

FLOODWATER RETARDING DAM NO.6 SANDERSON CANYON WATERSHED PROJECT

BREWSTER, PECOS AND TERRELL COUNTIES, TEXAS

DRAINAGE AREA	10624	ACRES
TOTAL STORAGE	2568	AC. FT.
HEIGHT OF DAM	65	FEET
VOLUME OF FILL	9,381,372	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
1979

AS-Built Plans
184

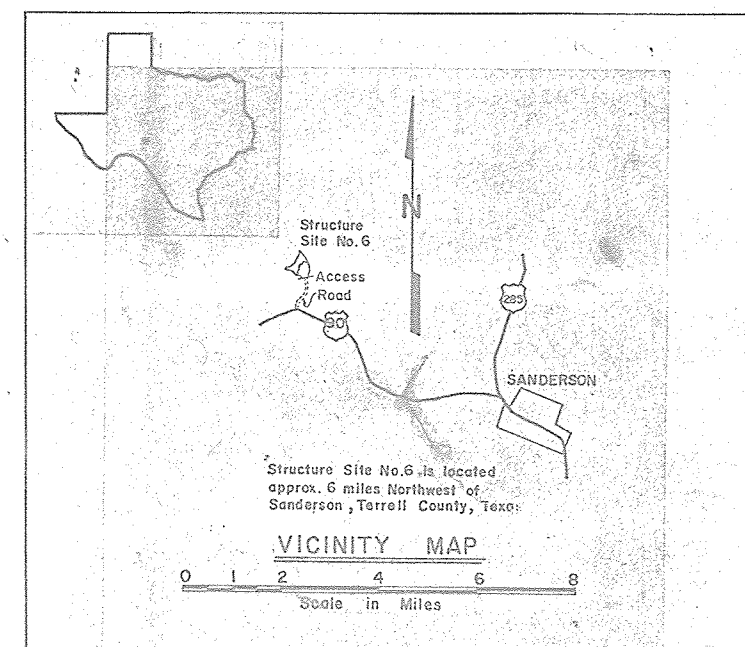
AS-BUILT PLANS
CONTRACT NO. 50-7442-3-2381
CONTRACTOR West Texas Roads, Inc.
CONSTRUCTION COMMENCED 1/14/83
GOV. REPRESENTATIVE Bill H. Ramey
GOV. INSPECTOR Ed. J. Smith
BID PRICE \$2,212,673.88
FINAL PRICE \$2,526,565.94
CONSTRUCTION COMPLETED 3/27/84

15/ Robert A. Frank, Jr. Approved
By Letter Dated 4-23-79
HEAD ENGINEERING STAFF SCS
FT. WORTH, TEXAS

CONSTRUCTION DRAWINGS APPROVED
By Gene C. Vittles (By D.C.M.)
STATE CONSERVATION ENGINEER SCS
TEMPLE, TEXAS
5-7-79 DATE

Blom Engineering Corp.
BLOM ENGINEERING CORP.
HOUSTON, TEXAS
4/20/79 DATE

INDEX OF DRAWINGS	
SHEET NO.	TITLE
1	General Plan of Reservoir
2	Plan of Embankment and Spillways
3	Profile on Centerline of Dam
4	Profile and Sections
5-6	Principal Spillway - Plan and Section
7	Plan and Profile of Centerline of Diversion Structure
8-11	Embankment Foundation Drain
12	Pipe Details
13	Principal Spillway Inlet
14-16	Steel Placement - Principal Spillway Inlet
17	Principal Spillway Inlet Scour Apron
18	Port Trash Rack
19	Trash Rack, Slide Gate, and Pipe Cantilever Support Details
20-24	Plan and Profiles for Geologic Investigations



BLOM ENGINEERING CORPORATION
HOUSTON, TEXAS

4-E-36,791

EMERGENCY SPILLWAY
CREST EL. 3070.2

PRINCIPAL SPILLWAY CREST EL. 3052.9
LOWEST UNGATED OUTLET EL. 3043.0

NOTE: FINAL LOCATION AND ALIGNMENT OF
DIVERSION TERRACES SHALL BE AS
STAKED BY THE ENGINEER.
(SEE SHEET 7)

ROCK WASTE AREA

EMERGENCY SPILLWAY
CREST EL. 3070.2

STA. 9+64.16 @
EMERGENCY SPILLWAY
STA. 6+35.14 @ DAM

PT. 10+00 @ DAM

PROPERTY LINE

FENCE

P.I. STA. 35+00

RELOCATION OF
PRIVATE ROAD
BY S.L.O.

PRIVATE ROAD

@ DAM

DOWNSTREAM TOE

@ PRINCIPAL SPILLWAY

WASTE AREA

@ DIVERSION
DIKE

CONSTRUCTION
CAMP SITE

ACCESS ROAD TO SITE

@ SANDERSON CANYON
EXISTING DIKE

SANDERSON

GENERAL PLAN OF RESERVOIR

SCALE IN FEET
0 200 400 600 800

LEGEND

- LIMITS OF AREA TO BE CLEARED & GRUBBED
- LIMITS OF WORK AREA
- LIMITS OF BORROW AREA
- FENCE TO BE REMOVED BY S.L.O. PRIOR TO CONSTRUCTION
- FENCE TO BE CONSTRUCTED BY S.L.O.
- EXISTING FENCE TO REMAIN
- ROAD TO BE RELOCATED BY S.L.O.
- S.L.O. SPONSORING LOCAL ORGANIZATION
- DIVERSION TERRACE

AS-BUILT PLANS
CONSTRUCTION
COMPLETED 3/27/84



GENERAL PLAN OF RESERVOIR
FLOODWATER RETARDING STRUCTURE SITE NO. 6
SANDERSON CANYON WATERSHED
IN
BREWSTER, PECOS, AND TERRELL COUNTIES TEXAS
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	C.H.S.	2-79	App'd	C.H.S.	2-79
Drawn	C.A.N.	2-79	Checked	C.A.N.	2-79
Traced	C.A.N.	2-79	Reviewed	C.A.N.	2-79
Checked	D.E.M.	2-79	Approved	D.E.M.	2-79

EMERGENCY SPILLWAY CURVE DATA

$\Delta = 44^\circ$
 $D = 1432' 14" 19' 26"$
 $R = 2400'$
 $L = 307.18'$
 $P.C. = STA. 6+92.82$
 $P.T. = STA. 10+00$

STA. 0+00 @ DIVERSION
 DIKE STA. 10+75
 337.5' RT. OF C
 EMERGENCY SPILLWAY

PT. 10+00

EL. 3072.95

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EL. 3072.95

ELEVATION	SURFACE ACRES	CAPACITY ACRE FEET	INCHES
3020	0	0	0.00
3024	1	1	0.00
3028	2	7	.01
3032	5	22	.03
3036	11	60	.07
3040	22	126	.14
3044	30	200	.23
3047.1	42	336	.38
3052.9	65	673	.76
3053.8	70	735	.83
3056	80	889	1.00
3064	123	1698	1.92
3068	144	2232	2.52
3070.2	157	2568	2.90
3072	168	2855	3.22
3084	249	5334	6.02
3088.3	277	5887.5	6.65
3088	280	6392	7.22
Drainage Area, Acres		10,624	
Top of Dam (effective) El.		3086.3	
Emergency Spillway Crest El.		3070.2	
Principal Spillway Crest El.		3052.9	
Lowest Ungated Outlet El.		3043.0	
Sediment Capacity, Acre Feet		735	
Floodwater Capacity, Acre Feet		1833	
Maximum Emergency Spillway Capacity, cubic feet/second		71,940	
Principal Spillway Capacity, @ El. 3070.2, cubic feet/second		1782	

1/ 50 yr. Submerged Sediment
 2/ 100 yr. Submerged Sediment
 3/ 200 yr. Foot Level

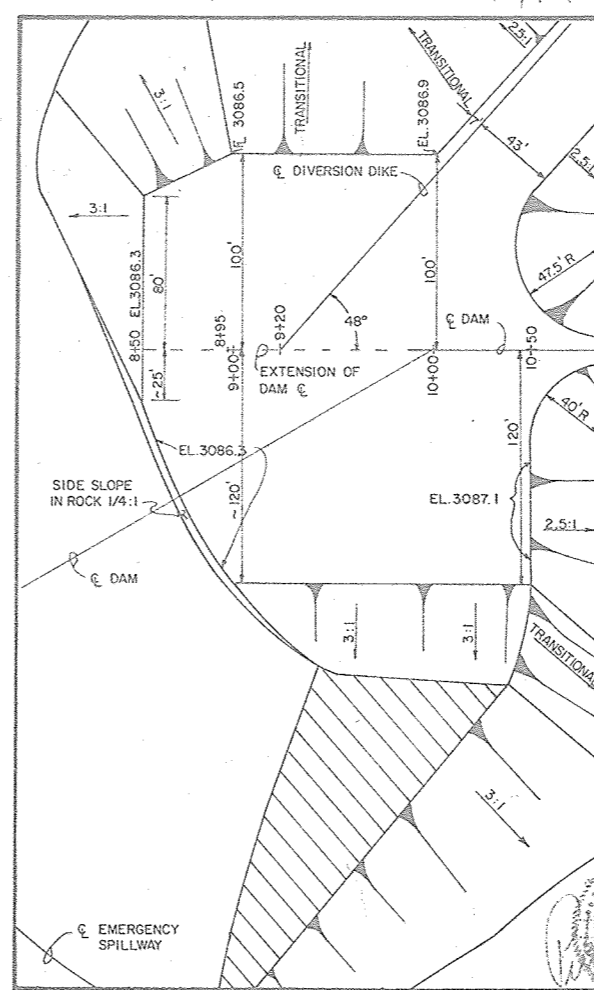
PLAN OF EMBANKMENT AND SPILLWAYS

SCALE IN FEET

NOTE: SHOULD THE CONTRACTOR ELECT TO CONSTRUCT A RAMP ON
 THE LEFT AND RIGHT ABUTMENT, THE SIDE SLOPES SHALL HAVE A
 MINIMUM 1.0 FT. THICK ROCK BLANKET AND GRAVEL SHALL
 BE PLACED ON THE CROWN. THE RAMP SHALL REMAIN IN
 PLACE AFTER COMPLETION OF THE CONTRACT.

FILL AREA - FILL TO BE PLACED AND
 PAID FOR AS "EARTH FILL EMBANKMENT".
 (SEE CONSTRUCTION SPEC. 23A)

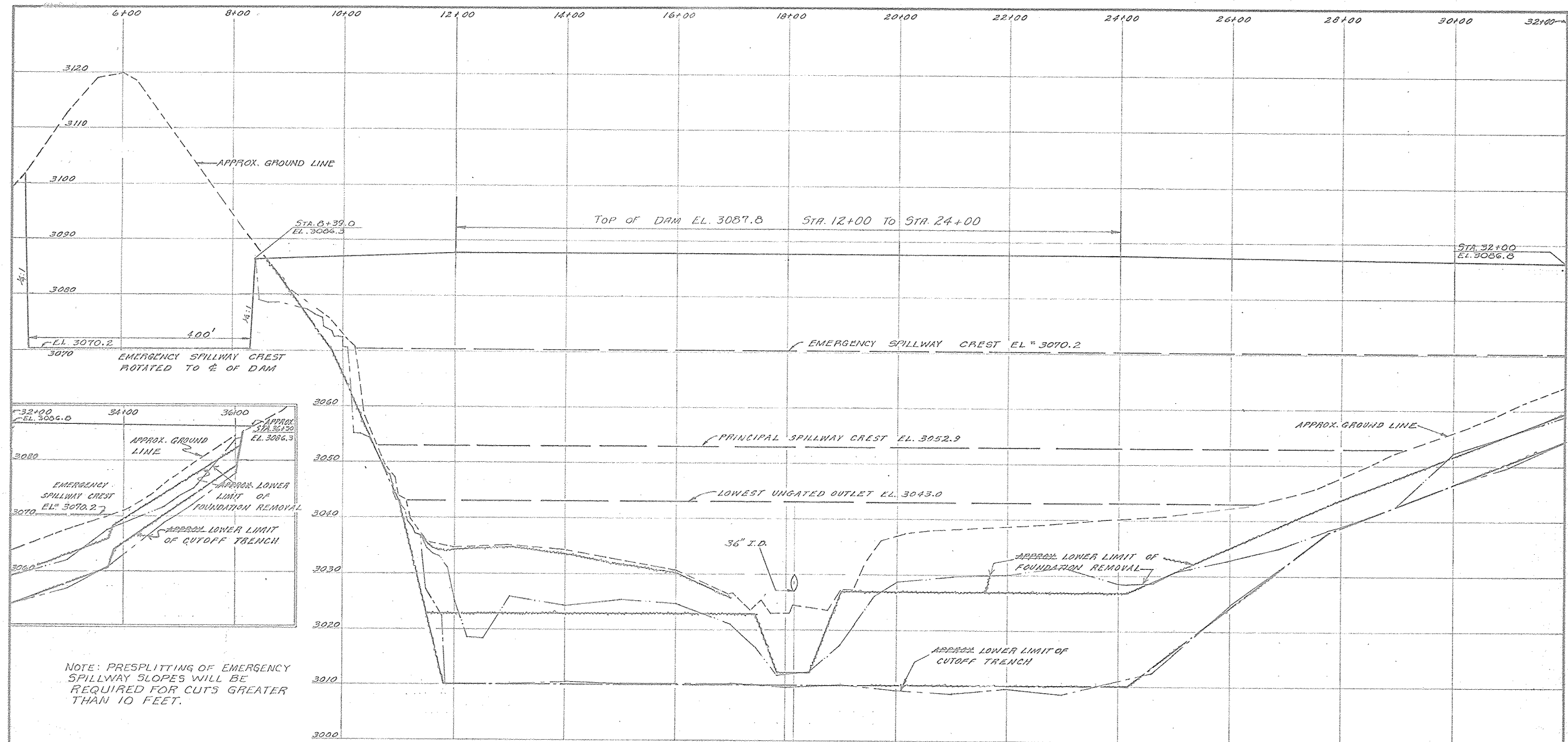
0 50 100 150



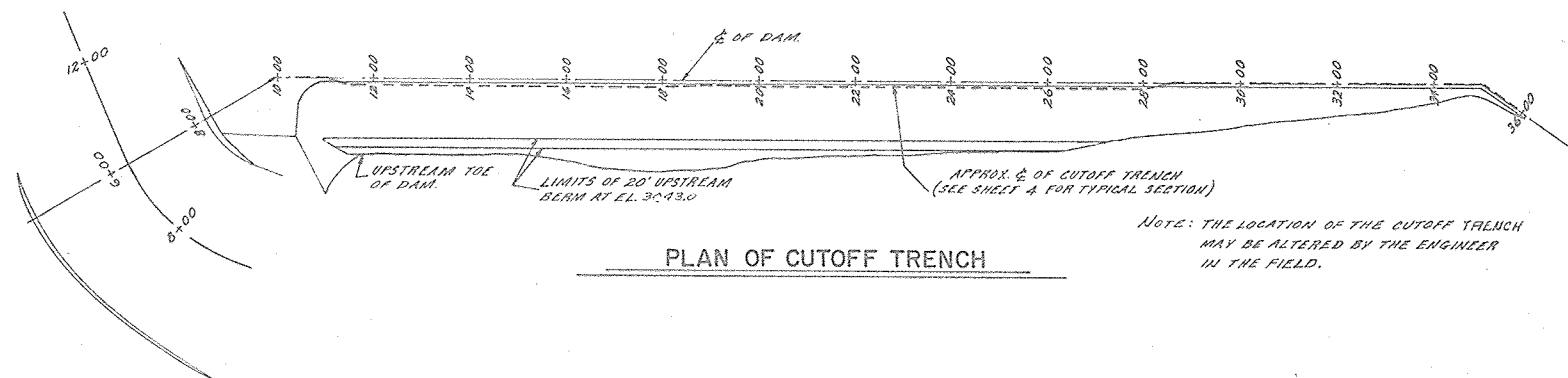
Embankment
 Curve Data
 $\Delta = 35^\circ$
 $D = 70'$
 $R = 81.85'$
 $L = 50'$
 $P.C. = 34+74.19$
 $P.T. = 35+24.19$

