



T.D. 101 3-72



FLOODWATER RETARDING DAM NO. 2 SANDERSON CANYON WATERSHED PROJECT BREWSTER, PECOS AND TERRELL COUNTIES, TEXAS

DRAINAGE AREA 34,067 ACRES
TOTAL STORAGE 5,990 AC.FT.
HEIGHT OF DAM 56 FEET
VOLUME OF FILL ~~1,987,838~~ 2,328,464 CU. YDS.

SPONSORED BY
RIO GRANDE-PECOS RIVER, BIG BEND AND TRANS-PECOS SOIL AND WATER CONSERVATION DISTRICTS
TERRELL, PECOS AND BREWSTER COUNTY COMMISSIONERS COURTS
COOPERATING WITH
SOIL CONSERVATION SERVICE
OF THE
U.S. DEPARTMENT OF AGRICULTURE

AS BUILT PLANS
CONTRACT NO. 50-74-42-3-2607
CONTRACTOR J. D. Abrams, Inc.
CONSTRUCTION COMMENCED 9/27/83
GOV. REPRESENTATIVE Billy J. Gunter
GOV. INSPECTOR Cyril W. Hamilton
BID PRICE 4,876,079.74
FINAL PRICE 5,735,346.24
CONSTRUCTION COMPLETED 4/2/87

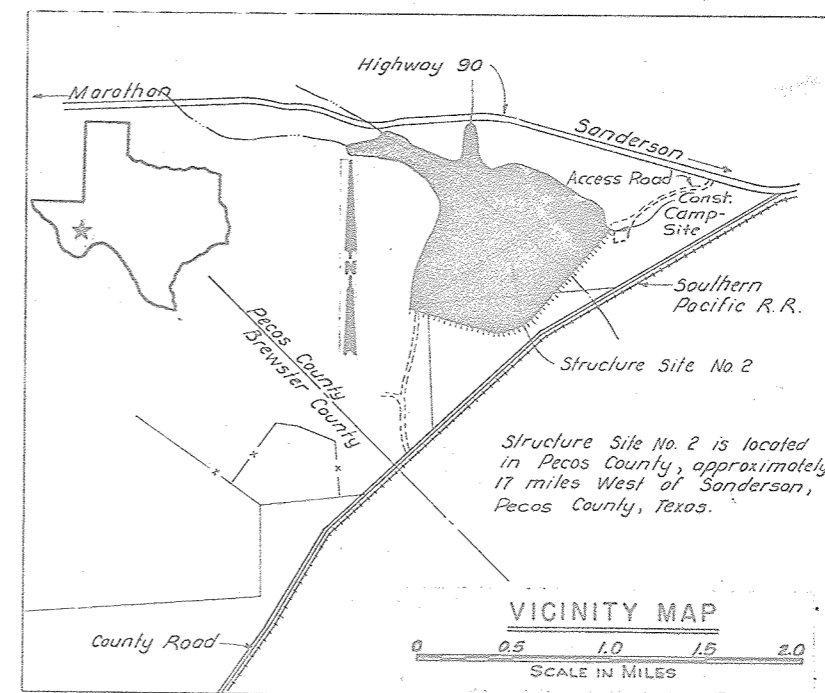
1st Robert A. Frank, Jr.
Approved by letter of 5-13-80
HEAD ENGINEERING STAFF, SCS DATE
FT. WORTH, TEXAS

1980
CONSTRUCTION DRAWINGS APPROVED
Gene C. Vittetoe (S.E.) 5-3-80
STATE CONSERVATION ENGR. S.C.S. DATE
TEMPLE, TEXAS

John S. Almon, P.E. 1-25-80
BENHAM-BLAIR & AFFILIATES, INC. DATE



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17	Port Trash Rack
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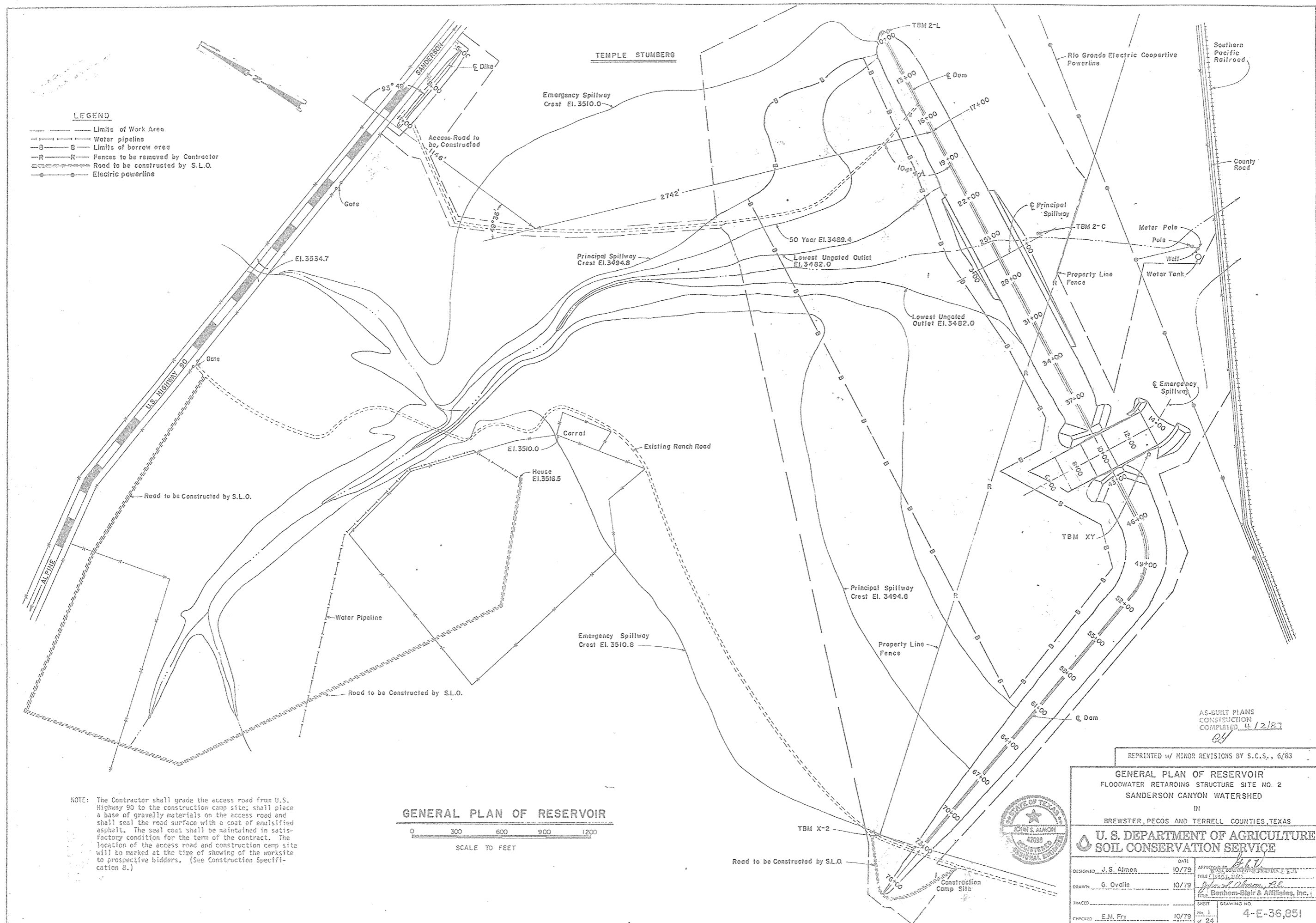
BENHAM - BLAIR & AFFILIATES, INC.
ARCHITECTS ENGINEERS PLANNERS CONSULTANTS
SUITE 470 SOUTH TOWER G.P.M. LIFE BUILDING SAN ANTONIO, TEXAS

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Drawing No.
4-E-36,851

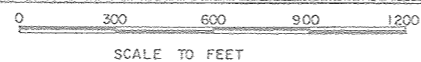
LEGEND

- Limits of Work Area
- Water pipeline
- Limits of borrow area
- Fences to be removed by Contractor
- Road to be constructed by S.L.O.
- Electric powerline



NOTE: The Contractor shall grade the access road from U.S. Highway 90 to the construction camp site; shall place a base of gravelly materials on the access road and shall seal the road surface with a coat of emulsified asphalt. The seal coat shall be maintained in satisfactory condition for the term of the contract. The location of the access road and construction camp site will be marked at the time of showing of the worksite to prospective bidders. (See Construction Specification 8.)

GENERAL PLAN OF RESERVOIR



SCALE TO FEET

AS-BUILT PLANS
CONSTRUCTION
COMPLETED 4/2/87

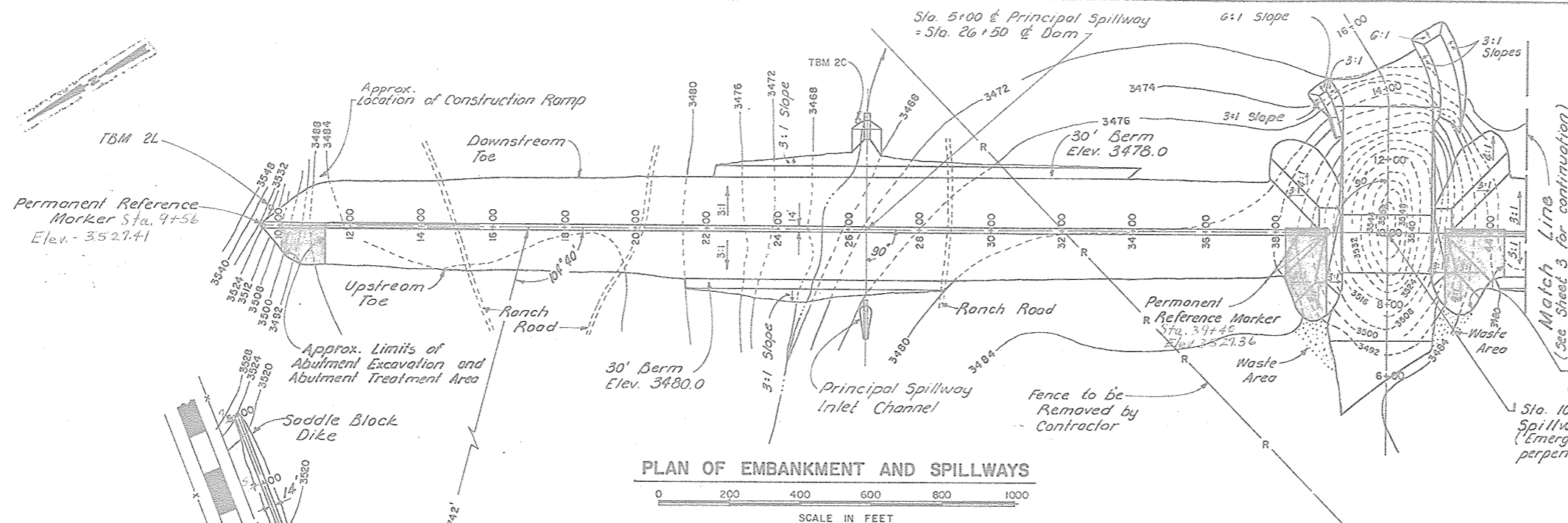
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GENERAL PLAN OF RESERVOIR FLOODWATER RETARDING STRUCTURE SITE NO. 2 SANDERSON CANYON WATERSHED

IN
BREWSTER, PECOS AND TERRELL COUNTIES, TEXAS

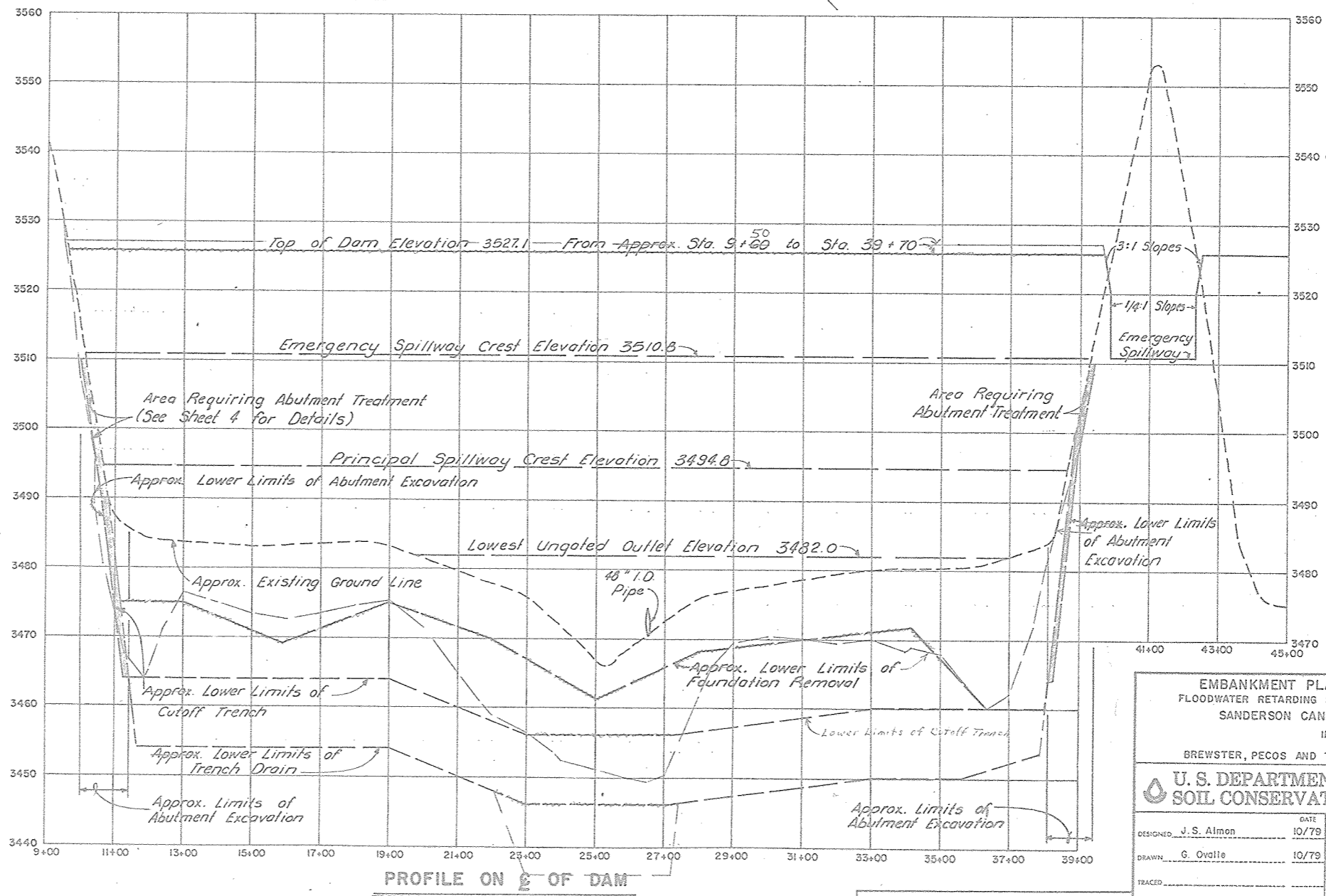
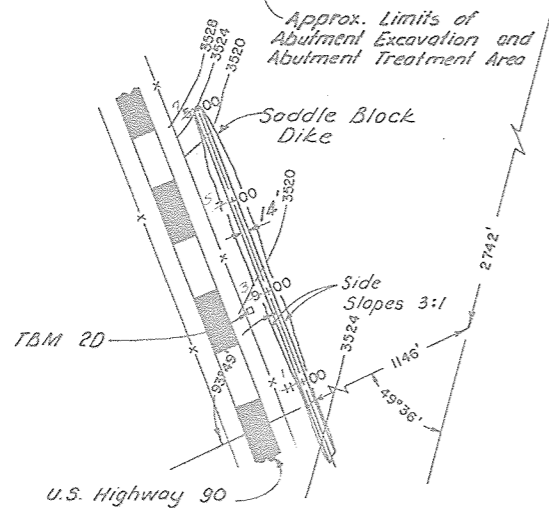
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

DESIGNED	J. S. Almon	DATE	10/79
DRAWN	G. Ovde	DATE	10/79
TRACED			
CHECKED	E. M. Fry	DATE	10/79
APPROVED		DATE	10/79
BY		DATE	10/79
FOR		DATE	10/79
SHEET		NO.	1
DRAWING NO.			4-E-36,851



Emergency Spillway Curve Data
 $\Delta = 31^\circ 30'$
 $D = 31^\circ 30'$
 $R = 181.89'$
 $L = 100.00'$
 $P.C. Sta. 13+50$
 $P.T. Sta. 14+50$

Note:
 Should the Contractor elect to construct a ramp on the abutments, the side slopes of any ramp shall have a minimum 1.0 ft. thick rock blanket and gravel shall be placed on the crown. The ramp(s) shall remain in place after completion of the contract.

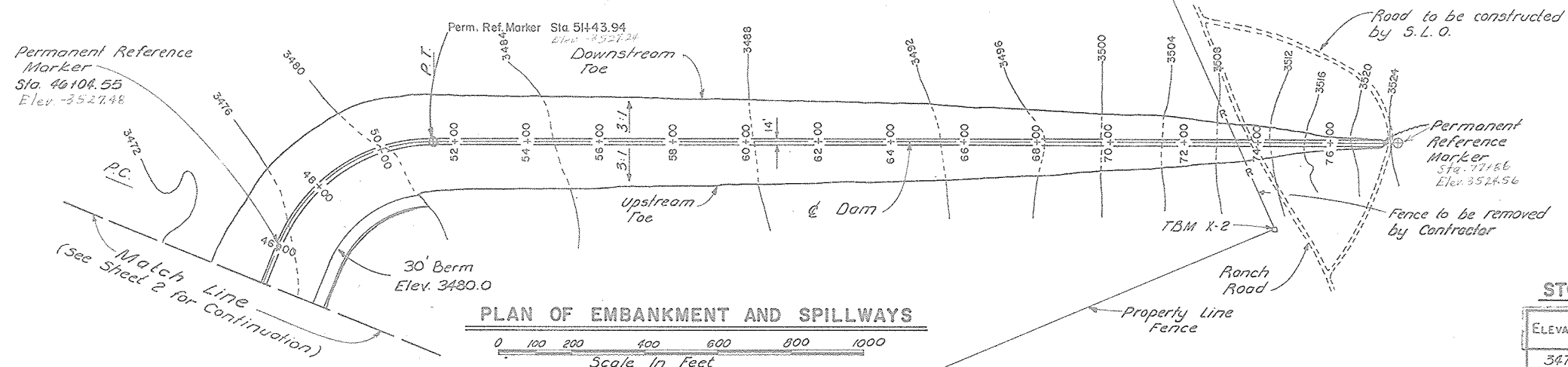


AS-BUILT PLANS
 CONSTRUCTION
 COMPLETED 4/2/87
 [Signature]



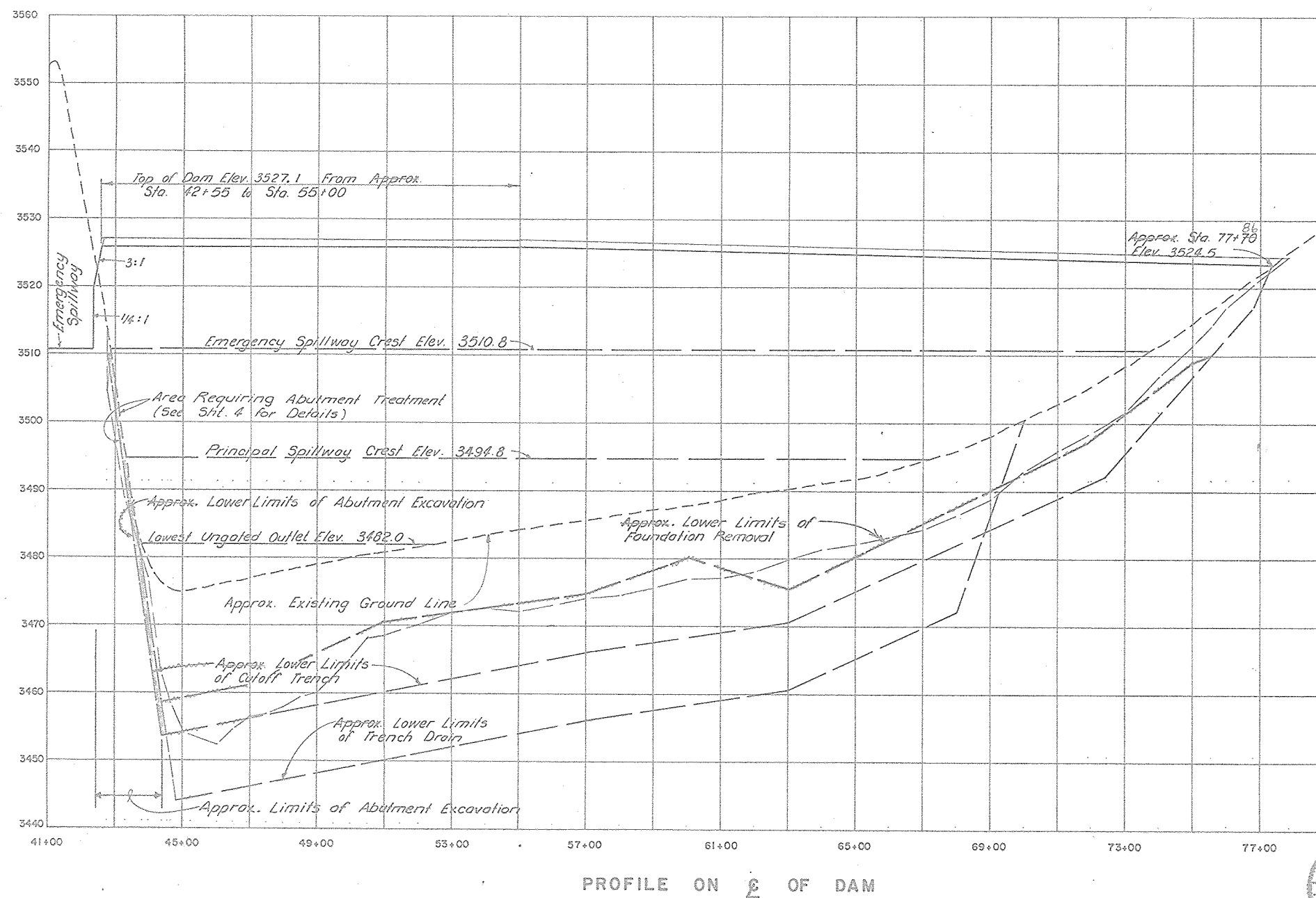
EMBANKMENT PLAN AND PROFILE FLOODWATER RETARDING STRUCTURE SITE NO. 2 SANDERSON CANYON WATERSHED IN BREWSTER, PECOS AND TERRELL COUNTIES, TEXAS			
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
DESIGNED J. S. Almon	DATE 10/79	APPROVED BY [Signature]	TITLE [Signature]
DRAWN G. Ovalle	DATE 10/79	[Signature]	
TRACED	DATE 10/79	[Signature]	
SHEET 2 of 24		DRAWING NO. 4-E-36,851	

