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Geologic Report (Final)  
RWCD Floodway - Reach 6  
Contract No. E10101276000  
for  
Greiner Engineering Sciences  
Job No. 2125J108



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November 25, 1985

Attn: Mr. Michael S. Shapiro  
Project Manager

Re: Geologic Report (Final)  
RWCD Floodway - Reach 6  
Contract No. E10101276000

Job No. 2125J108

Our final geologic report for the above project is attached. The work was performed according to our contract dated April 15, 1985.

Thirty-two backhoe test pits were excavated along the alignment at the locations shown on the accompanying plan sheets. During exploration, subsoils were examined visually and sampled at selected intervals. The field investigation was conducted from May 13 to May 22, 1985. Field engineering services were performed by Steve Myers. All samples were shipped to the SCS Soil Mechanics Laboratory in Lincoln, Nebraska on May 28, 1985.

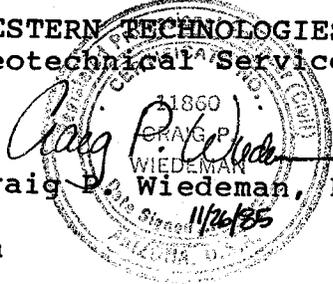
Soils along the alignment consisted primarily of clayey sands and sandy clays with varying degrees of calcite cementation. All data developed during the field investigation is included hereinafter. Field and office geology information was provided by Steve Myers and Mike Dennis. The report was prepared by Craig Wiedeman and reviewed by Ken Ricker and John Rosner.

Greiner Engineering Sciences, Inc.  
Job No. 2125J108

This final geologic report completes the Phase II services for this project. If you have any questions concerning this information, please do not hesitate to contact us.

Sincerely,

WESTERN TECHNOLOGIES INC.  
Geotechnical Services

  
Craig P. Wiedeman, P.E.

  
Reviewed by: Kenneth L. Ricker, P.E.

jh

Copies to: Addressee (8)



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## INTRODUCTION

This report contains the results of our geologic investigation for the proposed RWCD Floodway - Reach 6 located along the existing Roosevelt Irrigation Canal between Brown Road and Broadway Road in Maricopa County, Arizona. The purpose of these services is to provide the following information:

- Regional geology
- Site geology
- Geologic hazards
- Erosion stability
- All on-site investigational data and information
- Recorded logs of investigations
- Plan sheets showing the locations of all test pits
- Stratigraphic unit profile

Geotechnical investigations for the roadway crossing structures at Brown Road, University Drive, Higley Road/Apache Trail and Broadway Road were previously performed by others. These structures were therefore not included as part of this investigation.

## PROPOSED CONSTRUCTION

Reach 6 will start approximately 300 feet north of Brown Road (Sta. 29+45) and will extend to the existing structure at Broadway Road (Sta. 156+00). The floodway will run parallel to the east side of the existing Roosevelt Irrigation Canal. New roadway crossings will be (or have been) designed at Brown Road and Higley Road/Apache Trail. The existing bridge structure at University Drive will remain. The bottom width of the floodway will vary from 26 feet to 110 feet with 3:1 side slopes (horizontal:vertical)



along a majority of the reach and 2:1 side slopes near the structures. The design flow for this reach will vary from 300 to 2400 cfs with a maximum flow depth of 7.5 feet. Average invert slope is anticipated to be 0.00015 ft/ft with maximum slopes of 0.0035 ft/ft from Sta. 122+00 to Sta. 127+00 and 0.0053 ft/ft at Broadway Road Bridge. Sta. 122+00 to 127+00 is the area of the Higley Road/Apache Trail roadway crossings. A permanent crossing structure is presently being designed for this area. The proposed canal at Broadway Road Bridge will have 2:1 side slopes and a 30-foot bottom width.

#### SITE CONDITIONS

At the time of the field investigation, a majority of the reach had been cleared and some grading and excavation had taken place. Following is a detailed description of site conditions recorded during the field investigation:

Sta. 29+70 to Brown Road: Within a fenced area which has been leveled and cleared of weeds. Immediately north of Sta. 29+70 are several masonry houses in good condition. A wood frame house is located just east of Sta. 33+50. Several small to moderate sized trees exist between the fence and Brown Road. The existing pavement on Brown Road is of unknown thickness but appears to be in good condition (2 lanes wide at this location). An orange grove is west of the RWCD Canal.

Brown Road to Sta. 45+50: East of the baseline of the floodway was an orange grove which has been cleared (numerous pits contained roots of the trees). In places, weeds have grown back moderately heavy. A dirt road is located approximately 80 feet west of the baseline and extends from Brown Road to University Drive. Another dirt road exists approximately 10 feet west of



the first road and parallels the RWCD canal. These roads are separated by an unlined ditch 10 feet wide and 6 feet deep (dry and weed choked at the time of investigation). Another road is located immediately west of the canal and also extends along the entire length of the canal. An orange grove is located west of the canal.

Sta. 45+50 to 46+00: Same as above except for several fill piles and some debris approximately 75 feet west of the baseline of the floodway.

Sta. 46+00 to 59+00: More cleared orange groves with varying degrees of returning weeds. A 3 to 4 foot high dirt berm runs along the east edge of the powerline road. More orange groves exist to the west (west of the RWCD canal).

Sta. 59+00 to 69+00: A small drainage cut approximately 1 to 2 feet deep and approximately 50 feet wide is located approximately 10 feet east of the baseline of the floodway to 40 feet west of the floodway. East of the baseline is a cleared orange grove with heavy weeds and large fill and debris piles. At Sta. 61+00 and Sta. 63+00, the retention basin has been filled with fill piles and debris. South of this blockage the basin becomes slightly deeper (2 to 3 feet). At the end of the retention basin a large fill stockpile is located approximately 100 feet east of the floodway baseline.

Sta. 69+00 to 76+00: Large fill stockpile approximately 100 feet east of the baseline of the floodway with a narrow cut immediately west of it from Sta. 70+00 to 71+00. Sta. 71+00 to 76+00 is a retention basin approximately 30 feet wide and 3 feet deep with intermittent heavy and sparse weeds. East of the stockpile is another cleared orange grove. End of orange grove west of RWCD at Sta. 76+00. A residential development begins at Sta. 76+00.



Sta. 76+00 to 91+00: Retention basin 30 to 40 feet wide and 3 to 4 feet deep. Sparse weeds east of the baseline of the floodway in vacant field. Residential area west of RWCD. Large fill piles from 84+00 to 87+00. Appears to be spoils from dredging canal, dumped along floodway baseline. Large dirt berm at 89+50 to 89+75 immediately north of University Drive.

Sta. 91+00 to 121+00: Large retention basin approximately centered on the baseline of the floodway. Fifty feet wide, 5 to 8 feet deep with spread fill zones both east and west of basin. Sparse weeds in bottom of basin. Mobile home parks located on both sides of right of way canal road approximately 10 feet above bottom of basin. End mobile home park west of RWCD at Sta. 117+00. Vacant lot from Sta. 117+00 to Apache Trail on west side of RWCD. End retention basin at Sta. 121+00.

Sta. 121+50 to 126+00: Apache Trail and Circle K at southeast corner of Highley and Apache Trail. Pavement is in excellent condition. Circle K is concrete and masonry and in good shape.

Sta. 126+00 to 138+00: Vacant field with sparse weeds. Rows of fill 2 to 3 feet high running north to south. Construction going on east of right of way. Eastern canal road 4 to 5 feet above the baseline of the floodway. Small retention cut just below east side of east canal road.

Sta. 138+00 top 143+00: Same as above except residential area east of east edge of floodway road.

Sta. 143+00 to 154+00: Small retention basin approximately 20 feet east of east ROW. Mobile homes east of that. Presently large diameter pipe (sewer?) being installed by McAfee-Gutherie



near Station 143+00, 125 feet Lt. Sparse weeds in vacant field with loose fill berms. Mobile homes west of RWCD. Retention basin approximately 60 feet west of baseline becoming wider and deeper (approximately 40 feet wide, 3 to 4 feet deep). End project at Sta. 154+00 (Broadway Road).

#### SCOPE OF SERVICES

Thirty-two pits were excavated with a Ford 555 Extend-A-Hoe at the locations shown on the plan sheets. The pits were spaced on approximately 300 foot centers and alternated between baseline and the east and west banks. The test pits were located in the field by offset measurements with a cloth tape and hand-level elevations from existing baseline control points established by others. Test pit depths varied from 7 to 17 feet below the existing ground surface at the time of exploration. All pits were excavated to a depth of 5 feet below the proposed channel invert elevation. Subsoils were visually examined in each test pit and sampled at selected intervals. Disturbed samples of all stratigraphic units encountered in each pit were obtained by vertical cuts in the test pit walls. Undisturbed samples consisted of hand-cut block samples taken using SCS recommended methods. The locations and depths of the undisturbed samples were selected to obtain representative coverage of all the major soil groups encountered.

Soil samples were shipped to the SCS Soil Mechanics Laboratory in Lincoln, Nebraska on May 28, 1985. The following tests were requested on selected samples:



- Sieve analysis
- Hydrometer analysis
- Specific gravity
- Atterberg limits
- Unconfined compression
- Direct shear
- Standard proctor
- Water content
- Dry density
- Dispersion characteristics
- Soluble salts
- Sodium content
- Calcium content
- Sulfate content
- Gypsum content

Test results will be utilized in the development of the conclusions and analysis contained in the soil mechanics report. Direct shear data will be used in the canal bank slope stability analysis. Unconfined compression and gradation data will be used in the erosion analysis. Mineral and salts content were requested for use in identification of dispersive soils.

#### INTERPRETATION OF CONDITIONS

Regional Geology: Reach 6 of the RWCD Floodway is located within the Salt River Valley in the Basin and Range Physiographic Province. This province includes the southwestern half of Arizona along a northwest-southeast trend from lake Mead to Globe and extends into southern Nevada, southeastern California and south-eastward into Mexico (Figure 1). Structurally, this province is dominated by fault block mountains separated by broad, sediment



filled basins with a characteristic northwest-southeast orientation. These features are formed as the result of block movement along high angle normal faults in which upthrown blocks become narrow mountain ranges or horsts and the down dropped blocks become basins or grabens (Figure 2).

Faulting began approximately 18 million years ago during the late Tertiary Period and ceased approximately 1.5 million years ago. Subsequent erosion of adjacent mountain ranges have filled these basins with thousands of feet of alluvial debris consisting of gravel, sand, clay, and silt. Some of these deposits have thick sequences of evaporites such as salt and gypsum. These deposits indicate long periods of interior drainage in which water ponded and evaporated, leaving layer upon layer of salts to accumulate on subsiding basin floors. These evaporites are usually interbedded with clastic debris washed in from the mountains. (The Luke Salt Body west of Phoenix is an example of this process.)

Site Geology: Reach 6 of the RWCD Floodway is located near the eastern margin of the Salt River Valley. The floodway is situated on very thick Quaternary (Pleistocene) deposits of gravel, sand, silt and clays which have filled a structural basin or graben.

The deposits making up the valley fill were derived from broken mountainous country to the north and east and from isolated hills within the valley (inselbergs). Although some of the component rock fragments observed during field exploration were well rounded, most of them are sufficiently angular to indicate that the material has not been transported far. From the irregular manner in which the materials were deposited, it is clear the material was transported by stream flows of varying intensities. Occasional lenses and interbedded layers of sand, silt and clay occur at random and often without lateral continuity from one test pit to the next.



At the time of field exploration, five stratigraphic units were recognized. The oldest unit is a light brown to very light brown clayey sand ( $SC_1$ ) with appreciable amounts of silt and occasional lenses of sandy clay. This unit was subsequently eroded and modified resulting in a highly irregular topographic surface prior to the deposition of the next unit (Figure 3).

Following this erosion, a reddish-brown to brown sandy clay ( $CL_1$ ) was deposited on the irregular surface of  $SC_1$ . This unit probably represents an overbank deposit from the nearby stream during flood stage (Salt River). This clay was also subjected to a period of erosion which stripped off all of the overbank clays which had not settled in topographic depressions of the older clayey sand unit (Figure 4).

The next unit to be deposited consisted of sands and clayey sand ( $SC_2$ ) which probably represents a small wash which meandered across the floodway in a northwest-southeast direction. Contemporaneous with the deposition of  $SC_2$  was the formation of calcareous cement (caliche) in units  $SC_1$  and  $CL_1$ . This cement is formed by the near-surface crystallization of calcite by upward moving solutions to form calcareous nodules. Both  $SC_1$  and  $CL_1$  exhibit light to moderate cementation at varying depths with generally heavy cementation below 10 feet.

The next two units are very recent deposits resulting from construction modification of the area. The oldest of these deposits is man-made fills of clayey sands, silty sands and sandy silts ( $F_1$ ) in areas of construction activity and excavation of the existing retention basins. Some debris was noted in these fills, particularly at Stations 105+00-70 feet Rt. and 113+00-100 feet Lt. The youngest unit observed during field exploration consists of very thin layers of stratified sands, silts and clays ( $R_1$ ).



This material has been washed into low lying areas along the floodway during recent floods (Figure 5).

Geologic Hazards: Although no faults were observed within Reach 6, a number of normal faults associated with the formation of horsts and grabens are located within several miles. Inspection of the local Bouguer gravity map and examination of structure contours constructed for the base of the valley fill alluvium suggests several things. First, a rock pediment may begin abruptly about 3.5 miles northwest of the floodway at a complex fault scarp with a general northwest orientation. Second, several faults are postulated to intersect near Buckhorn, located approximately one mile east of the RWCD at U.S. 60. The concentration of several hot water springs in this area tend to support this theory. However, available data indicates that these faults have been inactive in recent periods.

Also located within several miles of the site is an area of known land subsidence and earth fissures. General large scale land subsidence in the area southeast of Buckhorn (located at U.S. 60 and Recker Road) is estimated to be about 2 feet. Based on information contained in the U.S. Geological Survey Water-Resources Investigations 78-83 Open-File Report dated June, 1978, it is estimated that land subsidence of 1 to 3 feet and groundwater level declines of approximately 325 feet have already occurred at the project site. Both earth fissures and land subsidence are related to the rapid water level declines that have occurred in recent years within alluvial sediments which overlie consolidated bedrock.

In nearly all cases, earth fissures produced by subsidence appear to form over or near subsurface fault scarps, bedrock protrusions or near-surface bedrock discontinuities. Since it is estimated that the thickness of alluvial overburden is in excess of 500 feet along the alignment, the occurrence of earth fissures does not appear likely.



Large scale land subsidence will continue if additional groundwater depletion occurs in the valley alluvium. This is a long-term process which should have no immediate impact on the proposed floodway. This type of subsidence can generally be remedied during grade adjustments made as part of routine maintenance.

Availability of Bed Material/Flow Conditions: The following information was taken from the report titled "Bedload Transport Analysis, RWCD Floodway, Williams - Chandler Watershed" dated March 31, 1976 by the Soil Conservation Service. The next two paragraphs were excerpted from the conclusions written by Mr. Aubrey C. Sanders, Jr.:

"Based upon the evaluation of transport capacity of the designed channel and the incremental size of bedload materials, it is concluded that for all runoff producing storms there will be bedload sized material introduced into, and deposited in the channel. There is no indication that these materials will be transported through the system. The analysis indicated that bedload materials brought in by a 10 year or more frequent storm will be deposited at the point where they enter the Floodway, except in the concrete-lined portions. However, it is apparent that some distribution of this sediment in downstream areas from the point of entrance will occur. This conclusion is based upon observation of existing conditions in the present channel. All significant sediment sources are upstream from channel station 1120+00."