AS-BUILT PLANS
 CONSTRUCTION
 COMPLETED 3/27/84

PLAN OF EMBANKMENT AND SPILLWAYS FLOODWATER RETARDING STRUCTURE SITE NO. 6 SANDERSON CANYON WATERSHED IN BREWSTER, PECOS, AND TERRELL COUNTIES TEXAS			
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
Designed by	C.H.S.	Date	2-79
Drawn by	C.A.N.	Date	2-79
Checked by	C.A.N.	Date	2-79
Approved by	D.E.M.	Date	2-79
Title		4-E-36,791	
Sheet		No. 2 of 24	



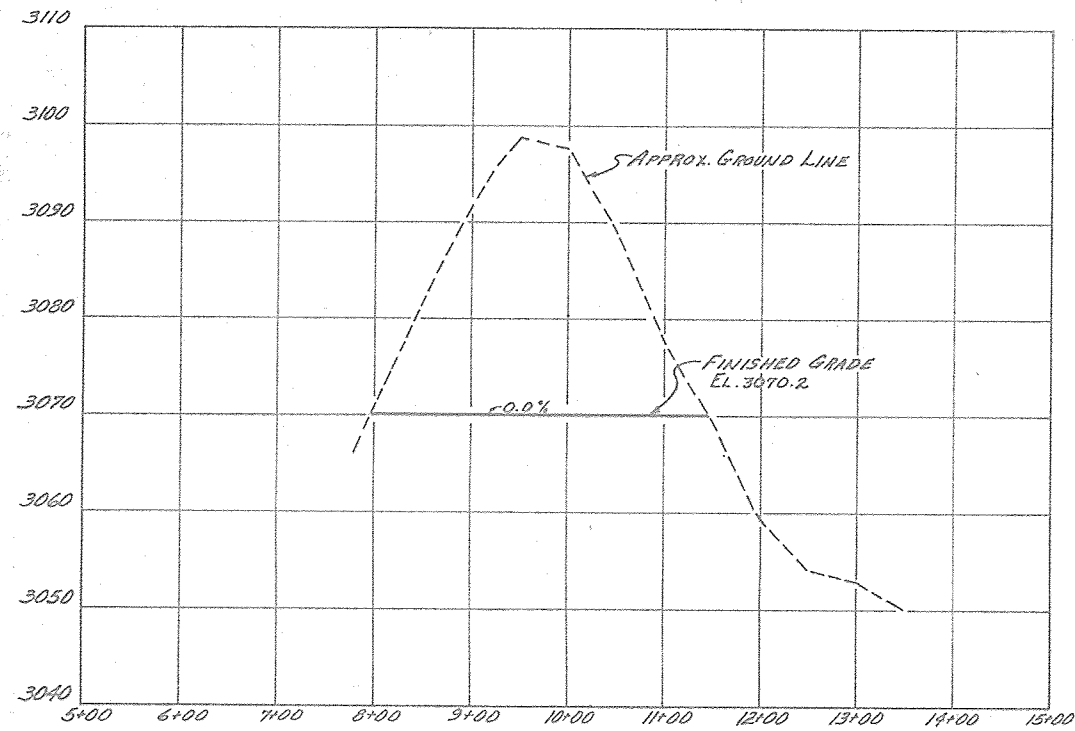
PROFILE ON C OF DAM



PLAN OF CUTOFF TRENCH

AS-BUILT PLANS
CONSTRUCTION
COMPLETED 5/27/84
G.S.

PROFILE ON C OF DAM FLOODWATER RETARDING STRUCTURE SITE NO. 6 SANDERSON CANYON WATERSHED IN BREWSTER, PECOS AND TERRELL COUNTIES, TEXAS			
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
Designed	C.H.S.	Date	2-79
Drawn	C.A.N.	Date	2-79
Traced	C.A.N.	Date	2-79
Checked	D.E.M.	Date	2-79
Approved by State Construction Manager Title State Engineer Date 5/27/84		Drawing No. 4-E-36,791	

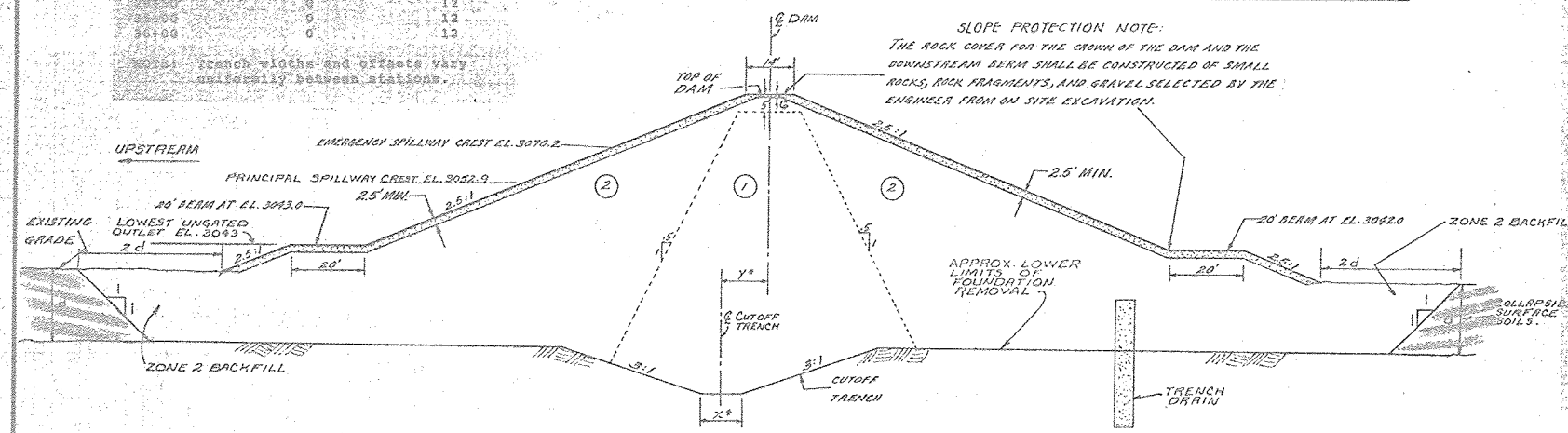


PROFILE ON C OF EMERGENCY SPILLWAY

TABLE 1

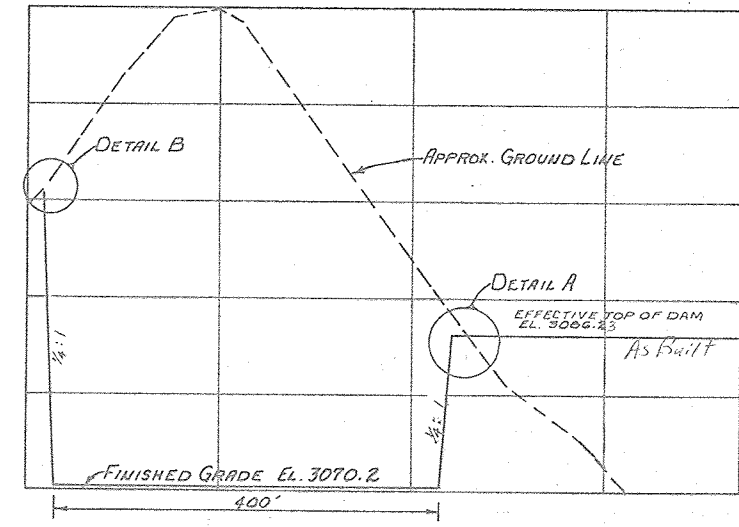
Station	DAM B TO CUTOFF TRENCH	Cutoff Trench Width
5+00	0	12
6+00	0	20
7+00	0	20
8+00	0	20
9+00	13	12
10+00	13	12
11+00	13	12
12+00	13	12
13+00	13	12
14+00	13	12
15+00	0	12
16+00	0	12

NOTE: Trench widths and offsets vary uniformly between stations.

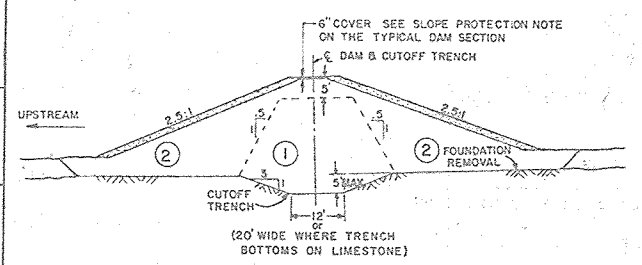
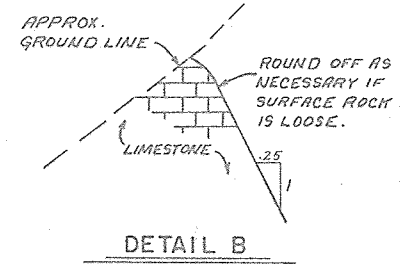
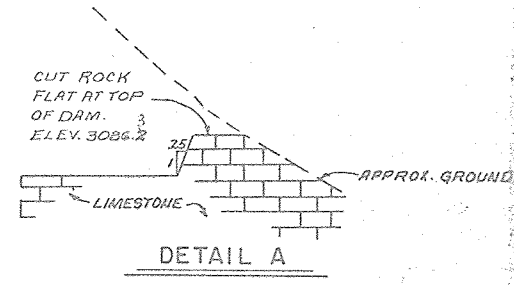


TYPICAL DAM SECTION

* FOR DIMENSIONS SEE TABLE 1



TYPICAL SECTION EMERGENCY SPILLWAY



TYPICAL ABUTMENT SECTION

NOTE: THE INITIAL LAYER OF CORE MATERIAL PLACED AGAINST ROCK ABUTMENTS SHALL BE PLACED AT +3% WET OF OPTIMUM.

MATERIALS PLACEMENT DATA

Bankment Zone	Unified Classification and Type	Tech. Test		Max. Size of Rock Fragments in Fill	Max. Thickness of Layer	Slope	Min. Dry Density of Field Test	Min. Dry Density of Lab. Test	Moisture Limits to Field Test	Moisture Limits to Lab. Test
		Number	Method							
1	CU, clay, sandy clay, gravelly clay	1-698	C	6"	4"	2:1	125	125	15	15
2	SC, clayey sand, gravelly clayey sand	1-698	C	6"	4"	2:1	125	125	15	15
3	SC, clayey sand, gravelly clayey sand	1-698	C	6"	4"	2:1	125	125	15	15
4	SC, clayey sand, gravelly clayey sand	1-698	C	6"	4"	2:1	125	125	15	15
Slope Protection	Limestone rock									

- The zone boundaries shown in the typical section are approximate. They may be varied as determined by the Engineer, to allow the use of all suitable and needed materials from the required excavation.
- 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". Mixing of oversized rock materials from the required excavations to meet the specified gradation will be required. Durable rock and rock fragments (max. dimension 20 in.) from rock excavation and separated from the required excavations, shall be placed in riprap sections and in the plunge basin at the outlet of the principal spillway. No special compaction or moisture control will be required. The rock shall be spread in approximately horizontal layers not more than 3 ft. in thickness. The rock shall be placed so that the completed fill shall have the smaller rock fragments in the inner portion of the riprap sections and the larger rock fragments on the outer slopes. The rock and rock fragments shall be placed in a manner that will produce a stable fill that contains no large unfilled spaces caused by bridging of the larger fragments. (See Construction Specification 23A.)
- Class "C" compaction shall be accomplished by a minimum of 4 complete passes per layer of tamping roller weighing not less than 1200 pounds per foot of roller width at a toying or traveling speed of 2 mph or greater.
- Less gravelly materials shall be used in Zone 1 or Zone 2. Only more gravelly materials shall be used in Zone 2.
- For use in the plunge basin, the riprap shall be placed in a manner that will produce a stable fill that contains no large unfilled spaces caused by bridging of the larger fragments.

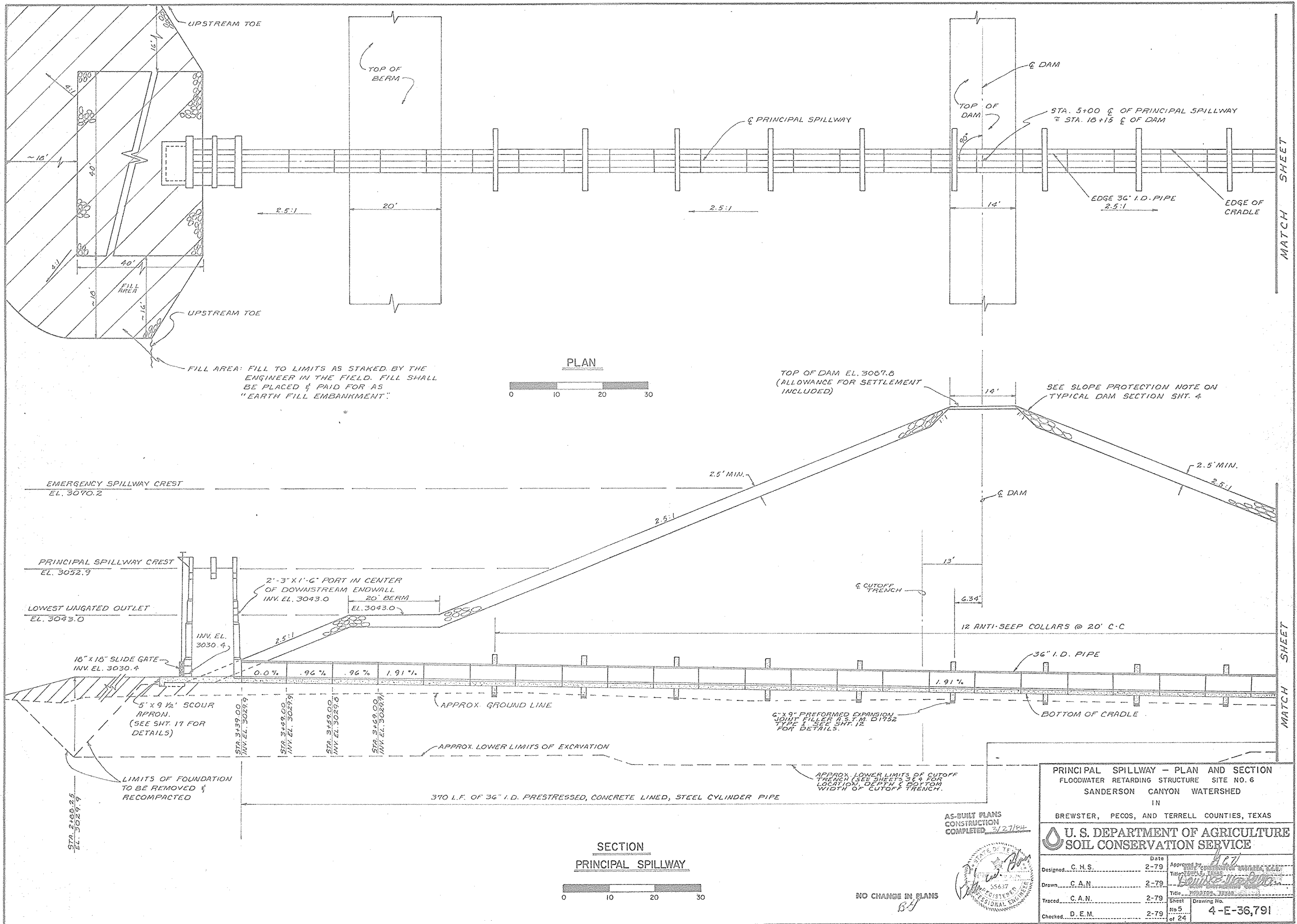
ZONED EMBANKMENT DATA

AS-BUILT PLANS
CONSTRUCTION
COMPLETED 3/27/64
155



PROFILE AND SECTIONS
FLOODWATER RETARDING STRUCTURE SITE NO. 6
SANDERSON CANYON WATERSHED
IN
BREWSTER, PECOS, AND TERRELL COUNTIES TEXAS
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	C.H.S.	Date	2-79	Approved by	407
Drawn	C.A.N.	Date	2-79	Title	David E. McArthur
Traced	C.A.N.	Date	2-79	Title	Assistant Engineer
Checked	D.E.M.	Date	2-79	Sheet	No. 4 of 24
				Drawing No.	4-E-36,791