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Embankment Curve Data

$\Delta = 67^\circ 55'$
$D = 12^\circ 35' 29''$
$R = 455.04'$
$L = 539.39'$
P.C. Sta. 46+04.55
P.T. Sta. 51+43.94



STORAGE-CAPACITY TABLE

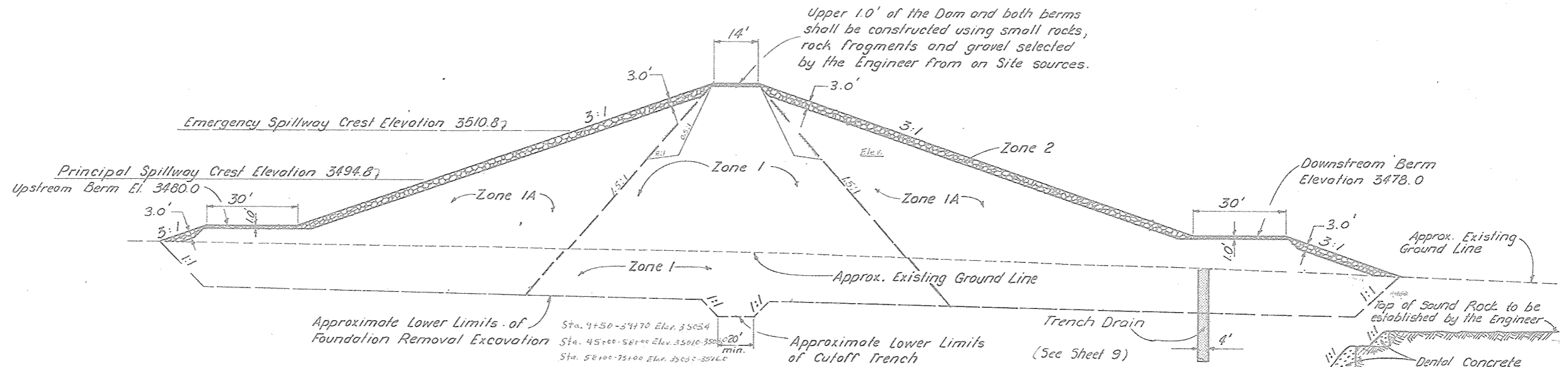
ELEVATION	SURFACE ACRES	CAPACITY	
		ACRE FEET	INCHES
3470	1.8	4	0.001
3474	6.1	20	0.007
3478	15.5	63	0.002
3482	51.0	200	0.070
3486	98.2	495	0.170
1/ 3489.4	124.0	852	0.30
3490	126.8	945	0.33
3494	160.7	1520	0.54
2/ 3494.8	169.0	1704	0.60
3495.7	180.0	1874	0.66
3498	223.10	2288	0.81
3502	258.4	3251	1.15
3506	308.9	4386	1.54
3510	355.10	5714	2.01
3510.8	363.0	5930	2.11
3511	364.0	6067	2.125
3511.5	366.0	6258	2.16
3512	372	6450	2.20
3513	384	6834	2.25
3514	396.8	7218	2.54
3515.8	410.0	8006	2.82
3518	423.3	8858	3.12
3522	465.0	10,635	3.75
3524.5	516.0	11,789	4.15
Drainage Area, Acres 34,067			
Top of Dam (effective) El. 3524.5			
Emergency Spillway Crest El. 3510.8			
Principal Spillway Crest El. 3494.8			
Lowest Ungated Outlet El. 3482.0			
Sediment Capacity, Acre Feet 1874			
Floodwater Capacity, Acre Feet 4,116			
Maximum Emergency Spillway Capacity, cubic feet/second 35,102			
Principal Spillway Capacity, @ El. 3510.8, cubic feet/second 319.8			
1/ 50 yr. Submerged Sediment			
2/ 100 yr. Submerged Sediment			

AS-BUILT PLANS
CONSTRUCTION
COMPLETED 4/2/87

REPRINTED w/ MINOR REVISIONS BY S.C.S., 6/83

EMBANKMENT PLAN AND PROFILE
FLOODWATER RETARDING STRUCTURE SITE NO. 2
SANDERSON CANYON WATERSHED
IN
BREWSTER, PECOS AND TERRELL COUNTIES, TEXAS
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DESIGNED: J. S. Almon DATE: 10/79
DRAWN: C. Ovello DATE: 10/79
CHECKED: E. M. Fry DATE: 10/79
APPROVED BY: [Signature] DATE: 10/79
TITLE: [Signature]
FIRM: [Signature]
SHEET: 3 of 24
DRAWING NO: 4-E-36,851





MATERIALS PLACEMENT DATA									
Embankment Zone No.	Type or Unified Classification	Field Control Test		Placement and Compaction Requirements					
		ASTM Test		Max. Allowable Particle Size	Max. Uncompacted Layer Thickness	Specified Compaction Class	Min. Dry Density, Percent of Field Test Max. Dry Density	Moisture Limits, Relative to Field Test Optimum %	
		Number	Method					From	To
1 & 1A	Silty Clay with Sand and Gravel; CL	D698	A	6"	9"	A	95	-2	+2
2	Rockfill - Ls. Md. S - G	-	-	30"	36"	-	-	-	-
1A	SC; Sandy Clay	Moisture Only	-	6"	9"	C	91	-2	+2
1A	GC; Gravely Clay	Moisture Only	-	6"	9"	C	91	-2	+2

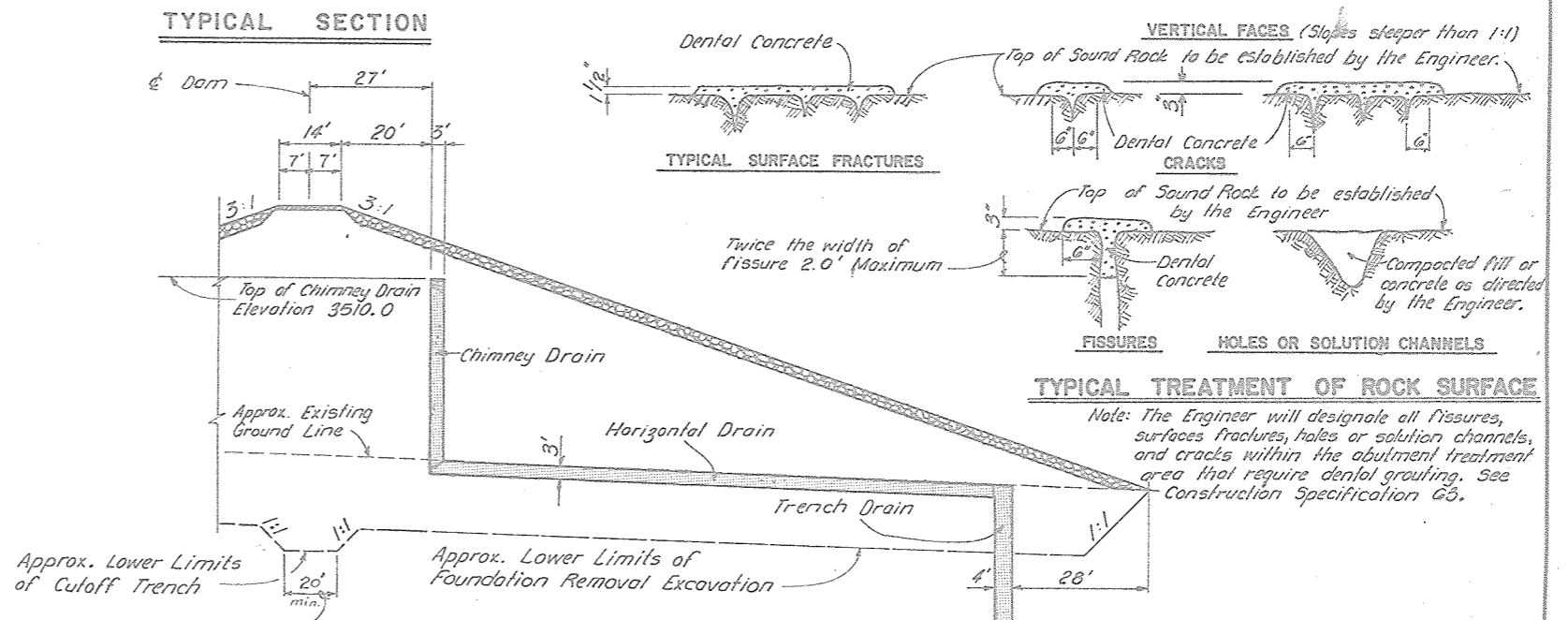
ZONED EMBANKMENT DATA

1. The zone boundaries shown in the typical section are approximate. They may be varied as permitted by the Engineer, to allow the use of all suitable and needed materials from the required excavations.

2. Rock shall be reasonably well graded from a maximum particle size of 30" down to the 6" size with not less than 50% by weight larger than 12". Sizing of oversized rock materials from the required excavations to meet the specified gradations will be required. No special compaction or moisture control will be required. (See Construction Specification 25.)

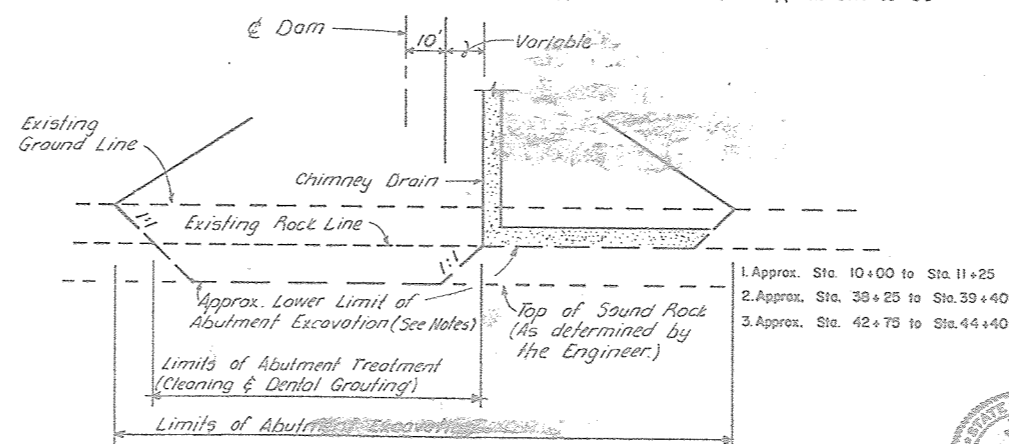
3. Class "C" compaction shall be accomplished by a minimum of 6 complete passes per layer of tamping roller weighing not less than 1200 pounds per foot of roller width at a towing or traveling speed of 2 mph or greater.

TYPICAL SECTION



TYPICAL SECTION

1. Left Abutment Base (Approx. Sta. 11+25) to Approx. Sta. 15+00
2. Approx. Sta. 34+50 to Abutment Base (Approx. Sta. 38+25)
3. Abutment Base (Approx. Sta. 44+40) to Approx. Sta. 49+00



TYPICAL SECTION (ABUTMENTS)

Note: Transition sections for the chimney drain and cutoff trench shall be as stated by the Engineer. Transition sections shall be required at the base of each abutment treatment area.

AS-BUILT PLANS
CONSTRUCTION
COMPLETED 4/2/87

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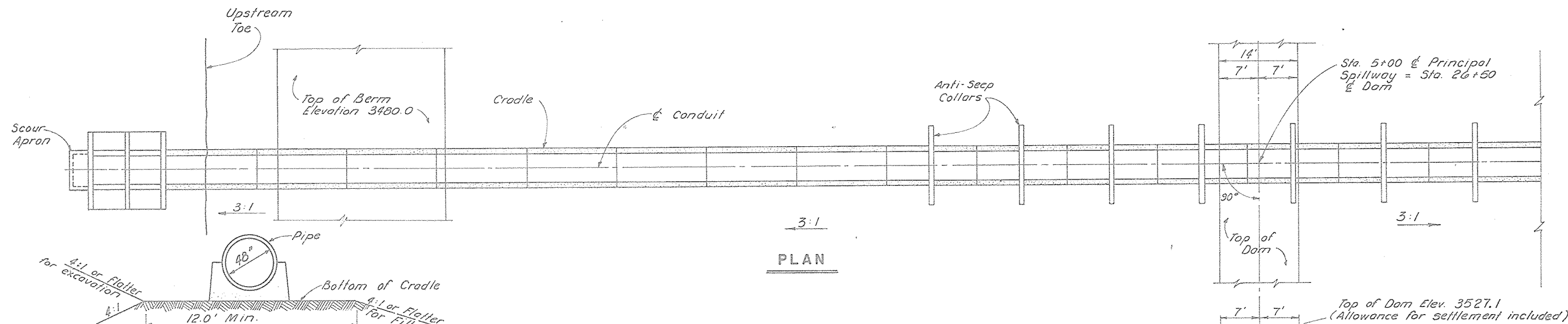
MATERIAL PLACEMENT
FLOODWATER RETARDING STRUCTURE SITE NO. 2
SANDERSON CANYON WATERSHED

IN
BREWSTER, PECOS AND TERRELL COUNTIES, TEXAS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed J. S. Almon 10/79
Drawn G. Ovalle 10/79
Traced
Checked E. M. Fry 10/79
Date 10/79
Approved by
Title
Sheet No. 4 of 24
Drawing No. 4-E-36,851

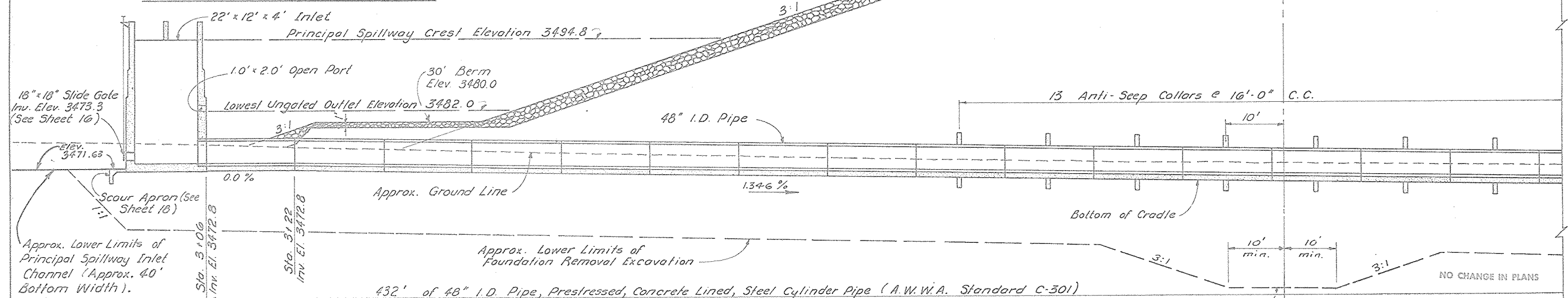




PLAN

Prior to placing fill material around the completed conduit, the exposed earth surfaces shall be reworked as necessary and to the depth necessary to remove all cracks caused by weathering and to establish or restore the density and moisture requirements specified for that type of material. Earth fills and backfills to be compacted by hand tamping or with manually directed power tampers or plate vibrators shall be placed in layers not exceeding four inches in thickness before compaction. Maximum allowable particle size for such material shall be three inches. Each layer shall be carefully bonded to the preceding layer by methods approved by the Engineer.

TYPICAL CONDUIT FOUNDATION



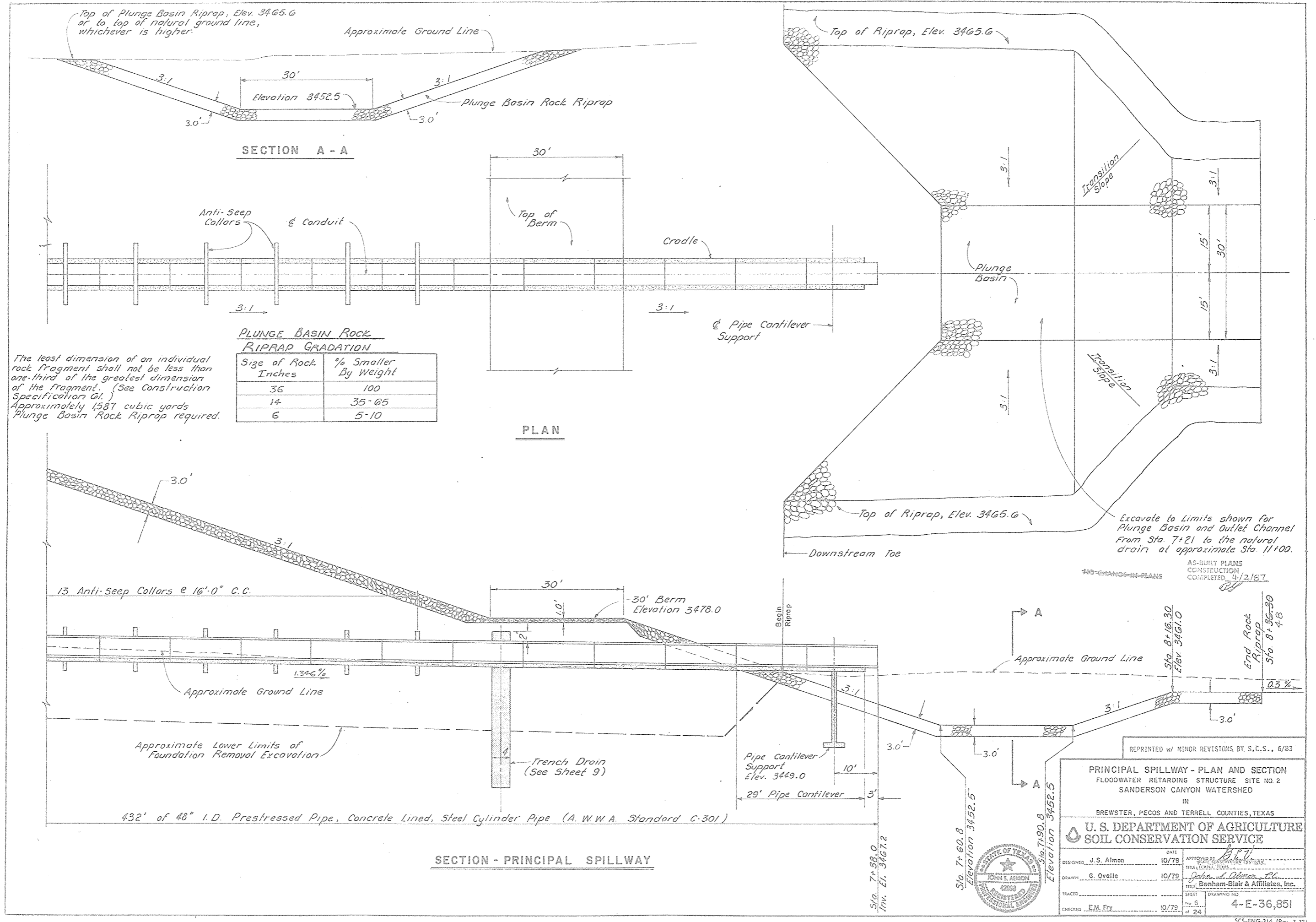
SECTION - PRINCIPAL SPILLWAY

Cutoff Trench: Transition side slopes of cutoff trench from 1:1 to 3:1 in the reach common to the principal spillway conduit foundation as directed by the Engineer.

AS-BUILT PLANS
CONSTRUCTION
COMPLETED 4/2/67

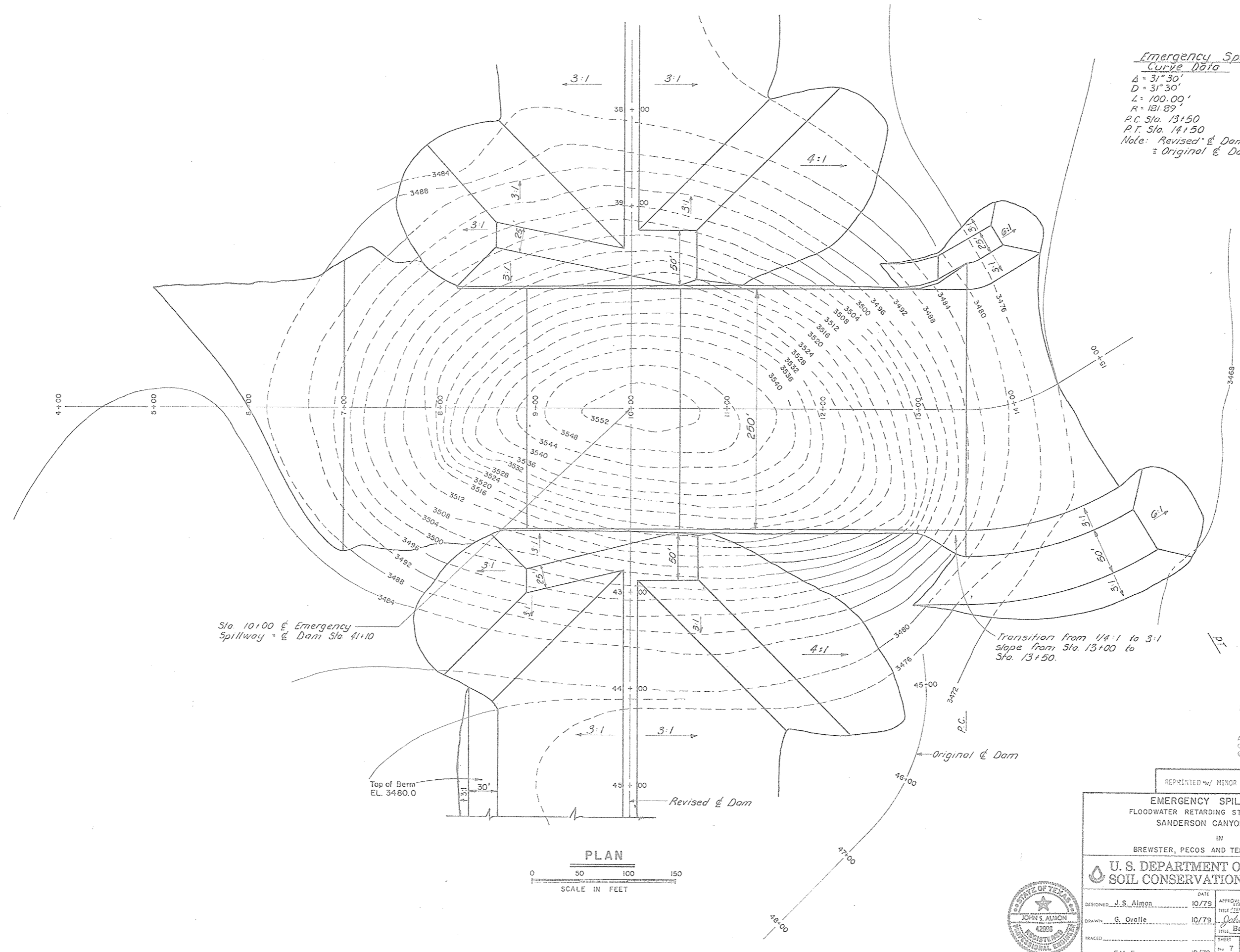


PRINCIPAL SPILLWAY - PLAN AND SECTION FLOODWATER RETARDING STRUCTURE SITE NO. 2 SANDERSON CANYON WATERSHED IN BREWSTER, PECOS AND TERRELL COUNTIES, TEXAS			
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
DESIGNED	J. S. Almon	DATE	10/79
DRAWN	G. Ovalle	DATE	10/79
CHECKED	E.M. Fry	DATE	10/79
APPROVED BY JOHN S. ALMON REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS LICENSE NO. 6088		APPROVED BY J. S. Almon, P.E. TITLE: Benham-Blair & Associates, Inc. SHEET NO. 5 OF 24	
REPRINTED w/ MINOR REVISIONS BY S.C.S., 6/83		4-E-36,851	



Emergency Spillway
Curve Data

$\Delta = 31^\circ 30'$
 $D = 31^\circ 30'$
 $L = 100.00'$
 $R = 181.89'$
 P.C. Sta. 13+50
 P.T. Sta. 14+50
 Note: Revised $\&$ Dam Sta. 51+43.94
 Original $\&$ Dam Sta. 53+83.90



Sta. 10+00 $\&$ Emergency Spillway $\&$ Dam Sta. 41+10

Transition from 1 1/4:1 to 3:1 slope from Sta. 13+00 to Sta. 13+50.