In order to maintain the designed channel capacity maintenance procedures for removal of sediment will be required. Maintenance of the existing channel consists of periodic removal of sediment by the Roosevelt Water Conservation District Personnel, as well as other public agencies and private individuals

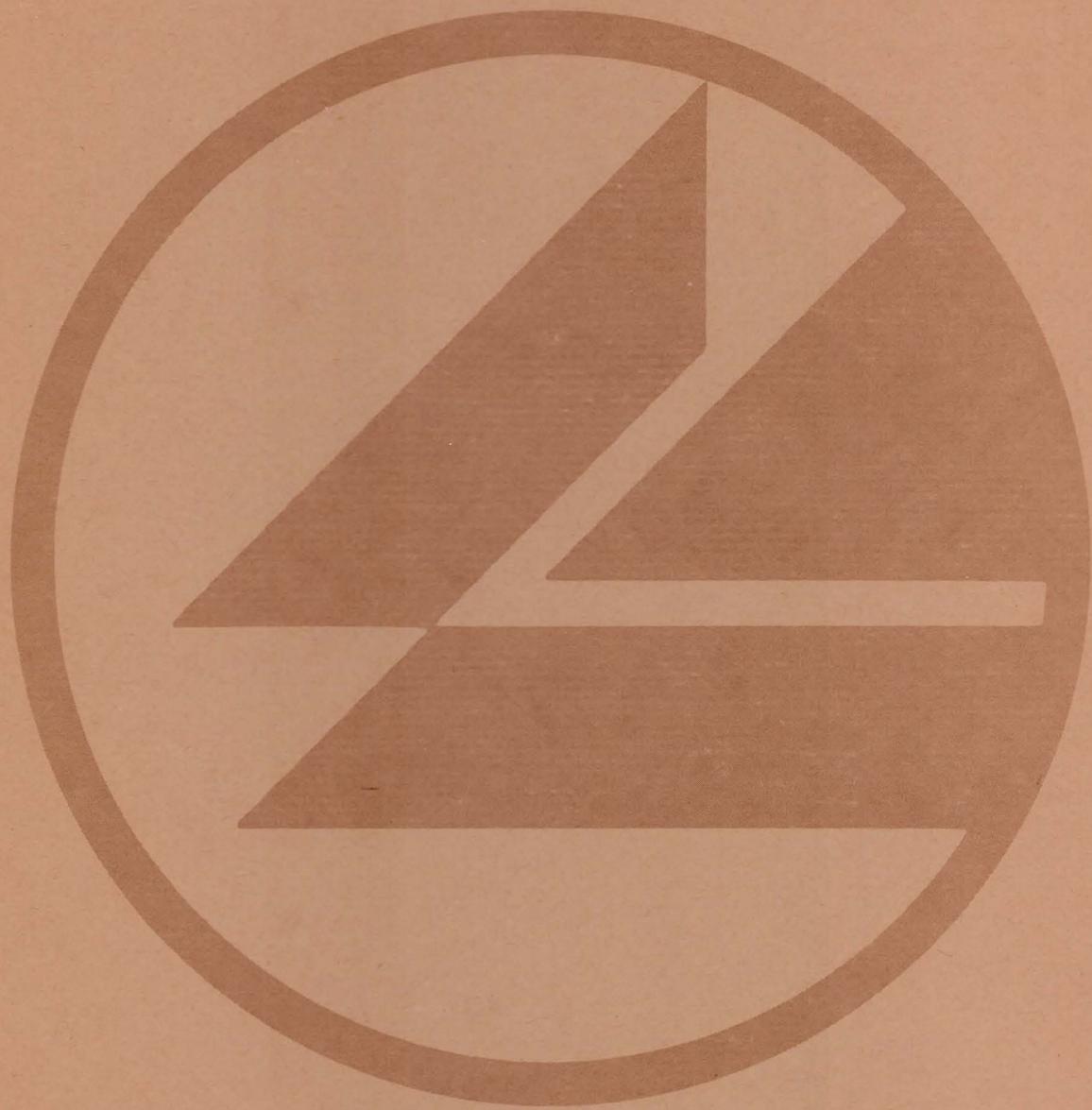
who utilize the sediment for fill material and aggregate. Due to the fact that the removal of sediment is largely uncontrolled there are no valid estimates available to determine the actual volumes removed."

This report also included computations of suspended sediment for various storm frequencies in both present and future conditions. Accordingly, sediment free flow conditions will be used in the erosion analysis to be included in the soil mechanics report.

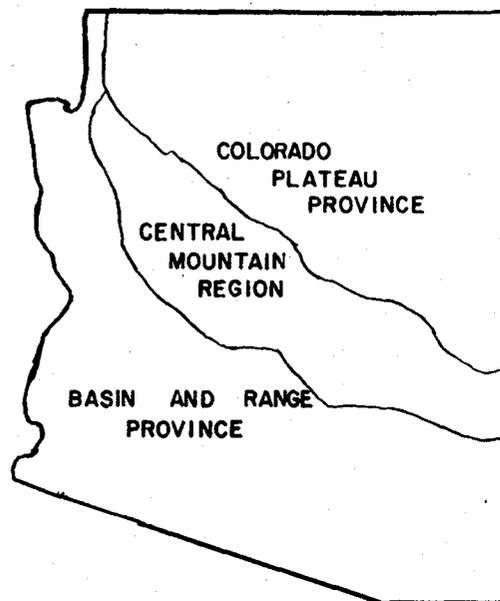
#### CONCLUSIONS

Subsoils encountered throughout the reach consisted primarily of sandy clays and clayey sands with varying degrees of calcite cementation. The subsoils exhibited medium densities and generally low plasticity. As to be expected in a recent alluvium overbank area, soil types varied within short distances as a result of different flow environments present during deposition. All of the native subsoils encountered within the reach appeared to be suitable for use in embankment fill. Cleared citrus groves were encountered along the east side of the alignment between Brown Road and Sta. 76+00. Depending on final grades in this area, overexcavation may be necessary to remove any remaining tree pits. Calcite cementation varied from light to heavy and generally tended to increase with depth. Refusal was not encountered during excavation of any of the pits, and therefore it is anticipated that canal excavation will be possible with conventional excavation equipment. Depth to groundwater in the vicinity of Reach 6 is reported to be 400 to 500 feet, and should not affect either construction or performance of the floodway.

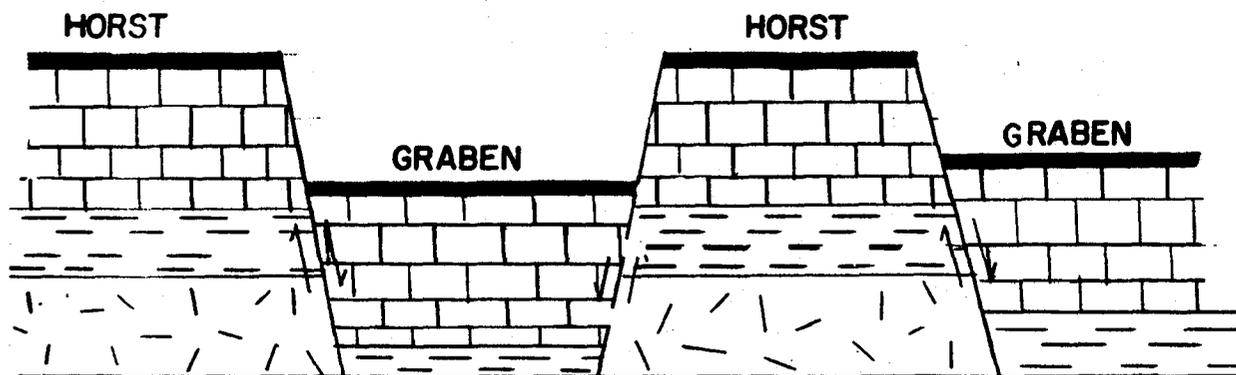




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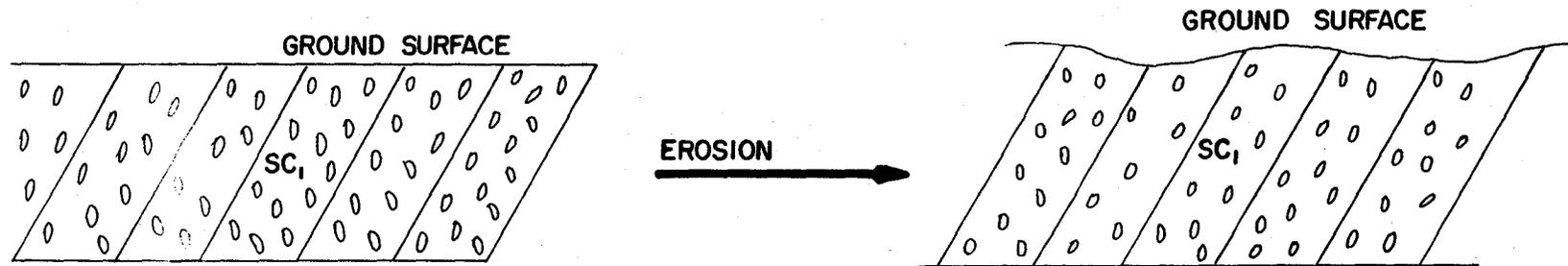
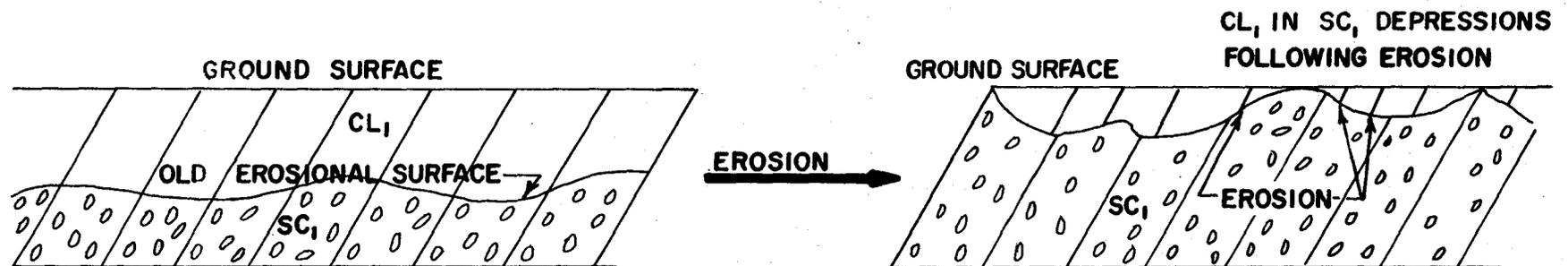
**FIG. 1 STRUCTURAL-PHYSIOGRAPHIC PROVINCES OF ARIZONA.  
REPRODUCED FROM NATIONS AND STUMP , 1981, GEOLOGY OF ARIZONA.**



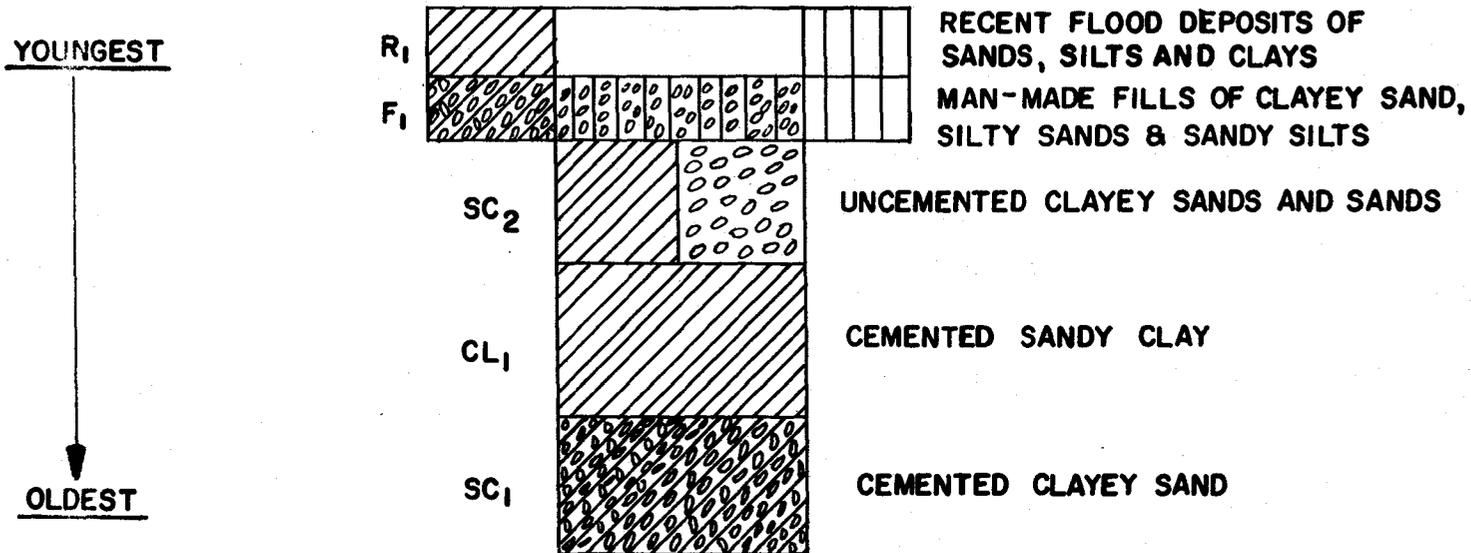
**FIG. 2 SIMPLIFIED DIAGRAM SHOWING FAULTING OF HORSTS AND GRABENS.**

I-1

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FIG. 3. DEPOSITION AND SUBSEQUENT EROSION OF CLAYEY SAND (SC<sub>1</sub>).FIG. 4. DEPOSITION OF CL<sub>1</sub> ON EROSIONAL SURFACE OF SC<sub>1</sub> AND SUBSEQUENT EROSION OF CL<sub>1</sub>.

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**FIG. 5 COMPLETE STRATIGRAPHIC COLUMN OF ALL UNITS ENCOUNTERED DURING FIELD EXPLORATION;**

## INTERNAL WORK SHEETS

Project/Subject RWCD Floodway - Reach 6Job No. 2125J108Erosion AnalysisDate 8/26/85 Sheet 1 of 1By CPWSediment Concentration

Sta. 28+25 to Sta. 90+60 :

$$Q_{10}(\text{as-built}) \quad - \quad C = 370 \times \frac{109.4}{75} = 539.7 \text{ ppm}$$

$$Q_{100}(\text{aged}) \quad - \quad C = 370 \times \frac{175.2}{297} = 218.3 \text{ ppm}$$

Sta. 90+60 to Sta. 122+00 :

$$Q_{10}(\text{as-built}) \quad - \quad C = 370 \times \frac{241.3}{484} = 184.5 \text{ ppm}$$

$$Q_{100}(\text{aged}) \quad - \quad C = 370 \times \frac{374.1}{1965} = 70.4 \text{ ppm}$$

Sta. 122+00 to Sta. 156+00 :

$$Q_{10}(\text{as-built}) \quad - \quad C = 370 \times \frac{322.4}{484} = 246.5 \text{ ppm}$$

$$Q_{100}(\text{aged}) \quad - \quad C = 370 \times \frac{497.5}{1965} = 93.7 \text{ ppm}$$

∴ Use sediment free Flows at all locations

Note : Sediment transport rates obtained from "Bedload Transport Analysis, RWCD Floodway, Williams - Chandler Watershed" dated March 31, 1976 by SCS

Reference Eq. 6-1 from "Design of Open Channels" (TR 25) dated 10/77 by SCS



## METHOD OF SOIL CLASSIFICATION (ASTM D 2487)

### COARSE-GRAINED SOILS

LESS THAN 50% FINES\*

GROUP SYMBOLS	DESCRIPTION	MAJOR DIVISIONS
GW	WELL-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LESS THAN 5% FINES	GRAVELS More than half of coarse fraction is larger than No. 4 sieve size
GP	POORLY-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LESS THAN 5% FINES	
GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES, MORE THAN 12% FINES	
GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, MORE THAN 12% FINES	
SW	WELL-GRADED SANDS OR GRAVELLY SANDS, LESS THAN 5% FINES	SANDS More than half of coarse fraction is smaller than No. 4 sieve size
SP	POORLY-GRADED SANDS OR GRAVELLY SANDS, LESS THAN 5% FINES	
SM	SILTY SANDS, SAND-SILT MIXTURES, MORE THAN 12% FINES	
SC	CLAYEY SANDS, SAND-CLAY MIXTURES, MORE THAN 12% FINES	

**NOTE:**

Coarse grained soils receive dual symbols if they contain 5 to 12% fines (e.g. SW-SM, GP-GC, etc.)

### FINE-GRAINED SOILS

MORE THAN 50% FINES\*

GROUP SYMBOLS	DESCRIPTION	MAJOR DIVISIONS
ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS	SILTS AND CLAYS Liquid limit less than 50
CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
OL	ORGANIC SILTS OR ORGANIC SILTY-CLAYS OF LOW PLASTICITY	
MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDS OR SILTS, ELASTIC SILTS	SILTS AND CLAYS Liquid Limit more than 50
CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY	HIGHLY ORGANIC SOILS
PT	PEAT, MUCK, AND OTHER HIGHLY ORGANIC SOILS	

**NOTE:**

Fine grained soils receive dual symbols if their limits plot in the hatched zone on the Plasticity Chart (ML-CL)

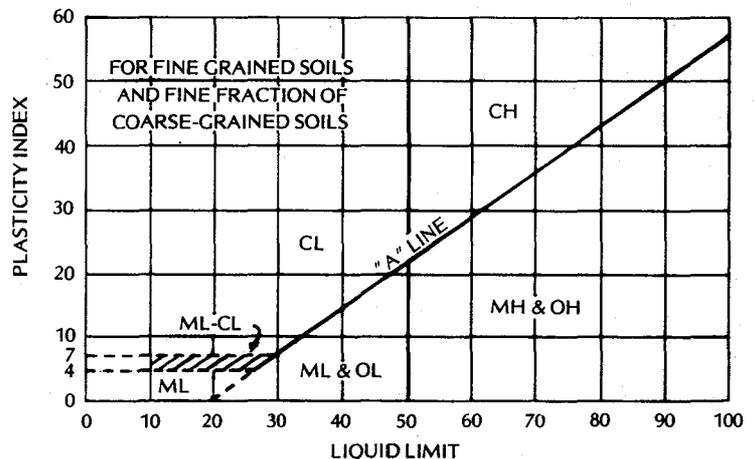
### SOIL SIZES

COMPONENT	SIZE RANGE
BOULDERS	ABOVE 12 in.
COBBLES	3 in. to 12 in.
GRAVEL	No. 4 to 3 in.
Coarse	¾ in. to 3 in.
Fine	No. 4 to ¾ in.
SAND	No. 200 to No. 4
Coarse	No. 10 to No. 4
Medium	No. 40 to No. 10
Fine	No. 200 to No. 40
* FINES (Silt or Clay)	BELOW No. 200

**NOTE:**

Only sizes smaller than three inches are used to classify soils.

