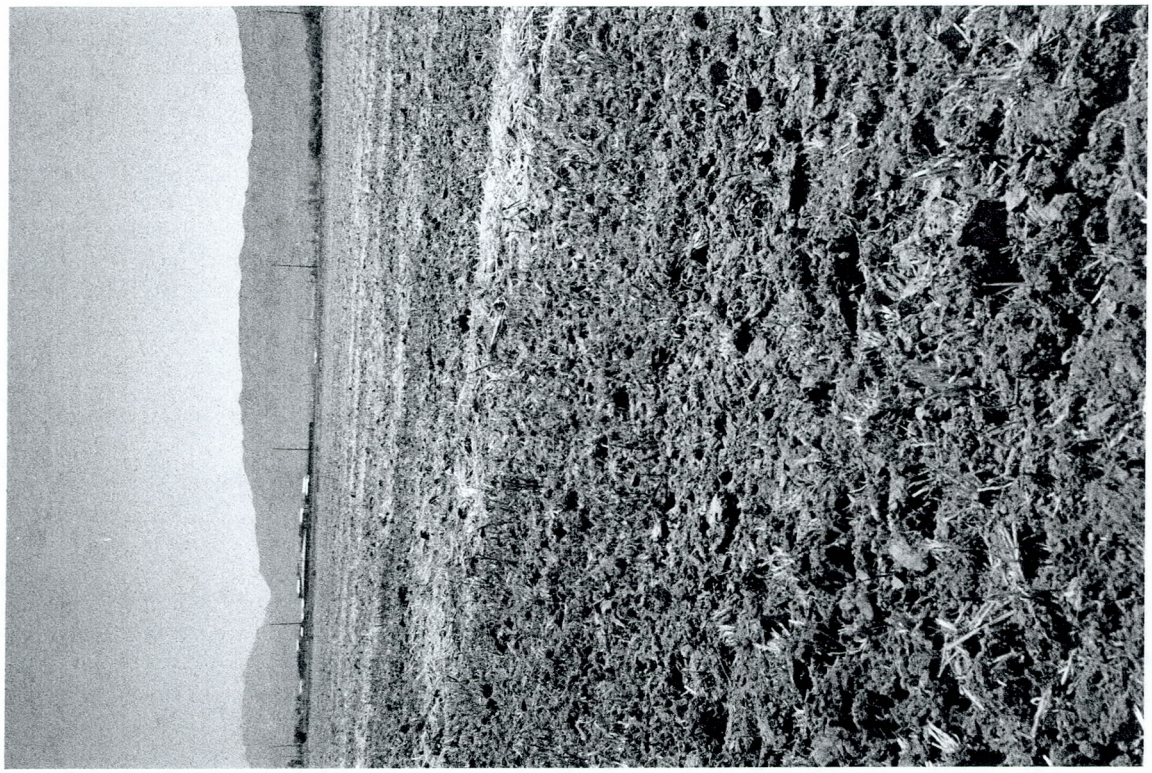


Photo 35. Region EE (field crop)

Photo 36. Region EE (field crop)

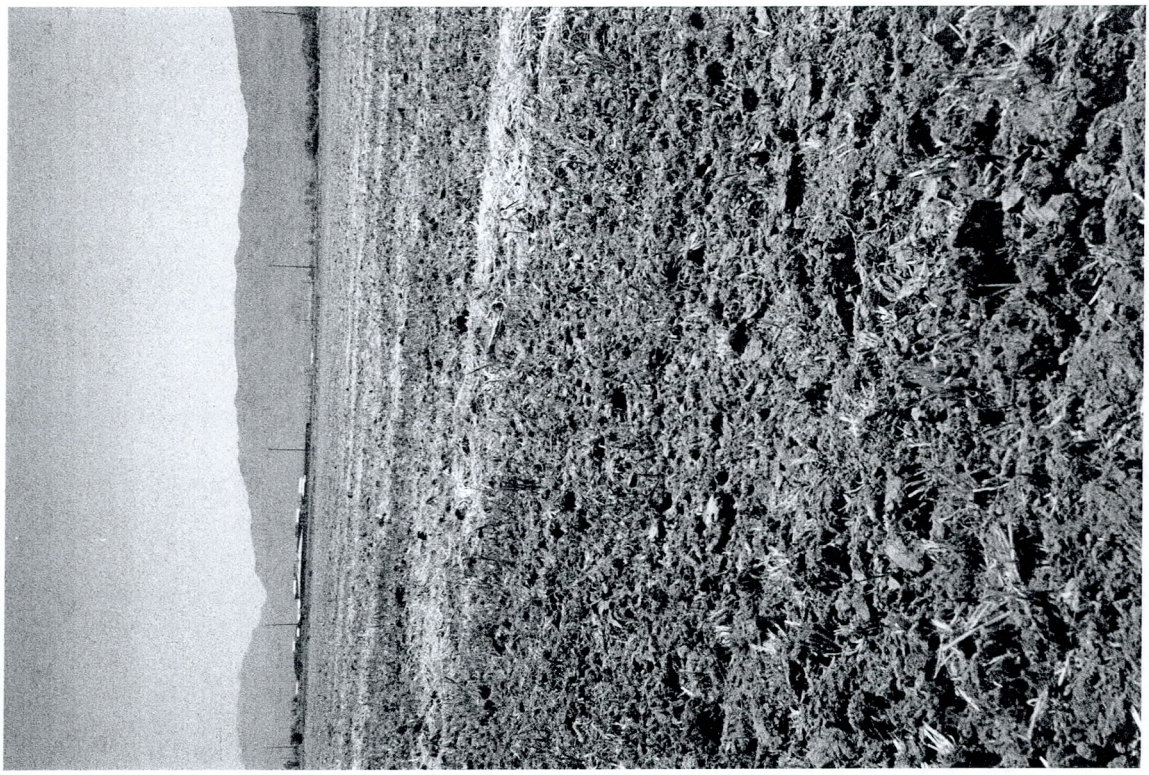


Photo 35. Region EE (field crop)

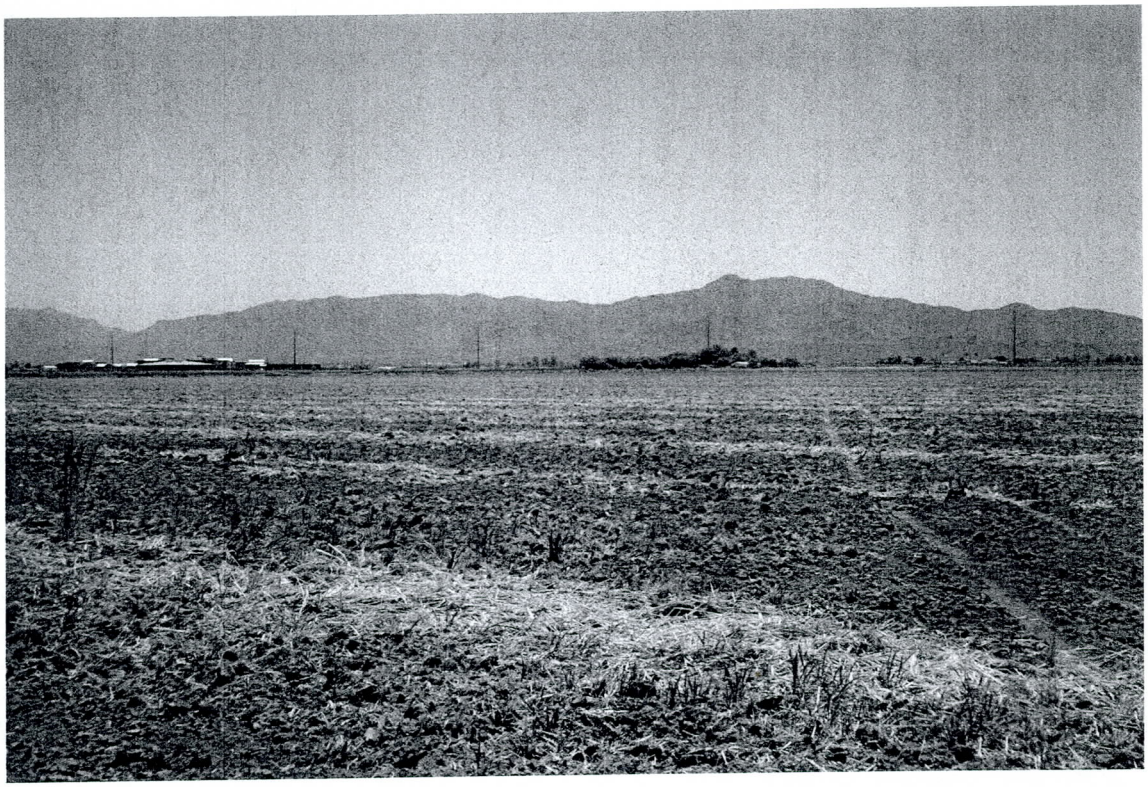


Photo 36. Region EE (field crop)

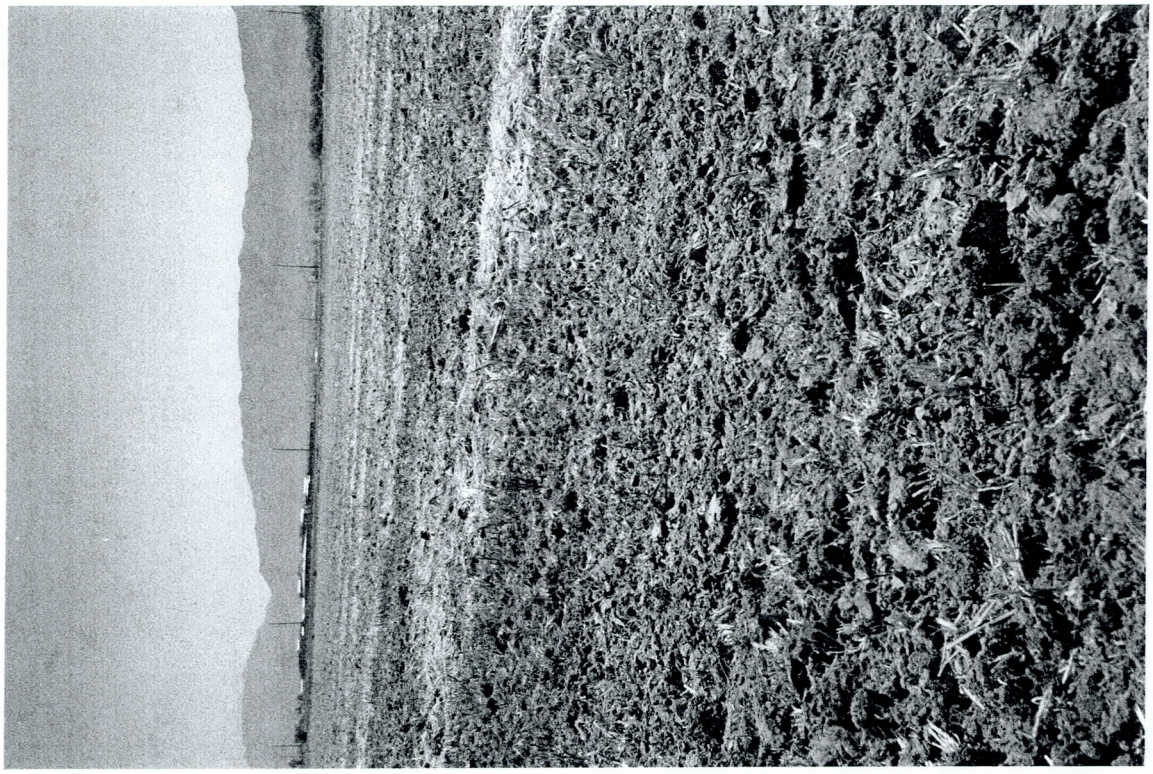


Photo 35. Region EE (field crop)

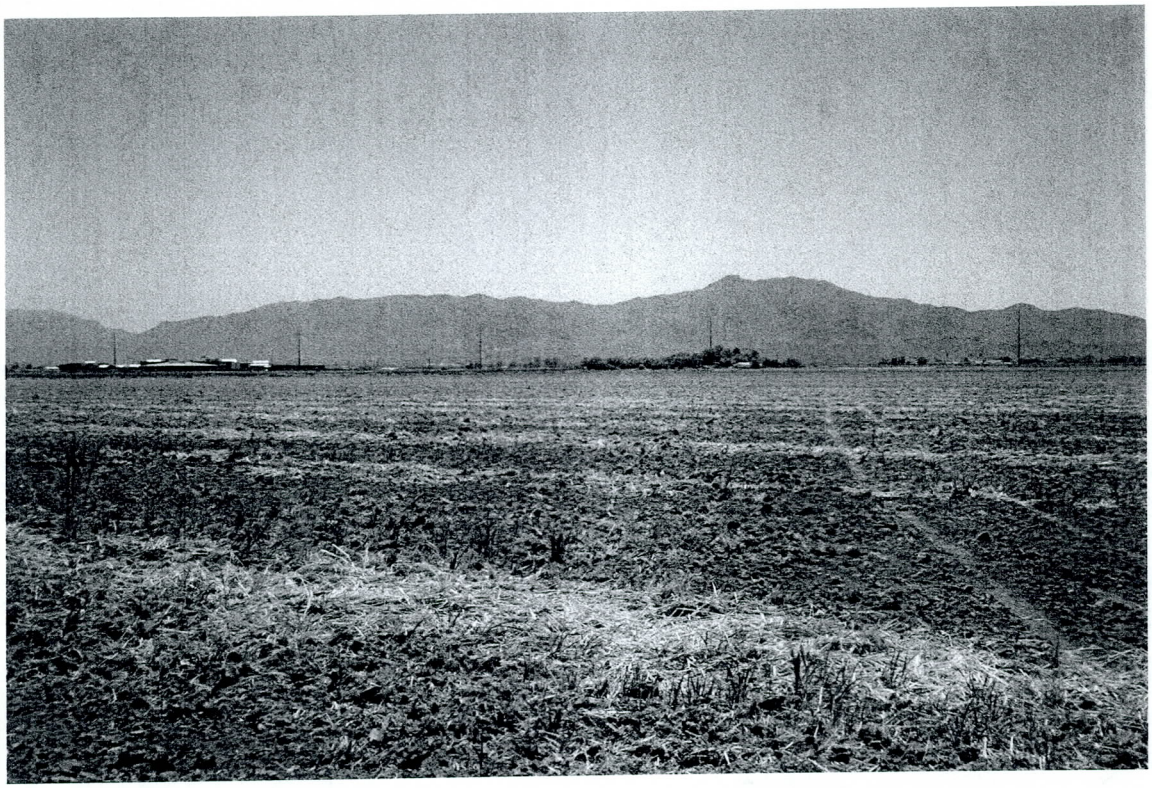


Photo 36. Region EE (field crop)

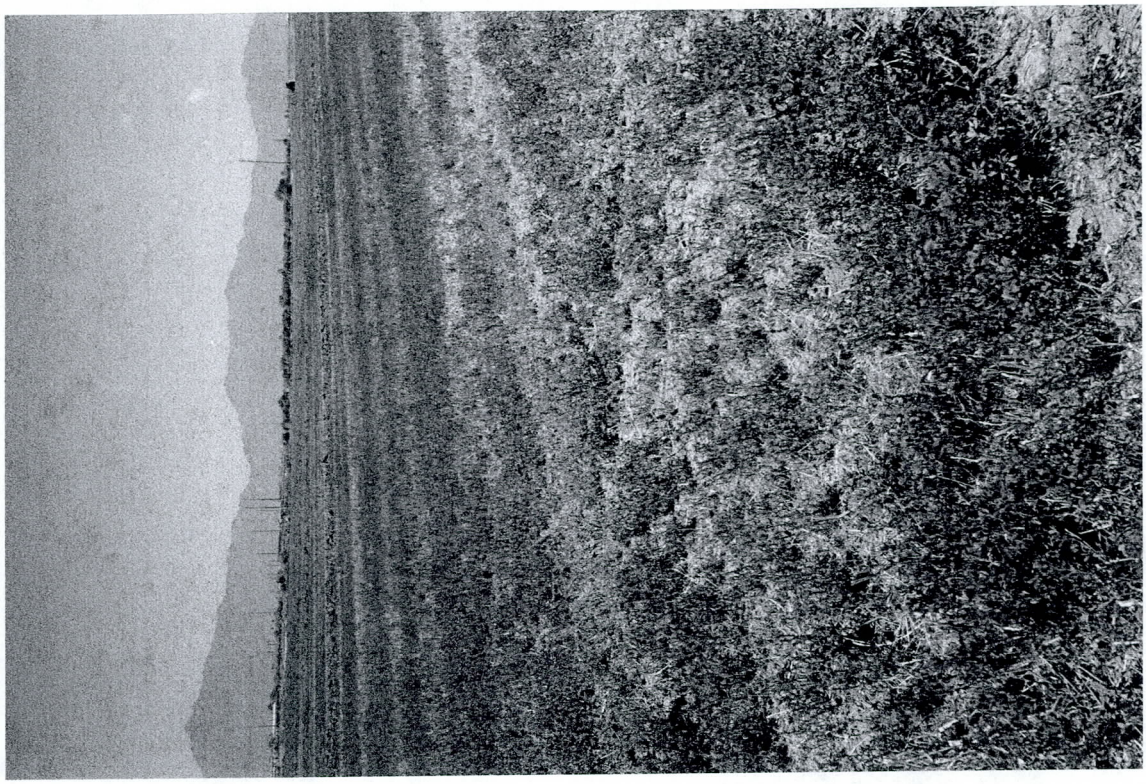


Photo 37. Region GG (field crop)

Photo 38. Region GG (field crop)

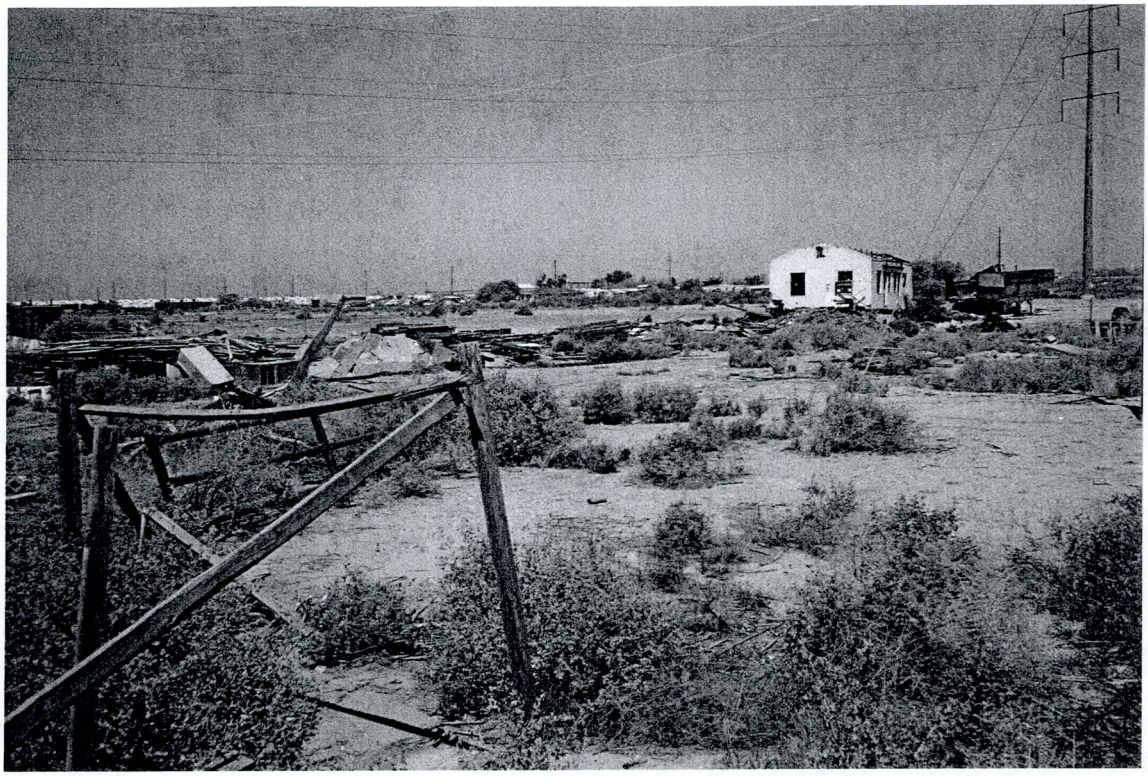


Photo 39. Region HH (scattered brush & clear)

Photo 40. Region HH (scattered brush & clear)

Photo 41. Region HH (scattered brush & clear)

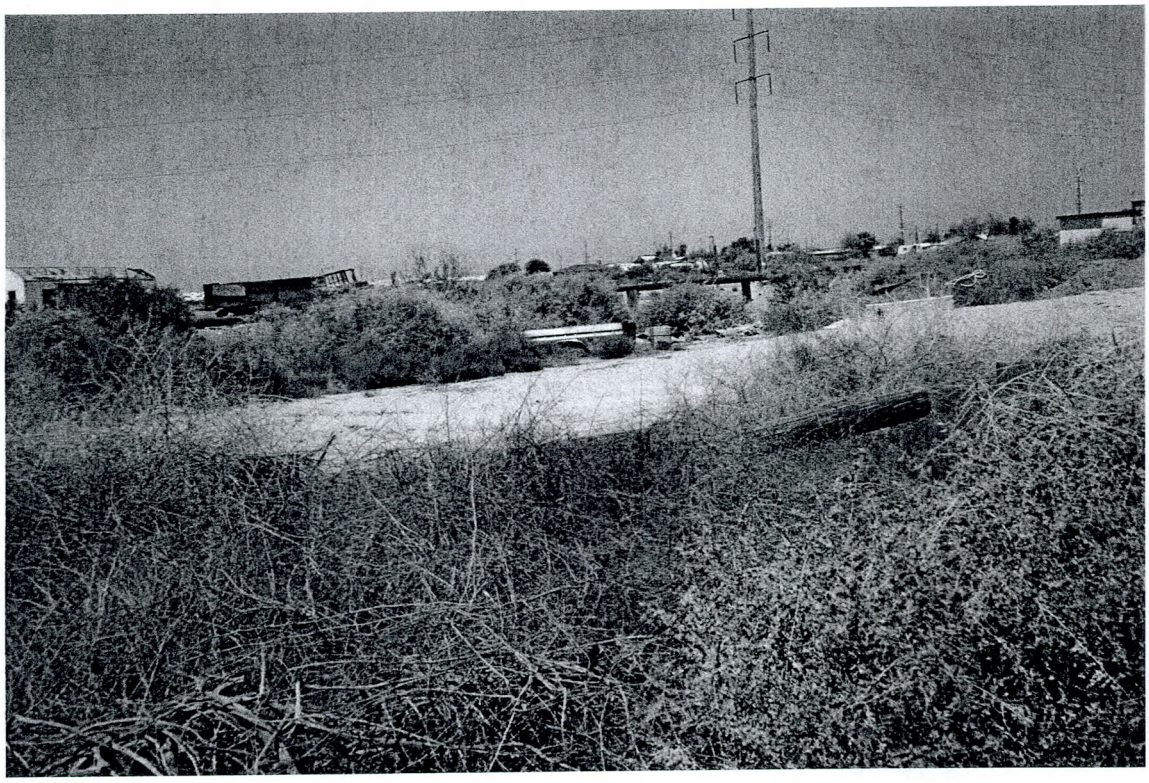


Photo 42. Region HH (scattered brush & clear)

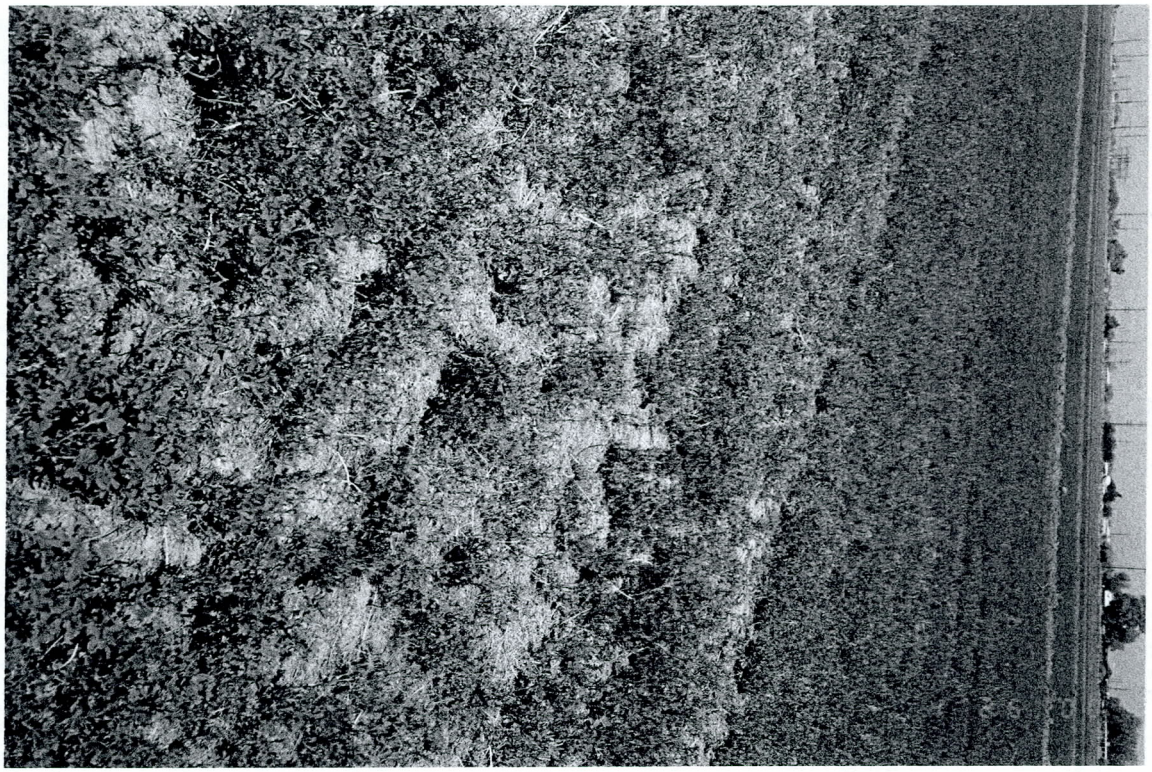


Photo 43. Region II (field crop)

Photo 44. Region II (field crop)

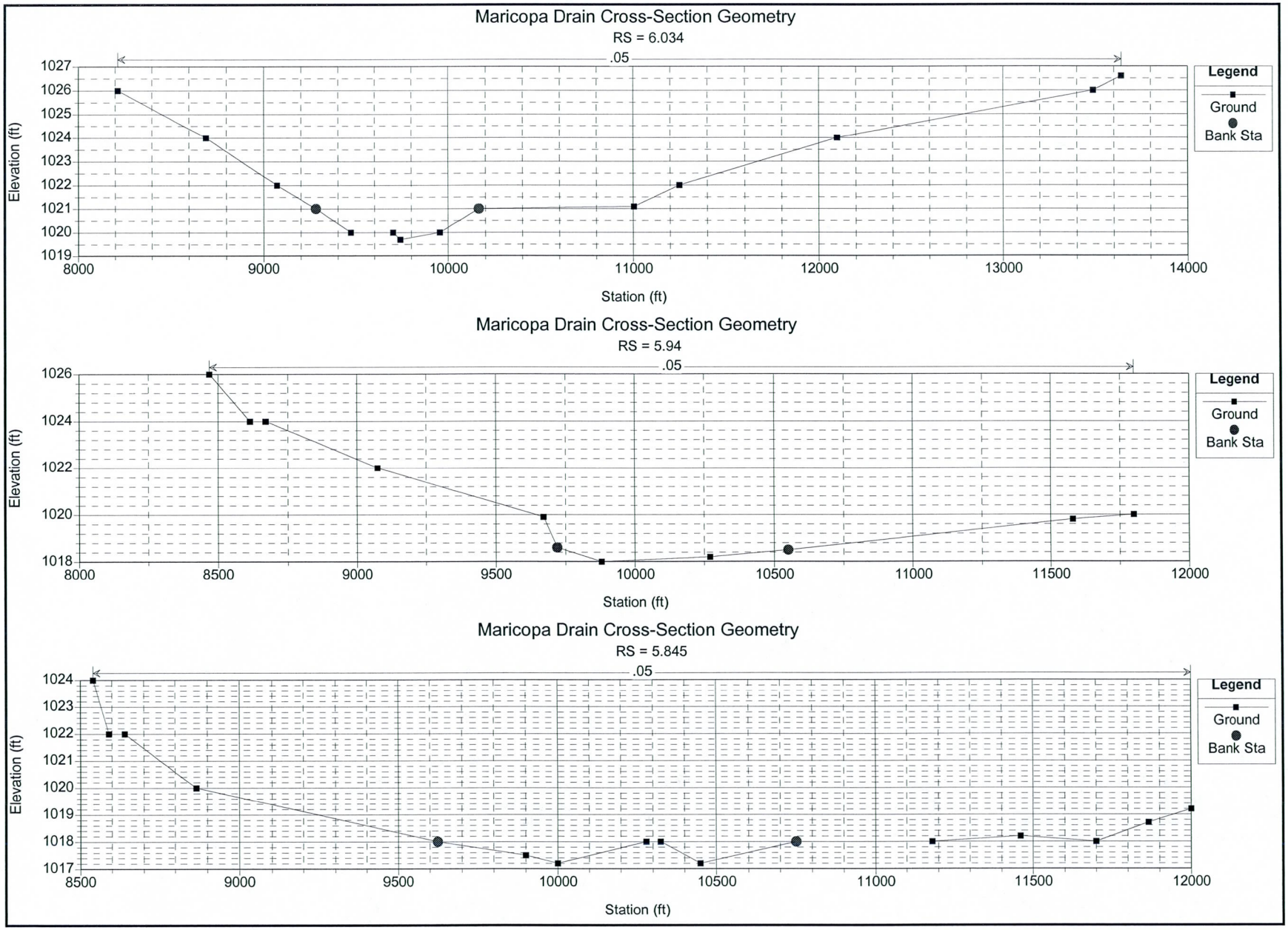
Photo 45. Region JJ (Empty lot with a building)

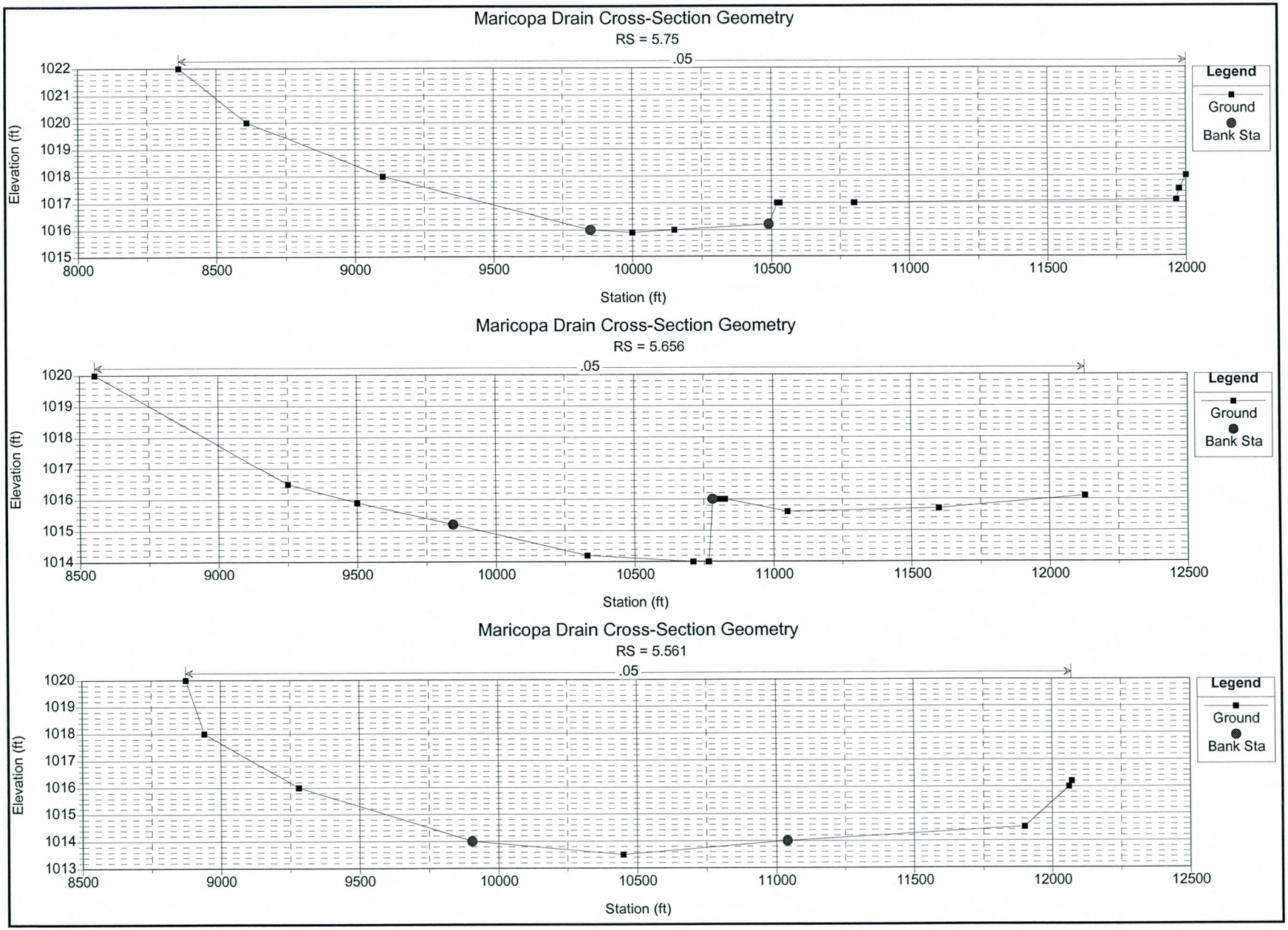
Photo 46. Lot North of Region JJ (scattered brush & clear)

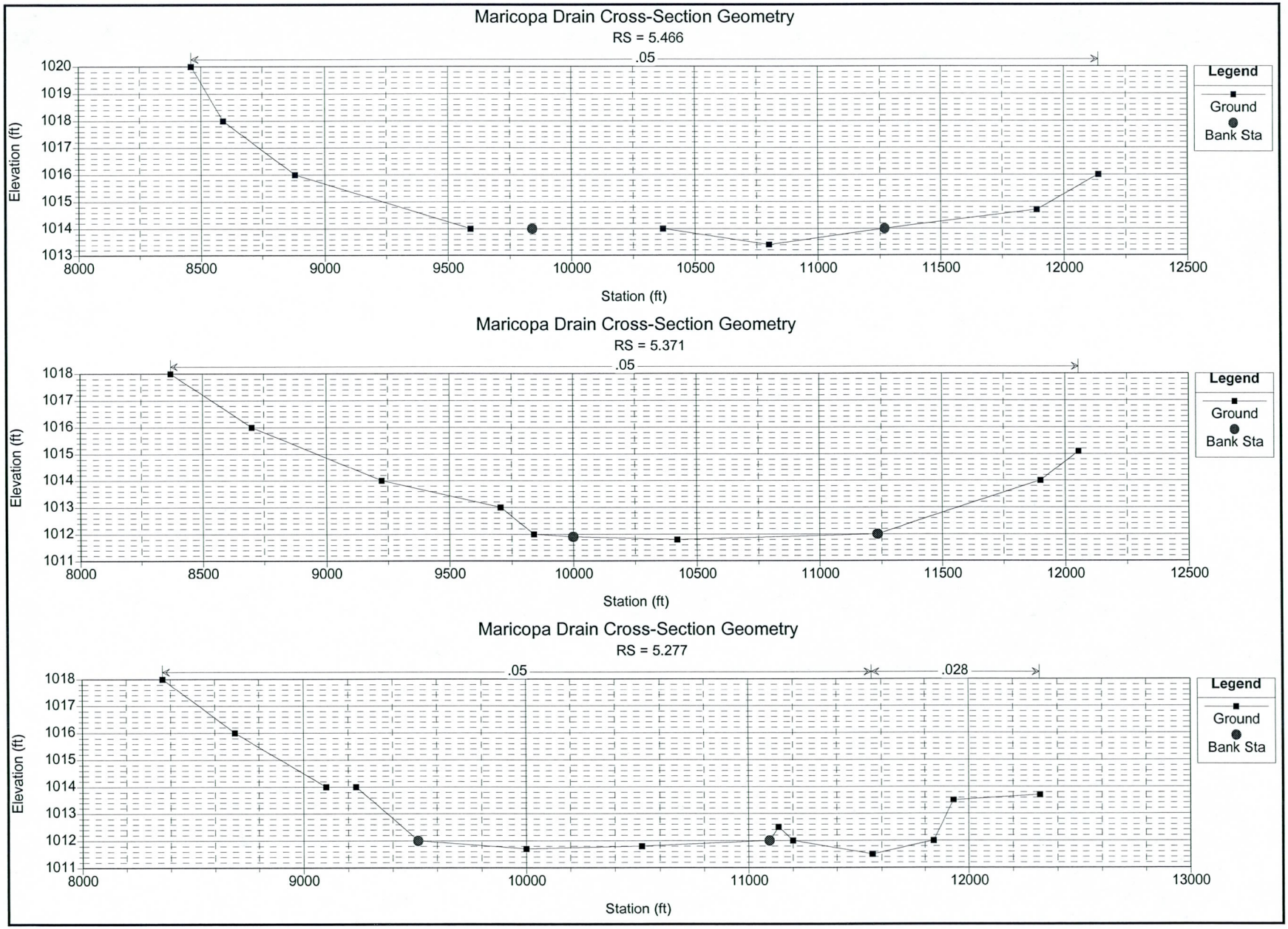
Photo 47. Lot South of Region DD (field crop)
17(1)

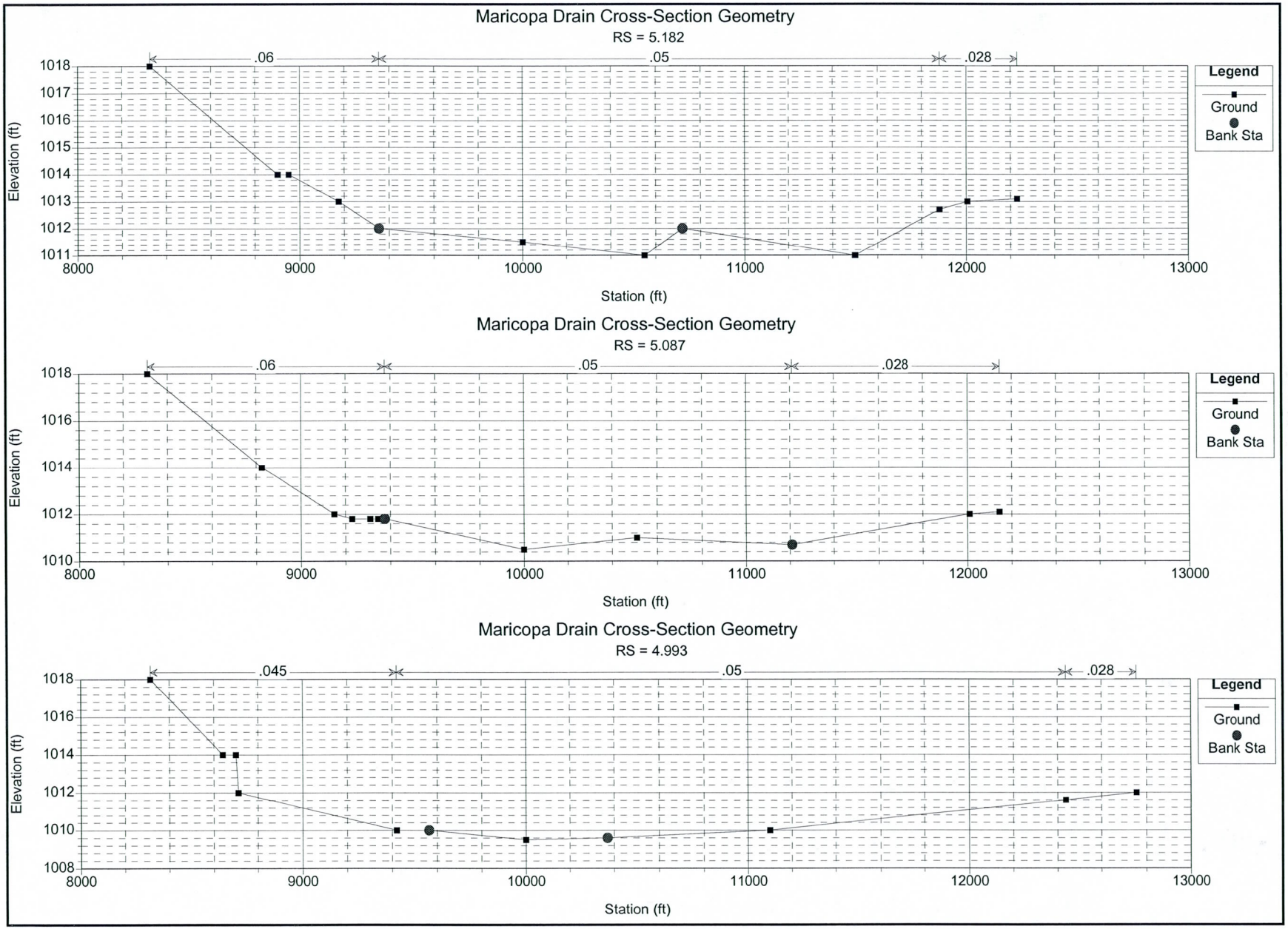
APPENDIX E.2

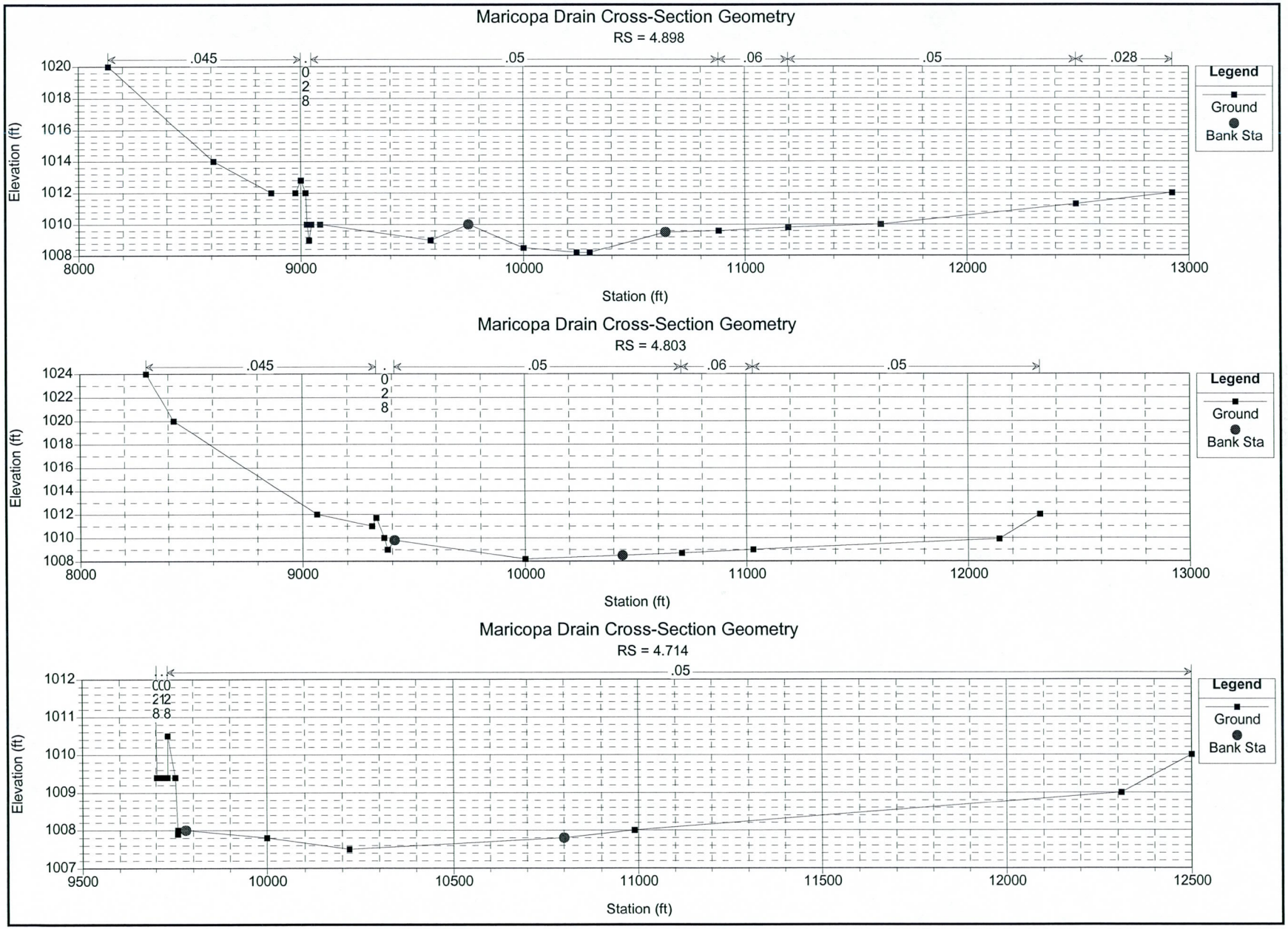
CROSS SECTION PLOTS

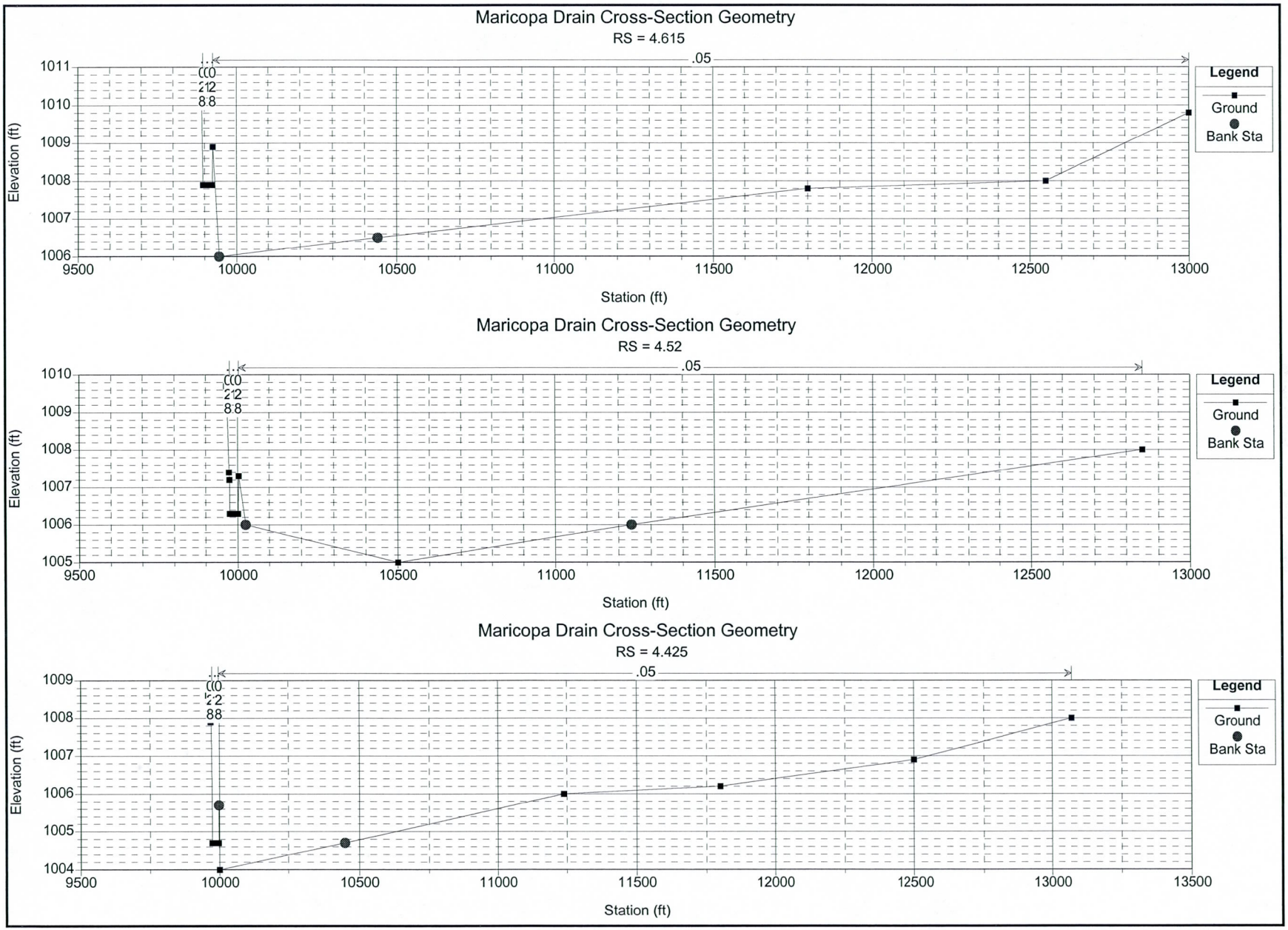

Maricopa Drain Cross-Section Geometry
RS = 6.034
.05
Elevation (ft)
1027
1026
1025
1024
1023
1022
1021
1020
1019
8000
9000
10000
11000
12000
13000
14000
Station (ft)
Legend
Ground
Bank Sta
Maricopa Drain Cross-Section Geometry
RS = 5.94
.05
Elevation (ft)
1026
1024
1022
1020
1018
8000
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)
Legend
Ground
Bank Sta
Maricopa Drain Cross-Section Geometry
RS = 5.845
.05
Elevation (ft)
1024
1023
1022
1021
1020
1019
1018
1017
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)
Legend
Ground
Bank Sta

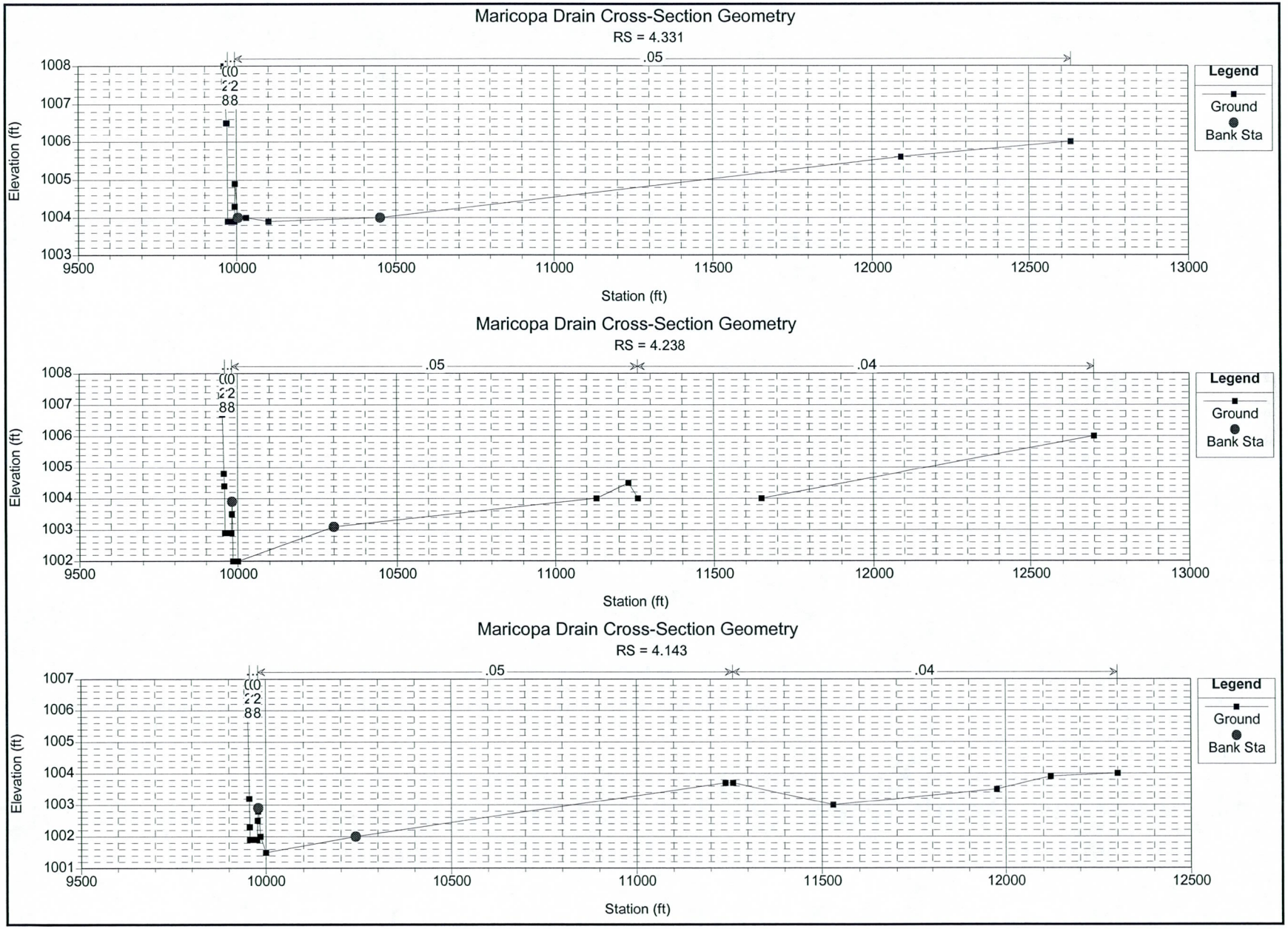

Maricopa Drain Cross-Section Geometry
RS = 5.75
.05
Legend
Ground
Bank Sta
Elevation (ft)
1022
1021
1020
1019
1018
1017
1016
1015
8000
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 5.656
.05
Legend
Ground
Bank Sta
Elevation (ft)
1020
1019
1018
1017
1016
1015
1014
8500
9000
9500
10000
10500
11000
11500
12000
12500
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 5.561
.05
Legend
Ground
Bank Sta
Elevation (ft)
1020
1019
1018
1017
1016
1015
1014
1013
8500
9000
9500
10000
10500
11000
11500
12000
12500
Station (ft)