PRINCIPAL SPILLWAY - PLAN AND SECTION
FLOODWATER RETARDING STRUCTURE SITE NO. 6
SANDERSON CANYON WATERSHED
IN
BREWSTER, PECOS, AND TERRELL COUNTIES, TEXAS

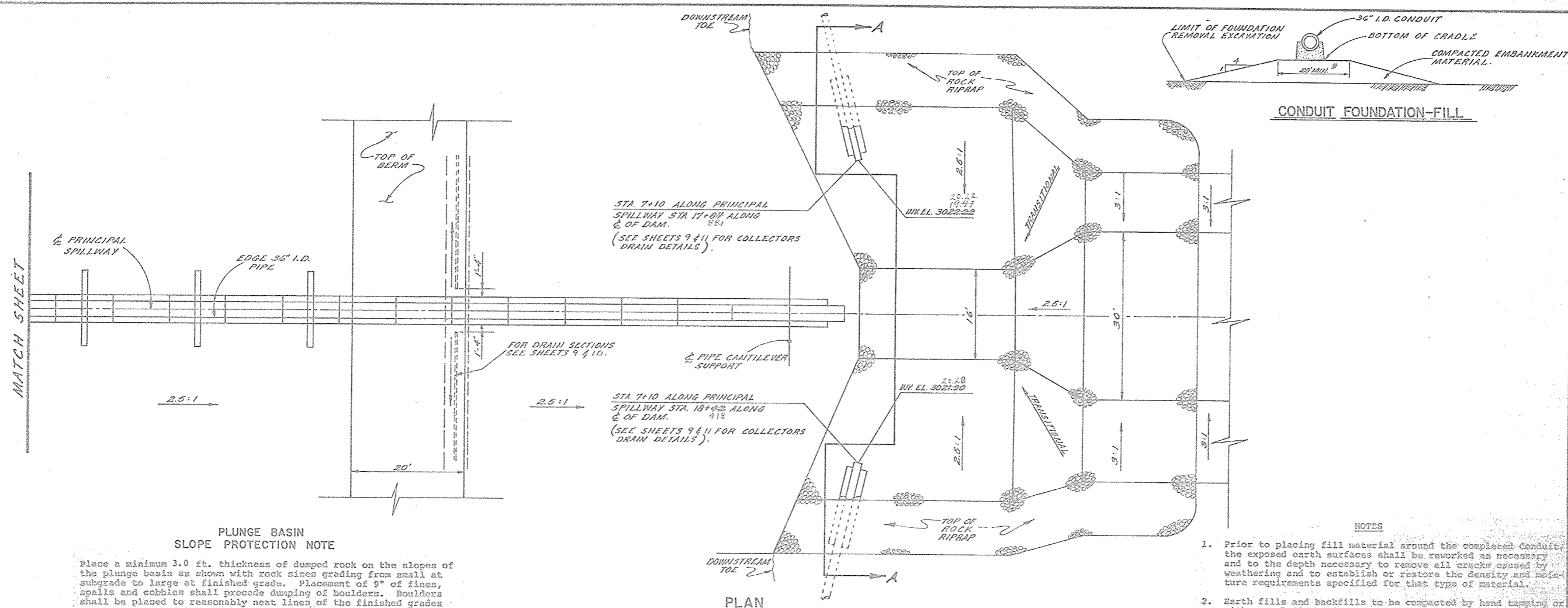
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	C. H. S.	Date	2-79	Approved	[Signature]
Drawn	C. A. N.	Date	2-79	Checked	[Signature]
Traced	C. A. N.	Date	2-79	Sheet	5 of 24
Checked	D. E. M.	Date	2-79	Drawing No.	4-E-36,791

AS-BUILT PLANS
CONSTRUCTION
COMPLETED 3/27/84



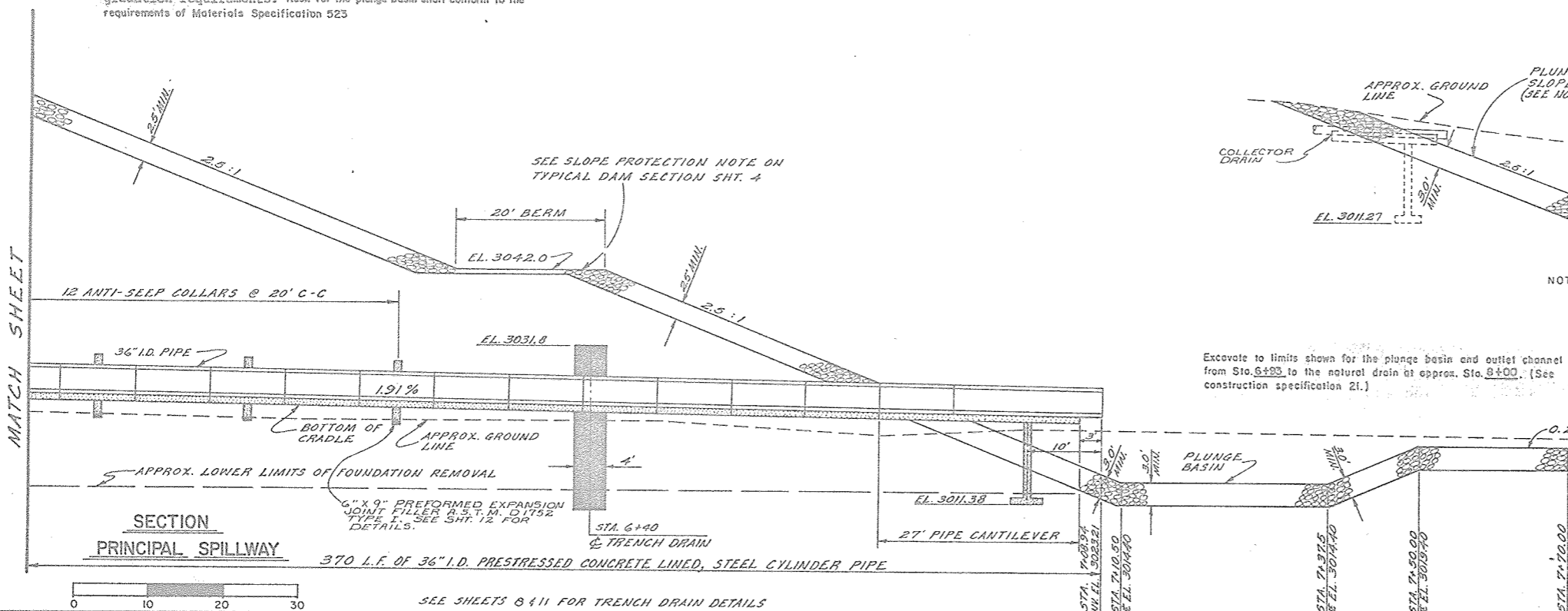
NO CHANGE IN PLANS
B.J.



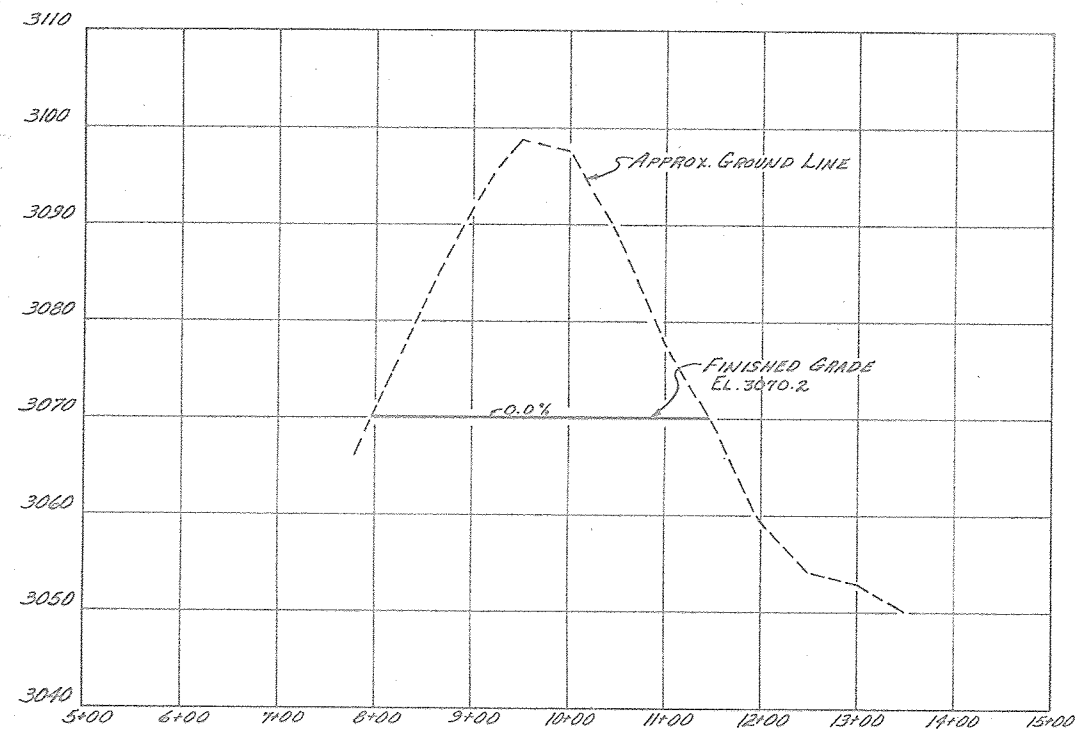
PLUNGE BASIN SLOPE PROTECTION NOTE

Place a minimum 3.0 ft. thickness of dumped rock on the slopes of the plunge basin as shown with rock sizes grading from small at subgrade to large at finished grade. Placement of 9" of fines, spalls and cobbles shall precede dumping of boulders. Boulders shall be placed to reasonably neat lines of the finished grades as shown in the drawings. Rock against the Principal Spillway shall be carefully placed to avoid damaging pipe and other structural works. Sources of rock materials shall be durable rock separated from required site excavations. Rock fill for plunge basin shall be measured and paid for as "Earth Fill, Embankment." (See Construction Specification 23A). See Sheet 4 for rock gradation requirements. Rock for the plunge basin shall conform to the requirements of Materials Specification 523.

- ## NOTES
1. 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.
 2. Earth fills and backfills to be compacted by hand tamping or with manual 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.
 3. Minimum width required to facilitate construction of conduit.



PRINCIPAL SPILLWAY - PLAN AND SECTION FLOODWATER RETARDING STRUCTURE SITE NO. 6 SANDERSON CANYON WATERSHED IN BREWSTER, PECOS, AND TERRELL COUNTIES TEXAS			
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
Designed by	C.H.S.	Date	2-79
Drawn by	J.E.G.	Date	2-79
Traced by	J.E.G.	Date	2-79
Checked by	D.E.M.	Date	2-79
Approved by Title Date		Approved by Title Date	
Sheet No. 6 of 24		Drawing No. 4-E-36,791	

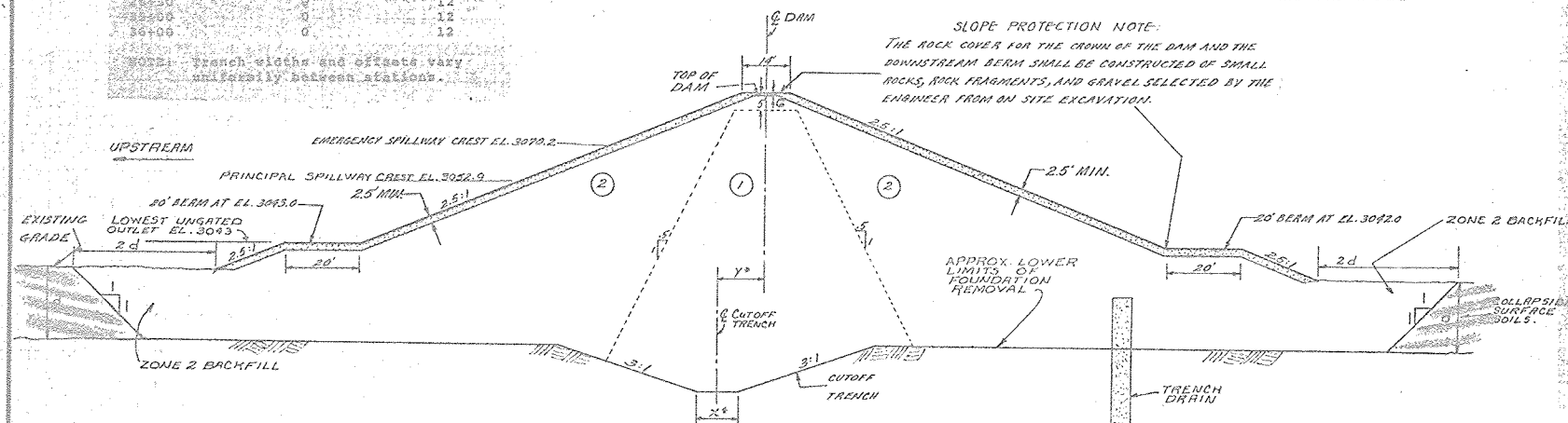


PROFILE ON C. OF EMERGENCY SPILLWAY

TABLE 1

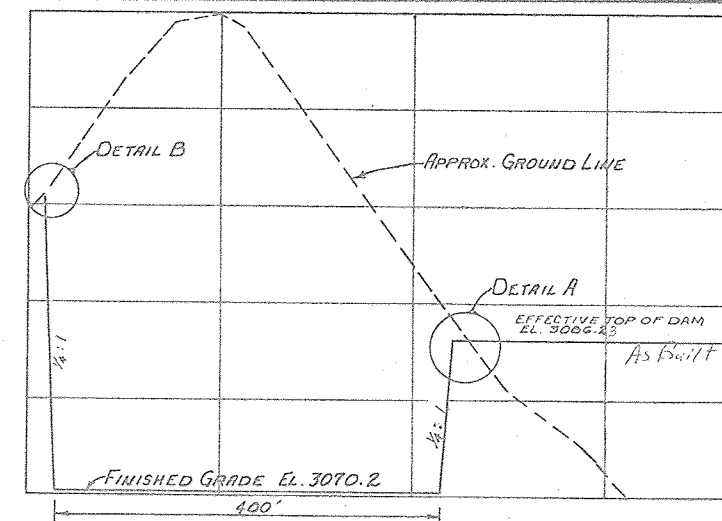
Station	Dam to Cutoff Trench	Cutoff Trench Width
5+00	0	20
6+00	0	20
7+00	0	20
8+00	0	20
9+00	0	20
10+00	0	20
11+00	0	20
12+00	0	20
13+00	0	20
14+00	0	20
15+00	0	20

NOTE: Trench widths and offsets vary uniformly between stations.