### PLASTICITY CHART



**HNTB**

The HNTB Companies

Made by BGBDate 9-16-98Job Number 27559

Checked by

Date

Sheet Number

For

Backchecked by

Date

REACH 1

	<u>As-Builts</u>	<u>Feet</u>	<u>Mile</u>
	<u>1454+68.09 Downstream End</u>	<u>0+00</u>	<u>0.000</u>
	<u>1430+7583</u>	<u>2793.09</u>	<u>0.4535</u>
Loose Rip-Rap	<u>1414+95</u>	<u>2973.09</u>	<u>0.752</u>
	<u>1401+41</u>	<u>5727.09</u>	<u>1.009</u>
Loose Rip-Rap	<u>1395+40</u>	<u>5929.09</u>	<u>1.123</u>
	<u>1380+99</u>	<u>7369.09</u>	<u>1.396</u>
	<u>1367+90 SR 587 Bridge</u>	<u>8678.09</u>	<u>1.644</u>
	<u>1315+09.05 Dip Section</u>	<u>13959.04</u>	<u>2.644</u>
Loose Rip-Rap	<u>1284+68.97 San Juan Canal</u>	<u>16999.12</u>	<u>3.220</u>
	<u>1249+80</u>	<u>20488.09</u>	<u>3.880</u>
Loose Rip-Rap	<u>1235+89 Santa Baptist Church Rd. Bridge</u>	<u>21879.09</u>	<u>4.144</u>
	<u>1235+39.27</u>	<u>21928.82</u>	<u>4.153</u>
	<u>1234+80</u>	<u>21988.09</u>	<u>4.164</u>
	<u>12015+75 ±</u>	<u>27893.09</u>	<u>4.525</u>
	<u>Upstream End Reach 1</u>		

<b>HNTB</b> <small>For HNTB Companies</small> For	Made by	1868	Date	9.18.98	Job Number	27559
	Checked by		Date		Sheet Number	1/2
	Backchecked by		Date			

REACH 2

As-Builts	Feet Station	Mile	HEC-RAS	
1454+68.09	Downstream End of Reach 1	0	0.000	
1215+75	Upstream END OF Reach 1	23893.09	4.525 4.487	
1216+50	Downstream End Reach 2	23918.09	4.511 4.506	
<del>1215+00</del>		23968.09	4.539	
1212+66.84	SR 87	24201.25	4.584 4.584	
Rock Rip-Rap	1211+11.65	S.P.R.R.	24356.44	4.613 4.613
	1208+04.42		24663.67	4.671 4.669
	1160+22.10		29445.99	5.577 5.578
Loose rock riprap	1160+16.60		29451.49	5.578
dissipator basin	1160+01.60		29466.49	5.581 5.581
Conc. Outlet	1159+72.60	End Transition	29495.49	5.586 5.586
	1155+99.60	Begin Transition	29868.49	5.657 5.658
Conc. Channel = 65'				
Conc.	1127+49.60	End Transition	32718.49	6.197 6.196
	1125+71.10	Begin "	32896.99	6.230 6.230
rock riprap	1111+94.17	End Transition	34273.92	6.491 6.486
	1110+94.17	Begin "	34373.92	6.510 6.510

**HNTB**

The HNTB Companies

For

Made by FGSDate 9.19.98

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Date

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Date

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## REACH 2

Description	As-Builts	Feet	Mile	MEC-RAS
End Transition	1090+00	36,368.09	6.888	<del>6.894</del>
End Loose Riprap	1090+67	36,401.09	6.894	6.894
Begin Loose Riprap on Side Dip Section Crossing	1090+42	36,426.09	6.899	6.898
A.C. Dip Section Crossing	1090+30	36,438.09	6.901	6.902
Up. Side Dip Crossing	1090+18	36,450.09	6.903	6.907
Begin Transition	1089+60	36,508.09	6.914	
End <sup>Bank</sup> Rock riprap	1029+60	42,508.09	8.051	8.057
Begin Bank riprap	1027+72.35	42,695.74	8.086	8.104
End Bank Riprap	1012+90	44,178.09	8.767	8.34
Begin " "	1011+50.01	44,318.08	8.794	8.403
End Bank Riprap	999+60	45,508.09	8.619	8.594
Begin " "	996+99.79	45,768.30	8.668	8.668
Begin Reach 2	981+00	47,368.09	8.971	
Upstream End of Reach 2				9.001

REACH 3

1/3  
10-1-98

As-Builts	Feet	Mile	HEC-RAS
1454+68.09 Downstream End of Reach 1	0	0.000	0.000
1215+75 Upstream End of Reach 1	23893.09	4.525	4.487
1216+50 Downstream End of Reach 2	23818.09	4.511	4.506
981+00 Upstream End of Reach 2	47368.09	8.971	9.001
977+25 Downstream End of Reach 3	47743.09	9.042	9.018
976+00 East Side Inlet (35'±)	47868.09	9.066	
962+00 East Side Inlet (20'±)	49268.09	9.331	
947+00 East Side Inlet	50768.09	9.615	
934+50 Retaining Wall E. Side (65'± wide)	52018.09	9.852	
915+00 ± Riggs Road Inlet	53968.09	10.221	10.207 10.171
900+00 East side Inlet	55468.09	10.505	10.518 & 10.441

Reach 3 (Cont'd)

2/3

10-3-98

	As-Builts	Feet	Mile	HEC-RAS
	886+50 East Side Inlet	56818.09	10.761	
	874+25 E. Side Inlet	58043.09	10.993	
	860+55 E. Side Inlet	59413.09	11.252	11.249 & 11.237
	860+25 ± Chandler Heights Rd.	59443.09	11.258	
Riprap Channel →	858+70 E. Side Inlet	59598.09	11.288	11.297 & 11.260
	858+25 End Transition	59643.09	11.296	
	857+55 End Sill Begin Trans.	59713.09	11.309	
	857+00 Drop Structure	59768.09	11.320	
Queen Creek	842+35 Sediment Basin Outlet (70')	61233.09	11.597	11.609 & 11.572
	835+00 Side Inlet	61968.09	11.736	
	800+50 ± Ocotillo Rd.	65418.09	12.390	12.349 Downstream of Ocotillo Rd.
	794+00 Side Inlet	66068.09	12.513	
	773+60 Side Inlets (Both Sides)	68108.09	12.899	12.905 & 12.901

Reach 3 (Cont'd)

3/3

As-Builts	Feet	Mile	HEC-RAS
745+28.37 Queen Creek Bridge	70939.72	13.436	13.431
743+00 End of Reach 3	71168.09	13.479	13.471

## REACH 4

As-Builts	Feet	Mile	
1454+68.09	∅	0.000	0.000
1215+75	Up. End Reach 1	23893.09	4.525 4.487
1216+50	Down. End Reach 2	23818.09	4.511 4.506
981+00	Up. End Reach 2	47368.09	8.971 9.001
977+25	Down. End Reach 3	47743.09	9.042 9.018
743+00	Up. End Reach 3	71168.09	13.479 13.471
Queen Cr. Road 745+2837	Down. End Reach 4	70939.72	13.436
726+50	Side Inlet 10' Wide	72818.09	13.791
Highly Red. 717+70		73698.09	13.958 13.954
714+00	Side Inlet 10' Wide		

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REACH 5 (Cont'd)  
 reach 5 f. x f

STATION (FT)	Distance (ft)	Mile	Left Bank Station
1088+18.95	500 500.00 500	20.610	3628.55 3700.97
1083+28.94	490.01 490.01 490.01	20.517	3652.46
1078+61.05	455 467.89 460	20.428	3742.05
1074+64.27	540 396.78 350	20.353	3706.75
1073+61.35	130 102.92 (Sta 378+50 AB = 204 ft) spillway 100	20.334	3677.15
<del>1072+14.57</del>	32.13 32.13 32.13	<del>20.306</del>	
1073+29.21	Elliot Rd. Bridge Upstream Face	20.328	skew 0.0716°
1073+04.81	♀ Elliot Rd. Bridge (Sta 331+76.56 AB) = 58.98'	20.323	4303.50
1072+70.23	Elliot Rd. Bridge Downstream Face 55.60 55.66 55.66	20.316	skew 0.1873°
1072+14.57	310.50 310.56 310.50	20.306	3667.53
1069+04.01	1000 1000.00 1000	20.247	8' Right Level 3651.24
1059+04.01	1027.32 1027.32 1027.32	20.058	8' Level 3595.29
1048+76.69	550 622.24 640	19.863	End of 8' Level 3506.91
1042+54.45	810.92 810.92 810.92	19.745	0' Level 3523.73
1034+43.53	269.10 269.16 269.10	19.592	0' Level 3556.77
1031+74.37	just downstream of 60' side 270.65 270.65 info at 1033+32± 270.65 or Sta. 442+50 (AB)	19.541	12' Level 3567.73

<b>HNTB</b> The HNTB Companies For	Made by	BGS	Date	7.8.98	Job Number	27559
	Checked by		Date		Sheet Number	72/7
	Backchecked by		Date			

REACH 5 (Cont'd)  
 reach 59. lxx

STATION (ft)	Distance (ft)	Mill	Left Bank Station
1029+03.72	270.65		
1029+03.72		19.489	12 level 3599.99
	16438 164.38 16438		
1027+39.34		19.458	8 level 3622.03
	350 263.11 250		
1024+76.73		19.408	End of level 3656.03
	700 583.23 560		level (8)
1018+93.00	Downstream of 208 side inlets	19.298	3539.55
at 1022+82	at 432+00 (AB)	1,000.00	1000
Wagner Rd at 1008+93.00		19.109	3359.54
1019+82±	610 731.32 750		
OR Sta. 435+00 (AB)	1001+61.68	Downstream of 209 side inlets	18.970
	840 994.23	at 1003+32 or Sta. 451+50	3267.03
		1020	
991+67.45		18.782	3375.00
	1510 1300.18 1250		
978+67.27		18.535	3243.29
968+59.54	620 1007.73 1280	18.345	3371.26
	Downstream of 17 side inlets at Sta. 43477+00 (AB)		
	Sta. 485+94 (AB) at 720'		
} End of	Reach 5	988+49± = Sta. 486+33.58 (AB)	
	= Reach 4	Sta. 485+88.08 (AB)	18.340



## TEST PIT LOCATIONS

<u>Test Pit No.</u>	<u>Station</u>	<u>Offset</u>
VI-1	34+00	90' Lt
VI-2	37+00	Baseline
VI-3	41+00	75' Rt
VI-4	45+00	Baseline
VI-5	49+00	100' Lt
VI-6	53+00	Baseline
VI-7	57+00	75' Rt
VI-8	61+00	Baseline
VI-9	65+00	100' Lt
VI-10	69+00	Baseline
VI-11	73+00	75' Rt
VI-12	77+00	Baseline
VI-13	81+00	100' Lt
VI-14	85+00	Baseline
VI-15	89+00	75' Rt
VI-16	93+00	Baseline
VI-17	97+00	100' Lt
VI-18	101+00	Baseline
VI-19	105+00	70' Rt
VI-20	109+00	Baseline
VI-21	113+00	100' Lt
VI-22	117+00	Baseline
VI-23	119+00	Baseline
VI-24	121+00	60' Rt
VI-25	127+00	Baseline
VI-26	129+00	70' Lt
VI-27	133+00	Baseline
VI-28	137+00	60' Rt
VI-29	141+00	Baseline
VI-30	145+00	70' Lt
VI-31	149+00	Baseline
VI-32	154+00	50' Rt



BORING LOG NOTES

The number shown in "LOG OF BORING NO." refers to the approximate location of the same number indicated on the "Site Plan" as positioned in the field by measurements from baseline control points established by Greiner Engineering.

"STA" refers to the approximate stationing of the test pit along the proposed Floodway alignment according to the baseline control points.

"R" or "L" refers to the approximate lateral offset, right or left respectively, from the baseline of the proposed Floodway alignment.

"ELEVATION" refers to ground surface elevation at the test pit location relative to the indicated "DATUM" established by measurements with a hand level from baseline control points.

"Sample Type" refers to the form of sample recovery, in which B = Block sample and G = Grab sample.

"Unified Classification" refers to the soil type as defined by "Method of Soil Classification". The soils were classified visually in the field and, where appropriate, classifications were modified by visual examination of samples in the laboratory and/or by appropriate tests.

Boring logs depict our interpretations of subsurface conditions at the locations and on the date(s) noted. Variations in subsurface conditions and soil characteristics may occur between borings. Groundwater levels may fluctuate due to seasonal variations and other factors.

In general, terms and symbols on the boring logs conform with "Standard Definitions of Terms and Symbols Relating to Soil and Rock Mechanics" (ASTM D653).



LOG OF BORING NO. VI-1 - 90' Lt.

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1348.0' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/16/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
			G			CL/ ML	SANDY CLAY/SANDY SILT; light brown, stiff, -PL, slightly stratified, recent
			G				
5						CL	SANDY CLAY; with silt, light brown, very stiff to hard, -PL, light to moderate cementation, some inter-bedded clayey sands
10			G				Heavy cementation
15							
20							Stopped @ 16 feet
25							
30							



LOG OF BORING NO. VI-2 - Baseline

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1347.4' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/15/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
5						CL	SANDY CLAY; brown, stiff, -PL
10			B				Light brown, light cementation, very stiff, more sand
15			G				Trace gravel, very light brown Very stiff to hard, moderate cementation Heavy cementation
20							Stopped @ 15 feet
25							
30							



**LOG OF BORING NO. VI-3 - 75' Rt.**

Project RWCD Floodway - Reach 6 Job No. 2125J108

Elevation 1348.5' Datum Baseline Control Points

Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe

Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/15/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pct	Water Content, %	Unified Classification	Description
	C	N/R					
			G			SM/ ML	SILTY SAND/SANDY SILT; light brown, medium dense, slightly stratified, very small inclusions of clean sand and clay
			G			CL	
5			G			CL	SANDY CLAY; some silt, brown, stiff to very stiff, -PL, some interbedded clayey sands
10			G			SM	SILTY SAND; with clay, trace gravel, very light brown, very dense, slightly damp, moderate cementation  Heavy cementation
15							
20							Stopped @ 17 feet
25							
30							



LOG OF BORING NO. VI-4 - Baseline

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1346.2' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/15/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
5			G			SC	CLAYEY SAND; some silt, brown, medium dense, damp, slightly stratified
10							Less clay, light brown, dense to very dense, slightly damp, light to moderate cementation
			B				Very dense, moderate to heavy cementation
15							Stopped @ 14 feet
20							
25							
30							



LOG OF BORING NO. VI-5 - 100' Lt.

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1348.1' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/15/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
5			G			CL	SANDY CLAY; with silt, trace gravel, brown, medium dense, damp, slightly stratified, tree roots extending to 2.5 feet
10							Lighter brown, light to moderate cementation, very dense
15							Moderate to heavy cementation below 10 feet
20							Stopped @ 16 feet
25							
30							



**LOG OF BORING NO. VI-6 - Baseline**

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1347.4' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/15/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
0							
5			G			CL	SANDY CLAY; brown, stiff, -PL, some interbedded clayey sands
			B				Trace gravel, light brown Very stiff to hard Light cementation
10							Hard, moderate to heavy cementation
15							Very heavy cementation
20							Stopped @ 15 feet
25							
30							



LOG OF BORING NO. VI-7 - 75' Rt.

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1344.5' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/15/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
			G			ML/CL	CLAYEY SILT/SILTY CLAY; some sand, light brown, stiff, -PL, stratified, recent flood deposit
5			G			CL	SANDY CLAY; brown, stiff to very stiff, -PL, some interbedded clayey sands
10			G			ML/SM	SANDY SILT/SILTY SAND; with clay, trace gravel, light brown, dense to very dense, slightly damp, light to moderate cementation, slightly stratified, some interbedded sandy clays  Lighter brown, very dense, moderate to heavy cementation
15							Stopped @ 13 feet
20							
25							
30							



**LOG OF BORING NO. VI-8 - Baseline**

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1344.3' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/14/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
			G			CL	SILTY CLAY; some sand, light brown, stiff, -PL, stratified
5						CL	SANDY CLAY; brown, stiff, -PL, small amount of interbedded clayey sand, slightly stratified, tree branches at 4 feet
			B				Lighter brown, very stiff to hard, light to moderate cementation
10							
			G				Moderate to heavy cementation, hard
15							
20							
25							
30							Stopped @ 12 feet



LOG OF BORING NO. VI-9 - 100' Lt.