Maricopa Drain Cross-Section Geometry
RS = 5.466
.05
Elevation (ft)
1020
1019
1018
1017
1016
1015
1014
1013
8000
8500
9000
9500
10000
10500
11000
11500
12000
12500
Station (ft)
Legend
Ground
Bank Sta
Maricopa Drain Cross-Section Geometry
RS = 5.371
.05
Elevation (ft)
1018
1017
1016
1015
1014
1013
1012
1011
8000
8500
9000
9500
10000
10500
11000
11500
12000
12500
Station (ft)
Legend
Ground
Bank Sta
Maricopa Drain Cross-Section Geometry
RS = 5.277
.05
.028
Elevation (ft)
1018
1017
1016
1015
1014
1013
1012
1011
8000
9000
10000
11000
12000
13000
Station (ft)
Legend
Ground
Bank Sta


Maricopa Drain Cross-Section Geometry
RS = 5.182
.06
.05
.028
Legend
Ground
Bank Sta
Elevation (ft)
1018
1017
1016
1015
1014
1013
1012
1011
8000
9000
10000
11000
12000
13000
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 5.087
.06
.05
.028
Legend
Ground
Bank Sta
Elevation (ft)
1018
1016
1014
1012
1010
8000
9000
10000
11000
12000
13000
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 4.993
.045
.05
.028
Legend
Ground
Bank Sta
Elevation (ft)
1018
1016
1014
1012
1010
1008
8000
9000
10000
11000
12000
13000
Station (ft)


Maricopa Drain Cross-Section Geometry
RS = 4.898
.045
.05
.06
.05
.028
Legend
Ground
Bank Sta
Elevation (ft)
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 4.803
.045
.05
.06
.05
Legend
Ground
Bank Sta
Elevation (ft)
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 4.714
.05
Legend
Ground
Bank Sta
Elevation (ft)
Station (ft)


Maricopa Drain Cross-Section Geometry
RS = 4.615
.05
Legend
Ground
Bank Sta
Elevation (ft)
1011
1010
1009
1008
1007
1006
9500
10000
10500
11000
11500
12000
12500
13000
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 4.52
.05
Legend
Ground
Bank Sta
Elevation (ft)
1010
1009
1008
1007
1006
1005
9500
10000
10500
11000
11500
12000
12500
13000
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 4.425
.05
Legend
Ground
Bank Sta
Elevation (ft)
1009
1008
1007
1006
1005
1004
9500
10000
10500
11000
11500
12000
12500
13000
13500
Station (ft)


Maricopa Drain Cross-Section Geometry
RS = 4.331
.05
Legend
Ground
Bank Sta
Elevation (ft)
1008
1007
1006
1005
1004
1003
9500
10000
10500
11000
11500
12000
12500
13000
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 4.238
.05
.04
Legend
Ground
Bank Sta
Elevation (ft)
1008
1007
1006
1005
1004
1003
1002
9500
10000
10500
11000
11500
12000
12500
13000
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 4.143
.05
.04
Legend
Ground
Bank Sta
Elevation (ft)
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11500
12000
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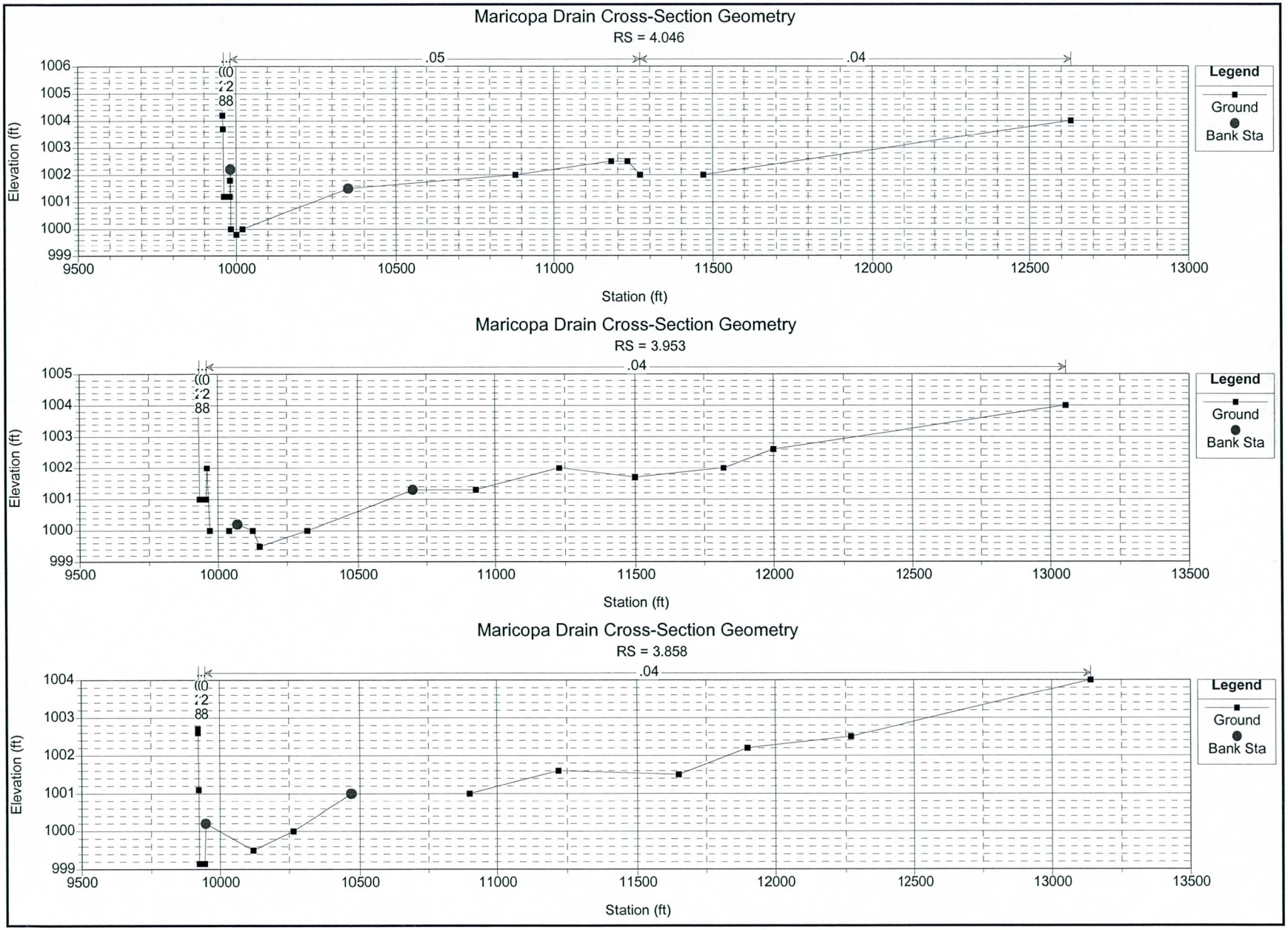
Station (ft)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Ground
Bank Sta
Elevation (ft)
Station (ft)
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1005
1004
1003
1002
1001
1000
999
9500
10000
10500
11000
11500
12000
12500
13000
Maricopa Drain Cross-Section Geometry
RS = 3.953
.04
Legend
Ground
Bank Sta
Elevation (ft)
Station (ft)
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1004
1003
1002
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1000
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9500
10000
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11000
11500
12000
12500
13000
13500
Maricopa Drain Cross-Section Geometry
RS = 3.858
.04
Legend
Ground
Bank Sta
Elevation (ft)
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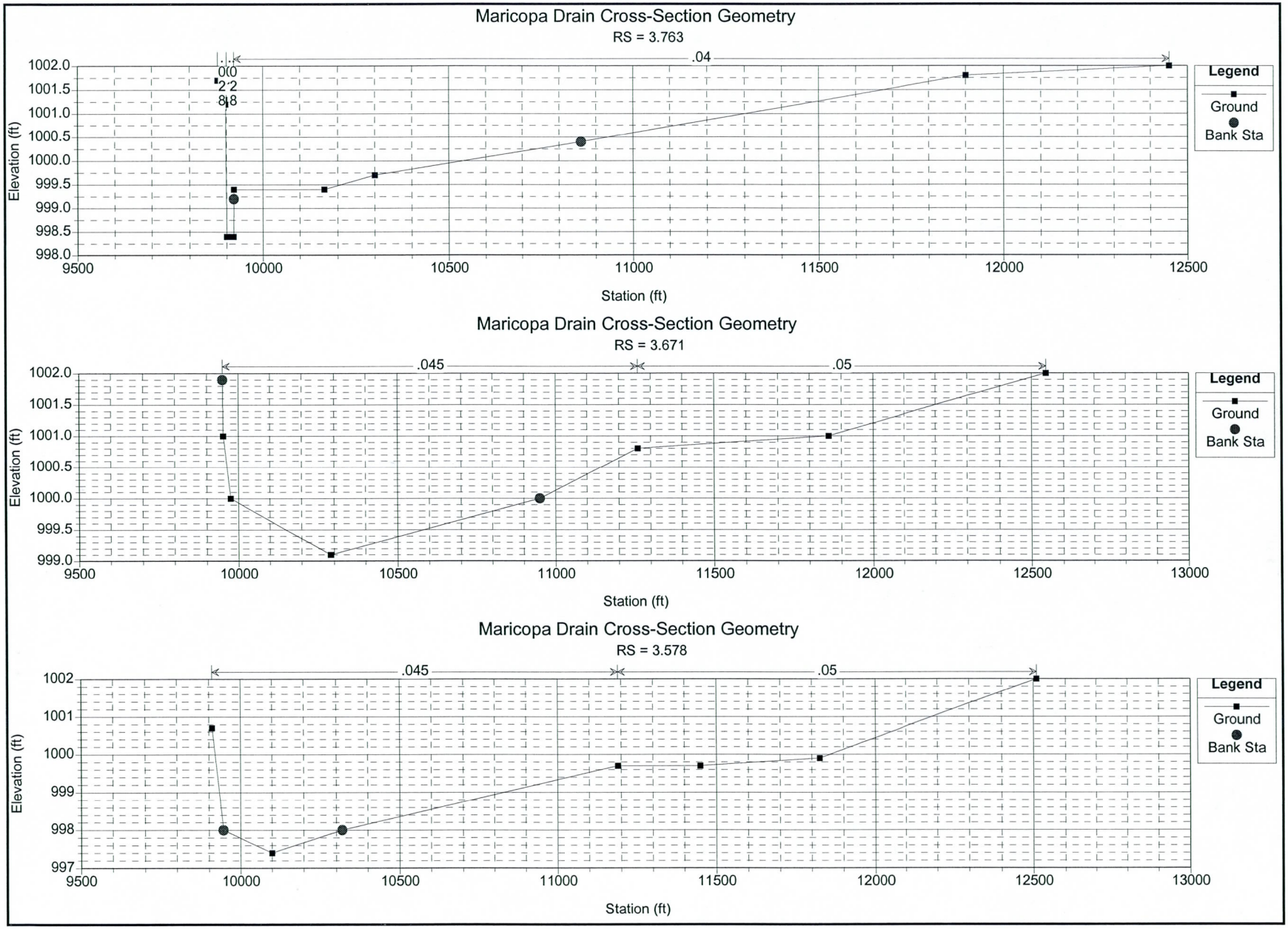
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Legend
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Legend
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Bank Sta
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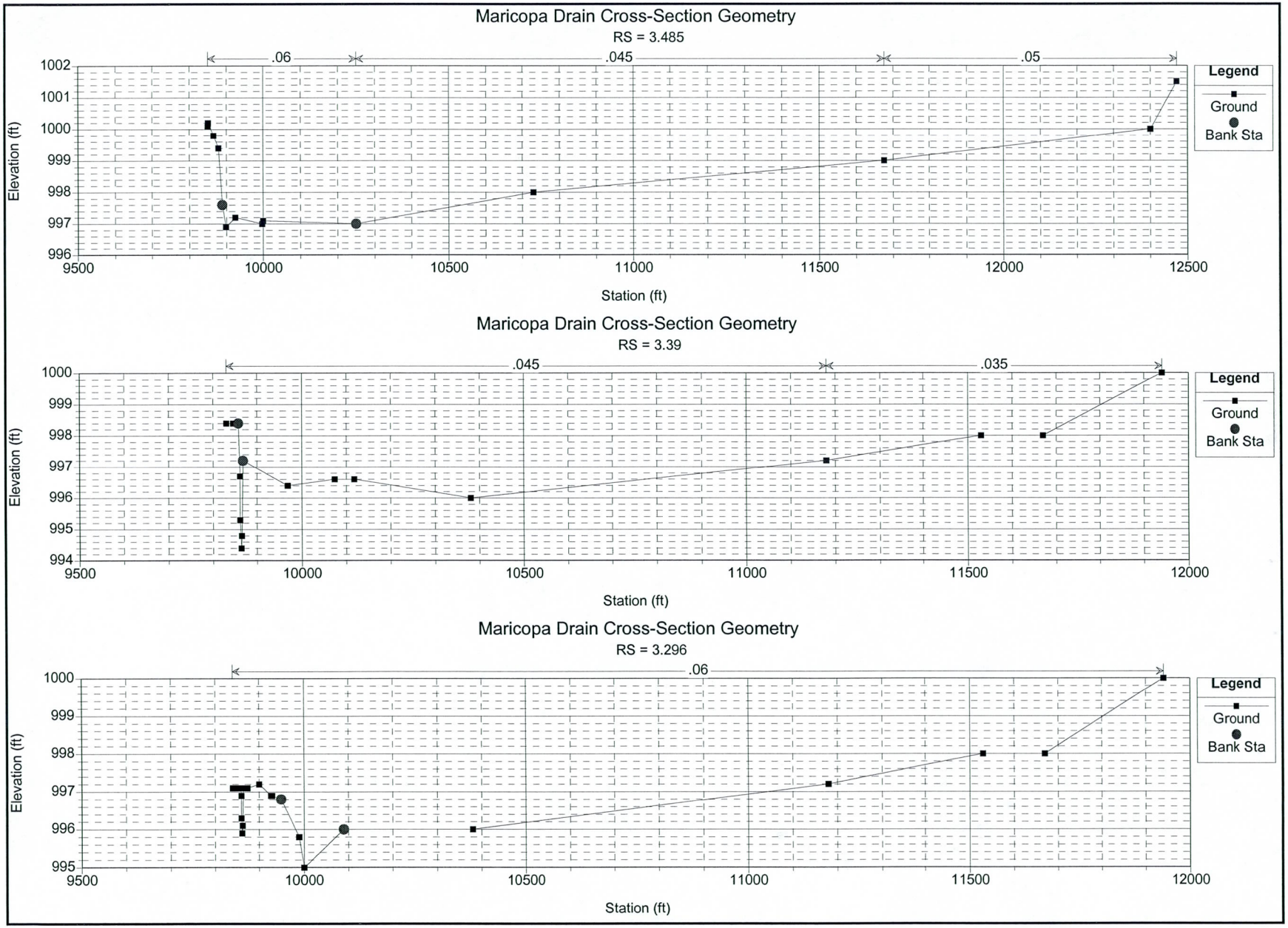
Station (ft)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Bank Sta
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997
996
9500
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11000
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12000
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Station (ft)
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RS = 3.39
.045
.035
Legend
Ground
Bank Sta
Elevation (ft)
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999
998
997
996
995
994
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10000
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11500
12000
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 3.296
.06
Legend
Ground
Bank Sta
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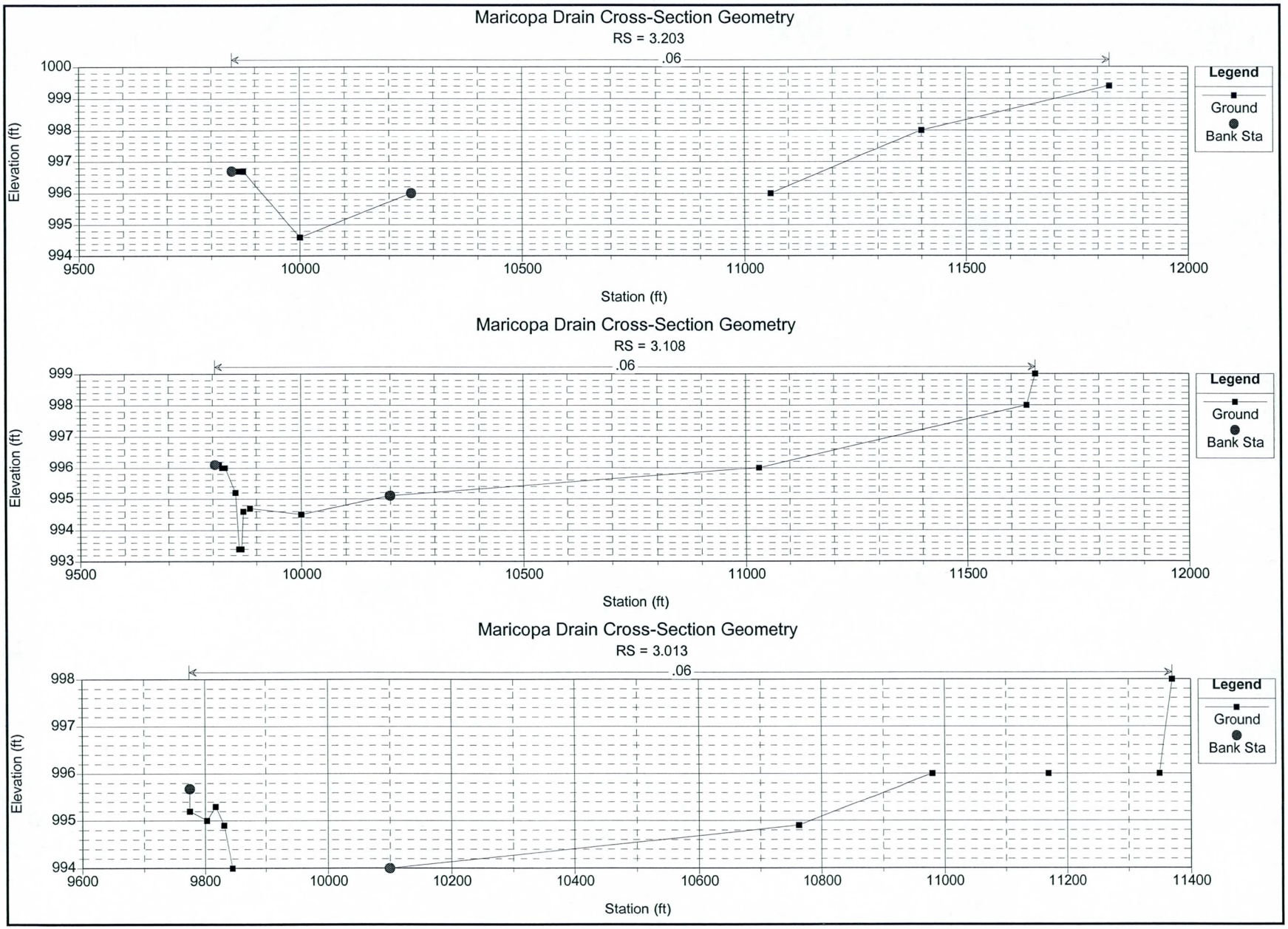
Station (ft)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Ground
Bank Sta
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997
996
995
994
9500
10000
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11000
11500
12000
Station (ft)
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RS = 3.108
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Legend
Ground
Bank Sta
Elevation (ft)
999
998
997
996
995
994
993
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10000
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Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 3.013
.06
Legend
Ground
Bank Sta
Elevation (ft)
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997
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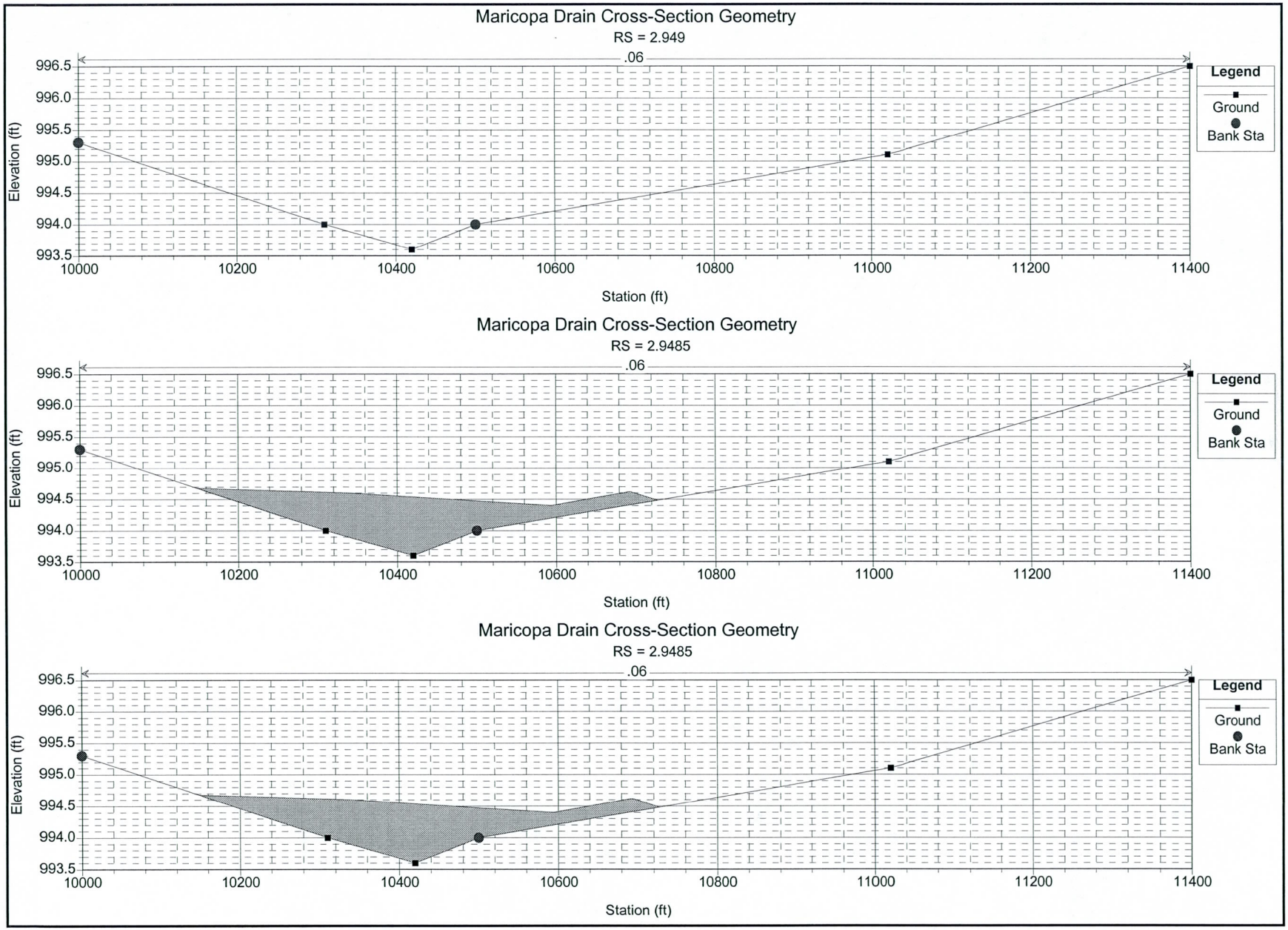
Station (ft)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Legend
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Bank Sta
Elevation (ft)
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994.5
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10200
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11400
Station (ft)
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RS = 2.9485
.06
Legend
Ground
Bank Sta
Elevation (ft)
Station (ft)
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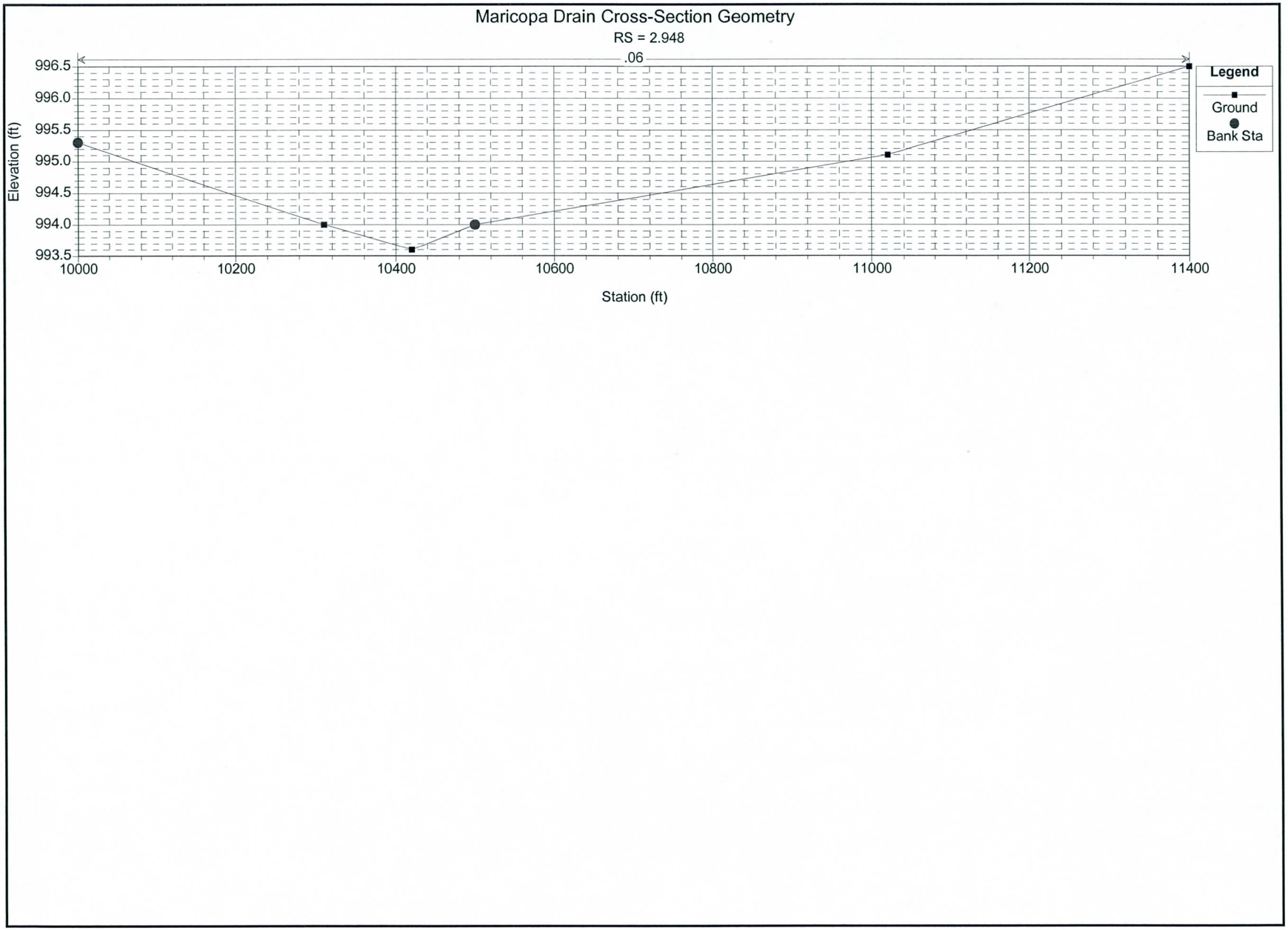
Legend
Ground
Bank Sta
Elevation (ft)
Station (ft)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RS = 2.948
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Elevation (ft)
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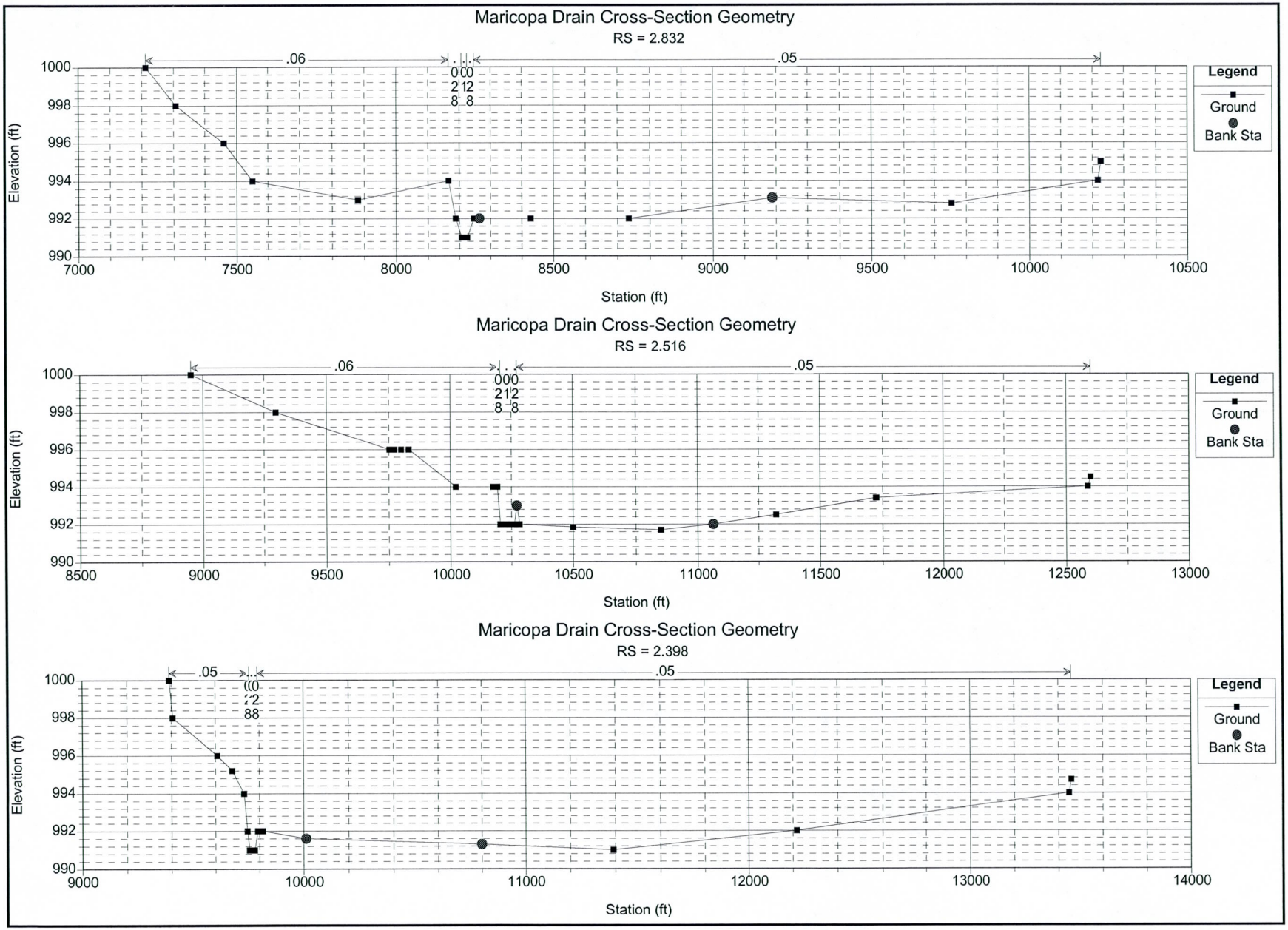
Station (ft)
Legend
Ground
Bank Sta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Ground
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Maricopa Drain Cross-Section Geometry
RS = 2.516
.06
.05
Legend
Ground
Bank Sta
Elevation (ft)
Station (ft)
Maricopa Drain Cross-Section Geometry
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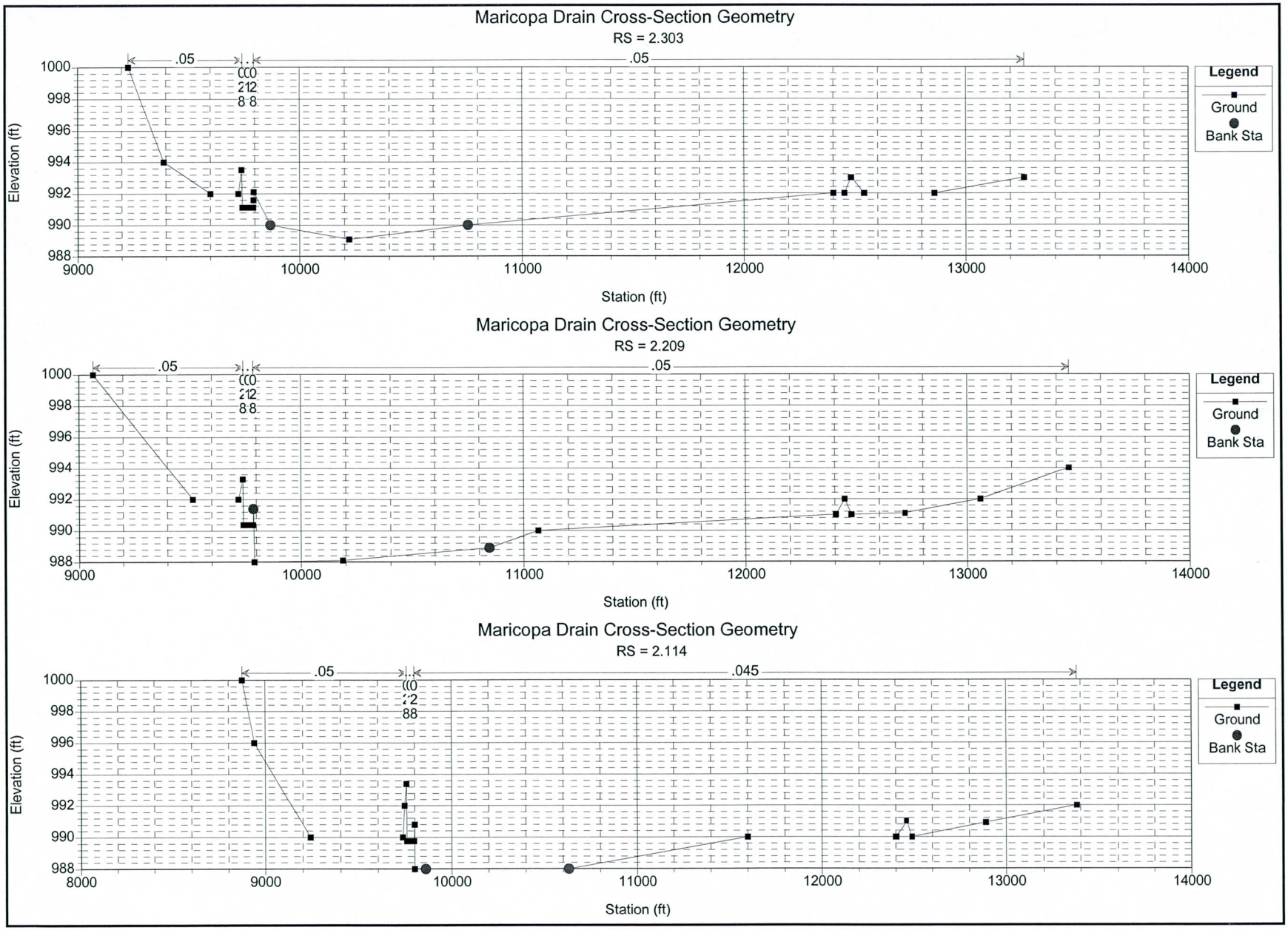
Legend
Ground
Bank Sta
Elevation (ft)
Station (ft)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Legend
Ground
Bank Sta
Elevation (ft)
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14000
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 2.209
.05
.05
Legend
Ground
Bank Sta
Elevation (ft)
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998
996
994
992
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Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 2.114
.05
.045
Legend
Ground
Bank Sta
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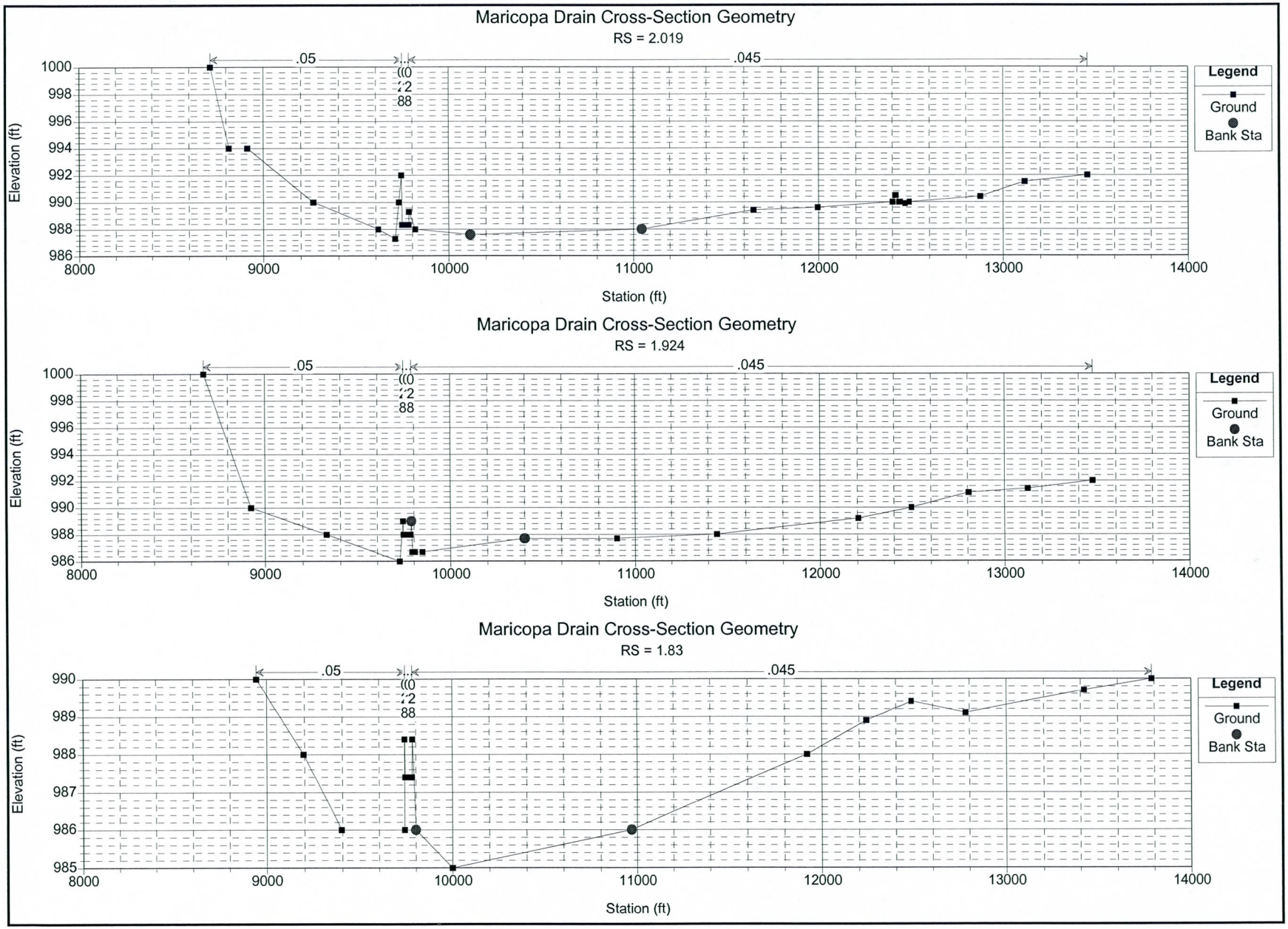
Station (ft)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RS = 2.019
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Ground
Bank Sta
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Station (ft)
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992
990
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8000
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14000
Maricopa Drain Cross-Section Geometry
RS = 1.924
.05
.045
Legend
Ground
Bank Sta
Elevation (ft)
Station (ft)
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998
996
994
992
990
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986
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9000
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11000
12000
13000
14000
Maricopa Drain Cross-Section Geometry
RS = 1.83
.05
.045
Legend
Ground
Bank Sta
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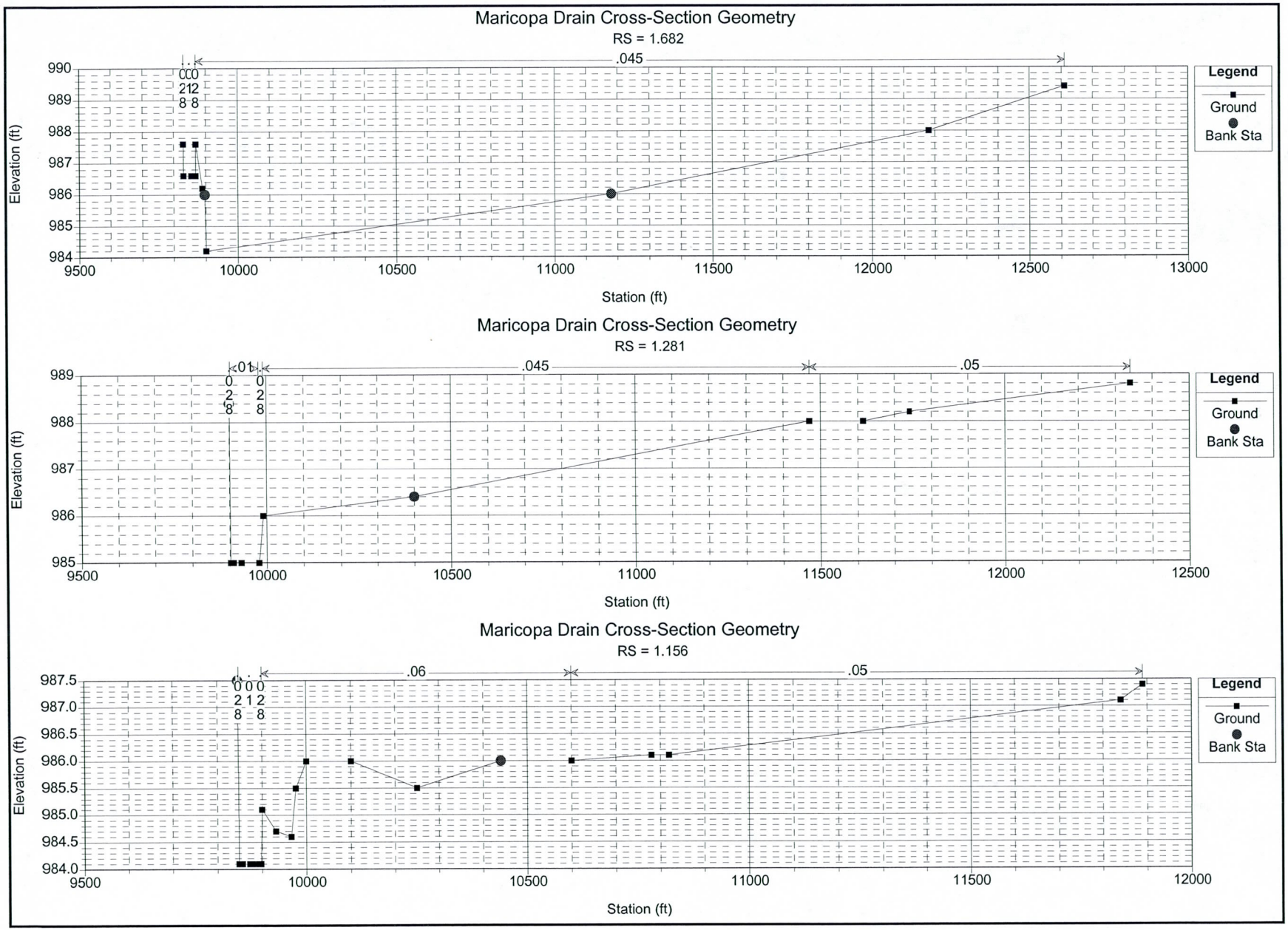
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RS = 1.682
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Bank Sta
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987
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984
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10000
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11500
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13000
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 1.281
.045
.05
Legend
Ground
Bank Sta
Elevation (ft)
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988
987
986
985
9500
10000
10500
11000
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12000
12500
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 1.156
.06
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Legend
Ground
Bank Sta
Elevation (ft)
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987.0
986.5
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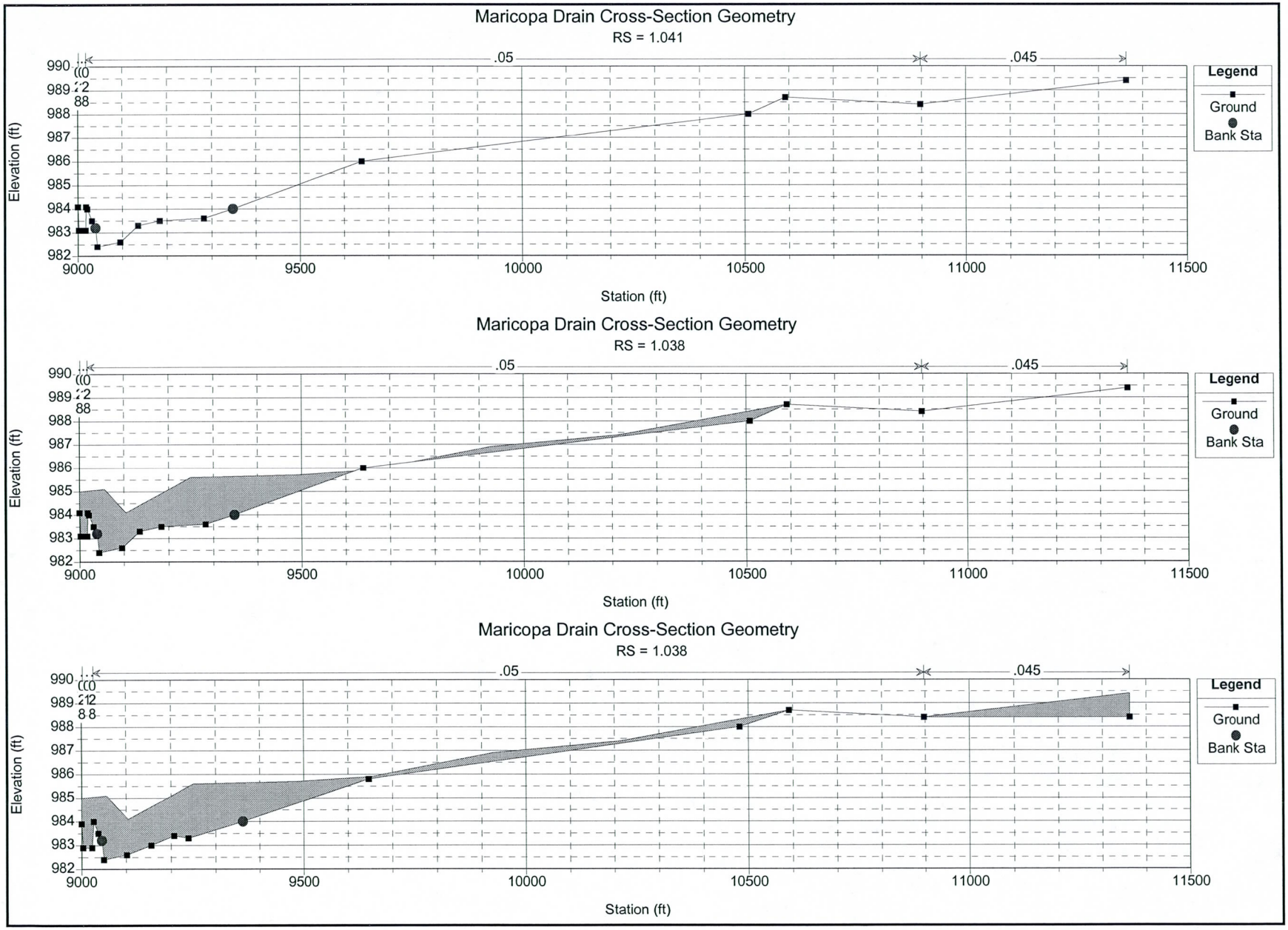
Station (ft)


Maricopa Drain Cross-Section Geometry
RS = 1.041
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Legend
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Bank Sta
Elevation (ft)
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10000
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11500
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 1.038
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.045
Legend
Ground
Bank Sta
Elevation (ft)
990
989
988
987
986
985
984
983
982
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9500
10000
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11000
11500
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 1.038
.05
.045
Legend
Ground
Bank Sta
Elevation (ft)
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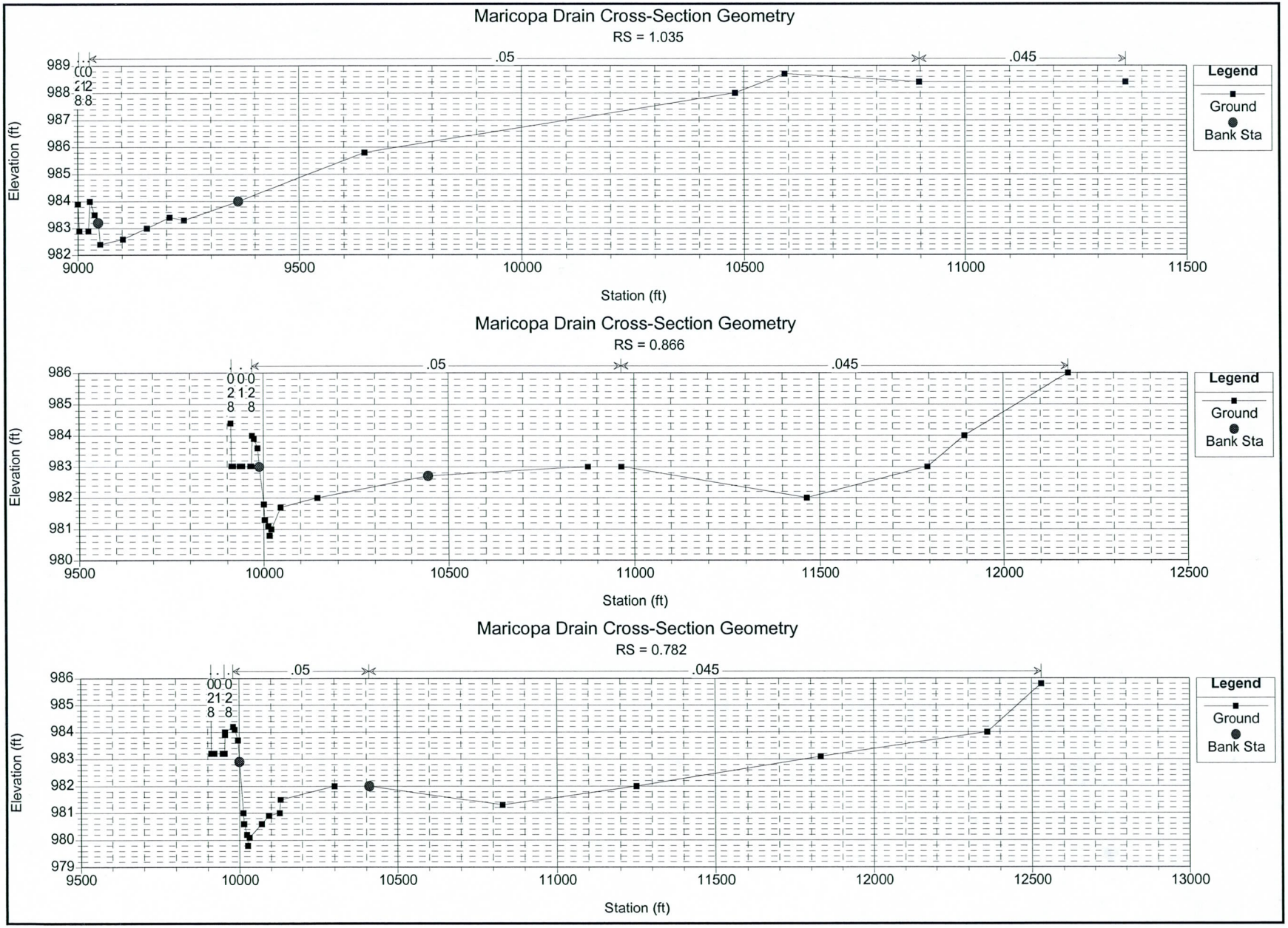
Station (ft)