Top of Berm
EL. 3480.0

Revised $\&$ Dam

Original $\&$ Dam



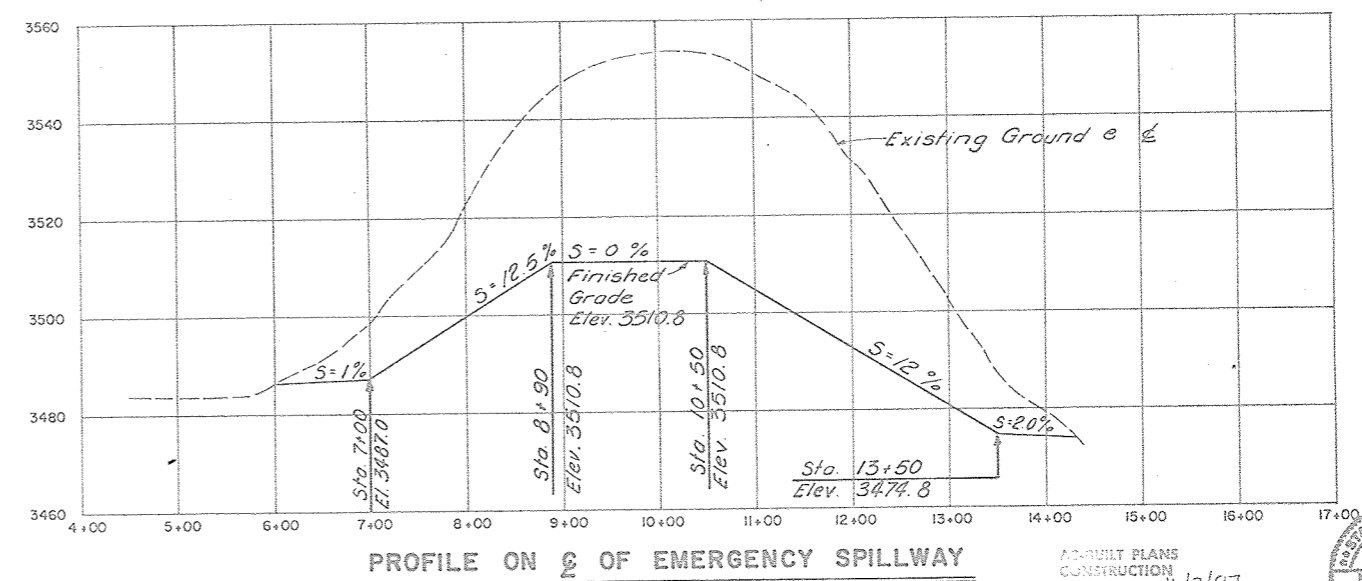
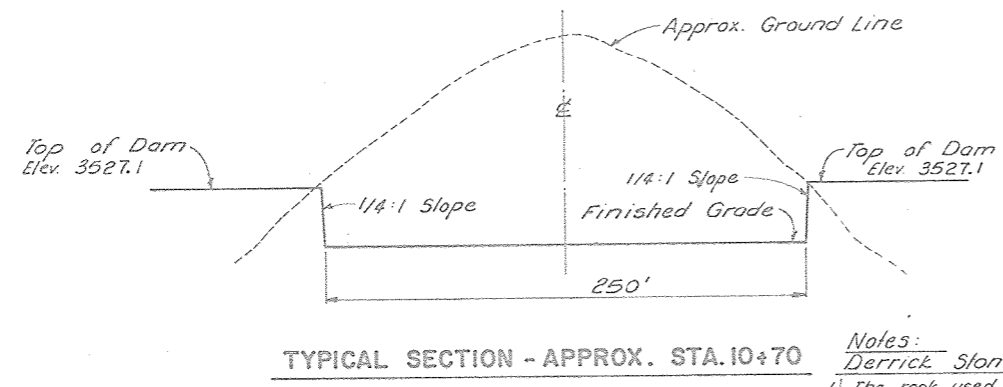
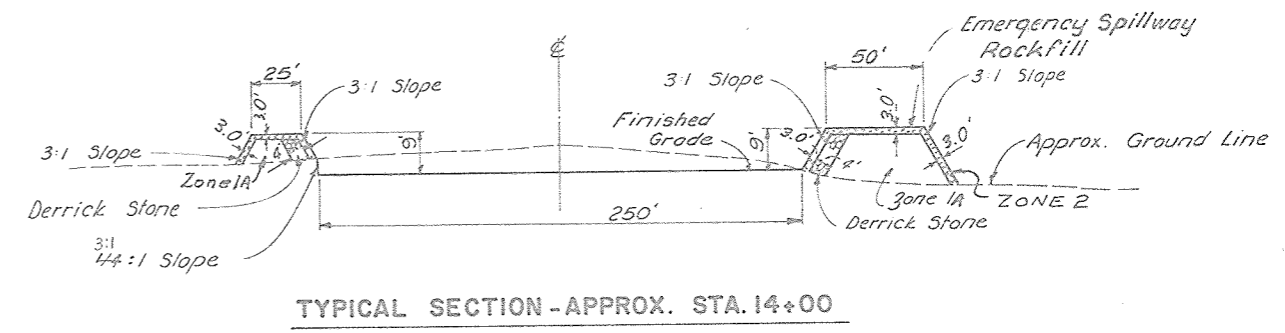
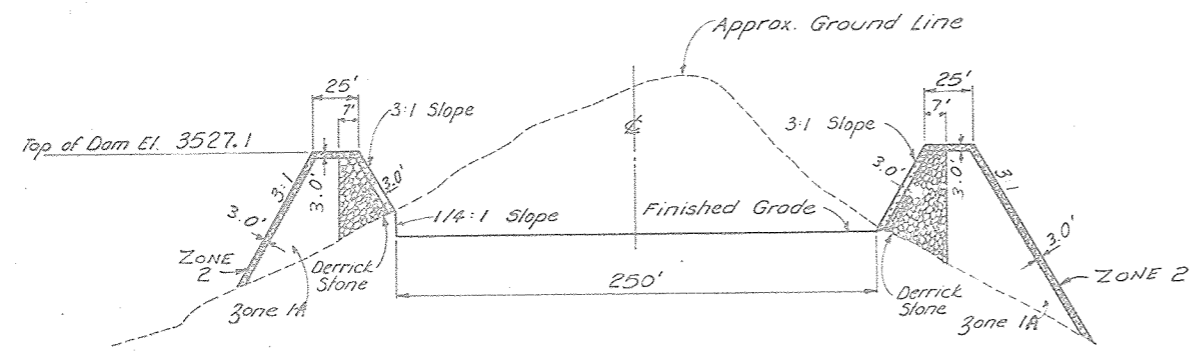
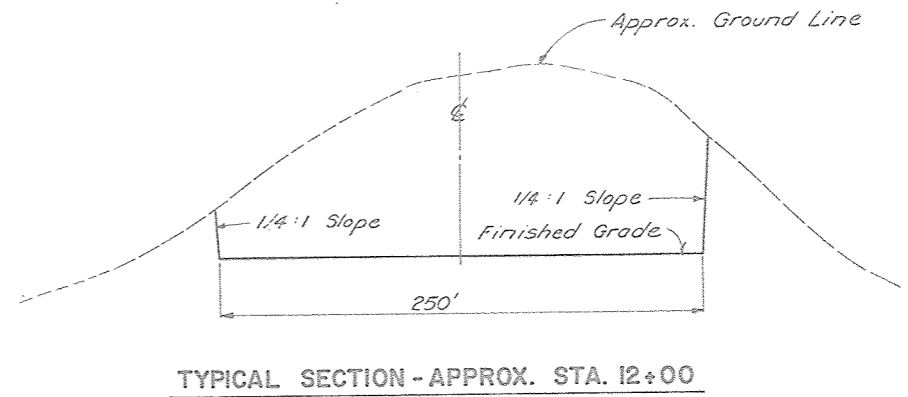
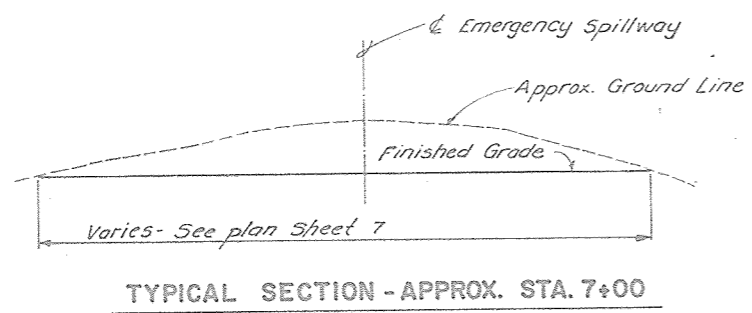
NO CHANGE IN PLANS

AS-BUILT PLANS
CONSTRUCTION
COMPLETED 4/12/87

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EMERGENCY SPILLWAY PLAN FLOODWATER RETARDING STRUCTURE SITE NO. 2 SANDERSON CANYON WATERSHED IN BREWSTER, PECOS AND TERRELL COUNTIES, U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
DESIGNED	J. S. Almon	DATE	10/79
DRAWN	G. Ovalle	DATE	10/79
CHECKED	E.M. Fry	DATE	10/79
APPROVED BY		TITLE: <i>John S. Almon, P.E.</i> Benham-Blair & Associates, Inc.	
SHEET		DRAWING NO.	
No. 7 of 24		4-E-36,851	





Note: Presplit all 1/4:1 Slopes.

Notes:
Derrick Stone
 1) The rock used for the derrick stone shall be harvested or produced stone that shall have individual or stone weights ranging from 1400 to 4000 pounds. The derrick stone shall be placed so as to produce a reasonably dense fill with a minimum of voids. (See Construction Specification 61.1) 3,619 Cubic Yards Derrick Stone required.

Emergency Spillway Rock Fill
 2) Areas of Emergency Spillway floor where durable rock is not exposed at grade shall be overexcavated a minimum of 1.0' and brought back to grade with rock fill material selected by the Engineer. The rock fill shall be placed and paid for as "Rock Fill, Embankment." (See Construction Specification 25)

AD-8111 PLANS
 CONSTRUCTION
 COMPLETED 4/2/87

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EMERGENCY SPILLWAY PROFILE AND SECTIONS
 FLOODWATER RETARDING STRUCTURE SITE NO. 2
 SANDERSON CANYON WATERSHED

IN
 BREWSTER, PECOS AND TERRELL COUNTIES,

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

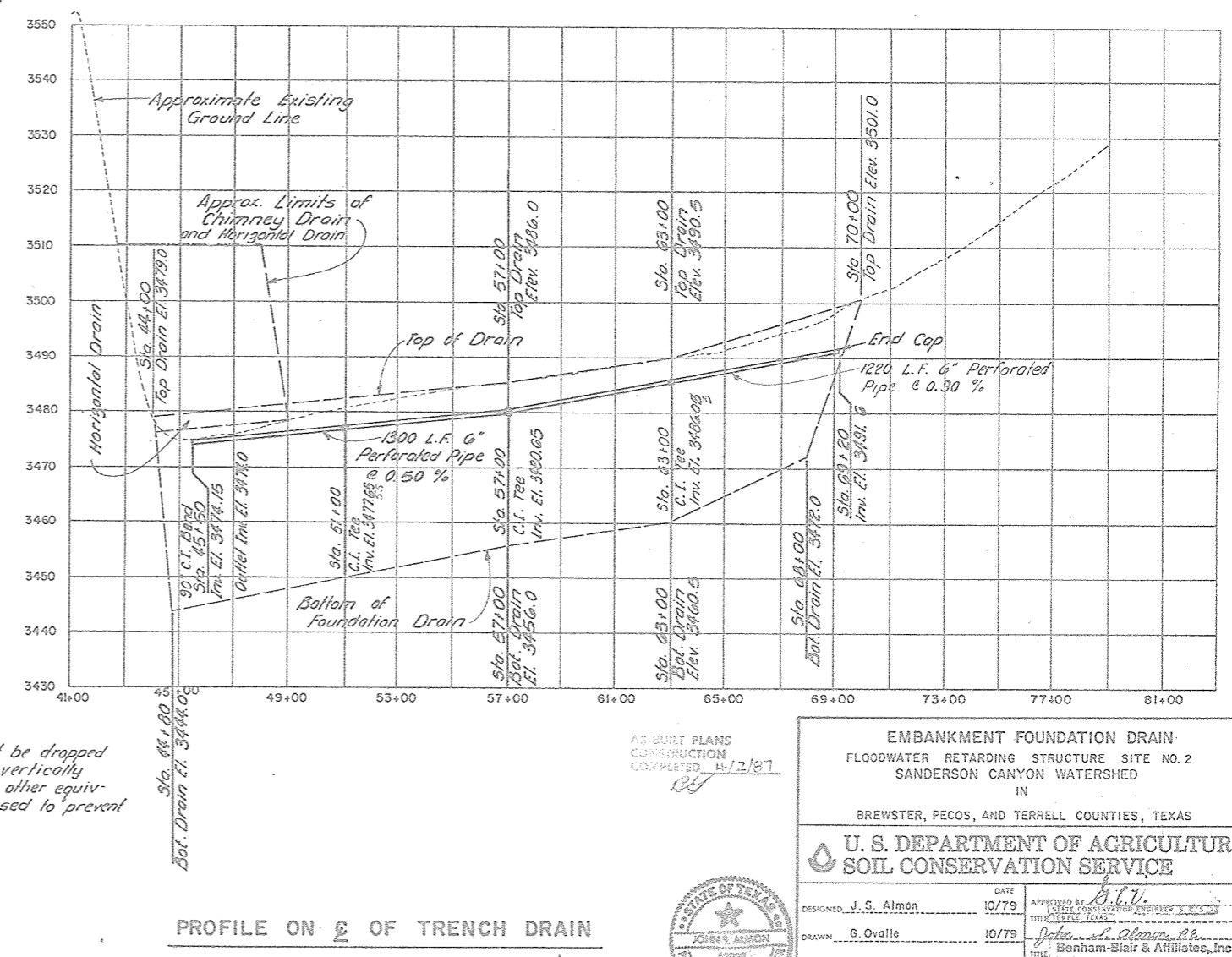
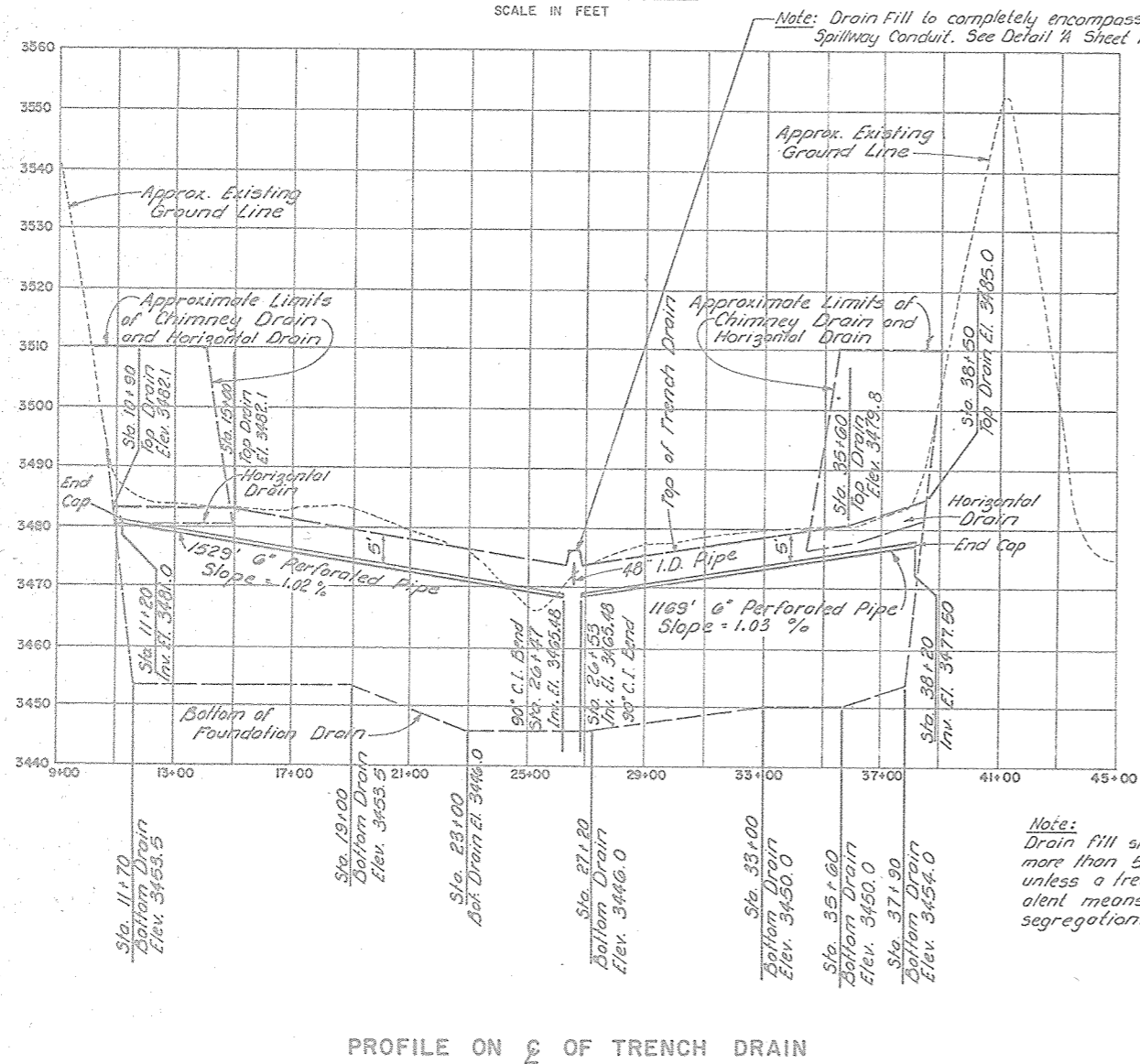
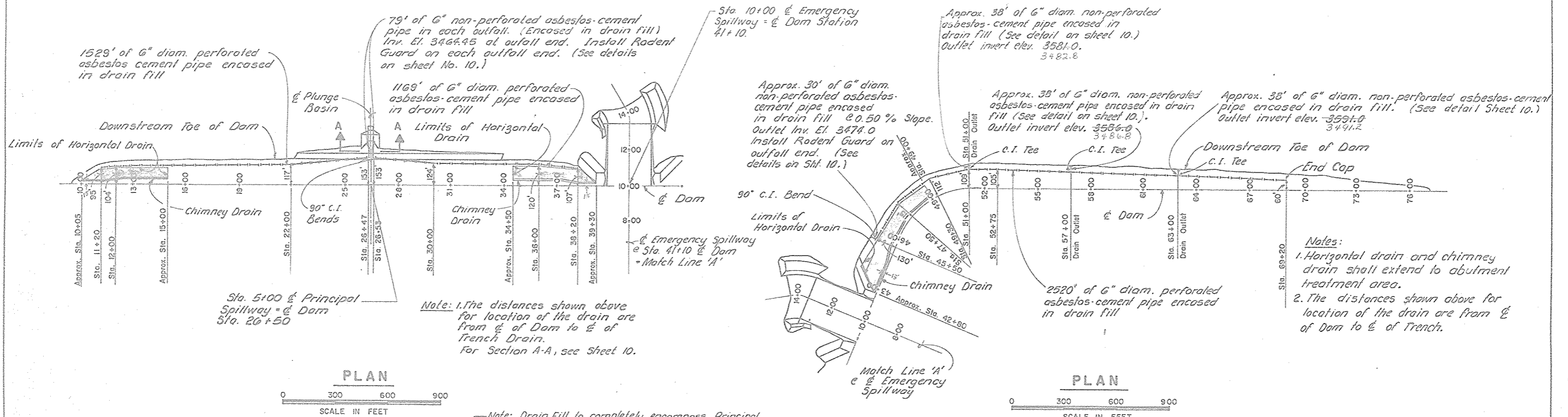
DESIGNED: J.S. Almon DATE: 10/79
 DRAWN: G. Ovale DATE: 10/79
 TRACED: DATE: 10/79
 CHECKED: E.M. Fry DATE: 10/79

APPROVED BY: [Signature]
 TITLE: [Signature]
 FIRM: Benham-Blair & Associates, Inc.