2125J108

Project RWCD Floodway - Reach 6

Job No. \_\_\_\_\_

Elevation 1345.8'

Datum Baseline Control Points

Type/Size Boring Backhoe

Rig Type Ford 555 Extend-A-Hoe

Groundwater Conditions None Encountered

Prepared by: Steve Myers

Date 5/14/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
5			G			CL	SANDY CLAY; with gravel and silt, trace cobbles, fill, brown, moderately compacted, stiff to very stiff, -PL
10			G			SM	SILTY SAND; with clay, trace gravel, light brown, dense to very dense, slightly damp, light to moderate cementation, slightly stratified with interbedded sandy clay  Cementation increasing with depth (moderate to heavy)
15							Stopped @ 14 feet
20							
25							
30							



**LOG OF BORING NO. VI-10 - Baseline**

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1343.3' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/14/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
5			G			CL	SANDY CLAY; brown, stiff, -PL
10			B			SC	CLAYEY SAND; with silt, light brown, dense to very dense, slightly damp, light cementation  Moderate to heavy cementation
15							Stopped @ 11 feet
20							
25							
30							



LOG OF BORING NO. VI-11 - 75' Rt.

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1343.7' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/18/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
5			G			CL	SANDY CLAY; brown, stiff, -PL
10			G				Stiff to very stiff, very light cementation  More sand, very light brown, moderate to heavy cementation
15							Stopped @ 12 feet
20							
25							
30							



LOG OF BORING NO. VI-12 - Baseline

2125J108

Project RWCD Floodway Job No. \_\_\_\_\_

Elevation 1342.8' Datum Baseline Control Points

Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe

Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/14/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
0						CL	SANDY CLAY; brown, stiff to very stiff, -PL, some interbedded clayey sands
5			B			SC	CLAYEY SAND; with silt, light brown, dense to very dense, slightly damp, light to moderate cementation
10			G				Lighter brown, moderate cementation
15							Stopped @ 11 feet
20							
25							
30							



LOG OF BORING NO. VI-13 - 100' Lt.

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1344.7' Datum Centerline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/13/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
5			G			ML	SANDY SILT; with clay, brown, stiff, -PL
10			G				Slightly lighter brown, stiff to very stiff, light cementation
							Very light brown, moderate cementation below 9'
							Moderate to heavy cementation
15							Stopped @ 13 feet
20							
25							
30							



LOG OF BORING NO. VI-14 - Baseline

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1344.7' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/13/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
0						ML	SANDY SILT; with clay, brown, stiff, -PL, slightly stratified
5			B				Light brown, light to moderate cementation, very stiff
10							Trace gravel
			G				Moderate cementation below 9 feet
15							Stopped @ 13 feet
20							
25							
30							



**LOG OF BORING NO. VI-15 - 75' Rt.**

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1345.1' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/13/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
0						CL/ML	SANDY CLAY/SANDY SILT; brown, stiff, -PL, probable fill
5			G			SM	SILTY SAND; brown, loose to medium dense, damp
			G			ML	SANDY SILT; brown, medium dense, damp
10			G			CL	SANDY CLAY; reddish brown, stiff, -PL, light cementation  Light brown, moderate cementation below 8 feet
15							Stopped @ 15 feet
20							
25							
30							



**LOG OF BORING NO. VI-16 - Baseline**

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1341.3' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/17/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
			G			SM	SILTY SAND; trace gravel and clay, brown. loose, slightly damp, recent flood deposit
5						CL	SANDY CLAY; with silt, brown, stiff, -PL, slightly stratified with interbedded clayey sand  Light brown, light to moderate cementation below 5 feet
10			B				Stopped @ 10 feet
15							
20							
25							
30							



**LOG OF BORING NO. VI-17 - 100' Lt.**

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1344.5' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type For 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/17/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
5			G			CL/ML	SANDY CLAY/SANDY SILT; trace gravel, brown, medium dense, slightly damp
10			G			CL	SANDY CLAY; brown, stiff to very stiff, -PL, light cementation  Light brown, moderate cementation below 10 feet
15							Stopped @ 13 feet
20							
25							
30							



**LOG OF BORING NO. VI-18 - Baseline**

Project RWCD Floodway - Reach 6 Job No. 2125J108

Elevation 1339.7' Datum Baseline Control Points

Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe

Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/17/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
			G			CH	SILTY CLAY; some sand, light brown, stiff, -PL, very stratified, recent
			G			CL	
5			B			SC	CLAYEY SAND; with silt, trace gravel, light brown, very dense, slightly damp, light to moderate cementation
10							Stopped @ 7 feet
15							
20							
25							
30							



LOG OF BORING NO. VI-19 - 70' Rt.

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1343.7' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/20/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
0			G			SM	SILTY SAND; some clay, trace gravel, fill, light brown, well compacted, medium dense, slightly damp, some wood fragments
5			G			CL	SANDY CLAY; with silt, brown, stiff, -PL,  Stiff to very stiff, some interbedded clayey sands
10							Very stiff to hard, light to moderate cementation
15							Stopped @ 12 feet
20							
25							
30							



**LOG OF BORING NO. VI-20 - Baseline**

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1340.8' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/20/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
5			B			SC	CLAYEY SAND; brown, medium dense, damp
			G				Trace gravel, dense, light cementation, slightly lower plasticity
							Some gravel, light brown, light to moderate cementation
10							Stopped @ 9 feet
15							
20							
25							
30							



**LOG OF BORING NO. VI-21 - 100' Lt.**

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1345.2' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/20/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
0			G			SM	SILTY SAND: with gravel, some clay, fill, light brown, well compacted, medium dense, slightly damp, asphalt fragments noted
5			G			CL	SANDY CLAY; with silt, trace gravel, brown, stiff, -PI
10							Very stiff to hard, moderate to heavy cementation, below 10 feet
15							Stopped @ 14 feet
20							
25							
30							



LOG OF BORING NO. VI-22 - Baseline

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1340.6' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/20/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
			G			ML	SANDY SILT; some clay, light brown, stiff, slightly damp, recent flood deposit
5			G			SC	CLAYEY SAND; brown, medium dense, damp, some inter-bedded sandy clay  Lighter brown, light cementation below 4 feet  Light to moderate cementation below 7 feet
10			B				Stopped @ 9 feet
15							
20							
25							
30							



LOG OF BORING NO. VI-23 - Baseline

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1340.9' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/22/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
			B			ML	SANDY SILT; light brown, soft, -PL, recent flood deposit
5			G			SC	CLAYEY SAND; dark brown, medium dense, damp,  Very light brown, dense to very dense, moderate to heavy cementation
10							Stopped @ 8 feet
15							
20							
25							
30							



LOG OF BORING NO. VI-24 - 60' Rt.

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1344.0' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/20/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
			G			SP	SAND; with silt, loose, slightly damp, recent flood deposit
5			G			CL	SANDY CLAY; with silt, brown, stiff, -PL, some interbedded silty sand
10			G				Light brown, very stiff to hard, light to moderate cementation  Heavy cementation below 10 feet
15							Stopped @ 13 feet
20							
25							
30							



LOG OF BORING NO. VI-25 - Baseline

Project RWCD Floodway - Reach 6 Job No. 2125J108

Elevation 1342.5' Datum Baseline Control Points

Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe

Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/22/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
0						CL	SANDY CLAY; brown, stiff, -PL, large roots extending downward to 4 feet, interbedded silty sand lense from 1 to 3 feet, stratified, 2 feet deep, approximately 4 feet long, trending east-west
5			B				More sand, light brown, stiff to very stiff, light cementation
10			G				Coarser sand; dirty white, stiff to hard, moderate to heavy cementation
15							Stopped @ 12 feet
20							
25							
30							



LOG OF BORING NO. VI-26 - 70' Lt.

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1343.5' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/21/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
0						SW/SM	SAND; some silt, trace gravel, brown, loose, slightly damp
5			G			CL	SANDY CLAY; brown, stiff, -PL  Light brown, stiff to very stiff, light cementation  Very light brown, very stiff to hard, moderate to heavy cementation
15							Stopped @ 13 feet
20							
25							
30							



LOG OF BORING NO. VI-27 - Baseline

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1341.9' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/21/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
5			B			CL	SANDY CLAY; brown, stiff, -PL, large (up to 3" diameter) roots extending downward to a maximum of 6 feet, some interbedded clayey sand
10			G				Slightly lighter brown, stiff to very stiff, light cementation  Hard, trace gravel, very light brown, moderate to heavy cementation
15							Stopped @ 12 feet
20							
25							
30							



LOG OF BORING NO. VI-28 - 60' Rt.

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1339.3' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/21/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
5			G			CL	SANDY CLAY; brown, stiff, -PL  More sand, trace gravel, lighter brown, stiff to very stiff, light to moderate cementation
10							Stopped @ 9 feet
15							
20							
25							
30							



LOG OF BORING NO. VI-29 - Baseline

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1341.9' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/21/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
5			B			CL	SANDY CLAY; brown, stiff, -PL
			G				More sand, light brown, stiff to very stiff, light to moderate cementation
10							More sand, very stiff to hard, moderate to heavy cementation
15							Stopped @ 12 feet
20							
25							
30							



LOG OF BORING NO. VI-30 - 70' Lt.

Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1343.0' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/21/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
5			G			CL	SANDY CLAY; brown, stiff, -PL  More sand, light cementation  Clayey sand lens approximately 4 feet wide and 3 feet high, extending in an east-west direction through pit  Light brown, very stiff to hard, moderate to heavy
10							
15							Stopped @ 13 feet
20							
25							
30							



LOG OF BORING NO. VI-31 - Baseline

Project RWCD Floodway - Reach 6 Job No. 2125J108

Elevation 1341.6' Datum Baseline Control Points

Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe

Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/22/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
5			G			CL	SANDY CLAY; brown, stiff, -PL
10			B			SC	CLAYEY SAND, with silt, some gravel, light brown, very dense, slightly damp, moderate to heavy cementation
15							Stopped @ 12 feet
20							
25							
30							



LOG OF BORING NO. VI-32 - 50' Rt.

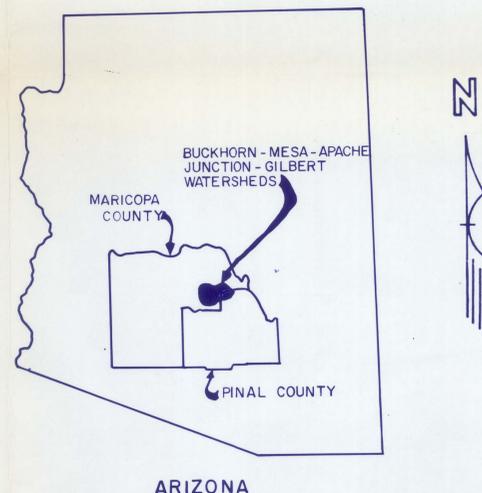
Project RWCD Floodway - Reach 6 Job No. 2125J108  
 Elevation 1340.7' Datum Baseline Control Points  
 Type/Size Boring Backhoe Rig Type Ford 555 Extend-A-Hoe  
 Groundwater Conditions None Encountered Prepared by: Steve Myers Date 5/22/85

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					
5			G			CL	SANDY CLAY; brown, stiff, -PL  Light cementation  More sand, very light brown, very stiff to hard, moderate to heavy cementation, some interbedded clayey and silty sand
10			G				
15							Stopped @ 11 feet
20							
25							
30							



# BUCKHORN - MESA - APACHE JUNCTION - GILBERT WATERSHEDS PROTECTION AND FLOOD PREVENTION PROJECT

## MARICOPA COUNTY, ARIZONA PLANS FOR THE GEOLOGIC INVESTIGATION OF R.W.C.D. FLOODWAY - REACH 6



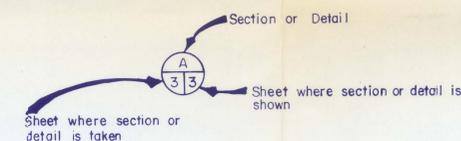
PREPARED FOR THE  
 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY  
 EAST MARICOPA NATURAL RESOURCE CONSERVATION DISTRICT  
 BY  
 SOIL CONSERVATION SERVICE  
 U.S. DEPARTMENT OF AGRICULTURE

### INDEX OF DRAWINGS

DRAWING No.	SHT. No.	TITLE
85015-AZ-CH	1.	INDEX OF DRAWINGS
	2.	LOCATION MAP
	3.	PLAN & PROFILE - STA. 29+45.52 STA. 45+00
	4.	PLAN & PROFILE - STA. 45+00 STA. 65+00
	5.	PLAN & PROFILE - STA. 65+00 STA. 85+00
	6.	PLAN & PROFILE - STA. 85+00 STA. 105+00
	7.	PLAN & PROFILE - STA. 105+00 STA. 125+00
	8.	PLAN & PROFILE - STA. 125+00 STA. 145+00
	9.	PLAN & PROFILE - STA. 145+00 STA. 161+30

### BENCHMARKS

- BM#1. UNIVERSITY DRIVE AT THE FLOODWAY 1347.58 CHISELED SQUARE IN THE EAST END OF THE SOUTH BRIDGE WALL (CANAL BRIDGE)
- BM#2. BROWN ROAD AT THE FLOODWAY 1351.63 B.C. IN THE WEST END OF THE NORTH WALL OF THE CANAL BRIDGE
- BM#3. APACHE BOULEVARD (MAIN STREET) AT THE FLOODWAY 1345.05 B.C. IN THE SOUTH BRIDGE WALL (CANAL BRIDGE)
- BM#7. BROADWAY ROAD AT THE FLOODWAY 1346.41 BLACK X NORTHWEST CORNER OF THE FLOODWAY BRIDGE WALL



### GENERAL NOTES

1. ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL U.S.G.S. DATUM.
2. ALL STATIONING REFERS TO BASELINE OF FLOODWAY AND IS THE MEASURED HORIZONTAL DISTANCE.
3. ALL SOIL CLASSIFICATION SYMBOLS SHOWN ARE BASED ON THE UNIFIED SOIL CLASSIFICATION SYSTEM. FIELD IDENTIFICATION WAS USED EXCEPT WHERE INDICATED BY AN ASTERISK (\*). THIS DENOTES LABORATORY CLASSIFICATION. LOGS AND DESCRIPTIONS ARE ABRIDGED. COMPLETE DRILLING LOGS, LABORATORY REPORTS AND GEOLOGY REPORT ARE AVAILABLE FOR INSPECTION AT THE PROJECT OFFICE.
4. ALL BEARINGS ARE REFERENCED TO TRUE NORTH.
5. ALL FLOODWAY CROSS SECTIONS ARE SHOWN LOOKING IN THE DIRECTION OF INCREASING STATIONS.
6. ALL SOIL INFORMATION IS BASED ON THE BASELINE STATIONING OF THE FLOODWAY.