Maricopa Drain Cross-Section Geometry
RS = 1.035
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Legend
Ground
Bank Sta
Elevation (ft)
Station (ft)
989
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987
986
985
984
983
982
9000
9500
10000
10500
11000
11500
Maricopa Drain Cross-Section Geometry
RS = 0.866
.05
.045
Legend
Ground
Bank Sta
Elevation (ft)
Station (ft)
986
985
984
983
982
981
980
9500
10000
10500
11000
11500
12000
12500
Maricopa Drain Cross-Section Geometry
RS = 0.782
.05
.045
Legend
Ground
Bank Sta
Elevation (ft)
Station (ft)
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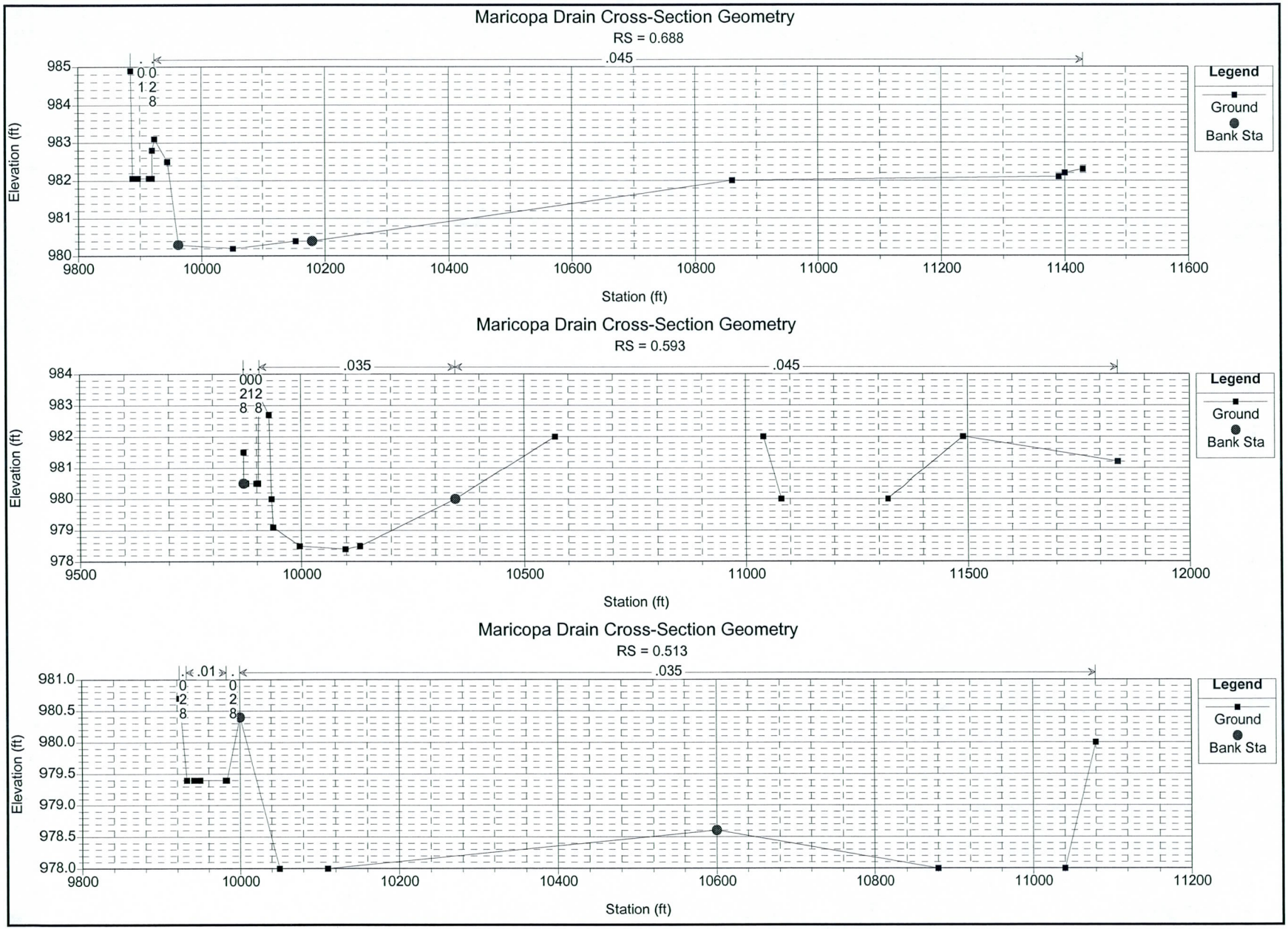
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RS = 0.688
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Legend
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Bank Sta
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983
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980
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10000
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10600
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11000
11200
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11600
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 0.593
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.045
Legend
Ground
Bank Sta
Elevation (ft)
984
983
982
981
980
979
978
9500
10000
10500
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11500
12000
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 0.513
.01
.035
Legend
Ground
Bank Sta
Elevation (ft)
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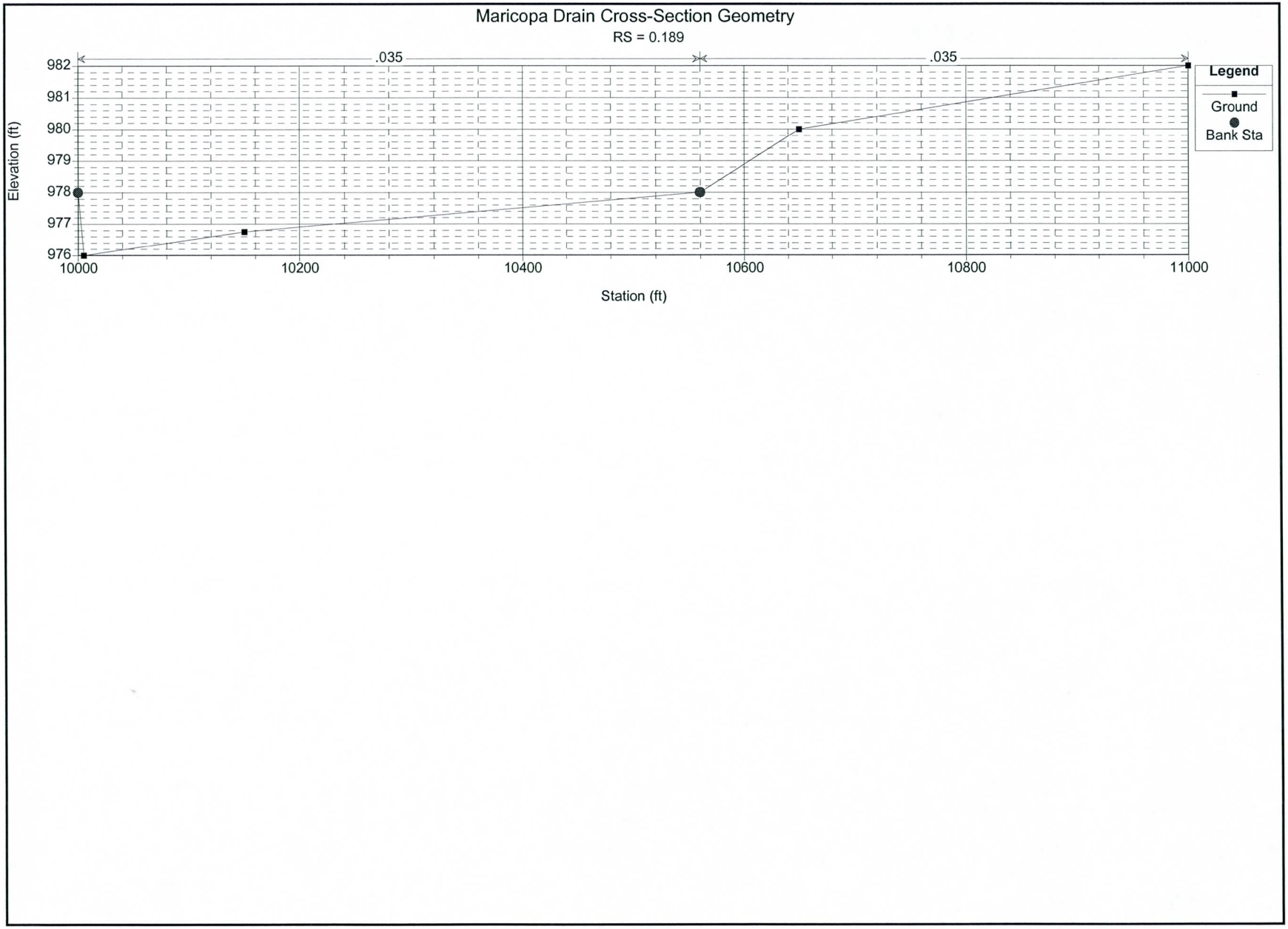
Station (ft)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RS = 0.189
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Ground
Bank Sta
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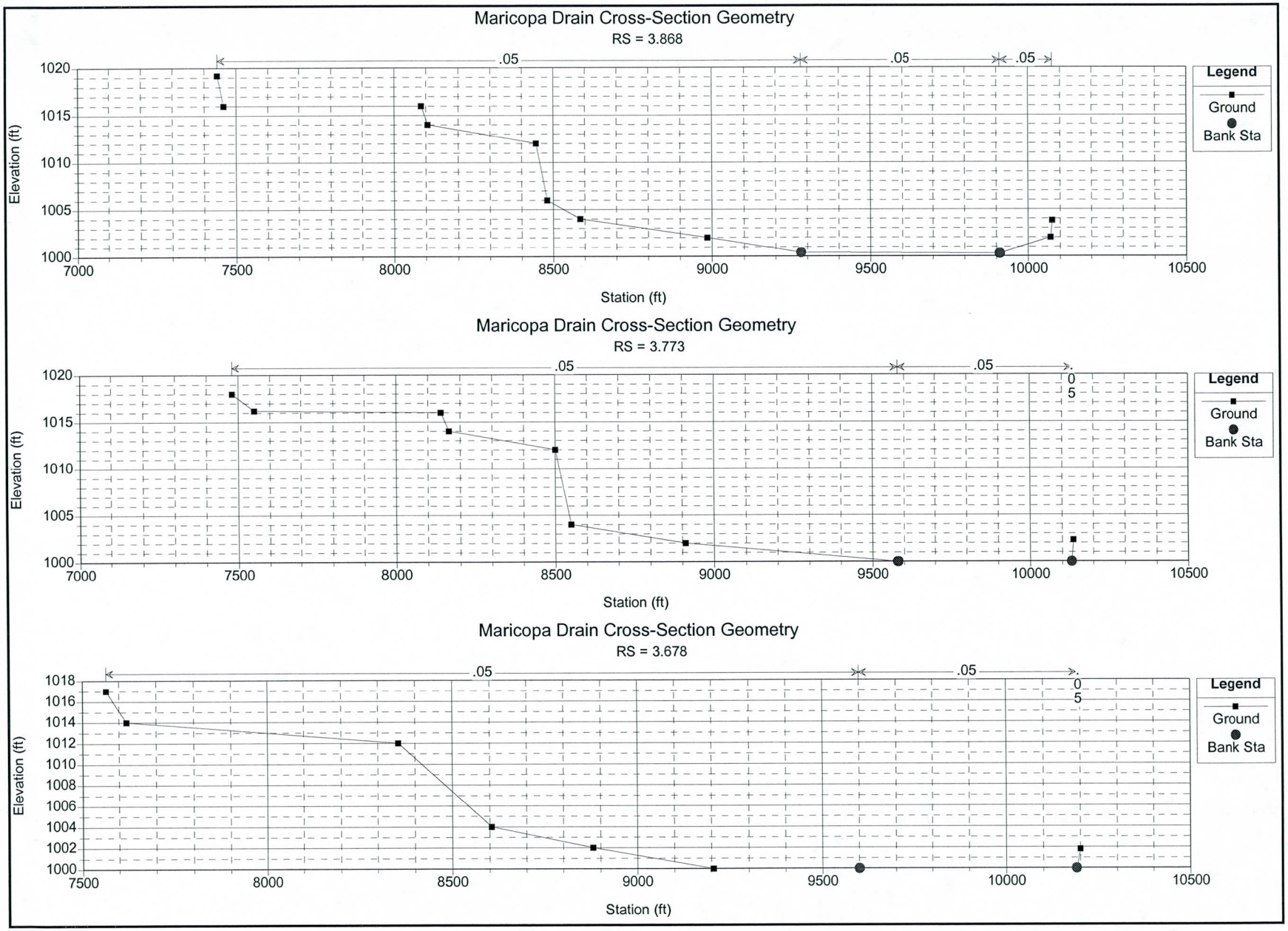
Station (ft)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Legend
Ground
Bank Sta
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10000
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Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 3.773
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Legend
Ground
Bank Sta
Elevation (ft)
1020
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1010
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8000
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10000
10500
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 3.678
.05
.05
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Legend
Ground
Bank Sta
Elevation (ft)
1018
1016
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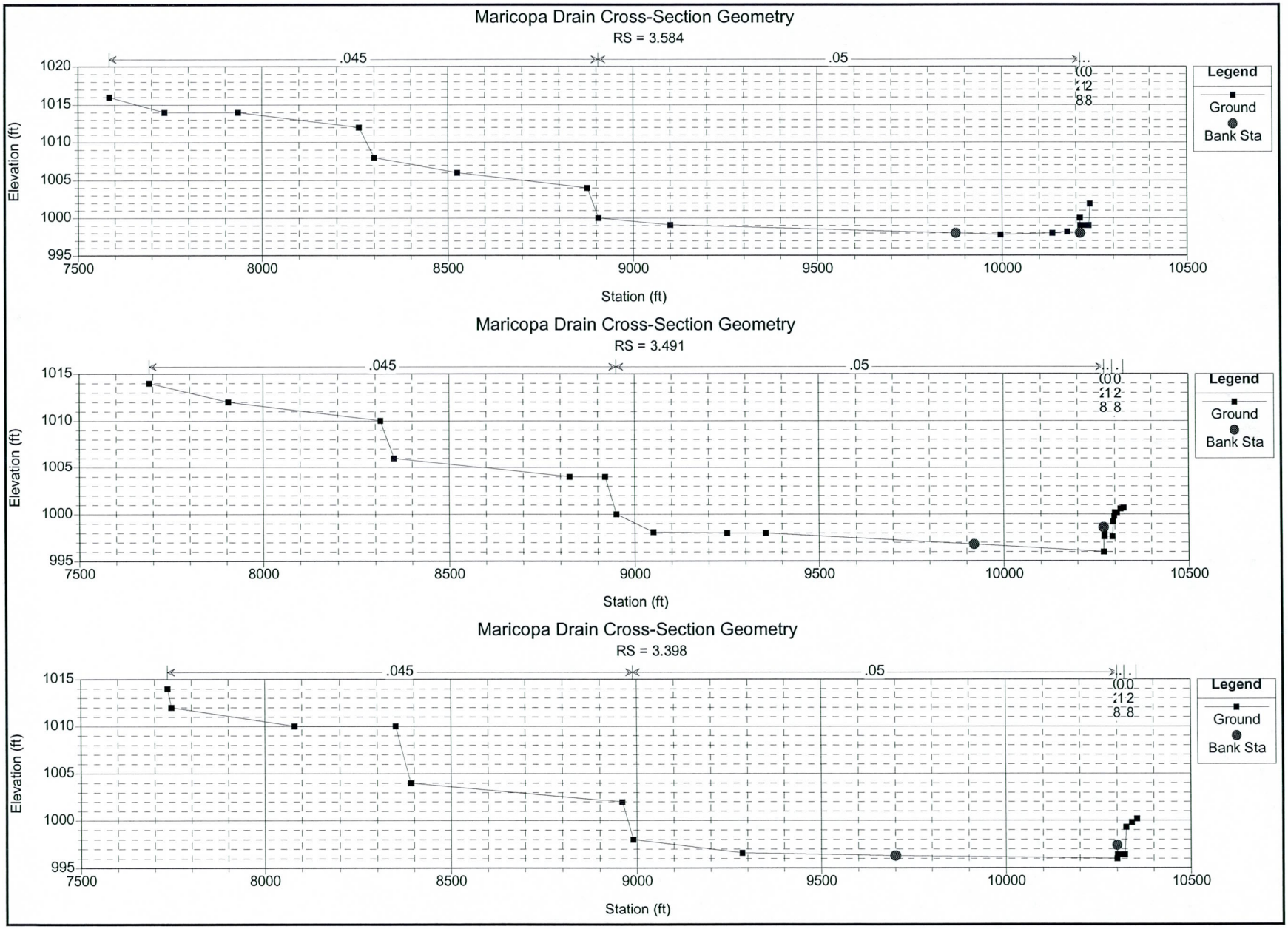
Station (ft)


Maricopa Drain Cross-Section Geometry
RS = 3.584
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Legend
Ground
Bank Sta
Elevation (ft)
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995
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9500
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10500
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 3.491
.045
.05
Legend
Ground
Bank Sta
Elevation (ft)
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1010
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995
7500
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8500
9000
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10000
10500
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 3.398
.045
.05
Legend
Ground
Bank Sta
Elevation (ft)
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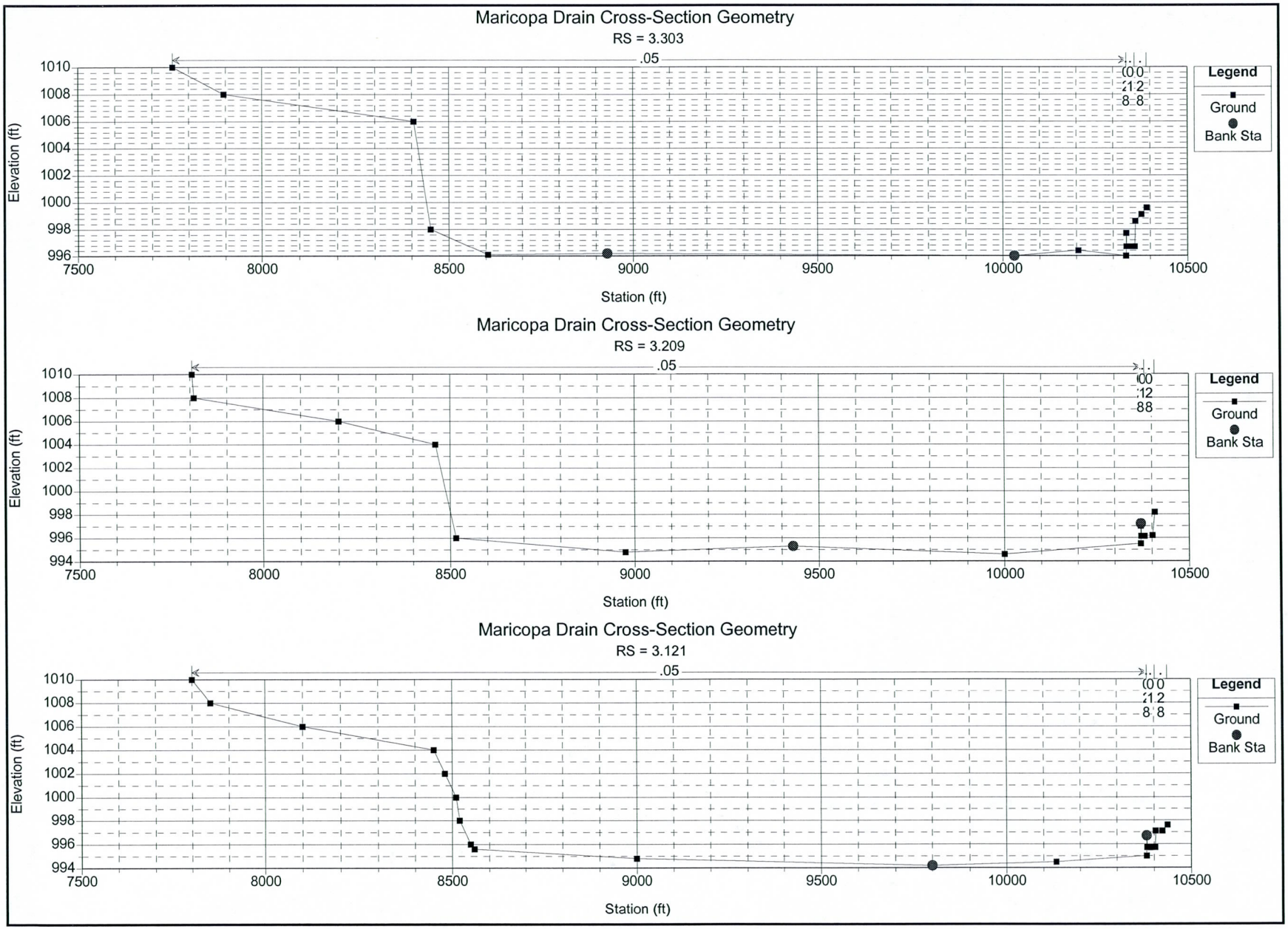
Station (ft)


Maricopa Drain Cross-Section Geometry
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Ground
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Elevation (ft)
Station (ft)
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1002
1000
998
996
7500
8000
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9000
9500
10000
10500
Maricopa Drain Cross-Section Geometry
RS = 3.209
.05
Legend
Ground
Bank Sta
Elevation (ft)
Station (ft)
1010
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1006
1004
1002
1000
998
996
994
7500
8000
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9000
9500
10000
10500
Maricopa Drain Cross-Section Geometry
RS = 3.121
.05
Legend
Ground
Bank Sta
Elevation (ft)
Station (ft)
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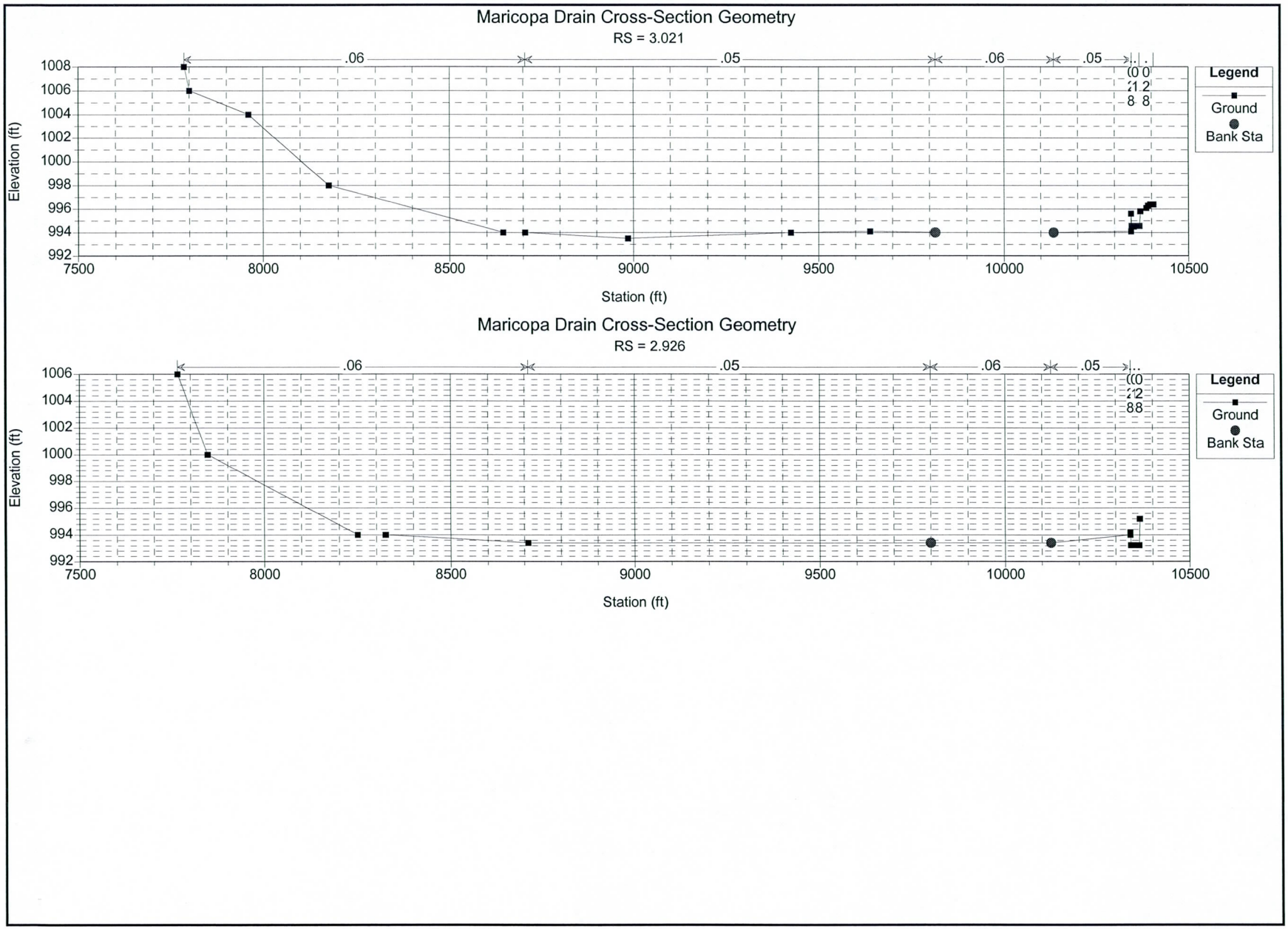
Maricopa Drain Cross-Section Geometry
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.06
.05
.06
.05
Legend
Ground
Bank Sta
Elevation (ft)
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1006
1004
1002
1000
998
996
994
992
7500
8000
8500
9000
9500
10000
10500
Station (ft)
Maricopa Drain Cross-Section Geometry
RS = 2.926
.06
.05
.06
.05
Legend
Ground
Bank Sta
Elevation (ft)
1006
1004
1002
1000
998
996
994
992
7500
8000
8500
9000
9500
10000
10500
Station (ft)

APPENDIX E.3

EXPANSION AND CONTRACTION COEFFICIENTS

(NOT APPLICABLE)

APPENDIX E.4

ANALYSIS OF STRUCTURES

(NOT APPLICABLE)