SHEET: 8
 OF 24

DRAWING NO: 4-E-36,851



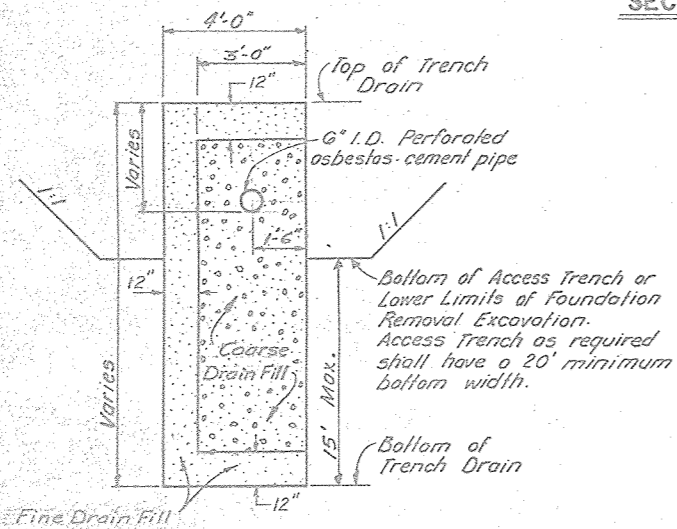


AS-BUILT PLANS
CONSTRUCTION
COMPLETED 4/2/87



EMBANKMENT FOUNDATION DRAIN FLOODWATER RETARDING STRUCTURE SITE NO. 2 SANDERSON CANYON WATERSHED IN BREWSTER, PECOS, AND TERRELL COUNTIES, TEXAS			
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
DESIGNED J. S. Almon	DATE 10/79	APPROVED BY [Signature]	TITLE [Blank]
DRAWN G. Ovalle	10/79	Benham-Blair & Associates, Inc.	
TRACED [Blank]		SHEET [Blank]	
CHECKED E.M. Fry	10/79	No. 9 of 24	4-E-36,851

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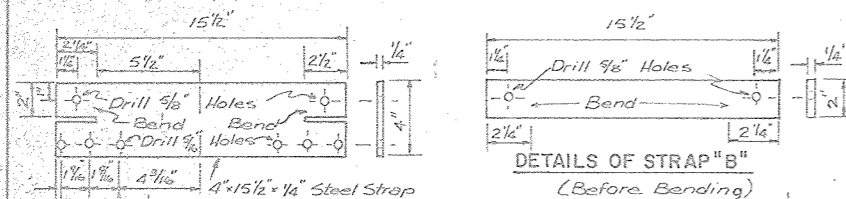
TYPICAL SECTION - TRENCH DRAIN

Notes:

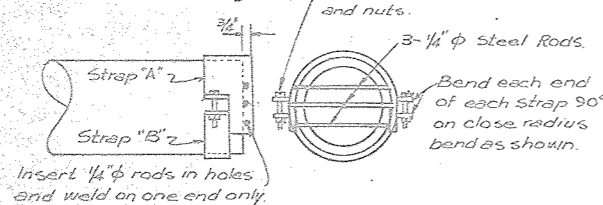
Excavations for the Trench Drain shall have vertical sides and be 4'-0" wide as shown in the typical section. (See Construction Specification 24.)

Place a minimum 2.0 ft. thickness of fill immediately above and adjacent to the top of the trench drain using relatively pervious site materials selected by the Engineer.

This fill to be placed and paid for as "Earth Fill, Embankment."



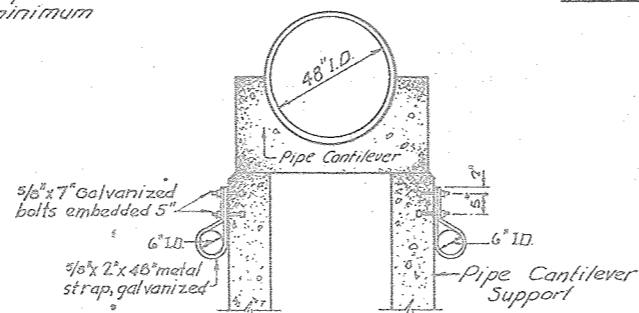
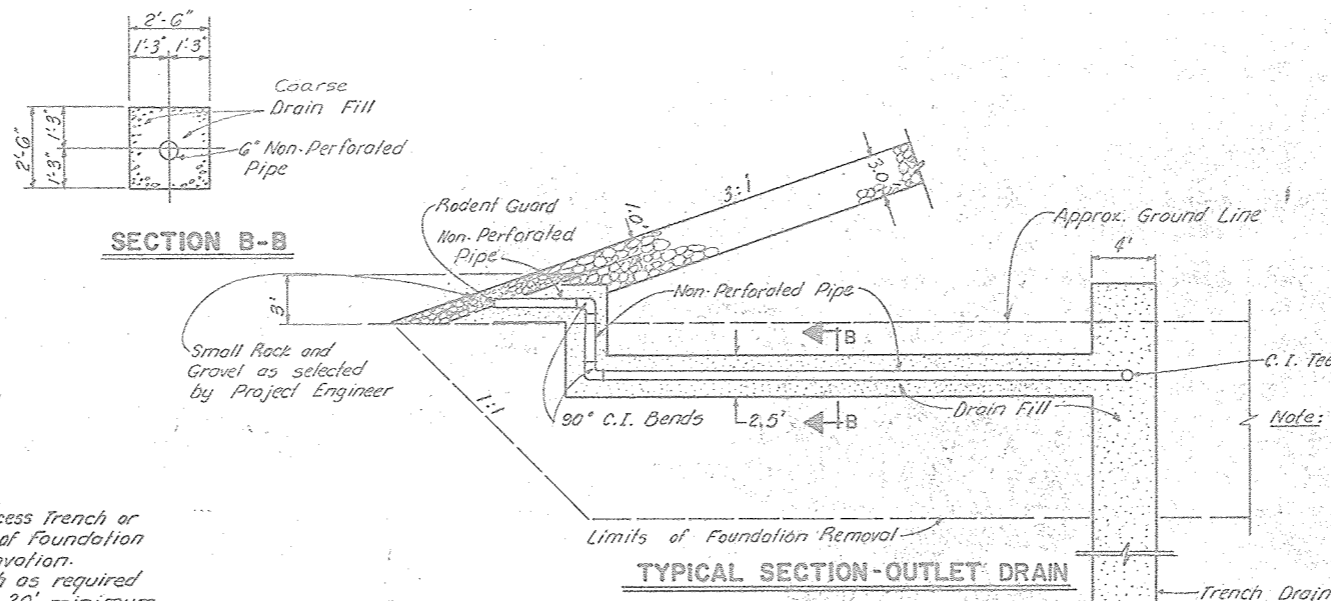
DETAILS OF STRAP "A"
(Before Bending)



SIDE ELEVATION END ELEVATION

Note: Bend Straps A and B on a radius 1/4" larger than the outside diameter of the asbestos-cement pipe. Cut off tapered end of the asbestos-cement pipe and install the rodent guard so that the asbestos-cement pipe has full wall thickness at point of installation. Install with rods horizontal. All materials (except brass) shall be galvanized after fabrication.

RODENT GUARD DETAILS

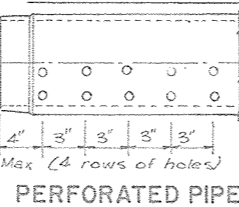
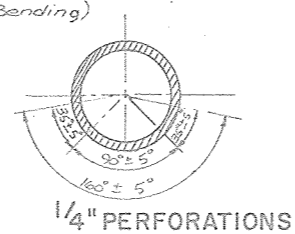


SECTION A-A

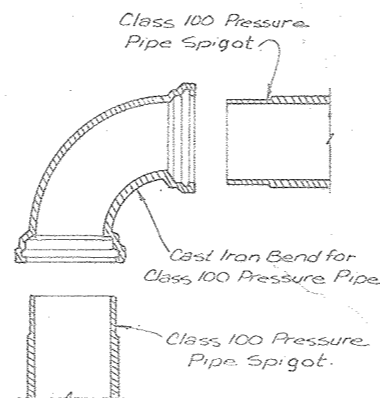
The last section of each outfall pipe shall be fastened to the pipe cantilever support with a strap and 2 bolts as shown. Each of the last two sections in each outfall line shall be a minimum 13 ft. in length. 1 strap and 2 bolts are required for each outfall line. The straps and bolts shall be galvanized. The end of the drain pipe shall extend approx. 4 ft. beyond the 1/2 of the pipe cantilever support.

Note:

For location of Section A-A, See Sheet 10.



PERFORATED PIPE



DETAILS - PIPE FITTINGS

(Other than Straight Couplings)

Note: Drain fill shall not be dropped more than 5 feet vertically unless a frame or other equivalent means is used to prevent segregation.

Note: Bends shall be 90°, 45°, 22 1/2°, or 11 1/4° as designated on the Plan and shall comply with the requirements of Material Specification 545.

For changes in horizontal or vertical alignment which are less than 10° or which differ from the standard bends mentioned above, the alignment change not taken up by the standard bend, shall be made by deflection of an equal number of pipe sections on either side of the point of intersection of the alignment shown. No angle of deflection for a single pipe joint shall exceed 4° or 7 1/2°. Tees, Crosses, Wyes, and Reducers, if required, shall be the same as specified for Bends. Deflection of pipe sections, if required to complete alignment changes, shall be the same as specified for Bends.

Drain Fill Requirements

Installation and materials quality shall comply with the requirements of Construction Specification 24 and Materials Specification 521.

The fine drain fill shall comply with the gradation requirements for ASTM, C-33, Fine Concrete Aggregates.

The Coarse Drain Fill shall consist of a mixture of 1 part of ASTM-D-448 Aggregate Size No. 57 and 1 part of ASTM-D448 Coarse Aggregate, Size No. 9 or any other aggregate that will grade within the following limits:

Sieve Size	% Passing by Weight
3"	100
1 1/2"	82 - 100
3/4"	60 - 100
3/8"	50 - 85
No. 4	20 - 70
No. 10	5 - 30
No. 20	0 - 20
No. 40	0 - 13
No. 200	0 - 5

NOTE: The Chimney and Horizontal Drains shall consist of Fine Drain Fill (ASTM, C-33) only.

Note: All Asbestos-Cement Pipe and Couplings shall be Class 100, Pressure Pipe and shall conform to the requirements of Materials Specification 545.

The bedding of perforated pipe installed in filter material shall be ordinary bedding providing uniform and continuous bedding contact throughout the entire line. Joining shall be in accordance with the manufacturer's recommendations. Tamping of the filter material under and on the sides and top of the pipe, will be required only to the extent necessary to eliminate voids or empty pockets. The installation of the non-perforated pipe shall be with ordinary bedding that provides uniform and continuous bedding contact throughout the entire line. Joining shall be in accordance with the manufacturer's recommendations. Backfill and compaction shall be as specified in Construction Specification 23A.

AS-BUILT PLANS
CONSTRUCTION
COMPLETED 4/2/87

NO CHANGE IN PLANS

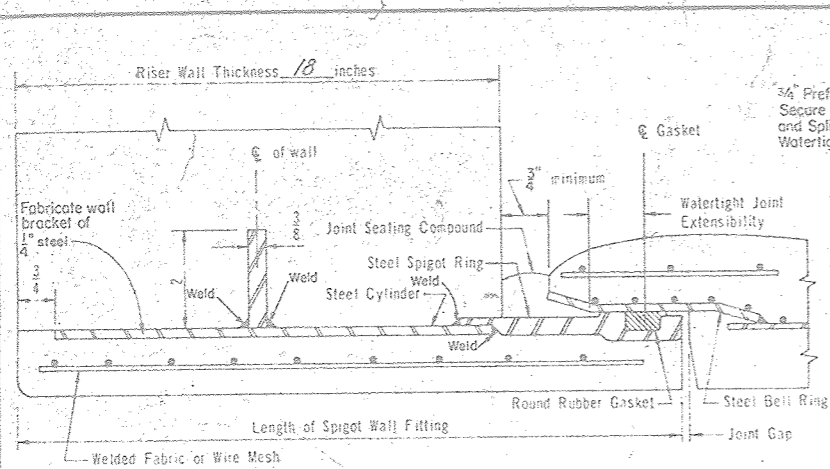
REPRINTED w/ MINOR REVISIONS BY S.C.S. 6/83

EMBANKMENT FOUNDATION DRAIN DETAILS
FLOODWATER RETARDING STRUCTURE/ SITE NO. 2
SANDERSON CANYON WATERSHED

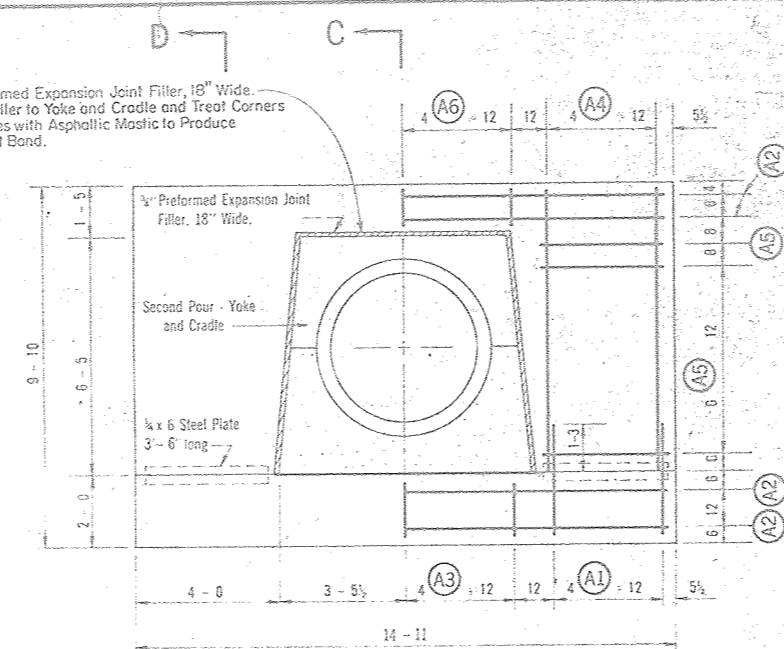
BREWSTER, PECOS, AND TERRELL COUNTIES, TEXAS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

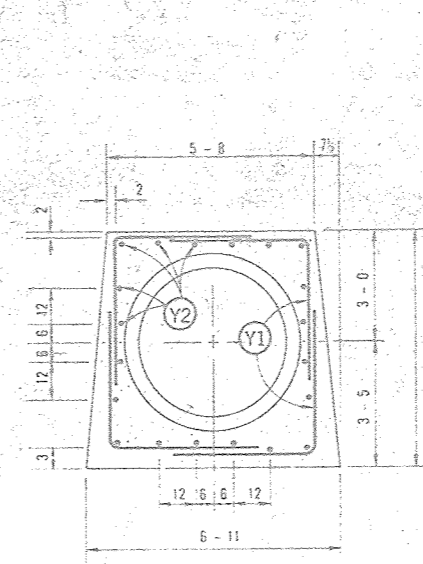
DESIGNED	J. S. Almon	DATE	10/79	APPROVED BY	B. C. J.
DRAWN	G. Ovello	DATE	10/79	TITLE	EMBANKMENT FOUNDATION DRAIN DETAILS
TRACED				BY	John S. Almon, P.E.
CHECKED	E. M. Fry	DATE	10/79	BY	Bonham-Blair & Associates, Inc.
				SHEET	No. 10
				OF	24
				DRAWING NO.	4-E-36,851



DETAIL A



DETAIL OF ANTI-SEEP COLLAR

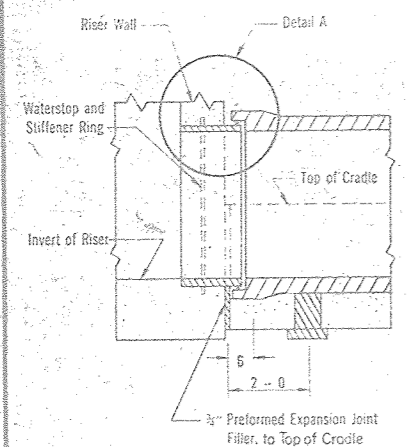


DETAIL OF ANTI-SEEP COLLAR YOKE

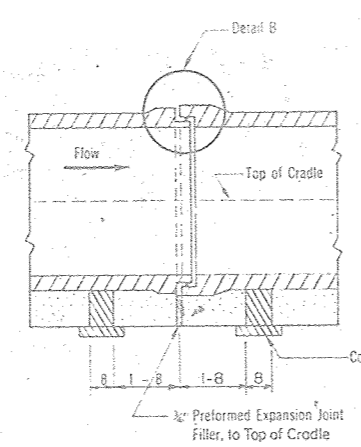
STEEL SCHEDULE						
Anti-seep Collar and Yoke, 18 Required						
Mark	Size	Quantity per Collar	Length	Type	Total Quantity	Total Length
A1	4	8	3'-0"	1	104	312'-0"
A2	4	4	14'-5"	1	52	749'-8"
A3	4	7	1'-8"	1	91	136'-6"
A4	4	8	7'-7"	1	104	788'-8"
A5	4	14	3'-0"	1	182	637'-0"
A6	4	7	1'-0"	1	91	91'-0"
Y1	4	12	7'-4"	21	156	1144'-0"
Y2	4	20	1'-2"	1	260	303'-4"
TOTAL						4,182'-2"

QUANTITIES		Cu. Yds.
Concrete		
Anti-seep Collar including Yoke		
* Each		3.987
Total 18 Collars		51.831
Cradle		
** Per Linear Foot of Cradle		0.5163
Total (402 lin. ft. less 8.5 lin. ft. in yokes) = 380.5		196.432
Steel		Pounds
Anti-seep Collar including Yoke, 1 Collar		215.871
Total, 18 Collars		2,780.323

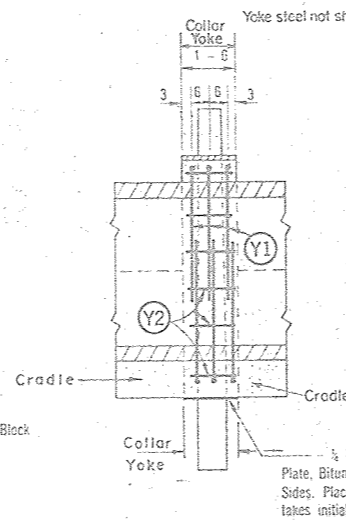
Concrete quantities are based on an outside diameter of pipe of 56 inches. Steel quantities do not change with outside diameter of pipe.
 * This quantity is given by $4.937 - 0.000303 (Df)^2$ cu yds.
 ** This quantity is given by $0.8330 - 0.00010 (Df)^2$ cu yds.
 Df = outside diameter of pipe furnished, inches.



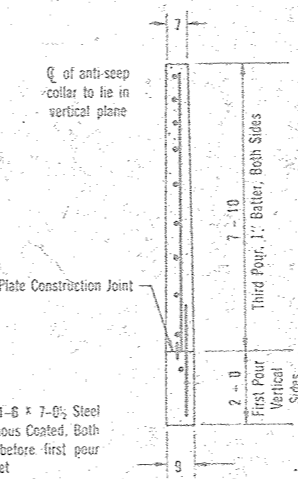
DETAIL OF SPIGOT WALL FITTING



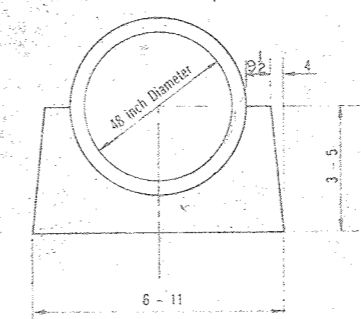
DETAIL OF PIPE JOINT



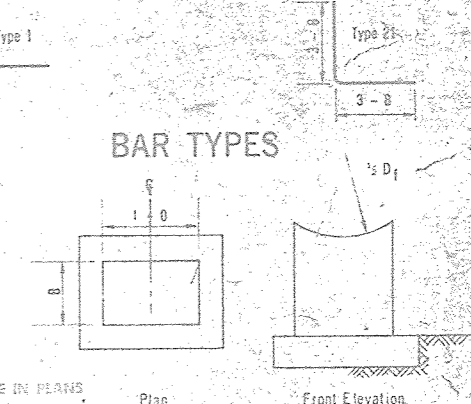
SECTION C-C



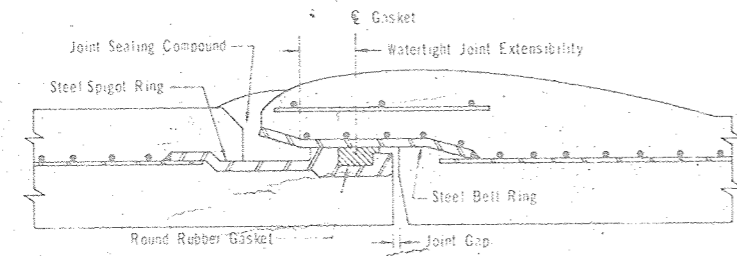
SECTION D-D



DETAIL OF CRADLE



SUGGESTED SUPPORT BLOCKS



DETAIL B

Joint length equals watertight joint extensibility plus joint gap.
 The pipe shall be drawn together so that the maximum joint gap does not exceed 1/8 inch for pipe laid on a straight line. For cambered pipe or pipe laid on a curved line, the joint gap at the closest point shall not exceed 3/16 inch.

JOINT REQUIREMENTS				
Length of Pipe Section	Minimum Joint Length	Minimum Joint Limiting Angle		
feet	inches	radians	degrees	
16	3"	0.0137	0°-47'	

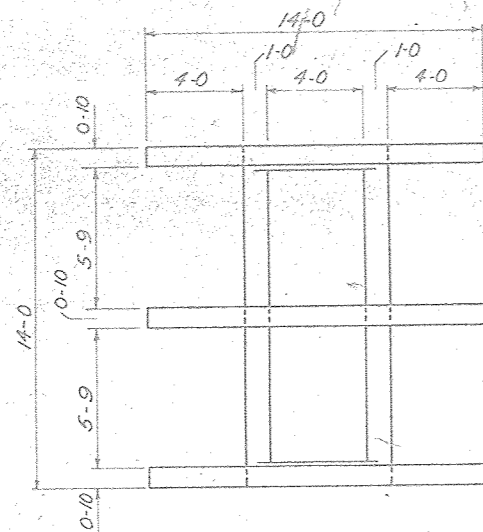
For pipe length other than shown, joint requirements will be determined by the Engineer.
 Where pipes of different length are connected, adjoining pipes shall meet the requirements of the longer pipe.
 Prior to delivery of pipe, the pipe joint detail proposed for use shall be submitted to the Engineer for approval.

STRENGTH REQUIREMENTS			
Inside Diameter of Pipe	Internal Load	External Load	
		Minimum 3-Edge Bearing Strength in Pounds per Linear Foot of Pipe	
		Applicable Standard Specification	
	Hydrostatic Pressure	AWWA C-301	AWWA C-300
	Head of Water	Load to produce 0.001 inch crack one foot long	Load to produce 0.01 inch crack one foot long
48 inches	60 feet	12,000	

The outside diameter of pipe assumed in design is 56 inches. Where the pipe furnished has an outside diameter greater than assumed in design, the three-edge bearing strength of the pipe furnished must not be less than the specified three-edge bearing strength multiplied by the ratio of the outside diameter of the pipe furnished to the outside diameter assumed in design.