### LEGEND

- TEST PIT
- ▲ BENCHMARK
- P — POWER LINE
- T — TELEPHONE LINE
- + COORDINATE GRID POINTS
- △ SURVEY MONUMENTS
- △ AERIAL CONTROL POINTS

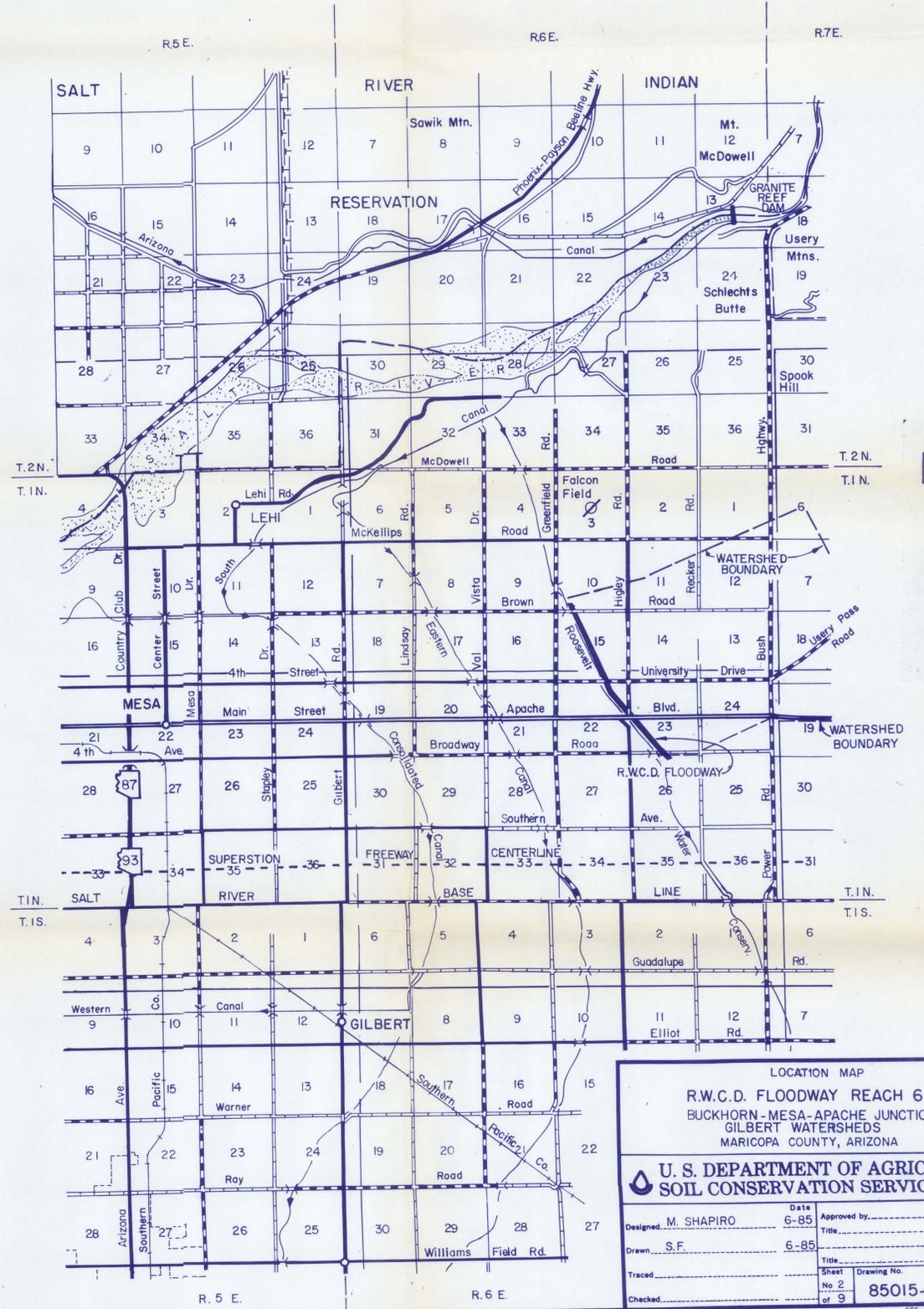
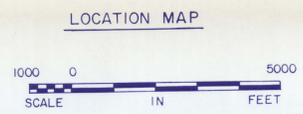
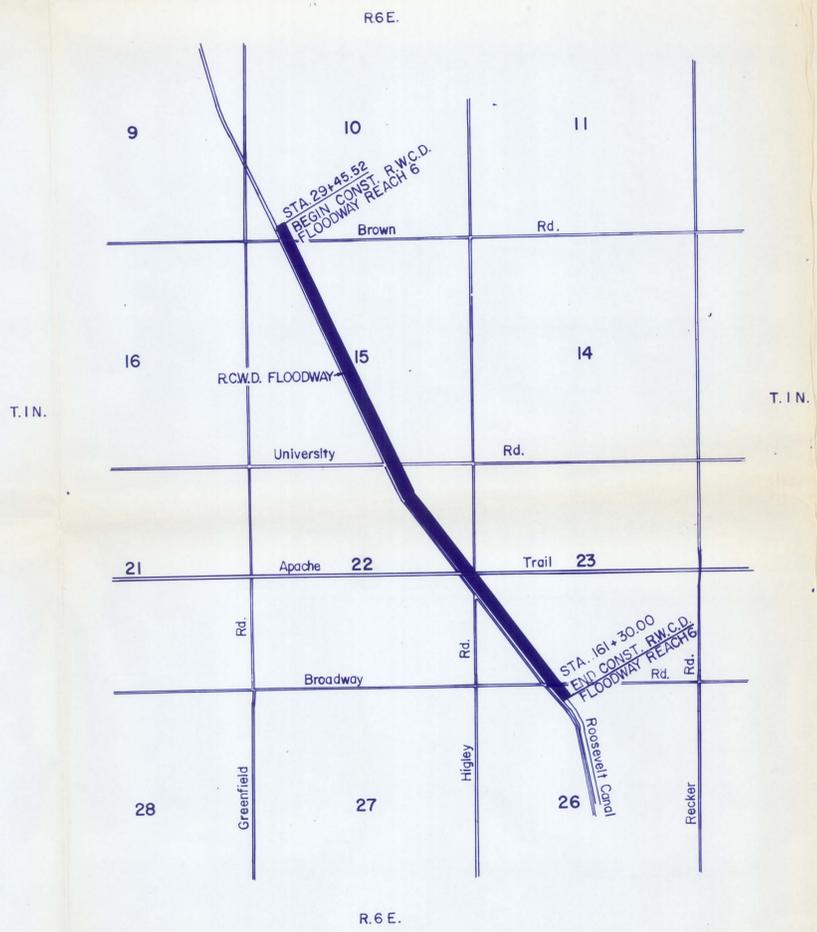
INDEX OF DRAWINGS  
 GEOLOGIC INVESTIGATION  
 R.W.C.D. FLOODWAY REACH 6  
 BUCKHORN - MESA - APACHE JUNCTION  
 GILBERT WATERSHEDS  
 MARICOPA COUNTY, ARIZONA

**U. S. DEPARTMENT OF AGRICULTURE  
 SOIL CONSERVATION SERVICE**

Designed	M. SHAPIRO	Date	6-85	Approved by	_____
Drawn	A.S.	Date	6-85	Title	_____
Traced	_____	Sheet	_____	Drawing No.	_____
Checked	_____	No. of	9	Drawing No.	85015-AZ-CH

EAST MARICOPA NATURAL RESOURCE CONSERVATION DISTRICT <b>APPROVED</b>	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY <b>APPROVED</b>
DATE _____ CHAIRMAN BOARD OF SUPERVISORS	DATE _____ CHIEF ENGINEER

REVISIONS



LOCATION MAP  
 R.W.C.D. FLOODWAY REACH 6  
 BUCKHORN-MESA-APACHE JUNCTION  
 GILBERT WATERSHEDS  
 MARICOPA COUNTY, ARIZONA

**U. S. DEPARTMENT OF AGRICULTURE  
 SOIL CONSERVATION SERVICE**

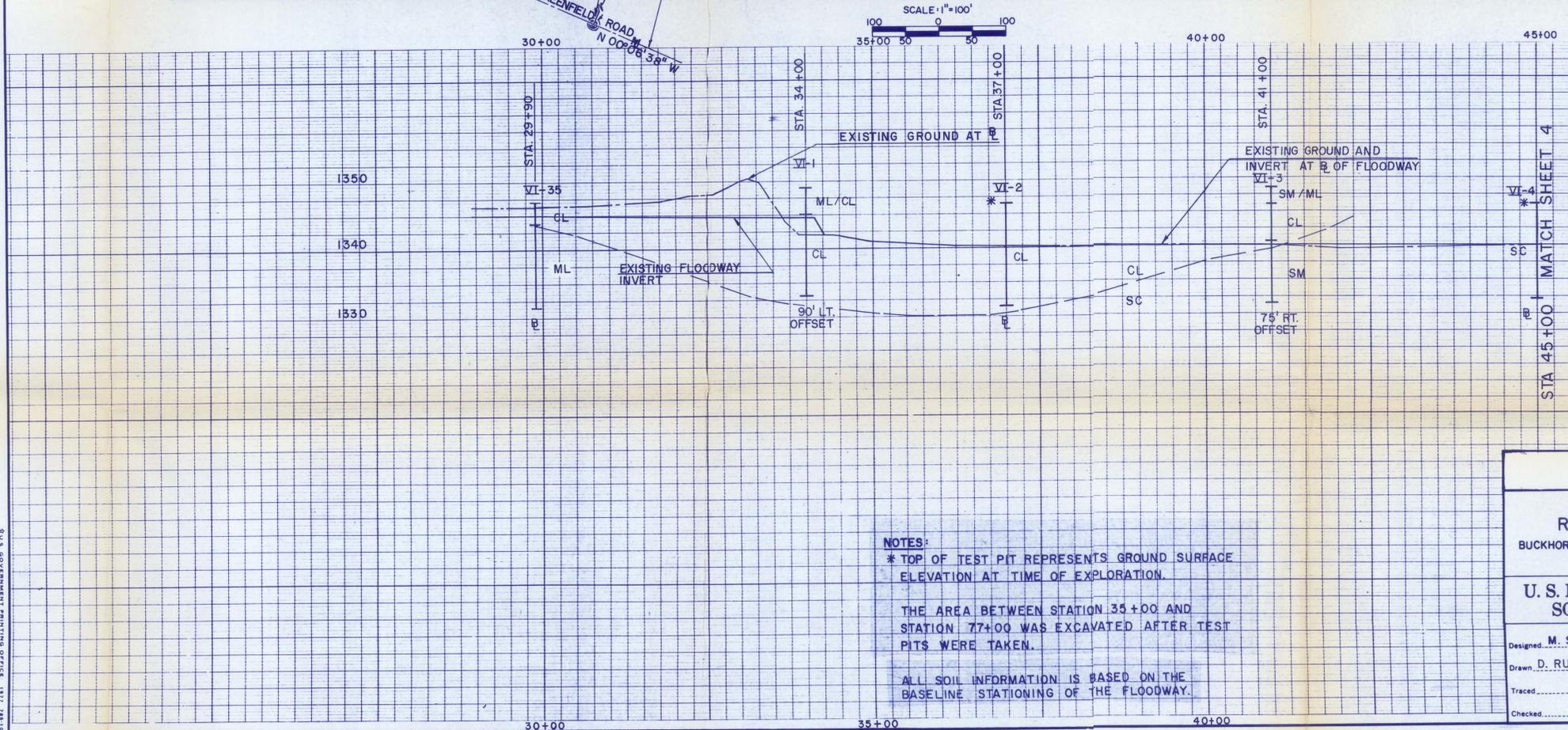
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Drawn	S.F.	Date	6-85	Title	
Traced		Sheet	No. 2	Drawing No.	
Checked		of	9		

**85015-AZ-CH**



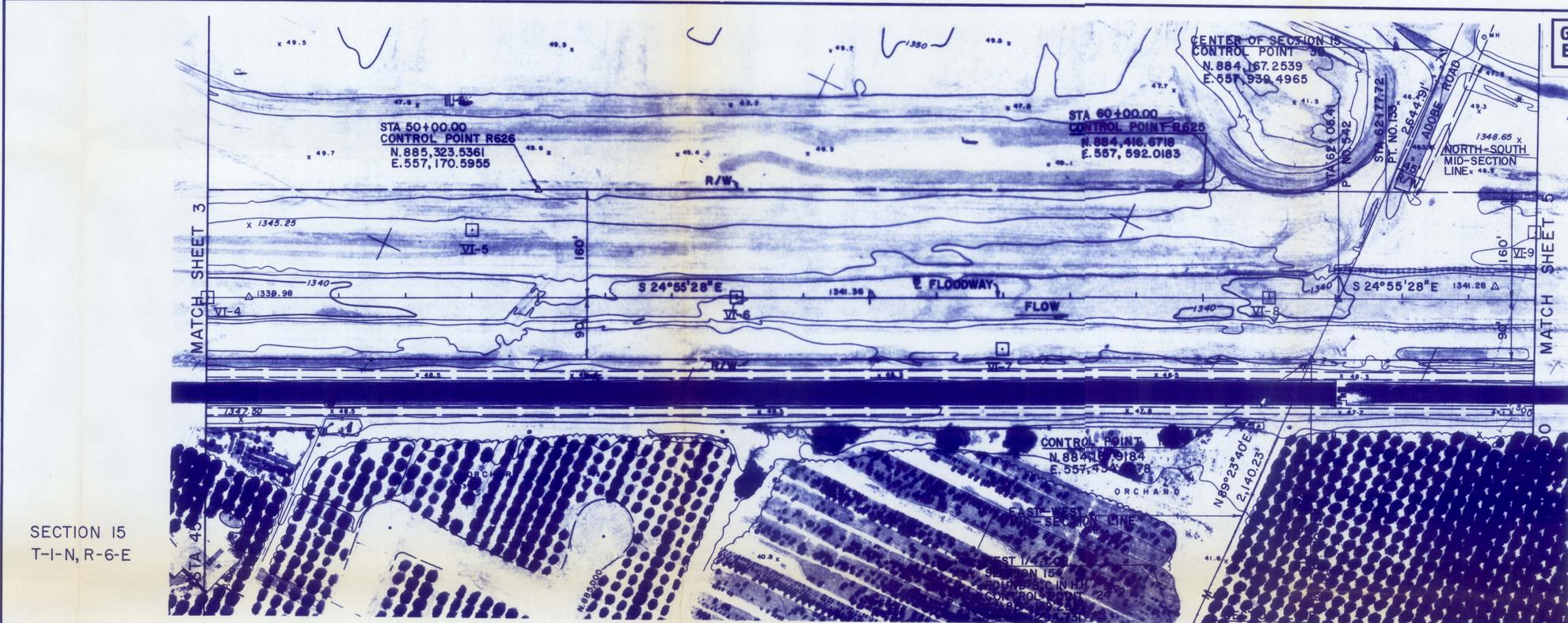
SECTION 10  
T-I-N, R-6-E

SECTION 15  
T-I-N, R-6-E



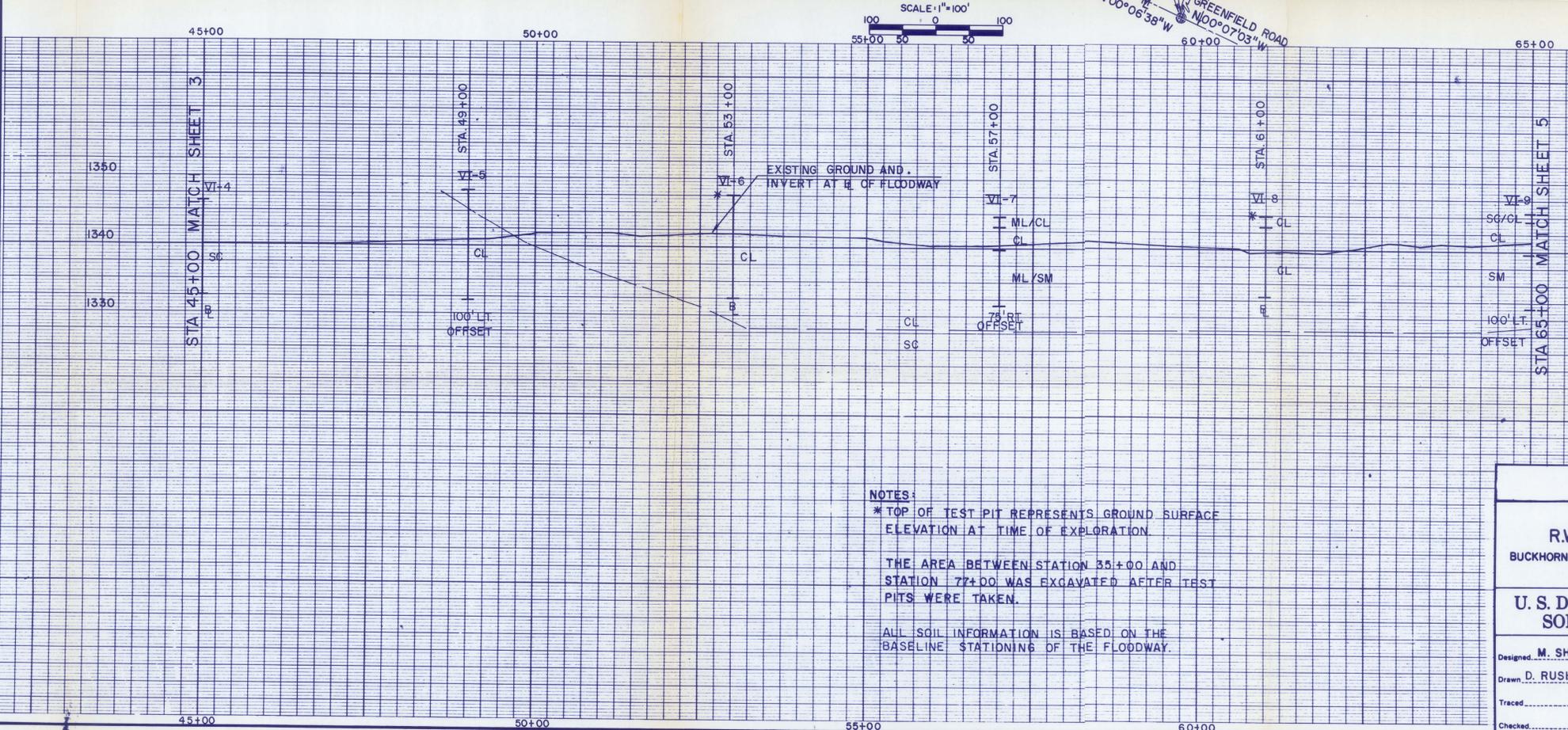
**NOTES:**  
 \* TOP OF TEST PIT REPRESENTS GROUND SURFACE ELEVATION AT TIME OF EXPLORATION.  
 THE AREA BETWEEN STATION 35+00 AND STATION 41+00 WAS EXCAVATED AFTER TEST PITS WERE TAKEN.  
 ALL SOIL INFORMATION IS BASED ON THE BASELINE STATIONING OF THE FLOODWAY.