APPENDIX E.5

HYDRAULIC CALCULATIONS

```
*
* THIS FILE PRESENTS THE 100-YEAR FLOODPLAIN AND FLOODWAY SIMULATION FOR LAVEEN
* HYDRAULIC STUDY (MARICOPA DRAIN IRRIGATION CHANNEL, FORMERLY CHAMPION DRAIN)
* PERFORMED BY WEST CONSULTANTS INC (ZORAN LAKICEVIC AND JAMES HEYEN) IN MAY 2000.
* THE ORIGINAL MODEL DEVELOPED BY CELLA BARR ASSOCIATES (CBA) IN 1992 WAS USED
* AS A BASIS FOR THIS MODEL.
* THE FOLLOWING CHANGES FROM THE ORIGINAL MODEL ARE INCORPORATED IN THIS MODEL:
*
* 1. THE NEW FLOW RATES ARE USED, BASED ON YEAR 2000 HYDROLOGY STUDY PERFORMED BY FLOOD
* CONTROL DISTRICT OF MARICOPA COUNTY. THE FLOW RATES ARE GENERALLY ABOUT 40%
* LOWER THEN IN THE ORIGINAL CBA MODEL. THE FLOW RATE IS APPLIED IN DOWNSTREAM OR
* UPSTREAM REACH FROM THE PARTICULAR CROSS SECTION AS LONG AS IT IS HIGHER THEN THE
* ADJACENT REACH FLOW RATE. IF ADJACENT REACH FLOW RATE IS HIGHER THEN THE HIGHER
* FLOW RATE IS USED.
*
* 2. THE NEW REVISED MANNING'S ROUGHNESS COEFFICIENTS ARE USED REFLECTING CURRENT FIELD
* CONDITIONS. THEY ARE GENERALLY LOWER THEN THE ORIGINAL COEFFICIENTS. THE MODEL IS
* NOT SIGNIFICANTLY SENSITIVE TO THIS PARAMETER.
*
* 3. THE MARICOPA DRAIN CONVEYANCE IS ADDED TO THE ORIGINAL MODEL, BY INPUTTING
* THE GEOMETRY OF THE DRAIN BASED ON SURVEY PERFORMED BY MORRISON MAIERLE INC., IN
* 1999. THE BASE FLOW OF THE DRAIN IS ASSUMED TO BE AT ITS MAXIMUM LEVEL WHICH IS 1 FOOT
* BELOW THE LOWER TOP OF THE LEVEE, REDUCING THE TOTAL AVAILABLE CONVEYANCE OF THE
* DRAIN IN CASE OF FLOODING. IN ORDER TO MODEL THIS THE DRAIN CROSS SECTIONS ARE CUT AT
* THE LEVEL OF 1 FOOT BELOW THE LOWER LEVEE, BY SPECIFYING THE APPROPRIATE GR CARDS. ALSO THE
* MANNING'S ROUGHNESS COEFFICIENT FOR THIS PORTION OF THE DRAIN IS ARTIFICIALLY
* SET TO THE LOW VALUE (0.01) IN ORDER TO SIMULATE THE ROUGHNESS AT INTERFACE BETWEEN
* THE BASE FLOW IN DRAIN AND FLOODING FLOWS.
*
* 4. TWO NEW CROSS-SECTIONS 0.189 AND 0.513 ARE ADDED AT THE DOWNSTREAM END OF THE MODEL
* IN ORDER TO TIE THIS MODEL INTO THE EXISTING SALT RIVER FLOODPLAIN (BAKER, 1998).
*
* 5. BASELINE ROAD APPEARS TO BE APPROXIMATELY 2 FT ELEVATED FROM THE SURROUNDING
* GROUND, CAUSING THAT THE FLOW OVER THE BASELINE ROAD IS HYDRAULIC WEIR FLOW SITUATION.
* THEREFOR THE BASELINE ROAD IS MODELED AS A WEIR AT TWO LOCATIONS: (1) INTERSECTION
* OF BASELINE ROAD AND MARICOPA DRAIN CLOSE TO 75th AVENUE (CROSS SECTION 1.035),
* (2) INTERSECTION OF BASELINE ROAD AND MARICOPA DRAIN CLOSE TO 67th AVENUE (CROSS
* SECTION 2.948). THE WEIR IS MODELED USING A HEC-2 SPECIAL BRIDGE ROUTINE.
*
* 6. IN ADDITION TO SPLIT FLOWS MODELED IN ORIGINAL CBA MODEL, THE FOLLOWING SPLIT
* FLOWS ARE MODELED IN THIS MODEL:
*  (a) BASELINE ROAD CROSSING MARICOPA DRAIN NEAR 75th AVENUE: IN ORIGINAL MODEL
*      THIS SPLIT FLOW IS APPROXIMATED USING THE NORMAL DEPTH CALCULATION. IN THIS
*      MODEL THE SPLIT FLOW AT THESE LOCATIONS (from 0.866 to 1.035, and from 1.041 to
*      1.156) IS MODELED USING THE STANDARD HEC-2 SPLIT FLOW NORMAL DEPTH OPTION.
*      NOTE THAT AT THIS LOCATION THE COMBINATION OF SPLIT FLOW OVER MARICOPA DRAIN
*      AND WEIR FLOW OVER BASELINE ROAD IS MODELED.
*  (b) PONDING AREA ON THE NORTH OF MARICOPA DRAIN FROM 1.282 TO 1.682: IN ORIGINAL
*      CBA MODEL THIS IS MODELED IN HEC-1 AS A RESERVOIR ROUTING. IN THIS MODEL
*      THE HEC-2 SPLIT FLOW WEIR OPTION IS USED TO MODEL THE FLOW CROSSING THE MARICOPA
*      DRAIN TO SOUTH (FROM 1.281 TO 1.682).
*
* 7. BASED ON THE NEW HYDROLOGY THE PEAK DISCHARGE FOR SECTIONS 2.926 TO 3.209 IS ROUGHLY
* ABOUT 3 HOURS AHEAD OF THE PEAK ON THE NORTH SIDE OF BASELINE ROAD.  THE DISCHARGE FOR
* THIS REACH IS 224 CFS AT TIME OF NORTH SIDE PEAK WHEN WEIR FLOW OCCURS
* FROM NORTH TO SOUTH.  CONSEQUENTLY WEIR FLOW FROM THE NORTH SIDE IS
* ADDED TO THE 224 CFS ON THE SOUTHSIDE.  THE Q-100 FOR THE SOUTHSIDE
* IS 765 CFS AND IS USED AS A MINIMUM DISCHARGE.
*
* 8. THE ENCROACHMENT ANALYSIS IN THIS MODEL WAS FIRST PERFORMED IN HEC-RAS.  IN THOSE CROSS
* SECTIONS WHICH INCLUDED THE DRAIN AS PART OF THE GEOMETRY, THE DRAIN WAS PROTECTED FROM
* ENCROACHMENT.  THE BANK STATIONS WERE ALSO ADJUSTED WHERE NECESSARY.  AT MOST CROSS
* SECTIONS, THE DRAIN IS AT THE VERY EDGE OF THE GEOMETRIC DATA.  CONSEQUENTLY, AT
* MANY LOCATIONS THERE WAS NO ENCROACHMENT POSSIBLE FROM THAT SIDE OF THE CROSS SECTION.
* A METHOD 4 ANALYSES WAS PERFORMED STARTING AT THE DOWNSTREAM END OF THE REACH.
* THE RESULTS OF THIS ANALYSIS WERE THEN TRANSFERRED INTO THE HEC-2 DECK AND CODED IN USING
* METHOD-1 TO SET THE ENCROACHMENT.  THE FINAL ADJUSTMENT TO THE ENCROACHMENT STATIONS WERE
* COMPLETED IN HEC-2 MANUALLY.
*
* 9. DUE TO THE EXISTENCE OF AN ELEVATED MAINTENANCE ROAD ADJACENT TO MARICOPA DRAIN
* IRRIGATION CHANNEL BETWEEN CROSS-SECTIONS 1.830 AND 2.303, THE BASE FLOOD ELEVATIONS
* AND 100-YR FLOODPLAIN BOUNDARIES WERE DETERMINED FOR BOTH "WITH LEVEE" AND "WITHOUT
* LEVEE" CONDITIONS.
*
* THE FOLLOWING ARE COMMENTS FROM THE ORIGINAL CBA MODEL WHICH ARE STILL VALID
* FOR THIS MODEL:
C
C    11
C 1.156  EXTENDED SECTIONS 1.156 - 1.682 ARE LOCATED ALONG THE BOUNDARY
C 1.156  OF THE GILA INDIAN RESERVATION (LIMITS OF STUDY AREA).
C 1.830  DIVIDED FLOW MESSAGES DUE TO CHAMPION DRAIN LEVEE THAT IS ASSUMED
C 1.830  TO FAIL AT TIME OF THE 100-YEAR EVENT.
C 3.013  WEIR FLOW OCCURS FROM SECTION 3.013 TO 3.390 AS FLOW FROM THE NORTH
C 3.013  SIDE OF BASELINE ROAD WEIRS ACROSS THE ROADWAY TO THE SOUTH.  THE
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C 3.013  AMOUNT OF DISCHARGE SPILLING SOUTH OVER THE ROADWAY WAS CALCULATED
C 3.013  USING THE SPLIT FLOW ROUTINE (HEC2 FILE WITH-LW.DAT) AND THE
C 3.013  CALCULATED Q WAS SUBTRACTED FROM THE NORTHSIDE DISCHARGE.
C 3.763  59TH AVENUE
C 4.803  51ST AVENUE
T1  MARICOPA DRAIN FLOODPLAIN, WITH LEVEES, 100-YR PROFILE
T2  WEST CONSULTANTS INC.
T3
* STARTING WATER SURFACE ELEVATION ASSUMED TO BE A NORMAL DEPTH WITH ENERGY
* SLOPE OF 0.003.
J1      0       3       0       0    .003       0       0       0   977.8       0
J2      1       0      -1       0       0       0      -1       0       0      15
* J3   110     115     150     200
* J3    38       1      50      68       4      27      21      22      28     110
* J3   100
J3     38       1      53      54       4
QT      2  1237.9  1237.9
* FLOW IS FROM CPCD3C
* CROSS SECTION AT SALT RIVER (CPCD3C)
* THE FOLLOWING IS ADDITIONAL CROSS SECTION TO CONECT THE ORIGINAL MODEL TO NEW
* EXISTING FLODDPLAIN OF SALT RIVER
NC 0.035   0.035   0.035
X1 0.189       6  10000.   10560       0       0       0
GR 978.0   10000   976.0   10005  976.75   10150  978.00  10560.  980.00  10650.
GR 982.0   11000
*
NH      4   0.028  9931.9   0.010  9983.1   0.028   10000   0.035   11080
X1 0.513      14  10000.   10600     580     580     580
GR 980.7  9923.0   979.4  9931.9   979.4  9932.3   979.4  9941.2   979.4  9949.0
GR 979.4  9981.6   979.4  9983.1   980.4   10000     978   10050   978.0   10110
GR 978.6   10600     978   10880     978   11040     980   11080
NH      5   0.028  9870.2   0.010  9903.1   0.028  9906.3   0.035   10345   0.045
NH 11840
X1 0.593      21  9870.2  10345.     420     420     420
GR981.50  9870.0  980.50  9870.2  980.50  9873.5  980.50  9876.2  980.50  9898.8
GR980.50  9903.1  983.20  9904.5  983.30  9906.3  982.70  9928.1  980.00  9933.6
GR979.10  9936.6  978.50  9996.0  978.40  10098.  978.50  10130.  980.00  10345.
GR982.00  10570.  982.00  11040.  980.00  11080.  980.00  11320.  982.00  11490.
GR981.20  11840.
NH      4   0.028  9885.0   0.010  9919.6   0.028  9923.5   0.045  11430.
X1 0.688      17  9961.5 10180.0     500     500     500
GR984.90  9885.0  982.06  9887.8  982.06  9896.4  982.06  9914.3  982.06  9917.0
GR982.06  9919.6  982.80  9920.0  983.10  9923.5  982.50  9944.4  980.30  9961.5
GR980.20 10051.3  980.40 10153.3  980.40 10180.0  982.00 10860.0  982.10  11390.
GR982.20  11400.  982.30 11430.0
NH      5   0.028  9911.3   0.010  9952.7   0.028  9980.5    0.05  10410.   0.045
NH 12530
X1 0.782      31 10000.3  10410.     500     500     500
GR984.60  9910.0  983.21  9911.3  983.21  9919.3  983.21  9920.3  983.21  9946.8
GR983.21  9947.5  983.21  9950.1  983.21  9952.7  983.90  9954.2  984.00  9954.3
GR984.20  9980.5  984.10  9985.4  983.70  9995.7  982.90 10000.3  981.00 10012.1
GR980.60  10014.  980.60 10014.5  980.20 10023.3  979.80 10026.5  980.10 10031.3
GR980.60  10071.  980.90 10093.1  981.00 10126.6  981.50 10130.0  982.00 10300.0
GR982.00  10410.  981.30 10830.0  982.00 11250.0  983.10 11830.0  984.00 12360.0
GR985.80  12530.
* FLOW IS FROM CPCD3C (IT IS HIGHER THEN DIBASE FLOW OF 641 cfs)
* SECTION D/S OF BASELINE ROAD (DIBASE)
NH      5   0.028  9911.3   0.010  9966.8   0.028  9968.4    0.05  10965.   0.045
NH 12175
X1 0.866      32  9988.4  10445.     440     440     440
GR984.40  9910.0  983.02  9911.3  983.02  9916.2  983.02  9916.8  983.02  9934.3
GR983.02  9935.0  983.02  9937.6  983.02  9938.2  983.02  9941.8  983.02  9941.9
GR983.02  9963.3  983.02  9964.5  983.02  9966.8  984.00  9968.4  983.90  9973.3
GR983.60  9983.8  983.00  9988.4  981.80 10000.3  981.30 10002.5  981.30 10002.7
GR981.10 10011.7  980.80 10014.9  981.00 10019.7  981.70 10045.0  982.00  10145.
GR982.70  10445.  983.00 10875.0  983.00 10965.0  982.00 11465.0  983.00  11795.
GR984.00  11895.  986.00 12175.0
QT      2  1296.5  1296.5
*
* FIRST D/S CROSS SECTION FROM BASELINE WEIR
NH      5   0.028  9003.2   0.010  9023.3   0.028  9027.1    0.05 10897.4   0.045
NH 11363
X1 1.035      17  9045.9  9361.4     891     891     891
GR 983.9  9000.0   982.9  9003.2   982.9  9023.3   984.0  9027.1   983.5  9037.9
GR 983.2  9045.9   982.4  9049.8   982.6  9101.4   983.0  9155.9   983.4  9207.1
GR 983.3  9239.5   984.0  9361.4   985.8  9646.4   988.0 10480.4   988.7 10591.6
GR 988.4 10897.4   988.4 11363.0
* SPECIAL BRIDGE INPUT TO MODEL BASELINE WEIR
SB  1.05     1.0     3.0       0  0.0001  0.0001  0.0001  0.0001
* FIRST U/S CROSS SECTION FROM BASELINE WEIR
NH      5   0.028  9001.9   0.010  9017.0   0.028  9018.1    0.05 10897.4   0.045
NH 11363
X1 1.041      19  9039.4  9347.5      30      30      30
* X2 CARD HAS SKEW OF 46 DEGRES (COS=0.695) TO ACCOUNT FOR SKEW OF BASELINE ROAD
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X2                      1   982.4   984.1                           0.695
QT   -11  9000.0   985.0     982  9081.4   985.1     982  9150.0   984.1     982
QT        9360.0   985.6     982  9700.0   985.7     982  9940.0   985.9     982
BT       10330.4   986.9     982 10750.0   987.4     982 11290.0   988.7     982
BT       11730.0   988.4     982 12400.0   989.4     982
GR 984.1  9000.0   983.1  9001.9   983.1  9005.1   983.1  9017.0   984.1  9018.1
GR 984.0  9020.7   983.5  9031.5   983.2  9039.4   982.4  9043.4   982.6  9095.0
GR 983.3  9135.3   983.5  9183.3   983.6  9282.1   984.0  9347.5   986.0  9639.4
GR 988.0 10508.2   988.7 10591.6   988.4 10897.4   989.4 11363.0
*
* SECTION U/S OF BASELINE ROAD (CCD2C)
* FLOW IS FROM CCD2C
* INTERPOLATED CROSS-SECTION
*
NH     5   0.028  9848.3   0.010 9897.20   0.028 9899.90   0.060  10600.    0.05
NH 11890
QT     2  1809.6  1809.6
X1 1.156      23  9846.3  10440.     620     620     620
GR987.50  9846.3  984.10  9848.3  984.10  9850.0  984.10  9850.8  984.10  9855.8
GR984.10  9872.4  984.10  9875.6  984.10  9878.5  984.10  9892.7  984.10  9897.2
GR985.10  9899.9  984.70  9930.9  984.60  9965.7  985.50  9975.9  986.00  10000.
GR986.00  10100.  985.50  10250.  986.00  10440.  986.00  10600.  986.10  10780.
GR986.10  10820.  987.10  11840.  987.40  11890.
NH     5   0.028  9902.1   0.010  9978.8   0.028   9990.   0.045   11470    0.05
NH 12340
X1 1.281      11  9900.2  10400.     660     660     660
GR988.40  9900.2  985.00  9902.1  985.00  9910.1  985.00  9930.6  985.00  9978.8
GR986.00  9990.0  986.40  10400.  988.00  11470.  988.00  11615.  988.20  11740.
GR988.80  12340.
* CROSS-SECTION AT SOUTH MOUNTAIN AVENUE AND MARICOPA COUNTY
* FLOW IS FROM CCD2C
QT     2    1876    1876
NH     4   0.028 9830.20   0.010  9867.7   0.028 9868.20   0.045  12610.
ET           4.1          9829.7   10530
X1 1.682      13  9896.0  11180.    2220    1535    2115
GR987.60  9829.7  986.60  9830.2  986.60  9854.8  986.60  9857.0  986.60  9860.3
GR986.60  9867.7  987.60  9868.2  986.20  9888.6  986.00  9896.0  984.20  9900.0
GR986.00  11180.  988.00  12180.  989.40  12610.
NH     4   0.028  9740.6   0.010  9778.5   0.028    9780   0.045   13785
* NC  0.07    0.07    0.07
ET           4.1          9738.2   10410
X1 1.830      21  9800.0  10970.     785     520     780
* FIRST D/S CROSS-SECTION WITH LEVEE
GR988.40  9738.2  987.40  9740.6  987.40  9754.0  987.40  9765.9  987.40  9767.7
GR987.40  9768.3  987.40  9771.7  987.40  9771.9  987.40  9774.3  987.40  9776.9
GR987.40  9778.5  988.40  9780.0  986.00  9800.0  985.00  10000.  986.00  10970.
GR988.00  11920.  988.90  12240.  989.40  12485.  989.10  12780.  989.70  13420.
GR990.00  13785.
NH     4   0.028  9742.5   0.010  9780.2   0.028  9785.5   0.045  13475.
ET           4.1            9740 10400.0
X1 1.924      15  9785.5  10900.     500     500     500
GR991.00  9740.0  988.00  9742.5  988.00  9780.2  989.00  9785.5  986.70  9789.0
GR986.70  9805.0  986.70  9845.0  987.60  10400.  987.60  10900.  988.00  11445.
GR989.20  12205.  990.00  12495.  991.10  12805.  991.40  13125.  992.00  13475.
NH     4   0.028  9742.9   0.010  9779.4   0.028  9781.1   0.045  13455.
ET           4.1            9740 10165.0
X1 2.019      24  10115.  11045.     500     500     500
GR992.00  9740.0  988.33  9742.9  988.33  9749.9  988.33  9769.5  988.33  9771.3
GR988.33  9772.1  988.33  9775.4  988.33  9777.9  988.33  9778.8  988.33  9779.4
GR989.30  9781.1  988.00  9815.0  987.60  10115.  988.00  11045.  989.40  11650.
GR989.60  11995.  990.00  12400.  990.50  12415.  990.00  12435.  989.90  12465.
GR990.00  12490.  990.40  12875.  991.50  13115.  992.00  13455.
NH     4   0.028  9757.4   0.010  9796.3   0.028  9799.6   0.045  13380.
* ET           4.1            9755 10202.4
ET           4.1            9755 10202.4
X1 2.114      21  9860.0  10600.     500     500     500
GR993.40  9755.0  989.76  9757.4  989.76  9764.9  989.76  9784.5  989.76  9786.3
GR989.76  9787.0  989.76  9790.3  989.76  9792.6  989.76  9793.5  989.76  9794.0
GR989.76  9796.3  990.80  9799.6  988.00  9800.0  988.00  9860.0  988.00  10630.
GR990.00  11600.  990.00  12400.  991.00  12455.  990.00  12490.  990.90  12890.
GR992.00  13380.
NH     4   0.028  9742.6   0.010  9784.8   0.028    9787    0.05  13455.
* ET           4.1            9740 10176.6
ET           4.1            9740 10175.0
X1 2.209      25  9787.0  10842.     500     500     500
GR993.30  9740.0  990.38  9742.6  990.38  9764.5  990.38  9766.1  990.38  9768.6
GR990.38  9770.6  990.38  9771.0  990.38  9771.1  990.38  9772.0  990.38  9774.4
GR990.38  9774.9  990.38  9775.9  990.38  9780.9  990.38  9784.8  991.40  9787.0
GR988.00  9790.0  988.10  10185.  988.90  10845.  990.00  11065.  991.00  12405.
GR992.00  12445.  991.00  12475.  991.10  12715.  992.00  13060.  994.00  13455.
NH     4   0.028  9743.0   0.010  9792.6   0.028  9794.7    0.05  13260.
* ET           4.1            9740   10100
ET           4.1            9740   10250
X1 2.303      25   9870.  10752.     500     500     500
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* LAST CROSS-SECTION WITH LEVEE
GR993.50  9740.0  991.13  9743.0  991.13  9752.2  991.13  9757.8  991.13  9766.2
GR991.13  9773.1  991.13  9774.5  991.13  9775.0  991.13  9777.8  991.13  9780.3
GR991.13  9780.8  991.13  9781.9  991.13  9787.1  991.13  9792.6  991.60  9793.4
GR992.10  9794.7  990.00  9870.0  989.10  10220.  990.00  10755.  992.00  12400.
GR992.00  12450.  993.00  12480.  992.00  12540.  992.00  12860.  993.00  13260.
NH     5   0.050    9745   0.028  9754.0   0.010  9778.0   0.028  9791.0    0.05
NH13458.
QT     2    1899    1899
* 67th AVENUE (CPCD1C)
* FLOW IS FROM CB163C (IT IS HIGHER THAN CPCD1C FLOW OF 1869 cfs)
ET           4.1             9745   10285
X1 2.398      17  10012.  10800.     500     500     500
GR1000.0  9390.0  998.00  9406.0  996.00  9608.0  995.20  9675.0  994.00  9730.0
GR992.00  9745.0  991.00  9754.0  991.00  9762.3  991.00  9778.0  992.00  9791.0
GR992.00  9816.0  991.60  10012.  991.30  10800.  991.00  11390.  992.00  12217.
GR994.00  13447.  994.70  13458.
NH     5   0.06  10192.   0.028  10204.   0.010  10260.   0.028  10272.    0.05
NH 12600
ET           4.1            10192   10735
X1 2.516      22  10272.  11064.     625     450     625
GR1000.0  8950.0  998.00  9297.0  996.00  9754.0  996.00  9772.0  996.00   9800.
GR996.00  9831.0  994.00  10022.  994.00  10175.  994.00  10192.  992.00  10204.
GR992.00  10217.  992.00  10241.  992.00  10260.  993.00  10272.  992.00  10283.
GR991.85  10500.  991.70  10852.  992.00  11064.  992.50  11321.  993.40  11725.
GR994.00  12588.  994.50  12600.
NH     5   0.06  8165.0   0.028  8207.0   0.010  8225.0   0.028    8246    0.05
NH 10227
QT     2    1899    1899
* 65th AVENUE
ET           4.1             8188    8750
X1 2.832      17  8264.0   9188.     700     500     665
GR1000.0  7212.0  998.00  7307.0  996.00  7459.0  994.00  7550.0  993.00  7880.0
GR994.00  8165.0  992.00  8188.0  991.00  8207.0  991.00  8225.0  992.00  8246.0
GR992.00  8264.0  992.00  8428.0  992.00  8734.0  993.10  9188.0  992.80  9753.0
GR994.00  10217.  995.00  10227.
* BASELINE CROSSING AT 67th AVENUE
NH     1   0.060  11400.
QT     2  1117.3  1117.3
ET           4.1            10000   10410
X1 2.948       6  10000.    10500    1320     620    1430
GR995.30  10000.     994   10310   993.6   10420     994   10500   995.1   11020
GR996.50  11400.
* SPECIAL BRIDGE INPUT TO MODEL BASELINE WEIR
SB  1.05     1.0     3.0       0  0.0001  0.0001  0.0001  0.0001
* FIRST U/S CROSS SECTION FROM BASELINE WEIR
ET           4.1            10000   10390
X1 2.949                                30      30      30
* X2 CARD HAS SKEW OF 45 DEGRES (COS=0.707) TO ACCOUNT FOR SKEW OF BASELINE ROAD
X2                      1     993   993.5                                 0.707
BT    -7  10000.  995.30     993  10150.   994.7     993  10480.   994.6     993
BT        10840.   994.4     993  10980.  994.62     993  11200.   994.0     993
BT        11420.   993.5     993
*
NH     1   0.060   11370
QT     2  1160.7  1160.7
* D/S END OF SPLIT FLOW SECTION
ET           4.1             9775   10080
X1 3.013      12  9775.0  10100.     350     850     500
GR995.68  9775.0  995.20  9775.1  995.00  9802.4  995.30  9817.0  994.90  9831.0
GR994.00  9844.6  994.00  10100.  994.90  10763.  996.00  10980.  996.00  11170.
GR996.00  11350.  998.00  11370.
NH     1   0.060  11655.
QT     2  1378.1  1378.1
ET           4.1          9805.1 10170.0
X1 3.108      15  9805.1  10200.     500     500     500
GR996.10  9805.1  996.10  9808.0  996.10  9814.3  996.00  9821.3  996.00  9827.7
GR995.20  9852.1  993.40  9859.4  993.40  9864.7  994.60  9869.8  994.70  9884.8
GR994.50  10000.  995.10  10200.  996.00  11030.  998.00  11635.  999.00  11655.
NH     1   0.060  11825.
QT     2  1792.4  1792.4
ET           4.1          9846.7 10250.0
X1 3.203       8  9846.7  10250.     500     500     500
GR996.70  9846.7  996.70  9862.2  996.70  9872.7  994.60  10000.  996.00  10250.
GR996.00  11060.  998.00  11400.  999.40  11825.
NH     1   0.060   11940
QT     2    1899    1899
* U/S SECTION OF SPLIT FLOW SECTION
* 63th AVENUE (CB163C)
* FLOW IS FROM CB163C
ET           4.1          9839.8 10330.0
X1 3.296      23  9949.9  10090.     490     490     490
GR997.10  9839.8  997.10  9839.9  997.10  9840.0  997.10  9849.9  997.10  9857.3
GR996.90  9859.4  996.30  9859.6  995.90  9861.0  996.10  9862.0  997.10  9863.9
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GR997.10  9873.2  997.20  9900.1  996.90  9927.3  996.90  9929.8  996.80  9949.9
GR995.80  9989.5  995.00  10000.  996.00  10090.  996.00  10380.  997.20  11180.
GR998.00  11530.  998.00  11670.  1000.0  11940.
NH     2   0.045   11180   0.035   11940
QT     2    1899    1899
ET           4.1             9830 10330.0
X1 3.390      16  9857.6  9868.1     500     500     500
GR998.40 9830.00  998.40  9845.7  998.40  9857.6  996.70  9860.9  995.30  9861.3
GR994.40 9863.50  994.80  9865.0  997.20  9868.1  996.40  9969.2  996.60 10073.6
GR996.60 10117.9  996.00  10380.  997.20  11180.  998.00  11530.  998.00  11670.
GR1000.0 11940.0
NH     3   0.060   10250   0.045   11675    0.05   12470
ET           4.1             9850   10350
X1 3.485      14  9888.4  10250.     500     500     500
GR1000.1  9850.0  1000.2  9850.1  999.80  9865.2  999.40  9878.7  997.60  9888.4
GR996.90  9898.1  997.20  9923.7  997.00  9997.4  997.10  10000.  997.00  10250.
GR998.00  10730.  999.00  11675.  1000.0  12400.  1001.5  12470.
NH     2   0.045   11190    0.05   12510
ET           4.1             9960 10320.0
X1 3.578       8  9945.0  10320.     500     500     500
GR1000.7  9910.0  998.00  9945.0  997.40  10100.  998.00  10320.  999.70  11190.
GR999.70  11450.  999.90  11825.  1002.0  12510.
NH     2   0.045   11260    0.05   12545
ET           4.1             9950   10215
X1 3.671       9  9950.0  10950.     500     500     500
GR1001.9  9950.0  1001.0  9951.0  1001.0  9952.0  1000.0  9975.0  999.10  10290.
GR1000.0  10950.  1000.8  11260.  1001.0  11860.  1002.0  12545.
NH     4   0.028  9899.9   0.010  9918.9   0.028 9920.00    0.04 12450.0
ET           4.1             9876 10250.0
X1 3.763      14  9920.0  10860.     500     500     500
GR1001.7  9876.0  1001.3  9895.1  1001.2  9897.8  998.40  9899.9  998.40  9904.0
GR998.40  9912.1  998.40  9918.9  999.20  9920.0  999.40  9920.0  999.40  10165.
GR999.70  10300.  1000.4  10860.  1001.8  11900.  1002.0  12450.
QT     2    1710    1710
* 59th AVENUE (CB159C)
* FLOW IS FROM CB51C (IT IS HIGHER THEN CB159C FLOW OF 1598 cfs)
NH     4   0.028  9923.5   0.010  9944.1   0.028 9947.80    0.04 13140.0
ET           4.1             9920   10470
X1 3.858      18  9947.8  10470.     500     500     500
GR1002.7  9920.0  1002.6  9920.4  1001.1  9921.9  999.15  9923.5  999.15  9925.9
GR999.15  9942.5  999.15  9944.1  1000.2  9947.5  1000.2  9947.8  999.50  10120.
GR1000.0  10265.  1001.0  10470.  1001.0  10900.  1001.6  11220.  1001.5  11650.
GR1002.2  11900.  1002.5  12270.  1004.0  13140.
NH     4   0.028  9933.4   0.010  9956.6   0.028   9960.    0.04   13055
ET           4.1           9928.2 10700.0
X1 3.953      21  10070.  10700.     500     500     500
GR1004.4  9928.2  1004.4  9928.5  1004.1  9929.5  1003.8  9930.0 1001.00  9933.4
GR1001.0  9947.2  1001.0  9956.6  1002.0  9960.0  1000.0  9970.0  1000.0  10040.
GR1000.2  10070.  1000.0  10125.  999.50  10150.  1000.0  10320.  1001.3  10700.
GR1001.3  10930.  1002.0  11230.  1001.7  11500.  1002.0  11820.  1002.6  12000.
GR1004.0  13055.
NH     5   0.028  9961.5   0.010  9980.0   0.028  9982.4    0.05   11270    0.04
NH 12630
ET           4.1             9955 10350.0
X1 4.046      23  9982.4  10350.     490     490     490
GR1005.1  9955.0  1004.9  9956.3  1004.8  9956.5  1004.2  9958.0  1003.7  9959.0
GR1001.2  9961.5  1001.2  9967.4  1001.2  9968.4  1001.2  9973.0  1001.2  9980.0
GR1001.8  9980.8  1002.2  9982.2  1002.2  9982.4  1000.0  9983.0  999.80  10000.
GR1000.0  10020.  1001.5  10350.  1002.0  10880.  1002.5  11180.  1002.5  11230.
GR1002.0  11270.  1002.0  11470.  1004.0  12630.
NH     5   0.028  9956.7   0.010  9976.3   0.028  9979.4    0.05   11260    0.04
NH 12300
ET           4.1             9950 10240.0
X1 4.143      21  9979.4  10240.     515     515     515
GR1006.6  9950.0  1005.9  9951.6  1003.2  9955.1  1002.3  9956.4  1001.9  9956.7
GR1001.9  9963.6  1001.9  9964.2  1001.9  9967.0  1001.9  9976.3  1002.5  9977.2
GR1002.8  9978.5  1002.9  9979.4  1002.0  9985.0  1001.5  10000.  1002.0  10240.
GR1003.7  11240.  1003.7  11260.  1003.0  11530.  1003.5  11975.  1003.9  12120.
GR1004.0  12300.
NH     5   0.028  9959.3   0.010  9980.2   0.028  9982.3    0.05  11260.    0.04
NH 12700
ET           4.1             9950   10300
X1 4.238      20  9982.3  10300.     500     500     500
GR1007.3  9950.0  1006.7  9952.0  1004.8  9956.4  1004.4  9958.0  1002.9  9959.3
GR1002.9  9967.0  1002.9  9967.8  1002.9  9970.5  1002.9  9971.8  1002.9  9980.2
GR1003.5  9981.5  1003.9  9982.3  1002.0  9985.0  1002.0  10000.  1003.1  10300.
GR1004.0  11130.  1004.5  11230.  1004.0  11260.  1004.0  11650.  1006.0  12700.
NH     4   0.028  9972.0   0.010  9993.9   0.028  9995.1    0.05   12630
ET           4.1           9960 10275.0
X1 4.331      18  10005.  10450.     500     500     500
GR1008.0  9960.0  1007.6  9962.4  1006.5  9967.7  1006.5  9969.6  1003.9  9972.0
GR1003.9  9980.4  1003.9  9981.4  1003.9  9983.9  1003.9  9985.2  1003.9  9993.9
GR1004.3  9994.4  1004.9  9995.1  1004.0  10005.  1004.0  10030.  1003.9  10100.
GR1004.0  10450.  1005.6  12090.  1006.0  12630.
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NH     4   0.028  9974.1   0.010  9996.5   0.028  9997.4    0.05  13070.
ET           4.1            9960 10450.0
X1 4.425      14  9997.4  10450.     500      500      500
GR1008.6  9960.0  1007.9  9968.7  1008.2  9970.9  1004.7  9974.1  1004.7  9984.3
GR1004.7  9986.7  1004.7  9996.5  1005.7  9997.4  1004.0  10000.  1004.7  10450.
GR1006.0  11240.  1006.2  11800.  1006.9  12500.  1008.0  13070.
NH     4   0.028  9975.1   0.010 10000.7   0.028 10003.6    0.05   12850
ET           4.1            9965 10350.0
X1 4.520      11  10025. 11240.0     500      500      500
GR1009.7  9965.0  1007.4  9972.4  1007.2  9974.3  1006.3  9975.1  1006.3  9984.7
GR1006.3 10000.7  1007.3 10003.6  1006.0  10025.  1005.0 10500.0  1006.0 11240.0
GR1008.0 12850.0
NH     4   0.028  9894.8   0.010  9924.0   0.028  9925.6    0.05   13000
ET           4.1            9890 10440.0
X1 4.615      12  9945.0  10440.     500      500      500
GR1010.6  9890.0  1007.9  9894.8  1007.9  9897.9  1007.9  9906.7  1007.9  9906.9
GR1007.9  9924.0  1008.9  9925.6  1006.0  9945.0  1006.5  10440.  1007.8 11800.0
GR1008.0  12550.  1009.8  13000.
NH     4   0.028  9702.2   0.010  9731.5   0.028  9732.5    0.05   12500
ET           4.1            9700 10220.0
X1 4.714      16   9780.  10800.     475      450      525
GR1011.6  9700.0  1009.4  9702.2  1009.4  9714.6  1009.4  9720.0  1009.4  9731.5
GR1010.5  9732.5  1009.4  9752.5  1007.9  9759.2  1008.0  9760.0  1008.0  9780.0
GR1007.8  10000.  1007.5  10220.  1007.8  10800.  1008.0  10990.  1009.0  12310.
GR1010.0  12500.
QT     2    1801    1801
NH     5   0.045    9330   0.028    9410    0.05 10705.8   0.060   11030    0.05
NH 12325
ET           4.1            9565   10085
X1 4.803      14    9410   10440      420      225      470
* 51st AVENUE (CB51C)
* FLOW IS FROM CVR47C (IT IS HIGHER THAN CB51C FLOW OF 1710 cfs)
GR1024.0  8300.0  1020.0  8425.0  1012.0  9065.0  1011.0  9310.0  1011.7  9330.0
GR1010.0  9365.0  1009.0  9380.0  1009.8  9410.0  1008.2  10000.  1008.5  10440.
GR1008.7 10705.8  1009.0  11030.  1009.9  12140.  1012.0  12325.
NH     6   0.045    9000   0.028    9045    0.05 10880.5   0.060 11196.2    0.05
NH 12493   0.028   12925
ET           4.1            9930   10460
X1 4.898      21    9750   10640      410      400      500
GR1020.0  8135.0  1014.0  8610.0  1012.0  8870.0  1012.0  8975.0  1012.8  9000.0
GR1012.0  9020.0  1010.0  9025.0  1009.0  9035.0  1010.0  9045.0  1010.0  9085.0
GR1009.0  9580.0  1010.0  9750.0  1008.5  10000.  1008.2  10240.  1008.2  10300.
GR1009.5  10640.  1009.6 10880.5  1009.8 11196.2  1010.0  11610.  1011.3   12493
GR1012.0  12925.
NH     3   0.045    9420    0.05 12436.3   0.028   12755
ET           4.1            9695   10240
X1 4.993      11    9565   10370      550      330      500
GR1018.0  8315.0  1014.0  8640.0  1014.0  8700.0  1012.0  8710.0  1010.0  9420.0
GR1010.0  9565.0  1009.5  10000.  1009.6  10370.  1010.0  11100.  1011.6 12436.3
GR1012.0  12755.
NH     3   0.060    9375    0.05   11210   0.028   12145
ET           4.1            9970   10605
X1 5.087      12    9375   11210      630      280      500
GR1018.0  8310.0  1014.0  8825.0  1012.0  9150.0  1011.8  9230.0  1011.8  9310.0
GR1011.8  9345.0  1011.8  9375.0  1010.5  9999.0  1011.0  10510.  1010.7  11210.
GR1012.0  12010.  1012.1  12145.
NH     3   0.060    9355    0.05   11880   0.028   12230
ET           4.1            9690   10385
X1 5.182      12    9355   10720      490      460      500
GR1018.0  8325.0  1014.0  8900.0  1014.0  8950.0  1013.0  9175.0  1012.0  9355.0
GR1011.5  10000.  1011.0  10550.  1012.0  10720.  1011.0  11500.  1012.7  11880.
GR1013.0  12005.  1013.1  12230.
NH     2    0.05   11560   0.028   12320
ET           4.1            9975   10635
X1 5.277      14    9515   11095      630      240      500
GR1018.0  8365.0  1016.0  8690.0  1014.0  9100.0  1014.0  9235.0  1012.0  9515.0
GR1011.7  10000.  1011.8  10520.  1012.0  11095.  1012.5  11135.  1012.0  11200.
GR1011.5  11560.  1012.0  11840.  1013.5  11930.  1013.7  12320.
NH     1    0.05   12055
ET           4.1            10315   10920
X1 5.371      10   10000   11235      510      475      500
GR1018.0  8370.0  1016.0  8700.0  1014.0  9225.0  1013.0  9705.0  1012.0  9840.0
GR1011.9  10000.  1011.8  10420.  1012.0  11235.  1014.0  11900.  1015.1  12055.
NH     1    0.05   12140
ET           4.1            10300   10810
X1 5.466      10    9840   11270      500      470      500
GR1020.0  8460.0  1018.0  8590.0  1016.0  8880.0  1014.0  9590.0  1014.0  9840.0
GR1014.0  10370.  1013.4  10800.  1014.0  11270.  1014.7  11890.  1016.0  12140.
QT     2    1801    1801
* 47th AVENUE (CVR47C)
* FLOW IS FROM CVR47C
NH     1    0.05   12070
ET           4.1            10220   10715
X1 5.561       9    9905   11040      380      610      500
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GR1020.0  8875.0  1018.0  8940.0  1016.0  9280.0  1014.0  9905.0  1013.5  10450.
GR1014.0  11040.  1014.5  11900.  1016.0  12060.  1016.2  12070.
NH     1    0.05   12130
ET            4.1            10100   10525
X1 5.656       14     9845   10780     380     660     500
GR1020.0  8555.0  1016.5  9250.0  1015.9  9500.0  1015.2  9845.0  1014.2  10330.
GR1014.0  10710.  1014.0  10765.  1016.0  10780.  1016.0  10800.  1016.0  10810.
GR1016.0  10825.  1015.6  11050.  1015.7  11600.  1016.1  12130.
NH     1    0.05   12000
ET            4.1             9950   10390
X1 5.750       13     9850   10490     375     600     500
GR1022.0  8365.0  1020.0  8610.0  1018.0  9100.0  1016.0  9850.0  1015.9  10000.
GR1016.0  10150.  1016.2  10490.  1017.0  10520.  1017.0  10530.  1017.0  10800.
GR1017.1  11965.  1017.5  11975.  1018.0  12000.
NH     1    0.05   12000
ET            4.1             9955   10380
X1 5.845       16     9625   10750     500     500     500
GR1024.0  8540.0  1022.0  8590.0  1022.0  8640.0  1020.0  8865.0  1018.0  9625.0
GR1017.5  9900.0  1017.2  10000.  1018.0  10280.  1018.0  10325.  1017.2  10450.
GR1018.0  10750.  1018.0  11180.  1018.2  11460.  1018.0  11700.  1018.7  11865.
GR1019.2  12000.
NH     1    0.05   11800
ET            4.1             9930   10340
X1 5.940       11     9720   10550     500     500     500
GR1026.0  8470.0  1024.0  8615.0  1024.0  8670.0  1022.0  9075.0  1019.9  9670.0
GR1018.6  9720.0  1018.0  9880.0  1018.2  10270.  1018.5  10550.  1019.8  11580.
GR1020.0  11800.
NH     1    0.05   13640
* 43d AVENUE
ET            4.1            10023   10422
X1 6.034       14     9280   10165     380     750     500
GR1026.0  8215.0  1024.0  8690.0  1022.0  9070.0  1021.0  9280.0  1020.0  9470.0
GR1020.0  9700.0  1019.7  9740.0  1020.0  9955.0  1021.0  10165.  1021.1  11005.
GR1022.0  11250.  1024.0  12100.  1026.0  13490.  1026.6  13640.
NH     5    0.06  8165.0   0.028  8207.0   0.010  8225.0   0.028    8246    0.05
NH 10227
QT     2    1899    1899
* 65th AVENUE, BEGINING OF SPLIT FLOW BRANCH
* FLOW IS FROM CB163C
ET            4.1             8188    8750
X1-2.832       17  8264.0   9188.     700     500     665
GR1000.0  7212.0  998.00  7307.0  996.00  7459.0  994.00  7550.0  993.00  7880.0
GR994.00  8165.0  992.00  8188.0  991.00  8207.0  991.00  8225.0  992.00  8246.0
GR992.00  8264.0  992.00  8428.0  992.00  8734.0  993.10  9188.0  992.80  9753.0
GR994.00  10217.  995.00  10227.
NH     7    .060    8710     .05    9800    .060   10125     .05   10340   0.028
NH 10341    .010 10363.4    .028 10365.4
QT     2   969.7   969.7
ET            4.1             9910 10365.4
X1 2.926       15     9800   10125     300    1700    1450
GR  1006    7765    1000    7845     994    8250     994    8325   993.4    8710
GR 993.4    9800   993.4   10125     994   10340   994.2  10340.  993.22 10341.0
GR993.22 10347.8  993.22 10350.2  993.22 10354.4  993.22 10363.4   995.2 10365.4
NH     7    .060    8705     .05    9815    .060   10135     .05 10345.1    .028
NH 10346    .010 10367.5    .028 10405.1
QT     2   926.3   926.3
ET            4.1            10010 10405.1
X1 3.021       23     9815   10135     500     500     500
GR  1008    7785    1006    7800    1004    7960     998    8175     994    8645
GR   994    8705   993.5    8985     994    9425   994.1    9640     994    9815
GR   994   10135   994.1   10345   995.6 10345.1  994.56   10346  994.56 10352.2
GR 994.5 10352.7  994.56 10353.7  994.56 10367.5   995.8   10370   996.1 10385.9
GR 996.3 10390.3   996.4 10395.7   996.4 10405.1
NH     4    .050 10380.1   .0280   10381    .010 10402.5   .0280 10435.6
QT     2     765     765
ET            4.1             9950 10435.6
X1 3.121       21     9800 10380.1     500     500     500
GR  1010    7800    1008    7850    1006    8100    1004    8450    1002    8480
GR  1000    8510     998    8520     996    8550   995.6    8560   994.8    9000
GR 994.2    9800   994.5   10135     995   10380   996.7 10380.1  995.72   10381
GR 995.7 10389.5  995.72 10394.6  995.72 10402.5   997.1 10403.9   997.1 10421.6
GR 997.6 10435.6
NH     4    .050 10370.2   .0280 10371.4    .010 10379.9   .0280 10407.6
QT     2     765     765
ET            4.1            10050 10407.6
X1 3.209       17     9430 10370.2     490     490     490
GR  1010    7805    1008    7810    1006    8200    1004    8460     996    8515
GR 994.8    8975   995.3    9430   994.6   10000   995.5   10370     997 10370.1
GR 997.2 10370.2   997.1 10370.3  996.15 10371.4  996.15   10379  996.15 10379.9
GR 996.2 10400.8   998.2 10407.6
NH     4    .050 10335.1   .0280 10336.3    .010 10357.7   .0280 10390.3
QT            4.1            10050 10390.3
X1 3.303       17     8930   10030     500     500     500
GR  1010    7755    1008    7895    1006    8405     998    8450   996.1    8605
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GR 996.2    8930     996   10030   996.4   10205     996   10335   997.7 10335.1
GR 996.7 10336.3  996.71 10345.1  996.71 10349.4  996.71 10357.7   998.6 10359.9
GR 999.1 10376.2   999.6 10390.3
NH     5    .045    8990.   .0500 10300.1    .028 10301.4   .0100 10320.7  0.0280
NH 10354
ET            4.1          10120   10354
X1 3.398       17    9700 10300.1     500     500     500
GR  1014     7735     1012     7745     1010     8080     1010     8350     1004     8390
GR  1002     8960      998     8990    996.6     9285    996.3     9700      996    10300
GR 997.4 10300.1  996.42 10301.4  996.42 10312.9  996.42 10320.7   999.3 10324.2
GR 999.8 10339.8  1000.2 10354.0
NH     5    .045    8950.   .0500 10270.1    .028 10272.4   .0100 10293.0   0.028
NH 10324
ET            4.1          10100   10324
X1 3.491       22    9920 10270.1     500     500     500
GR  1014     7690     1012     7905     1010     8315     1006     8350     1004     8825
GR  1004     8920     1000     8950    998.1     9050      998     9250      998     9355
GR 996.8     9920      996    10270    998.6 10270.1      998 10271.9   997.64 10272.4
GR997.64    10293    999.2    10295    999.8 10298.5   1000.2 10300.1   1000.2 10305.9
GR1000.6 10315.5   1000.7 10324.0
NH     5    .045    8905    .0500    10210    .028 10211.3   .0100 10233.7   0.028
NH 10237
ET            4.1          10030   10237
X1 3.584       20    9875    10210     500     500     500
GR  1016     7585     1014     7735     1014     7935     1012     8260     1008     8300
GR  1006     8525     1004     8875     1000     8905    999.1     9100      998     9875
GR 997.8     9995      998    10135    998.2    10175      998    10210     1000 10210.1
GR999.03 10211.3   999.03 10220.8   999.03 10225.1   999.03 10233.7   1001.9 10237.0
NC  0.05     .050    0.050
ET            4.1           9985   10200
X1 3.678        9     9600    10190     500     500     500
GR  1017     7565     1014     7620     1012     8355     1004     8605     1002     8880
GR  1000     9205     1000     9600     1000    10190   1001.8    10200
ET            4.1         9870.0   10135
X1 3.773       10     9580    10130     500     500     500
GR  1018     7480   1016.2     7550     1016     8140     1014     8165     1012     8500
GR  1004     8550     1002     8910     1000     9580     1000    10130   1002.3    10135
ET            4.1         9715.0   10075
X1 3.868       12     9280     9910     500     500     500
GR1019.2     7440     1016     7460     1016     8085     1014     8105     1012     8445
GR  1006     8480     1004     8585     1002     8985   1000.4     9280   1000.3     9910
GR  1002    10070   1003.8    10075
EJ
T1  MARICOPA DRAIN FLOODPLAIN, WITH LEVEES, 100-YR PROFILE
T2  WEST CONSULTANTS INC.
T3
J1   -10        2        0        0     .003        0        0        0    977.8        0
J2    15        0       -1        0        0        0        0        0        0       15


ER
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SF  MARICOPA DRAIN SPLIT FLOW ANALYSIS
IC
IP    10       0       0       0       0
*
TW  SPLIT FLOW BETWEEN 3.013 AND 3.390
WS     3    3013    3108    2832     3.0
WC  1000  995.68    1230   996.1    1500  996.10
TW
WS     3    3108    3203    2832     3.0
WC  1000  996.10    1430   996.5    1500  996.70
TW
WS     3    3203    3296    2832     3.0
WC  1000  996.70    1450     997    1500  997.10
TW
WS     3    3296    3390    2832     3.0
WC  1000  997.10    1300   998.0    1500  998.40
*
TW  SPLIT FLOW BETWEEN 1.281 AND 1.682
WS     3    1281    1682      -1     3.0
WC  1000  988.40    2710  987.72    4020  987.60
*
TN  U/S OF BASELINE ROAD-USED NORMAL DEPTH OPTION
NS     4    1041    1156      -1    0.03    .001
NG  1000  984.05    1043  984.05    1253  986.54    1620  987.45
TN  D/S OF BASELINE ROAD-USED NORMAL DEPTH OPTION
NS     7     866    1035      -1    0.03    .001
NG  1000  984.41    1664  984.16    1696  984.37    1738  983.87    1761  983.93
NG  1838  984.35    1891  984.35
*
EE
T1  MARICOPA DRAIN FLOODPLAIN, WITHOUT LEVEES, 100-YR PROFILE
T2  WEST CONSULTANTS INC.
T3
* STARTING WATER SURFACE ELEVATION ASSUMED TO BE A NORMAL DEPTH WITH ENERGY
*  SLOPE OF 0.003.
J1     0       2       0    .003       0       0       0   977.8       0
J2     1       0      -1       0       0       0      -1       0       0      15
J3   100     105     150     200
QT     2    1876    1876
* FLOW IS FROM CPCD3C
* CROSS SECTION AT SALT RIVER (CPCD3C)
* THE FOLLOWING IS ADDITIONAL CROSS SECTION TO CONECT THE ORIGINAL MODEL TO NEW
  EXISTING FLODDPLAIN OF SALT RIVER
NC 0.035   0.035   0.035
X1   189       6  10000.   10560       0       0       0
GR 978.0   10000   976.0   10005  976.75   10150  978.00  10560.  980.00  10650.
GR 982.0   11000
*
NH     4   0.028  9931.9   0.010  9983.1   0.028   10000   0.035   11080
X1   513      14  10000.   10600     580     580     580
GR 980.7  9923.0   979.4  9931.9   979.4  9932.3   979.4  9941.2   979.4  9949.0
GR 979.4  9981.6   979.4  9983.1   980.4   10000     978   10050   978.0   10110
GR 978.6   10600     978   10880     978   11040     980   11080
NH     5   0.028  9870.2   0.010  9903.1   0.028  9906.3   0.035   10345   0.045
NH 11840
X1   593      21  9870.2  10345.     420     420     420
GR981.50  9870.0  980.50  9870.2  980.50  9873.5  980.50  9876.2  980.50  9898.8
GR980.50  9903.1  983.20  9904.5  983.30  9906.3  982.70  9928.1  980.00  9933.6
GR979.10  9936.6  978.50  9996.0  978.40   10098.  978.50   10130.  980.00  10345.
GR982.00  10570.  982.00  11040.  980.00  11080.  980.00  11320.  982.00  11490.
GR981.20  11840.
NH     4   0.028  9885.0   0.010  9919.6   0.028  9923.5   0.045  11430.
X1   688      17  9961.5 10180.0     500     500     500
GR984.90  9885.0  982.06  9887.8  982.06  9896.4  982.06  9914.3  982.06  9917.0
GR982.06  9919.6  982.80  9920.0  983.10  9923.5  982.50  9944.4  980.30  9961.5
GR980.20 10051.3  980.40 10153.3  980.40 10180.0  982.00 10860.0  982.10  11390.
GR982.20  11400.  982.30 11430.0
NH     5   0.028  9911.3   0.010  9952.7   0.028  9980.5    0.05  10410.   0.045
NH 12530
X1   782      31 10000.3  10410.     500     500     500
GR984.60  9910.0  983.21  9911.3  983.21  9919.3  983.21  9920.3  983.21  9946.8
GR983.21  9947.5  983.21  9950.1  983.21  9952.7  983.90  9954.2  984.00  9954.3
GR984.20  9980.5  984.10  9985.4  983.70  9995.7  982.90 10000.3  981.00 10012.1
GR980.60  10014.  980.60 10014.5  980.20 10023.3  979.80 10026.5  980.10 10031.3
GR980.60  10071.  980.90 10093.1  981.00 10126.6  981.50 10130.0  982.00 10300.0
GR982.00  10410.  981.30 10830.0  982.00 11250.0  983.10 11830.0  984.00 12360.0
GR985.80  12530.
* FLOW IS FROM CPCD3C (IT IS HIGHER THEN DIBASE FLOW OF 641 cfs)
* SECTION D/S OF BASELINE ROAD (DIBASE)
NH     5   0.028  9911.3   0.010  9966.8   0.028  9968.4    0.05  10965.   0.045
NH 12175
X1   866      32  9988.4  10445.     440     440     440
GR984.40  9910.0  983.02  9911.3  983.02  9916.2  983.02  9916.8  983.02  9934.3
GR983.02  9935.0  983.02  9937.6  983.02  9938.2  983.02  9941.8  983.02  9941.9
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GR983.02  9963.3  983.02  9964.5  983.02  9966.8  984.00  9968.4  983.90  9973.3
GR983.60  9983.8  983.00  9988.4  981.80 10000.3  981.30 10002.5  981.30 10002.7
GR981.10 10011.7  980.80 10014.9  981.00 10019.7  981.70 10045.0  982.00  10145.
GR982.70  10445.  983.00 10875.0  983.00 10965.0  982.00 11465.0  983.00  11795.
GR984.00  11895.  986.00 12175.0
*
* FIRST D/S CROSS SECTION FROM BASELINE WEIR
NH     5   0.028  9003.2   0.010  9023.3   0.028  9027.1    0.05 10897.4   0.045
NH 11363
X1  1035      17  9045.9  9361.4     891     891     891
GR 983.9  9000.0   982.9  9003.2   982.9  9023.3   984.0  9027.1   983.5  9037.9
GR 983.2  9045.9   982.4  9049.8   982.6  9101.4   983.0  9155.9   983.4  9207.1
GR 983.3  9239.5   984.0  9361.4   985.8  9646.4   988.0 10480.4   988.7 10591.6
GR 988.4 10897.4   988.4 11363.0
* SPECIAL BRIDGE INPUT TO MODEL BASELINE WEIR
SB  1.05     1.0     3.0       0  0.0001  0.0001  0.0001  0.0001
* FIRST U/S CROSS SECTION FROM BASELINE WEIR
NH     5   0.028  9001.9   0.010  9017.0   0.028  9018.1    0.05 10897.4   0.045
NH 11363
X1  1041      19  9039.4  9347.5      30      30      30
* X2 CARD HAS SKEW OF 46 DEGRES (COS=0.695) TO ACCOUNT FOR SKEW OF BASELINE ROAD
X2                     1   982.4   984.1                           0.695
BT   -11  9000.0   985.0     982  9081.4   985.1     982  9150.0   984.1     982
BT        9360.0   985.6     982  9700.0   985.7     982  9940.0   985.9     982
BT       10330.4   986.9     982 10750.0   987.4     982 11290.0   988.7     982
BT       11730.0   988.4     982 12400.0   989.4     982
GR 984.1  9000.0   983.1  9001.9   983.1  9005.1   983.1  9017.0   984.1  9018.1
GR 984.0  9020.7   983.5  9031.5   983.2  9039.4   982.4  9043.4   982.6  9095.0
GR 983.3  9135.3   983.5  9183.3   983.6  9282.1   984.0  9347.5   986.0  9639.4
GR 988.0 10508.2   988.7 10591.6   988.4 10897.4   989.4 11363.0
*
* SECTION U/S OF BASELINE ROAD (CCD2C)
* FLOW IS FROM CCD2C
* INTERPOLATED CROSS-SECTION
*
NH     5   0.028  9848.3   0.010 9897.20   0.028 9899.90   0.060  10600.    0.05
NH 11890
X1  1156      23  9846.3  10440.     620     620     620
GR987.50  9846.3  984.10  9848.3  984.10  9850.0  984.10  9850.8  984.10  9855.8
GR984.10  9872.4  984.10  9875.6  984.10  9878.5  984.10  9892.7  984.10  9897.2
GR985.10  9899.9  984.70  9930.9  984.60  9965.7  985.50  9975.9  986.00  10000.
GR986.00  10100.  985.50  10250.  986.00  10440.  986.00  10600.  986.10  10780.
GR986.10  10820.  987.10  11840.  987.40  11890.
NH     5   0.028  9902.1   0.010  9978.8   0.028   9990.   0.045   11470    0.05
NH 12340
X1  1281      11  9900.2  10400.     660     660     660
GR988.40  9900.2  985.00  9902.1  985.00  9910.1  985.00  9930.6  985.00  9978.8
GR986.00  9990.0  986.40  10400.  988.00  11470.  988.00  11615.  988.20  11740.
GR988.80  12340.
* CROSS-SECTION AT SOUTH MOUNTAIN AVENUE AND MARICOPA COUNTY
* FLOW IS FROM CCD2C
QT     2    1876    1876
NH     4   0.028 9830.20   0.010  9867.7   0.028 9868.20   0.045  12610.
X1  1682      13  9896.0  11180.    2220    1535    2115
GR987.60  9829.7  986.60  9830.2  986.60  9854.8  986.60  9857.0  986.60  9860.3
GR986.60  9867.7  987.60  9868.2  986.20  9888.6  986.00  9896.0  984.20  9900.0
GR986.00  11180.  988.00  12180.  989.40  12610.
NH     4   0.028  9740.6   0.010  9778.5   0.028    9780   0.045   13785
* NC  0.07    0.07    0.07
X1  1830      21  9738.2   10970     785     520     780
* FIRST D/S CROSS-SECTION WITH LEVEE
GR988.40  9738.2  987.40  9740.6  987.40  9754.0  987.40  9765.9  987.40  9767.7
GR987.40  9768.3  987.40  9771.7  987.40  9771.9  987.40  9774.3  987.40  9776.9
GR987.40  9778.5  988.40  9780.0  986.00  9800.0  985.00  10000.  986.00  10970.
GR988.00  11920.  988.90  12240.  989.40  12485.  989.10  12780.  989.70  13420.
GR990.00  13785.
NH     4   0.028  9742.5   0.010  9780.2   0.028  9785.5   0.045  13475.
X1  1924      15  9805.0  10900.     500     500     500
GR991.00  9740.0  988.00  9742.5  988.00  9780.2  989.00  9785.5  986.70  9789.0
GR986.70  9805.0  986.70  9845.0  987.60  10400.  987.60  10900.  988.00  11445.
GR989.20  12205.  990.00  12495.  991.10  12805.  991.40  13125.  992.00  13475.
NH     4   0.028  9742.9   0.010  9779.4   0.028  9781.1   0.045  13455.
X1  2019      24  10115.  11045.     500     500     500
GR992.00  9740.0  988.33  9742.9  988.33  9749.9  988.33  9769.5  988.33  9771.3
GR988.33  9772.1  988.33  9775.4  988.33  9777.9  988.33  9778.8  988.33  9779.4
GR989.30  9781.1  988.00  9815.0  987.60  10115.  988.00  11045.  989.40  11650.
GR989.60  11995.  990.00  12400.  990.50  12415.  990.00  12435.  989.90  12465.
GR990.00  12490.  990.40  12875.  991.50  13115.  992.00  13455.
NH     4   0.028  9757.4   0.010  9796.3   0.028  9799.6   0.045  13380.
X1  2114      21  9860.0  10630.     500     500     500
GR993.40  9755.0  989.76  9757.4  989.76  9764.9  989.76  9784.5  989.76  9786.3
GR989.76  9787.0  989.76  9790.3  989.76  9792.6  989.76  9793.5  989.76  9794.0
GR989.76  9796.3  990.80  9799.6  988.00  9800.0  988.00  9860.0  988.00  10630.
GR990.00  11600.  990.00  12400.  991.00  12455.  990.00  12490.  990.90  12890.
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GR992.00  13380.
NH     4   0.028  9742.6   0.010  9784.8   0.028    9787    0.05  13455.
X1  2209      25  9787.0  10845.     500      500     500
GR993.30  9740.0  990.38  9742.6  990.38  9764.5  990.38  9766.1  990.38  9768.6
GR990.38  9770.6  990.38  9771.0  990.38  9771.1  990.38  9772.0  990.38  9774.4
GR990.38  9774.9  990.38  9775.9  990.38  9780.9  990.38  9784.8  991.40  9787.0
GR988.00  9790.0  988.10  10185.  988.90  10845.  990.00  11065.  991.00  12405.
GR992.00  12445.  991.00  12475.  991.10  12715.  992.00  13060.  994.00  13455.
NH     4   0.028  9743.0   0.010  9792.6   0.028  9794.7    0.05  13260.
X1  2303      25   9870.  10755.     500      500     500
* LAST CROSS-SECTION WITH LEVEE
GR993.50  9740.0  991.13  9743.0  991.13  9752.2  991.13  9757.8  991.13  9766.2
GR991.13  9773.1  991.13  9774.5  991.13  9775.0  991.13  9777.8  991.13  9780.3
GR991.13  9780.8  991.13  9781.9  991.13  9787.1  991.13  9792.6  991.60  9793.4
GR992.10  9794.7  990.00  9870.0  989.10  10220.  990.00  10755.  992.00  12400.
GR992.00  12450.  993.00  12480.  992.00  12540.  992.00  12860.  993.00  13260.
NH     5   0.050    9745   0.028  9754.0   0.010  9778.0   0.028  9791.0    0.05
NH13458.
QT     2    1899    1899
* 67th AVENUE (CPCD1C)
* FLOW IS FROM CB163C (IT IS HIGHER THAN CPCD1C FLOW OF 1869 cfs)
X1  2398      17  10012.  10800.     500      500     500
GR1000.0  9390.0  998.00  9406.0  996.00  9608.0  995.20  9675.0  994.00  9730.0
GR992.00  9745.0  991.00  9754.0  991.00  9762.3  991.00  9778.0  992.00  9791.0
GR992.00  9816.0  991.60  10012.  991.30  10800.  991.00  11390.  992.00  12217.
GR994.00  13447.  994.70  13458.
NH     5    0.06  10192.   0.028  10204.   0.010  10260.   0.028  10272.    0.05
NH 12600
X1  2516      22  10272.  11064.     625      450     625
GR1000.0  8950.0  998.00  9297.0  996.00  9754.0  996.00  9772.0  996.00   9800.
GR996.00  9831.0  994.00  10022.  994.00  10175.  994.00  10192.  992.00  10204.
GR992.00  10217.  992.00  10241.  992.00  10260.  993.00  10272.  992.00  10283.
GR991.85  10500.  991.70  10852.  992.00  11064.  992.50  11321.  993.40  11725.
GR994.00  12588.  994.50  12600.
NH     5    0.06  8165.0   0.028  8207.0   0.010  8225.0   0.028    8246    0.05
NH 10227
QT     2    1899    1899
* 65th AVENUE
X1  2832      17  8264.0   9188.     700      500     665
GR1000.0  7212.0  998.00  7307.0  996.00  7459.0  994.00  7550.0  993.00  7880.0
GR994.00  8165.0  992.00  8188.0  991.00  8207.0  991.00  8225.0  992.00  8246.0
GR992.00  8264.0  992.00  8428.0  992.00  8734.0  993.10  9188.0  992.80  9753.0
GR994.00  10217.  995.00  10227.
* BASELINE CROSSING AT 67th AVENUE
NH     1   0.060  11400.
X1  2948       6  10000.   10500    1320      620    1430
GR995.30  10000.     994   10310   993.6   10420     994   10500   995.1   11020
GR996.50  11400.
* SPECIAL BRIDGE INPUT TO MODEL BASELINE WEIR
SB  1.05     1.0      3.0        0  0.0001  0.0001  0.0001  0.0001
* FIRST U/S CROSS SECTION FROM BASELINE WEIR
X1  2949                          30      30      30
* X2 CARD HAS SKEW OF 45 DEGRES (COS=0.707) TO ACCOUNT FOR SKEW OF BASELINE ROAD
X2                     1     993   993.5                          0.707
BT    -7  10000.  995.05     993  10150.   994.7     993  10480.   994.6     993
BT        10840.   994.4     993  10980.  994.62     993  11200.   994.0     993
BT        11420.   993.5     993
*
NH     1   0.060   11370
* D/S END OF SPLIT FLOW SECTION
X1  3013      12  9775.0  10100.     350      850     500
GR995.68  9775.0  995.20  9775.1  995.00  9802.4  995.30  9817.0  994.90  9831.0
GR994.00  9844.6  994.00  10100.  994.90  10763.  996.00  10980.  996.00  11170.
GR996.00  11350.  998.00  11370.
NH     1   0.060  11655.
X1  3108      15  9805.1  10200.     500      500     500
GR996.10  9805.1  996.10  9808.0  996.10  9814.3  996.00  9821.3  996.00  9827.7
GR995.20  9852.1  993.40  9859.4  993.40  9864.7  994.60  9869.8  994.70  9884.8
GR994.50  10000.  995.10  10200.  996.00  11030.  998.00  11635.  999.00  11655.
NH     1   0.060  11825.
X1  3203       8  9846.7  10250.     500      500     500
GR996.70  9846.7  996.70  9862.2  996.70  9872.7  994.60  10000.  996.00  10250.
GR996.00  11060.  998.00  11400.  999.40  11825.
NH     1   0.060   11940
QT     2    1899    1899
* U/S SECTION OF SPLIT FLOW SECTION
* 63th AVENUE (CB163C)
* FLOW IS FROM CB163C
X1  3296      23  9839.8  10380.     490      490     490
GR997.10  9839.8  997.10  9839.9  997.10  9840.0  997.10  9849.9  997.10  9857.3
GR996.90  9859.4  996.30  9859.6  995.90  9861.0  996.10  9862.0  997.10  9863.9
GR997.10  9873.2  997.20  9900.1  996.90  9927.3  996.90  9929.8  996.80  9949.9
GR995.80  9989.5  995.00  10000.  996.00  10090.  996.00  10380.  997.20  11180.
GR998.00  11530.  998.00  11670.  1000.0  11940.
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NH     2   0.045   11180   0.035   11940
QT     2    1899    1899
X1  3390      16  9830.0  10380.     500     500     500
GR998.40 9830.00  998.40  9845.7  998.40  9857.6  996.70  9860.9  995.30  9861.3
GR994.40 9863.50  994.80  9865.0  997.20  9868.1  996.40  9969.2  996.60 10073.6
GR996.60 10117.9  996.00  10380.  997.20  11180.  998.00  11530.  998.00  11670.
GR1000.0 11940.0
NH     3   0.060   10250   0.045   11675    0.05   12470
X1  3485      14  9888.4  10250.     500     500     500
GR1000.1  9850.0  1000.2  9850.1  999.80  9865.2  999.40  9878.7  997.60  9888.4
GR996.90  9898.1  997.20  9923.7  997.00  9997.4  997.10  10000.  997.00  10250.
GR998.00  10730.  999.00  11675.  1000.0  12400.  1001.5  12470.
NH     2   0.045   11190    0.05   12510
X1  3578       8  9945.0  10320.     500     500     500
GR1000.7  9910.0  998.00  9945.0  997.40  10100.  998.00  10320.  999.70  11190.
GR999.70  11450.  999.90  11825.  1002.0  12510.
NH     2   0.045   11260    0.05   12545
X1  3671       9  9950.0  10950.     500     500     500
GR1001.9  9950.0  1001.0  9951.0  1001.0  9952.0  1000.0  9975.0  999.10  10290.
GR1000.0  10950.  1000.8  11260.  1001.0  11860.  1002.0  12545.
NH     4   0.028  9899.9   0.010  9918.9   0.028 9920.00    0.04 12450.0
X1  3763      14  9920.0  10860.     500     500     500
GR1001.7  9876.0  1001.3  9895.1  1001.2  9897.8  998.40  9899.9  998.40  9904.0
GR998.40  9912.1  998.40  9918.9  999.20  9920.0  999.40  9920.0  999.40  10165.
GR999.70  10300.  1000.4  10860.  1001.8  11900.  1002.0  12450.
QT     2    1710    1710
* 59th AVENUE (CB159C)
* FLOW IS FROM CB51C (IT IS HIGHER THEN CB159C FLOW OF 1598 cfs)
NH     4   0.028  9923.5   0.010  9944.1   0.028 9947.80    0.04 13140.0
X1  3858      18  9947.8  10470.     500     500     500
GR1002.7  9920.0  1002.6  9920.4  1001.1  9921.9  999.15  9923.5  999.15  9925.9
GR999.15  9942.5  999.15  9944.1  1000.2  9947.5  1000.2  9947.8  999.50  10120.
GR1000.0  10265.  1001.0  10470.  1001.0  10900.  1001.6  11220.  1001.5  11650.
GR1002.2  11900.  1002.5  12270.  1004.0  13140.
NH     4   0.028  9933.4   0.010  9956.6   0.028   9960.    0.04   13055
X1  3953      21  10070.  10700.     500     500     500
GR1004.4  9928.2  1004.4  9928.5  1004.1  9929.5  1003.8  9930.0 1001.00  9933.4
GR1001.0  9947.2  1001.0  9956.6  1002.0  9960.0  1000.0  9970.0  1000.0  10040.
GR1000.2  10070.  1000.0  10125.  999.50  10150.  1000.0  10320.  1001.3  10700.
GR1001.3  10930.  1002.0  11230.  1001.7  11500.  1002.0  11820.  1002.6  12000.
GR1004.0  13055.
NH     5   0.028  9961.5   0.010  9980.0   0.028  9982.4    0.05   11270    0.04
NH 12630
X1  4046      23  9982.4  10350.     490     490     490
GR1005.1  9955.0  1004.9  9956.3  1004.8  9956.5  1004.2  9958.0  1003.7  9959.0
GR1001.2  9961.5  1001.2  9967.4  1001.2  9968.4  1001.2  9973.0  1001.2  9980.0
GR1001.8  9980.8  1002.2  9982.2  1002.2  9982.4  1000.0  9983.0  999.80  10000.
GR1000.0  10020.  1001.5  10350.  1002.0  10880.  1002.5  11180.  1002.5  11230.
GR1002.0  11270.  1002.0  11470.  1004.0  12630.
NH     5   0.028  9956.7   0.010  9976.3   0.028  9979.4    0.05   11260    0.04
NH 12300
X1  4143      21  9979.4  11260.     515     515     515
GR1006.6  9950.0  1005.9  9951.6  1003.2  9955.1  1002.3  9956.4  1001.9  9956.7
GR1001.9  9963.6  1001.9  9964.2  1001.9  9967.0  1001.9  9976.3  1002.5  9977.2
GR1002.8  9978.5  1002.9  9979.4  1002.0  9985.0  1001.5  10000.  1002.0  10240.
GR1003.7  11240.  1003.7  11260.  1003.0  11530.  1003.5  11975.  1003.9  12120.
GR1004.0  12300.
NH     5   0.028  9959.3   0.010  9980.2   0.028  9982.3    0.05  11260.    0.04
NH 12700
X1  4238      20  9982.3  11130.     500     500     500
GR1007.3  9950.0  1006.7  9952.0  1004.8  9956.4  1004.4  9958.0  1002.9  9959.3
GR1002.9  9967.0  1002.9  9967.8  1002.9  9970.5  1002.9  9971.8  1002.9  9980.2
GR1003.5  9981.5  1003.9  9982.3  1002.0  9985.0  1002.0  10000.  1003.1  10300.
GR1004.0  11130.  1004.5  11230.  1004.0  11260.  1004.0  11650.  1006.0  12700.
NH     4   0.028  9972.0   0.010  9993.9   0.028  9995.1    0.05   12630
X1  4331      18  10005.  10450.     500     500     500
GR1008.0  9960.0  1007.6  9962.4  1006.5  9967.7  1006.5  9969.6  1003.9  9972.0
GR1003.9  9980.4  1003.9  9981.4  1003.9  9983.9  1003.9  9985.2  1003.9  9993.9
GR1004.3  9994.4  1004.9  9995.1  1004.0  10005.  1004.0  10030.  1003.9  10100.
GR1004.0  10450.  1005.6  12090.  1006.0  12630.
NH     4   0.028  9974.1   0.010  9996.5   0.028  9997.5    0.05  13070.
X1  4425      14  9997.4  10450.     500     500     500
GR1008.6  9960.0  1007.9  9968.7  1008.2  9970.9  1004.7  9974.1  1004.7  9984.3
GR1004.7  9986.7  1004.7  9996.5  1005.7  9997.4  1004.0  10000.  1004.7  10450.
GR1006.0  11240.  1006.2  11800.  1006.9  12500.  1008.0  13070.
NH     4   0.028  9975.1   0.010 10000.7   0.028 10003.6    0.05   12850
X1  4520      11  10025. 11240.0     500     500     500
GR1009.7  9965.0  1007.4  9972.4  1007.2  9974.3  1006.3  9975.1  1006.3  9984.7
GR1006.3 10000.7  1007.3 10003.6  1006.0  10025.  1005.0 10500.0  1006.0 11240.0
GR1008.0 12850.0
NH     4   0.028  9894.8   0.010  9924.0   0.028 9925.55    0.05   13000
X1  4615      12  9945.0  10440.     500     500     500
GR1010.6  9890.0  1007.9  9894.8  1007.9  9897.9  1007.9  9906.7  1007.9  9906.9
GR1007.9  9924.0  1008.9  9925.6  1006.0  9945.0  1006.5  10440.  1007.8 11800.0
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GR1008.0  12550.  1009.8  13000.
NH     4   0.028  9702.2   0.010  9731.5   0.028  9732.5    0.05   12500
X1  4714      16  10000.  10800.     475     450     525
GR1011.6  9700.0  1009.4  9702.2  1009.4  9714.6  1009.4  9720.0  1009.4  9731.5
GR1010.5  9732.5  1009.4  9752.5  1007.9  9759.2  1008.0  9760.0  1008.0  9780.0
GR1007.8  10000.  1007.5  10220.  1007.8  10800.  1008.0  10990.  1009.0  12310.
GR1010.0  12500.
QT     2    1801    1801
NH     5   0.045    9330   0.028    9410    0.05   10710   0.060   11030    0.05
NH 12325
X1  4803      14   10000 10705.8     420     225     470
* 51st AVENUE (CB51C)
* FLOW IS FROM CVR47C (IT IS HIGHER THEN CB51C FLOW OF 1710 cfs)
GR1024.0  8300.0  1020.0  8425.0  1012.0  9065.0  1011.0  9310.0  1011.7  9330.0
GR1010.0  9365.0  1009.0  9380.0  1009.8  9410.0  1008.2  10000.  1008.5  10440.
GR1008.7 10705.8  1009.0  11030.  1009.9  12140.  1012.0  12325.
NH     6   0.045    9000   0.028    9045    0.05   10880   0.060   11200    0.05
NH 12500   0.028   12925
X1  4898      21    9750   10640     410     400     500
GR1020.0  8135.0  1014.0  8610.0  1012.0  8870.0  1012.0  8975.0  1012.8  9000.0
GR1012.0  9020.0  1010.0  9025.0  1009.0  9035.0  1010.0  9045.0  1010.0  9085.0
GR1009.0  9580.0  1010.0  9750.0  1008.5  10000.  1008.2  10240.  1008.2  10300.
GR1009.5  10640.  1009.6 10880.5  1009.8 11196.2  1010.0  11610.  1011.3 12492.7
GR1012.0  12925.
NH     3   0.045    9420    0.05   12425   0.028   12755
X1  4993      11    9420   10370     550     330     500
GR1018.0  8315.0  1014.0  8640.0  1014.0  8700.0  1012.0  8710.0  1010.0  9420.0
GR1010.0  9565.0  1009.5  10000.  1009.6  10370.  1010.0  11100.  1011.6 12436.3
GR1012.0  12755.
NH     3   0.060    9375    0.05   11210   0.028   12145
X1  5087      12    9375   11210     630     280     500
GR1018.0  8310.0  1014.0  8825.0  1012.0  9150.0  1011.8  9230.0  1011.8  9310.0
GR1011.8  9345.0  1011.8  9375.0  1010.5  9999.0  1011.0  10510.  1010.7  11210.
GR1012.0  12010.  1012.1  12145.
NH     3   0.060    9355    0.05   11880   0.028   12230
X1  5182      12    9355   10720     490     460     500
GR1018.0  8325.0  1014.0  8900.0  1014.0  8950.0  1013.0  9175.0  1012.0  9355.0
GR1011.5  10000.  1011.0  10550.  1012.0  10720.  1011.0  11500.  1012.7  11880.
GR1013.0  12005.  1013.1  12230.
NH     2    0.05   11560   0.028   12320
X1  5277      14    9515   11095     630     240     500
GR1018.0  8365.0  1016.0  8690.0  1014.0  9100.0  1014.0  9235.0  1012.0  9515.0
GR1011.7  10000.  1011.8  10520.  1012.0  11095.  1012.5  11135.  1012.0  11200.
GR1011.5  11560.  1012.0  11840.  1013.5  11930.  1013.7  12320.
NH     1    0.05   12055
X1  5371      10   10000   11235     510     475     500
GR1018.0  8370.0  1016.0  8700.0  1014.0  9225.0  1013.0  9705.0  1012.0  9840.0
GR1011.9  10000.  1011.8  10420.  1012.0  11235.  1014.0  11900.  1015.1  12055.
NH     1    0.05   12140
X1  5466      10    9840   11270     500     470     500
GR1020.0  8460.0  1018.0  8590.0  1016.0  8880.0  1014.0  9590.0  1014.0  9840.0
GR1014.0  10370.  1013.4  10800.  1014.0  11270.  1014.7  11890.  1016.0  12140.
QT     2    1801    1801
* 47th AVENUE (CVR47C)
* FLOW IS FROM CVR47C
NH     1    0.05   12070
X1  5561       9    9905   11040     380     610     500
GR1020.0  8875.0  1018.0  8940.0  1016.0  9280.0  1014.0  9905.0  1013.5  10450.
GR1014.0  11040.  1014.5  11900.  1016.0  12060.  1016.2  12070.
NH     1    0.05   12130
X1  5656      14    9845   10780     380     660     500
GR1020.0  8555.0  1016.5  9250.0  1015.9  9500.0  1015.2  9845.0  1014.2  10330.
GR1014.0  10710.  1014.0  10765.  1016.0  10780.  1016.0  10800.  1016.0  10810.
GR1016.0  10825.  1015.6  11050.  1015.7  11600.  1016.1  12130.
NH     1    0.05   12000
X1  5750      13    9850   10490     375     600     500
GR1022.0  8365.0  1020.0  8610.0  1018.0  9100.0  1016.0  9850.0  1015.9  10000.
GR1016.0  10150.  1016.2  10490.  1017.0  10520.  1017.0  10530.  1017.0  10800.
GR1017.1  11965.  1017.5  11975.  1018.0  12000.
NH     1    0.05   12000
X1  5845      16    9625   10750     500     500     500
GR1024.0  8540.0  1022.0  8590.0  1022.0  8640.0  1020.0  8865.0  1018.0  9625.0
GR1017.5  9900.0  1017.2  10000.  1018.0  10280.  1018.0  10325.  1017.2  10450.
GR1018.0  10750.  1018.0  11180.  1018.2  11460.  1018.0  11700.  1018.7  11865.
GR1019.2  12000.
NH     1    0.05   11800
X1  5940      11    9720   10550     500     500     500
GR1026.0  8470.0  1024.0  8615.0  1024.0  8670.0  1022.0  9075.0  1019.9  9670.0
GR1018.6  9720.0  1018.0  9880.0  1018.2  10270.  1018.5  10550.  1019.8  11580.
GR1020.0  11800.
NH     1    0.05   13640
* 43d AVENUE
X1  6034      14    9470    9955     380     750     500
GR1026.0  8215.0  1024.0  8690.0  1022.0  9070.0  1021.0  9280.0  1020.0  9470.0
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GR1020.0  9700.0  1019.7  9740.0  1020.0  9955.0  1021.0  10165.  1021.1  11005.
GR1022.0  11250.  1024.0  12100.  1026.0  13490.  1026.6  13640.
NH     6    0.06  8686.3   0.028  8689.1   0.010  8743.9   0.028    8750    0.05
NH 10420   0.060   11600
QT     2    1899    1899
* 65th AVENUE, BEGINING OF SPLIT FLOW BRANCH
* FLOW IS FROM CB163C
EJ
ER
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1*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  RUN DATE    11AUG00    TIME   09:23:16  *
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*  U.S. ARMY CORPS OF ENGINEERS      *
*  HYDROLOGIC ENGINEERING CENTER     *
*  609 SECOND STREET, SUITE D        *
*  DAVIS, CALIFORNIA 95616-4687      *
*          (916) 756-1104            *
**************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                   X
X     X  X        X     X             X
X     X  XXXXXXX   XXXXX              XXXXXXX
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THIS RUN EXECUTED 11AUG00 09:23:16

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 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
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THIS FILE PRESENTS THE 100-YEAR FLOODPLAIN AND FLOODWAY SIMULATION FOR LAVEEN HYDRAULIC STUDY (MARICOPA DRAIN IRRIGATION CHANNEL, FORMERLY CHAMPION DRAIN) PERFORMED BY WEST CONSULTANTS INC (ZORAN LAKICEVIC AND JAMES HEYEN) IN MAY 200 THE ORIGINAL MODEL DEVELOPED BY CELLA BARR ASSOCIATES (CBA) IN 1992 WAS USED AS A BASIS FOR THIS MODEL.
THE FOLLOWING CHANGES FROM THE ORIGINAL MODEL ARE INCORPORATED IN THIS MODEL:

1. THE NEW FLOW RATES ARE USED, BASED ON YEAR 2000 HYDROLOGY STUDY PERFORMED B CONTROL DISTRICT OF MARICOPA COUNTY. THE FLOW RATES ARE GENERALLY ABOUT 40% LOWER THEN IN THE ORIGINAL CBA MODEL. THE FLOW RATE IS APPLIED IN DOWNSTREAM O UPSTREAM REACH FROM THE PARTICULAR CROSS SECTION AS LONG AS IT IS HIGHER THEN ADJACENT REACH FLOW RATE. IF ADJACENT REACH FLOW RATE IS HIGHER THEN THE HIGHE FLOW RATE IS USED.

2. THE NEW REVISED MANNING'S ROUGHNESS COEFFICIENTS ARE USED REFLECTING CURREN CONDITIONS. THEY ARE GENERALLY LOWER THEN THE ORIGINAL COEFFICIENTS. THE MODEL NOT SIGNIFICANTLY SENSITIVE TO THIS PARAMETER.

3. THE MARICOPA DRAIN CONVEYANCE IS ADDED TO THE ORIGINAL MODEL, BY INPUTTING THE GEOMETRY OF THE DRAIN BASED ON SURVEY PERFORMED BY MORRISON MAIERLE INC., 1999. THE BASE FLOW OF THE DRAIN IS ASSUMED TO BE AT ITS MAXIMUM LEVEL WHICH I BELOW THE LOWER TOP OF THE LEVEE, REDUCING THE TOTAL AVAILABLE CONVEYANCE OF T DRAIN IN CASE OF FLOODING. IN ORDER TO MODEL THIS THE DRAIN CROSS SECTIONS ARE THE LEVEL OF 1 FOOT BELOW THE LOWER LEVEE, BY SPECIFYING THE APPROPRIATE GR CA MANNING'S ROUGHNESS COEFFICIENT FOR THIS PORTION OF THE DRAIN IS ARTIFICIALLY SET TO THE LOW VALUE (0.01) IN ORDER TO SIMULATE THE ROUGHNESS AT INTERFACE BE THE BASE FLOW IN DRAIN AND FLOODING FLOWS.

4. TWO NEW CROSS-SECTIONS 0.189 AND 0.513 ARE ADDED AT THE DOWNSTREAM END OF T IN ORDER TO TIE THIS MODEL INTO THE EXISTING SALT RIVER FLOODPLAIN (BAKER, 199

5. BASELINE ROAD APPEARS TO BE APPROXIMATELY 2 FT ELEVATED FROM THE SURROUNDIN GROUND, CAUSING THAT THE FLOW OVER THE BASELINE ROAD IS HYDRAULIC WEIR FLOW SI THEREFOR THE BASELINE ROAD IS MODELED AS A WEIR AT TWO LOCATIONS: (1) INTERSEC OF BASELINE ROAD AND MARICOPA DRAIN CLOSE TO 75th AVENUE (CROSS SECTION 1.035) (2) INTERSECTION OF BASELINE ROAD AND MARICOPA DRAIN CLOSE TO 67th AVENUE (CRO SECTION 2.948). THE WEIR IS MODELED USING A HEC-2 SPECIAL BRIDGE ROUTINE.

6. IN ADDITION TO SPLIT FLOWS MODELED IN ORIGINAL CBA MODEL, THE FOLLOWING SPL FLOWS ARE MODELED IN THIS MODEL:
 (a) BASELINE ROAD CROSSING MARICOPA DRAIN NEAR 75th AVENUE: IN ORIGINAL MODEL THIS SPLIT FLOW IS APPROXIMATED USING THE NORMAL DEPTH CALCULATION. IN TH MODEL THE SPLIT FLOW AT THESE LOCATIONS (from 0.866 to 1.035, and from 1. 1.156) IS MODELED USING THE STANDARD HEC-2 SPLIT FLOW NORMAL DEPTH OPTION NOTE THAT AT THIS LOCATION THE COMBINATION OF SPLIT FLOW OVER MARICOPA DR

AND WEIR FLOW OVER BASELINE ROAD IS MODELED.
(b) PONDING AREA ON THE NORTH OF MARICOPA DRAIN FROM 1.282 TO 1.682: IN ORIGI CBA MODEL THIS IS MODELED IN HEC-1 AS A RESERVOIR ROUTING. IN THIS MODEL THE HEC-2 SPLIT FLOW WEIR OPTION IS USED TO MODEL THE FLOW CROSSING THE M DRAIN TO SOUTH (FROM 1.281 TO 1.682).

7. BASED ON THE NEW HYDROLOGY THE PEAK DISCHARGE FOR SECTIONS 2.926 TO 3.209 I ABOUT 3 HOURS AHEAD OF THE PEAK ON THE NORTH SIDE OF BASELINE ROAD. THE DISCH THIS REACH IS 188 CFS AT TIME OF NORTH SIDE PEAK WHEN WEIR FLOW OCCURS FROM NORTH TO SOUTH. CONSEQUENTLY WEIR FLOW FROM THE NORTH SIDE IS ADDED TO THE 188 CFS ON THE SOUTHSIDE. THE Q-100 FOR THE SOUTHSIDE IS 765 CFS AND IS USED AS A MINIMUM DISCHARGE.

8. THE ENCROACHMENT ANALYSIS IN THIS MODEL WAS FIRST PERFORMED IN HEC-RAS. IN SECTIONS WHICH INCLUDED THE DRAIN AS PART OF THE GEOMETRY, THE DRAIN WAS PROTE ENCROACHMENT. THE BANK STATIONS WERE ALSO ADJUSTED WHERE NECESSARY. AT MOST SECTIONS, THE DRAIN IS AT THE VERY EDGE OF THE GEOMETRIC DATA. CONSEQUENTLY, MANY LOCATIONS THERE WAS NO ENCROACHMENT POSSIBLE FROM THAT SIDE OF THE CROSS A METHOD 4 ANALYSES WAS PERFORMED STARTING AT THE DOWNSTREAM END OF THE REACH. THE RESULTS OF THIS ANALYSIS WERE THEN TRANSFERRED INTO THE HEC-2 DECK AND COD METHOD-1 TO SET THE ENCROACHMENT. THE FINAL ADJUSTMENT TO THE ENCROACHMENT ST COMPLETED IN HEC-2 MANUALLY.

9. DUE TO THE EXISTENCE OF AN ELEVATED MAINTENANCE ROAD ADJACENT TO MARICOPA D IRRIGATION CHANNEL BETWEEN CROSS-SECTIONS 1.830 AND 2.303, THE BASE FLOOD ELEV AND 100-YR FLOODPLAIN BOUNDARIES WERE DETERMINED FOR BOTH "WITH LEVEE" AND "WI LEVEE" CONDITIONS.

THE FOLLOWING ARE COMMENTS FROM THE ORIGINAL CBA MODEL WHICH ARE STILL VALID FOR THIS MODEL:

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T1  MARICOPA DRAIN FLOODPLAIN, WITH LEVEES, 100-YR PROFILE
T2  WEST CONSULTANTS INC.
T3
  STARTING WATER SURFACE ELEVATION ASSUMED TO BE A NORMAL DEPTH WITH ENERGY
  SLOPE OF 0.003.
J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
       0         3         0         0      .003         0         0         0     977.8         0
J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
      -1         0        -1         0         0         0        -1         0         0         15
  J3   110     115     150     200
J3  VARIABLE CODES FOR SUMMARY PRINTOUT
      38         1         50         68         4         27         21         22         28         110
  J3   100
  J3    38         1      53      54       4
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QT        2     1237.9     1237.9
  FLOW IS FROM CPCD3C
  CROSS SECTION AT SALT RIVER (CPCD3C)
  THE FOLLOWING IS ADDITIONAL CROSS SECTION TO CONECT THE ORIGINAL MODEL TO NEW
  EXISTING FLODDPLAIN OF SALT RIVER
NC    0.035      0.035      0.035
X1    0.189          6    10000.      10560          0          0          0
GR    978.0      10000      976.0      10005     976.75      10150     978.00     10560.     980.00     10650.
GR    982.0      11000


NH        4      0.028     9931.9      0.010     9983.1      0.028      10000      0.035      11080
X1    0.513         14    10000.      10600        580        580        580
GR    980.7     9923.0      979.4     9931.9      979.4     9932.3      979.4     9941.2      979.4     9949.0
GR    979.4     9981.6      979.4     9983.1      980.4      10000        978      10050      978.0      10110
GR    978.6      10600        978      10880        978      11040        980      11080

NH        5      0.028     9870.2      0.010     9903.1      0.028     9906.3      0.035      10345      0.045
NH    11840
X1    0.593         21     9870.2     10345.        420        420        420
GR   981.50     9870.0      980.50     9870.2     980.50     9873.5     980.50     9876.2     980.50     9898.8
GR   980.50     9903.1      983.20     9904.5     983.30     9906.3     982.70     9928.1     980.00     9933.6
GR   979.10     9936.6      978.50     9996.0     978.40      10098.    978.50     10130.     980.00     10345.
GR   982.00      10570.     982.00     11040.     980.00     11080.     980.00     11320.     982.00     11490.
GR   981.20      11840.

NH        4      0.028     9885.0      0.010     9919.6      0.028     9923.5      0.045      11430.
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X1    0.688        17     9961.5    10180.0        500         500         500
GR   984.90    9885.0     982.06     9887.8     982.06      9896.4      982.06    9914.3     982.06     9917.0
GR   982.06    9919.6     982.80     9920.0     983.10      9923.5      982.50    9944.4     980.30     9961.5
GR   980.20   10051.3     980.40    10153.3     980.40     10180.0      982.00   10860.0     982.10    11390.
GR   982.20   11400.      982.30    11430.0

NH        5     0.028     9911.3      0.010     9952.7       0.028      9980.5      0.05     10410.      0.045
NH    12530
X1    0.782        31    10000.3    10410.        500         500         500
GR   984.60    9910.0     983.21     9911.3     983.21      9919.3      983.21    9920.3     983.21     9946.8
GR   983.21    9947.5     983.21     9950.1     983.21      9952.7      983.90    9954.2     984.00     9954.3
GR   984.20    9980.5     984.10     9985.4     983.70      9995.7      982.90   10000.3     981.00    10012.1
GR   980.60   10014.      980.60    10014.5     980.20     10023.3      979.80   10026.5     980.10    10031.3
GR   980.60   10071.      980.90    10093.1     981.00     10126.6      981.50   10130.0     982.00    10300.0
GR   982.00   10410.      981.30    10830.0     982.00     11250.0      983.10   11830.0     984.00    12360.0
GR   985.80   12530.
  FLOW IS FROM CPCD3C (IT IS HIGHER THEN DIBASE FLOW OF 641 cfs)
  SECTION D/S OF BASELINE ROAD (DIBASE)

NH        5     0.028     9911.3      0.010     9966.8       0.028      9968.4      0.05     10965.      0.045
NH    12175
X1    0.866        32     9988.4    10445.        440         440         440
GR   984.40    9910.0     983.02     9911.3     983.02      9916.2      983.02    9916.8     983.02     9934.3
GR   983.02    9935.0     983.02     9937.6     983.02      9938.2      983.02    9941.8     983.02     9941.9
GR   983.02    9963.3     983.02     9964.5     983.02      9966.8      984.00    9968.4     983.90     9973.3
GR   983.60    9983.8     983.00     9988.4     981.80     10000.3      981.30   10002.5     981.30    10002.7
1
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GR   981.10   10011.7     980.80    10014.9     981.00     10019.7      981.70   10045.0     982.00     10145.
GR   982.70   10445.      983.00    10875.0     983.00     10965.0      982.00   11465.0     983.00     11795.
GR   984.00   11895.      986.00    12175.0

QT        2     1296.5     1296.5

  FIRST D/S CROSS SECTION FROM BASELINE WEIR
NH        5     0.028     9003.2      0.010     9023.3       0.028      9027.1      0.05     10897.4     0.045
NH    11363
X1    1.035        17     9045.9     9361.4        891         891         891
GR   983.9     9000.0      982.9     9003.2      982.9      9023.3      984.0    9027.1      983.5     9037.9
GR   983.2     9045.9      982.4     9049.8      982.6      9101.4      983.0    9155.9      983.4     9207.1
GR   983.3     9239.5      984.0     9361.4      985.8      9646.4      988.0   10480.4      988.7    10591.6
GR   988.4    10897.4      988.4    11363.0
  SPECIAL BRIDGE INPUT TO MODEL BASELINE WEIR

SB    1.05         1.0         3.0          0     0.0001      0.0001      0.0001    0.0001
  FIRST U/S CROSS SECTION FROM BASELINE WEIR
NH        5     0.028     9001.9      0.010     9017.0       0.028      9018.1      0.05     10897.4     0.045
NH    11363
X1    1.041        19     9039.4     9347.5         30          30          30
  X2 CARD HAS SKEW OF 46 DEGRES (COS=0.695) TO ACCOUNT FOR SKEW OF BASELINE ROAD
X2                          1      982.4      984.1                                                  0.695
BT      -11     9000.0      985.0        982     9081.4       985.1         982    9150.0      984.1        982
BT              9360.0      985.6        982     9700.0       985.7         982    9940.0      985.9        982
BT             10330.4      986.9        982    10750.0       987.4         982   11290.0      988.7        982
BT             11730.0      988.4        982    12400.0       989.4         982
GR   984.1     9000.0      983.1     9001.9      983.1      9005.1      983.1    9017.0      984.1     9018.1
GR   984.0     9020.7      983.5     9031.5      983.2      9039.4      982.4    9043.4      982.6     9095.0
GR   983.3     9135.3      983.5     9183.3      983.6      9282.1      984.0    9347.5      986.0     9639.4
GR   988.0    10508.2      988.7    10591.6      988.4     10897.4      989.4   11363.0

  SECTION U/S OF BASELINE ROAD (CCD2C)
  FLOW IS FROM CCD2C
  INTERPOLATED CROSS-SECTION


NH        5     0.028     9848.3      0.010    9897.20       0.028     9899.90     0.060     10600.      0.05
NH    11890
QT        2     1809.6     1809.6
        EXTENDED SECTIONS 1.156 - 1.682 ARE LOCATED ALONG THE BOUNDARY
        OF THE GILA INDIAN RESERVATION (LIMITS OF STUDY AREA).
X1    1.156        23     9846.3    10440.        620         620         620
GR   987.50    9846.3     984.10     9848.3     984.10      9850.0      984.10    9850.8     984.10     9855.8
GR   984.10    9872.4     984.10     9875.6     984.10      9878.5      984.10    9892.7     984.10     9897.2
GR   985.10    9899.9     984.70     9930.9     984.60      9965.7      985.50    9975.9     986.00    10000.
GR   986.00   10100.      985.50    10250.      986.00     10440.       986.00   10600.      986.10    10780.
GR   986.10   10820.      987.10    11840.      987.40     11890.
1
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NH        5     0.028     9902.1      0.010     9978.8       0.028      9990.      0.045      11470      0.05
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NH    12340
X1    1.281        11      9900.2     10400.        660         660         660
GR   988.40     9900.2     985.00     9902.1     985.00      9910.1     985.00     9930.6     985.00     9978.8
GR   986.00     9990.0     986.40     10400.     988.00      11470.     988.00     11615.     988.20     11740.
GR   988.80     12340.
  CROSS-SECTION AT SOUTH MOUNTAIN AVENUE AND MARICOPA COUNTY
  FLOW IS FROM CCD2C

QT        2       1876       1876
NH        4      0.028     9830.20      0.010      9867.7      0.028     9868.20      0.045     12610.
ET               4.1                   9829.7      10530
X1    1.682         13      9896.0     11180.        2220        1535        2115
GR   987.60     9829.7     986.60     9830.2     986.60      9854.8     986.60     9857.0     986.60     9860.3
GR   986.60     9867.7     987.60     9868.2     986.20      9888.6     986.00     9896.0     984.20     9900.0
GR   986.00     11180.     988.00     12180.     989.40      12610.

NH        5      0.050     9738.2      0.028      9740.6      0.010     9778.5      0.028       9780      0.045
NH    13785
ET               4.1                   9738.2      10410
          DIVIDED FLOW MESSAGES DUE TO CHAMPION DRAIN LEVEE THAT IS ASSUMED
          TO FAIL AT TIME OF THE 100-YEAR EVENT.
X1    1.830         25      9800.0     10970.         785         520         780
  FIRST D/S CROSS-SECTION WITH LEVEE
GR   990.00     8945.0     988.00     9195.0     986.00      9395.0     986.00     9738.0     988.40     9738.2
GR   987.40     9740.6     987.40     9754.0     987.40      9765.9     987.40     9767.7     987.40     9768.3
GR   987.40     9771.7     987.40     9771.9     987.40      9774.3     987.40     9776.9     987.40     9778.5
GR   988.40     9780.0     986.00     9800.0     985.00      10000.     986.00     10970.     988.00     11920.
GR   988.90     12240.     989.40     12485.     989.10      12780.     989.70     13420.     990.00     13785.

NH        5      0.050       9740      0.028      9742.5      0.010     9780.2      0.028      9785.5      0.045
NH    13475.
ET               4.1                     9740     10400.0
X1    1.924         22      9785.5     10400.         500         500         500
GR  1000.0     8670.0     990.00     8925.0     988.00      9325.0     986.00     9720.0     989.00     9740.0
GR   988.00     9742.5     988.00     9769.5     988.00      9771.4     988.00     9775.6     988.00     9780.2
GR   989.00     9785.5     986.70     9789.0     986.70      9805.0     986.70     9845.0     987.70     10400.
GR   987.70     10900.     988.00     11445.     989.20      12205.     990.00     12495.     991.10     12805.
GR   991.40     13125.     992.00     13475.

NH        5      0.050       9740      0.028      9742.9      0.010     9779.4      0.028      9781.1      0.045
NH    13455.
ET               4.1                     9740     10165.0
X1    2.019         31     10115.     11045.         500         500         500
GR  1000.0     8715.0     994.00     8815.0     994.00      8915.0     990.00     9265.0     988.00     9615.0
GR   987.30     9705.0     990.00     9725.0     992.00      9740.0     988.33     9742.9     988.33     9749.9
GR   988.33     9769.5     988.33     9771.3     988.33      9772.1     988.33     9775.4     988.33     9777.9
GR   988.33     9778.8     988.33     9779.4     989.30      9781.1     988.00     9815.0     987.60     10115.
GR   988.00     11045.     989.40     11650.     989.60      11995.     990.00     12400.     990.50     12415.
GR   990.00     12435.     989.90     12465.     990.00      12490.     990.40     12875.     991.50     13115.
GR   992.00     13455.
1
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NH        5      0.050       9755      0.028      9757.4      0.010     9796.3      0.028      9799.6      0.045
NH    13380.
ET               4.1                     9755     10202.4
X1    2.114         26      9860.0     10630.         500         500         500
GR  1000.0     8875.0     996.00     8940.0     990.00      9240.0     990.00     9735.0     992.00     9745.0
GR   993.40     9755.0     989.76     9757.4     989.76      9764.9     989.76     9784.5     989.76     9786.3
GR   989.76     9787.0     989.76     9790.3     989.76      9792.6     989.76     9793.5     989.76     9794.0
GR   989.76     9796.3     990.80     9799.6     988.00      9800.0     988.00     9860.0     988.00     10630.
GR   990.00     11600.     990.00     12400.     991.00      12455.     990.00     12490.     990.90     12890.
GR   992.00     13380.

NH        5      0.050       9740      0.028      9742.6      0.010     9784.8      0.028       9787       0.05
NH    13455.
ET               4.1                     9740     10175
X1    2.209         28      9787.0     10845.         500         500         500
GR  1000.0     9065.0     992.00     9515.0     992.00      9720.0     993.30     9740.0     990.38     9742.6
GR   990.38     9764.5     990.38     9766.1     990.38      9768.6     990.38     9770.6     990.38     9771.0
GR   990.38     9771.1     990.38     9772.0     990.38      9774.4     990.38     9774.9     990.38     9775.9
GR   990.38     9780.9     990.38     9784.8     991.40      9787.0     988.00     9790.0     988.10     10185.
GR   988.90     10845.     990.00     11065.     991.00      12405.     992.00     12445.     991.00     12475.
GR   991.10     12715.     992.00     13060.     994.00      13455.

NH        5      0.050       9740      0.028      9743.0      0.010     9792.6      0.028      9794.7       0.05
NH    13260.
ET               4.1                     9740     10250
X1    2.303         29      9870.     10755.         500         500         500
  LAST CROSS-SECTION WITH LEVEE
GR  1000.0     9230.0     994.00     9390.0     992.00      9600.0     992.00     9725.0     993.50     9740.0
GR   991.13     9743.0     991.13     9752.2     991.13      9757.8     991.13     9766.2     991.13     9773.1
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GR   991.13     9774.5     991.13     9775.0     991.13     9777.8     991.13     9780.3     991.13     9780.8
GR   991.13     9781.9     991.13     9787.1     991.13     9792.6     991.60     9793.4     992.10     9794.7
GR   990.00     9870.0     989.10     10220.     990.00     10755.     992.00     12400.     992.00     12450.
GR   993.00     12480.     992.00     12540.     992.00     12860.     993.00     13260.

NH        5      0.050       9745      0.028      9754.0      0.010      9778.0      0.028      9791.0      0.05
NH   13458.
QT        2       1899       1899
  67th AVENUE (CPCD1C)
  FLOW IS FROM CB163C (IT IS HIGHER THAN CPCD1C FLOW OF 1869 cfs)
ET                 4.1                  9745      10285
X1    2.398         17      10012.     10800.        500        500        500
GR   1000.0     9390.0     998.00     9406.0     996.00     9608.0     995.20     9675.0     994.00     9730.0
GR   992.00     9745.0     991.00     9754.0     991.00     9762.3     991.00     9778.0     992.00     9791.0
GR   992.00     9816.0     991.60     10012.     991.30     10800.     991.00     11390.     992.00     12217.
GR   994.00     13447.     994.70     13458.

NH        5      0.06       10192.     0.028      10204.      0.010      10260.      0.028      10272.      0.05
NH   12600
ET                 4.1                 10192      10735
1
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X1    2.516         22      10272.     11064.        625        450        625
GR   1000.0     8950.0     998.00     9297.0     996.00     9754.0     996.00     9772.0     996.00     9800.
GR   996.00     9831.0     994.00     10022.     994.00     10175.     994.00     10192.     992.00     10204.
GR   992.00     10217.     992.00     10241.     992.00     10260.     993.00     10272.     992.00     10283.
GR   991.85     10500.     991.70     10852.     992.00     11064.     992.50     11321.     993.40     11725.
GR   994.00     12588.     994.50     12600.

NH        5      0.06       8165.0     0.028      8207.0      0.010      8225.0      0.028       8246       0.05
NH   10227
QT        2       1899       1899
  65th AVENUE
ET                 4.1                  8188       8750
X1    2.832         17       8264.0     9188.        700        500        665
GR   1000.0     7212.0     998.00     7307.0     996.00     7459.0     994.00     7550.0     993.00     7880.0
GR   994.00     8165.0     992.00     8188.0     991.00     8207.0     991.00     8225.0     992.00     8246.0
GR   992.00     8264.0     992.00     8428.0     992.00     8734.0     993.10     9188.0     992.80     9753.0
GR   994.00     10217.     995.00     10227.
  BASELINE CROSSING AT 67th AVENUE

NH        1      0.060      11400.
QT        2     1117.3     1117.3
ET                 4.1                 10000      10410
X1    2.948          6      10000.      10500       1320        620       1430
GR   995.30     10000.        994      10310      993.6      10420        994      10500      995.1      11020
GR   996.50     11400.
  SPECIAL BRIDGE INPUT TO MODEL BASELINE WEIR

SB     1.05        1.0        3.0          0     0.0001     0.0001     0.0001     0.0001
  FIRST U/S CROSS SECTION FROM BASELINE WEIR
ET                 4.1                 10000      10390
X1    2.949                                          30         30         30
  X2 CARD HAS SKEW OF 45 DEGRES (COS=0.707) TO ACCOUNT FOR SKEW OF BASELINE ROAD
X2                                1        993      993.5                                    0.707
BT       -7     10000.     995.30        993      10150.      994.7        993      10480.     994.6        993
BT              10840.      994.4        993      10980.     994.62        993      11200.     994.0        993
BT              11420.      993.5        993


NH        1      0.060      11370
QT        2     1160.7     1160.7
  D/S END OF SPLIT FLOW SECTION
ET                 4.1                  9775      10080
        WEIR FLOW OCCURS FROM SECTION 3.013 TO 3.390 AS FLOW FROM THE NORTH
        SIDE OF BASELINE ROAD WEIRS ACROSS THE ROADWAY TO THE SOUTH.  THE
        AMOUNT OF DISCHARGE SPILLING SOUTH OVER THE ROADWAY WAS CALCULATED
        USING THE SPLIT FLOW ROUTINE (HEC2 FILE WITH-LW.DAT) AND THE
        CALCULATED Q WAS SUBTRACTED FROM THE NORTHSIDE DISCHARGE.
X1    3.013         12       9775.0     10100.        350        850        500
GR   995.68     9775.0     995.20     9775.1     995.00     9802.4     995.30     9817.0     994.90     9831.0
GR   994.00     9844.6     994.00     10100.     994.90     10763.     996.00     10980.     996.00     11170.
GR   996.00     11350.     998.00     11370.
1
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NH        1      0.060      11655.
QT        2     1378.2     1378.2
ET                 4.1                 9805.1     10170.0
X1    3.108         15      9805.1     10200.        500        500        500
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GR   996.10     9805.1     996.10     9808.0     996.10     9814.3     996.00     9821.3     996.00     9827.7
GR   995.20     9852.1     993.40     9859.4     993.40     9864.7     994.60     9869.8     994.70     9884.8
GR   994.50     10000.     995.10     10200.     996.00     11030.     998.00     11635.     999.00     11655.

NH       1      0.060     11825.
QT       2     1792.4     1792.4
ET                4.1                9846.7     10250.0
X1   3.203          8     9846.7     10250.        500        500        500
GR   996.70     9846.7     996.70     9862.2     996.70     9872.7     994.60     10000.     996.00     10250.
GR   996.00     11060.     998.00     11400.     999.40     11825.

NH       1      0.060      11940
QT       2       1899       1899
  U/S SECTION OF SPLIT FLOW SECTION
  63th AVENUE (CB163C)
  FLOW IS FROM CB163C
ET                4.1                9839.8     10330.0
X1   3.296         23     9949.9     10090.        490        490        490
GR   997.10     9839.8     997.10     9839.9     997.10     9840.0     997.10     9849.9     997.10     9857.3
GR   996.90     9859.4     996.30     9859.6     995.90     9861.0     996.10     9862.0     997.10     9863.9
GR   997.10     9873.2     997.20     9900.1     996.90     9927.3     996.90     9929.8     996.80     9949.9
GR   995.80     9989.5     995.00     10000.     996.00     10090.     996.00     10380.     997.20     11180.
GR   998.00     11530.     998.00     11670.     1000.0     11940.

NH       2      0.045      11180      0.035      11940
QT       2       1899       1899
ET                4.1                9830     10330.0
X1   3.390         16     9857.6     9868.1        500        500        500
GR   998.40     9830.00    998.40     9845.7     998.40     9857.6     996.70     9860.9     995.30     9861.3
GR   994.40     9863.50    994.80     9865.0     997.20     9868.1     996.40     9969.2     996.60     10073.6
GR   996.60     10117.9    996.00     10380.     997.20     11180.     998.00     11530.     998.00     11670.
GR   1000.0     11940.0

NH       3      0.060      10250      0.045      11675       0.05      12470
ET                4.1                9850     10350
X1   3.485         14     9888.4     10250.        500        500        500
GR   1000.1     9850.0     1000.2     9850.1     999.80     9865.2     999.40     9878.7     997.60     9888.4
GR   996.90     9898.1     997.20     9923.7     997.00     9997.4     997.10     10000.     997.00     10250.
GR   998.00     10730.     999.00     11675.     1000.0     12400.     1001.5     12470.

NH       2      0.045      11190       0.05      12510
ET                4.1                9960     10320.0
X1   3.578          8     9945.0     10320.        500        500        500
GR   1000.7     9910.0     998.00     9945.0     997.40     10100.     998.00     10320.     999.70     11190.
GR   999.70     11450.     999.90     11825.     1002.0     12510.
1
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NH       2      0.045      11260       0.05      12545
ET                4.1                9950     10215
X1   3.671          9     9950.0     10950.        500        500        500
GR   1001.9     9950.0     1001.0     9951.0     1001.0     9952.0     1000.0     9975.0     999.10     10290.
GR   1000.0     10950.     1000.8     11260.     1001.0     11860.     1002.0     12545.

NH       4      0.028      9899.9      0.010      9918.9      0.028     9920.00       0.04     12450.0
ET                4.1                9876     10250.0
          59TH AVENUE
X1   3.763         14     9920.0     10860.        500        500        500
GR   1001.7     9876.0     1001.3     9895.1     1001.2     9897.8     998.40     9899.9     998.40     9904.0
GR   998.40     9912.1     998.40     9918.9     999.20     9920.0     999.40     9920.0     999.40     10165.
GR   999.70     10300.     1000.4     10860.     1001.8     11900.     1002.0     12450.

QT       2       1710       1710
  59th AVENUE (CB159C)
  FLOW IS FROM CB51C (IT IS HIGHER THEN CB159C FLOW OF 1598 cfs)
NH       4      0.028      9923.5      0.010      9944.1      0.028     9947.80       0.04     13140.0
ET                4.1                9920     10470
X1   3.858         18     9947.8     10470.        500        500        500
GR   1002.7     9920.0     1002.6     9920.4     1001.1     9921.9     999.15     9923.5     999.15     9925.9
GR   999.15     9942.5     999.15     9944.1     1000.2     9947.5     1000.2     9947.8     999.50     10120.
GR   1000.0     10265.     1001.0     10470.     1001.0     10900.     1001.6     11220.     1001.5     11650.
GR   1002.2     11900.     1002.5     12270.     1004.0     13140.

NH       4      0.028      9933.4      0.010      9956.6      0.028      9960.       0.04      13055
ET                4.1                9928.2     10700.0
X1   3.953         21     10070.     10700.        500        500        500
GR   1004.4     9928.2     1004.4     9928.5     1004.1     9929.5     1003.8     9930.0     1001.00    9933.4
GR   1001.0     9947.2     1001.0     9956.6     1002.0     9960.0     1000.0     9970.0     1000.0     10040.
GR   1000.2     10070.     1000.0     10125.     999.50     10150.     1000.0     10320.     1001.3     10700.
GR   1001.3     10930.     1002.0     11230.     1001.7     11500.     1002.0     11820.     1002.6     12000.
GR   1004.0     13055.
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NH        5      0.028      9961.5       0.010      9980.0       0.028      9982.4       0.05       11270        0.04
NH    12630
ET                 4.1                    9955      10350.0
X1    4.046          23      9982.4      10350.         490         490         490
GR   1005.1      9955.0      1004.9      9956.3      1004.8      9956.5      1004.2      9958.0      1003.7      9959.0
GR   1001.2      9961.5      1001.2      9967.4      1001.2      9968.4      1001.2      9973.0      1001.2      9980.0
GR   1001.8      9980.8      1002.2      9982.2      1002.2      9982.4      1000.0      9983.0      999.80      10000.
GR   1000.0      10020.      1001.5      10350.      1002.0      10880.      1002.5      11180.      1002.5      11230.
GR   1002.0      11270.      1002.0      11470.      1004.0      12630.

NH        5      0.028      9956.7       0.010      9976.3       0.028      9979.4       0.05       11260        0.04
NH    12300
ET                 4.1                    9950      10240.0
X1    4.143          21      9979.4      10240.         515         515         515
GR   1006.6      9950.0      1005.9      9951.6      1003.2      9955.1      1002.3      9956.4      1001.9      9956.7
GR   1001.9      9963.6      1001.9      9964.2      1001.9      9967.0      1001.9      9976.3      1002.5      9977.2
GR   1002.8      9978.5      1002.9      9979.4      1002.0      9985.0      1001.5      10000.      1002.0      10240.
GR   1003.7      11240.      1003.7      11260.      1003.0      11530.      1003.5      11975.      1003.9      12120.
GR   1004.0      12300.
1
    11AUG00      09:23:16                                                                                    PAGE   10


NH        5      0.028      9959.3       0.010      9980.2       0.028      9982.3       0.05       11260.       0.04
NH    12700
ET                 4.1                    9950       10300
X1    4.238          20      9982.3      10300.         500         500         500
GR   1007.3      9950.0      1006.7      9952.0      1004.8      9956.4      1004.4      9958.0      1002.9      9959.3
GR   1002.9      9967.0      1002.9      9967.8      1002.9      9970.5      1002.9      9971.8      1002.9      9980.2
GR   1003.5      9981.5      1003.9      9982.3      1002.0      9985.0      1002.0      10000.      1003.1      10300.
GR   1004.0      11130.      1004.5      11230.      1004.0      11260.      1004.0      11650.      1006.0      12700.

NH        4      0.028      9972.0       0.010      9993.9       0.028      9995.1       0.05        12630
ET                 4.1                    9960      10275.0
X1    4.331          18      10005.      10450.         500         500         500
GR   1008.0      9960.0      1007.6      9962.4      1006.5      9967.7      1006.5      9969.6      1003.9      9972.0
GR   1003.9      9980.4      1003.9      9981.4      1003.9      9983.9      1003.9      9985.2      1003.9      9993.9
GR   1004.3      9994.4      1004.9      9995.1      1004.0      10005.      1004.0      10030.      1003.9      10100.
GR   1004.0      10450.      1005.6      12090.      1006.0      12630.

NH        4      0.028      9974.1       0.010      9996.5       0.028      9997.4       0.05       13070.
ET                 4.1                    9960      10450.0
X1    4.425          14      9997.4      10450.         500         500         500
GR   1008.6      9960.0      1007.9      9968.7      1008.2      9970.9      1004.7      9974.1      1004.7      9984.3
GR   1004.7      9986.7      1004.7      9996.5      1005.7      9997.4      1004.0      10000.      1004.7      10450.
GR   1006.0      11240.      1006.2      11800.      1006.9      12500.      1008.0      13070.

NH        4      0.028      9975.1       0.010     10000.7       0.028     10003.6       0.05       12850
ET                 4.1                    9965      10350.0
X1    4.520          11      10025.      11240.0        500         500         500
GR   1009.7      9965.0      1007.4      9972.4      1007.2      9974.3      1006.3      9975.1      1006.3      9984.7
GR   1006.3     10000.7      1007.3     10003.6      1006.0      10025.      1005.0     10500.0      1006.0     11240.0
GR   1008.0     12850.0

NH        4      0.028      9894.8       0.010      9924.0       0.028      9925.6       0.05       13000
ET                 4.1                    9890      10440.0
X1    4.615          12      9945.0      10440.         500         500         500
GR   1010.6      9890.0      1007.9      9894.8      1007.9      9897.9      1007.9      9906.7      1007.9      9906.9
GR   1007.9      9924.0      1008.9      9925.6      1006.0      9945.0      1006.5      10440.      1007.8      11800.0
GR   1008.0      12550.      1009.8      13000.

NH        4      0.028      9702.2       0.010      9731.5       0.028      9732.5       0.05       12500
ET                 4.1                    9700      10220.0
X1    4.714          16       9780.      10800.         475         450         525
GR   1011.6      9700.0      1009.4      9702.2      1009.4      9714.6      1009.4      9720.0      1009.4      9731.5
GR   1010.5      9732.5      1009.4      9752.5      1007.9      9759.2      1008.0      9760.0      1008.0      9780.0
GR   1007.8      10000.      1007.5      10220.      1007.8      10800.      1008.0      10990.      1009.0      12310.
GR   1010.0      12500.

QT        2        1801        1801
NH        5      0.045        9330       0.028        9410        0.05      10705.8       0.060       11030        0.05
NH    12325
ET                 4.1                    9565       10085
1
    11AUG00      09:23:16                                                                                    PAGE   11


          51ST AVENUE
X1    4.803          14        9410       10440         420         225         470
  51st AVENUE (CB51C)
  FLOW IS FROM CVR47C (IT IS HIGHER THAN CB51C FLOW OF 1710 cfs)
GR   1024.0      8300.0      1020.0      8425.0      1012.0      9065.0      1011.0      9310.0      1011.7      9330.0
GR   1010.0      9365.0      1009.0      9380.0      1009.8      9410.0      1008.2      10000.      1008.5      10440.
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GR   1008.7    10705.8     1009.0     11030.     1009.9     12140.     1012.0     12325.

NH        6     0.045        9000      0.028       9045      0.05     10880.5     0.060     11196.2      0.05
NH    12493     0.028       12925
ET                4.1                   9930      10460
X1    4.898        21        9750      10640        410       400         500
GR   1020.0     8135.0     1014.0     8610.0     1012.0     8870.0     1012.0     8975.0     1012.8     9000.0
GR   1012.0     9020.0     1010.0     9025.0     1009.0     9035.0     1010.0     9045.0     1010.0     9085.0
GR   1009.0     9580.0     1010.0     9750.0     1008.5     10000.     1008.2     10240.     1008.2     10300.
GR   1009.5     10640.     1009.6     10880.5    1009.8     11196.2    1010.0     11610.     1011.3      12493
GR   1012.0     12925.

NH        3     0.045        9420      0.05      12436.3     0.028      12755
ET                4.1                   9695      10240
X1    4.993        11        9565      10370        550       330         500
GR   1018.0     8315.0     1014.0     8640.0     1014.0     8700.0     1012.0     8710.0     1010.0     9420.0
GR   1010.0     9565.0     1009.5     10000.     1009.6     10370.     1010.0     11100.     1011.6     12436.3
GR   1012.0     12755.

NH        3     0.060        9375      0.05       11210     0.028      12145
ET                4.1                   9970      10605
X1    5.087        12        9375      11210        630       280         500
GR   1018.0     8310.0     1014.0     8825.0     1012.0     9150.0     1011.8     9230.0     1011.8     9310.0
GR   1011.8     9345.0     1011.8     9375.0     1010.5     9999.0     1011.0     10510.     1010.7     11210.
GR   1012.0     12010.     1012.1     12145.

NH        3     0.060        9355      0.05       11880     0.028      12230
ET                4.1                   9690      10385
X1    5.182        12        9355      10720        490       460         500
GR   1018.0     8325.0     1014.0     8900.0     1014.0     8950.0     1013.0     9175.0     1012.0     9355.0
GR   1011.5     10000.     1011.0     10550.     1012.0     10720.     1011.0     11500.     1012.7     11880.
GR   1013.0     12005.     1013.1     12230.

NH        2      0.05        11560     0.028      12320
ET                4.1                   9975      10635
X1    5.277        14        9515      11095        630       240         500
GR   1018.0     8365.0     1016.0     8690.0     1014.0     9100.0     1014.0     9235.0     1012.0     9515.0
GR   1011.7     10000.     1011.8     10520.     1012.0     11095.     1012.5     11135.     1012.0     11200.
GR   1011.5     11560.     1012.0     11840.     1013.5     11930.     1013.7     12320.

NH        1      0.05        12055
ET                4.1                   10315     10920
X1    5.371        10        10000      11235        510       475         500
GR   1018.0     8370.0     1016.0     8700.0     1014.0     9225.0     1013.0     9705.0     1012.0     9840.0
GR   1011.9     10000.     1011.8     10420.     1012.0     11235.     1014.0     11900.     1015.1     12055.
1
    11AUG00      09:23:16                                                                                  PAGE   12


NH        1      0.05        12140
ET                4.1                   10300     10810
X1    5.466        10        9840      11270        500       470         500
GR   1020.0     8460.0     1018.0     8590.0     1016.0     8880.0     1014.0     9590.0     1014.0     9840.0
GR   1014.0     10370.     1013.4     10800.     1014.0     11270.     1014.7     11890.     1016.0     12140.

QT        2      1801        1801
  47th AVENUE (CVR47C)
  FLOW IS FROM CVR47C
NH        1      0.05        12070
ET                4.1                   10220     10715
X1    5.561         9        9905      11040        380       610         500
GR   1020.0     8875.0     1018.0     8940.0     1016.0     9280.0     1014.0     9905.0     1013.5     10450.
GR   1014.0     11040.     1014.5     11900.     1016.0     12060.     1016.2     12070.

NH        1      0.05        12130
ET                4.1                   10100     10525
X1    5.656        14        9845      10780        380       660         500
GR   1020.0     8555.0     1016.5     9250.0     1015.9     9500.0     1015.2     9845.0     1014.2     10330.
GR   1014.0     10710.     1014.0     10765.     1016.0     10780.     1016.0     10800.     1016.0     10810.
GR   1016.0     10825.     1015.6     11050.     1015.7     11600.     1016.1     12130.

NH        1      0.05        12000
ET                4.1                   9950      10390
X1    5.750        13        9850      10490        375       600         500
GR   1022.0     8365.0     1020.0     8610.0     1018.0     9100.0     1016.0     9850.0     1015.9     10000.
GR   1016.0     10150.     1016.2     10490.     1017.0     10520.     1017.0     10530.     1017.0     10800.
GR   1017.1     11965.     1017.5     11975.     1018.0     12000.

NH        1      0.05        12000
ET                4.1                   9955      10380
X1    5.845        16        9625      10750        500       500         500
GR   1024.0     8540.0     1022.0     8590.0     1022.0     8640.0     1020.0     8865.0     1018.0     9625.0
GR   1017.5     9900.0     1017.2     10000.     1018.0     10280.     1018.0     10325.     1017.2     10450.
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GR   1018.0     10750.     1018.0     11180.     1018.2     11460.     1018.0     11700.     1018.7     11865.
GR   1019.2     12000.

NH        1       0.05      11800
ET                 4.1                9930       10340
X1    5.940         11       9720      10550        500        500        500
GR   1026.0     8470.0     1024.0     8615.0     1024.0     8670.0     1022.0     9075.0     1019.9     9670.0
GR   1018.6     9720.0     1018.0     9880.0     1018.2     10270.     1018.5     10550.     1019.8     11580.
GR   1020.0     11800.

NH        1       0.05      13640
  43d AVENUE
ET                 4.1                10023      10422
X1    6.034         14       9280      10165        380        750        500
GR   1026.0     8215.0     1024.0     8690.0     1022.0     9070.0     1021.0     9280.0     1020.0     9470.0
GR   1020.0     9700.0     1019.7     9740.0     1020.0     9955.0     1021.0     10165.     1021.1     11005.
GR   1022.0     11250.     1024.0     12100.     1026.0     13490.     1026.6     13640.
1
    11AUG00      09:23:16                                                                                PAGE   13


NH        5       0.06      8165.0      0.028     8207.0      0.010     8225.0      0.028      8246       0.05
NH    10227
QT        2       1899        1899
  65th AVENUE, BEGINING OF SPLIT FLOW BRANCH
  FLOW IS FROM CB163C
ET                 4.1                8188       8750
X1   -2.832         17       8264.0     9188.       700        500        665
GR   1000.0     7212.0     998.00     7307.0     996.00     7459.0     994.00     7550.0     993.00     7880.0
GR   994.00     8165.0     992.00     8188.0     991.00     8207.0     991.00     8225.0     992.00     8246.0
GR   992.00     8264.0     992.00     8428.0     992.00     8734.0     993.10     9188.0     992.80     9753.0
GR   994.00     10217.     995.00     10227.

NH        7       .060       8710        .05      9800       .060      10125        .05      10340       0.028
NH    10341       .010    10363.4        .028   10365.4
QT        2      969.8      969.8
ET                 4.1                9910       10365.4
X1    2.926         15       9800      10125        300       1700       1450
GR    1006       7765       1000       7845        994       8250        994       8325      993.4       8710
GR   993.4       9800      993.4      10125        994      10340      994.2      10340.    993.22     10341.0
GR   993.22    10347.8     993.22     10350.2     993.22     10354.4    993.22     10363.4    995.2      10365.4

NH        7       .060       8705        .05      9815       .060      10135        .05     10345.1       .028
NH    10346       .010    10367.5        .028   10405.1
QT        2      926.3      926.3
ET                 4.1                10010      10405.1
X1    3.021         23       9815      10135        500        500        500
GR    1008       7785       1006       7800       1004       7960        998       8175        994       8645
GR     994       8705      993.5       8985        994       9425      994.1       9640        994       9815
GR     994      10135      994.1      10345      995.6     10345.1     994.56      10346     994.56     10352.2
GR   994.5     10352.7     994.56     10353.7     994.56     10367.5    995.8      10370      996.1      10385.9
GR   996.3     10390.3     996.4      10395.7     996.4      10405.1

NH        4       .050     10380.1      .0280     10381       .010      10402.5      .0280     10435.6
QT        2        765         765
ET                 4.1                9950       10435.6
X1    3.121         21       9800     10380.1        500        500        500
GR    1010       7800       1008       7850       1006       8100       1004       8450       1002       8480
GR    1000       8510        998       8520        996       8550      995.6       8560      994.8       9000
GR   994.2       9800      994.5      10135        995      10380      996.7      10380.1    995.72      10381
GR   995.7     10389.5     995.72     10394.6     995.72     10402.5    997.1      10403.9    997.1      10421.6
GR   997.6     10435.6

NH        4       .050     10370.2      .0280     10371.4       .010     10379.9      .0280     10407.6
QT        2        765         765
ET                 4.1                10050      10407.6
X1    3.209         17       9430     10370.2        490        490        490
GR    1010       7805       1008       7810       1006       8200       1004       8460        996       8515
GR   994.8       8975      995.3       9430        994.6      10000      995.5      10370       997       10370.1
GR   997.2     10370.2     997.1      10370.3     996.15     10371.4    996.15     10379      996.15     10379.9
GR   996.2     10400.8      998.2     10407.6
1
    11AUG00      09:23:16                                                                                PAGE   14


NH        4       .050     10335.1      .0280     10336.3       .010     10357.7      .0280     10390.3
ET                 4.1                10050      10390.3
X1    3.303         17       8930      10030        500        500        500
GR    1010       7755       1008       7895       1006       8405        998       8450      996.1       8605
GR   996.2       8930        996      10030      996.4      10205        996      10335      997.7      10335.1
GR   996.7     10336.3     996.71     10345.1     996.71     10349.4    996.71     10357.7    998.6      10359.9
GR   999.1     10376.2      999.6     10390.3
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NH       5       .045      8990.      .0500     10300.1       .028     10301.4       .0100     10320.7      0.0280
NH   10354
ET                 4.1                 10120      10354
X1   3.398          17       9700     10300.1       500         500         500
GR    1014        7735       1012       7745      1010        8080        1010        8350       1004        8390
GR    1002        8960        998       8990     996.6        9285       996.3        9700        996       10300
GR   997.4    10300.1     996.42    10301.4     996.42    10312.9      996.42     10320.7      999.3    10324.2
GR   999.8    10339.8     1000.2    10354.0

NH       5       .045      8950.      .0500     10270.1       .028     10272.4       .0100     10293.0       0.028
NH   10324
ET                 4.1                 10100      10324
X1   3.491          22       9920     10270.1       500         500         500
GR    1014        7690       1012       7905      1010        8315        1006        8350       1004        8825
GR    1004        8920       1000       8950     998.1        9050         998        9250        998        9355
GR   996.8        9920        996      10270     998.6    10270.1         998     10271.9     997.64    10272.4
GR  997.64       10293      999.2      10295     999.8    10298.5      1000.2     10300.1     1000.2    10305.9
GR  1000.6    10315.5     1000.7    10324.0

NH       5       .045       8905      .0500      10210       .028     10211.3       .0100     10233.7       0.028
NH   10237
ET                 4.1                 10030      10237
X1   3.584          20       9875      10210        500         500         500
GR    1016        7585       1014       7735       1014        7935        1012        8260       1008        8300
GR    1006        8525       1004       8875       1000        8905       999.1        9100        998        9875
GR   997.8        9995        998      10135      998.2       10175         998       10210       1000     10210.1
GR  999.03    10211.3      999.03    10220.8     999.03    10225.1      999.03     10233.7     1001.9    10237.0

NC    0.05       .050       0.050
ET                 4.1                  9985      10200
X1   3.678           9       9600      10190        500         500         500
GR    1017        7565       1014       7620       1012        8355        1004        8605       1002        8880
GR    1000        9205       1000       9600       1000       10190      1001.8       10200

ET                 4.1                9870.0      10135
X1   3.773          10       9580      10130        500         500         500
GR    1018        7480     1016.2       7550       1016        8140        1014        8165       1012        8500
GR    1004        8550       1002       8910       1000        9580        1000       10130     1002.3       10135

ET                 4.1                9715.0      10075
X1   3.868          12       9280       9910        500         500         500
GR  1019.2        7440       1016       7460       1016        8085        1014        8105       1012        8445
GR    1006        8480       1004       8585       1002        8985      1000.4        9280     1000.3        9910
GR    1002       10070     1003.8      10075
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

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*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

*SECNO  .189
3280 CROSS SECTION       .19 EXTENDED       .08 FEET

      .189      2.08    978.08    977.51    977.80    978.16       .08       .00       .00    978.00
    1237.9        .0    1237.9        .0        .0     543.3        .2        .0        .0    978.00
       .00       .00      2.28       .28      .000      .035      .035      .000    976.00  10000.00
   .003003        0.        0.        0.         0        15         6       .00    563.73  10563.73


FLOW DISTRIBUTION FOR SECNO=       .19          CWSEL=    978.08

STA=   10000.   10560.   10564.
  PER Q=    100.0       .0
   AREA=    543.3       .2
    VEL=      2.3       .3
  DEPTH=      1.0       .0

1490 NH CARD USED
*SECNO  .513

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.63

      .513      1.14    979.14    978.60       .00    979.17       .03      1.01       .00    980.40
    1237.9        .0     639.9     598.0        .0     495.1     431.8       9.8      10.7    978.60
       .12       .00      1.29      1.38      .000      .035      .035      .000    978.00  10026.19
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   .001128      580.      580.      580.         3        14         0       .00   1036.66  11062.85


 FLOW DISTRIBUTION FOR SECNO=       .51          CWSEL=    979.14

 STA=   10026.   10600.   10880.   11040.   11063.
   PER Q=     51.7     24.3     23.0      1.0
    AREA=    495.1    236.0    182.8     13.1
     VEL=      1.3      1.3      1.6      1.0
   DEPTH=       .9       .8      1.1       .6

1
   11AUG00      09:23:16                                                                                PAGE   16

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


 1490 NH CARD USED
 *SECNO  .593

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .47

      .593      1.50    979.90    979.49       .00    980.05       .15       .88       .00    980.50
    1237.9        .0    1237.9        .0        .0     402.4        .0      16.2      17.6    980.00
       .16       .00      3.08       .00      .000      .035      .000      .000    978.40   9933.92
   .005160      420.      420.      420.         2         8         0       .00    397.20  10331.13


 FLOW DISTRIBUTION FOR SECNO=       .59          CWSEL=    979.90

 STA=    9934.   10345.
   PER Q=    100.0
    AREA=    402.4
     VEL=      3.1
   DEPTH=      1.0

 1490 NH CARD USED
 *SECNO  .688

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.41

      .688      1.57    981.77    981.15       .00    981.82       .05      1.77       .00    980.30
    1237.9      11.4     704.9     521.6       8.4     323.2     399.4      22.7      24.5    980.40
       .24      1.36      2.18      1.31      .045      .045      .045      .000    980.20   9950.07
   .002587      500.      500.      500.         4        14         0       .00    812.61  10762.67


 FLOW DISTRIBUTION FOR SECNO=       .69          CWSEL=    981.77

 STA=    9950.    9962.   10180.   10763.
   PER Q=       .9     56.9     42.1
    AREA=      8.4    323.2    399.4
     VEL=      1.4      2.2      1.3
   DEPTH=       .7      1.5       .7

 1490 NH CARD USED
 *SECNO  .782
1
   11AUG00      09:23:16                                                                                PAGE   17

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


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.62

      .782      2.76    982.56    981.90       .00    982.58       .01       .76       .00    982.90
    1237.9        .0     436.2     801.7        .0     442.1     861.1      34.4      38.1    982.00
       .38       .00       .99       .93      .000      .050      .045      .000    979.80  10002.33
   .000990      500.      500.      500.         4        15         0       .00   1549.44  11551.78


 FLOW DISTRIBUTION FOR SECNO=       .78          CWSEL=    982.56

 STA=   10002.   10410.   10830.   11250.   11552.
   PER Q=     35.2     30.8     30.8      3.1
```