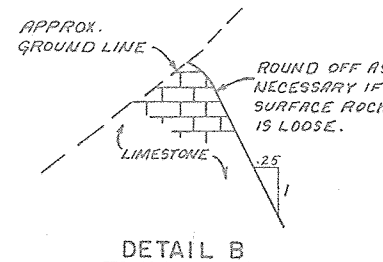
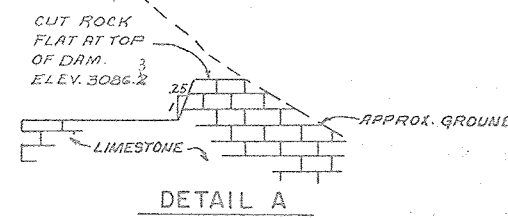


TYPICAL DAM SECTION

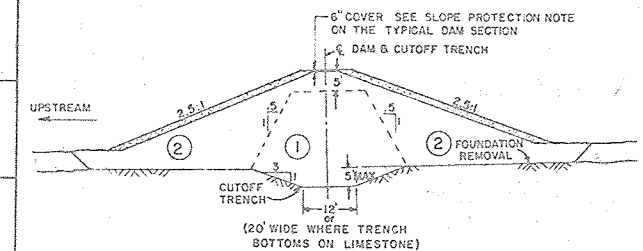
* FOR DIMENSIONS SEE TABLE 1



TYPICAL SECTION
EMERGENCY SPILLWAY



DETAIL B



TYPICAL ABUTMENT SECTION

NOTE: THE INITIAL LAYER OF CORE MATERIAL PLACED AGAINST ROCK ABUTMENTS SHALL BE PLACED AT + 3% WET OF OPTIMUM.

MATERIALS PLACEMENT DATA

Embankment Zone	Unified Classification and Type	ASTM Test		Max. Allowable Size Side	Max. Undisturbed Layer Thickness	Specified Compaction Classification	Min. Dry Density Percent of Field Test	Moisture Limit to Field Test	Moisture Limit to Field Test
		Number	Method						
1	CH, clay, sandy clay, gravelly clay	0-698	C	5"	3"	A	95	1.0	1.0
2	SC, clayey sand, gravelly sand	0-698	C	5"	3"	A	95	1.0	1.0
3	SC, clayey sand, gravelly sand	0-698	C	5"	3"	A	95	1.0	1.0
4	SC, clayey sand, gravelly sand	0-698	C	5"	3"	A	95	1.0	1.0
5	SC, clayey sand, gravelly sand	0-698	C	5"	3"	A	95	1.0	1.0
6	SC, clayey sand, gravelly sand	0-698	C	5"	3"	A	95	1.0	1.0
7	SC, clayey sand, gravelly sand	0-698	C	5"	3"	A	95	1.0	1.0
8	SC, clayey sand, gravelly sand	0-698	C	5"	3"	A	95	1.0	1.0
9	SC, clayey sand, gravelly sand	0-698	C	5"	3"	A	95	1.0	1.0
10	SC, clayey sand, gravelly sand	0-698	C	5"	3"	A	95	1.0	1.0

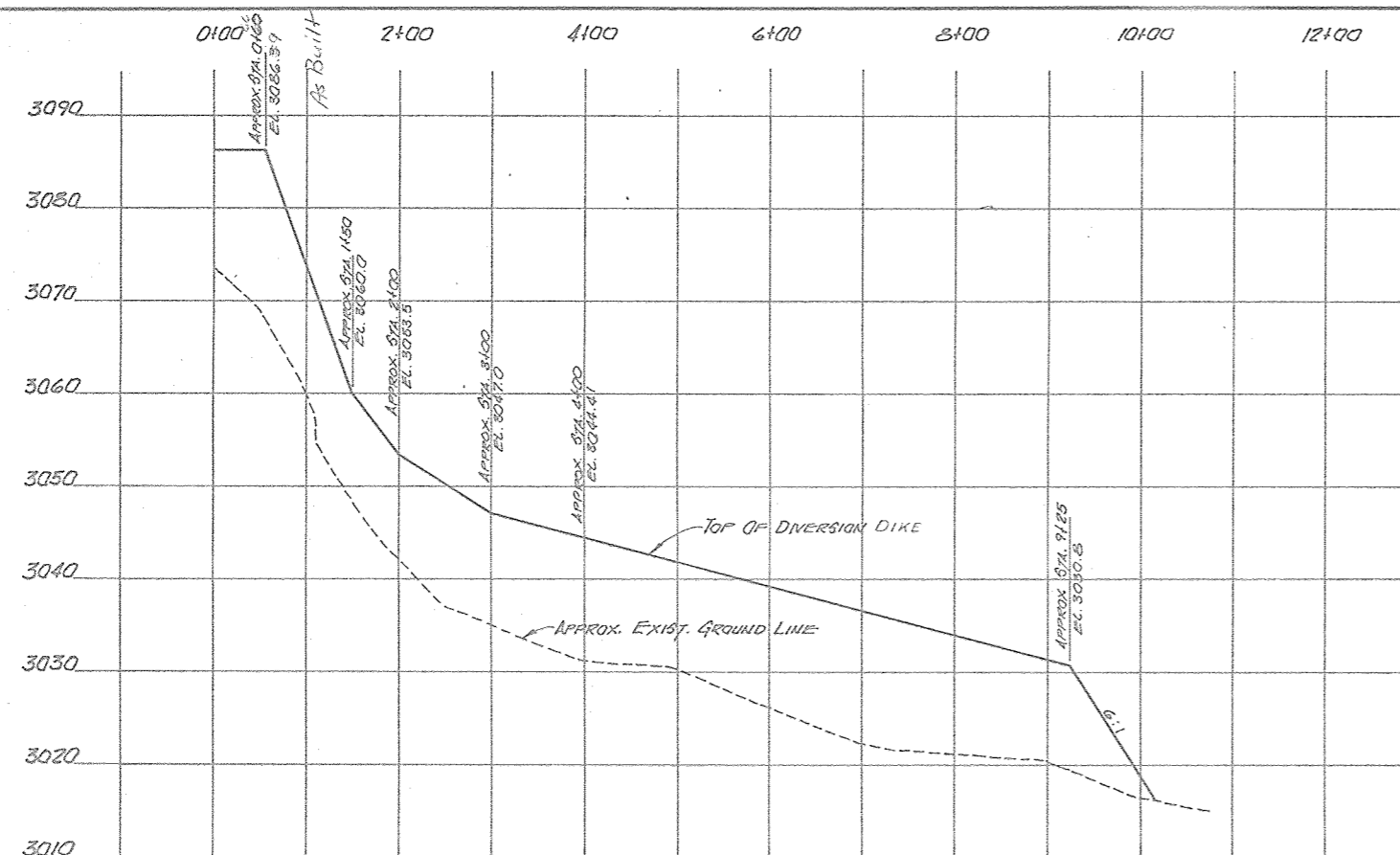
- The zone boundaries shown in the typical section are approximate. They may be varied as permitted by the Engineer, to allow the use of all suitable and needed materials from the required excavations.
- Rock shall be reasonably well graded from a maximum particle size of 36" down to the 6" size with not less than 50% by weight larger than 12". Sizing of oversized rock materials from the required excavations to meet the specified gradation will be required.
- Durable rock and rock fragments (max. dimension 30 in.) from rock excavation and separated from other required excavations, shall be placed in riprap sections and in the plans begin at the cutoff of the principal spillway. No special construction or moisture control will be required. The rock shall be spread in approximately horizontal layers not more than 3 ft. in thickness. The rock shall be placed so that the completed fill shall have the smaller rock fragments in the inner portion of the riprap sections and the larger rock fragments on the outer slopes. The rock and rock fragments shall be placed in a manner that will produce a stable fill that contains no large unfilled spaces caused by bridging of the larger fractions. (See Construction Specification 33A.)
- Class "C" compaction shall be accomplished by a minimum of 4 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.
- Less gravelly materials shall be used in zone 1 or zone 2. Only more gravelly materials shall be used in zone 2.
- For use in construction of the dam, the materials shall be placed in a manner that will produce a stable fill that contains no large unfilled spaces caused by bridging of the larger fractions.

ZONED EMBANKMENT DATA

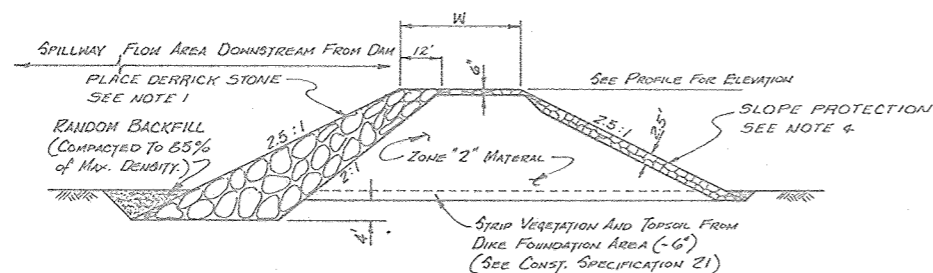
AS-BUILT PLANS
CONSTRUCTION
COMPLETED 3/27/84
BY



PROFILE AND SECTIONS FLOODWATER RETARDING STRUCTURE SITE NO. 6 SANDERSON CANYON WATERSHED IN BREWSTER, PECOS, AND TERRELL COUNTIES TEXAS U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
Designed	C.H.S.	Date	2-79
Drawn	C.A.N.	Date	2-79
Traced	C.A.N.	Date	2-79
Checked	D.E.M.	Date	2-79
Approved by: <i>[Signature]</i> Title: <i>[Title]</i>		Drawing No. 4-E-36,791	

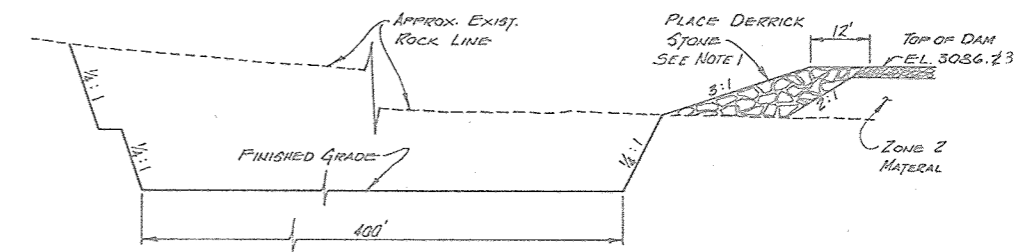


PROFILE ON C. OF DIVERSION DIKE



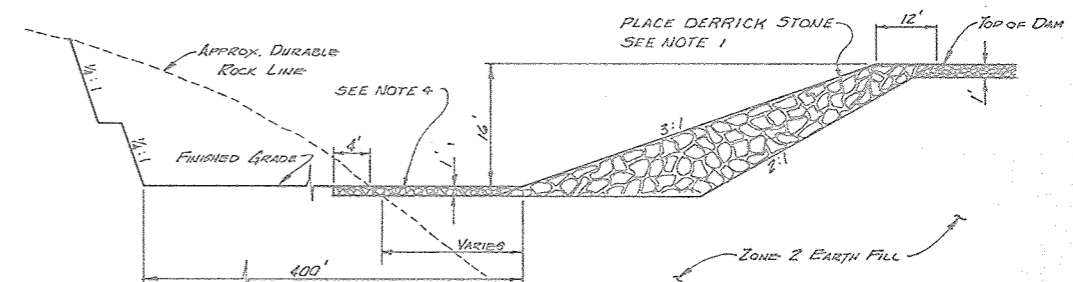
TYPICAL SECTION DIVERSION DIKE

FROM STA. 0+60 TO STA. 3+00 W=50'
FROM STA. 3+00 TO STA. 4+00 TRANSITION W=From 50' to 12'
FROM STA. 4+00 TO STA. 9+25 W=12'



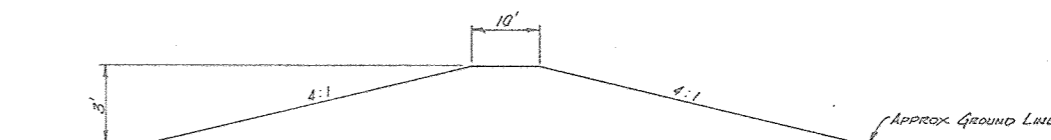
TYPICAL SECTION - EMERGENCY SPILLWAY

APPROX. STA. 10+50 TO APPROX. STA. 11+70
& APPROX. STA. 7+20 TO APPROX. STA. 8+80



TYPICAL SECTION - EMERGENCY SPILLWAY

APPROX. STA. 6+50 TO APPROX. STA. 7+20



TYPICAL SECTION - DIVERSION TERRACE

NOTE: DIVERSION TERRACE SHALL BE PLACED AND PAID FOR AS "EARTH FILL EMBANKMENT" (SEE CONST. SPEC. 23A.)

NOTES:

- The rock used for the derrick stone shall be harvested or produced stone that shall have individual 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. Derrick stone shall be placed and paid for as "Earth Fill, Embankment", (see Construction Specification 23A). Derrick stone shall also conform to the requirements of materials Spec. 523.
- Material forming dikes and transition sections shall be placed and paid for as "Earth Fill, Embankment", (see Construction Specification 23A).
- Where durable rock is not exposed at grade, the emergency spillway shall be overexcavated approximately 1.0 ft. and backfilled with rock. See note 4 for gradation.
- Rock shall be reasonably well graded from a maximum particle size of 12" down to the 3" size with not more than 50% by weight larger than 6". Sizing of oversized rock from required excavation to meet the specified gradation will be required. Rock shall be placed and paid for as "Earth Fill, Embankment", (see Construction Specification 23A).

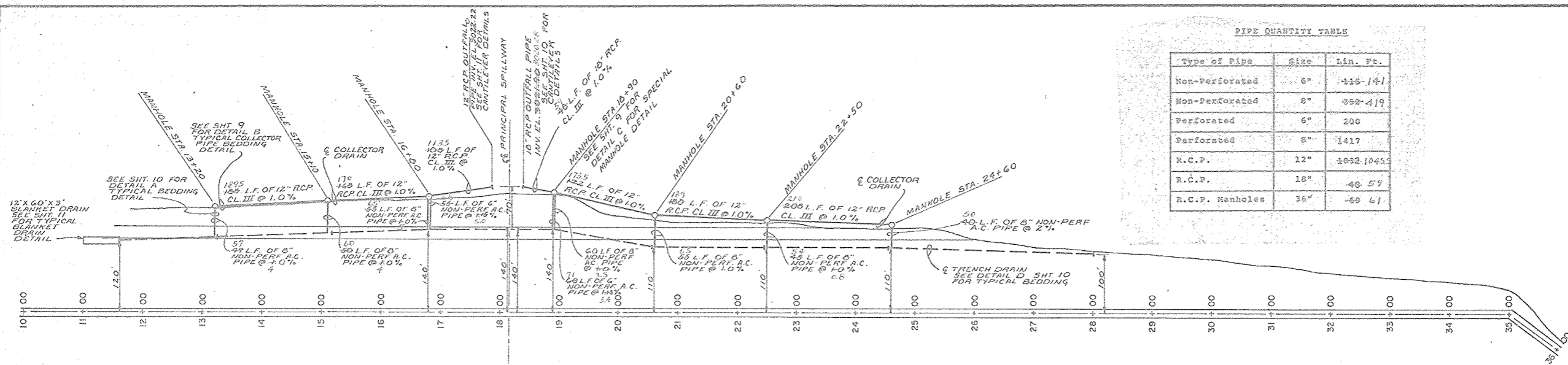
AS-BUILT PLANS
CONSTRUCTION
COMPLETED 3/27/84



PLAN AND PROFILE OF C. OF DIVERSION STRUCTURE
FLOODWATER RETARDING STRUCTURE SITE NO. 6
SANDERSON CANYON WATERSHED
IN
BREWSTER, PECOS, AND TERRELL COUNTIES TEXAS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	C.H.S.	Date	2-79	Approved by	hcd
Drawn	C.A.N.	Date	2-79	Title	ENGINEER
Traced	D.O.W.	Date	2-79	Title	REGISTERED
Checked	D.E.M.	Date	2-79	Sheet	4-E-36,791