GEOLOGIC EXHIBIT			
PLAN & PROFILE STA. 29+45.52 TO STA. 45+00 R.W.C.D. FLOODWAY REACH 6 BUCKHORN-MESA-APACHE JUNCTION-GILBERT WATERSHEDS MARICOPA COUNTY, ARIZONA			
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
Designed <b>M. SHAPIRO</b>	Date <b>8/85</b>	Approved by _____	
Drawn <b>D. RUSH-GERBER</b>	Date <b>8/85</b>	Title _____	
Traced _____	Sheet <b>No. 3</b>	Drawing No. <b>85015-AZ-CH</b>	
Checked _____	of <b>9</b>		



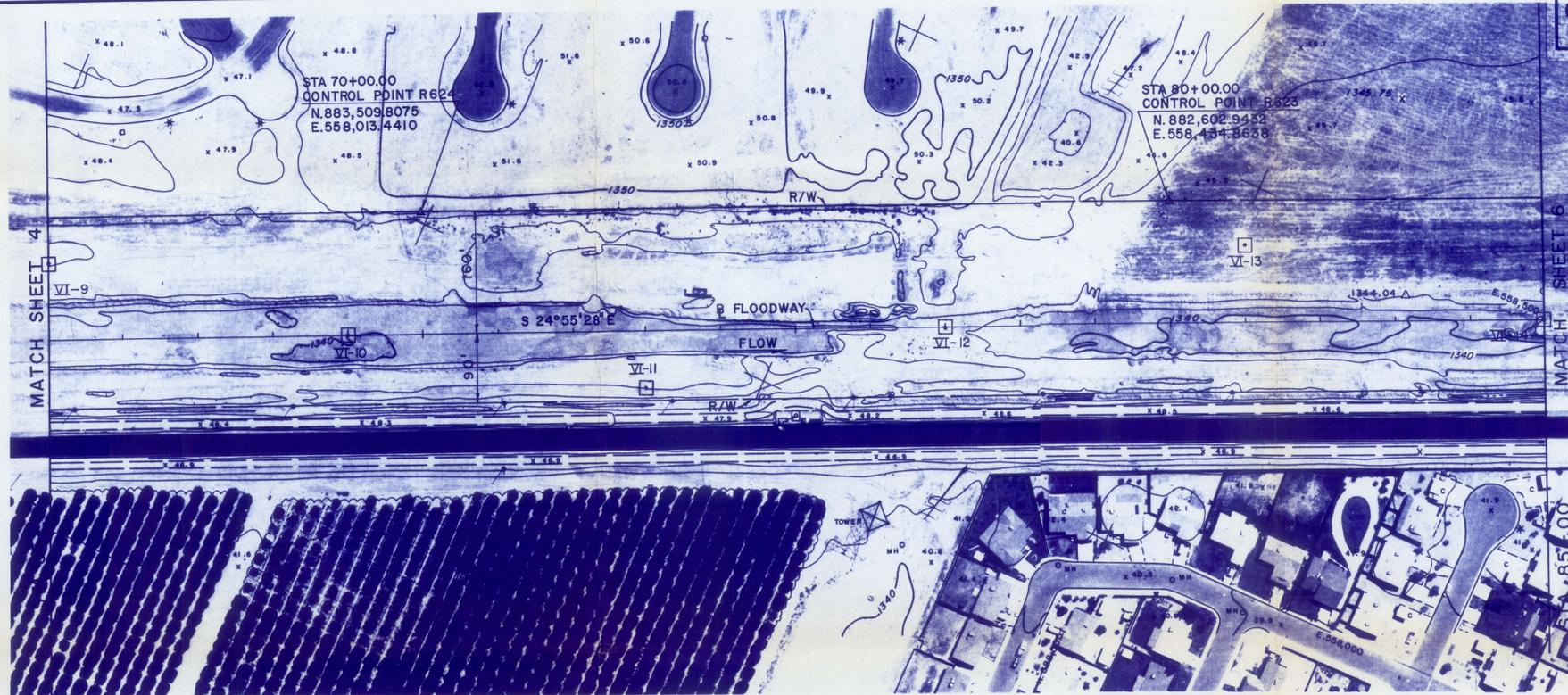
SECTION 15  
T-I-N, R-6-E

SECTION 15  
T-I-N, R-6-E



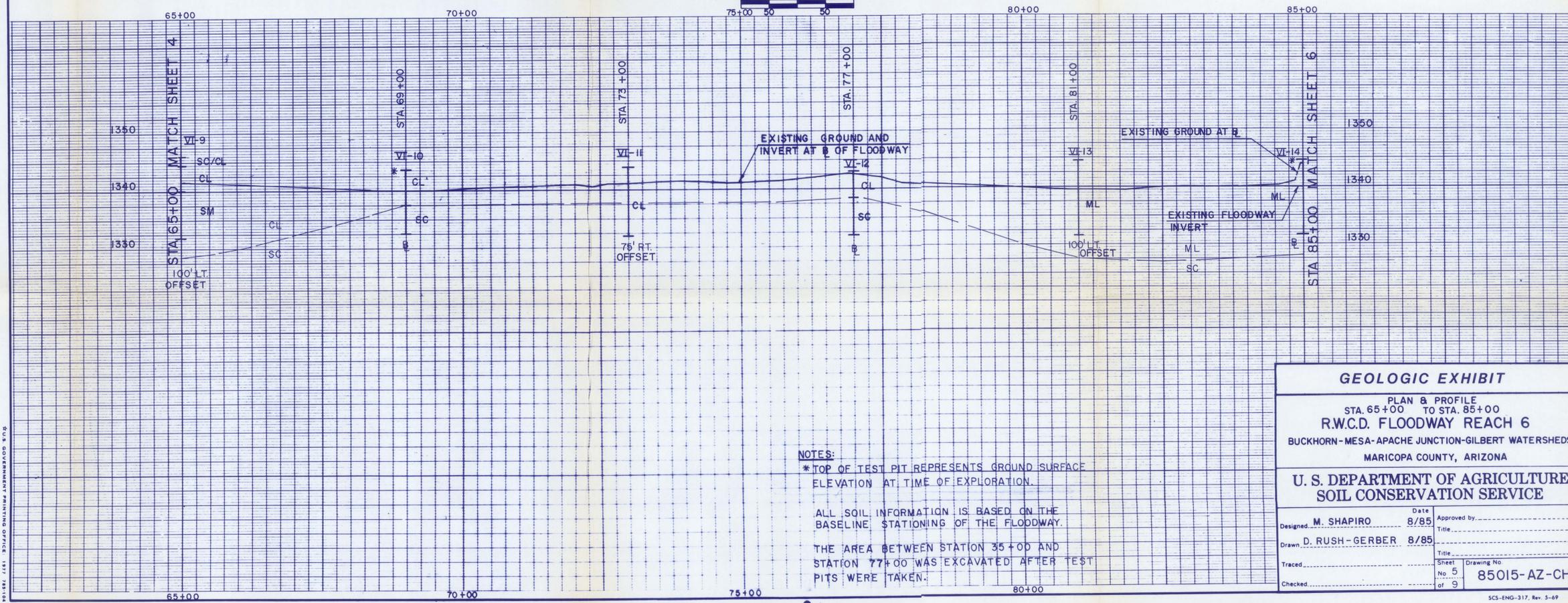
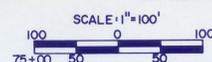
**NOTES:**  
 \* TOP OF TEST PIT REPRESENTS GROUND SURFACE ELEVATION AT TIME OF EXPLORATION.  
 THE AREA BETWEEN STATION 35+00 AND STATION 77+00 WAS EXCAVATED AFTER TEST PITS WERE TAKEN.  
 ALL SOIL INFORMATION IS BASED ON THE 'BASELINE' STATIONING OF THE FLOODWAY.

GEOLOGIC EXHIBIT	
PLAN & PROFILE STA. 45+00 TO STA. 65+00 <b>R.W.C.D. FLOODWAY REACH 6</b> BUCKHORN-MESA-APACHE JUNCTION-GILBERT WATERSHEDS MARICOPA COUNTY, ARIZONA	
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	
Designed by <b>M. SHAPIRO</b>	Date <b>8/85</b>
Drawn by <b>D. RUSH-GERBER</b>	Approved by _____
Traced by _____	Title _____
Checked by _____	Sheet No. <b>4</b>
	Drawing No. <b>85015-AZ-CH</b>
	of <b>9</b>



SECTION 15  
T-I-N, R-6-E

SECTION 15  
T-I-N, R-6-E



**NOTES:**  
 \*TOP OF TEST PIT REPRESENTS GROUND SURFACE ELEVATION AT TIME OF EXPLORATION.  
 ALL SOIL INFORMATION IS BASED ON THE BASELINE STATIONING OF THE FLOODWAY.  
 THE AREA BETWEEN STATION 75+00 AND STATION 77+00 WAS EXCAVATED AFTER TEST PITS WERE TAKEN.

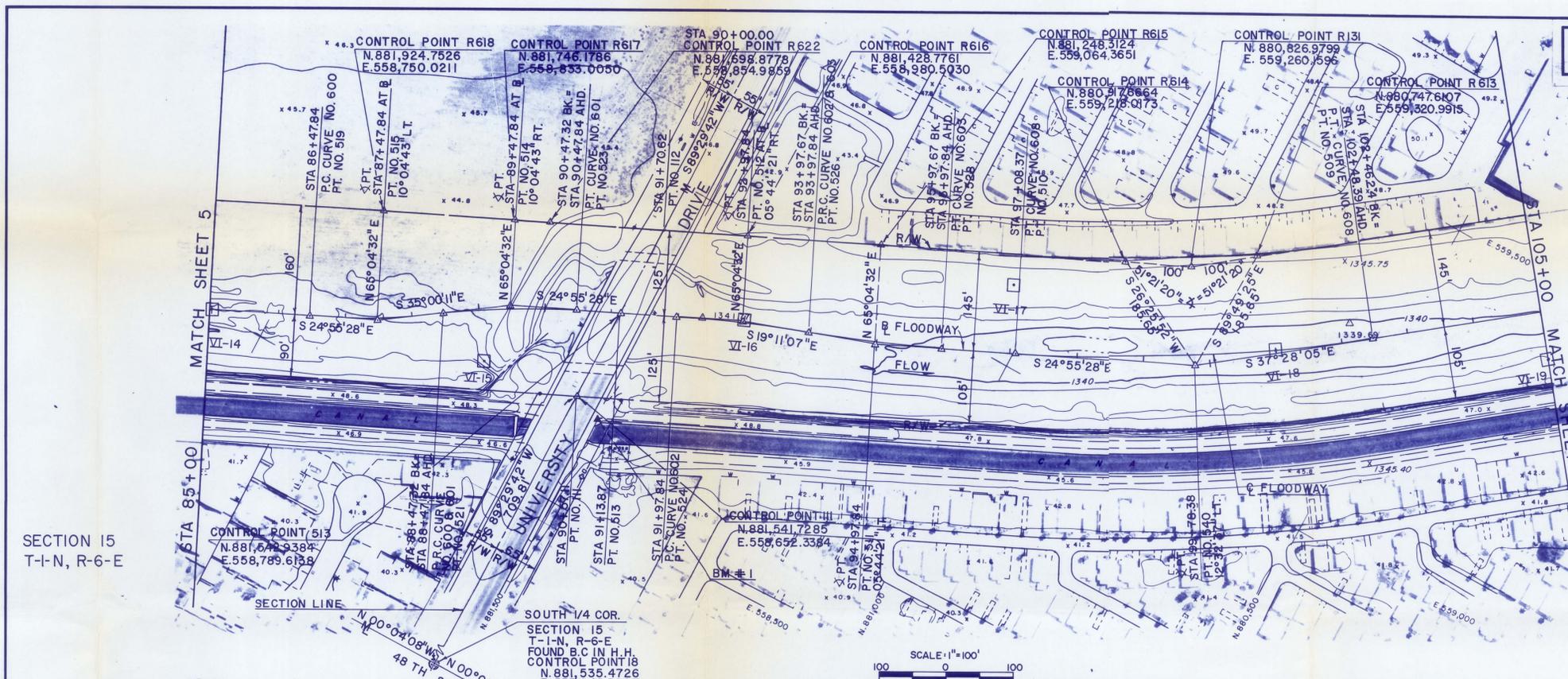
**GEOLOGIC EXHIBIT**

PLAN & PROFILE  
 STA. 65+00 TO STA. 85+00  
**R.W.C.D. FLOODWAY REACH 6**  
 BUCKHORN-MESA-APACHE JUNCTION-GILBERT WATERSHEDS  
 MARICOPA COUNTY, ARIZONA

**U. S. DEPARTMENT OF AGRICULTURE  
 SOIL CONSERVATION SERVICE**

Designed: <b>M. SHAPIRO</b>	Date: <b>8/85</b>	Approved by: _____
Drawn: <b>D. RUSH-GERBER</b>	Date: <b>8/85</b>	Title: _____
Traced: _____	Sheet No. <b>5</b>	Drawing No. <b>85015-AZ-CH</b>
Checked: _____	of <b>9</b>	

K01002 (REV. 1/81) EDWARD DANILIN, ADMINISTRATOR, RCD



SECTION 15  
T-1-N, R-6-E

**CURVE NO. 600 & 601**

Δ = 10°04'43"  
 D = 05°03'09"  
 R = 1,134.04'  
 T = 100.00'  
 L = 199.48'  
 C = 199.23'

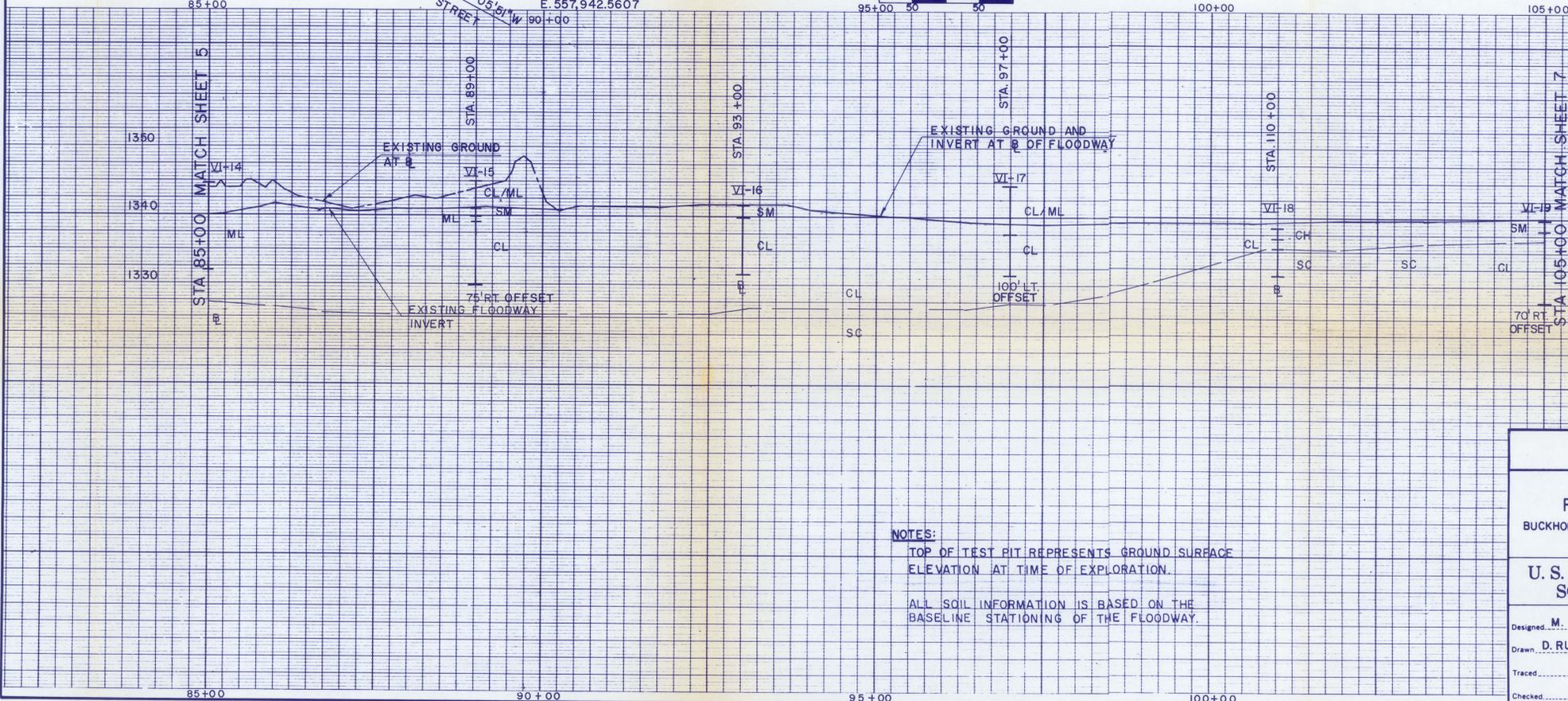
**CURVE NO. 602 & 603**

Δ = 05°44'21"  
 D = 02°52'19"  
 R = 1,994.99'  
 T = 100.00'  
 L = 199.83'  
 C = 199.75'