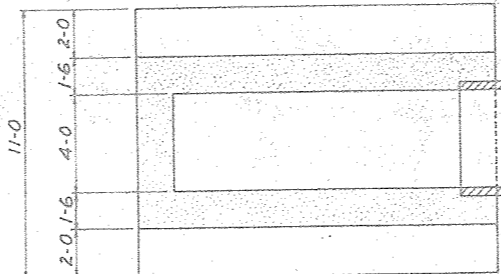


DESIGNED BY: J. S. Almon
 DRAWN BY: G. Ovalle
 CHECKED BY: E. M. Fry
 DATE: 10/79
 TITLE: FLOODWATER RETARDING STRUCTURE SITE NO. 2 SANDERSON CANYON WATERSHED IN BREWSTER, PECOS AND TERRELL COUNTIES, TEXAS
 U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE
 SHEET NO. 11 OF 24
 DRAWING NO. 4-E-36,851

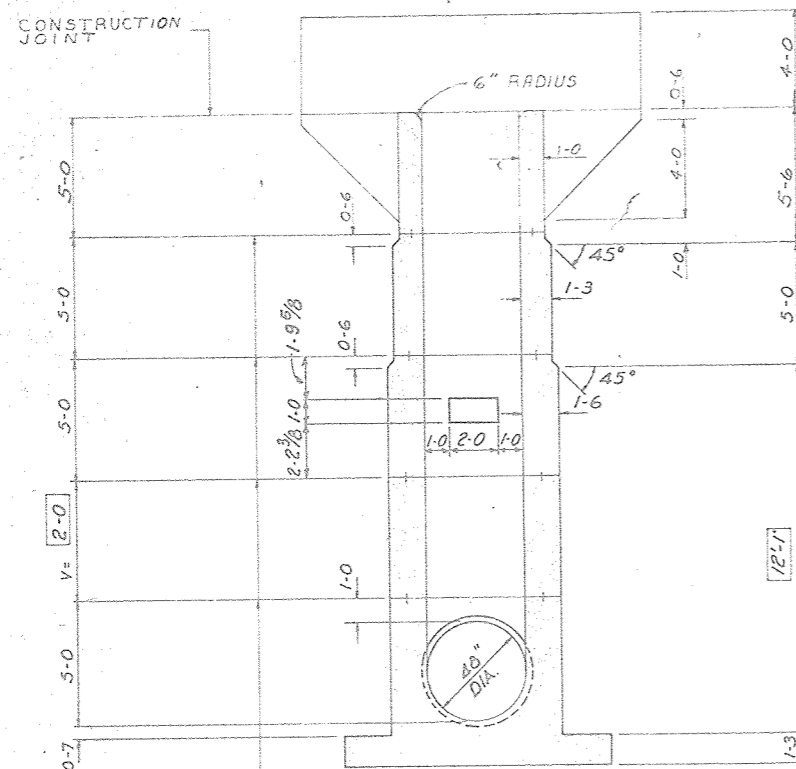


TOP PLAN

SPIGOT WALL FITTING.
FOR DETAIL SEE
SHEET 11



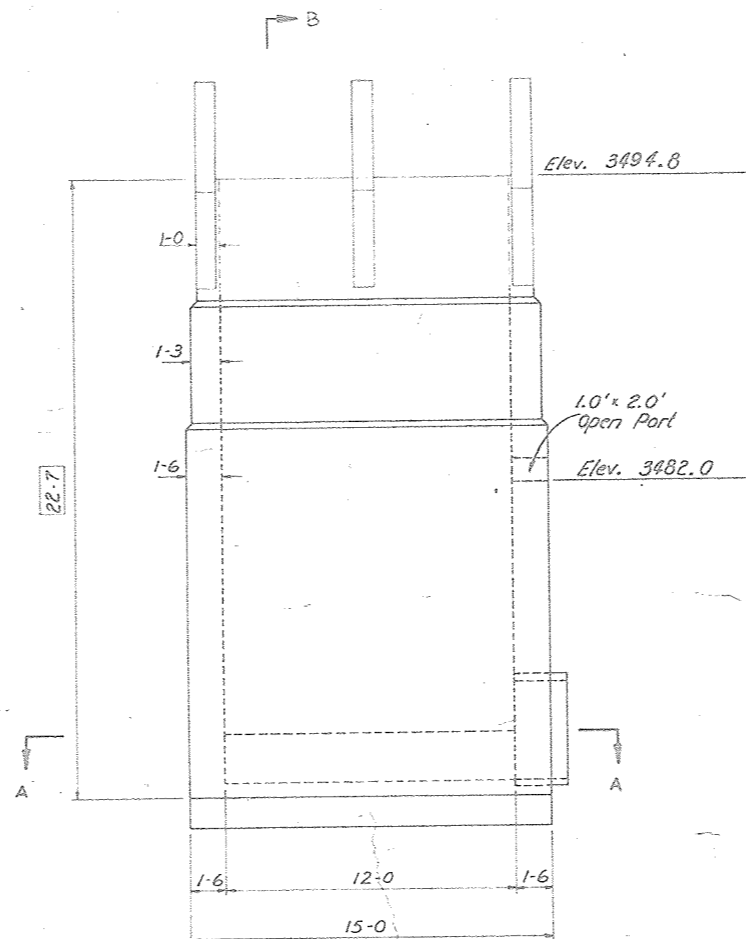
SECTION A-A



SECTION B-B

PLATE CONSTRUCTION
JOINT, FOR DETAIL
SEE SHEET 16

FOR PORT TRASH DETAILS, See
Sheet 17.



SIDEWALL ELEVATION

STEEL SCHEDULE

MARK	SIZE	QUANTITY	LENGTH	TYPE	B	C	TOTAL LENGTH	MARK	SIZE	QUANTITY	LENGTH	TYPE	B	C	TOTAL LENGTH
B1	6	15	10-6	1	—	—	157-6	T1	5	20	4-8	1	—	—	93-4
B2	6	11	14-6	1	—	—	159-6	T2	5	10	8-10	1	—	—	88-4
B3	7	86	12-9	21	4-5	8-4	1096-6	T3	5	24	4-10	1	—	—	116-0
B4	6	11	14-6	1	—	—	159-6	T4	5	10	8-10	1	—	—	88-4
B5	6	15	10-6	1	—	—	157-6	T5	5	18	13-0	1	—	—	234-0
B6	6	7	9-3	21	1-0	6-3	64-9	T6	5	2	5-0	1	—	—	10-0
B7	6	6	9-3	21	1-0	6-3	55-6	T7	5	40	11-4	21	3-8	7-8	453-4
B8	6	24	9-3	21	1-0	6-3	222-0	T8	5	4	7-6	1	—	—	30-0
B9	6	2	9-3	21	1-0	6-3	18-6	T9	5	4	9-6	1	—	—	38-0
B10	7	16	13-0	1	—	—	208-0	T10	6	4	11-6	1	—	—	46-0
B11	6	7	5-0	1	—	—	35-0	T11	5	28	13-8	1	—	—	382-8
B12	6	24	12-8	21	4-4	8-4	304-0	T12	5	12	9-10	19	4-3	5-7	118-0
B13	6	2	10-4	21	2-0	8-4	20-8	T13	5	8	5-6	1	—	—	44-0
B14	6	4	9-9	21	1-5	6-4	39-0	T14	5	8	6-8	1	—	—	53-4
B15	6	4	9-5	21	1-1	6-4	37-8	T15	5	8	7-10	1	—	—	62-8
B16	6	4	9-2	21	0-10	6-4	36-8	T16	5	6	3-8	1	—	—	22-0
B17	6	4	9-1	21	0-9	6-4	36-4	T17	5	8	8-10	1	—	—	70-8
B18	6	2	10-4	21	2-0	8-4	20-8	T18	5	4	7-5	1	—	—	29-8
B19	6	2	3-3	1	—	—	6-6	T19	5	4	6-5	1	—	—	25-8
B20	6	2	2-6	1	—	—	5-0	T20	5	4	5-5	1	—	—	21-8
B21	6	1	2-4	1	—	—	2-4	T21	5	4	2-8	21	1-0	1-8	10-8
B22	6	2	2-4	1	—	—	4-8	T22	5	4	3-8	21	1-0	2-8	14-8
B23	6	2	2-10	1	—	—	5-8	T23	5	4	4-8	21	1-0	3-8	18-8
								T24	5	4	5-8	21	1-0	4-8	22-8

R1	6	24	8-11	1	—	—	214-0
R2	6	8	8-11	1	—	—	71-4
R3	6	30	6-6	1	—	—	195-0
R4	6	14	6-6	1	—	—	91-0
R5	7	6	13-0	1	—	—	78-0
R6	6	4	5-0	1	—	—	20-0
R7	6	18	12-8	21	4-4	6-4	602-8
R8	5	20	13-0	1	—	—	260-0
R9	6	10	5-0	1	—	—	50-0
R10	5	36	12-4	21	4-2	8-2	444-0
R11	6	26	4-4	1	—	—	112-8
R12	6	14	4-4	1	—	—	60-8
R13	5	4	11-10	21	3-11	7-11	47-4
R14	6	24	6-7	1	—	—	158-0
R15	6	8	6-7	1	—	—	52-8
R16	6	28	4-6	1	—	—	126-0
R17	6	12	4-6	1	—	—	54-0
R18	5	20	13-0	1	—	—	260-0
R19	6	10	5-0	1	—	—	50-0
R20	5	36	11-10	21	3-11	7-11	426-0
R21	6	28	4-0	1	—	—	112-0
R22	6	12	4-0	1	—	—	48-0
R23	5	4	11-4	21	3-8	7-8	45-4

QUANTITIES

STEEL

#5 BARS	3577-0	3731	LBS.
#6 BARS	3166-11	4756-71	LBS.
#7 BARS	1382-6	2825-83	LBS.
		11,313.54	LBS.

CONCRETE = $53.3 + 2.11 V = 57.52$ CU. YDS.

LENGTH OF #6 BARS = $(2372-11) + (\text{LENGTH OF BARS R1 THROUGH R4, R6 \& R7})$
 LENGTH OF #7 BARS = $(1304-6) + (\text{LENGTH OF BARS R5})$

0 2 4 6
SCALE IN FEET

NO CHANGE IN PLANS

AS-BUILT PLANS
CONSTRUCTION
COMPLETED 4/2/87



PRINCIPAL SPILLWAY INLET
FLOODWATER RETARDING STRUCTURE SITE NO. 2
SANDERSON CANYON WATERSHED

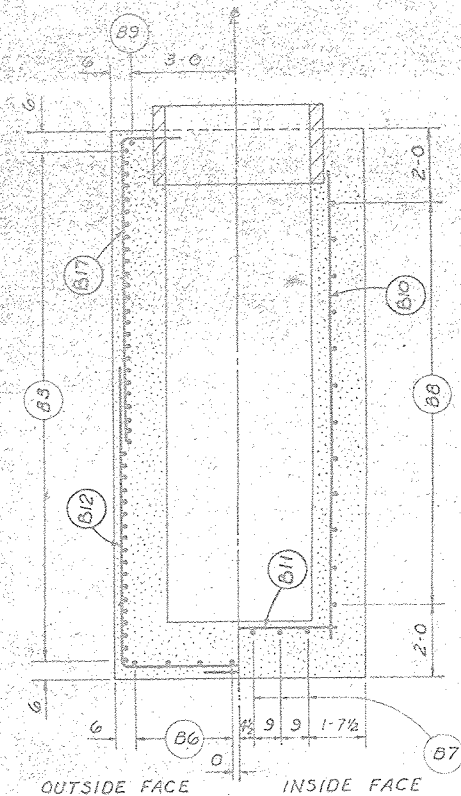
IN
BREWSTER, PECOS AND TERRELL COUNTIES, TEXAS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

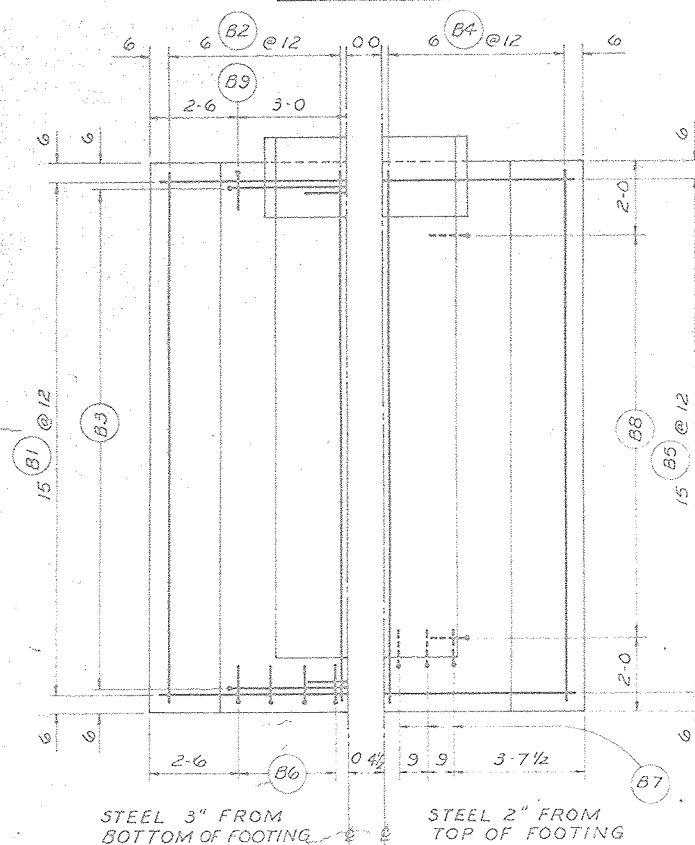
Designed J. S. Almon 10/79
Drawn G. Ovalle 10/79
Traced 10/79
Checked E.M. Fry 10/79
Date 10/79
Approved by J.S. Almon
Title STATE CONSERVATION ENGINEER, S.C.S.
John S. Almon, P.E.
Benham-Blair & Associates, Inc.
Sheet No. 12 of 24
Drawing No. 4-E-36,851

STANDARD OPEN RISER	
STANDARD DWG. NO.	ES- 3148-2525 R
DATE	2-69
SHEET 1 OF 4	
ADAPTED FROM	
STANDARD COVERED RISER	
DESIGN CONSTANTS	$f'_c = 4000$ psi $f'_c = 1600$ psi $n = 8$ $f_s = 20,000$ psi
STANDARD DWG. NO.	ES- 3048-3025 R
DATE	8-68
SHEET 1 OF 4	

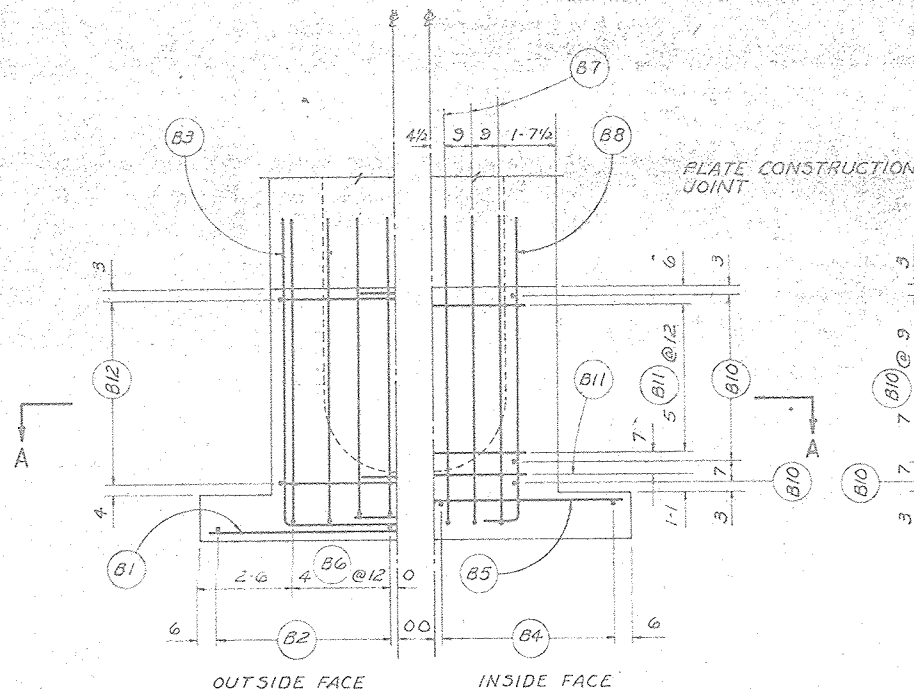
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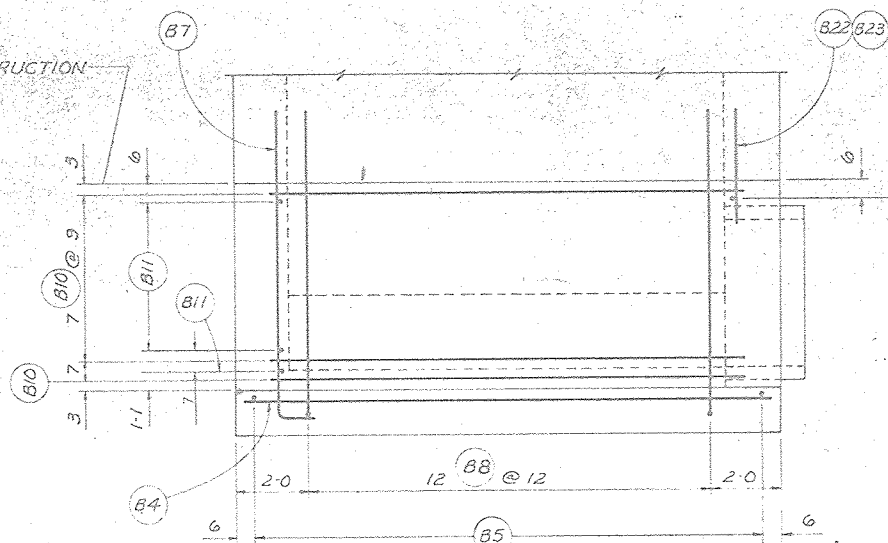
SECTION A-A



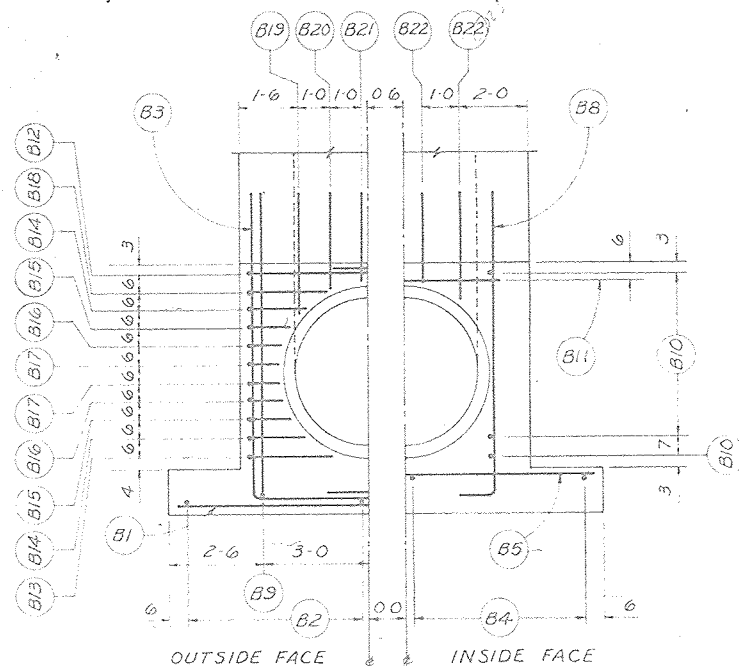
FOOTING PLAN



UPSTREAM ELEVATION

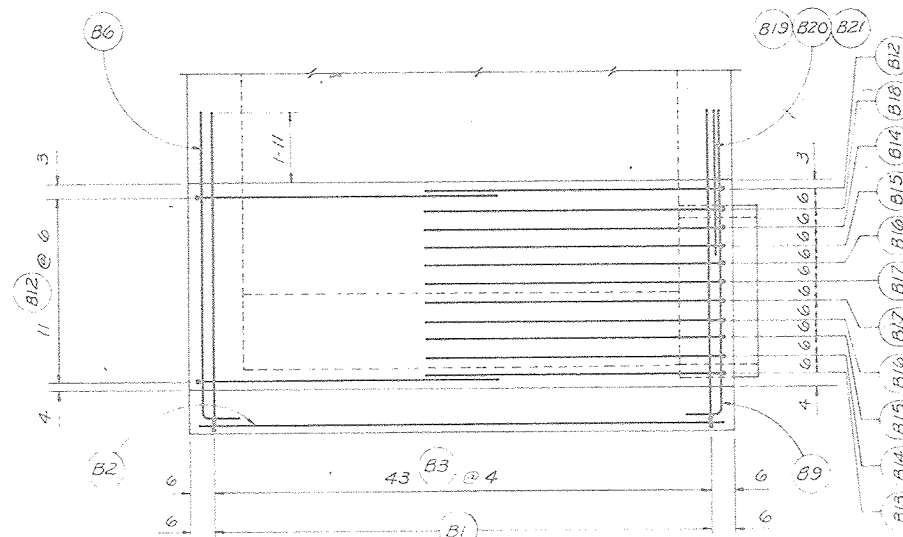


SIDEWALL ELEVATION



DOWNSTREAM ELEVATION

Note: Cut or shift steel as necessary to clear opening for slide gate 2".



SIDEWALL ELEVATION

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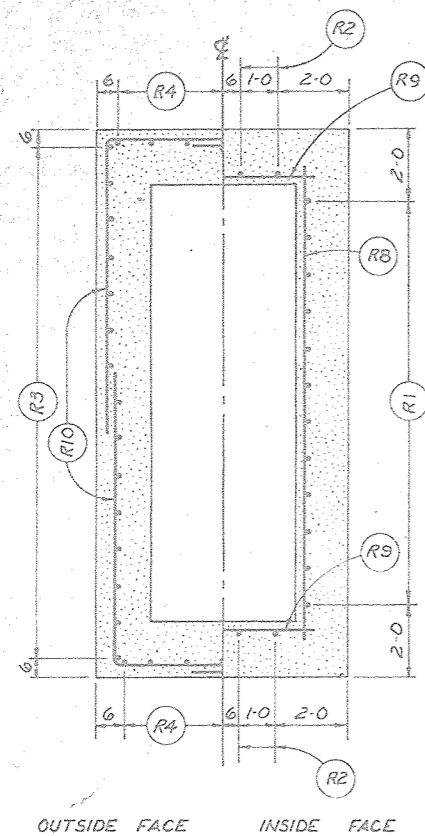
STEEL PLACEMENT-PRINCIPAL SPILLWAY INLET
FLOODWATER RETARDING STRUCTURE SITE NO. 2
SANDERSON CANYON WATERSHED
IN
BREWSTER, PECOS AND TERRELL COUNTIES, TEXAS
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE



Designed by J. S. Almon 10/79
Drawn by G. Oyelle 10/79
Checked by E. M. Fry 10/79
Date 10/79
Sheet No. 13 of 24
Drawing No. 4-E-36,851
Approved by John S. Almon, P.E.
State Conservation Engineer, S.C.S.
Title Benham-Blair & Associates, Inc.