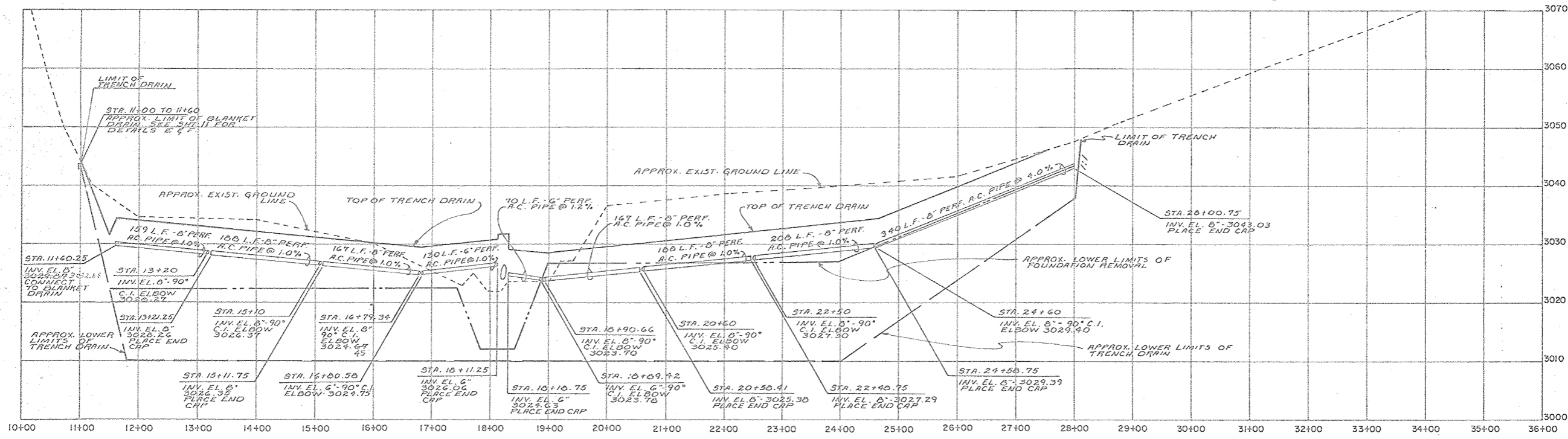


PLAN OF TRENCH DRAIN

NOTE:
FOR INVERT ELEVATIONS
OF ALL MANHOLES AND
PIPES ENTERING
MANHOLES SEE TABLE 2
ON SHT. 9

PIPE QUANTITY TABLE

Type of Pipe	Size	Lin. Ft.
Non-Perforated	6"	115-141
Non-Perforated	8"	352-419
Perforated	6"	200
Perforated	8"	1417
R.C.P.	12"	1032-1045
R.C.P.	18"	40-59
R.C.P. Manholes	36"	40-61



PROFILE ON C OF TRENCH DRAIN

AS-BUILT PLANS
CONSTRUCTION
COMPLETED 3/27/84
68

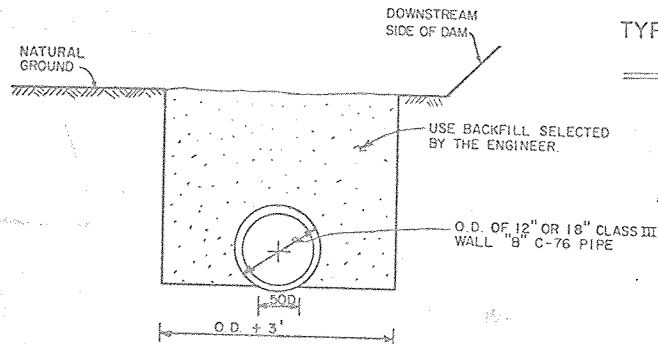
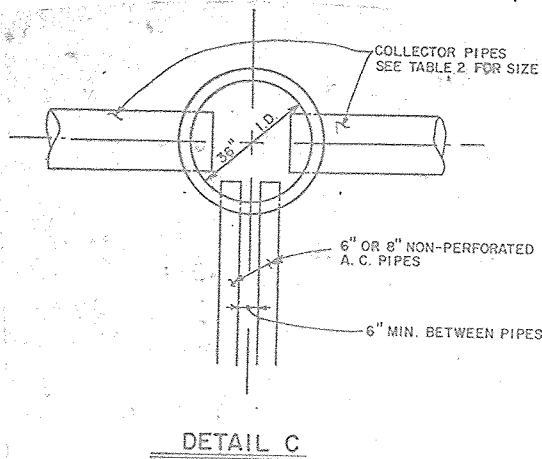
EMBANKMENT FOUNDATION DRAIN
FLOODWATER RETARDING STRUCTURE SITE NO. 6
SANDERSON CANYON WATERSHED
IN
BREWSTER, PECOS AND TERRELL COUNTIES, TEXAS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

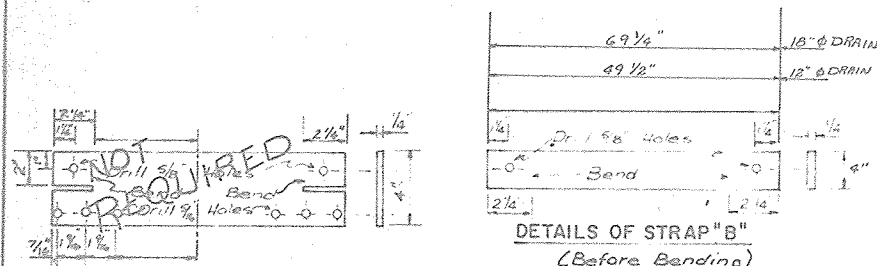
Designed: C.H.S. Date: 2-79
Drawn: C.A.N. Date: 2-79
Traced: C.A.N. Date: 2-79
Checked: D.E.M. Date: 2-79

Approved by: [Signature] Title: [Title]
[Signature] Title: [Title]
[Signature] Title: [Title]

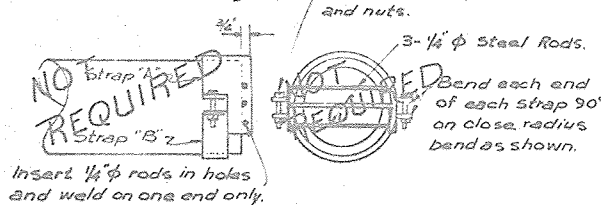
Drawing No. 4-E-36,791
No. 8 of 24



Back filling of the collector drain trench and around each manhole shall be accomplished in a manner to produce densities of each layer equivalent to the densities of the foundation materials prior to excavation of the collector drain trench. The maximum uncompacted layer thickness shall not exceed 12 inches. Backfill shall be placed in a moist condition, and shall contain no particle size greater than 6 inches.



DETAILS OF STRAP "A" (Before Bending)

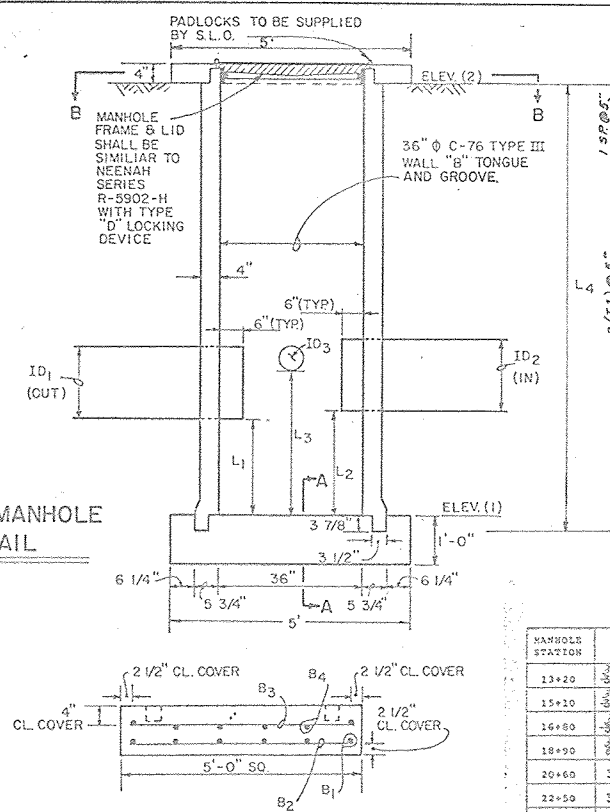


SIDE ELEVATION END ELEVATION

Note: Bend Straps A and B on a radius $\frac{1}{16}$ 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: (See construction specification 81)

RODENT GUARD DETAILS

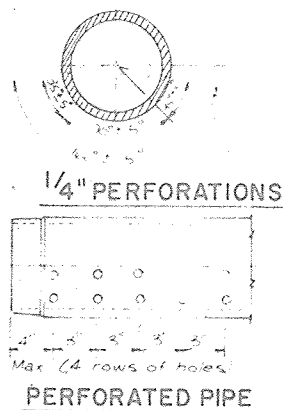
TYPICAL MANHOLE DETAIL



SECTION A-A

SECTION C-C

RODENT GUARD DETAIL



PERFORATED PIPE

SECTION B-B

TABLE 2

MANHOLE STATION	ELEV. (1)	ELEV. (2)	L ₁ Ft.	L ₂ Ft.	L ₃ Ft.	L ₄ Ft.	ID ₁ In.	ID ₂ In.	ID ₃ In.
13+20	3024.02	3024.02	1.59	---	2.48	6	12	---	8
15+10	3022.82	3022.82	2.19	2.19	3.05	6	12	12	8
16+80	3018.50	3018.50	1.99	1.99	2.80	6	12	12	8
18+90	3019.22	3019.22	1.57	1.57	2.45	6	12	12	8
20+60	3021.82	3021.82	2.31	2.31	3.03	12	12	12	8
22+50	3024.82	3024.82	1.21	1.21	2.03	12	12	12	8
24+60	3026.02	3026.02	1.31	---	1.78	12	12	---	8

MANHOLE SLAB QUANTITIES

BAR NO.	SIZE	QUANTITY	LENGTH	TYPE	TOTAL LENGTH
T ₁	4	8	4'-7"	1	36'-8"
T ₂	4	20 3/2	0'-6"	1	12'-0"
B ₁	4	7 6	4'-7"	1	32'-3" 27'-4"
B ₂	4	7 6	4'-7"	1	32'-3" 27'-4"
B ₃	4	7 6	4'-7"	1	32'-3" 27'-4"
B ₄	4	7 6	4'-7"	1	32'-3" 27'-4"
Total steel size No. 4 in lin. ft.					175'-0" 142'-8"
Total steel weight per manhole in lb.					1367
Total steel for 7 manholes in lb.					9569 1b.
Total concrete top slab in cu. yd.					818-3 76 c.c.
Total concrete bottom slab in cu. yd.					28 c.y.
Total concrete per manhole in cu. yd.					.93 c.y.
Total concrete for 7 manholes in cu. yd.					6.51 c.y.

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.

DETAILS-PIPE FITTINGS

(Other than straight Couplings)

NOTES:

- All non-perforated A.C. pipe to collector drain manholes shall be encased in filter material for that portion under the dam embankment.
- The quality of materials and construction for drain fill shall comply with the requirements of Construction Specification 24 and Material Specification 521.
- Rodent guards shall be installed on each A.C. pipe and concrete culvert pipe outletting from the trench drain or collector drain.
- All Asbestos Cement Pipe and couplings shall be Class 100 pressure pipe and shall conform to the requirements of Material Specification 545.
- All Reinforced Concrete Culvert Pipe shall be Class III, Type C-76, tongue and groove with Wall B unless otherwise noted. This includes those used for manholes.
- An access trench shall be required in the construction of the trench drain. This access trench shall have a 1:1 side slope with a minimum bottom width of 25 feet. (See Construction Specification 21)
- The trench drain shall be excavated as shown on the typical section and shall have vertical sides and a 4.0 foot bottom width. (See Construction Specification 24)
- Backfill of the access trench and fill adjacent to or above the top of the trench drain shall be relatively pervious on-site material, as selected by the Engineer. The Engineer may require stockpiling of these materials. The fill shall be placed and paid for as, "Earth Fill, Embankment."
- The drain filter material shall comply with the gradation requirements for one of the following:
 - ASTM, C-33, coarse concrete aggregate Size No. 7.
 - ASTM, C-33, coarse concrete aggregate Size No. 57.
 - ASTM, C-33, coarse concrete aggregate Size No. 67.
 Or any other aggregate that will grade within the limits shown in Table I.
- Drain filter material shall not be dropped more than 5 feet vertically unless a tremie or other equivalent means is used to prevent segregation.

TABLE I

Sieve Size	Percent Finer
1-1/2"	100
1"	95 - 100
1/2"	25 - 100
3/8"	20 - 75
4	0 - 25
8	0 - 10
16	0 - 5
200	0 - 5

The manholes shall be factory fabricated with pipe holes set to the elevation shown in Table 2. The total length of each manhole shall equal the length shown in Table 2. Once the collector pipes and trench drain pipe have been set to the prescribed elevation the void between the manhole side-wall and the O.D. of pipe shall be mortared.

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 23.

STRAIGHT TYPE I

BAR TYPE

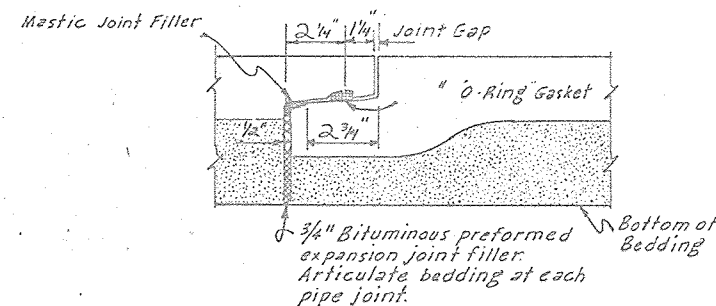
AS-BUILT PLANS
CONSTRUCTION
COMPLETED 3/27/84
BY

EMBANKMENT FOUNDATION DRAIN
FLOODWATER RETARDING STRUCTURE SITE NO. 6
SANDERSON CANYON WATERSHED
IN
BREWSTER, PECOS, AND TERRELL COUNTIES TEXAS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

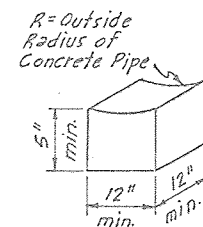
C.H.S.	2-79	STATE CONSERVATION ENGINEER, TEXAS
C.A.N.	2-79	TEMPLE, TEXAS
C.A.N.	2-79	HOUSTON, TEXAS
D.E.M.	2-79	HOUSTON, TEXAS

4-E-36,791



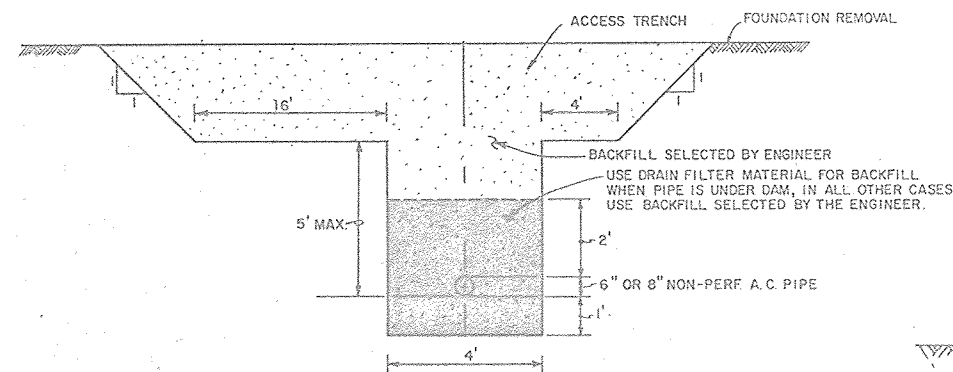
Upstream
PIPE JOINT
PIPE JOINT DETAILS
Downstream

The pipe shall be drawn together so that the maximum joint gap does not exceed $\frac{3}{16}$ " 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 $\frac{3}{16}$ ".