AREA=	442.1	387.4	387.4	86.4
VEL=	1.0	1.0	1.0	.5
DEPTH=	1.1	.9	.9	.3

1490 NH CARD USED
*SECNO .866

3265 DIVIDED FLOW

.866	2.34	983.14	982.59	.00	983.16	.02	.58	.00	983.00
1237.9	10.1	590.8	637.0	6.8	459.4	670.0	46.7	55.4	982.70
.49	1.49	1.29	.95	.010	.050	.046	.000	980.80	9911.19
.001859	440.	440.	440.	2	17	0	.00	1877.52	11809.04

FLOW DISTRIBUTION FOR SECNO= .87 CWSEL= 983.14

STA=	9911.	9988.	10445.	10875.	11465.	11795.	11809.
PER Q=	.8	47.7	5.7	27.7	18.1	.0	
AREA=	6.8	459.4	124.9	332.8	211.3	1.0	
VEL=	1.5	1.3	.6	1.0	1.1	.2	
DEPTH=	.1	1.0	.3	.6	.6	.1	

1490 NH CARD USED
*SECNO 1.035
3280 CROSS SECTION 1.03 EXTENDED .80 FEET

1.035	2.30	984.70	984.36	.00	984.94	.24	1.78	.00	983.20
1296.5	421.7	848.6	26.2	66.0	472.3	38.5	64.2	79.4	984.00
.57	6.39	1.80	.68	.014	.050	.050	.000	982.40	9000.00
.002135	891.	891.	891.	3	15	0	.00	471.87	9471.87

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

FLOW DISTRIBUTION FOR SECNO= 1.03 CWSEL= 984.70

STA=	9000.	9003.	9023.	9027.	9038.	9046.	9361.	9472.
PER Q=	.8	28.3	1.0	1.0	1.4	65.5	2.0	
AREA=	4.2	36.1	4.7	10.2	10.8	472.3	38.5	
VEL=	2.5	10.2	2.8	1.3	1.7	1.8	.7	
DEPTH=	1.3	1.8	1.2	.9	1.3	1.5	.3	

SPECIAL BRIDGE

5070, VARIABLE ELCHU OR ELCHD ON SB CARD NOT SPECIFIED

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
1.05	1.00	3.00	.00	.00	.00	.00	.00	982.40	982.40

1490 NH CARD USED
*SECNO 1.041
3280 CROSS SECTION 1.04 EXTENDED 1.94 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.65

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
**********	985.26	.32	1298.	0.	0.	0.	982.40	984.10	701.