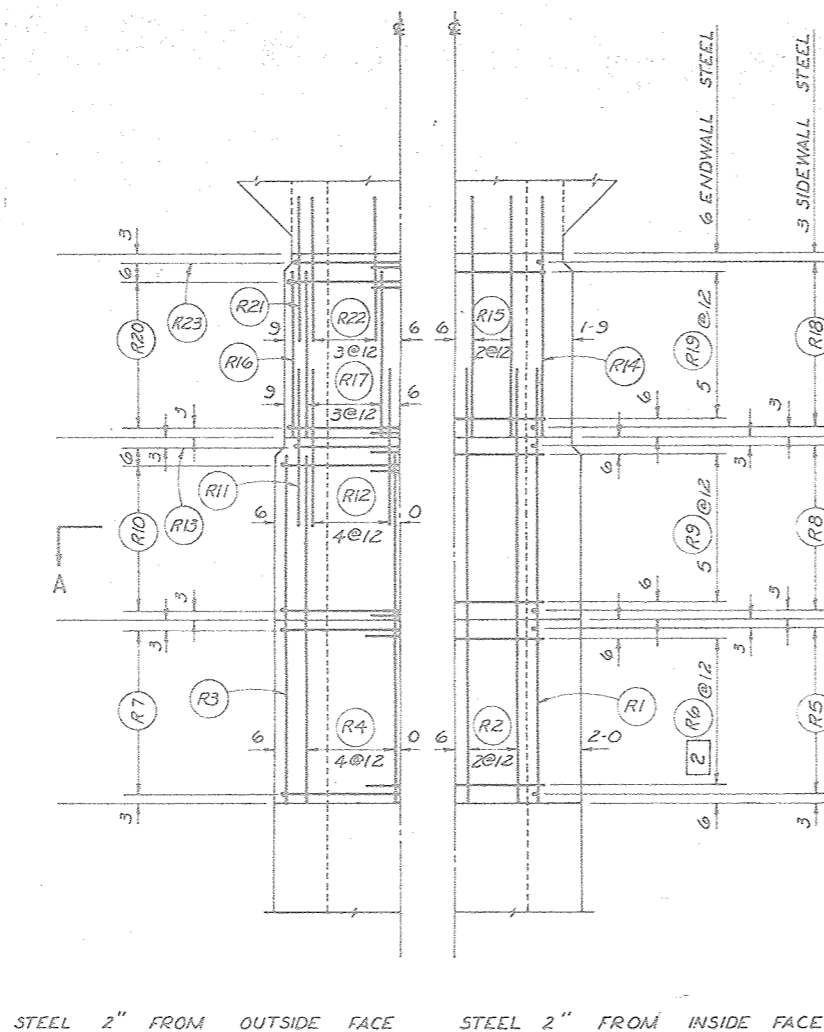
ADAPTED FROM STANDARD COVERED RISER		STANDARD OPEN RISER	
DESIGN CONSTANTS	$f'_c = 4000 \text{ psi}$ $n = 8$	$f'_c = 1600 \text{ psi}$ $f_s = 20,000 \text{ psi}$	
STANDARD DWG. NO.	ES-3048-3025 R	STANDARD DWG. NO.	ES-3148-2525 R
DATE	8-68	DATE	2-69
SHEET	2 OF 4	SHEET	2 OF 4

0 2 4 6
SCALE IN FEET

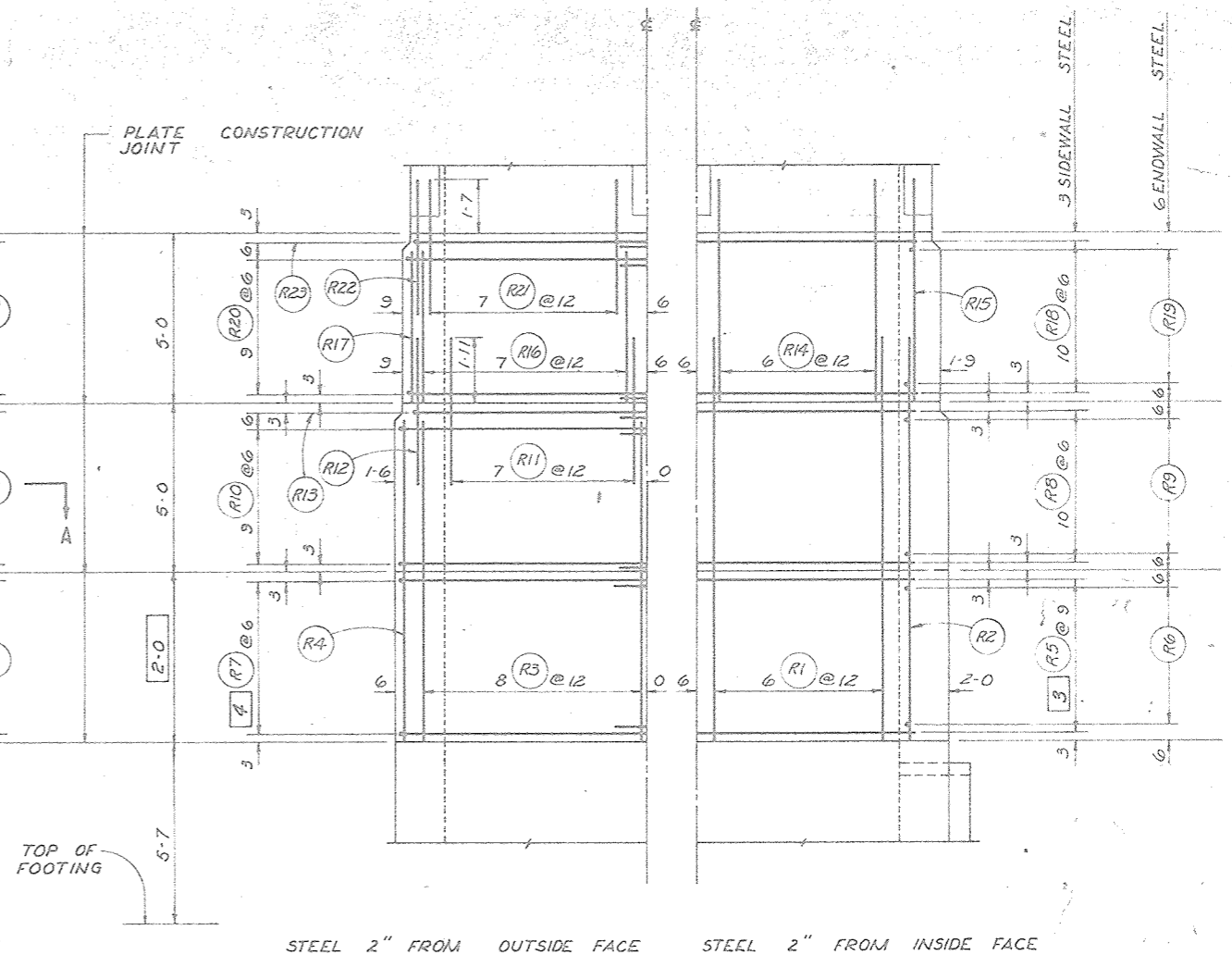


SECTION A-A

OTHER SECTIONS SIMILAR



ENDWALL ELEVATION



SIDEWALL ELEVATION

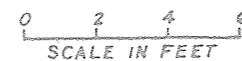
Note:
Cut, shift or deflect steel to
clear the port opening.

NO CHANGE IN PLANS

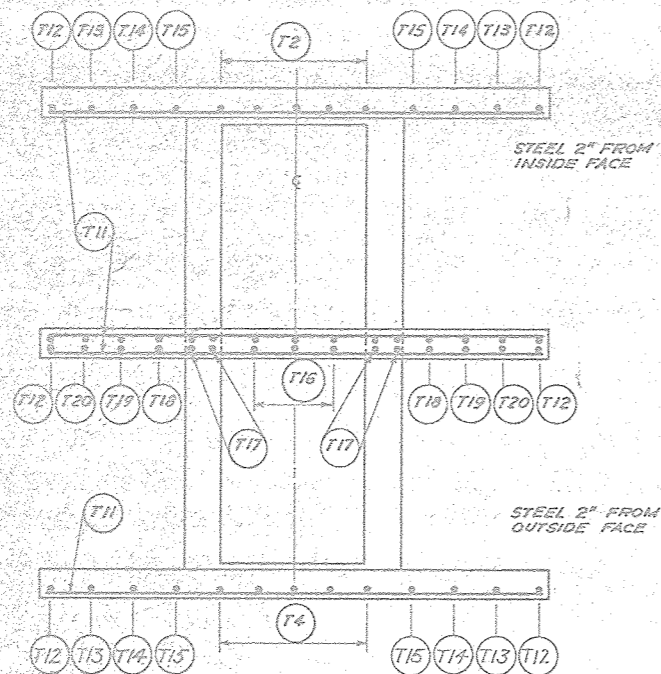
PLANS
CONSTRUCTION
COMPLETED 11/2/67
D.V.

REPRINTED BY S.C.S., 6/83

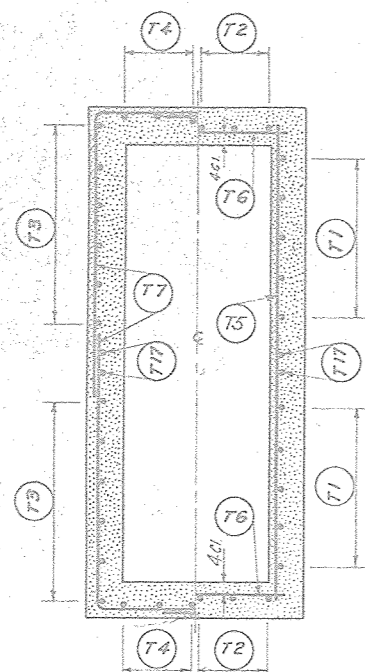
STANDARD OPEN RISER	
STANDARD DWG. NO.	ES-3148-2525R
DATE 2-69	SHEET 3 OF 4
ADAPTED FROM	
STANDARD COVERED RISER	
DESIGN CONSTANTS	$f'_c = 4000 \text{ psi}$ $f_c = 1600 \text{ psi}$ $n = 8$ $f_s = 20,000 \text{ psi}$
STANDARD DWG. NO.	ES-3048-3025R
DATE 8-68	SHEET 3 OF 4



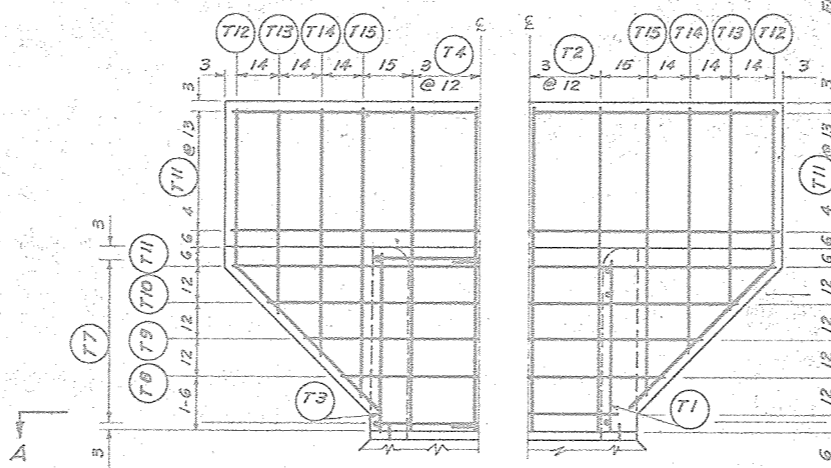
STEEL PLACEMENT-PRINCIPAL SPILLWAY INLET FLOODWATER RETARDING STRUCTURE SITE NO. 2 SANDERSON CANYON WATERSHED IN BREWSTER, PECOS AND TERRELL COUNTIES, TEXAS			
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
Designed	J. S. Almon	Date	10/79
Drawn	G. Ovalle	Date	10/79
Traced		Sheet	No. 14 of 24
Checked	E.M. Fry	Date	10/79
Approved by		John S. Almon, P.E. Benham-Blair & Associates, Inc.	
Drawing No.		4-E-36,851	



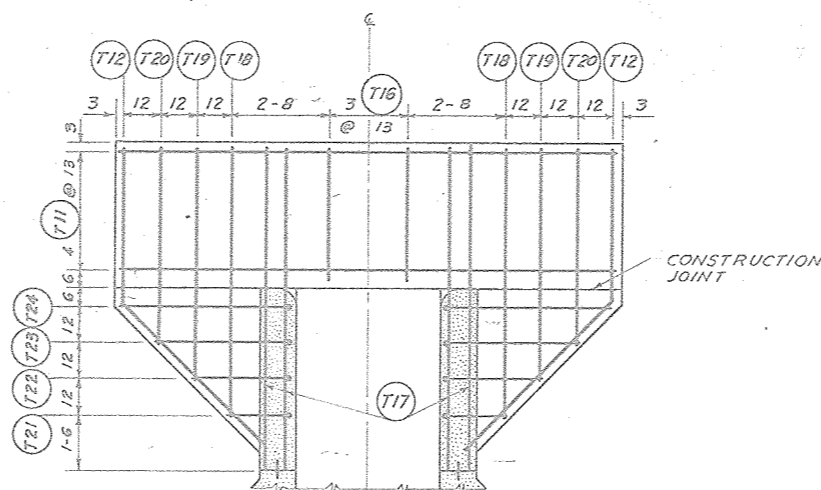
ANTI-VORTEX WALL PLAN



SECTION A-A

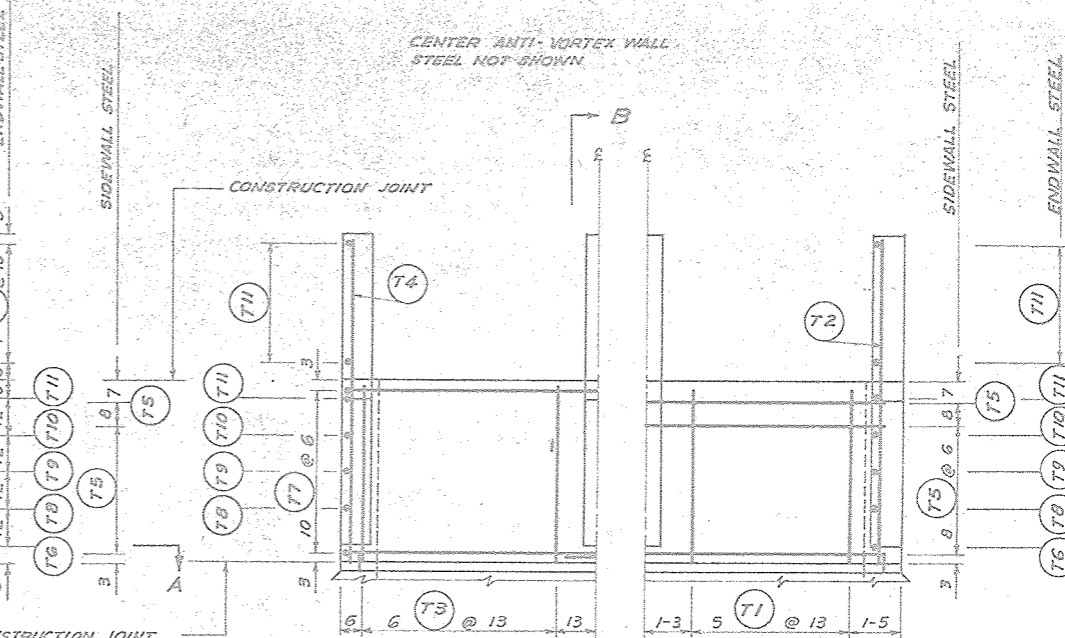


ENDWALL ELEVATION

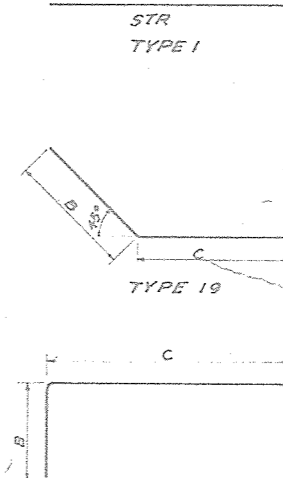


CENTER ANTI-VORTEX WALL ELEVATION
(STEEL IDENTICAL IN BOTH FACES)

SECTION B-B



SIDEWALL ELEVATION



TYPE 21
BAR TYPES

NO CHANGE IN PLANS

AS-BUILT PLANS
CONSTRUCTION
COMPLETED 4/2/87

REPRINTED BY S.C.S., 6/83

STEEL PLACEMENT-PRINCIPAL SPILLWAY INLET
FLOODWATER RETARDING STRUCTURE SITE NO. 2
SANDERSON CANYON WATERSHED
IN
BREWSTER, PECOS AND TERRELL COUNTIES, TEXAS
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed J. S. Almon 10/79
Drawn G. Ovalle 10/79
Traced 10/79
Checked E. M. Fry 10/79
Date 10/79
Approved by J. S. Almon, P.E.
Benham-Blair & Associates, Inc.
Sheet No. 15 of 24
Drawing No. 4-E-36,851

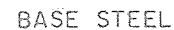
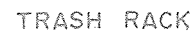
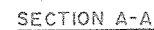
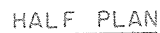
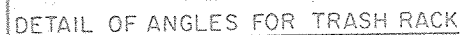


- NOTES:
1. BAR DIMENSIONS ARE OUT TO OUT OF BAR.
 2. THE 2" AND 3" DISTANCES FROM FACE OF CONCRETE TO STEEL ARE CLEAR DISTANCES.
 3. RADIUS OF BENDS EQUALS 3 BAR DIAMETERS FOR SIZES EQUAL TO OR LESS THAN #7 AND 4 BAR DIAMETERS FOR #8.

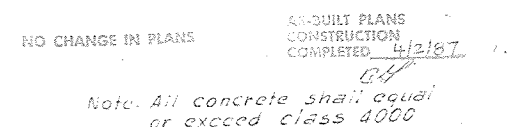
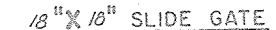
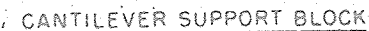
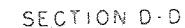
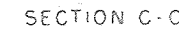
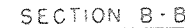
0 1 2 3 4 5 6
SCALE IN FEET

STANDARD OPEN RISER	
DESIGN CONSTANTS	$f'_c = 4000$ psi $f_c = 1600$ psi $n = 8$ $f_s = 20,000$ psi
STANDARD DWG. NO.	ES. 3148-2525 R
DATE	1-69
SHEET	4 OF 4