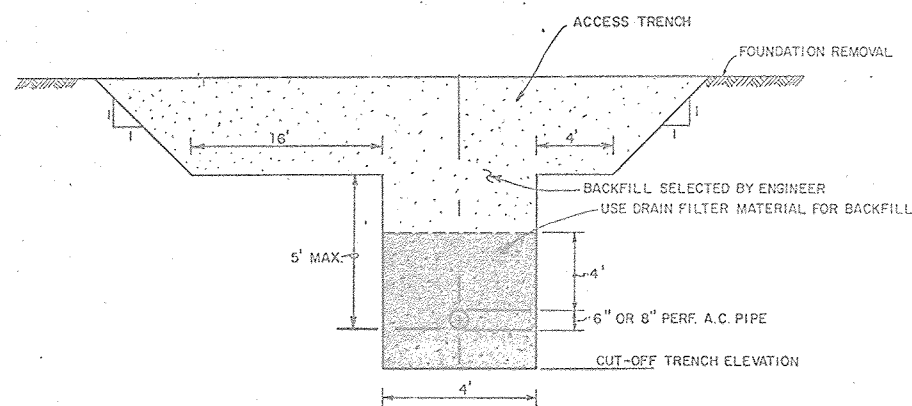


Use 2 or more blocks per joint of pipe. Opposed concrete wedge blocks are an acceptable alternate to the above support block.

SUPPORT BLOCK

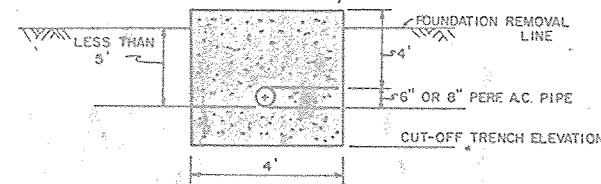


TYPICAL BEDDING DETAIL
DETAIL A



TYPICAL TRENCH DRAIN DETAIL
DETAIL D

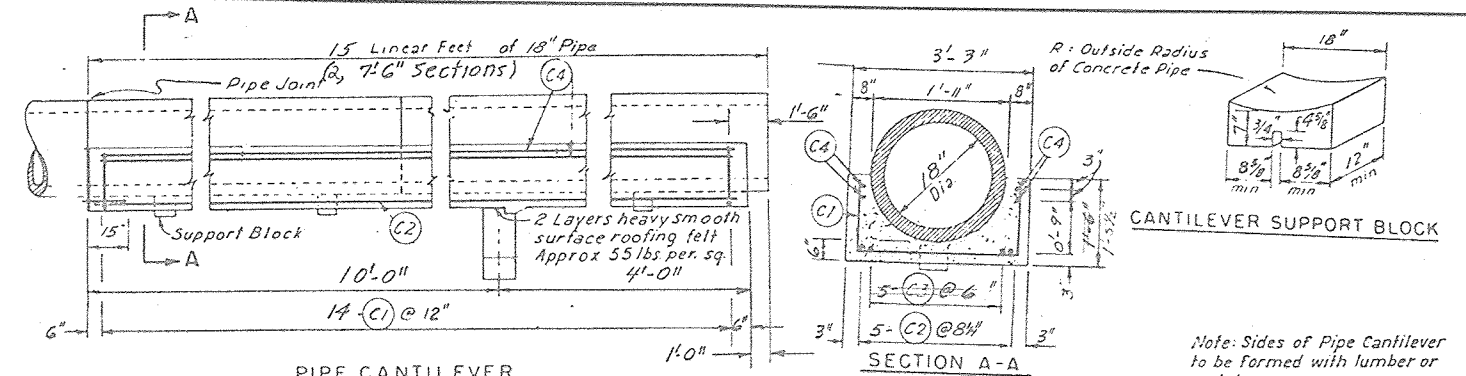
(DISTANCE FROM FOUNDATION REMOVAL LINE TO INVERT OF DRAIN PIPE MORE THAN 5')



TRENCH DRAIN DETAIL

(DISTANCE FROM FOUNDATION REMOVAL LINE TO INVERT OF DRAIN PIPE LESS THAN 5')

ALT. DETAIL D

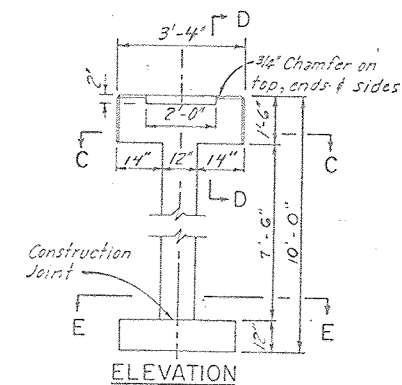


PIPE CANTILEVER

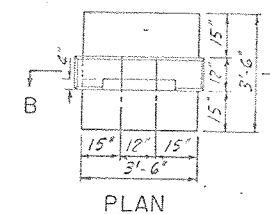
SECTION A-A

CANTILEVER SUPPORT BLOCK

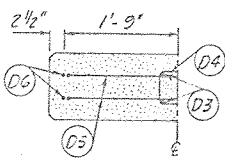
Note: Sides of Pipe Cantilever to be formed with lumber or metal.



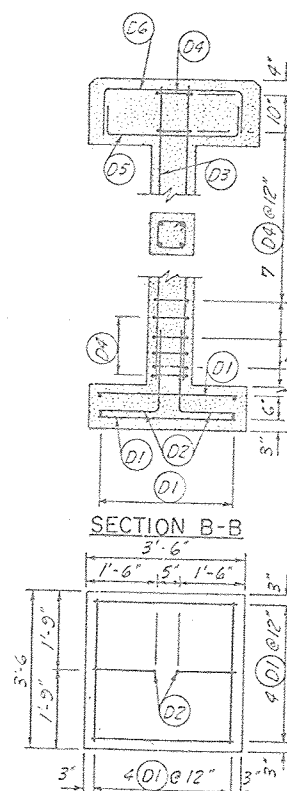
ELEVATION



PLAN

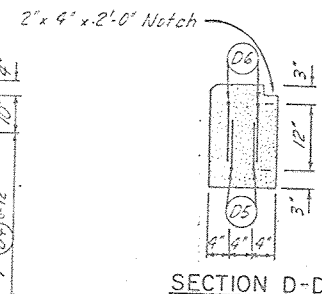


SECTION C-C

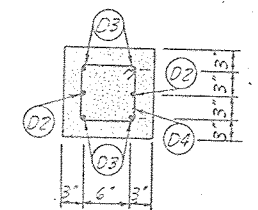


SECTION B-B

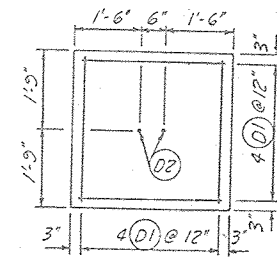
BASE BOTTOM STEEL



SECTION D-D



SECTION E-E



BASE TOP STEEL

PIPE CANTILEVER SUPPORT

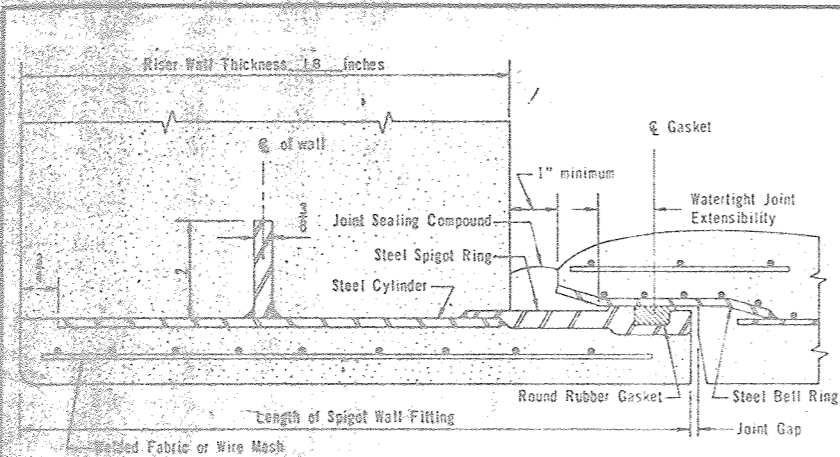
Bar No.	Location	Qty.	Lgth.	Total Length	Size	Type	A	B	C	D	E	F	G	H	J	O
C 1	Pipe Cantilever	14	4'-11"	68'-10"	4	S10			1-1	2-7	1-1					
C 2	"	5	13'-6"	67'-6"	5	S10										
C 4	"	4	13'-6"	54'-0"	7	S10										
Total Steel in Pipe Cantilever (Size 4) = 68'-10" = 45.98 lbs.																
Total Steel in Pipe Cantilever (Size 5) = 67'-6" = 70.40 lbs.																
Total Steel in Pipe Cantilever (Size 7) = 54'-0" = 110.38 lbs.																
Total Steel = 226.76 lbs.																
Total Reinforced Concrete in Pipe Cantilever = 1.781 cu. yds.																
D-1	Cantilever Support	16	3'-1"	49'-4"	4	S10			2-6	1-3						
D 2	"	2	3'-9"	7'-6"	6	S10										
D 3	"	4	8'-9"	35'-0"	6	S10										
D 4	"	13	3'-2"	41'-2"	3	T-1	0-4	0-7 1/2	0-7 1/2	0-7 1/2	0-4					
D 5	"	2	4'-11"	9'-10"	4	S10			2	0-9	3-5					
D 6	"	2	5'-7"	11'-2"	6	S10			1-0	3-7				1-0		
Total Steel in Pipe Cantilever Support (Size No. 3) = 41'-2" = 15.48 lbs.																
Total Steel in Pipe Cantilever Support (Size No. 4) = 59'-2" = 39.52 lbs.																
Total Steel in Pipe Cantilever Support (Size No. 6) = 53'-8" = 60.61 lbs.																
Total Steel = 135.61 lbs.																
Total Reinforced Concrete in Pipe Cantilever Support = 0.92 cu. yds.																

Note: Pipe supplied will be manufactured in accordance with the standard for ASTM C-76 Class III, Wall B, having a D-load capacity of not less than 2000 lbs. at the .01" crack. Elliptical reinforcement will not be permitted.

Pipe supplied with joint dimensions different from those shown, shall be approved by the Engineer.

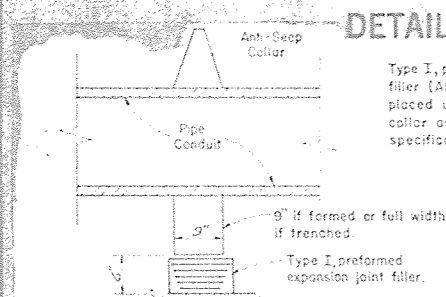
AS-BUILT PLANS
CONSTRUCTION
COMPLETED 3/27/84

EMBANKMENT FOUNDATION DRAIN FLOODWATER RETARDING STRUCTURE SITE NO. 6 SANDERSON CANYON WATERSHED IN BREWSTER, PECOS, AND TERRELL COUNTIES TEXAS			
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
Designed by	C.H.S.	Date	2-79
Drawn by	C.A.N.	Date	2-79
Traced by	C.A.N.	Date	2-79
Checked by	D.E.M.	Date	2-79
Approved by	APV	Date	2-79
Title: EMBANKMENT FOUNDATION DRAIN Drawing No. 4-E-36,791			

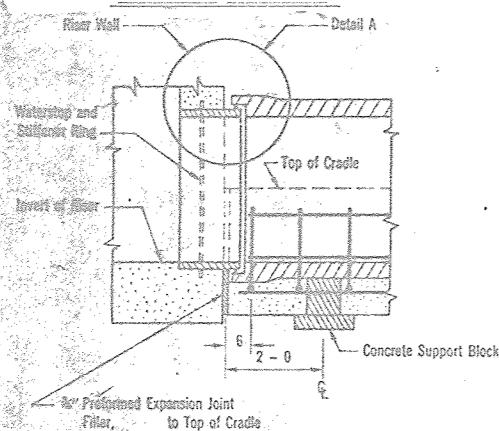


DETAIL A

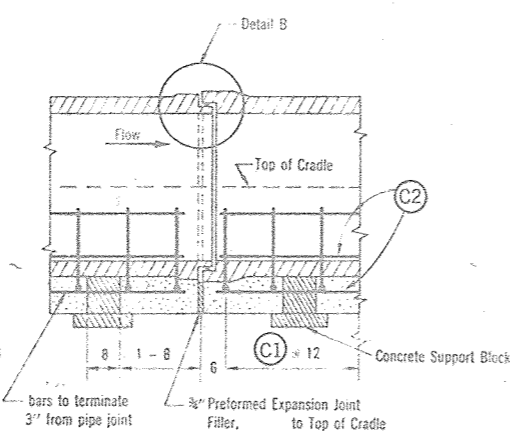
Type I, preformed expansion joint filler (ASTM D-1752) shall be placed under each anti-seep collar as shown (See materials specification 535).



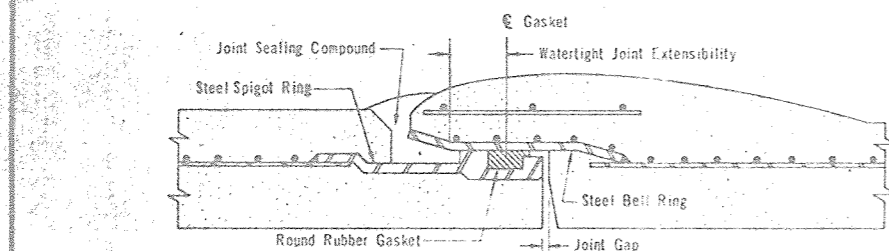
PREFORMED EXPANSION JOINT FILLER DETAIL



DETAIL OF SPIGOT WALL FITTING



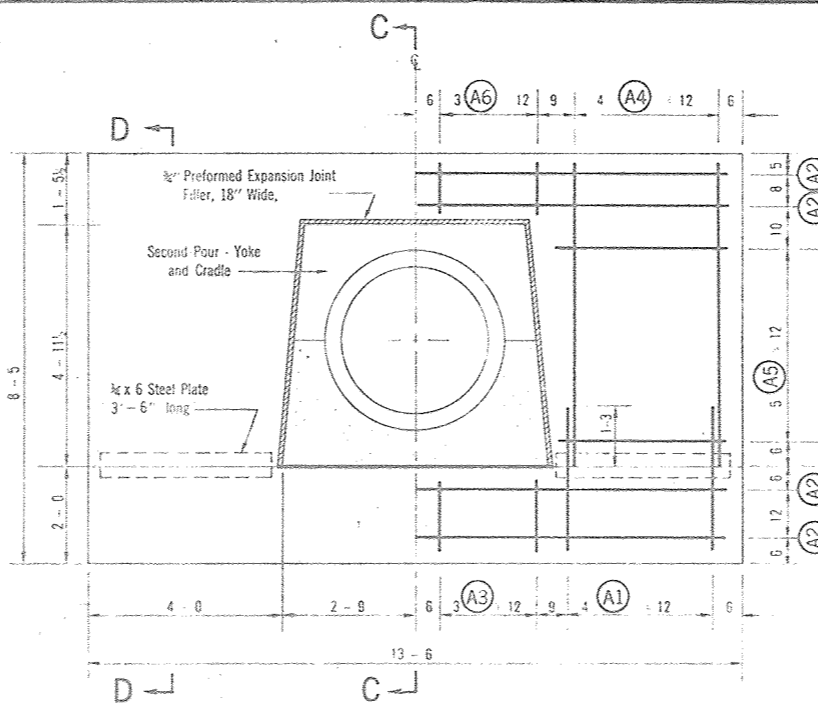
DETAIL OF PIPE JOINT



DETAIL B

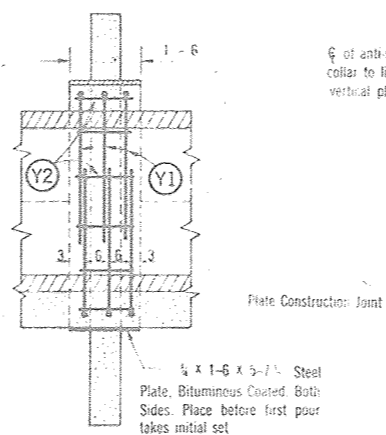
STANDARD CONDUIT DETAILS
FOR
REINFORCED CONCRETE PRESSURE PIPE
PRINCIPAL SPILLWAY
STANDARD SPEC. NO. ES-5036-CE
DATE 2-70 SHEET 1 OF 1

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 1/8 inch.