1.041	3.64	986.04	.00	.00	986.07	.04	1.14	.00	983.20
1296.5	291.1	845.1	160.2	102.7	838.1	302.7	64.8	79.8	984.00
.57	2.83	1.01	.53	.017	.050	.050	.000	982.40	9000.00
.000303	30.	30.	30.	2	0	12	.00	655.02	9655.02

FLOW DISTRIBUTION FOR SECNO= 1.04 CWSEL= 986.04

STA=	9000.	9005.	9017.	9039.	9348.	9639.	9655.
PER Q=	4.2	14.3	4.0	65.2	12.4	.0	
AREA=	14.0	34.9	53.8	838.1	302.4	.3	

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   VEL=      3.9       5.3       1.0       1.0        .5        .0
 DEPTH=      2.7       2.9       2.4       2.7       1.0        .0
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

1490 NH CARD USED
*SECNO 1.156

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .33

        EXTENDED SECTIONS 1.156 - 1.682 ARE LOCATED ALONG THE BOUNDARY
        OF THE GILA INDIAN RESERVATION (LIMITS OF STUDY AREA).
    1.156      2.53    986.63    986.23       .00    986.69       .06       .61       .00    987.50
   1809.6        .0    1351.9     457.7        .0     653.9     370.9      81.0      95.2    986.00
      .67       .00      2.07      1.23      .000      .057      .053      .000    984.10   9846.81
  .005469      620.      620.      620.         2        16         0       .00   1515.13  11361.94

FLOW DISTRIBUTION FOR SECNO=      1.16          CWSEL=    986.63

STA=    9847.   10440.   10600.   10780.   10820.   11362.
  PER Q=     74.7      7.5      8.9      1.7      7.2
   AREA=    653.9    101.0    104.6     21.3    144.0
    VEL=      2.1      1.3      1.5      1.4       .9
  DEPTH=      1.1       .6       .6       .5       .3

1490 NH CARD USED
*SECNO 1.281

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.21

    1.281      2.43    987.43    986.78       .00    987.50       .07       .81       .00    988.40
   1809.6        .0    1636.1     173.5        .0     714.2     355.1      96.8     115.7    986.40
      .75       .00      2.29       .49      .000      .019      .045      .000    985.00   9900.74
  .000530      660.      660.      660.         4        14         0       .00   1188.39  11089.13

FLOW DISTRIBUTION FOR SECNO=      1.28          CWSEL=    987.43

STA=    9901.    9902.    9979.    9990.   10400.   11089.
  PER Q=       .1     63.7      2.3     24.3      9.6
   AREA=      1.6    186.4     21.6    504.5    355.1
    VEL=       .9      6.2      1.9       .9       .5
  DEPTH=      1.2      2.4      1.9      1.2       .5
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

1490 NH CARD USED
*SECNO 1.682
3280 CROSS SECTION      1.68 EXTENDED       .16 FEET

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.16

    1.682      3.56    987.76    985.31       .00    987.76       .00       .26       .00    986.00
   1876.0      62.3    1636.1     177.6      74.0    3416.2     774.9     218.9     188.3    986.00
     1.98       .84       .48       .23      .015      .045      .045      .000    984.20   9829.70
  .000057     2220.     2115.     1535.         4        14         0       .00   2230.61  12060.31

FLOW DISTRIBUTION FOR SECNO=      1.68          CWSEL=    987.76

STA=    9830.    9855.    9857.    9860.    9868.    9889.    9896.   11180.   12060.
  PER Q=      1.9       .2       .3       .6       .2       .2      87.2      9.5
   AREA=     28.9      2.6      3.8      8.6     17.9     12.3    3416.2     774.9
    VEL=      1.2      1.2      1.2      1.2       .2       .3        .5        .2
  DEPTH=      1.2      1.2      1.2      1.2       .9      1.7       2.7        .9
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1490 NH CARD USED
*SECNO 1.830

3265 DIVIDED FLOW

DIVIDED FLOW MESSAGES DUE TO CHAMPION DRAIN LEVEE THAT IS ASSUMED
TO FAIL AT TIME OF THE 100-YEAR EVENT.

1.830	2.81	987.81	985.91	.00	987.81	.00	.05	.00	986.00
1876.0	294.7	1370.4	211.0	813.4	2700.9	776.8	290.9	226.5	986.00
2.43	.36	.51	.27	.048	.045	.045	.000	985.00	9214.15
.000077	785.	780.	520.	2	14	0	.00	2607.59	11829.02

FLOW DISTRIBUTION FOR SECNO= 1.83 CWSEL= 987.81

STA=	9214.	9738.	9800.	10970.	11829.
PER Q=	14.9	.8	73.0	11.2	
AREA=	783.8	29.6	2700.9	776.8	
VEL=	.4	.5	.5	.3	
DEPTH=	1.5	.5	2.3	.9	

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

1490 NH CARD USED
*SECNO 1.924

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .10

1.924	1.86	987.86	987.49	.00	987.94	.08	.13	.00	989.00
1876.0	852.1	953.8	70.1	349.0	425.5	94.7	320.6	251.6	987.70
2.50	2.44	2.24	.74	.050	.045	.045	.000	986.00	9354.82
.007498	500.	500.	500.	1	11	0	.00	1760.92	11170.67

FLOW DISTRIBUTION FOR SECNO= 1.92 CWSEL= 987.86

STA=	9355.	9720.	9732.	10400.	10900. 11171.
PER Q=	43.9	1.5	50.8	3.2	.5
AREA=	337.6	11.4	425.5	74.5	20.2
VEL=	2.4	2.4	2.2	.8	.5
DEPTH=	.9	.9	.7	.1	.1

1490 NH CARD USED
*SECNO 2.019

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.87

2.019	1.63	988.93	988.20	.00	988.94	.02	1.00	.00	987.60
1876.0	618.5	1144.3	113.2	575.9	1054.7	188.5	336.0	272.9	988.00
2.63	1.07	1.08	.60	.042	.045	.045	.000	987.30	9451.54
.000913	500.	500.	500.	1	13	0	.00	1961.61	11448.65

FLOW DISTRIBUTION FOR SECNO= 2.02 CWSEL= 988.93

STA=	9452.	9705.	9770.	10115.	11045.	11449.
PER Q=	8.7	3.2	21.1	61.0	6.0	
AREA=	191.9	26.1	357.9	1054.7	188.5	
VEL=	.9	2.3	1.1	1.1	.6	
DEPTH=	.8	.4	1.0	1.1	.5	

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

1490 NH CARD USED
*SECNO 2.114

2.114	1.39	989.39	988.52	.00	989.42	.02	.47	.00	988.00
1876.0	108.0	1385.1	383.0	83.8	1073.2	471.1	355.8	292.9	988.00
2.74	1.29	1.29	.81	.045	.045	.045	.000	988.00	9799.80
.000981	500.	500.	500.	4	17	0	.00	1506.16	11305.96

FLOW DISTRIBUTION FOR SECNO= 2.11 CWSEL= 989.39

STA=	9800.	9860.	10630.	11306.
PER Q=	5.8	73.8	20.4	
AREA=	83.8	1073.2	471.1	
VEL=	1.3	1.3	.8	
DEPTH=	1.4	1.4	.7	

1490 NH CARD USED
*SECNO 2.209

2.209	1.85	989.85	988.77	.00	989.87	.02	.45	.00	991.40
1876.0	.0	1828.2	47.8	.0	1608.0	91.1	374.9	308.7	988.90
2.87	.00	1.14	.52	.000	.050	.050	.000	988.00	9788.36
.000837	500.	500.	500.	1	11	0	.00	1247.48	11035.85

FLOW DISTRIBUTION FOR SECNO= 2.21 CWSEL= 989.85

STA=	9788.	10845.	11036.
PER Q=	97.5	2.5	
AREA=	1608.0	91.1	
VEL=	1.1	.5	
DEPTH=	1.5	.5	

1490 NH CARD USED
*SECNO 2.303

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .47

2.303	1.49	990.59	990.07	.00	990.65	.05	.78	.00	990.00
1876.0	5.2	1751.8	119.0	6.3	923.9	145.1	390.8	323.8	990.00
2.94	.82	1.90	.82	.050	.050	.050	.000	989.10	9848.70
.003843	500.	500.	500.	2	11	0	.00	1394.86	11243.56

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

FLOW DISTRIBUTION FOR SECNO= 2.30 CWSEL= 990.59

STA=	9849.	9870.	10755.	11244.
PER Q=	.3	93.4	6.3	
AREA=	6.3	923.9	145.1	
VEL=	.8	1.9	.8	
DEPTH=	.3	1.0	.3	

1490 NH CARD USED
*SECNO 2.398

2.398	1.06	992.06	991.82	.00	992.09	.03	1.45	.00	991.60
1899.0	239.5	493.2	1166.3	91.1	483.3	1006.0	406.0	346.2	991.30
3.05	2.63	1.02	1.16	.017	.050	.050	.000	991.00	9744.52
.002262	500.	500.	500.	4	11	0	.00	2511.44	12255.96

FLOW DISTRIBUTION FOR SECNO= 2.40 CWSEL= 992.06

STA=	9745.	9754.	9762.	9778.	9791.	9816.	10012.	10800.	11390.	12217.	12256.
PER Q=	.5	3.4	6.5	.7	.0	1.6	26.0	37.8	23.7	.0	
AREA=	5.1	8.8	16.7	7.3	1.6	51.6	483.3	538.9	465.9	1.2	
VEL=	1.7	7.4	7.4	1.7	.2	.6	1.0	1.3	1.0	.1	
DEPTH=	.5	1.1	1.1	.6	.1	.3	.6	.9	.6	.0	

1490 NH CARD USED
*SECNO 2.516

2.516	1.34	993.04	992.57	.00	993.16	.11	1.06	.00	993.00
1899.0	374.2	1281.5	243.2	68.3	949.4	271.0	424.1	370.1	992.00
3.12	5.48	1.35	.90	.011	.050	.050	.000	991.70	10197.73
.001620	625.	625.	450.	3	15	0	.00	1367.90	11565.63

FLOW DISTRIBUTION FOR SECNO= 2.52 CWSEL= 993.04

STA=	10198.	10204.	10217.	10241.	10260.	10272.	11064.	11321.	11566.
PER Q=	.2	4.4	8.1	6.4	.5	67.5	11.0	1.8	
AREA=	3.3	13.6	25.1	19.9	6.5	949.4	204.3	66.7	
VEL=	1.4	6.2	6.2	6.2	1.4	1.3	1.0	.5	
DEPTH=	.5	1.0	1.0	1.0	.5	1.2	.8	.3	

1

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

1490 NH CARD USED
*SECNO 2.832

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.81

2.832	2.67	993.67	993.12	.00	993.69	.02	.53	.00	992.00
1899.0	558.1	1069.1	271.9	319.7	1294.7	554.5	449.0	396.0	993.10
3.30	1.75	.83	.49	.021	.050	.050	.000	991.00	7658.42
.000492	700.	665.	500.	3	17	0	.00	2334.12	10089.96

FLOW DISTRIBUTION FOR SECNO= 2.83 CWSEL= 993.67

STA=	7658.	7880.	8071.	8188.	8207.	8225.	8246.	8264.	9188.	9753.	10090.
PER Q=	1.0	.9	.9	4.3	16.1	4.7	1.5	56.3	11.4	2.9	
AREA=	74.4	64.2	16.1	41.3	48.1	45.6	30.1	1294.7	407.6	146.8	
VEL=	.3	.3	1.0	2.0	6.3	2.0	.9	.8	.5	.4	
DEPTH=	.3	.3	.1	2.2	2.7	2.2	1.7	1.4	.7	.4	

1490 NH CARD USED
*SECNO 2.948

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .10

2.948	1.27	994.87	994.63	.00	994.96	.10	1.27	.00	995.30
1117.3	.0	784.5	332.8	.0	290.5	175.8	485.1	434.7	994.00
3.44	.00	2.70	1.89	.000	.060	.060	.000	993.60	10104.34
.017939	1320.	1430.	620.	1	22	0	.00	803.36	10907.70

FLOW DISTRIBUTION FOR SECNO= 2.95 CWSEL= 994.87

STA=	10104.	10500.	10908.
PER Q=	70.2	29.8	
AREA=	290.5	175.8	
VEL=	2.7	1.9	
DEPTH=	.7	.4	

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

SPECIAL BRIDGE

5070, VARIABLE ELCHU OR ELCHD ON SB CARD NOT SPECIFIED

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
1.05	1.00	3.00	.00	.00	.00	.00	.00	993.60	993.60

*SECNO 2.949
6870 D.S. ENERGY OF 994.96 IS HIGHER THAN COMPUTED ENERGY OF 994.94
PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID	ELLC	ELTRD	WEIRLN

						AREA			
**********	995.21	.25	1118.	0.	0.	0.	993.00	993.50	940.

2.949	1.27	994.87	.00	.00	994.96	.09	.00	.00	995.30
1117.3	.0	781.7	335.6	.0	294.4	179.8	485.4	435.2	994.00
3.44	.00	2.66	1.87	.000	.060	.060	.000	993.60	10102.03
.017181	30.	30.	30.	2	0	11	.00	810.26	10912.29

FLOW DISTRIBUTION FOR SECNO= 2.95 CWSEL= 994.87

STA=	10102.	10500.	10912.
PER Q=	70.0	30.0	
AREA=	294.4	179.8	
VEL=	2.7	1.9	
DEPTH=	.7	.4	

1490 NH CARD USED
*SECNO 3.013
3280 CROSS SECTION 3.01 EXTENDED .23 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 6.06

WEIR FLOW OCCURS FROM SECTION 3.013 TO 3.390 AS FLOW FROM THE NORTH SIDE OF BASELINE ROAD WEIRS ACROSS THE ROADWAY TO THE SOUTH. THE AMOUNT OF DISCHARGE SPILLING SOUTH OVER THE ROADWAY WAS CALCULATED USING THE SPLIT FLOW ROUTINE (HEC2 FILE WITH-LW.DAT) AND THE CALCULATED Q WAS SUBTRACTED FROM THE NORTHSIDE DISCHARGE.

3.013	1.90	995.90	994.65	.00	995.91	.01	.95	.00	995.68
1160.7	.0	435.4	725.3	.0	551.2	1065.7	502.4	451.8	994.00
3.69	.00	.79	.68	.000	.060	.060	.000	994.00	9775.00
.000504	350.	500.	850.	7	11	0	.00	1186.58	10961.58

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

FLOW DISTRIBUTION FOR SECNO= 3.01 CWSEL= 995.90

STA=	9775.	10100.	10763.	10962.
PER Q=	37.5	59.5	3.0	
AREA=	551.2	965.7	99.9	
VEL=	.8	.7	.4	
DEPTH=	1.7	1.5	.5	

1490 NH CARD USED
*SECNO 3.108
3280 CROSS SECTION 3.11 EXTENDED .24 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .65

3.108	2.93	996.33	995.49	.00	996.36	.02	.44	.00	996.10
1378.2	.0	806.0	572.2	.0	599.2	669.7	519.0	466.2	995.10
3.82	.00	1.35	.85	.000	.060	.060	.000	993.40	9805.10
.001695	500.	500.	500.	4	8	0	.00	1326.61	11131.71

FLOW DISTRIBUTION FOR SECNO= 3.11 CWSEL= 996.33

STA=	9805.	10200.	11030.	11132.
PER Q=	58.5	41.1	.4	
AREA=	599.2	652.6	17.1	
VEL=	1.3	.9	.3	
DEPTH=	1.5	.8	.2	

1490 NH CARD USED
*SECNO 3.203
3280 CROSS SECTION 3.20 EXTENDED .41 FEET

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

3.203	2.50	997.10	996.29	.00	997.12	.02	.76	.00	996.70
1792.4	.0	829.3	963.1	.0	648.8	1003.3	535.8	481.9	996.00

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      3.94       .00      1.28       .96      .000      .060      .060      .000    994.60   9846.70
    .001415      500.      500.      500.         2        11         0       .00   1401.90  11248.60


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


 FLOW DISTRIBUTION FOR SECNO=      3.20          CWSEL=    997.10

 STA=    9847.   10250.   11060.   11249.
   PER Q=     46.3     50.1      3.7
    AREA=    648.8    898.6    104.6
     VEL=      1.3      1.0       .6
   DEPTH=      1.6      1.1       .6

 1490 NH CARD USED
 *SECNO 3.296
 3280 CROSS SECTION      3.30 EXTENDED       .63 FEET

     3.296      2.73    997.73    996.70       .00    997.75       .02       .63       .00    996.80
    1899.0      54.6     380.4    1464.0      78.5     281.6    1465.1     555.3     498.6    996.00
      4.07       .70      1.35      1.00      .060      .060      .060      .000    995.00   9839.80
    .001173      490.      490.      490.         2        18         0       .00   1571.40  11411.20


 FLOW DISTRIBUTION FOR SECNO=      3.30          CWSEL=    997.73

 STA=    9840.    9950.   10090.   10380.   11180.   11411.
   PER Q=      2.9     20.0     32.3     43.7      1.1
    AREA=     78.4    281.6    501.3    902.8     61.1
     VEL=       .7      1.4      1.2       .9       .3
   DEPTH=       .7      2.0      1.7      1.1       .3

 1490 NH CARD USED
 *SECNO 3.390

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.67

     3.390      3.67    998.07    996.89       .00    998.08       .01       .33       .00    998.40
    1899.0        .0      20.9    1878.1         .0      21.3    2163.9     578.3     518.1    997.20
      4.23       .00       .98       .87      .000      .045      .045      .000    994.40   9858.25
    .000421      500.      500.      500.         3        13         0       .00   1820.60  11678.85


 FLOW DISTRIBUTION FOR SECNO=      3.39          CWSEL=    998.07

 STA=    9858.    9868.    9969.   10074.   10118.   10380.   11180.   11530.   11670.   11679.
   PER Q=      1.1       5.3       7.9       3.0      24.1      54.0       4.5        .1        .0
    AREA=     21.3     127.9     163.4      64.9     462.8    1172.4     162.9       9.2        .3
     VEL=      1.0        .8        .9        .9       1.0        .9        .5        .1        .1
   DEPTH=      2.2       1.3       1.6       1.5       1.8       1.5        .5        .1        .0

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


 1490 NH CARD USED
 *SECNO 3.485

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .36

     3.485      1.59    998.49    997.83       .00    998.53       .05       .46       .00    997.60
    1899.0       1.7     923.6     973.6       2.1     514.3     586.6     597.2     536.0    997.00
      4.31       .82      1.80      1.66      .060      .060      .045      .000    996.90   9883.62
    .003288      500.      500.      500.         2        11         0       .00   1307.41  11191.02


 FLOW DISTRIBUTION FOR SECNO=      3.48          CWSEL=    998.49

 STA=    9884.    9888.   10250.   10730.   11191.
   PER Q=       .1     48.6     46.9      4.4
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   AREA=      2.1    514.3    474.2    112.5
    VEL=       .8      1.8      1.9       .7
  DEPTH=       .4      1.4      1.0       .2

1490 NH CARD USED
*SECNO 3.578

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.53

     3.578      2.12    999.52    998.61       .00    999.56       .04      1.03       .00    998.00
    1899.0      15.6    1267.4     616.1      15.1     684.5     595.4     611.0     550.3    998.00
      4.40      1.03      1.85      1.03      .045      .045      .045      .000    997.40   9925.23
   .001409      500.      500.      500.         2        15         0       .00   1175.41  11100.64


FLOW DISTRIBUTION FOR SECNO=      3.58          CWSEL=    999.52

STA=    9925.    9945.   10320.   11101.
  PER Q=       .8     66.7     32.4
   AREA=     15.1    684.5    595.4
    VEL=      1.0      1.9      1.0
  DEPTH=       .8      1.8       .8

1490 NH CARD USED
*SECNO 3.671
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    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .65

     3.671      1.45   1000.55   1000.03       .00   1000.60       .05      1.04       .00   1001.90
    1899.0        .0    1852.2      46.8         .0     976.1      58.1     624.3     563.9   1000.00
      4.47       .00      1.90       .81      .000      .045      .045      .000    999.10   9962.41
   .003354      500.      500.      500.         2        18         0       .00   1199.80  11162.20


FLOW DISTRIBUTION FOR SECNO=      3.67          CWSEL=   1000.55

STA=    9962.   10950.   11162.
  PER Q=     97.5      2.5
   AREA=    976.1     58.1
    VEL=      1.9       .8
  DEPTH=      1.0       .3

1490 NH CARD USED
*SECNO 3.763

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.16

         59TH AVENUE
     3.763      2.69   1001.09   1000.85       .00   1001.27       .18       .67       .00    999.40
    1899.0     401.2    1411.5      86.4      56.3    1204.1     176.7     638.5     579.2   1000.40
      4.53      7.12      1.17       .49      .010      .040      .040      .000    998.40   9897.88
   .000716      500.      500.      500.         3        17         0       .00   1474.52  11372.41


FLOW DISTRIBUTION FOR SECNO=      3.76          CWSEL=   1001.09

STA=    9898.    9900.    9904.    9912.    9919.    9920.   10860.   11372.
  PER Q=       .2      4.5      8.8      7.4       .3     74.3      4.5
   AREA=      2.7     11.0     21.8     18.3      2.5   1204.1    176.7
    VEL=      1.2      7.7      7.7      7.7      2.0      1.2       .5
  DEPTH=      1.3      2.7      2.7      2.7      2.3      1.3       .3

1490 NH CARD USED
*SECNO 3.858
     3.858      2.30   1001.45   1001.35       .00   1001.71       .26       .44       .00   1000.20
    1710.0     431.4    1108.0     170.6      56.2     720.5     252.3     652.7     594.7   1001.00
      4.58      7.68      1.54       .68      .011      .040      .040      .000    999.15   9921.54
   .001116      500.      500.      500.         3        14         0       .00   1222.28  11143.83


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

FLOW DISTRIBUTION FOR SECNO= 3.86 CWSEL= 1001.45

STA=	9922.	9924.	9926.	9943.	9944.	9948.	9948.	10470.	10900.	11144.
PER Q=	.2	2.8	19.4	1.9	.9	.0	64.8	8.5	1.5	
AREA=	2.1	5.5	38.3	3.7	6.1	.4	720.5	196.6	55.7	
VEL=	1.6	8.7	8.7	8.7	2.5	2.1	1.5	.7	.5	
DEPTH=	1.1	2.3	2.3	2.3	1.8	1.3	1.4	.5	.2	

1490 NH CARD USED
*SECNO 3.953

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.58

3.953	2.52	1002.02	1000.72	.00	1002.04	.02	.34	.00	1000.20	
1710.0	334.1	1200.2	175.7	235.6	1070.4	379.7	668.2	612.6	1001.30	
4.70	1.42	1.12	.46	.033	.040	.040	.000	999.50	9932.16	
.000449	500.	500.	500.	2	11	0	.00	1894.56	11826.72	

FLOW DISTRIBUTION FOR SECNO= 3.95 CWSEL= 1002.02

STA=	9932.	9957.	10040.	10070.	10700.	10930.	11500.	11827.
PER Q=	4.5	11.0	4.1	70.2	6.2	3.3	.8	
AREA=	24.4	153.6	57.7	1070.4	166.2	158.3	55.2	
VEL=	3.1	1.2	1.2	1.1	.6	.4	.2	
DEPTH=	1.0	1.8	1.9	1.7	.7	.3	.2	

1490 NH CARD USED
*SECNO 4.046

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .47

4.046	2.54	1002.34	1001.41	.00	1002.45	.11	.41	.00	1002.20	
1710.0	157.6	1164.1	388.3	23.0	617.0	457.5	683.9	632.0	1001.50	
4.77	6.86	1.89	.85	.010	.050	.048	.000	999.80	9960.36	
.002033	490.	490.	490.	2	21	0	.00	1552.38	11669.20	

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

FLOW DISTRIBUTION FOR SECNO= 4.05 CWSEL= 1002.34

STA=	9960.	9968.	9980.	9982.	10350.	10880.	11470.	11669.
PER Q=	3.4	5.7	.1	68.1	17.4	4.3	1.0	
AREA=	8.5	13.3	1.2	617.0	314.5	108.8	34.2	
VEL=	6.9	7.3	1.5	1.9	.9	.7	.5	
DEPTH=	1.1	1.1	.5	1.7	.6	.2	.2	

1490 NH CARD USED
*SECNO 4.143

3265 DIVIDED FLOW

4.143	1.86	1003.36	1003.11	.00	1003.56	.20	1.11	.00	1002.90
1710.0	267.7	803.0	639.3	32.1	414.8	622.6	696.7	650.3	1002.00
4.82	8.33	1.94	1.03	.010	.050	.049	.000	1001.50	9954.90
.002284	515.	515.	515.	2	14	0	.00	1538.30	11847.51

FLOW DISTRIBUTION FOR SECNO= 4.14 CWSEL= 1003.36

STA=	9955.	9964.	9976.	9979.	10240.	11038.	11848.
PER Q=	5.5	9.9	.3	47.0	34.7	2.7	
AREA=	11.2	18.5	2.4	414.8	541.4	81.2	
VEL=	8.4	9.1	2.1	1.9	1.1	.6	
DEPTH=	1.3	1.5	.8	1.6	.7	.1	

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1490 NH CARD USED
*SECNO 4.238

3265 DIVIDED FLOW

     4.238      2.30   1004.30   1003.72       .00   1004.39       .09       .84       .00   1003.90
    1710.0     199.4     877.3     633.2      32.1     564.2     779.7     710.7     669.4   1003.10
      4.90      6.21      1.55       .81       .010      .050      .049      .000   1002.00   9958.08
   .001276      500.      500.      500.         2         9         0       .00   1800.04  11809.26


FLOW DISTRIBUTION FOR SECNO=      4.24          CWSEL=   1004.30

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


STA=    9958.     9967.     9980.     9982.    10300.    11130.    11650.    11809.
  PER Q=      4.3       7.2        .2      51.3      32.1       4.4        .5
   AREA=     11.7      18.5       1.9     564.2     625.3     130.3      24.2
    VEL=      6.2       6.7       1.7       1.6        .9        .6        .4
  DEPTH=      1.3       1.4        .9       1.8        .8        .3        .2

1490 NH CARD USED
*SECNO 4.331
     4.331      1.22   1005.12   1004.87       .00   1005.24       .12       .84       .00   1004.00
    1710.0     231.9     837.7     640.4      35.2     523.0     652.3     725.6     689.1   1004.00
      4.97      6.59      1.60       .98       .011      .050      .050      .000   1003.90   9970.87
   .002341      500.      500.      500.         1        18         0       .00   1635.53  11606.40


FLOW DISTRIBUTION FOR SECNO=      4.33          CWSEL=   1005.12

STA=    9971.     9980.     9994.    10005.    10450.    11606.
  PER Q=      5.0       8.0        .5      49.0      37.5
   AREA=     11.0      16.6       7.6     523.0     652.3
    VEL=      7.8       8.2       1.2       1.6       1.0
  DEPTH=      1.2       1.2        .7       1.2        .6

1490 NH CARD USED
*SECNO 4.425
     4.425      2.00   1006.00   1005.14       .00   1006.09       .09       .85       .00   1005.70
    1710.0     187.2    1111.2     411.6      30.6     745.0     512.6     739.9     705.8   1004.70
      5.04      6.12      1.49       .80       .010      .050      .050      .000   1004.00   9972.91
   .001298      500.      500.      500.         1         8         0       .00   1266.42  11239.33


FLOW DISTRIBUTION FOR SECNO=      4.43          CWSEL=   1006.00

STA=    9973.     9974.     9984.     9987.     9997.     9997.    10450.    11239.
  PER Q=        .0       4.9       1.2       4.7        .1      65.0      24.1
   AREA=        .8      13.2       3.1      12.7        .7     745.0     512.6
    VEL=       1.1       6.4       6.4       6.4       1.3       1.5        .8
  DEPTH=        .6       1.3       1.3       1.3        .8       1.6        .6

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


*SECNO 4.520

3265 DIVIDED FLOW

     4.520      1.68   1006.68   1005.86       .00   1006.70       .02       .61       .00   1006.00
    1710.0      27.0    1593.8      89.2      13.6    1428.3     183.7     756.7     723.4   1006.00
      5.17      1.98      1.12       .49       .013      .050      .050      .000   1005.00   9974.77
   .001136      500.      500.      500.         2        18         0       .00   1796.95  11783.81


FLOW DISTRIBUTION FOR SECNO=      4.52          CWSEL=   1006.68
```

```
STA=    9975.    9985.   10001.   10025.   11240.   11784.
 PER Q=      .5       .9       .1     93.2      5.2
  AREA=     3.6      6.0      4.0   1428.3    183.7
   VEL=     2.6      2.6       .5     1.1       .5
 DEPTH=      .4       .4       .2     1.2       .3

1490 NH CARD USED
*SECNO 4.615

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .63

    4.615     1.51  1007.51  1006.96      .00  1007.55      .04      .85      .00  1006.00
   1710.0     10.0   1159.1    540.8      7.7    624.9    536.3    772.7    742.7  1006.50
     5.26     1.31     1.85     1.01     .050     .050     .050     .000  1006.00  9934.88
  .002854     500.     500.     500.        2       11        0      .00  1564.37 11499.25


FLOW DISTRIBUTION FOR SECNO=      4.61          CWSEL=   1007.51

STA=    9935.    9945.   10440.   11499.
 PER Q=      .6     67.8     31.6
  AREA=     7.7    624.9    536.3
   VEL=     1.3      1.9      1.0
 DEPTH=      .8      1.3       .5

1490 NH CARD USED
*SECNO 4.714
    4.714     1.20  1008.70  1008.14      .00  1008.72      .02     1.17      .00  1008.00
   1710.0     16.0   1315.8    378.2     16.0   1015.1    474.5    787.9    763.2  1007.80
     5.37     1.00     1.30      .80     .050     .050     .050     .000  1007.50  9755.63
  .001914     475.     525.     450.        4       18        0      .00  2157.26 11912.89


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


FLOW DISTRIBUTION FOR SECNO=      4.71          CWSEL=   1008.70

STA=    9756.    9759.    9760.    9780.   10800.   10990.   11913.
 PER Q=      .1       .0       .8     76.9      9.9     12.2
  AREA=     1.4       .6     14.0   1015.1    151.8    322.6
   VEL=      .7      1.1      1.0      1.3      1.1       .6
 DEPTH=      .4       .7       .7      1.0       .8       .3

1490 NH CARD USED
*SECNO 4.803

3265 DIVIDED FLOW

         51ST AVENUE
    4.803     1.33  1009.53  1008.96      .00  1009.56      .02      .84      .00  1009.80
   1801.0      8.0   1142.6    650.5      7.5    850.6    647.9    801.0    780.1  1008.50
     5.46     1.06     1.34     1.00     .028     .050     .053     .000  1008.20  9371.96
  .002309     420.     470.     225.        2       14        0      .00  2211.25 11690.61


FLOW DISTRIBUTION FOR SECNO=      4.80          CWSEL=   1009.53

STA=    9372.    9380.    9400.   10440.   10706.   11030.   11691.
 PER Q=      .1       .3     63.4     18.9     11.4      5.8
  AREA=     2.2      5.4    850.6    248.7    222.3    176.9
   VEL=     1.1      1.1      1.3      1.4       .9       .6
 DEPTH=      .3       .3       .9       .9       .7       .3

1490 NH CARD USED
*SECNO 4.898

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.65

    4.898     1.96  1010.16  1009.16      .00  1010.18      .01      .62      .00  1010.00
   1801.0   302.8    1307.3    191.0    456.4   1222.3    405.1    819.9    804.8  1009.50
     5.60      .66     1.07      .47     .049     .050     .053     .000  1008.20  9024.61
  .000848     410.     500.     400.        2       19        0      .00  2692.10 11716.71


FLOW DISTRIBUTION FOR SECNO=      4.90          CWSEL=   1010.16
```

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

```
STA=    9025.    9580.    9750.   10640.   10881.   11196.   11717.
  PER Q=    12.8      4.1     72.6      5.0      3.4      2.1
   AREA=   344.7    111.7   1222.3    146.0    144.3    114.8
    VEL=      .7       .7      1.1       .6       .4       .3
  DEPTH=      .6       .7      1.4       .6       .5       .2

1490 NH CARD USED
*SECNO 4.993
    4.993     1.17  1010.67  1010.09      .00  1010.68      .02      .51      .00  1010.00
   1801.0    129.9    922.9    748.3    173.2    807.0    810.4    840.1    830.4  1009.60
     5.73      .75     1.14      .92      .048     .050     .050     .000  1009.50  9185.51
  .001476    550.     500.     330.        2       17        0      .00  2466.15 11651.67

FLOW DISTRIBUTION FOR SECNO=      4.99          CWSEL=   1010.67

STA=    9186.    9420.    9565.   10370.   11100.   11652.
  PER Q=     2.6      4.6     51.2     36.0      5.5
   AREA=    77.4     95.8    807.0    628.2    182.2
    VEL=      .6       .9      1.1      1.0       .5
  DEPTH=      .3       .7      1.0       .9       .3

1490 NH CARD USED
*SECNO 5.087
    5.087     1.04  1011.54  1011.15      .00  1011.57      .03      .89      .00  1011.80
   1801.0       .0   1441.6    359.4       .0  1159.2    221.0    856.0    853.4  1010.70
     5.82      .00     1.24     1.63     .000     .050     .028     .000  1010.50  9496.17
  .002949    630.     500.     280.        2       11        0      .00  2235.39 11731.56

FLOW DISTRIBUTION FOR SECNO=      5.09          CWSEL=   1011.54

STA=    9496.   11210.   11732.
  PER Q=    80.0     20.0
   AREA=  1159.2    221.0
    VEL=     1.2      1.6
  DEPTH=      .7       .4

1490 NH CARD USED
```


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

```
*SECNO 5.182

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.65

    5.182     1.37  1012.37  1011.69      .00  1012.38      .01      .82      .00  1012.00
   1801.0      3.3   1029.2    768.5     12.6   1168.9    892.4    875.3    880.0  1012.00
     5.98      .27      .88      .86      .060     .050     .050     .000  1011.00  9287.73
  .001079    490.     500.     460.        3       14        0      .00  2519.33 11807.06

FLOW DISTRIBUTION FOR SECNO=      5.18          CWSEL=   1012.37

STA=    9288.    9355.   10720.   11500.   11807.
  PER Q=      .2     57.1     33.8      8.9
   AREA=    12.6   1168.9    681.5    210.9
    VEL=      .3       .9       .9       .8
  DEPTH=      .2       .9       .9       .7

1490 NH CARD USED
*SECNO 5.277
    5.277     1.22  1012.72  1012.10      .00  1012.74      .01      .35      .00  1012.00
   1801.0     15.5   1070.3    715.2     37.2   1411.9    692.7    894.8    903.3  1012.00
     6.10      .42      .76     1.03     .050     .050     .038     .000  1011.50  9412.96
  .000756    630.     500.     240.        3       18        0      .00  2470.78 11883.73
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FLOW DISTRIBUTION FOR SECNO= 5.28 CWSEL= 1012.72

STA=	9413.	9515.	11095.	11135.	11200.	11560.	11840.	11884.
PER Q=	.9	59.4	.5	.9	15.8	21.9	.7	
AREA=	37.2	1411.9	19.2	31.1	352.4	274.1	15.9	
VEL=	.4	.8	.5	.5	.8	1.4	.7	
DEPTH=	.4	.9	.5	.5	1.0	1.0	.4	

1490 NH CARD USED
*SECNO 5.371

5.371	1.31	1013.11	1012.26	.00	1013.12	.01	.39	.00	1011.90
1801.0	222.6	1462.1	116.3	270.4	1513.9	204.4	918.3	928.4	1012.00
6.25	.82	.97	.57	.050	.050	.050	.000	1011.80	9652.76
.000805	510.	500.	475.	2	18	0	.00	1950.92	11603.68

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

FLOW DISTRIBUTION FOR SECNO= 5.37 CWSEL= 1013.11

STA=	9653.	9705.	9840.	10000.	11235.	11604.
PER Q=	.0	2.8	9.6	81.2	6.5	
AREA=	2.8	82.2	185.4	1513.9	204.4	
VEL=	.1	.6	.9	1.0	.6	
DEPTH=	.1	.6	1.2	1.2	.6	

1490 NH CARD USED
*SECNO 5.466

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .15

5.466	.81	1014.21	1014.17	.00	1014.34	.14	1.22	.00	1014.00
1801.0	104.1	1675.8	21.1	56.2	552.1	17.2	933.3	950.4	1014.00
6.30	1.85	3.04	1.22	.050	.050	.050	.000	1013.40	9519.97
.037110	500.	500.	470.	1	14	0	.00	1924.75	11444.72

FLOW DISTRIBUTION FOR SECNO= 5.47 CWSEL= 1014.21

STA=	9520.	9590.	9840.	11270.	11445.
PER Q=	.5	5.3	93.0	1.2	
AREA=	6.9	49.3	552.1	17.2	
VEL=	1.2	1.9	3.0	1.2	
DEPTH=	.1	.2	.4	.1	

1490 NH CARD USED
*SECNO 5.561

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 8.79

5.561	1.62	1015.12	1014.18	.00	1015.13	.01	.79	.00	1014.00
1801.0	87.9	1257.9	455.2	197.9	1561.2	773.8	952.0	975.8	1014.00
6.49	.44	.81	.59	.050	.050	.050	.000	1013.50	9553.27
.000480	380.	500.	610.	7	15	0	.00	2413.46	11966.73

FLOW DISTRIBUTION FOR SECNO= 5.56 CWSEL= 1015.12

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

STA=	9553.	9905.	11040.	11900.	11967.
PER Q=	4.9	69.8	24.9	.3	
AREA=	197.9	1561.2	753.0	20.9	
VEL=	.4	.8	.6	.3	
DEPTH=	.6	1.4	.9	.3	

1490 NH CARD USED

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*SECNO 5.656

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .44

     5.656      1.57   1015.57   1014.83       .00   1015.61       .04       .48       .00   1015.20
    1801.0      17.2    1783.8        .0      35.1    1083.1        .0     974.1     997.0    1016.00
      6.58       .49      1.65       .00       .050      .050      .000      .000   1014.00    9658.95
   .002513      380.      500.      660.         4         8         0       .00   1117.88   10776.83


FLOW DISTRIBUTION FOR SECNO=      5.66          CWSEL=   1015.57

STA=    9659.    9845.   10780.
  PER Q=      1.0      99.0
   AREA=     35.1   1083.1
    VEL=       .5       1.6
  DEPTH=       .2       1.2

1490 NH CARD USED
*SECNO 5.750
     5.750      1.22   1017.12   1016.62       .00   1017.18       .06      1.57       .00   1016.00
    1801.0     309.2    1427.9      63.9     236.1     699.2     134.1     986.4    1018.8    1016.20
      6.65      1.31      2.04       .48       .050      .050      .050      .000   1015.90    9429.16
   .004195      375.      500.      600.         3        14         0       .00   2536.40   11965.56


FLOW DISTRIBUTION FOR SECNO=      5.75          CWSEL=   1017.12

STA=    9429.    9850.   10490.   10520.   10530.   10800.   11965.
  PER Q=     17.2     79.3      1.1        .0        .9       1.6
   AREA=    236.1    699.2     15.7      1.2      33.0      84.2
    VEL=      1.3      2.0      1.2        .5        .5        .3
  DEPTH=       .6      1.1        .5        .1        .1        .1

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


1490 NH CARD USED
*SECNO 5.845

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.44

     5.845      1.36   1018.56   1018.08       .00   1018.59       .02      1.41       .00   1018.00
    1801.0      34.3    1334.4     432.3      59.9    1047.5     518.6    1001.9    1047.2    1018.00
      6.77       .57      1.27       .83       .050      .050      .050      .000   1017.20    9411.62
   .002021      500.      500.      500.         4        19         0       .00   2420.74   11832.36


FLOW DISTRIBUTION FOR SECNO=      5.84          CWSEL=   1018.56

STA=    9412.    9625.   10750.   11180.   11460.   11700.   11832.
  PER Q=      1.9      74.1      12.2       5.7       4.9       1.2
   AREA=     59.9   1047.5     241.5     129.2     110.8      37.2
    VEL=       .6       1.3        .9        .8        .8        .6
  DEPTH=       .3        .9        .6        .5        .5        .3

1490 NH CARD USED
*SECNO 5.940
     5.940      1.48   1019.48   1018.76       .00   1019.51       .03       .93       .00   1018.60
    1801.0      10.7    1497.5     292.8      15.0    1046.4     383.3    1019.5    1070.6    1018.50
      6.88       .71      1.43       .76       .050      .050      .050      .000   1018.00    9686.02
   .001703      500.      500.      500.         3        11         0       .00   1643.29   11329.31


FLOW DISTRIBUTION FOR SECNO=      5.94          CWSEL=   1019.48

STA=    9686.    9720.   10550.   11329.
  PER Q=       .6      83.1      16.3
   AREA=     15.0   1046.4     383.3
    VEL=       .7       1.4        .8
  DEPTH=       .4       1.3        .5

1490 NH CARD USED
*SECNO 6.034

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .48
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     6.034      1.35   1021.05   1020.62       .00   1021.14       .08      1.62       .00   1021.00
    1801.0        .1    1798.5       2.4        .3    768.3       10.9    1033.4    1091.0   1021.00
      6.94       .22      2.34       .22      .050      .050       .050      .000   1019.70   9269.31
   .007491       380.      500.      750.         3        14          0       .00   1323.38  10592.69


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

 FLOW DISTRIBUTION FOR SECNO=      6.03          CWSEL=   1021.05

 STA=    9269.    9280.   10165.   10593.
   PER Q=       .0     99.9       .1
    AREA=       .3    768.3     10.9
     VEL=       .2      2.3       .2
   DEPTH=       .0       .9       .0

 1490 NH CARD USED
 *SECNO -2.832
 START TRIB COMP
      -2.832     2.832   993.669

 3265 DIVIDED FLOW

    -2.832      2.67    993.67       .00       .00    993.69       .02       .80       .82    992.00
    1899.0     558.5    1069.3     271.2     318.7    1292.8     552.6    1054.9    1116.6    993.10
      7.11      1.75       .83       .49      .021      .050      .050      .000    991.00   7659.11
   .000495       700.      665.      500.         0         0         0       .00   2332.02  10089.16


 FLOW DISTRIBUTION FOR SECNO=     -2.83          CWSEL=    993.67

 STA=    7659.    7880.    8071.    8188.    8207.    8225.    8246.    8264.    9188.    9753.   10089.
   PER Q=      1.0       .9       .9      4.3     16.1      4.7      1.5     56.3     11.4      2.9
    AREA=     73.9     63.8     16.0     41.2     48.0     45.6     30.0   1292.8    406.5    146.1
     VEL=       .3       .3      1.0      2.0      6.4      2.0       .9       .8       .5       .4
   DEPTH=       .3       .3       .1      2.2      2.7      2.2      1.7      1.4       .7       .4

 1490 NH CARD USED
 *SECNO 2.926

 3265 DIVIDED FLOW


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .42

     2.926       .97    994.19    993.73       .00    994.20       .01       .51       .00    993.40
     969.8     680.9     148.5     140.4    1071.4     258.0     129.0    1098.8    1166.8    993.40
      7.48       .64       .58      1.09      .051      .060      .025      .000    993.22   8236.91
   .000734       300.     1450.     1700.         2        20         0       .00   2127.47  10364.38


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

 FLOW DISTRIBUTION FOR SECNO=      2.93          CWSEL=    994.19

 STA=    8237.    8250.    8325.    8710.    9800.   10125.   10340.   10341.   10348.   10350.   10354.   10363.   10364.
   PER Q=       .0       .3      8.2     61.6     15.3      5.5        .0      2.7      1.0      1.7      3.6        .0
    AREA=      1.3     14.5    190.2    865.4    258.0    106.2        .5      6.6      2.3      4.1      8.8        .5
     VEL=       .1       .2       .4       .7       .6       .5        .7      4.0      4.0      4.0      4.0        .7
   DEPTH=       .1       .2       .5       .8       .8       .5        .5      1.0      1.0      1.0      1.0        .5

 1490 NH CARD USED
 *SECNO 3.021

 3265 DIVIDED FLOW

     3.021      1.13    994.63    994.13       .00    994.64       .01       .43       .00    994.00
     926.3     729.5     116.3      80.5     911.4     199.1     121.6    1114.2    1189.3    994.00
```

```
      7.66       .80       .58       .66      .050      .060      .050      .000    993.50   8571.88
   .001047      500.      500.      500.         1        15         0       .00   1794.84  10367.63


 FLOW DISTRIBUTION FOR SECNO=      3.02          CWSEL=    994.63

 STA=    8572.    8705.    8985.    9425.    9640.    9815.   10135.   10345.   10368.
   PER Q=      3.3     23.1     36.4      8.8      7.2     12.6      8.6       .1
    AREA=     60.1    244.2    383.8    123.1    100.2    199.1    120.2      1.4
     VEL=       .5       .9       .9       .7       .7       .6       .7       .7
   DEPTH=       .5       .9       .9       .6       .6       .6       .6       .1

 1490 NH CARD USED
 *SECNO 3.121
      3.121       .98    995.18    994.67       .00    995.19       .01       .56       .00    994.20
      765.0     458.0     307.0         .0     591.4     387.8         .0    1126.9    1208.7    996.70
       7.84       .77       .79       .00      .050      .050      .000      .000    994.20   8786.83
    .001214      500.      500.      500.         2        18         0       .00   1593.18  10380.01


 FLOW DISTRIBUTION FOR SECNO=      3.12          CWSEL=    995.18

 STA=    8787.    9000.    9800.   10380.
   PER Q=      1.9     58.0     40.1
    AREA=     41.3    550.0    387.8
     VEL=       .3       .8       .8
   DEPTH=       .2       .7       .7

1
    11AUG00      09:23:16                                                                    PAGE   42

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


 1490 NH CARD USED
 *SECNO 3.209
      3.209      1.10    995.70    995.17       .00    995.71       .01       .51       .00    995.30
      765.0     283.6     481.4         .0     452.7     670.0         .0    1138.8    1227.5    997.20
       8.04       .63       .72       .00      .050      .050      .000      .000    994.60   8629.20
    .000918      490.      490.      490.         2        11         0       .00   1740.82  10370.01


 FLOW DISTRIBUTION FOR SECNO=      3.21          CWSEL=    995.70

 STA=    8629.    8975.    9430.   10370.
   PER Q=     10.8     26.3     62.9
    AREA=    156.0    296.7    670.0
     VEL=       .5       .7       .7
   DEPTH=       .5       .7       .7

 1490 NH CARD USED
 *SECNO 3.303

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .47

      3.303       .54    996.54    996.30       .00    996.56       .02       .85       .00    996.20
      765.0     134.5     534.3      96.1     134.2     482.6     103.3    1149.3    1247.6    996.00
       8.17      1.00      1.11       .93      .050      .050      .050      .000    996.00   8569.21
    .004165      500.      500.      500.         2        14         0       .00   1765.82  10335.03


 FLOW DISTRIBUTION FOR SECNO=      3.30          CWSEL=    996.54

 STA=    8569.    8605.    8930.   10030.   10205.   10335.
   PER Q=       .7     16.9     69.8      7.2      5.3
    AREA=      7.9    126.3    482.6     59.3     44.0
     VEL=       .7      1.0      1.1       .9       .9
   DEPTH=       .2       .4       .4       .3       .3

 1490 NH CARD USED
 *SECNO 3.398

 3265 DIVIDED FLOW

1
    11AUG00      09:23:16                                                                    PAGE   43

     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
```

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


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.54

     3.398      1.21    997.21    996.51       .00    997.23       .02       .67       .00    996.30
     765.0     213.4     501.6      50.0     356.0     637.6      16.1    1159.3    1264.4    997.40
      8.33       .60       .79      3.11      .050      .050      .010      .000    996.00   9155.92
   .000648      500.      500.      500.         3        12         0       .00   1165.48  10321.66


FLOW DISTRIBUTION FOR SECNO=      3.40          CWSEL=    997.21

STA=    9156.     9285.     9700.    10300.    10301.    10313.    10321.    10322.
  PER Q=      1.8      26.1      65.6        .0       3.9       2.6        .0
   AREA=     39.5     316.5     637.6        .4       9.1       6.2        .4
    VEL=       .3        .6        .8        .6       3.2       3.2        .6
  DEPTH=       .3        .8       1.1        .3        .8        .8        .4

1490 NH CARD USED
*SECNO 3.491

3265 DIVIDED FLOW


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .63

     3.491      1.69    997.69    996.93       .00    997.71       .03       .49       .00    996.80
     765.0     128.7     635.6        .7     184.9     450.2       1.0    1168.7    1275.6    998.60
      8.43       .70      1.41       .77      .050      .050      .010      .000    996.00   9502.74
   .001623      500.      500.      500.         3        15         0       .00    788.05  10293.06


FLOW DISTRIBUTION FOR SECNO=      3.49          CWSEL=    997.69

STA=    9503.     9920.    10270.    10293.
  PER Q=     16.8      83.1        .1
   AREA=    184.9     450.2       1.0
    VEL=       .7       1.4        .8
  DEPTH=       .4       1.3        .0

1490 NH CARD USED
1
   11AUG00      09:23:16                                                                    PAGE   44

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


*SECNO 3.584

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .67

     3.584      1.05    998.85    998.44       .00    998.88       .03      1.17       .00    998.00
     765.0     256.8     508.2        .0     253.1     302.4        .0    1175.5    1285.5    998.00
      8.53      1.01      1.68       .03      .050      .050      .028      .000    997.80   9277.82
   .003663      500.      500.      500.         3        22         0       .00    932.22  10210.04


FLOW DISTRIBUTION FOR SECNO=      3.58          CWSEL=    998.85

STA=    9278.     9875.    10210.
  PER Q=     33.6      66.4
   AREA=    253.1     302.4
    VEL=       1.0       1.7
  DEPTH=       .4        .9

*SECNO 3.678
     3.678       .61   1000.61   1000.26       .00   1000.64       .02      1.75       .00   1000.00
     765.0     320.5     443.7        .8     270.1     358.6       1.0    1182.3    1297.1   1000.00
      8.64      1.19      1.24       .77      .050      .050      .050      .000   1000.00   9106.22
   .003366      500.      500.      500.         4        11         0       .00   1087.15  10193.38


FLOW DISTRIBUTION FOR SECNO=      3.68          CWSEL=   1000.61

STA=    9106.     9205.     9600.    10190.    10193.
  PER Q=      3.1      38.8      58.0        .1
   AREA=     30.0     240.1     358.6       1.0
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     VEL=       .8      1.2      1.2       .8
   DEPTH=       .3       .6       .6       .3

*SECNO 3.773

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.27

     3.773      1.26   1001.26   1000.38       .00   1001.27       .01       .63       .00   1000.00
     765.0     148.9     615.2        .9     266.5     693.7       1.7    1191.5    1308.9   1000.00
      8.81       .56       .89       .52      .050      .050      .050      .000   1000.00   9157.47
   .000653      500.      500.      500.         4        14         0       .00    975.27  10132.74


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    11AUG00      09:23:16                                                                          PAGE   45

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

FLOW DISTRIBUTION FOR SECNO=      3.77          CWSEL=   1001.26

STA=    9157.    9580.   10130.   10133.
  PER Q=     19.5     80.4       .1
   AREA=    266.5    693.7      1.7
    VEL=       .6       .9       .5
  DEPTH=       .6      1.3       .6

*SECNO 3.868
     3.868      1.28   1001.58   1000.70       .00   1001.59       .01       .32       .00   1000.40
     765.0      66.5     656.4      42.2     127.8     773.4      76.8    1202.6    1320.1   1000.30
      8.98       .52       .85       .55      .050      .050      .050      .000   1000.30   9062.87
   .000620      500.      500.      500.         3        17         0       .00    967.37  10030.25

FLOW DISTRIBUTION FOR SECNO=      3.87          CWSEL=   1001.58

STA=    9063.    9280.    9910.   10030.
  PER Q=      8.7     85.8      5.5
   AREA=    127.8    773.4     76.8
    VEL=       .5       .8       .5
  DEPTH=       .6      1.2       .6

1
    11AUG00      09:23:16                                                                          PAGE   46


                                                                    THIS RUN EXECUTED 11AUG00     09:23:16

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

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

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


SUMMARY PRINTOUT

      SECNO     CWSEL    DIFWSP     FRCH     TOPWID    STENCL     STCHL     STCHR    STENCR
        .189    978.08       .00      .41     563.73       .00  10000.00  10560.00       .00
*       .513    979.14       .00      .25    1036.66       .00  10000.00  10600.00       .00
*       .593    979.90       .00      .54     397.20       .00   9870.20  10345.00       .00
*       .688    981.77       .00      .32     812.61       .00   9961.50  10180.00       .00
*       .782    982.56       .00      .17    1549.44       .00  10000.30  10410.00       .00
        .866    983.14       .00      .23    1877.52       .00   9988.40  10445.00       .00
       1.035    984.70       .00      .26     471.87       .00   9045.90   9361.40       .00
```