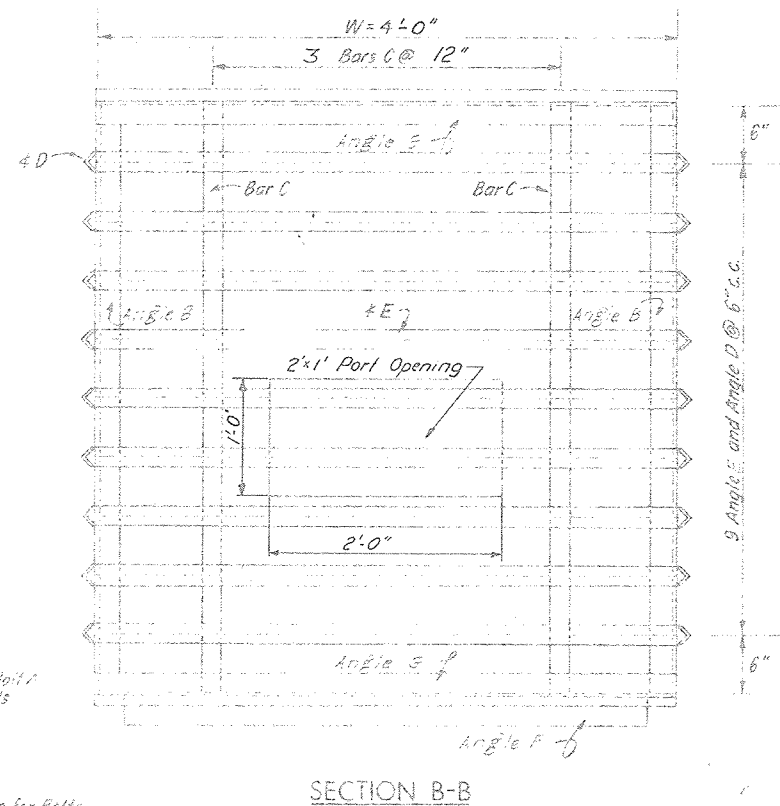
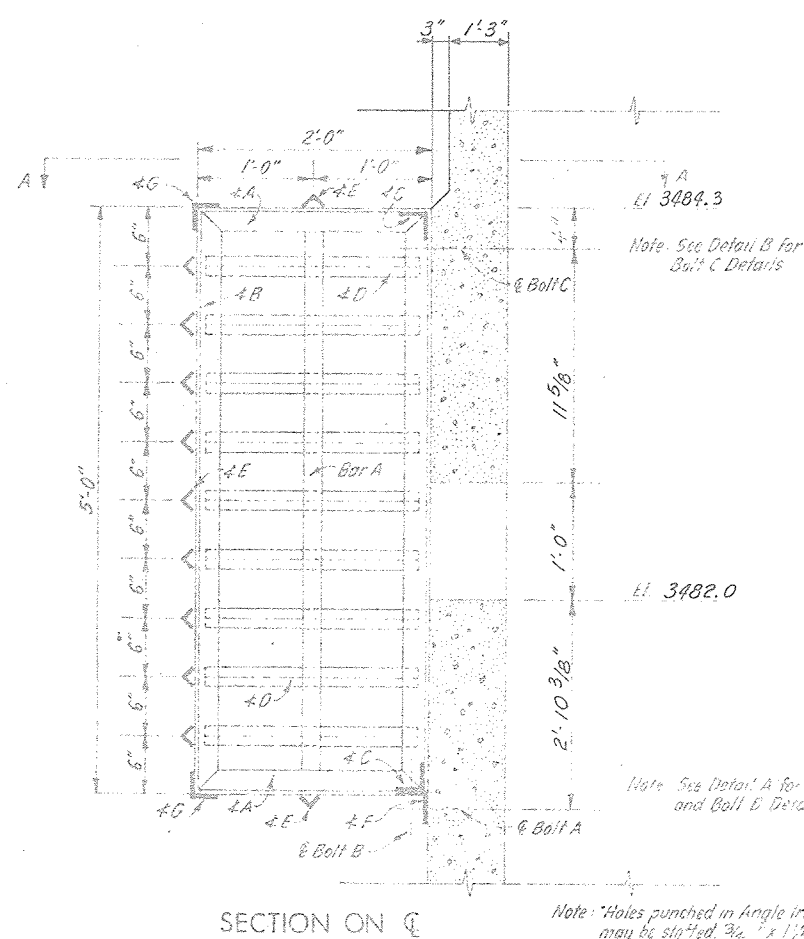
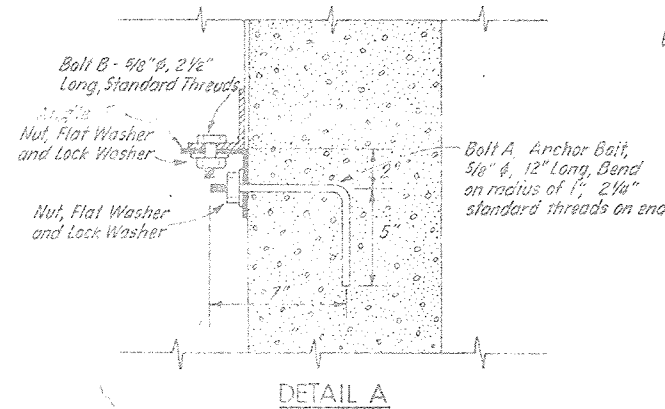
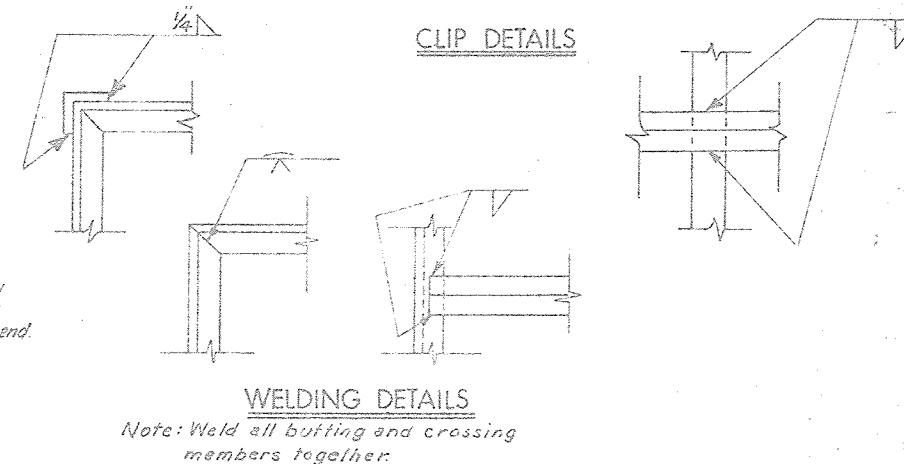
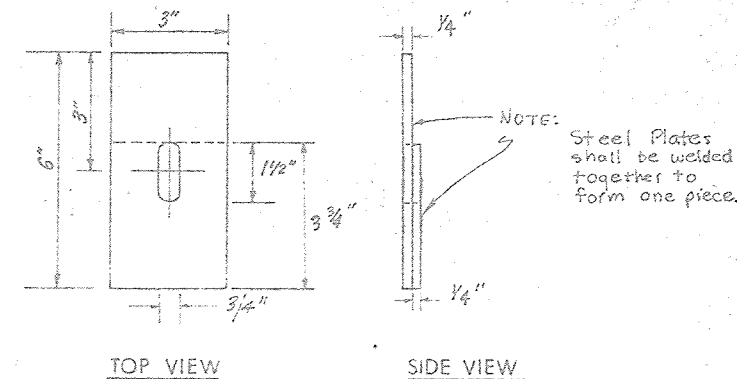
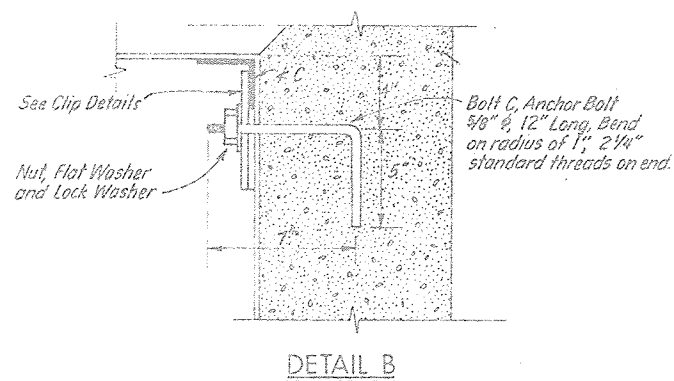
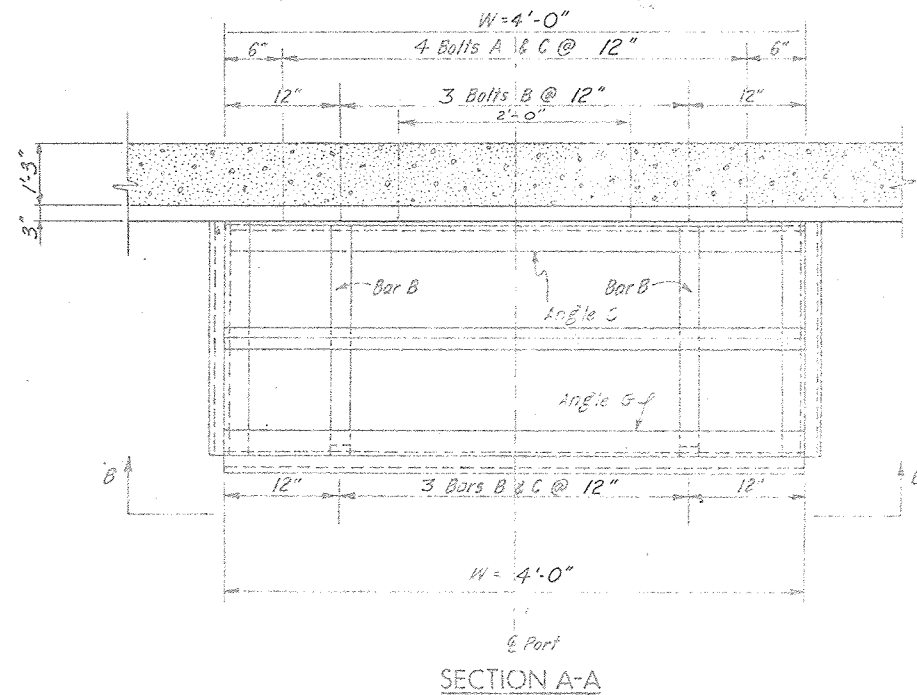
All parts of the trash rack shall be galvanized. See Construction Specification 81 and Material Specification 582.



FOR TYPICAL BAR TYPES REFER TO A C I STANDARD 715																
No	LOCATION	QTY	LENGTH	TOTAL LENGTH	SIZE	TYPE	A	B	C	D	E	F	G	H	J	K
C1	Pipe Cantilever	29	11'-5"	331'-1"	4	5-10		2-11	5	7	2-11					
C2	"	7	28'-6"	199'-6"	4	Str										
C3	"	7	5'-0"	35'-0"	4	"										
C4	"	4	28'-6"	114'-0"	8	"										
Total Steel in Pipe Cantilever							(Size 4) = 565'-7" = 377.81 lbs									
							(Size 8) = 114'-0" = 304.38 lbs									
							Total Steel = 682.19 lbs									
Total Reinforced Concrete in Pipe Cantilever = 12.29 cu yds.																
D1	Cantilever Supp	10	8'-7"	85'-10"	5	Str										
D2	"	22	3'-7"	78'-10"	5	"										
D3	"	4	3'-9"	15'-0"	6	2	1-3	2-6								
D4	"	8	15'-9"	126'-0"	7	Str										
D5	"	4	4'-7"	18'-4"	5	2	1-0	3-7								
D6	"	38	3'-2"	120'-4"	3	1-1	0-4	0-7 1/2	0-7 1/2	0-7 1/2	0-7 1/2			0-4		
Total Steel In Pipe Cantilever Support							(Size 3) = 120'-4" = 45.245 lbs									
							(Size 5) = 183'-0" = 190.869 lbs									
							(Size 6) = 15'-0" = 22.53 lbs									
							(Size 7) = 126'-0" = 257.544 lbs									
Total Steel = 516.188 lbs																
Total Reinforced Concrete in Pipe Cantilever Support = 2.63 cu yds.																



REPRINTED w/ MINOR REVISIONS BY S.C.S., 6/83			
TRASH RACK, SLIDE GATE, AND PIPE CANTILEVER SUPPORT DETAILS FLOODWATER RETARDING STRUCTURE SITE NO. 2 SANDERSON CANYON WATERSHED IN BREWSTER, PECOS AND TERRELL COUNTIES, TEXAS			
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
Designed	J. S. Almon	Date	10/79
Drawn	G. Ovalle	Date	10/79
Traced		Date	10/79
Checked	E. M. Fry	Date	10/79
Approved by <i>J.S. Almon</i> STATE ENGINEER TEMPLE, TEXAS <i>John L. Almon, P.E.</i> Benham-Blair & Associates, Inc.		Sheet No. 16 of 24 Drawing No. 4-E-36,851	



SCHEDULE OF MATERIALS REQUIRED FOR ONE RACK		
QUANTITY	ITEM	DESCRIPTION
4	Angle A	2 1/2" x 2 1/2" x 1/4" x 2'-0" Cut and weld
4	Angle B	2 1/2" x 2 1/2" x 1/4" x 5'-0" Cut and weld
2	Angle C*	3" x 3" x 1/4" x 3'-11 1/2" Weld
18	Angle D	1 1/2" x 1 1/2" x 1/4" x 1'-11" Weld
11	Angle E	1 1/2" x 1 1/2" x 1/4" x 4'-0" Weld
1	Angle F*	3 1/2" x 3 1/2" x 1/4" x 3'-6"
2	Angle G	2 1/2" x 2 1/2" x 1/4" x 4'-0" Weld
2	Bar A	1/4" x 2" x 4'-7" Weld
6	Bar B	1/4" x 2" x 2'-0" Weld
3	Bar C	1/4" x 2" x 4'-11 1/4" Weld
4	Bolt A	5/8" Ø Anchor Bolt, See Detail A
3	Bolt B	5/8" Ø, See Detail A
4	Bolt C	5/8" Ø, Anchor Bolt, See Detail B
4	Clip	See Clip Details
15	Nuts, Flat & Lock Washers	See Detail A and Detail B

*Angle C and Angle F shall have slots punched to allow Bolts A, B and C to pass through.

Trash Rack shall be galvanized after Fabrication.

Number of Racks Required: One

All bolts, nuts, washers and other parts of trash rack shall be galvanized.

AS-BUILT PLANS
CONSTRUCTION
COMPLETED 12/2/7

NO CHANGE IN PLANS



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PORT TRASH RACK

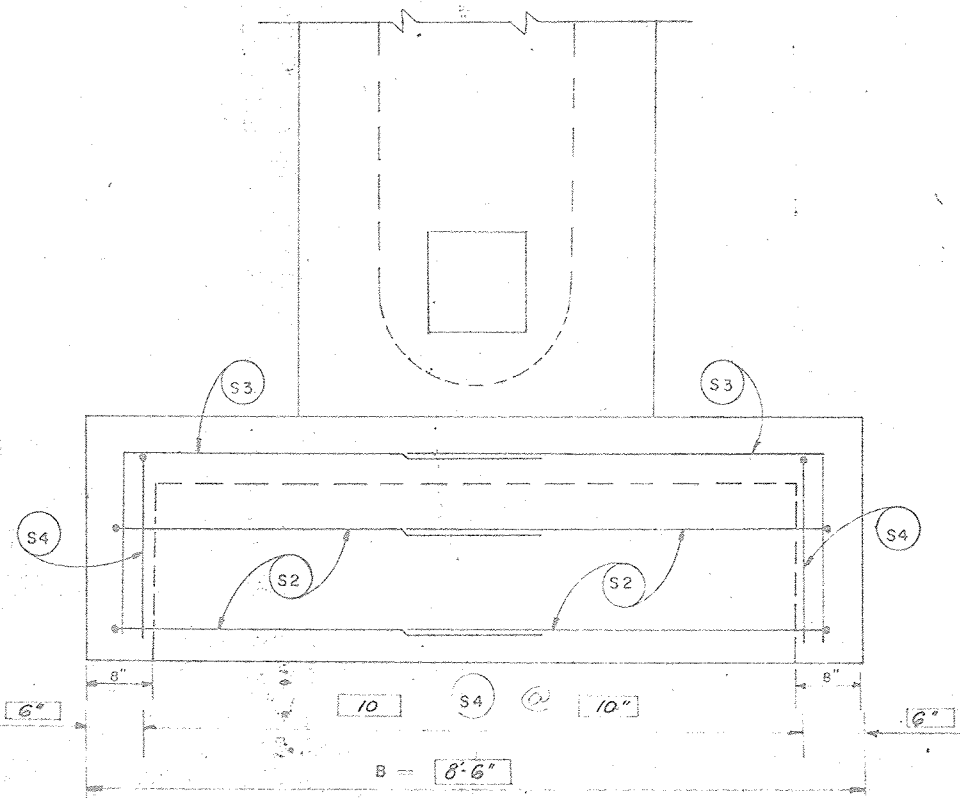
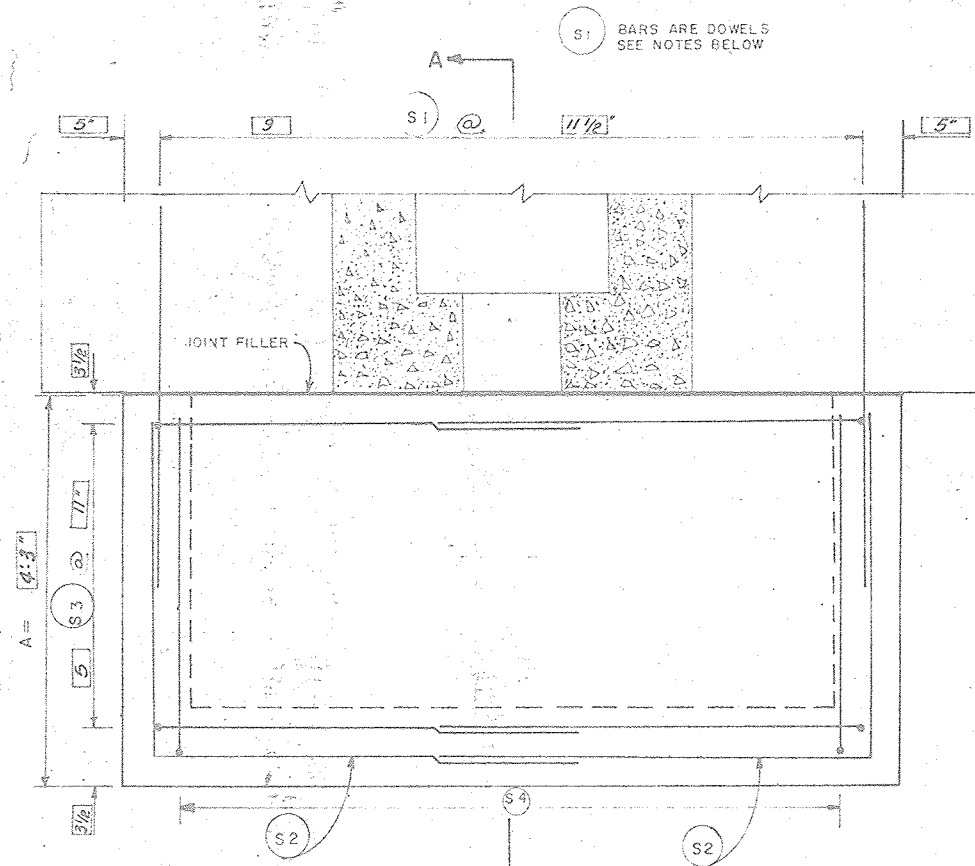
FLOODWATER RETARDING STRUCTURE SITE NO. 2
SANDERSON CANYON WATERSHED

IN
BREWSTER, PECOS AND TERRELL COUNTIES, TEXAS

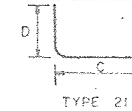
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

DESIGNED BY	J. S. Almon	DATE	10/79	APPROVED BY	B.P.V.
DRAWN BY	G. Ovalle	DATE	10/79	STATE CONSERVATION ENGINEER, S.C.S., TEXAS	
TRACED BY		DATE		Benham-Blair & Affiliates, Inc.	
CHECKED BY	C.M. Fry	DATE	10/79	DRAWING NO.	4-E-36,851

VARIABLE BAR DATA
Length of Angle C = W - 1/2"
Length of Angle E = W
Length of Angle F = W - 6"
Length of Angle G = W



BAR TYPE



MARK	SIZE	QUANTITY	LENGTH	TYPE	D	C	TOTAL LENGTH	BAR NO.	C. LENGTH EQUALS	D. LENGTH EQUALS
S2	4	4	8'5"	21	3'9"	4'8"	33'8"	S2	B+5	A-6
S3	4	10	6'6"	21	1'-11"	4'7"	65'0"	S3	B+4	
S4	4	10	5'8"	21	1'-11"	3'9"	56'8"	S4	A-6	

TOTAL STEEL (SIZE 4) 155'4" Lin.Ft.

TOTAL STEEL 103.76 Lbs.

TOTAL REINFORCED CONCRETE 1.6 Cu.Yds.

CU YDS. CONCRETE = $8(A)(B) + 126(B) + 352(A) - 2816$

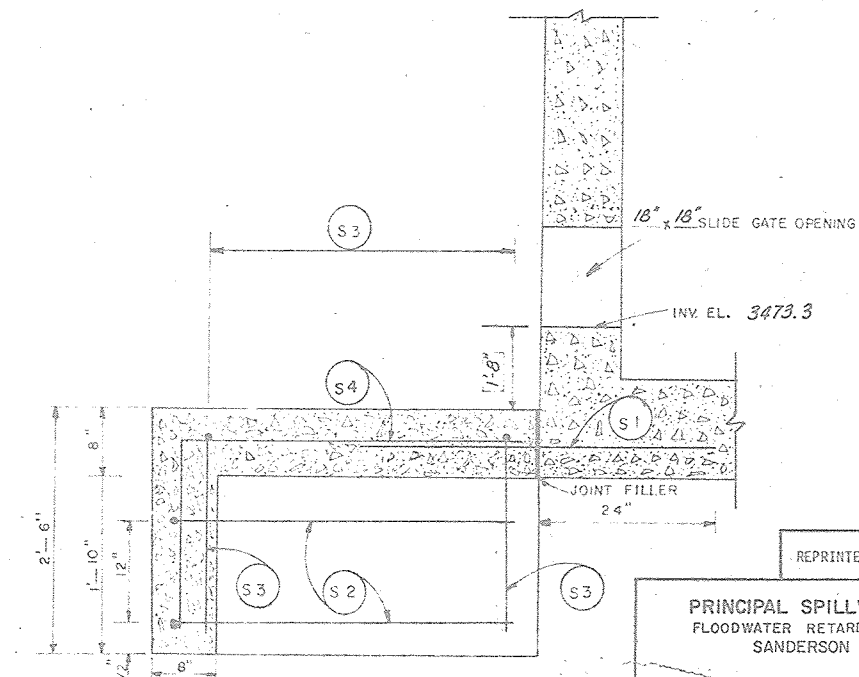
A=INCHES 46656
B=INCHES

NOTES: MAXIMUM CENTER SPACING OF NO.4 BARS SHALL NOT EXCEED 12"

THE SCOUR APRON SHALL BE FASTENED TO THE INLET BASE WITH DOWELS OF NO.6 DEFORMED REINFORCING STEEL 4 FEET LONG; 9 ARE REQUIRED. CENTER SPACING OF NO.6 BARS SHALL BE 15" OR LESS. ALL CONCRETE SHALL EQUAL OR EXCEED CLASS 4000.

MINIMUM STEEL CLEARANCE AGAINST EARTH SHALL BE 3" EXCEPT S1 DOWELS AND S4 BARS SHALL BE CENTERED IN THE TOP SLAB.

JOINT FILLER SHALL BE 3/4" PREFORMED EXPANSION JOINT FILLER.



AS-BUILT PLANS
CONSTRUCTION
COMPLETED 4/2/87

NO CHANGE IN PLANS

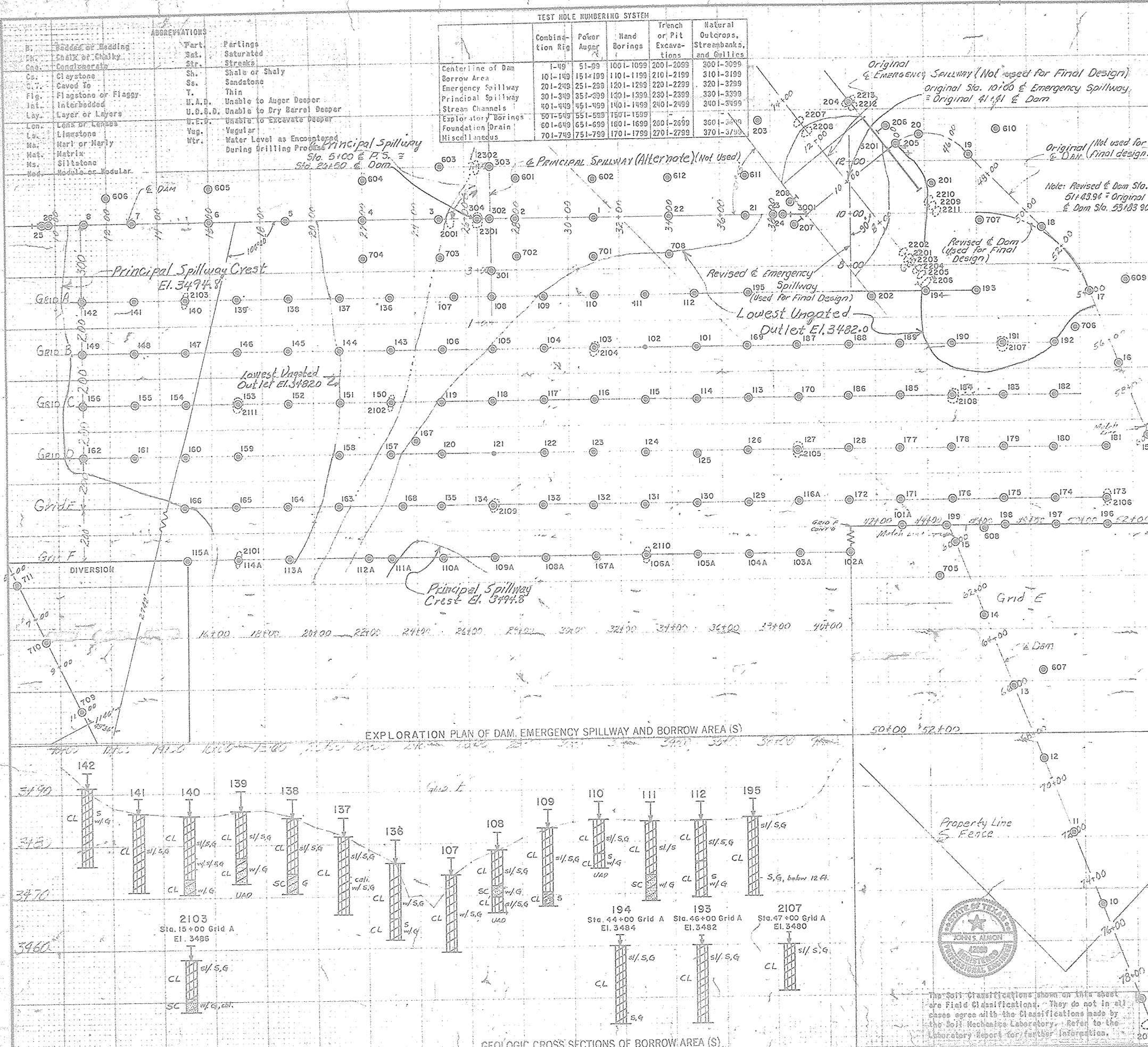
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PRINCIPAL SPILLWAY INLET SCOUR APRON
FLOODWATER RETARDING STRUCTURE SITE NO.2
SANDERSON CANYON WATERSHED