**CURVE NO. 608**

Δ = 12°32'37"  
 D = 02°19'56"  
 R = 2,456.83'  
 T = 270.01'  
 L = 537.87'  
 C = 536.79'

SECTION 22  
T-1-N, R-6-E



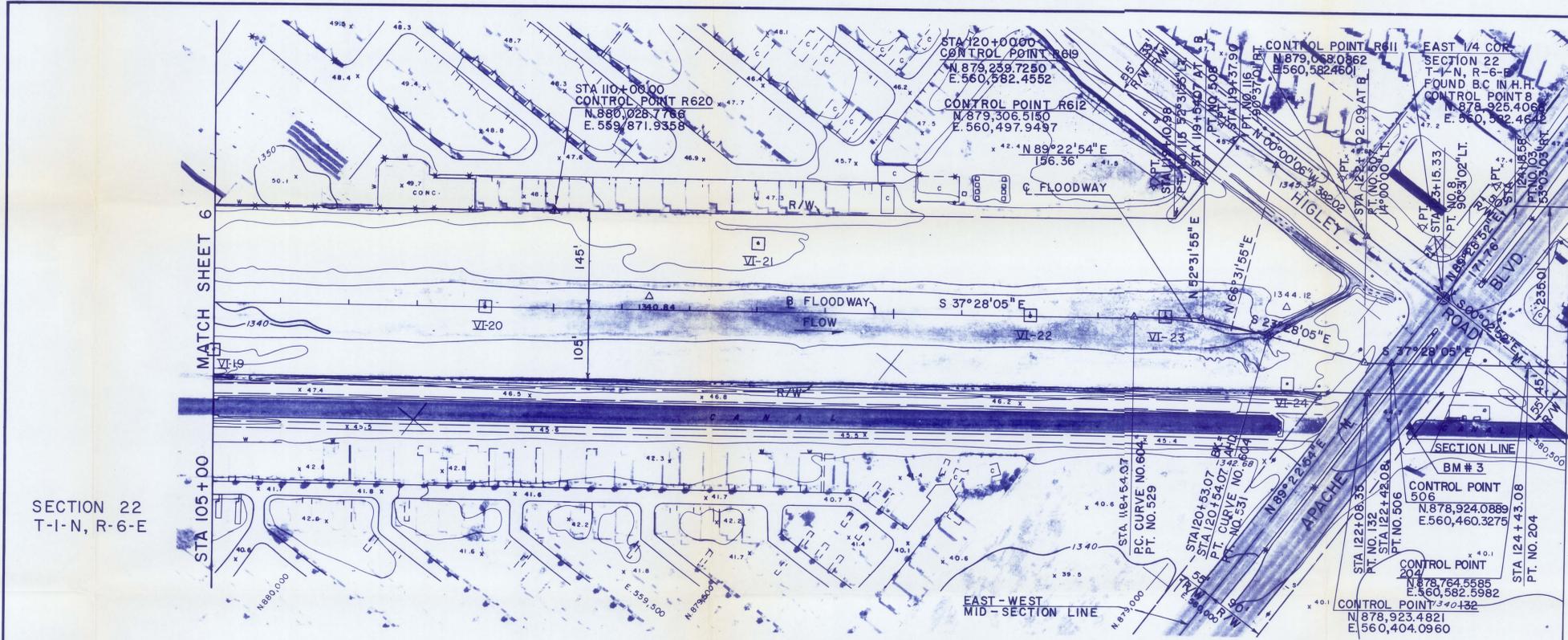
**NOTES:**  
 TOP OF TEST PIT REPRESENTS GROUND SURFACE ELEVATION AT TIME OF EXPLORATION.  
 ALL SOIL INFORMATION IS BASED ON THE BASELINE STATIONING OF THE FLOODWAY.

**GEOLOGIC EXHIBIT**

PLAN & PROFILE  
 STA. 85+00 TO STA. 105+00  
**R.W.C.D. FLOODWAY REACH 6**  
 BUCKHORN-MESA-APACHE JUNCTION-GILBERT WATERSHEDS  
 MARICOPA COUNTY, ARIZONA

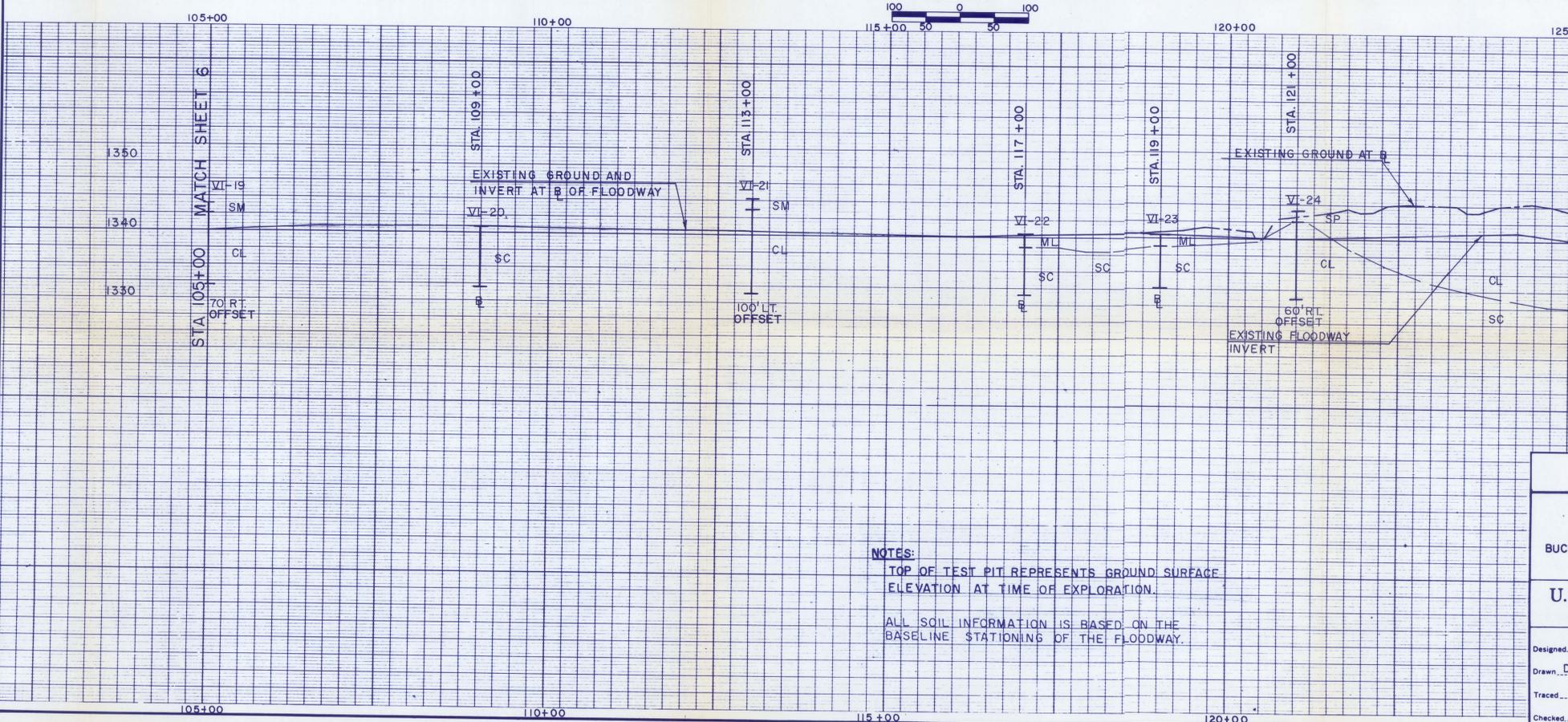
**U. S. DEPARTMENT OF AGRICULTURE  
 SOIL CONSERVATION SERVICE**

Designed <b>M. SHAPIRO</b>	Date <b>8/85</b>	Approved by _____
Drawn <b>D. RUSH-GERBER</b>	Date <b>8/85</b>	Title _____
Traced _____	Sheet _____	Drawing No. _____
Checked _____	No. <b>6</b>	<b>85015-AZ-CH</b>
	of <b>9</b>	



SECTION 23  
T-I-N, R-6-E

CURVE NO. 604  
 $\Delta = 14^\circ 00' 00''$   
 $D = 07^\circ 02' 06''$   
 $R = 814.43'$   
 $L = 100.00'$   
 $T = 199.00'$   
 $C = 198.51'$



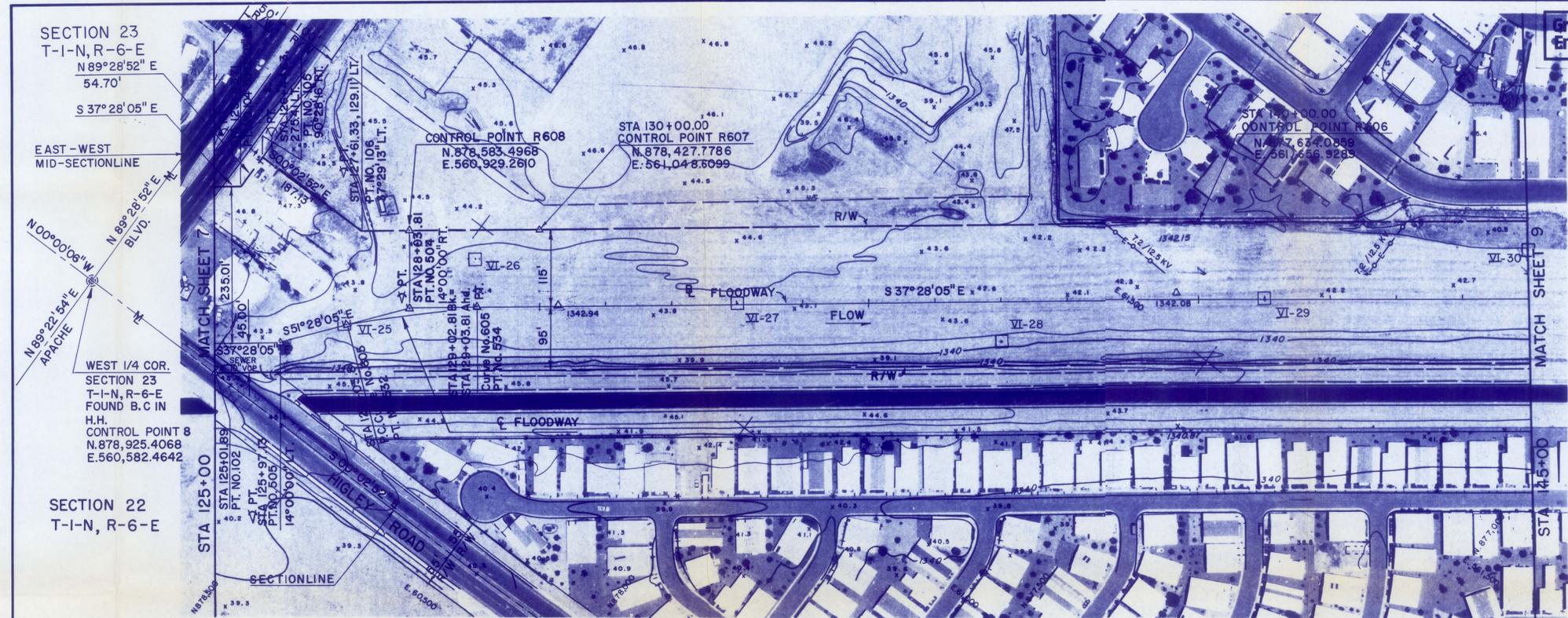
NOTES:  
 TOP OF TEST PIT REPRESENTS GROUND SURFACE ELEVATION AT TIME OF EXPLORATION.  
 ALL SOIL INFORMATION IS BASED ON THE BASELINE STATIONING OF THE FLOODWAY.

**GEOLOGIC EXHIBIT**

PLAN & PROFILE  
 STA. 105+00 TO STA. 125+00  
**R.W.C.D. FLOODWAY REACH 6**  
 BUCKHORN-MESA-APACHE JUNCTION-GILBERT WATERSHEDS  
 MARICOPA COUNTY, ARIZONA

**U. S. DEPARTMENT OF AGRICULTURE  
 SOIL CONSERVATION SERVICE**

Designed, <b>M. SHAPIRO</b>	Date <b>8/85</b>	Approved by	
Drawn, <b>D. RUSH-GERBER</b>	Date <b>8/85</b>	Title	
Traced		Sheet No. <b>7</b>	Drawing No.
Checked		of <b>9</b>	<b>85015-AZ-CH</b>

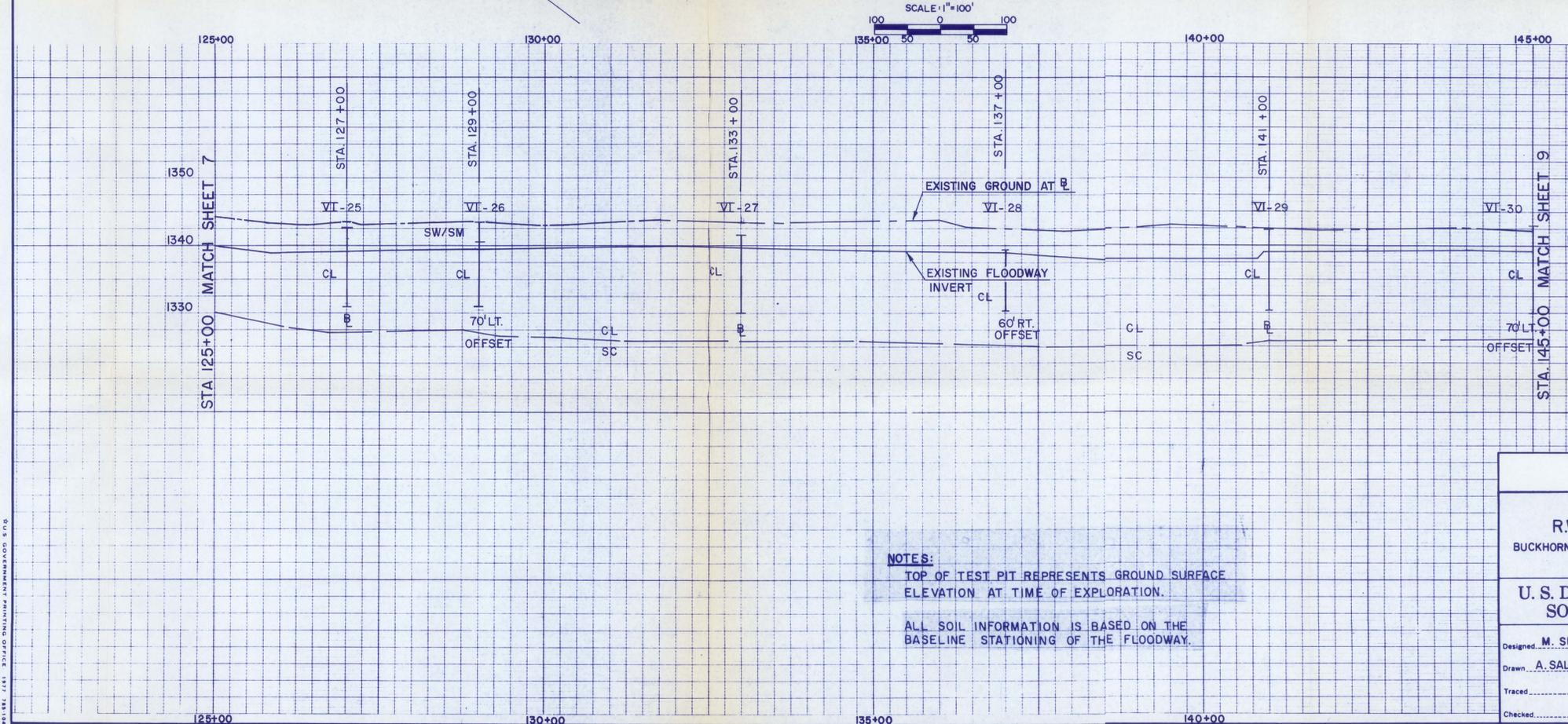
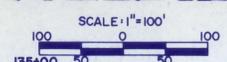


**CURVE No. 605**  
 $\Delta = 14^{\circ}00'00''$   
 $D = 07^{\circ}02'06''$   
 $R = 814.43'$   
 $T = 100.00'$   
 $L = 199.00'$   
 $C = 198.51'$