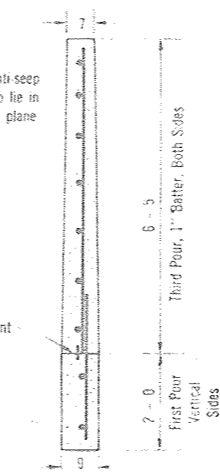
DETAIL OF ANTI-SEEP COLLAR

Yoke and Cradle steel not shown

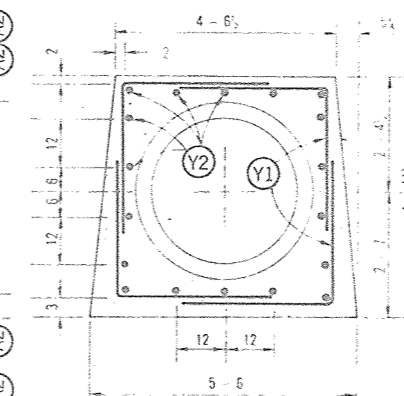


SECTION C-C

Anti-seep collar and cradle steel not shown.

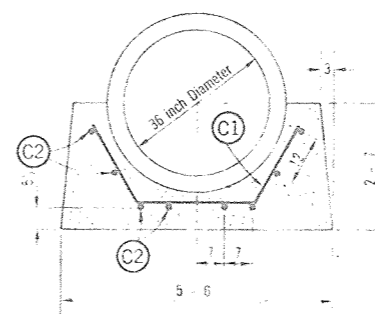


SECTION D-D



DETAIL OF ANTI-SEEP COLLAR YOKE

Cradle steel not shown, C2 bars to be continuous through yoke



DETAIL OF CRADLE

After horizontal spacing of lower four C2 bars as necessary to accommodate support blocks used

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
	Head of Water	Load to produce 0.001 inch crack one foot long	AWWA C-301
36 inches	50 feet	9,000	

The outside diameter of pipe assumed in design is 42 1/2 inches. When 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.

Rev 7-6-72
Rev 6-19

STEEL SCHEDULE

Anti-seep Collar and Yoke, 12 Required						
Mark	Size	Quantity per Collar	Length	Type	Total Quantity	Total Length
A1	4	8	3-0	1	96	288-0
A2	4	4	13-0	1	48	624-0
A3	4	6	1-6	1	72	108-0
A4	4	8	6-3	1	96	600-0
A5	4	10	3-6	1	120	420-0
A6	4	6	1-0	1	72	72-0
Y1	4	12	6-0	21	144	864-0
Y2	4	18	1-2	1	216	252-0
						3228-0

Cradle

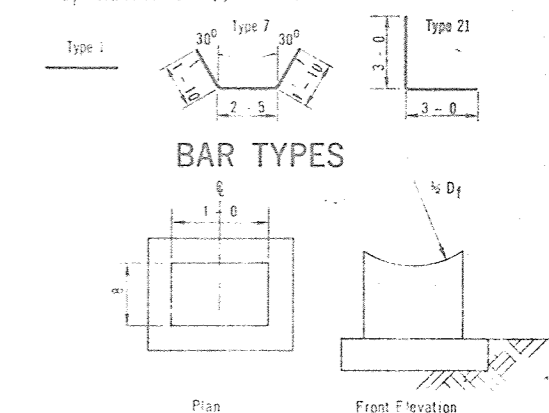
Mark	Size	Total Quantity	Length	Type	Total Length
C1	4	340	6-1	7	2068-4
C2	6	272	9-6	1	2584-0
					4652-4

QUANTITIES

	Cu. Yds.
Concrete	
Anti-seep Collar including Yoke	
* Each, Additional to Cradle	2.59
Total 12 Collars	31.08
Cradle	
** Per linear foot of Cradle	0.3199
Total (340 Lin. Ft.)	108.77
Steel	Pounds
Anti-seep Collar including Yoke, 12 Collars	2156.3
Cradle (For 340 Lin. Ft.)	5262.82

Concrete quantities are based on an outside diameter of pipe of 42 1/2 inches. Steel quantities do not change with outside diameter of pipe.

- This quantity is given by $2.568 - 0.0001515 (D_1 - 44) (D_1 - 44)$ cu yds
- This quantity is given by $0.3068 - 0.0001010 (D_1 - 44) (D_1 - 44)$ cu yds
- D_1 = outside diameter of pipe furnished, inches.



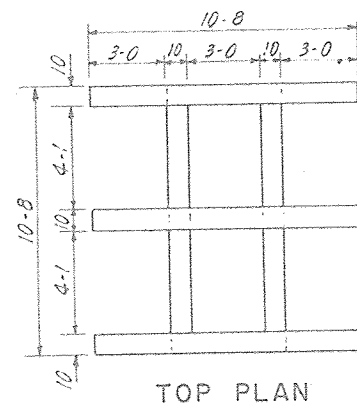
Plan Front Elevation

SUGGESTED SUPPORT BLOCKS

Sufficient blocks shall be provided to support the pipe to the required line and grade. The Contractor shall determine the number and size of blocks required. Wedges may be used as an alternate.

AS-BUILT PLANS
CONSTRUCTION
COMPLETED 3/27/84

PIPE DETAILS			
FLOODWATER RETARDING STRUCTURE SITE NO. 6			
SANDERSON CANYON WATERSHED			
IN			
BREWSTER, PECOS, AND TERRELL COUNTIES TEXAS			
U.S. DEPARTMENT OF AGRICULTURE			
SOIL CONSERVATION SERVICE			
Designed by	C.H.S.	Date	2-79
Drawn by	S.C.S.	Date	2-79
Traced by	S.C.S.	Date	2-79
Checked by	D.E.M.	Date	2-79
Approved by	John B. MacKinnon	Date	3-27-84
Sheet	4-E-36,791	of 12	01,24



For details of Trash
Rack Angles and Grating
see Sheets 10 & 19.

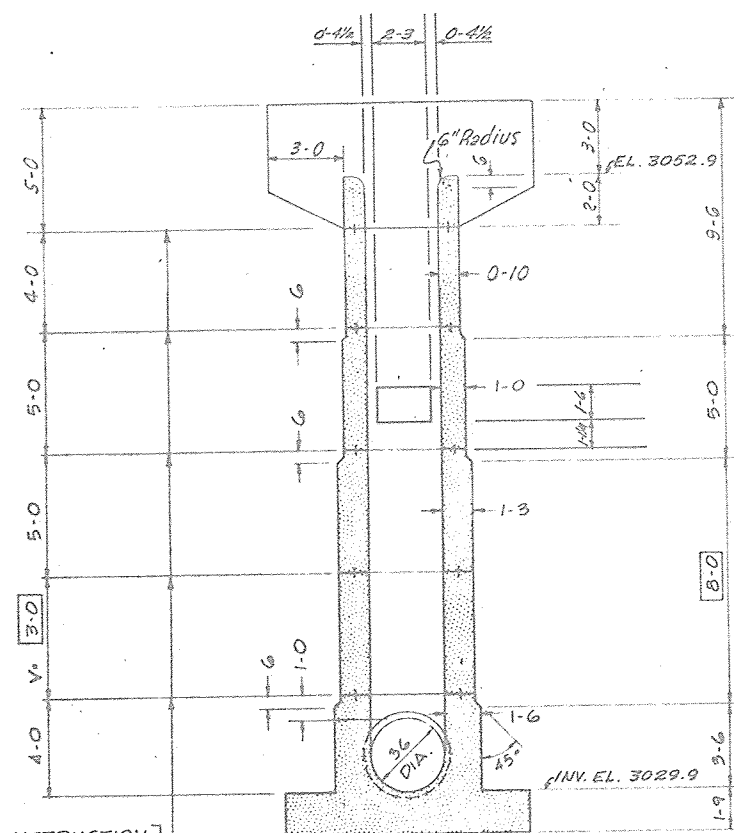
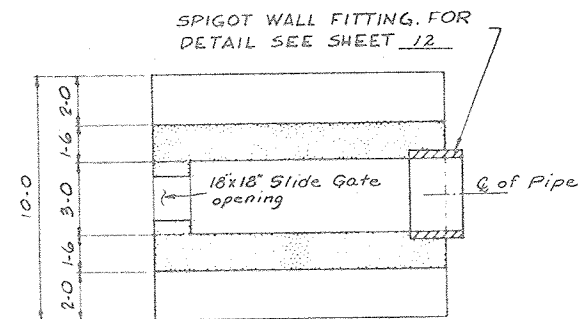
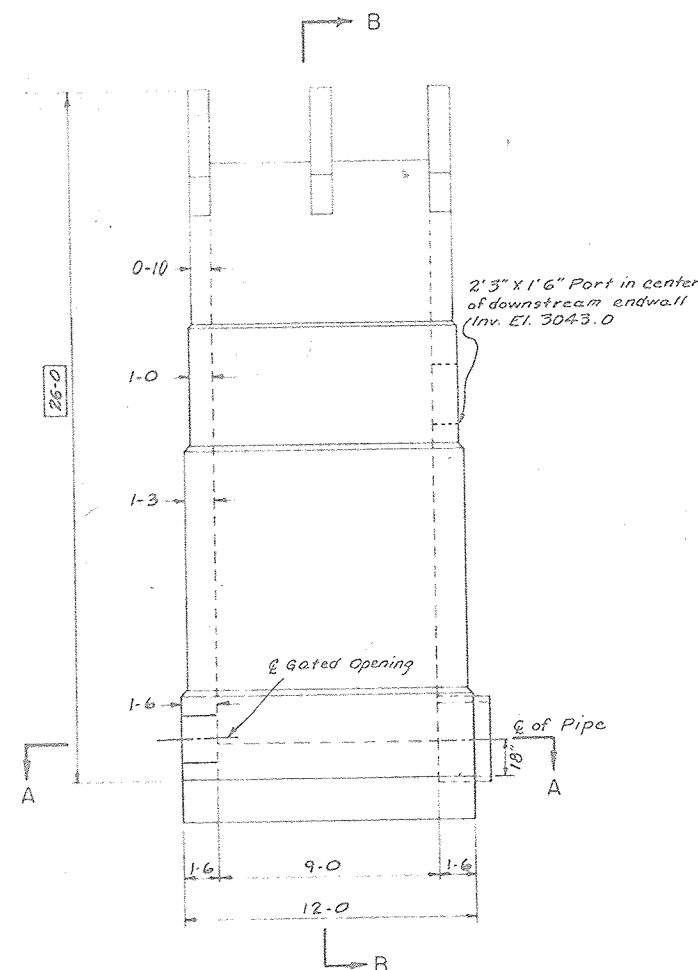
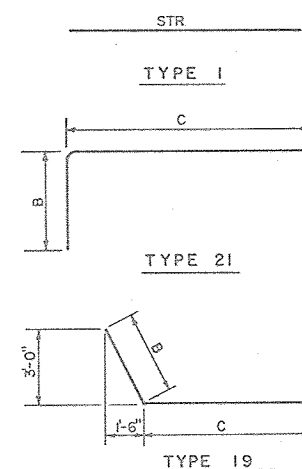


PLATE CONSTRUCTION
JOINT. FOR DETAIL SEE
SHEET 19

[illegible]

NOTES:

- 1- Bar dimensions are out to out of bar.
- 2- Radius of bands
= 3 bar diameters for sizes $\leq \# 7$
= 4 bar diameters for $\# 8$
- 3- The 2" and 3" distances from specified concrete surfaces are clear distances.
- 4- Cut or shift steel where necessary to clear the post by 2".

STANDARD OPEN RISER	
STANDARD DWG. NO.	ES-3136-2525R
DATE 3-67	SHEET 1 OF 4
ADAPTED FROM	
STANDARD COVERED RISER	
DESIGN CONSTANTS	
$f'_c = 4000$ $n = 8$	$f_c = 1600 \text{ psi}$ $f_s = 20,000 \text{ psi}$
STANDARD DWG NO.	ES-3036-3025R
DATE 5-65	SHEET 1 OF 4

0 1 2 3 4 5 6 7 8 9
SCALE IN FEET

QUANTITIES

# 5 BARS -	1091-9	-	426.770	LBS
# 6 BARS -	1133-10	-	1703.02	LBS
# 7 BARS -	575-8	-	1176.66	LBS
			7148.72	LBS

$$\text{CONCRETE} = 35.00 \div 1.35 V = \boxed{39.05}^{\frac{38.63}{71.47.38}} \text{ CU. YDS.}$$

LENGTH OF #5 BARS = (3395-11) + (LENGTH OF BARS R1, R2, R3, R4 AND R6)
 LENGTH OF #6 BARS = (789-10) + (LENGTH OF BARS R5 AND R7)