IN
BREWSTER, PECOS AND TERRELL COUNTIES, TEXAS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

DESIGNED BY J. S. Almon 10/79
DRAWN G. Ovalle 10/79
CHECKED E. M. Fry 10/79
APPROVED BY J. S. Almon 10/79
Benham-Blair & Associates, Inc.
SHEET 18
DRAWING NO. 4-E-36,851



TEST HOLE NUMBERING SYSTEM					
	Combina- tion Rig	Power Auger	Hand Borings	Trench or Pit Excava- tions	Natural Outcrops, Streambanks, and Gullies
Centerline of Dam	1-49	51-99	1001-1099	2001-2099	3001-3099
Borrow Area	101-149	151-199	1101-1199	2101-2199	3101-3199
Emergency Spillway	201-249	251-299	1201-1299	2201-2299	3201-3299
Principal Spillway	301-349	351-399	1301-1399	2301-2399	3301-3399
Stream Channels	401-449	451-499	1401-1499	2401-2499	3401-3499
Exploratory Borings	501-549	551-599	1501-1599		
Foundation Drains	601-649	651-699	1601-1699	2601-2699	3601-3699
Miscellaneous	701-749	751-799	1701-1799	2701-2799	3701-3799

LEGEND

SYMBOLS

UNCONSOLIDATED MATERIAL

gravel	sand	silt	clay	cobbles, boulders
gravel, sandy	sand, gravelly	silt, gravelly	clay, gravelly	peat or muck
gravel, silty	sand, silty	silt, sandy	clay, sandy	
gravel, clayey	sand, clayey	silt, clayey	clay, silty	

CONSOLIDATED MATERIAL

Sedimentary Rocks

conglomerate	shale	limestone	coal
breccia	siltstone	dolomite	gypsum
sandstone	marl	chalk	chert

Metamorphic Rocks

gneiss	schist	intrusive	extrusive
quartzite	slate	pyroclastic	
marble	soapstone	undifferentiated	

Other Symbols

hole logged only	strike and dip	angle hole-sampled and angle direction
hole sampled	pit or trench	

ABBREVIATIONS

ang. boulders (> 12")	lam. loose	G gravel, gravelly
calc. calcareous	mas. massive	S sand, sandy
cali. calcic	med. medium	M silt, silty
cav. cavities	mic. micaceous	C clay, clayey
cmt. cemented	mod. moderately	O organic
cse. coarse	n. r. no recovery	W well graded
cbi. cobbles (> 12")	per. permeable	P poorly graded
cpt. compact	po. poorly	
con. concretions	rd. rounded	
xin. crystalline	six. slightly	
ds. dense	stf. soft	
dip. dipping	s/. some	
d.s. downstream	slo. slowly	
fn. fine	stf. stiff	
frm. firm	t.b. thin-bedded	
frac. fractured	tuff. tuffaceous	
frg. fragments	u.s. upstream	
fri. friable	var. variable	
grn. grain	w/. very	
gyp. gypsaceous	w/. with	
hd. hard	wea. weathered	
h. highly	w.l. water static water level	

UNIFIED SOIL CLASSIFICATION SYSTEM SYMBOLS

GW	Well graded gravels; gravel-sand mixtures
GP	Poorly graded gravels
GM	Silty gravels; gravel-sand-silt mixtures
GC	Clayey gravels; gravel-sand-clay mixtures
SW	Well graded sands; sand-gravel mixtures
SP	Poorly graded sands
SM	Silty sand
SC	Clayey sands; sand-clay mixtures
ML	Silts with liquid limit of 50 or less
MH	Silts with liquid limit above 50
CL	Clays with liquid limit of 50 or less
CH	Clays with liquid limit above 50
OL	Organic silts and clays with liquid limit of 50 or less
OH	Organic silts and clays with liquid limit above 50

AS-BUILT PLANS COMPLETED 4/2/87

Revised February 1963

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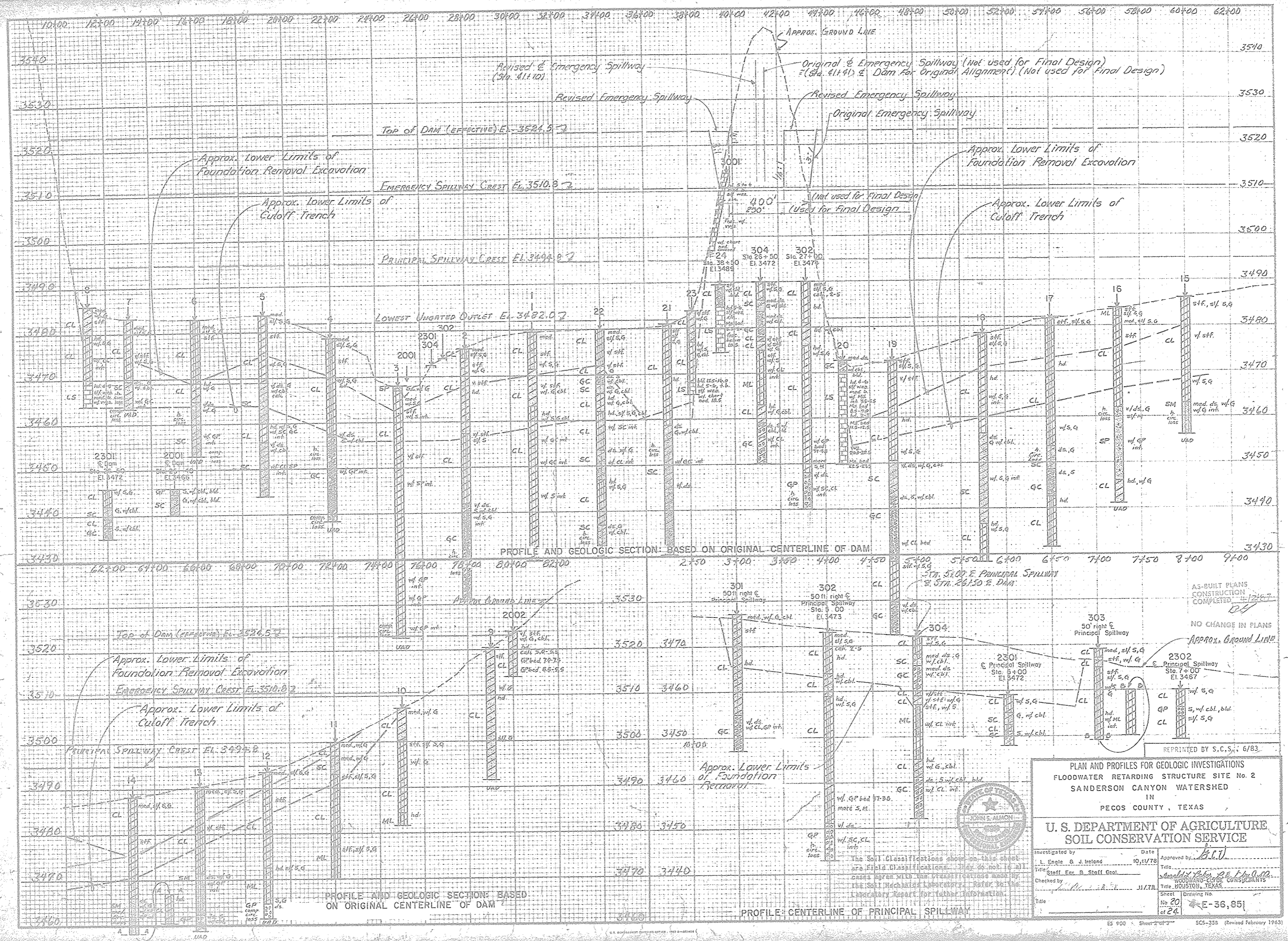
PLAN AND PROFILES FOR GEOLOGIC INVESTIGATIONS
FLOODWATER RETARDING STRUCTURE SITE No. 2
SANDERSON CANYON WATERSHED
IN
PECOS COUNTY, TEXAS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Investigated by L. Engle, A. J. Ireland, D. Lowe Date 10/11/78
Title Staff Geol. & Staff Geol. 7/13/79
Checked by J. Ireland Date 11/78
Title Staff Geologist Woodward-Clyde Consultants 9/79
Drawing No. No. 19
Sheet of 24 4-E-36, 851

The soil classifications shown on this sheet are field classifications. They do not in all cases agree with the classifications made by the Soil Mechanics Laboratory. Refer to the Laboratory Reports for further information.

GEOLOGIC CROSS SECTIONS OF BORROW AREA (S)



AS-BUILT PLANS
CONSTRUCTION
COMPLETED 4/24/87
DE

NO CHANGE IN PLANS
APPROX. GROUND LINE

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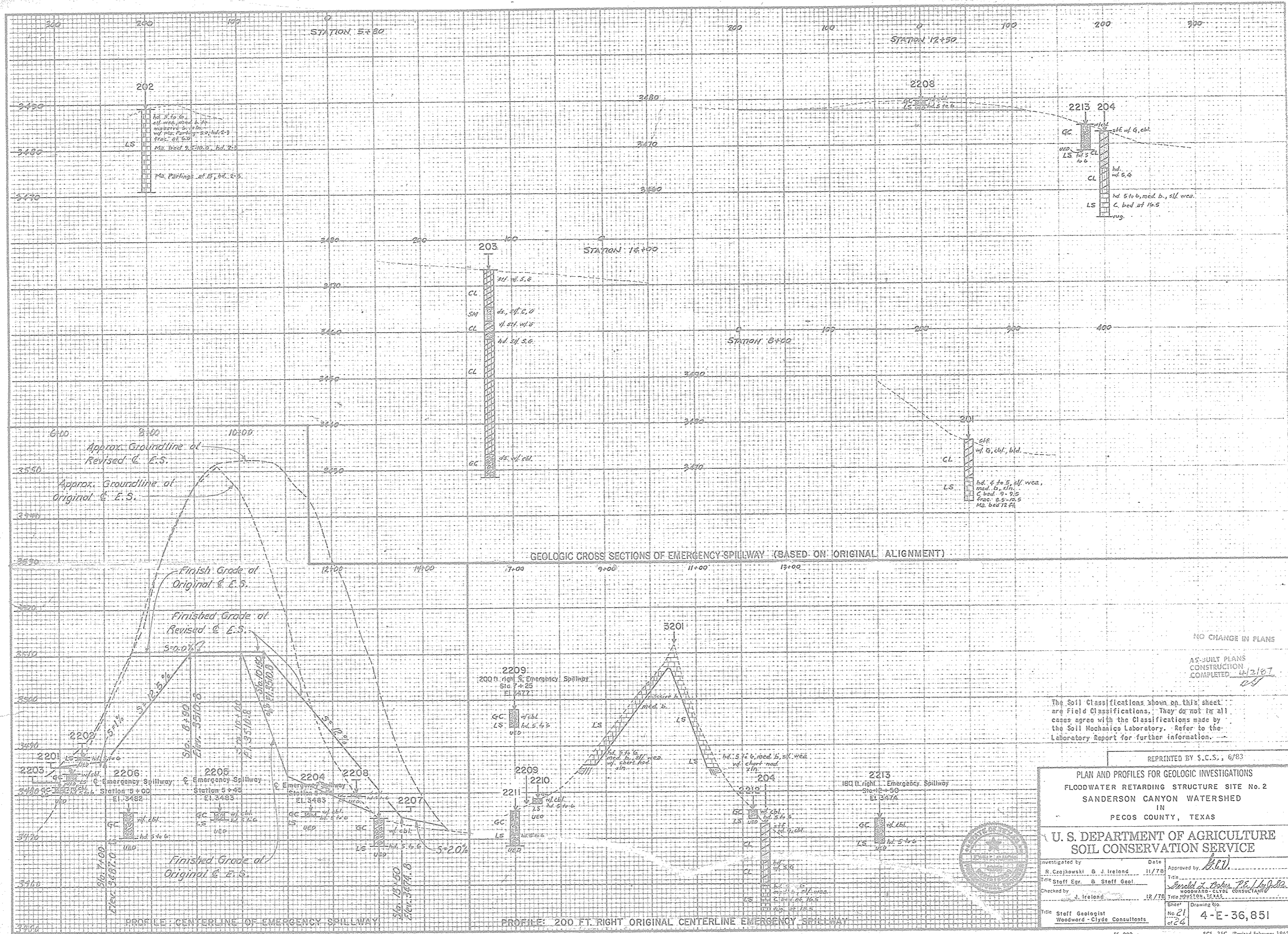
PLAN AND PROFILES FOR GEOLOGIC INVESTIGATIONS
FLOODWATER RETARDING STRUCTURE SITE No. 2
SANDERSON CANYON WATERSHED
IN
PECOS COUNTY, TEXAS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Investigated by	Date	Approved by
L. Engle & J. Ireland	10/11/78	<i>[Signature]</i>
Title		Title
Staff Exp. & Staff Geol.		<i>Analysis of 25 ft. by 10 ft.</i>
Checked by	J1/78	WOODWARD-CURDE CONSULTANTS
		WOODWARD-CURDE
		Sheet
		Drawing No.
		No. 20
		20
		E-36,851

The Soil Classifications shown on this sheet are Field Classifications. They do not in all cases agree with the Classifications made by the Soil Mechanics Laboratory. Refer to the Laboratory Report for further information.

PROFILE: CENTERLINE OF PRINCIPAL SPILLWAY



NO CHANGE IN PLANS
AS-BUILT PLANS
CONSTRUCTION
COMPLETED 4/2/87

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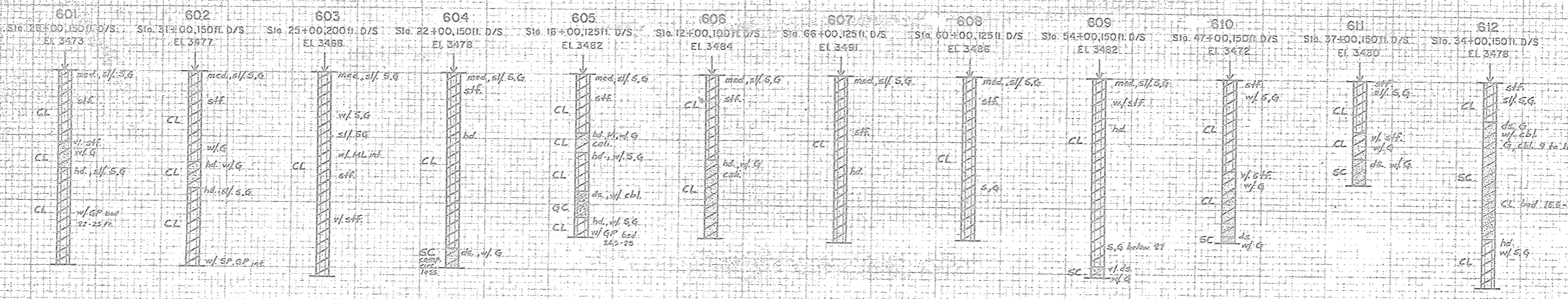
PLAN AND PROFILES FOR GEOLOGIC INVESTIGATIONS
FLOODWATER RETARDING STRUCTURE SITE No. 2
SANDERSON CANYON WATERSHED
IN
PECOS COUNTY, TEXAS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

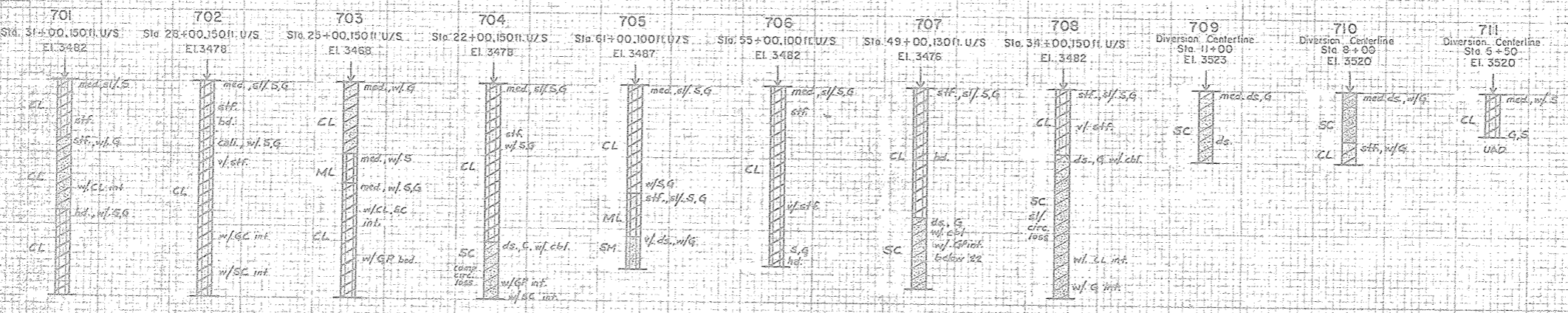
Investigated by R. Crojowski & J. Ireland	Date 11/78	Approved by L.V.
Title Staff Egr. & Staff Geol.		
Checked by J. Ireland	Date 12/78	
Title Staff Geologist Woodward-Clyde Consultants	Sheet No. 21 of 24	Drawing No. 4-E-36,851

U.S. GOVERNMENT PRINTING OFFICE: 1953 O-351457

ES 900 SCS-35C (Revised February 1963)



FOUNDATION DRAIN
(BASED ON ORIGINAL Q. DAM)



MISCELLANEOUS BORINGS
(BASED ON ORIGINAL Q. DAM)

NOT CHANGE IN PLANS
AS-SURVEY PLANS
CONSTRUCTION
COMPLETED 4/3/82



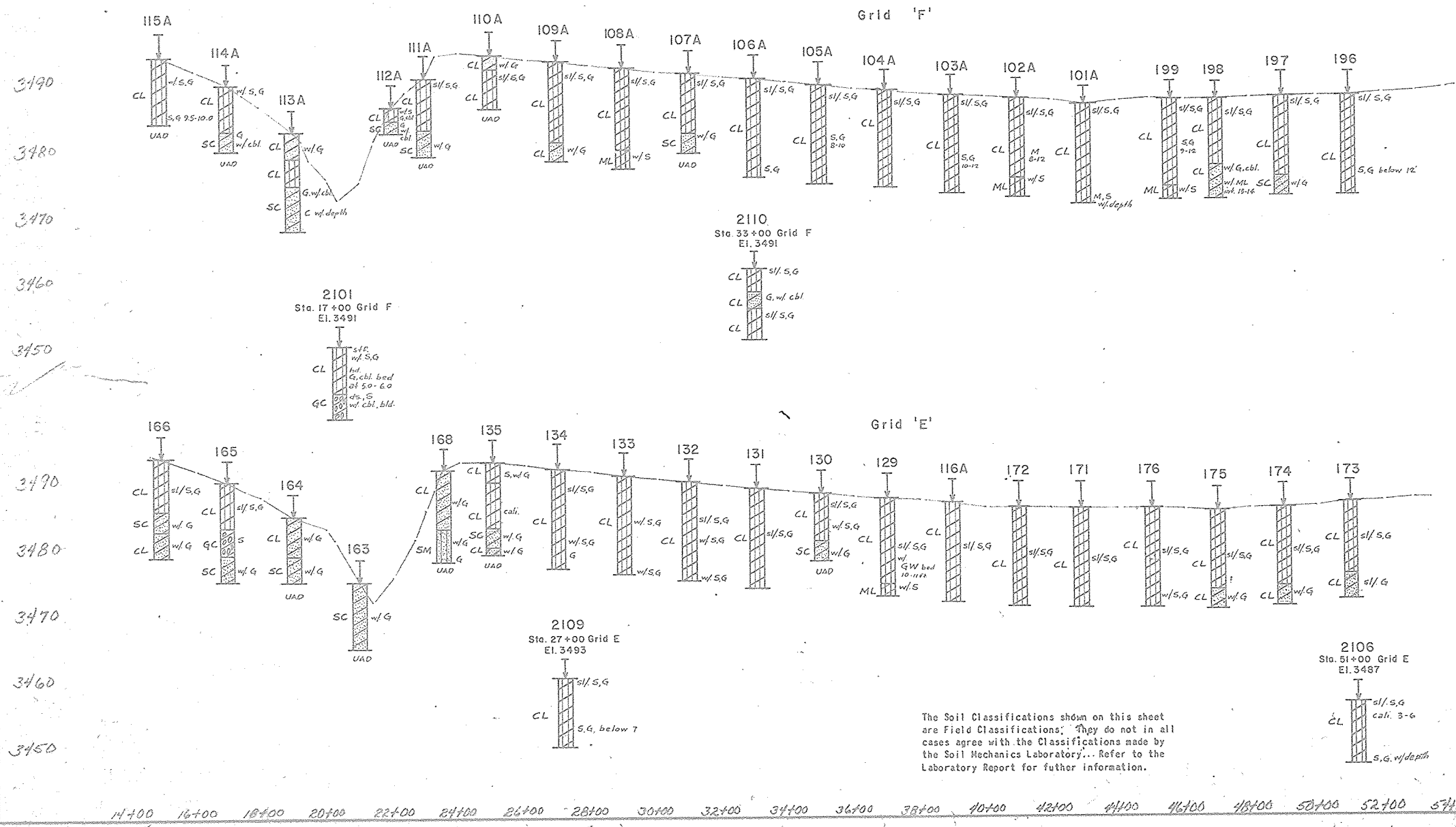
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PLAN AND PROFILES FOR GEOLOGIC INVESTIGATIONS
FLOODWATER RETARDING STRUCTURE SITE No. 2
SANDERSON CANYON WATERSHED
IN
PECOS COUNTY, TEXAS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed by Ireland	Date 11/78	Approved by H.C.V.
Drawn by R. B.	Date 12/78	Checked by Woodward Clyde Consultants
Traced	Date 12/78	Sheet No. 22 of 24
Checked by L. Engle	Date 12/78	Drawing No. 4-E-36, 851

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NO CHANGE IN PLANS
AS-BUILT PLANS
CONSTRUCTION
COMPLETED 4/2/67



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PLAN AND PROFILES FOR GEOLOGIC INVESTIGATIONS FLOODWATER RETARDING STRUCTURE SITE No. 2 SANDERSON CANYON WATERSHED IN PECOS COUNTY, TEXAS			
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
Designed J. Ireland	Date 11/78	Approved by <i>B.G.V.</i>	
Drawn R. Gomez	Date 12/78	Checked <i>David L. Baker, P.E.</i>	
Traced		Client	
Checked L. Engle	Date 12/78	Drawing No. 4-E-36,851	