*	1.041	986.04	.00	.11	655.02	.00	9039.40	9347.50	.00
*	1.156	986.63	.00	.35	1515.13	.00	9846.30	10440.00	.00
*	1.281	987.43	.00	.34	1188.39	.00	9900.20	10400.00	.00
*	1.682	987.76	.00	.05	2230.61	.00	9896.00	11180.00	.00
	1.830	987.81	.00	.06	2607.59	.00	9800.00	10970.00	.00
*	1.924	987.86	.00	.47	1760.92	.00	9785.50	10400.00	.00
*	2.019	988.93	.00	.18	1961.61	.00	10115.00	11045.00	.00
	2.114	989.39	.00	.19	1506.16	.00	9860.00	10630.00	.00
	2.209	989.85	.00	.16	1247.48	.00	9787.00	10845.00	.00
*	2.303	990.59	.00	.33	1394.86	.00	9870.00	10755.00	.00

SECNO	CWSEL	DIFWSP	FRCH	TOPWID	STENCL	STCHL	STCHR	STENCR
2.398	992.06	.00	.23	2511.44	.00	10012.00	10800.00	.00
2.516	993.04	.00	.22	1367.90	.00	10272.00	11064.00	.00
* 2.832	993.67	.00	.12	2334.12	.00	8264.00	9188.00	.00
* 2.948	994.87	.00	.56	803.36	.00	10000.00	10500.00	.00
2.949	994.87	.00	.54	810.26	.00	10000.00	10500.00	.00
* 3.013	995.90	.00	.11	1186.58	.00	9775.00	10100.00	.00
* 3.108	996.33	.00	.19	1326.61	.00	9805.10	10200.00	.00
* 3.203	997.10	.00	.18	1401.90	.00	9846.70	10250.00	.00
3.296	997.73	.00	.17	1571.40	.00	9949.90	10090.00	.00
* 3.390	998.07	.00	.12	1820.60	.00	9857.60	9868.10	.00
* 3.485	998.49	.00	.27	1307.41	.00	9888.40	10250.00	.00
* 3.578	999.52	.00	.24	1175.41	.00	9945.00	10320.00	.00
* 3.671	1000.55	.00	.34	1199.80	.00	9950.00	10950.00	.00
* 3.763	1001.09	.00	.18	1474.52	.00	9920.00	10860.00	.00
3.858	1001.45	.00	.23	1222.28	.00	9947.80	10470.00	.00
* 3.953	1002.02	.00	.15	1894.56	.00	10070.00	10700.00	.00
* 4.046	1002.34	.00	.26	1552.38	.00	9982.40	10350.00	.00
4.143	1003.36	.00	.27	1538.30	.00	9979.40	10240.00	.00
4.238	1004.30	.00	.21	1800.04	.00	9982.30	10300.00	.00
4.331	1005.12	.00	.26	1635.53	.00	10005.00	10450.00	.00
4.425	1006.00	.00	.20	1266.42	.00	9997.40	10450.00	.00
4.520	1006.68	.00	.18	1796.95	.00	10025.00	11240.00	.00
* 4.615	1007.51	.00	.29	1564.37	.00	9945.00	10440.00	.00
4.714	1008.70	.00	.23	2157.26	.00	9780.00	10800.00	.00
4.803	1009.53	.00	.26	2211.25	.00	9410.00	10440.00	.00
* 4.898	1010.16	.00	.16	2692.10	.00	9750.00	10640.00	.00

SECNO	CWSEL	DIFWSP	FRCH	TOPWID	STENCL	STCHL	STCHR	STENCR

	4.993	1010.67	.00	.20	2466.15	.00	9565.00	10370.00	.00
	5.087	1011.54	.00	.27	2235.39	.00	9375.00	11210.00	.00
*	5.182	1012.37	.00	.17	2519.33	.00	9355.00	10720.00	.00
	5.277	1012.72	.00	.14	2470.78	.00	9515.00	11095.00	.00
	5.371	1013.11	.00	.15	1950.92	.00	10000.00	11235.00	.00
*	5.466	1014.21	.00	.86	1924.75	.00	9840.00	11270.00	.00
*	5.561	1015.12	.00	.12	2413.46	.00	9905.00	11040.00	.00
*	5.656	1015.57	.00	.27	1117.88	.00	9845.00	10780.00	.00
	5.750	1017.12	.00	.34	2536.40	.00	9850.00	10490.00	.00
*	5.845	1018.56	.00	.23	2420.74	.00	9625.00	10750.00	.00
	5.940	1019.48	.00	.22	1643.29	.00	9720.00	10550.00	.00
*	6.034	1021.05	.00	.44	1323.38	.00	9280.00	10165.00	.00
	-2.832	993.67	.00	.12	2332.02	.00	8264.00	9188.00	.00
*	2.926	994.19	.00	.11	2127.47	.00	9800.00	10125.00	.00
	3.021	994.63	.00	.13	1794.84	.00	9815.00	10135.00	.00
	3.121	995.18	.00	.17	1593.18	.00	9800.00	10380.10	.00
	3.209	995.70	.00	.15	1740.82	.00	9430.00	10370.20	.00
*	3.303	996.54	.00	.29	1765.82	.00	8930.00	10030.00	.00
*	3.398	997.21	.00	.13	1165.48	.00	9700.00	10300.10	.00
*	3.491	997.69	.00	.22	788.05	.00	9920.00	10270.10	.00
*	3.584	998.85	.00	.31	932.22	.00	9875.00	10210.00	.00
	3.678	1000.61	.00	.28	1087.15	.00	9600.00	10190.00	.00
*	3.773	1001.26	.00	.14	975.27	.00	9580.00	10130.00	.00
	3.868	1001.58	.00	.13	967.37	.00	9280.00	9910.00	.00

SUMMARY PRINTOUT TABLE 110

	SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
	.189	978.08	.28	978.16	563.73	.00	1237.86	.04	.00	.00	10000.00	10560.00	.00
*	.513	979.14	.00	979.17	1036.66	.00	639.88	598.02	.00	.00	10000.00	10600.00	.00
*	.593	979.90	.00	980.05	397.20	.00	1237.90	.00	.00	.00	9870.20	10345.00	.00
*	.688	981.77	.00	981.82	812.61	11.45	704.89	521.57	.00	.00	9961.50	10180.00	.00
*	.782	982.56	.00	982.58	1549.44	.00	436.16	801.74	.00	.00	10000.30	10410.00	.00
	.866	983.14	.00	983.16	1877.52	10.07	590.84	636.99	.00	.00	9988.40	10445.00	.00
	1.035	984.70	.00	984.94	471.87	421.71	848.56	26.22	.00	.00	9045.90	9361.40	.00
*	1.041	986.04	.00	986.07	655.02	291.13	845.14	160.23	.00	.00	9039.40	9347.50	.00
*	1.156	986.63	.00	986.69	1515.13	.00	1351.87	457.73	.00	.00	9846.30	10440.00	.00
*	1.281	987.43	.00	987.50	1188.39	.00	1636.07	173.53	.00	.00	9900.20	10400.00	.00
*	1.682	987.76	.00	987.76	2230.61	62.33	1636.10	177.57	.00	.00	9896.00	11180.00	.00
	1.830	987.81	.00	987.81	2607.59	294.66	1370.36	210.98	.00	.00	9800.00	10970.00	.00
*	1.924	987.86	.00	987.94	1760.92	852.11	953.82	70.06	.00	.00	9785.50	10400.00	.00

*	2.019	988.93	.00	988.94	1961.61	618.52	1144.27	113.21	.00	.00	10115.00	11045.00	.00
	2.114	989.39	.00	989.42	1506.16	107.96	1385.06	382.98	.00	.00	9860.00	10630.00	.00
	2.209	989.85	.00	989.87	1247.48	.00	1828.20	47.80	.00	.00	9787.00	10845.00	.00
*	2.303	990.59	.00	990.65	1394.86	5.19	1751.82	118.99	.00	.00	9870.00	10755.00	.00
	2.398	992.06	.00	992.09	2511.44	239.50	493.16	1166.33	.00	.00	10012.00	10800.00	.00
	2.516	993.04	.00	993.16	1367.90	374.22	1281.53	243.25	.00	.00	10272.00	11064.00	.00
*	2.832	993.67	.00	993.69	2334.12	558.09	1069.05	271.86	.00	.00	8264.00	9188.00	.00
*	2.948	994.87	.00	994.96	803.36	.00	784.45	332.85	.00	.00	10000.00	10500.00	.00
	2.949	994.87	.00	994.96	810.26	.00	781.69	335.61	.00	.00	10000.00	10500.00	.00
*	3.013	995.90	.00	995.91	1186.58	.00	435.36	725.34	.00	.00	9775.00	10100.00	.00
*	3.108	996.33	.00	996.36	1326.61	.00	806.00	572.20	.00	.00	9805.10	10200.00	.00

	SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
*	3.203	997.10	.00	997.12	1401.90	.00	829.32	963.08	.00	.00	9846.70	10250.00	.00
	3.296	997.73	.00	997.75	1571.40	54.61	380.38	1464.01	.00	.00	9949.90	10090.00	.00
*	3.390	998.07	.00	998.08	1820.60	.00	20.86	1878.14	.00	.00	9857.60	9868.10	.00
*	3.485	998.49	.00	998.53	1307.41	1.74	923.64	973.63	.00	.00	9888.40	10250.00	.00
*	3.578	999.52	.00	999.56	1175.41	15.57	1267.35	616.07	.00	.00	9945.00	10320.00	.00
*	3.671	1000.55	.00	1000.60	1199.80	.00	1852.15	46.85	.00	.00	9950.00	10950.00	.00
*	3.763	1001.09	.00	1001.27	1474.52	401.18	1411.45	86.36	.00	.00	9920.00	10860.00	.00
	3.858	1001.45	.00	1001.71	1222.28	431.35	1108.05	170.60	.00	.00	9947.80	10470.00	.00
*	3.953	1002.02	.00	1002.04	1894.56	334.06	1200.23	175.70	.00	.00	10070.00	10700.00	.00
*	4.046	1002.34	.00	1002.45	1552.38	157.61	1164.06	388.33	.00	.00	9982.40	10350.00	.00
	4.143	1003.36	.00	1003.56	1538.30	267.72	802.97	639.31	.00	.00	9979.40	10240.00	.00
	4.238	1004.30	.00	1004.39	1800.04	199.44	877.34	633.22	.00	.00	9982.30	10300.00	.00
	4.331	1005.12	.00	1005.24	1635.53	231.88	837.71	640.41	.00	.00	10005.00	10450.00	.00
	4.425	1006.00	.00	1006.09	1266.42	187.19	1111.20	411.61	.00	.00	9997.40	10450.00	.00
	4.520	1006.68	.00	1006.70	1796.95	27.01	1593.75	89.24	.00	.00	10025.00	11240.00	.00
*	4.615	1007.51	.00	1007.55	1564.37	10.01	1159.14	540.85	.00	.00	9945.00	10440.00	.00
	4.714	1008.70	.00	1008.72	2157.26	15.95	1315.84	378.21	.00	.00	9780.00	10800.00	.00
	4.803	1009.53	.00	1009.56	2211.25	7.98	1142.57	650.46	.00	.00	9410.00	10440.00	.00
*	4.898	1010.16	.00	1010.18	2692.10	302.77	1307.27	190.95	.00	.00	9750.00	10640.00	.00
	4.993	1010.67	.00	1010.68	2466.15	129.87	922.86	748.27	.00	.00	9565.00	10370.00	.00
	5.087	1011.54	.00	1011.57	2235.39	.00	1441.61	359.39	.00	.00	9375.00	11210.00	.00
*	5.182	1012.37	.00	1012.38	2519.33	3.34	1029.19	768.47	.00	.00	9355.00	10720.00	.00
	5.277	1012.72	.00	1012.74	2470.78	15.50	1070.32	715.18	.00	.00	9515.00	11095.00	.00
	5.371	1013.11	.00	1013.12	1950.92	222.60	1462.09	116.31	.00	.00	10000.00	11235.00	.00
*	5.466	1014.21	.00	1014.34	1924.75	104.12	1675.82	21.06	.00	.00	9840.00	11270.00	.00
*	5.561	1015.12	.00	1015.13	2413.46	87.89	1257.93	455.17	.00	.00	9905.00	11040.00	.00

	SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
*	5.656	1015.57	.00	1015.61	1117.88	17.21	1783.79	.00	.00	.00	9845.00	10780.00	.00
	5.750	1017.12	.00	1017.18	2536.40	309.25	1427.85	63.90	.00	.00	9850.00	10490.00	.00
*	5.845	1018.56	.00	1018.59	2420.74	34.32	1334.36	432.33	.00	.00	9625.00	10750.00	.00
	5.940	1019.48	.00	1019.51	1643.29	10.68	1497.50	292.82	.00	.00	9720.00	10550.00	.00
*	6.034	1021.05	.00	1021.14	1323.38	.06	1798.52	2.42	.00	.00	9280.00	10165.00	.00
	-2.832	993.67	.00	993.69	2332.02	558.51	1069.29	271.20	.00	.00	8264.00	9188.00	.00
*	2.926	994.19	.00	994.20	2127.47	680.86	148.50	140.44	.00	.00	9800.00	10125.00	.00
	3.021	994.63	.00	994.64	1794.84	729.50	116.31	80.48	.00	.00	9815.00	10135.00	.00
	3.121	995.18	.00	995.19	1593.18	458.03	306.97	.00	.00	.00	9800.00	10380.10	.00
	3.209	995.70	.00	995.71	1740.82	283.58	481.42	.00	.00	.00	9430.00	10370.20	.00
*	3.303	996.54	.00	996.56	1765.82	134.52	534.33	96.15	.00	.00	8930.00	10030.00	.00
*	3.398	997.21	.00	997.23	1165.48	213.40	501.55	50.04	.00	.00	9700.00	10300.10	.00
*	3.491	997.69	.00	997.71	788.05	128.67	635.60	.73	.00	.00	9920.00	10270.10	.00
*	3.584	998.85	.00	998.88	932.22	256.83	508.17	.00	.00	.00	9875.00	10210.00	.00
	3.678	1000.61	.00	1000.64	1087.15	320.47	443.73	.79	.00	.00	9600.00	10190.00	.00
*	3.773	1001.26	.00	1001.27	975.27	148.87	615.22	.91	.00	.00	9580.00	10130.00	.00
	3.868	1001.58	.00	1001.59	967.37	66.48	656.35	42.17	.00	.00	9280.00	9910.00	.00

SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= .513 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= .593 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= .688 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= .782 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 1.041 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 1.156 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 1.281 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 1.682 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 1.924 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 2.019 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 2.303 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 2.832 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 2.948 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 3.013 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 3.108 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 3.203 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 3.390 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 3.485 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 3.578 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 3.671 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 3.763 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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WARNING SECNO= 4.615 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 4.898 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 5.182 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

1

WARNING SECNO= 5.466 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 5.561 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 5.656 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 5.845 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 6.034 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 2.926 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 3.303 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 3.398 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 3.491 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

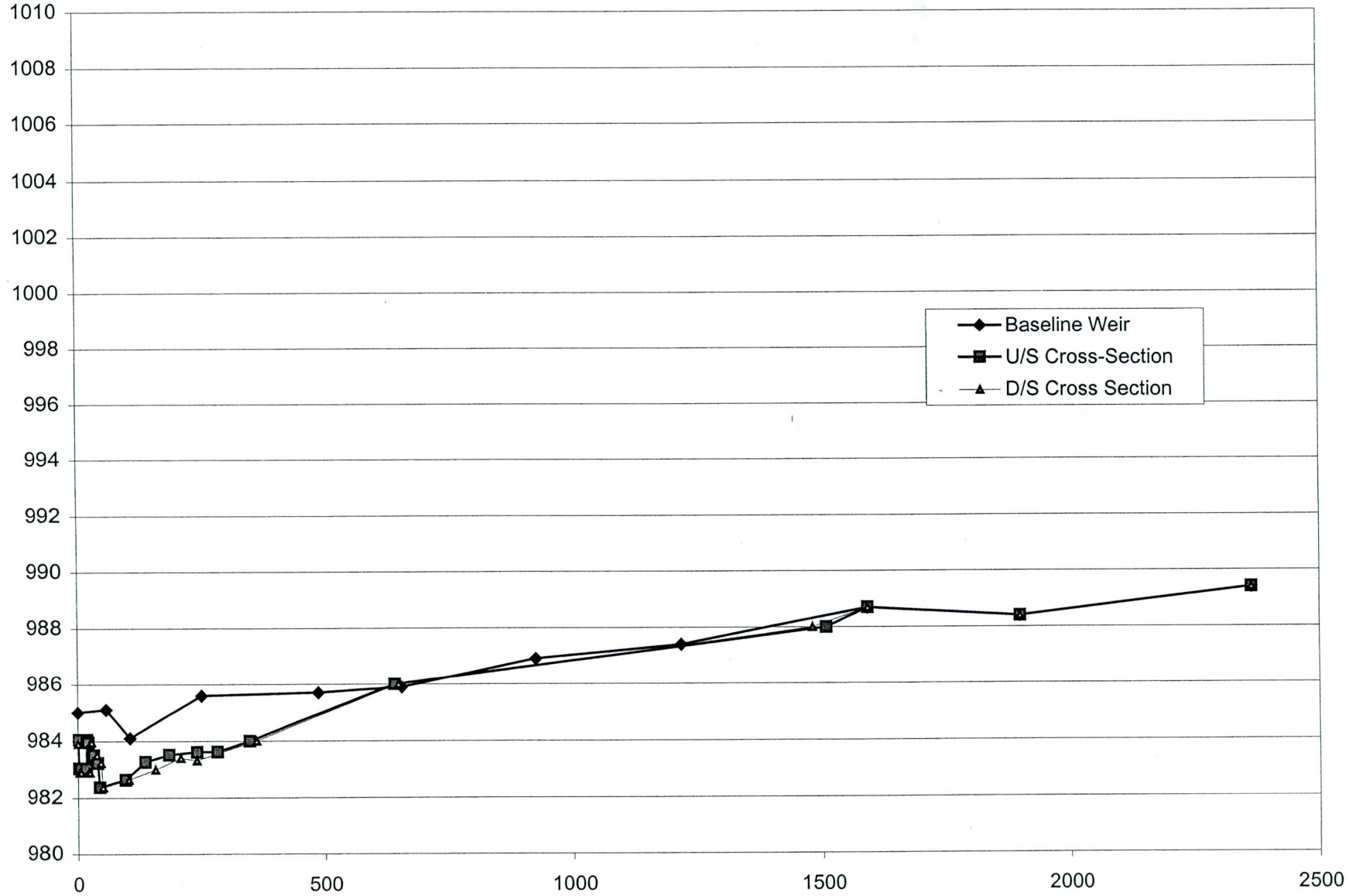
WARNING SECNO= 3.584 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 3.773 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

			Side Weir - Split Flow Option					
			Left	Right	Maxim.	D/S Length		Station
			Bank	Bank				
865620	605924	**D-0.866**	984.41		984.41	0		0.866
865115.7	606356.3	5A	984.16	983.76	984.16	664	664	0.992
865095	606379.9	5B	984.37	983.78	984.37	31	696	0.998
865063.8	606409.3	5C	983.87	983.83	983.87	43	738	1.006
865047.4	606425.4	5D	983.9	983.93	983.93	23	761	1.010
864988.4	606474.8	5G	983.78	984.35	984.35	77	838	1.025
		D/S Bas.			**984.35**	**53**	891	**1.035**
864949.3	606530.4	Baseline				15	15	1.038
		U/S Base			**984.05**	**15**	30	**1.041**
864895.9	606552.2	5E	984.05	984.05	984.05	43	43	1.049
864731.9	606683	5F	986.54	984.55	986.54	210	253	1.088
864459	606928	**E-1.156**	987.45		987.45	367	620	1.158
						1541		
						0.292		

SAEID TADAYON
USGS
(520) 670-6671
254
TUCSON

Zoran Lakicevic
WEST Consultants, Inc.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1008
1006
1004
1002
1000
998
996
994
992
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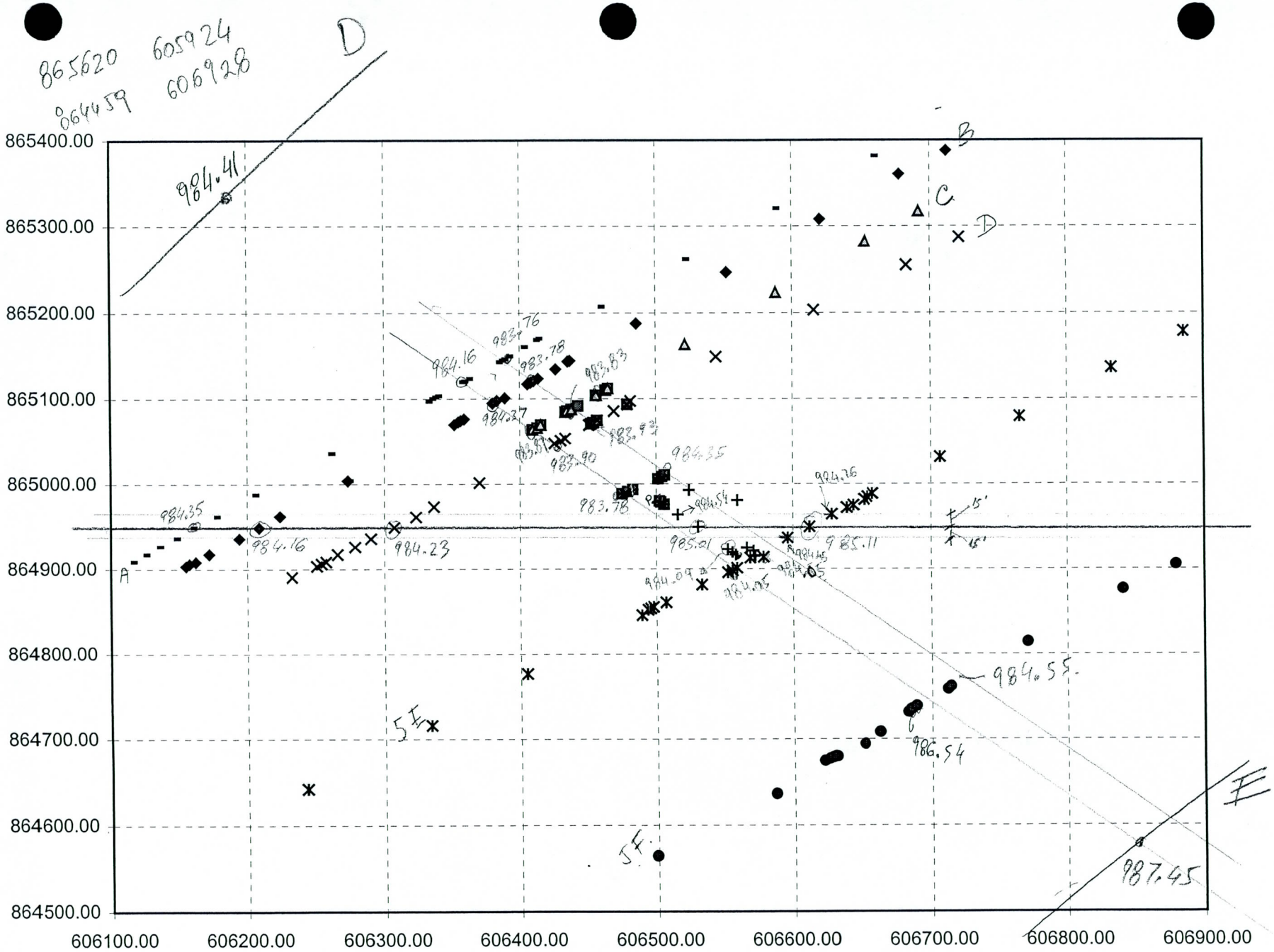
988
986
984
982
980
0
500
1000
1500
2000
2500
Baseline Weir
U/S Cross-Section
D/S Cross Section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D
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B
C
D
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865000.00
864900.00
864800.00
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864600.00
864500.00
606100.00
606200.00
606300.00
606400.00
606500.00
606600.00
606700.00
606800.00
606900.00
984.16
984.23
984.35
984.55
986.54
987.45
E
A

1. Sensitivity of model to Salt River WS.
Possibly include
Baker 4' topo : Apr. 1993
Work Map 2' topo : July 1990.
Dense Cross sections based on Apr. 1993 topo.
Also, look at survey data and revise accordingly.
Cross sections 0.593 to 1.281.

2. Find BASELINE. WEIR file or develop one.

3. Flow rates needs to be applied depends if the flow is increasing or decreasing.
If the flow is increasing then it is applied to WS node, and if it is decreasing it is applied to downstream node.
Need to look at hydrology of sub-basins delineated to decide the encroachment points.

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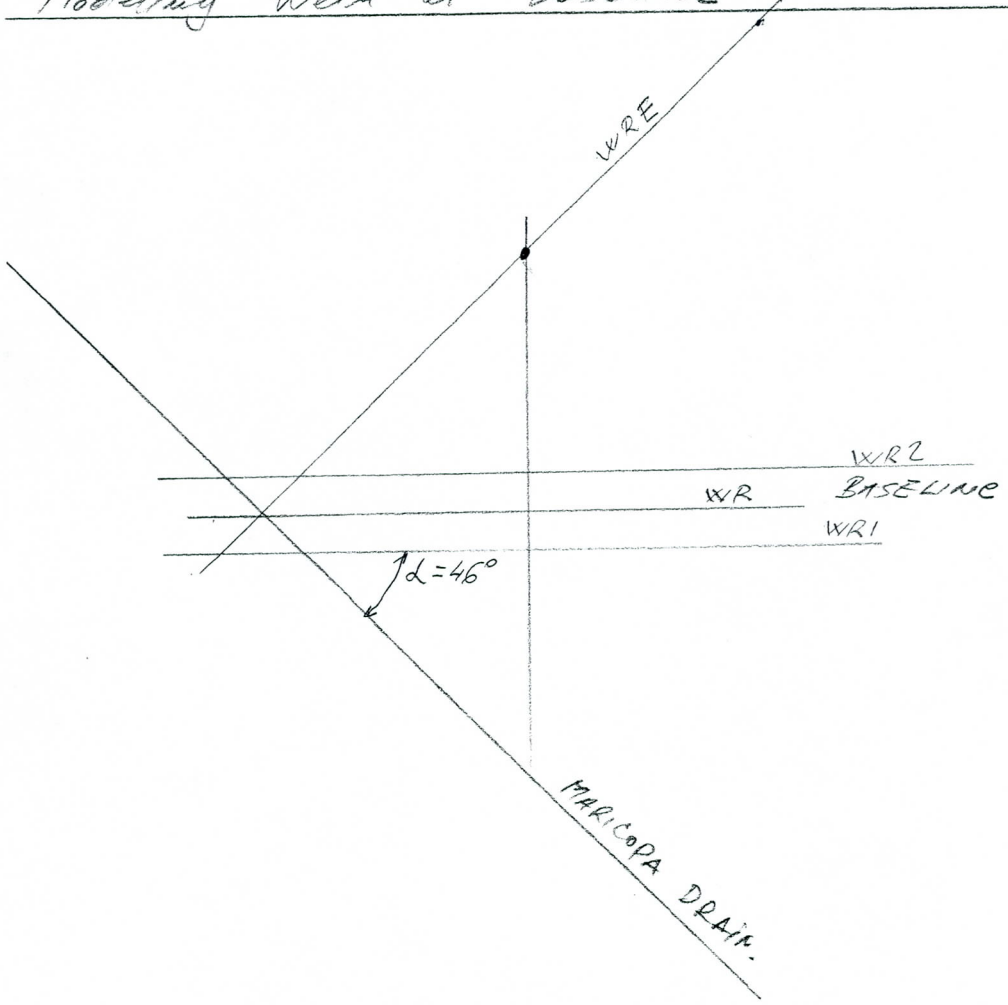
Modeling Weir at Baseline Road Crossing



WR1

Sta.	Elev.	Skew Sta.
0	984	0
500	984	719.8
920	986	1324.4
2170	988	

WR2

Sta.	Elev.	Skew Sta.
0	984	0
520	984	748.6
930	986	1338.8
2130	988	

WR

Sta.	Elev	Sta. Skew
0	984.8	
150	984.1	
360	985.6	
700	985.7	
940	985.9	
1330	986.9	
1750	987.4	
2290	988.7	
2730	988.4	
3400	989.4	

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~~Split Flow over Baseline Hydrology Assessment~~

Adjacent Cross-Section 2.949 to Model

Weir Flow Over Baseline at Moccasin Drive

DIS STA	Elev.	
0	993.8	Right Bank - Next to
950	993.8	
970	994.6	

Road:

	0.866	1.035
	1.041	1.156
0	995.2	
500	994.6	↓
850	994.4	
~~970~~	~~994.~~	

US. Section at DIS.

0	993.8	0.189
11000	993.8	0.513
11500	994.2	

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Additional Cross Section to Model Weir over Baseline at 67th Avenue.

Cross Section 2.949

Sta	Elev.
0	995.05
300	994.0
420	993.6
570	994.0
710	994.
1180	994.4

Weir	
0	995.05
150	994.7
480	994.6
840	994.4
980	994.62
~~220~~ 1200	994.0
1420	993.5

L	C	R
350	500	950
350	500	850

Water Surface at 994.94 so Make different Cross-Section

0	995.05
310	994
420	993.6
500	994
1020	995.1

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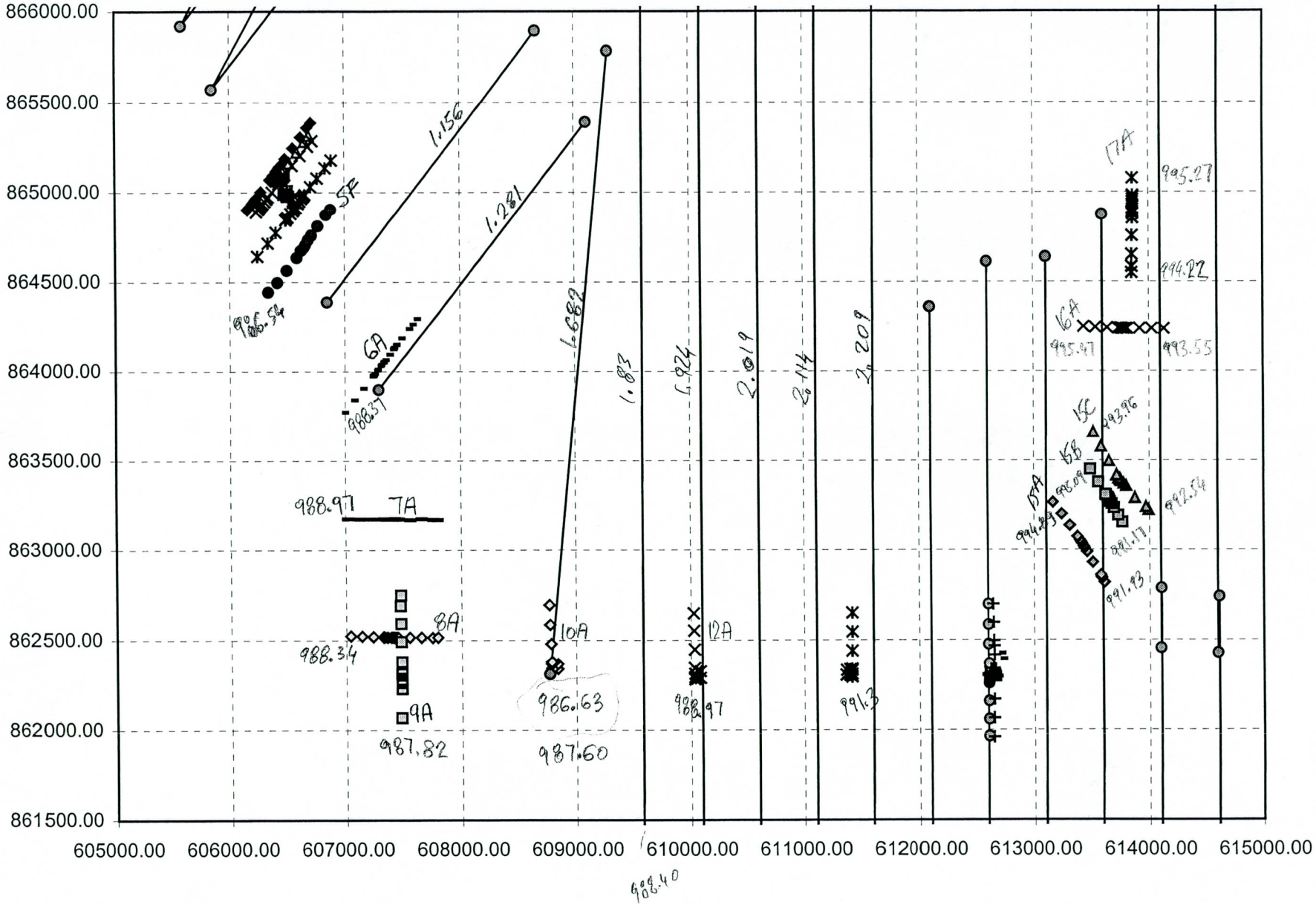
866000.00
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614000.00
615000.00
1.156
1.281
1.682
1.581
1.924
2.019
2.114
2.209
5F
6A
7A
8A
9A
10A
12A
15A
17A
15B
15C
988.54
988.37
988.97
988.34
987.82
986.63
987.60
988.97
991.3
995.27
994.22
995.97
993.55
993.96
992.54
991.93
994.89
991.17
908.40

1326.01

1380.97 1035

```
SF  MARICOPA DRAIN SPLIT FLOW ANALYSIS
      0       0      59       0       0
*
TW  SPLIT FLOW BETWEEN 3.013 AND 3.390
WS     3   3.013   3.108      -1     3.0
WC  1000  995.68    1230   996.1    1500  996.10
TW
WS     3   3.108   3.203      -1     3.0
WC  1000  996.10    1430   996.5    1500  996.70
TW        997.3    997.8
WS     3   3.203   3.296      -1     3.0
WC  1000  996.70    1450    997     1500  997.10
TW          997.8   998.1
WS     3   3.296   3.390      -1     3.0
WC  1000  997.10    1300   998.0    1500  998.40
*
TN  U/S OF BASELINE ROAD-USED NORMAL DEPTH OPTION
NS     2   1.041   1.156      -1    0.02  .00001
NG  1000  984.05    1620  987.45
* NG  1000  984.05    1043  984.05    1253  986.54    1620  987.45
TN  D/S OF BASELINE ROAD-USED NORMAL DEPTH OPTION
NS     2   0.866   1.035      -1    0.02  .00001
NG  1000  984.41    1891  984.35
* NG  1000  984.41    1664  984.16    1696  984.37    1738  983.87    1761  983.93
* NG  1838  984.35    1891  984.35
*
EE
*
```

996.74

997.28

998.10

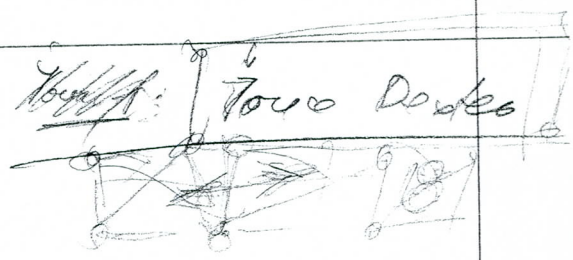
Sensitivity Analysis of Split Flow Option / CASE7.DAT ../SPLIT/...

n	Energy Slope	split Q (cfs)
0.03	0.01	750.95
0.03	0.001	372.34
0.03	0.0001	134.98
0.04	0.01	657.06
0.04	0.0001	102.71
0.02	0.01	867.29

495.04

1.46

0.82



A-1 (1000' D/S of (A))

10000	Right Bank; ~~977~~ 976
10150	976.75
10560	978
10650	980
11000	982

Sensitivity Analysis of Storky WS Elev:

1. new. 977.71; 979.84 0.003 0.0016

2 new (980.3~)

(480) 965-7146

A-2 (420' D/S of (A))

0	Right Bank
50	978
110	978
600	978.6
1080	980

880 978
1040 978

977.83; 978.83; 979.63.

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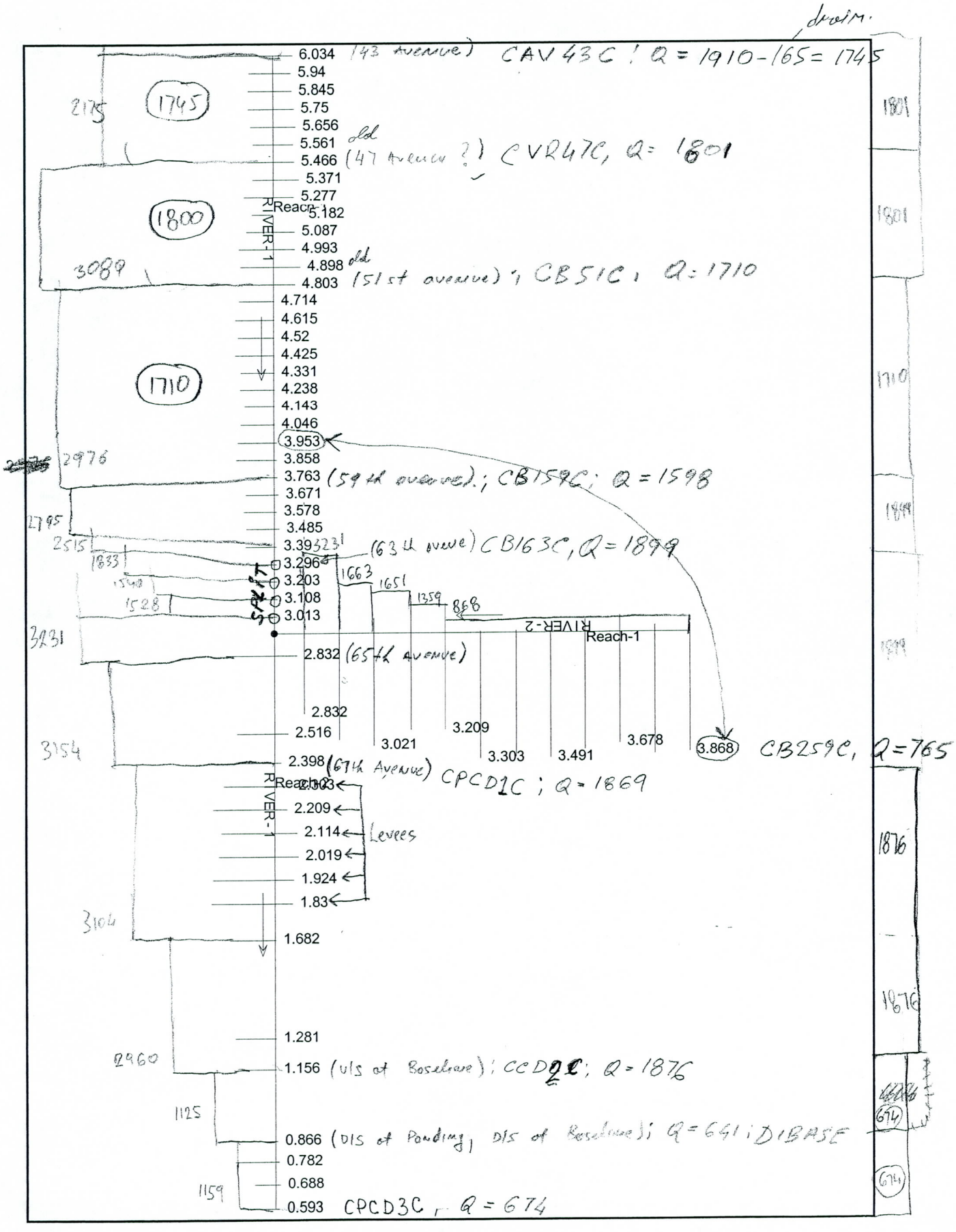
drain.
6.034 (43 Avenue) CAV43C ; Q = 1910-165 = 1745
5.94
5.845
5.75
5.656
5.561
5.466 (47 Avenue ?) CVR47C, Q = 1801
5.371
5.277
5.182
5.087
4.993
4.898
4.803 (51st avenue) ; CB51C , Q = 1710
4.714
4.615
4.52
4.425
4.331
4.238
4.143
4.046
3.953
3.858
3.763 (54th avenue) ; CB154C ; Q = 1598
3.671
3.578
3.485
3.392 (63 A Avenue) CB163C, Q = 1899
3.296
3.203
3.108
3.013
2.832 (65th Avenue)
2.832
2.516
3.021
3.209
3.303
3.491
3.678
3.868 CB259C, Q = 765
2.398 (67th Avenue) CPCD1C ; Q = 1869
2.303
2.209
2.114
2.019
1.924
1.83
1.682
1.281
1.156 (u/s of Baseline) ; CCD2C ; Q = 1876
0.866 (DIS of Ponding) DIS of Baseline) ; Q = 641 ; DIBASE
0.782
0.688
0.593 CPCD3C , Q = 674
Reach-1
RIVER-1
Reach-2
RIVER-2
Levees
1745
1800
1710
2175
3089
2976
2795
2515
1833
1540
1528
3231
3154
3104
2960
1125
1159
1663
1651
1359
868
1801
1899
1876
674

Modeling Approach based on FEMA Guidelines

• Floodplain Delineation - 100-yr

1. Starting WS Elevation

   a) 100-yr floodplain to be tied up with Salt river floodplain. Define one more cross-section.

   b) - normal depth, energy slope
   - Salt river floodplain elevation if coincident peaks are assumed.

   Sensitivity analysis indicate that the model is not sensitive to starting WS E.

2. Ponding Area: Normal floodplain delineation using the flow rates from Hydrology.
   Neglect extended cross-section warnings from HEC-2.

3. Levee;

   Cross sections 1.830 to 2.303 have levee. So two runs should be made with levees and with barbed levees.

   - with levees ⇒ no flow on south side
   - without levees on both side of levees.

4. Split Flow, flow will be reducing in the reaches and it will be increasing ~~in~~ ops on south side.
   Two runs: with levees and without levees.

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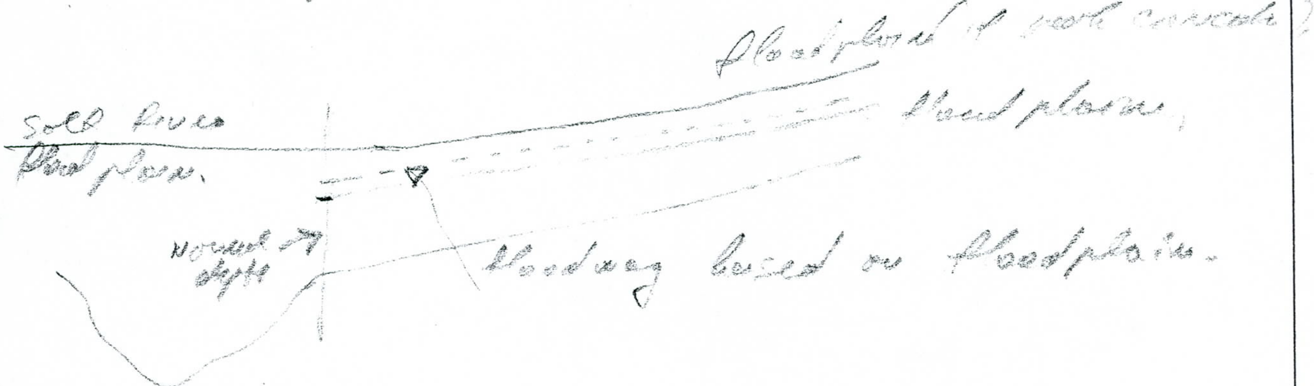
• <u>Floodway Delineation</u>

1. Equal Reduction of conveyance on opposite sides of stream. (Method #4).
   - Check approach to use Method #4 every where, and then go back and change to #1 where needed.

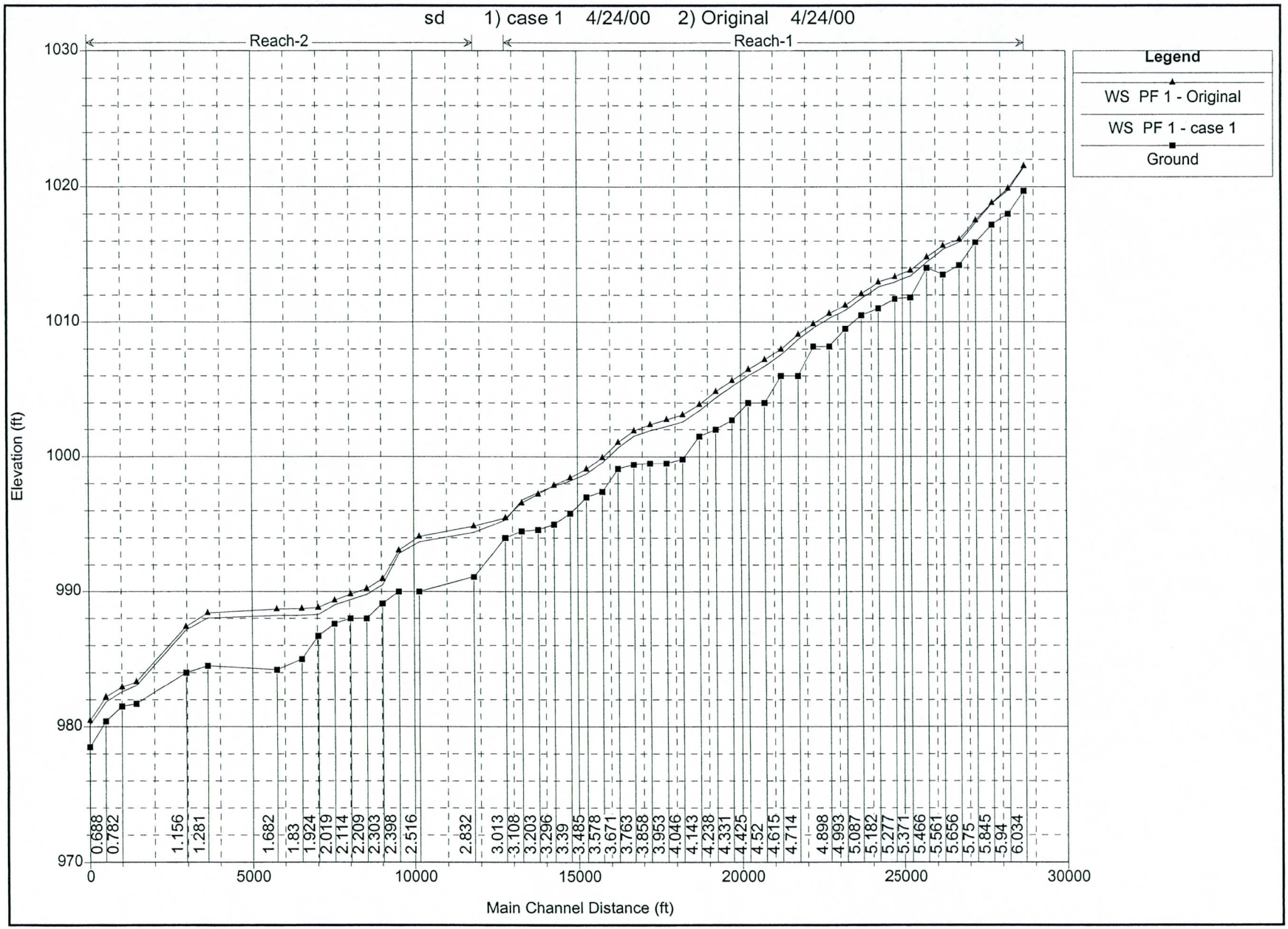
2. Starting Elevation:
   Use the normal depth, new floodplain is different than the original one (using actual Salt River).



3. - Storage Area behind structure:
   Do we need to encroach the ponding area => adjust stage-storage relationship, re-run HEC-1 => may end up with higher flow than the floodplain.
   Probably not to encroach the ponding area.
   - From CBA original, this ponding area and d/s to Salt river is not encroached because encroaching would force additional water to Indian Reservation. So, what?

4. Split flow area to be encroached using method #1.

5. Levees
   - with levees; levee are using method #1
   - without levees; leave as using method #4.

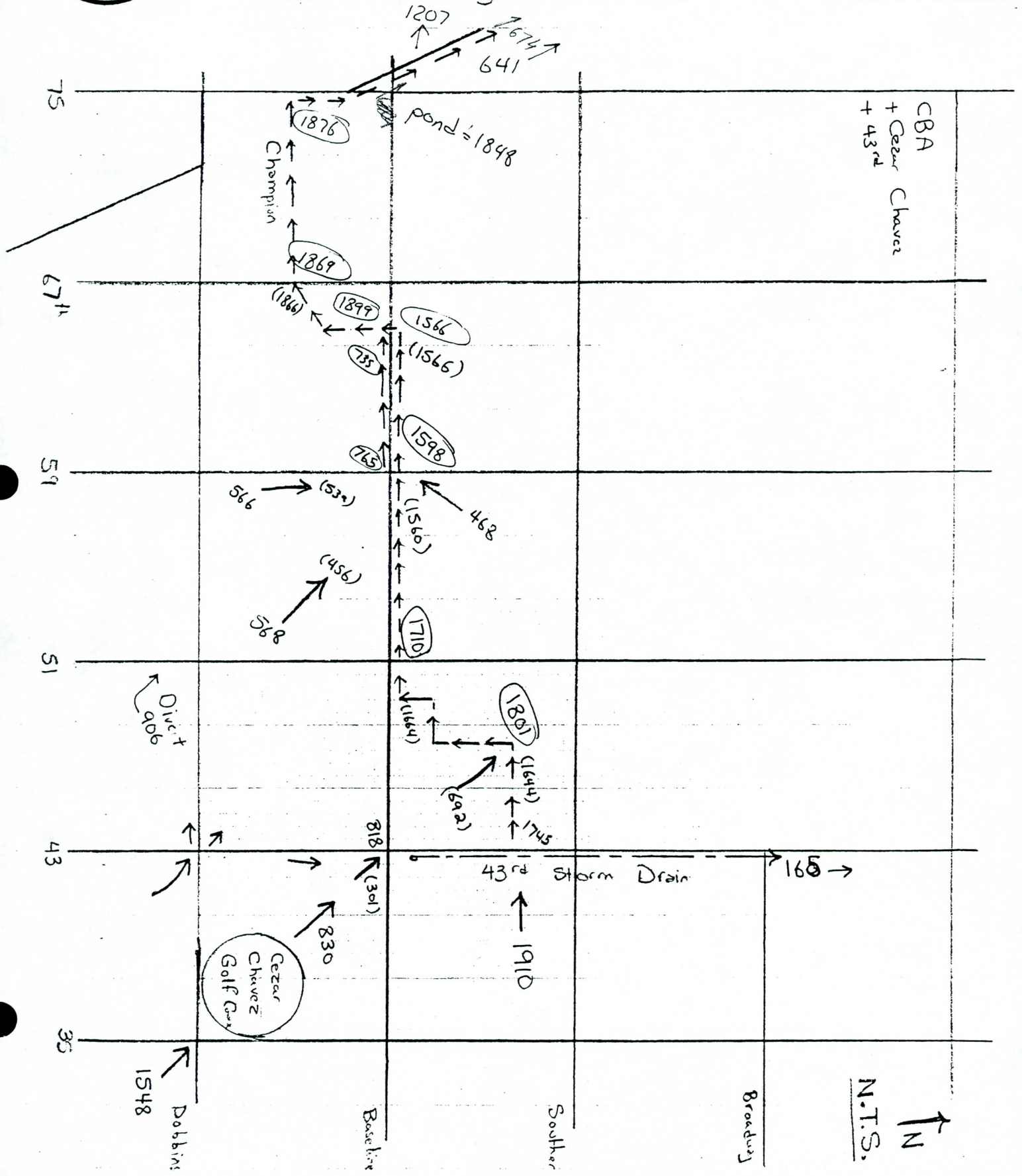

sd 1) case 1 4/24/00 2) Original 4/24/00
Reach-2
Reach-1
Legend
WS PF 1 - Original
WS PF 1 - case 1
Ground
Elevation (ft)
Main Channel Distance (ft)
1030
1020
1010
1000
990
980
970
0
5000
10000
15000
20000
25000
30000
0.688
0.782
1.156
1.281
1.682
1.83
1.924
2.019
2.114
2.209
2.303
2.398
2.516
2.832
3.013
3.108
3.203
3.296
3.39
3.485
3.578
3.671
3.763
3.858
3.953
4.046
4.143
4.238
4.331
4.425
4.52
4.615
4.714
4.898
4.993
5.087
5.182
5.277
5.371
5.466
5.561
5.656
5.75
5.845
5.94
6.034

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

PROJECT Laveen ADMS Update PAGE 3 OF ____

DETAIL Hydrologic Update COMPUTED AMM DATE 3/26/08

Comparison of 100 yr. Flows CHECKED BY ____ DATE ____



Date: 03/18/2000 | ZORAN LAWRENCE

Checking and Verification of HEC-2 model CHAPFDW.DAT

1. The model is re-runned and the results are checked against the WS from the work map. The results are the same, except for cross section 2.209 where the computed value is 990.37 vs 990.38 from work map.
Also, on cross-section 3.868 the computed values are 1001.81 and 1002.64 for floodplain and floodway, respectively, vs 1001.8 and 1002.8 from work map.
In both cases the differences are small, and due to the computational error (I case) or rounding up (II case).

2. The version of HEC-2 used in 1992 is 4.5.1. (September 1990) vs today version of 4.6.2. (May 1991). There are not significant difference noticed.

3. The input file was checked and compared visualy with hard copy of input file presented in Lawrence AMDS Hydraulic report (1992) and no differences were noticed.

4. The cross sections were plotted using PLOT2 interface, and where is specified for any irregularity. No any type of irregularity were found.