**SECTION 23**  
 T-I-N, R-6-E  
 $N 89^{\circ}28'52'' E$   
 $54.70'$   
 $S 37^{\circ}28'05'' E$   
 EAST-WEST  
 MID-SECTIONLINE  
 $N 89^{\circ}28'52'' E$   
 BLVD.  
 $N 89^{\circ}22'15'' E$   
 APACHE  
 $N 89^{\circ}22'15'' E$   
 WEST 1/4 COR.  
 SECTION 23  
 T-I-N, R-6-E  
 FOUND B.C IN  
 H.H.  
 CONTROL POINT B  
 $N.878,925.4068$   
 $E.560,582.4642$

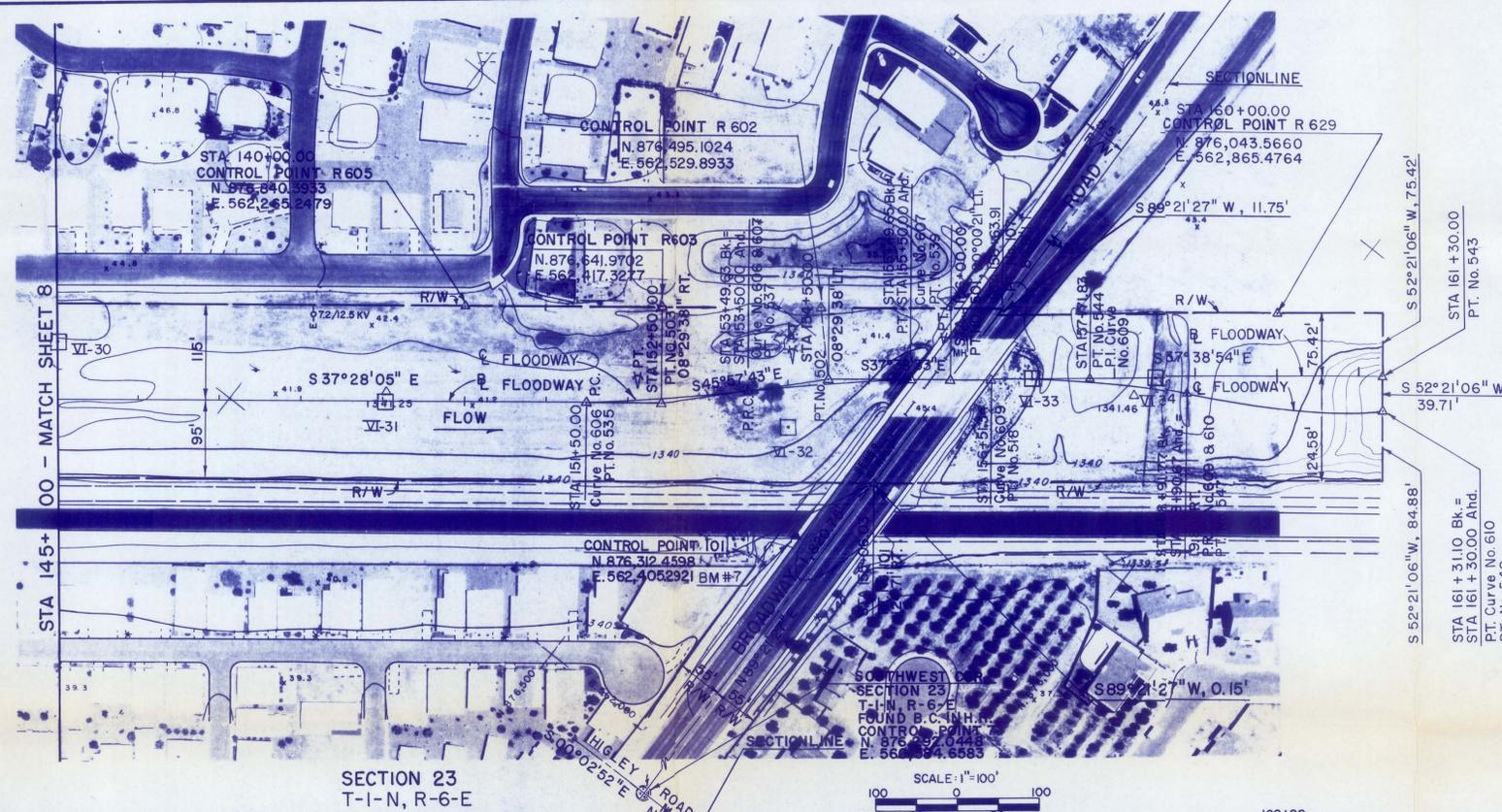
**SECTION 22**  
 T-I-N, R-6-E

**SECTION 23**  
 T-I-N, R-6-E



**NOTES:**  
 TOP OF TEST PIT REPRESENTS GROUND SURFACE  
 ELEVATION AT TIME OF EXPLORATION.  
 ALL SOIL INFORMATION IS BASED ON THE  
 BASELINE STATIONING OF THE FLOODWAY.

<b>GEOLOGIC EXHIBIT</b>			
PLAN & PROFILE STA. 125+00 TO STA. 145+00 <b>R.W.C.D. FLOODWAY REACH 6</b> BUCKHORN-MESA-APACHE JUNCTION-GILBERT WATERSHEDS MARICOPA COUNTY, ARIZONA			
<b>U. S. DEPARTMENT OF AGRICULTURE</b> <b>SOIL CONSERVATION SERVICE</b>			
Designed	M. SHAPIRO	Date	5/85
Drawn	A. SALSBERY	Approved by	_____
Traced	_____	Title	_____
Checked	_____	Sheet	No. 9
		of	9
		Drawing No.	85015-AZ-CH



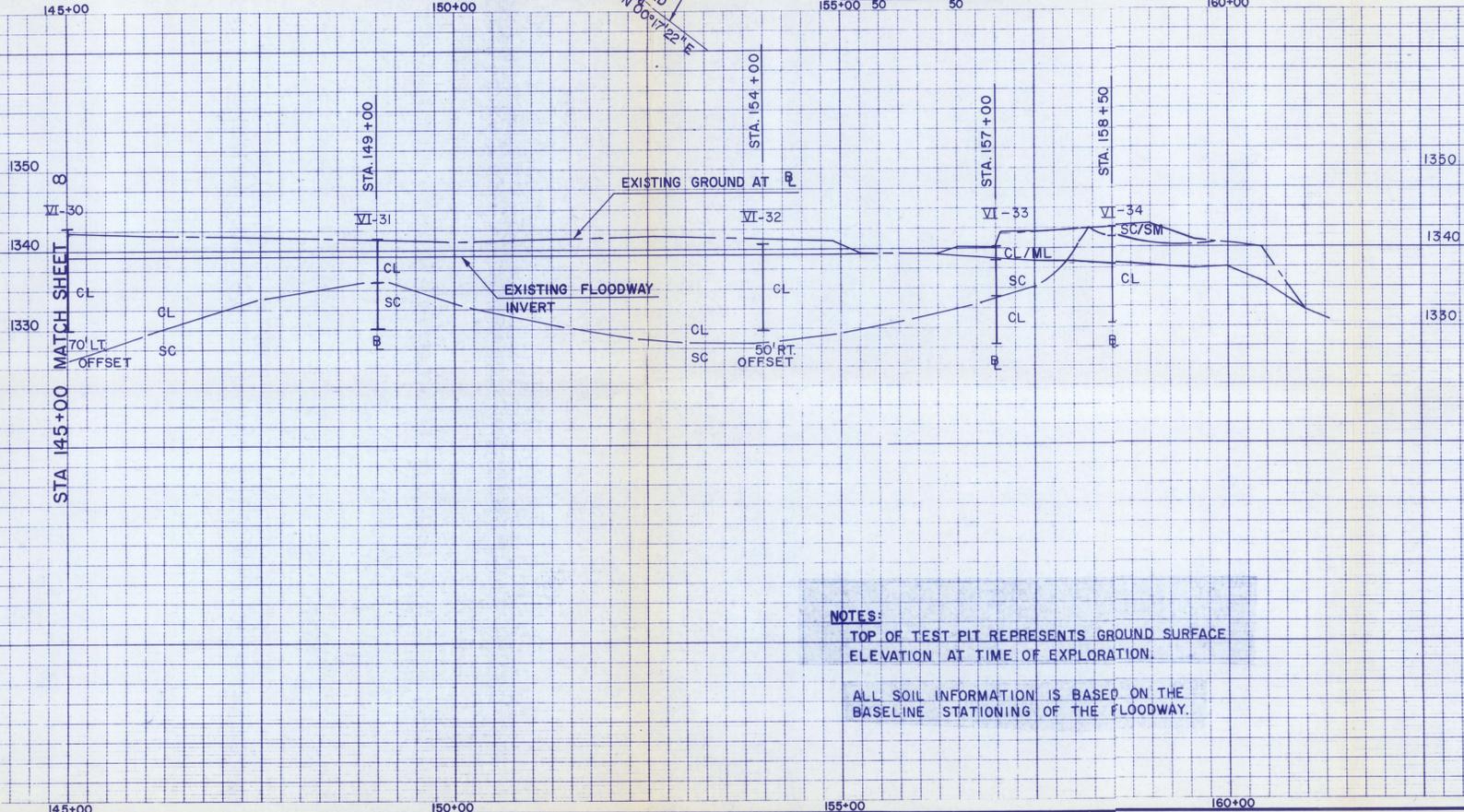
CURVE No.606	CURVE No.609 & 610
$\Delta = 08^{\circ} 29' 38''$	$\Delta = 09^{\circ} 29' 01''$
$D = 04^{\circ} 15' 17''$	$D = 03^{\circ} 56' 40''$
$R = 1346.63'$	$R = 1452.53'$
$T = 100.00'$	$T = 120.49'$
$L = 199.63'$	$L = 240.43'$
$C = 199.45'$	$C = 240.15'$

CURVE No.607
$\Delta = 08^{\circ} 19' 10''$
$D = 04^{\circ} 10' 02''$
$R = 1374.96'$
$T = 100.00'$
$L = 199.65'$
$C = 199.47'$

SECTION 23  
T-I-N, R-6-E

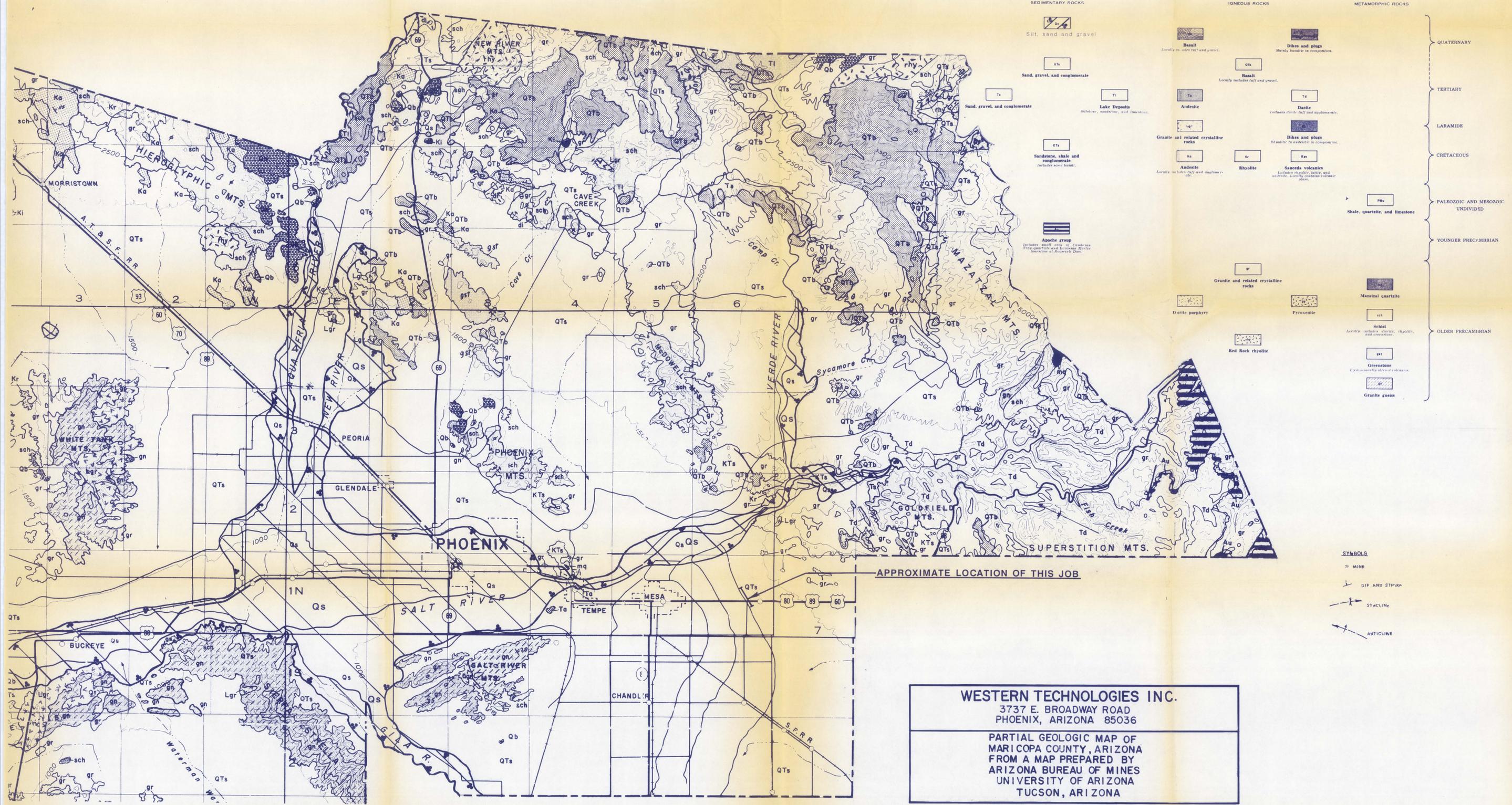
SECTION 26  
T-I-N, R-6-E



**NOTES:**  
 TOP OF TEST PIT REPRESENTS GROUND SURFACE ELEVATION AT TIME OF EXPLORATION.  
 ALL SOIL INFORMATION IS BASED ON THE BASELINE STATIONING OF THE FLOODWAY.

GEOLOGIC EXHIBIT			
PLAN & PROFILE STA. 145+00 TO STA. 161+30 R.W.C.D. FLOODWAY REACH 6 BUCKHORN-MESA-APACHE JUNCTION-GILBERT WATERSHEDS MARICOPA COUNTY, ARIZONA			
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
Designed by <b>M. SHAPIRO</b>	Date <b>5/85</b>	Approved by Title	
Drawn by <b>A. SALSBERY</b>	Date <b>5/85</b>	Title	
Traced	Sheet No. <b>9</b> of <b>9</b>	Drawing No. <b>85015-AZ-CH</b>	
Checked			





SEDIMENTARY ROCKS	IGNEOUS ROCKS	METAMORPHIC ROCKS	PERIOD
Silt, sand and gravel	Basalt <i>Locally in area left and gravel.</i>	Dikes and plugs <i>Mainly basaltic in composition.</i>	QUATERNARY
Sand, gravel, and conglomerate	Basalt <i>Locally includes tuff and gravel.</i>		TERTIARY
Sand, gravel, and conglomerate	Andesite <i>Includes diorite, gabbro and gneiss.</i>	Dikes and plugs <i>Basaltic to andesitic in composition.</i>	LARAMIDE
Sandstone, shale and conglomerate <i>Includes some basalt.</i>	Granite and related crystalline rocks	Rhyolite <i>Suspected volcanics Includes rhyolite, basalt, and andesite. Locally produces volcanic glass.</i>	CRETACEOUS
Lake Deposits <i>Siltstone, sandstone, and limestone.</i>	Andesite <i>Locally includes tuff and agglomerate.</i>		PALEOZOIC AND MESOZOIC UNDIVIDED
Apache group <i>Includes small area of Chinoan Ply quartzite and Devonian Marble Member of Roosevelt Dam.</i>	Rhyolite		YOUNGER PRECAMBRIAN
	Granite and related crystalline rocks		OLDER PRECAMBRIAN
	Diorite porphyry	Masatal quartzite	
	Pyroxenite	Schist <i>Locally includes chlorite, rhyolite, and oronotite.</i>	
	Red Rock rhyolite	Greenstone <i>PreCambrian to Devonian.</i>	
		Granite gneiss	

**SYMBOLS**

- ✕ MINE
- DIP AND STRIKE
- STACLINE
- ANTICLINE

**WESTERN TECHNOLOGIES INC.**  
 3737 E. BROADWAY ROAD  
 PHOENIX, ARIZONA 85036

PARTIAL GEOLOGIC MAP OF  
 MARICOPA COUNTY, ARIZONA  
 FROM A MAP PREPARED BY  
 ARIZONA BUREAU OF MINES  
 UNIVERSITY OF ARIZONA  
 TUCSON, ARIZONA

R.W.C.D. FLOODWAY  
 REACH 6  
 PROJECT NO. 2125J108