Conclusion:

1. The electronic form of model we have is the same one used in 1992 Lawrence AMDS Hydrology study.

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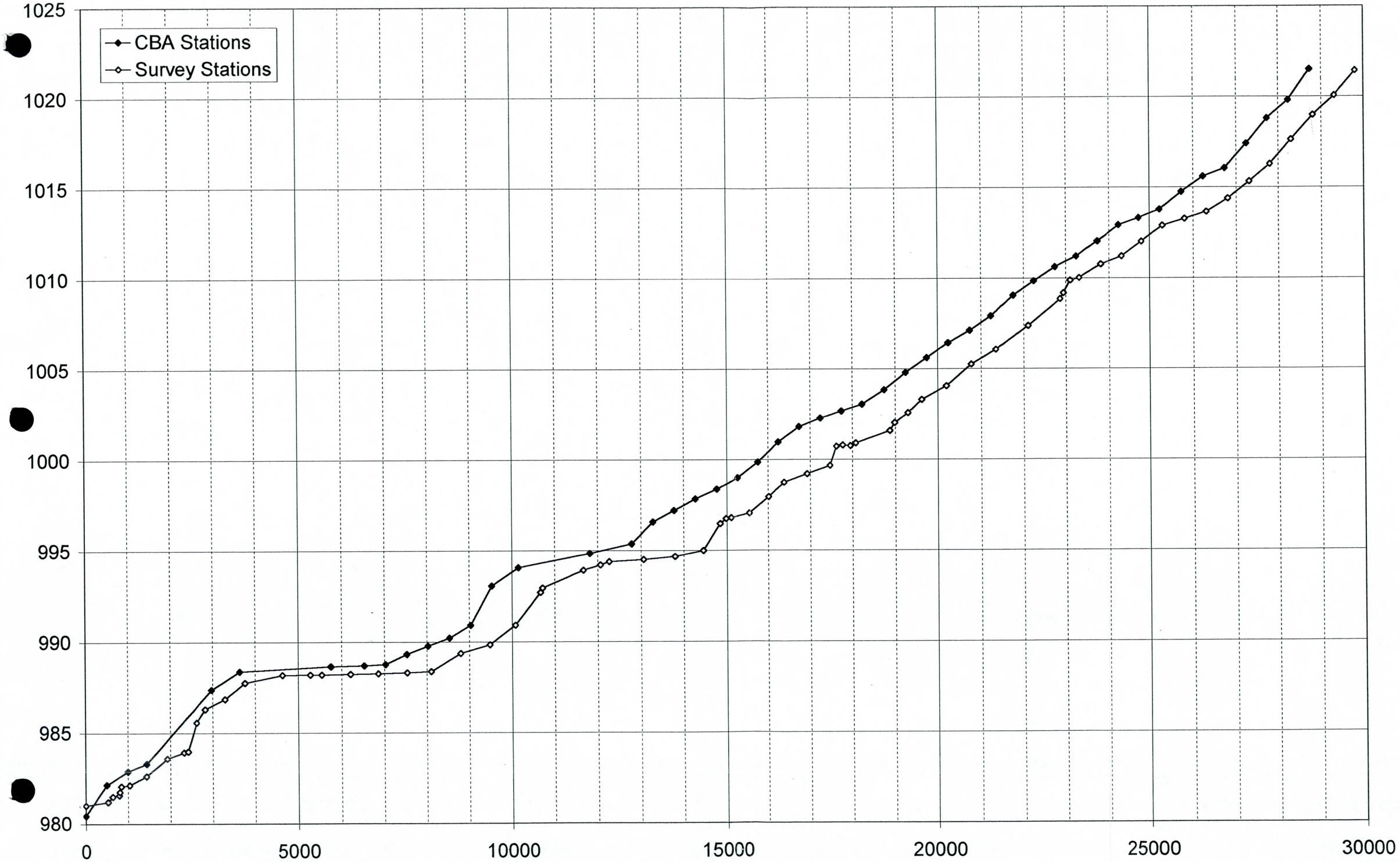
CBA Stations
Survey Stations
1025
1020
1015
1010
1005
1000
995
990
985
980
0
5000
10000
15000
20000
25000
30000

Inspection of photo 01/1999 compare with 1992 work map.

1. around 63th Avenue

2. east of 59th Avenue

3. east of 51st Avenue ~2 square floodplain.

4. The Champion Drain ends earlier.

1. Get As-builds existing ones - City of Phoenix ~8 sub divisi

2. Get the future planned constructions.

3. Areal photos from ~~1992~~ used in 1992

Baseline parking plan.

- east of 43 avenue,
- new structure. salt river; Q= 166000 cfs; W
- quality control

Job # 254A04

Update of Laveen Floodplain Delineation Study.

Phase 1: — 120 days - 30 days = 90 days = 3 months.

- Update hydraulics for Laveen Floodplain Delineat; FCD 89-70. using most developments.
- Hydrology will be revised by the District and given to WEST.
- WEST to need to review the hydrology.
- present in floodplain delineation format to indicate Colored extent of flooding and depths.
- include existing + to be constructed structures.

Phase 2: (need written direction from District). — 180 days = 6 months.

- modify the study to submit to FEMA, and have FEMA incorporate delineation of 5.1 miles of floodplain and floodway delineations into FIRM.

District will supply:

- topographic mapping. ✓ — from 89-70.
- aerial photographs. ✓ — 1999
- field survey data. ✓ — 89-70 + collect survey to
- hydrologic / hydrology data. ✓

WEST:

- delineate floodplains and floodways. (HEC-2)
- prepare Technical Data Notebooks.
- use District Hydrology concentration point's as input to hydraulic study.

Hydraulic part: Phase I:

- update HEC-2 with respect to new development.
- assess the sensitivity of the floodplain to inclusion of Roeroe Drain and its conveyance.
- floodplain.

Phase II:

- HIS data.

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(AD195)

LAVEEN AREA MASTER DRAINAGE STUDY - HYDRAULIC. Rp

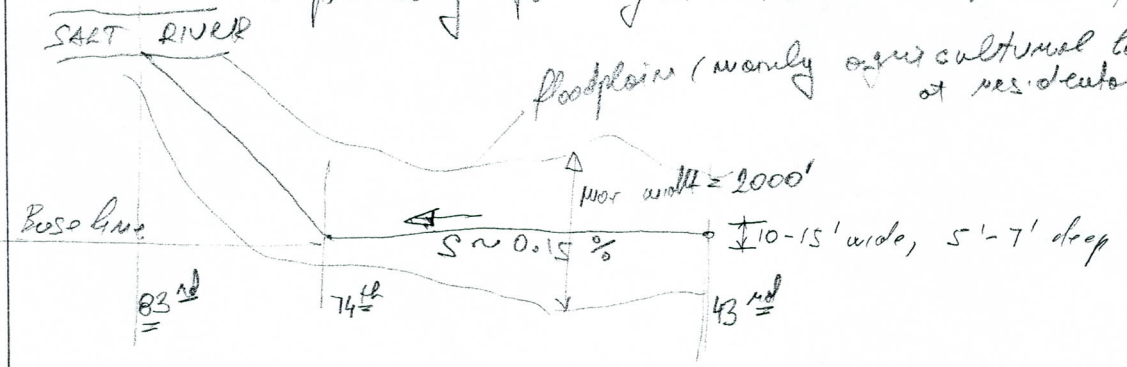
By. CBA, 07/02/92 FOR FCDMC.

CONTRACT No. FCD 89-70.

- 39 mi.² of watershed
- 100-yr. floodplain delineation. base flood elevation.

- Champion Drain from 43rd Avenue to the Salt River. (~83rd)
- Approximate methods for selected areas at the foothills.

- Champion Drive - no capacity remaining for stormwater. ⇒ primary for agricultural uses, not flood protection.



Floods:
- low flow velocity and some ponding.
- ponding at subdivisions (most of Base Line between 67 and 63) + sewer backflows.

Problems:
- shallow and wide flooding - Champion Drain
- ponding behind Western Canal.
- development occurs from the Phoenix Metropol. Area.
- There are no effective flood control measures.

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Hydrologic Analysis:

using HEC-1

"Lovern AMDS" Phase I, Hydrology Report, September 1991.

There is a list of discharges for Long Champion Drain and selected areas of foothills of Salt Mountains..

Hydraulic Analysis:

- 100-yr base flood elevation.
- floodplain boundaries.

using HEC-2:

- 60 cross-sections (ave. dist. 500 ft). from 1" = 400' scale 2-foot contour topographic mapping data fully 1990.
- Baseline Road - major paved internal, is north to four directions.
- Starting WS at CS 0.593., Slope-Area Method.
  Why not existing Salt River WS Elev..
- $n_{channel}$ = 0.03 ÷ 0.045 } approved by District
  $n_{overbank}$ = 0.04 ÷ 0.10. }

Areas of Special Interest:

- 1.156 and 1.682. natural depressed area. ⇒ ponding. 3,500 ft of overspill into Gila river indian. Reserve. Split flow in HEC-2 does not work, and HEC-1 is used.
- Find the work maps. Also the split-flow occurs at Baseline Road.

(-) Include the Maricopa Drain Survey

Sensitivity Analysis is performed for:

1. 20% increase and 20% decrease at Manning's "n".

2. Ungraded and new flow rates.

3. Starting WSE manual vs. auto cal.

No major differences were noted.

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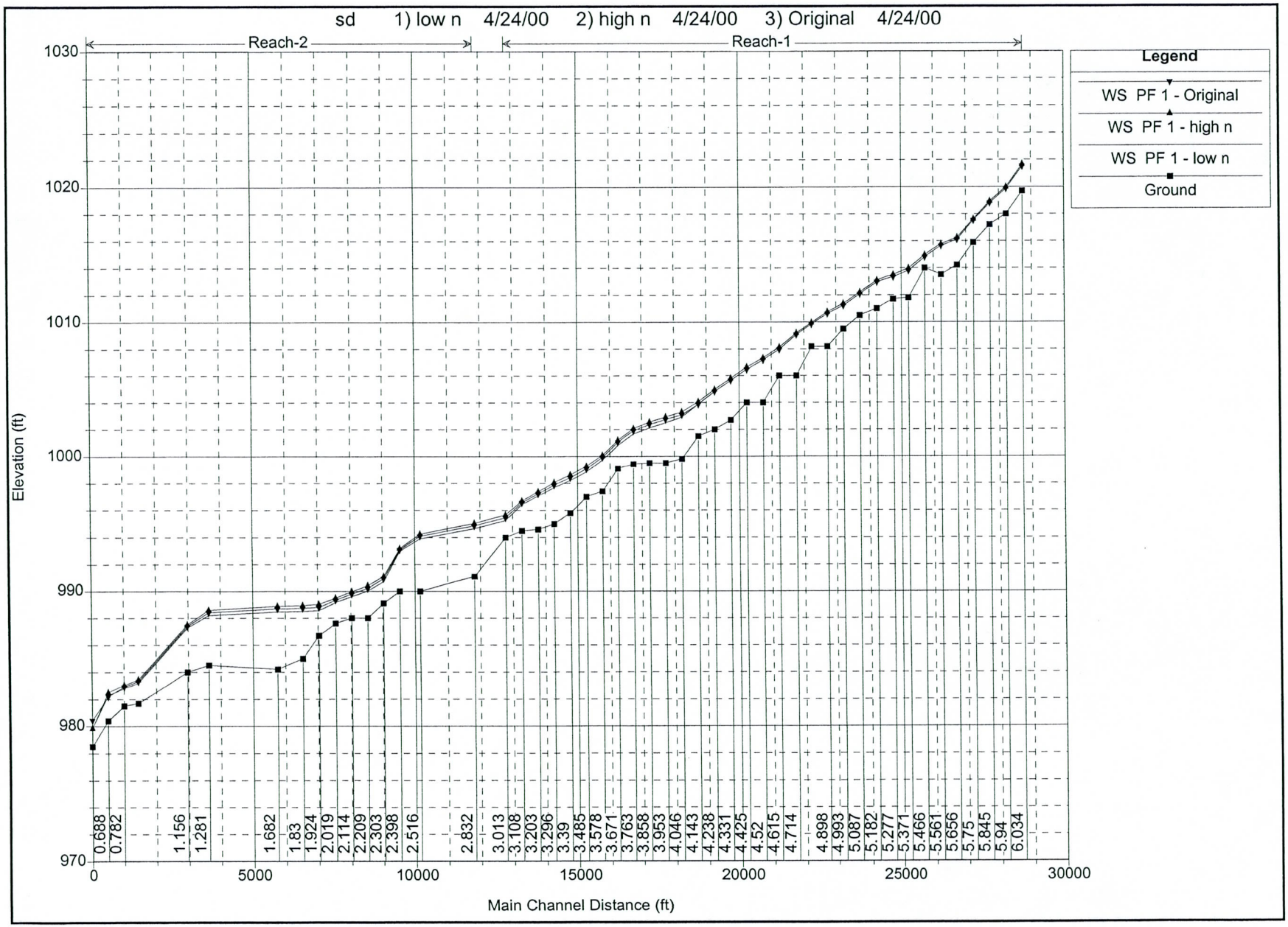
sd 1) low n 4/24/00 2) high n 4/24/00 3) Original 4/24/00
Reach-2
Reach-1
Legend
WS PF 1 - Original
WS PF 1 - high n
WS PF 1 - low n
Ground
Elevation (ft)
Main Channel Distance (ft)
1030
1020
1010
1000
990
980
970
0
5000
10000
15000
20000
25000
30000
0.688
0.782
1.156
1.281
1.682
1.83
1.924
2.019
2.114
2.209
2.303
2.398
2.516
2.832
3.013
3.108
3.203
3.296
3.39
3.485
3.578
3.671
3.763
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3.953
4.046
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4.238
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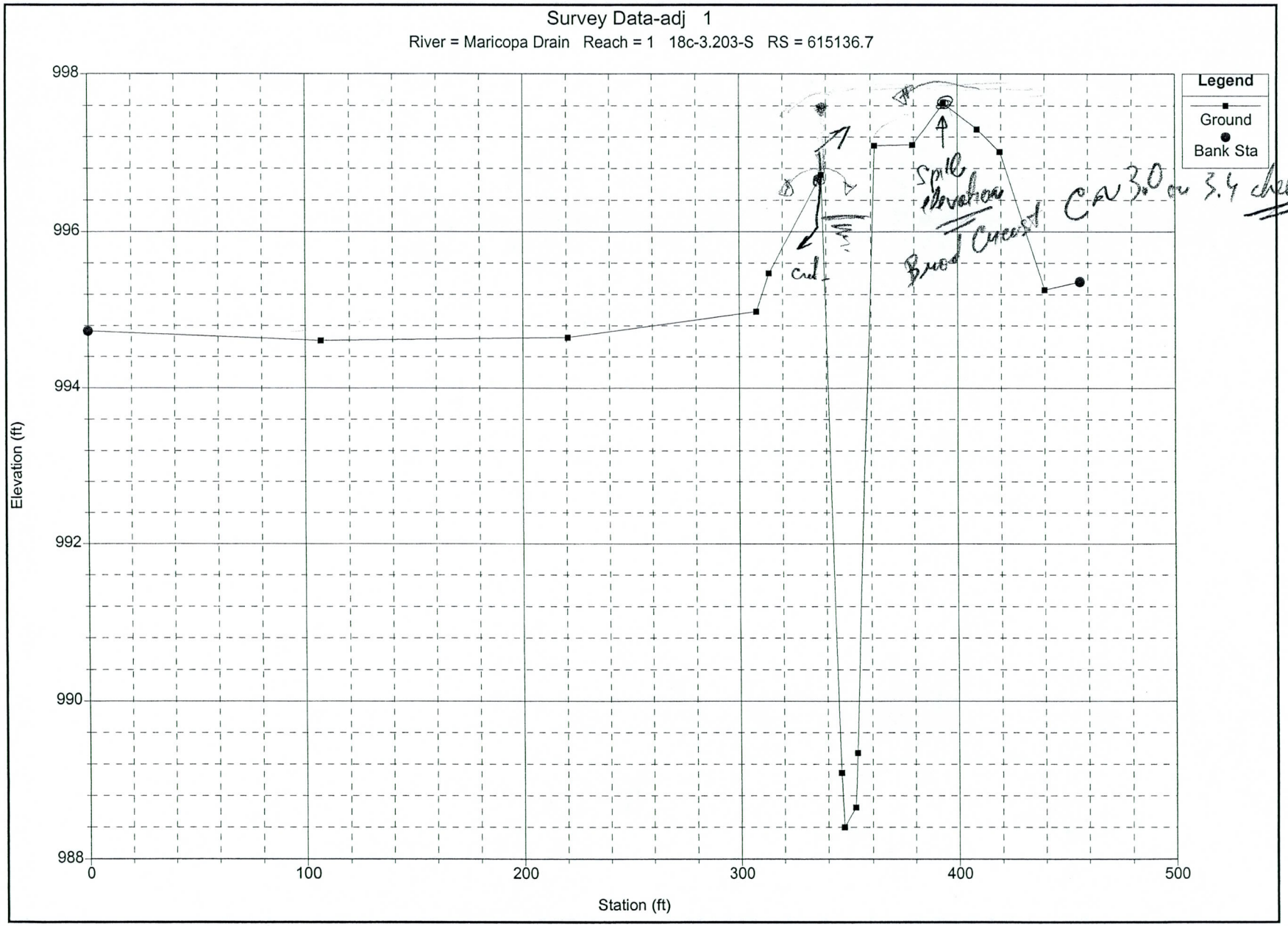
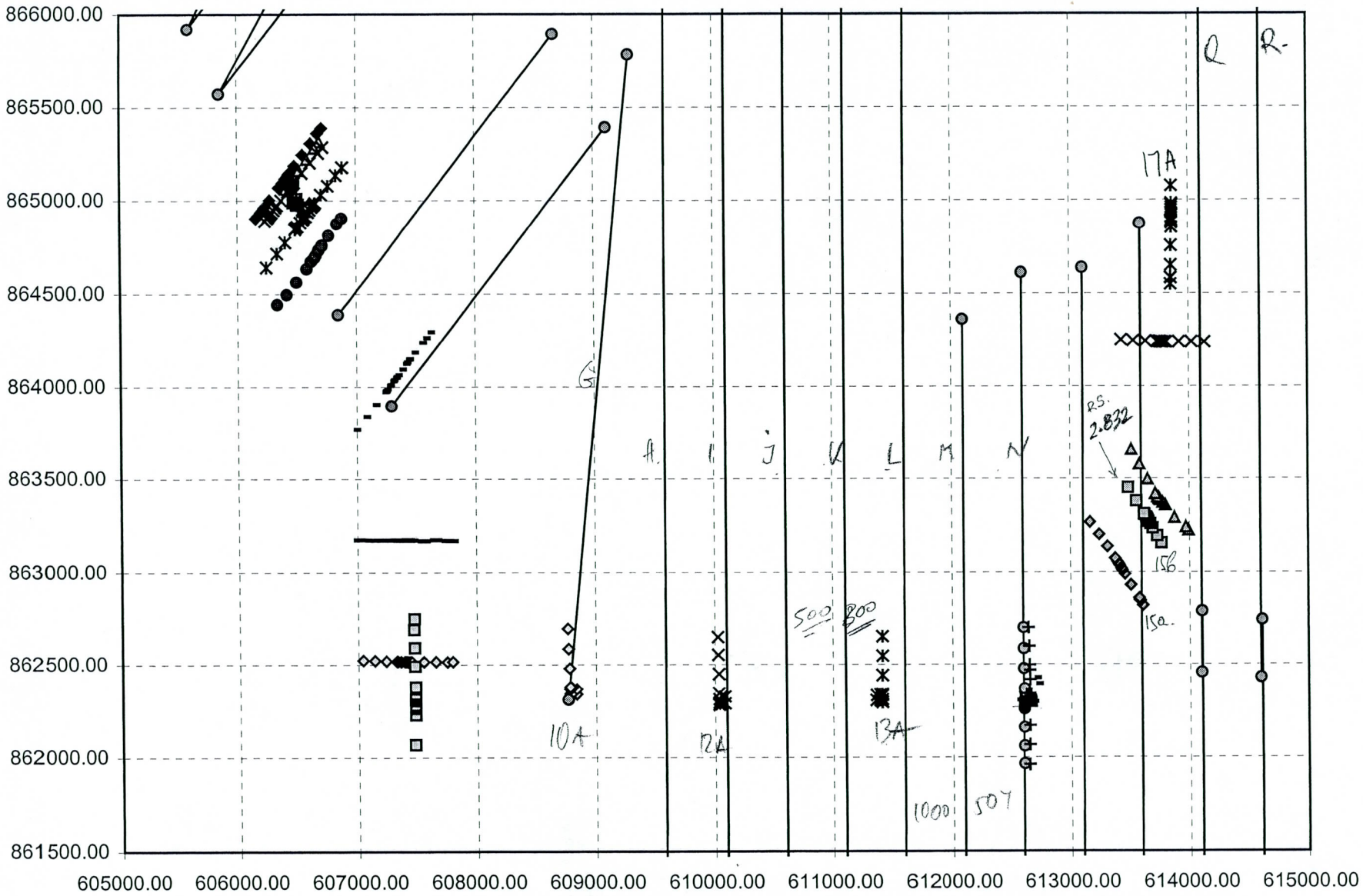
5.94
6.034


Survey Data-adj 1
River = Maricopa Drain Reach = 1 18c-3.203-S RS = 615136.7
Legend
Ground
Bank Sta
Elevation (ft)
998
996
994
992
990
988
0
100
200
300
400
500
Station (ft)
Spill Elevation
Broad Crest
Crest
C=W 3.0 or 3.4 check?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612000.00
613000.00
614000.00
615000.00
A
I
J
K
L
M
N
Q
R
17A
RS.
2.832
15b
15a
10A
12A
13A
500
800
1000
507

0.593 - A 2A

0.688 - B 3A

0.782 - C } interpolate → 4C and 5A

0.866 - D

1.156 - E 5F and 6A

1.281 - F 6A

1.682 - G 10A

1.830 - H 10A/12A

1.924 - I 12A

2.019 - J inter.

2.114 - K inter. → 13A

2.209 - L inter.

2.383 - M inter.

2.398 - N 14A, 14B, 14C, 14D → out

2.516 - O interpol 15A

2.832 - P 15B

3.013 - Q/BA (2.926) 17A

3.108 - R/BB (3.021) interpl.; 17A/18A.

3.203 - S/BC (3.131) 18C — Same.

3.296 - T/BD (3.209) ~~18E, 18D,~~ 18C, ~~18B~~ 18C/19A

3.390 - U/BE (3.303) ~~18A/18A~~ 19A

3.485 - V/BF (3.398) ~~19A~~ → 19C

3.578 - W/BG (3.491) ~~19C~~ 19C/20A

3.671 - X/BH (3.584) ~~19C/20A~~ 20A, 20B

Same.

3.763 - Y/BI (3.678) ~~20A, 20B~~ 20F — Same.

3.858 - Z/BJ (3.773) ~~20F~~ 20G/21D

3.953 - AA/BK (3.868) ~~20G/21D~~ 21D, 21

4.046 - AB ~~21D, 21A~~ 21B/21

4.143 - AC ~~21B/21C~~ 21C/22A

4.238 - AD ~~21B~~ 21C 21C/22A

4.331 - AE ~~21C~~ 21C/22A

4.425 - AF 22A ✓

4.520 - AG 23B/22A

4.615 - AH 23B/22A

4.714 - AI 23A

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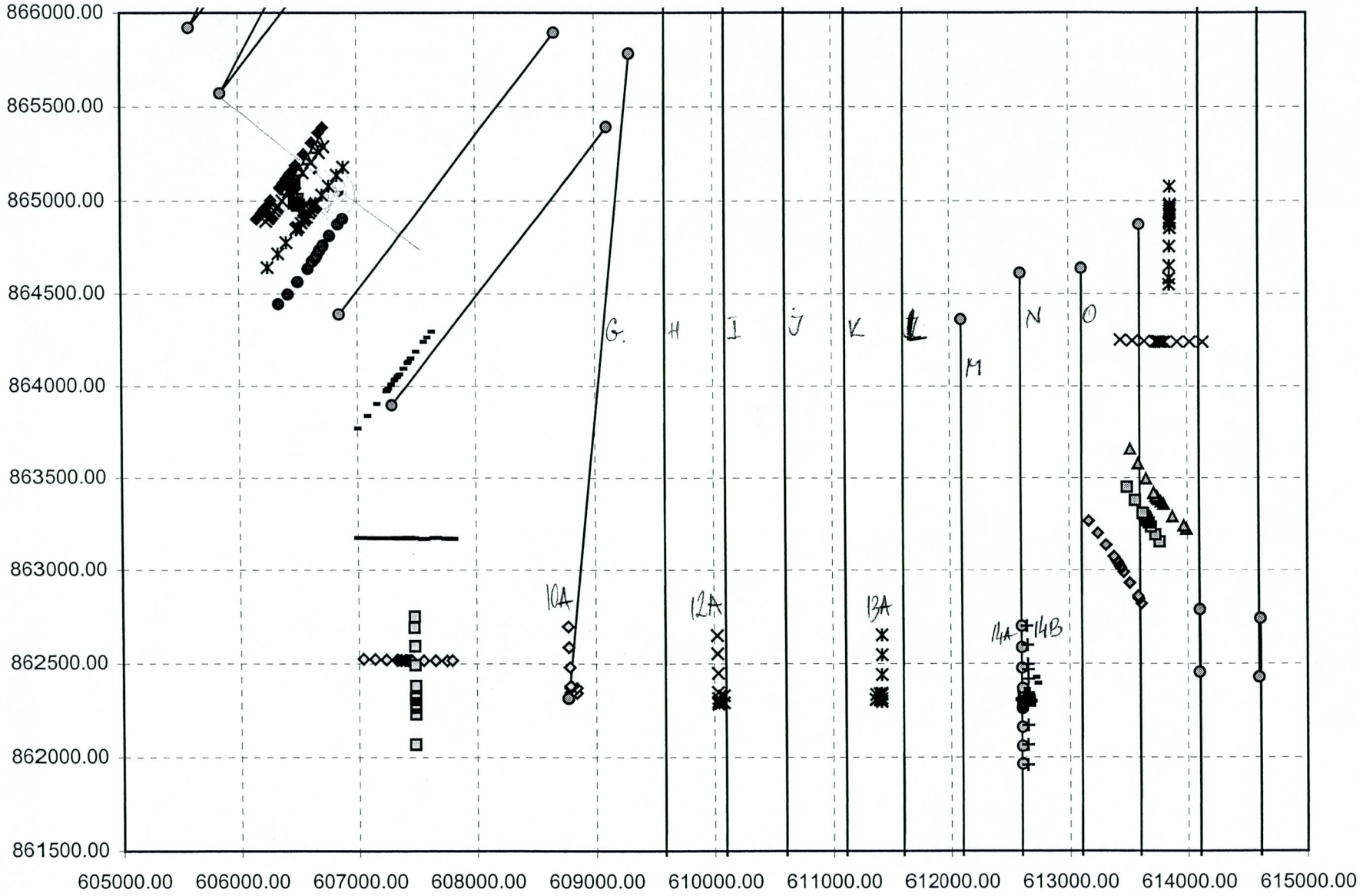
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G
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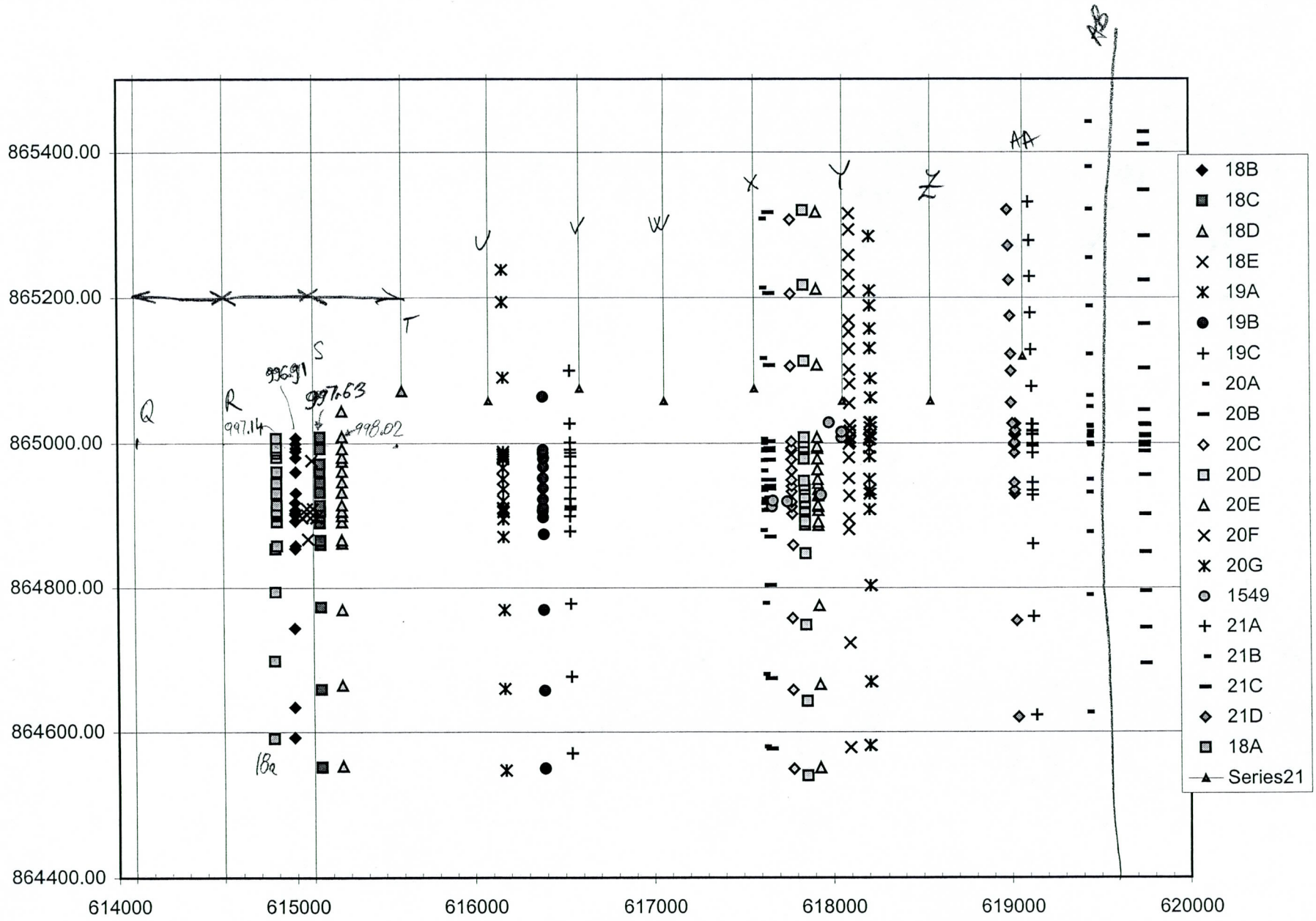
K
L
M
N
O
10A
12A
13A
14A
14B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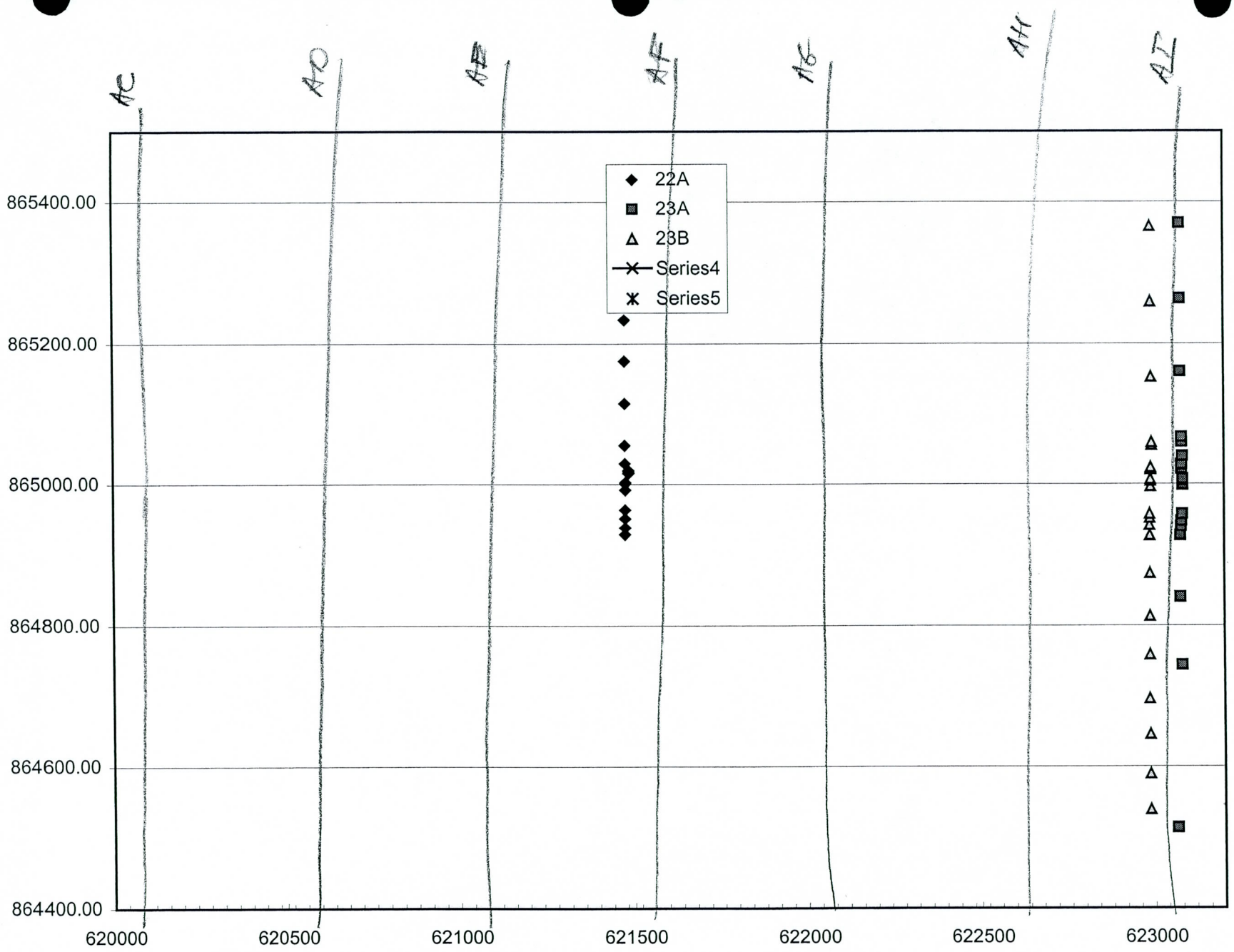
620000
Q
R
S
T
U
V
W
X
Y
Z
AA
BB
997.14
998.02
18B
18C
18D
18E
19A
19B
19C
20A
20B
20C
20D
20E
20F
20G
1549
21A
21B
21C
21D
18A
Series21


AC
AD
AE
AF
AG
AH
AI
22A
23A
23B
Series4
Series5
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864600.00
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620000
620500
621000
621500
622000
622500
623000

A	604912	866666
	606775	868178
B	605273	866306
	607087	867806
C	605585	865921
	607412	867410
D	605850	865573
	607688	867074
E	606847	864389
	608665	865894
F	607290	863899
	609107	865392
G	608768	862313
	609300	865784
H	609581	860005
	609596	866422
I	610098	860005
	610098	866333
J	610601	860005
	610601	866407
K	611104	860020
	611104	866422
L	611592	859976
	611606	866422
M	612097	860003
	612095	864362
N	612593	860011
	612596	864612
O	613096	860019
	613109	864639
P	613592	859986
	613596	864875
Q	614097	862455
	614097	866362
R	614597	862429
	614597	866348
S	615098	862403
	615098	866348
T	615595	865072
	615595	870308
U	616085	865058
	616085	870240
V	616592	865075
	616575	870240
W	617065	865058
	617082	870189
X	617572	865075
	617572	870189
Y	618062	865058

13e

12e

	618062	870139
Z	618552	865058
	618552	870240
AA	619069	865120
	619066	870301
AB	619546	857960
	619543	870284
AC	620066	857946
	620063	870287
AD	620571	857960
	620568	870315
AE	621063	857904
	621060	870287
AF	621554	857988
	621551	870329
AG	622060	857932
	622043	870329
AH	622551	857876
	622548	870315
AI	623071	857876
	623068	870357
AJ	623295	866326
	623267	868827
AK	623871	865022
	623422	868051
AL	625051	862758
	623408	869245
AM	625261	864964
	623450	869259
AN	626090	865006
	623534	869259
AO	627129	865090
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AP	626764	866383
	624068	869413
AQ	627008	866850
	624242	870006
AR	627120	867229
	624761	870357
AS	627654	867075
	625562	870721
AT	628075	867047
	626320	870876
AU	628482	867425
	626783	871072
AV	628876	867678
	627303	871086

AW	628482	869462
	628454	871874
BA	614102	860054
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BB	614608	860084
	614608	862742
BC	615099	860054
	615099	862698
BD	615590	857730
	615590	862312
BE	616095	857700
	616095	862356
BF	616586	857685
	616586	862356
BG	617077	857682
	617077	862341
BH	617567	857670
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BI	618058	857640
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BJ	618549	857685
	618549	862341
BK	619055	857700
	619040	862356

APPENDIX F

EROSION AND SEDIMENTATION TRANSPORT ANALYSIS SUPPORTING DOCUMENTATION

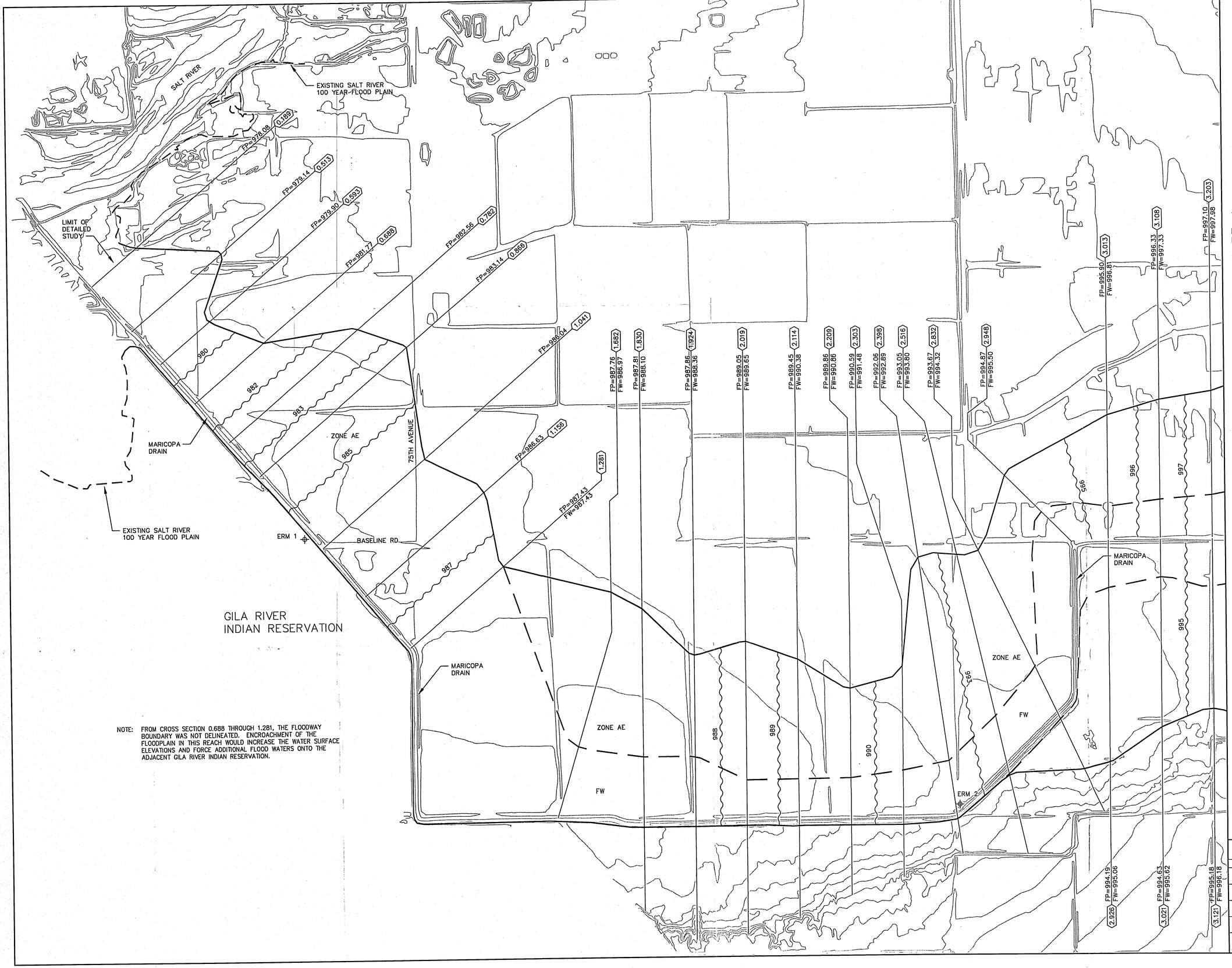
(NOT APPLICABLE)

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

PRELIMINARY

LAVEEN HYDRAULIC UPDATE
WORK MAP
WITH LEVEE SCENARIO

F.C.D. CONTRACT NO. 1999C048
ASSIGNMENT NO. 4



NOTE: FROM CROSS SECTION 0.688 THROUGH 1.281, THE FLOODWAY BOUNDARY WAS NOT DELINEATED. ENCROACHMENT OF THE FLOODPLAIN IN THIS REACH WOULD INCREASE THE WATER SURFACE ELEVATIONS AND FORCE ADDITIONAL FLOOD WATERS ONTO THE ADJACENT GILA RIVER INDIAN RESERVATION.

LEGEND

REVISED 100-YR FLOODPLAIN BOUNDARY	———
EXISTING 100-YR FLOODPLAIN BOUNDARY	– – – –
CROSS SECTION	FP = 100 YR WSE / FW = FLOODWAY WSE (2)
BASE FLOOD ELEVATIONS	1224
ZONE DESIGNATIONS	ZONE AE

ELEVATION REFERENCE MARKS

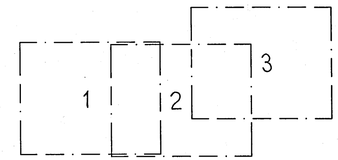
ERM 1 [ELEVATION = 984.13]
ALUMINUM CAP IN CONCRETE AT THE N.W. FENCE CORNER OF S.R.P. WELL SITE LOCATED AT THE N.W. CORNER OF BASELINE ROAD AND MARICOPA DRAIN.

ERM 2 [ELEVATION = 993.27]
ALUMINUM CAP IN CONCRETE AT SOUTH END OF CONCRETE IRRIGATION CANAL LOCATED 0.5 MILES SOUTH OF BASELINE ROAD AND ROUGHLY 175 FEET WEST OF 67TH AVENUE EXTENDED.

NOTES

ALL ELEVATIONS BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

INDEX MAP



400' 0' 400' 800'
SCALE: 1" = 400'
VERTICAL CONTOUR INTERVAL = 2 FEET

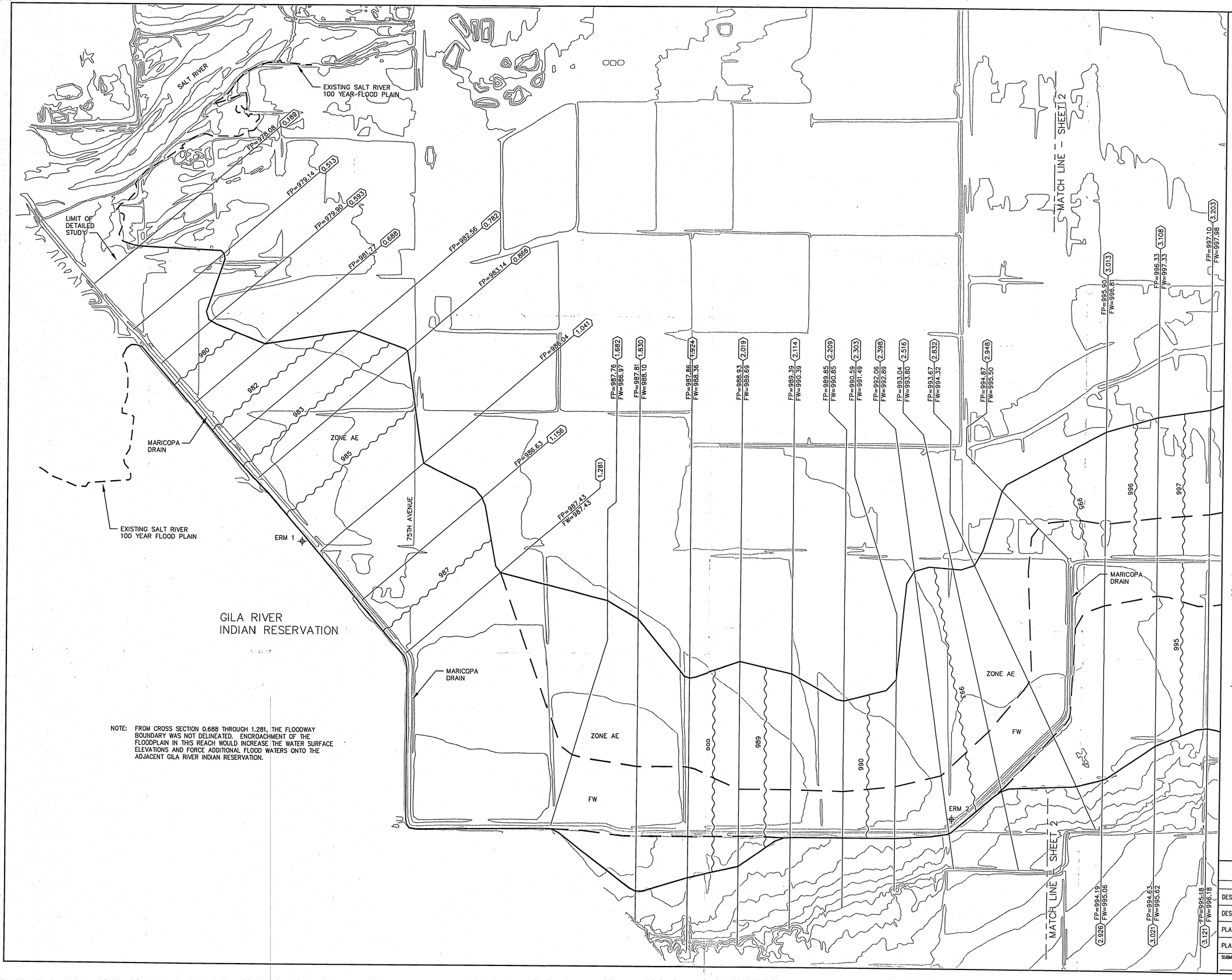
WEST Consultants, Inc.

	BY	DATE
DESIGN	---	---
DESIGN CHECK	---	---
PLANS	JEH	02/00
PLANS CHECK	DLR	02/00

SUBMITTED BY: DATE

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
RECOMMENDED BY: DATE
APPROVED BY: DATE
CHIEF ENGINEER AND GENERAL MANAGER

SHEET **1A** OF **3**



NOTE: FROM CROSS SECTION 0.688 THROUGH 1.281, THE FLOODWAY BOUNDARY WAS NOT DELINEATED. ENCROACHMENT OF THE FLOODPLAIN IN THIS REACH WOULD INCREASE THE WATER SURFACE ELEVATIONS AND FORCE ADDITIONAL FLOOD WATERS ONTO THE ADJACENT GILA RIVER INDIAN RESERVATION.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

PRELIMINARY

LAVEEN HYDRAULIC UPDATE
WORK MAP
NO LEVEE SCENARIO

F.C.D. CONTRACT NO. 1999C048
ASSIGNMENT NO. 4

LEGEND

REVISED 100-YR FLOODPLAIN BOUNDARY

EXISTING 100-YR FLOODPLAIN BOUNDARY

CROSS SECTION — FP = 100 YR WSE / FW = FLOODWAY WSE (2)

BASE FLOOD ELEVATIONS — 1224

ZONE DESIGNATIONS — ZONE AE

ELEVATION REFERENCE MARKS

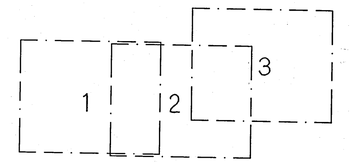
ERM 1 [ELEVATION = 984.13]
ALUMINUM CAP IN CONCRETE AT THE N.W. FENCE CORNER OF S.R.P. WELL SITE LOCATED AT THE N.W. CORNER OF BASELINE ROAD AND MARICOPA DRAIN.

ERM 2 [ELEVATION = 993.27]
ALUMINUM CAP IN CONCRETE AT SOUTH END OF CONCRETE IRRIGATION CANAL LOCATED 0.5 MILES SOUTH OF BASELINE ROAD AND ROUGHLY 175 FEET WEST OF 67TH AVENUE EXTENDED.

NOTES

ALL ELEVATIONS BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

INDEX MAP



N

400' 0' 400' 800'

SCALE: 1" = 400'

VERTICAL CONTOUR INTERVAL = 2 FEET

WEST Consultants, Inc.

	BY	DATE
DESIGN	---	---
DESIGN CHECK	---	---
PLANS	JEH	02/00
PLANS CHECK	DLR	02/00

SUBMITTED BY: _____ DATE

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: _____ DATE

APPROVED BY: _____ DATE
CHIEF ENGINEER AND GENERAL MANAGER

SHEET **1B** OF **3**

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

PRELIMINARY

LAVEEN HYDRAULIC UPDATE
WORK MAP

F.C.D. CONTRACT NO. 1999C048
ASSIGNMENT NO. 4

LEGEND

REVISED 100-YR FLOODPLAIN BOUNDARY

EXISTING 100-YR FLOODPLAIN BOUNDARY

CROSS SECTION — FP = 100 YR WSE, FW = FLOODWAY WSE (2)

BASE FLOOD ELEVATIONS — 1224

ZONE DESIGNATIONS — ZONE AE

ELEVATION REFERENCE MARKS

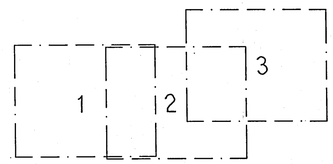
ERM 2 [ELEVATION = 993.27]
ALUMINUM CAP IN CONCRETE AT SOUTH END OF CONCRETE IRRIGATION CANAL LOCATED 0.5 MILES SOUTH OF BASELINE ROAD AND ROUGHLY 175 FEET WEST OF 67TH AVENUE EXTENDED.

ERM 3 [ELEVATION = 1001.25]
A.D.O.T. ALUMINUM CAP IN CONCRETE ROUGHLY 60 FEET EAST ADN 60 FEET SOUTH OF THE EASTERLY INTERSECTION OF 59TH AVENUE AND BASELINE ROAD BY TRANSMISSION POLE #25. CAP IS STAMPED "BM SWL NO.25 1986".

NOTES

ALL ELEVATIONS BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

INDEX MAP



400' 0' 400' 800'
SCALE: 1" = 400'
VERTICAL CONTOUR INTERVAL = 2 FEET

WEST Consultants, Inc.

	BY	DATE
DESIGN	---	---
DESIGN CHECK	---	---
PLANS	JEH	02/00
PLANS CHECK	DLR	02/00

SUBMITTED BY: DATE

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
RECOMMENDED BY: DATE
APPROVED BY: DATE
CHIEF ENGINEER AND GENERAL MANAGER

SHEET 2 OF 3

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

PRELIMINARY

LAVEEN HYDRAULIC UPDATE
WORK MAP

F.C.D. CONTRACT NO. 1999C048
ASSIGNMENT NO. 4

LEGEND

REVISED 100-YR FLOODPLAIN BOUNDARY

EXISTING 100-YR FLOODPLAIN BOUNDARY

CROSS SECTION — FP = 100 YR WSE / FW = FLOODWAY WSE (2)

BASE FLOOD ELEVATIONS — 1224

ZONE DESIGNATIONS — ZONE AE

ELEVATION REFERENCE MARKS

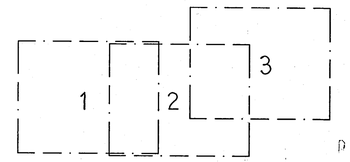
ERM 3 [ELEVATION = 1001.25]
A.D.O.T. ALUMINUM CAP IN CONCRETE ROUGHLY 60 FEET EAST ADN 60 FEET SOUTH OF THE EASTERLY INTERSECTION OF 59TH AVENUE AND BASELINE ROAD BY TRANSMISSION POLE #25. CAP IS STAMPED "BM SWL NO.25 1986".

ERM 4 [ELEVATION = 1010.26]
BRASS CAP IN HANDHOLE AT INTERSECTION OF BASELINE ROAD AND 51ST AVENUE.

NOTES

ALL ELEVATIONS BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

INDEX MAP



400' 0' 400' 800'
SCALE: 1" = 400'
VERTICAL CONTOUR INTERVAL = 2 FEET

WEST Consultants, Inc.

	BY	DATE
DESIGN	---	---
DESIGN CHECK	---	---
PLANS	JEH	02/00
PLANS CHECK	DLR	02/00

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
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CHIEF ENGINEER AND GENERAL MANAGER

SUBMITTED BY: _____ DATE

SHEET **3** OF **3**

FLOOD PROFILES

LAVEEN FLOODPLAIN

ELEVATION IN FEET (NGVD 88)

1040
1030
1020
1010
1000
990
980
970
960
950

NORTH REACH

SOUTH REACH

0.189 0.866 1.041 1.281 1.682 1.924 2.209 2.516 3.013 3.108 3.390 3.671 4.046 4.238 4.520 4.803 5.087 5.277 5.750 6.034

2.832 3.021 3.303 3.491 3.678 3.868

LEGEND

- 100–YEAR FLOODPLAIN
- 100–YEAR FLOODWAY
- STREAM BED
- ### CROSS SECTION LOCATION

0 3000 6000 9000 12000 15000 18000 21000 24000 27000 30000 33000 36000 39000

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH SALT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COMMUNITY OF LAVEEN, ARIZONA
MARICOPA COUNTY