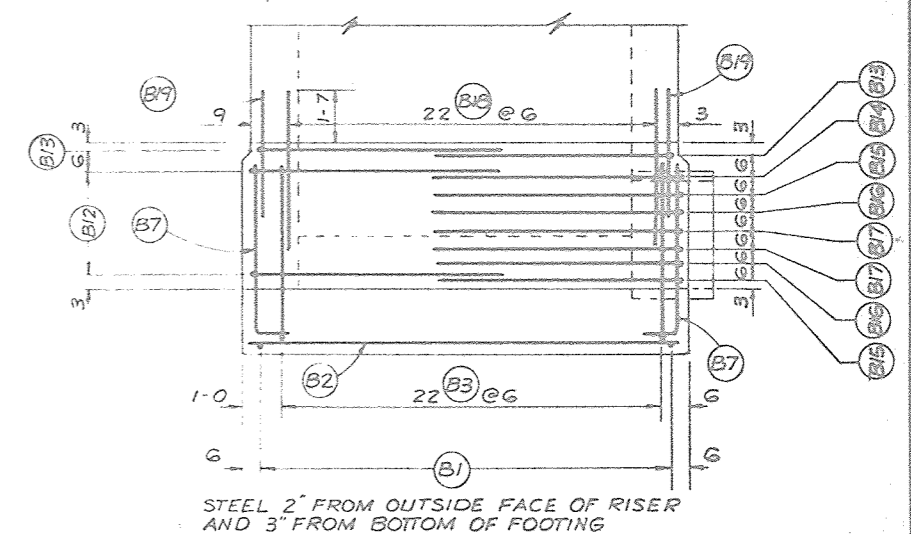
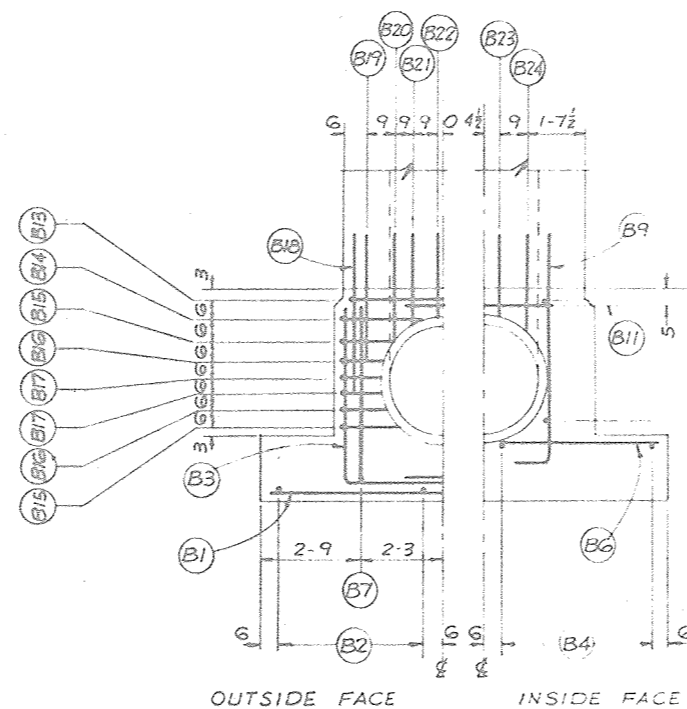
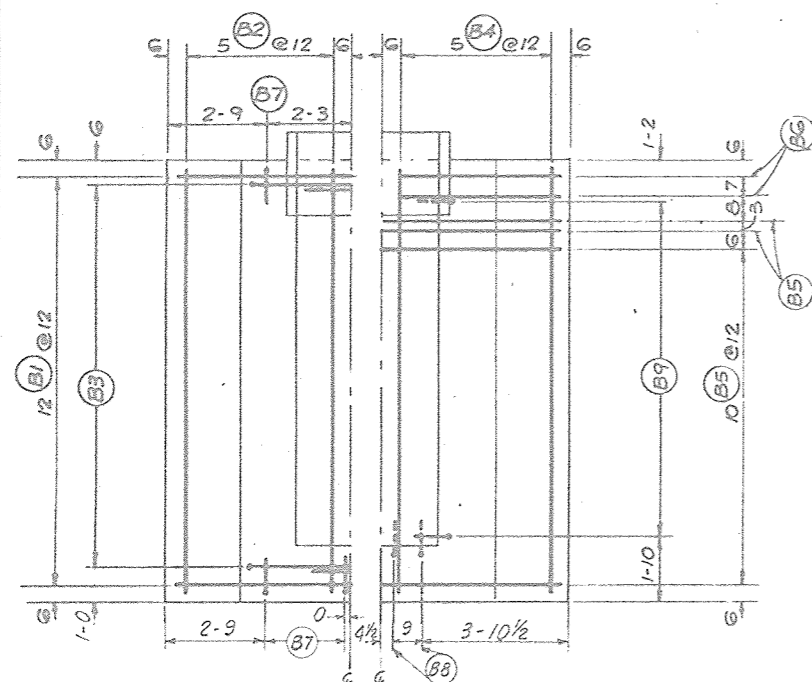
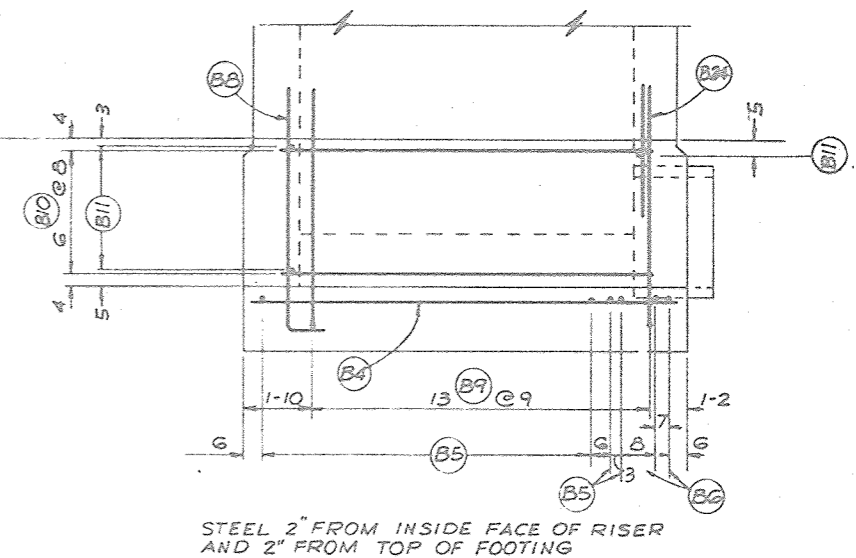
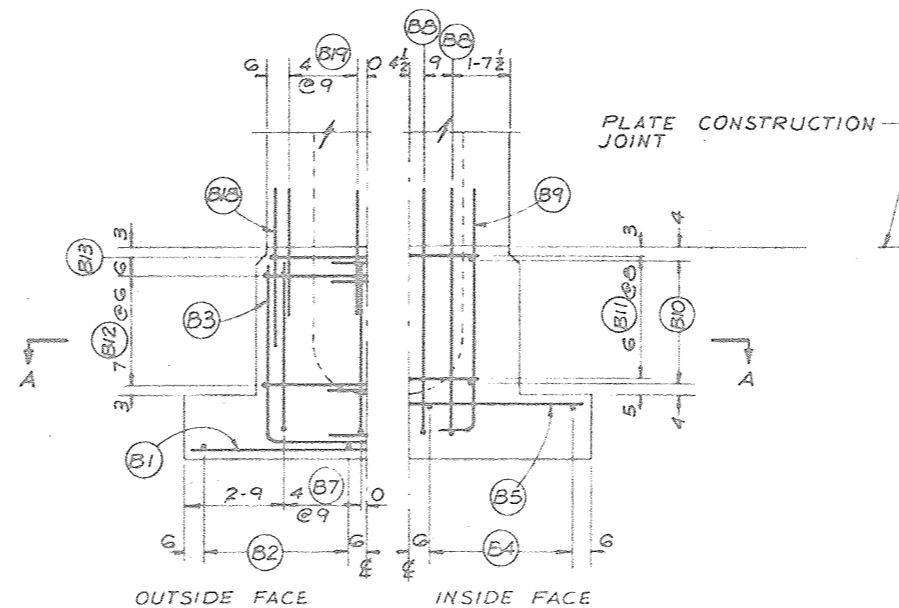
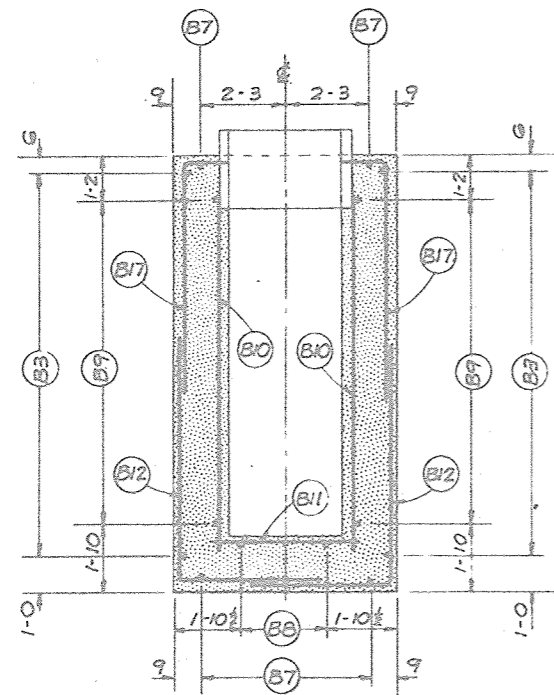
AS-BUILT PLANS
CONSTRUCTION
COMPLETED 3/27/84

PRINCIPAL SPILLWAY INLET
FLOODWATER RETARDING STRUCTURE SITE NO. 6
SANDERSON CANYON WATERSHED

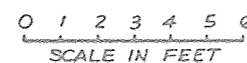
BREWSTER, PECOS, AND TERRELL COUNTIES TEXAS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

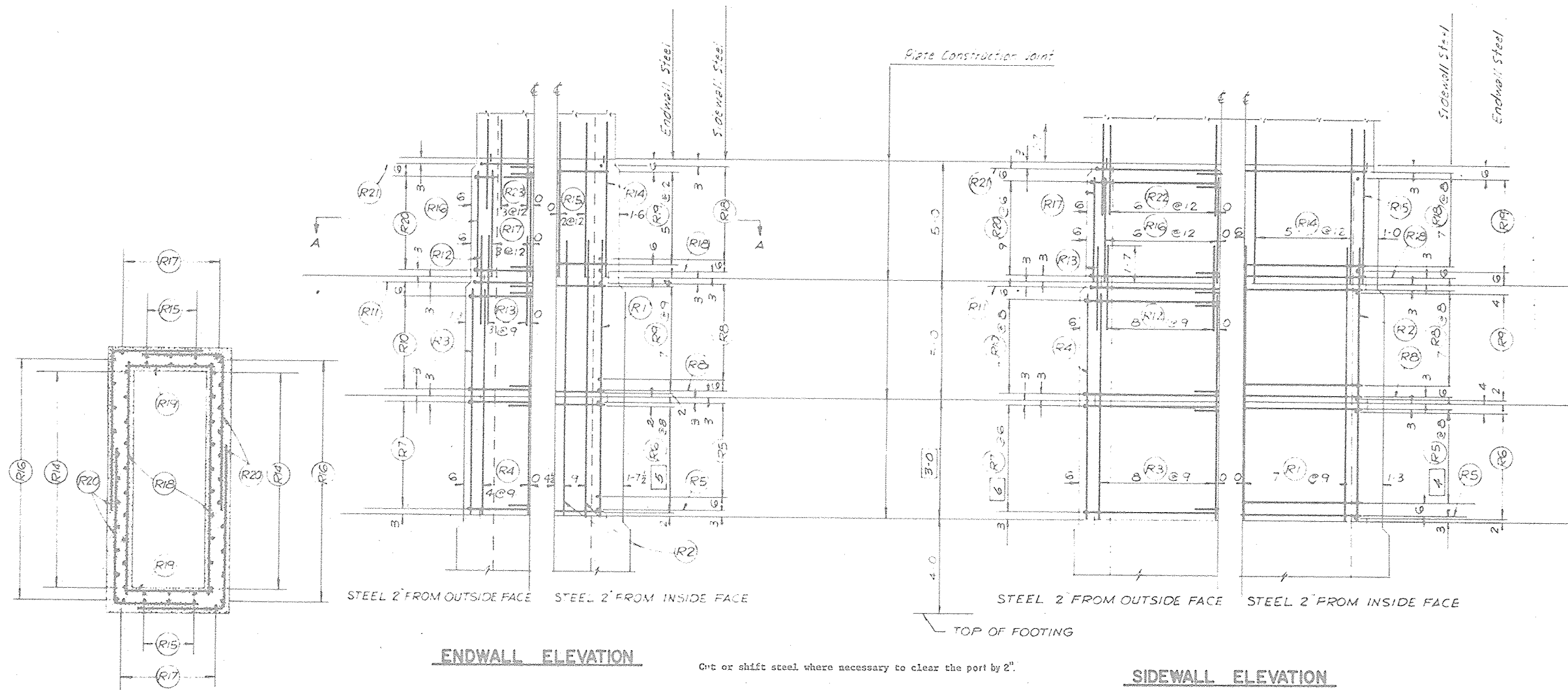
Designated	C. H. S.	Date	2-79	Approved by	<i>[Signature]</i> STATE CONSERVATION ENGINEER, S.C.
Drawn	S. C. S.	Title	2-79	<i>Design of 3' High 20' Wide</i> BLVD ENGINEERING COMP MOBILE, ALA.	
Traced	S. C. S.	Sheet	2-79	Drawing No	
Checked	D. E. M.	No. 1 of 24	2-79	A-E-36,791	



STANDARD OPEN RISER	
STANDARD DWG NO. ES-3136-2525 R	
DATE 3-67	SHEET 2 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-3036-3025 R	
DATE 5-65	SHEET 2 OF 4



STEEL PLACEMENT — PRINCIPAL SPILLWAY INLET			
FLOODWATER RETARDING STRUCTURE SITE NO. 6			
SANDERSON CANYON WATERSHED			
IN			
BREWSTER, PECOS, AND TERRELL COUNTIES TEXAS			
U. S. DEPARTMENT OF AGRICULTURE			
SOIL CONSERVATION SERVICE			
Designed	C. H. S.	Date	Apr. 14, 1964
		2-79	Asst. State Conservation Engineer, S.C.S.
Drawn	S. C. S.	2-79	This Project, Texas
			Don't Miss Pecos
Traced	S. C. S.	2-79	State Engineer
			Title
			HOUSTON, TEXAS
Checked	D. E. M.	2-79	Sheet
			No. 14
			of 24
			Drawing No.
			4-E-36,791



SECTION A-A

OTHER SECTIONS SIMILAR

ENDWALL ELEVATION

SIDEWALL ELEVATION

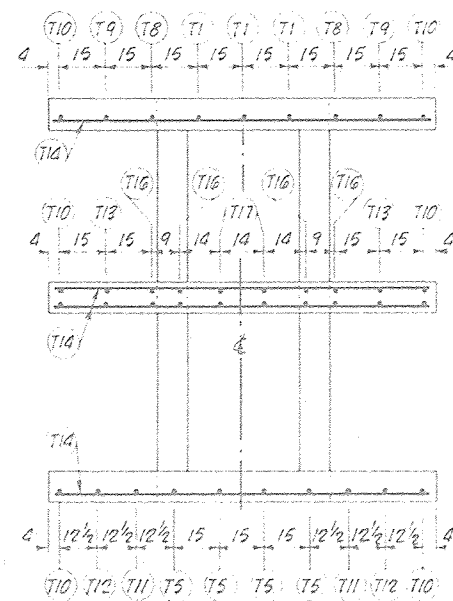
NO CHANGE IN PLANS
69

AS-BUILT PLANS
CONSTRUCTION
COMPLETED 3/27/84

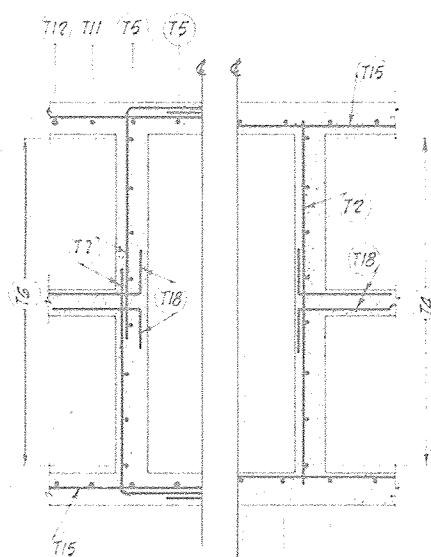
STANDARD OPEN RISER	
STANDARD DWS NO ES-3136-2525R	
DATE 3-67	SHEET 3 OF 4
ADAPTED FROM	
STANDARD COVERED RISER	
DESIGN CONSTANTS $f'_c = 4000 \text{ psi}$ $f_c = 1600 \text{ psi}$ $n = 8$ $f_s = 20,000 \text{ psi}$	
STANDARD DWS NO ES-3036-3025R	
DATE 5-65	SHEET 3 OF 4

0 1 2 3 4 5 6
SCALE IN FEET

STEEL PLACEMENT—PRINCIPAL SPILLWAY INLET FLOODWATER RETARDING STRUCTURE SITE NO. 6 SANDERSON CANYON WATERSHED IN BREWSTER, PECOS, AND TERRELL COUNTIES TEXAS			
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
Designed	C.H.S.	Date	2-79
Drawn	S.C.S.	Date	2-79
Traced	S.C.S.	Date	2-79
Checked	D.E.M.	Date	2-79
Approved by STATE CONSERVATION ENGINEER, S.C.S. TERRELL COUNTY, TEXAS BROWN ENGINEERING CORP. HOUSTON, TEXAS		Sheet	No. 15 of 24
		Drawing No.	4-E-36,791

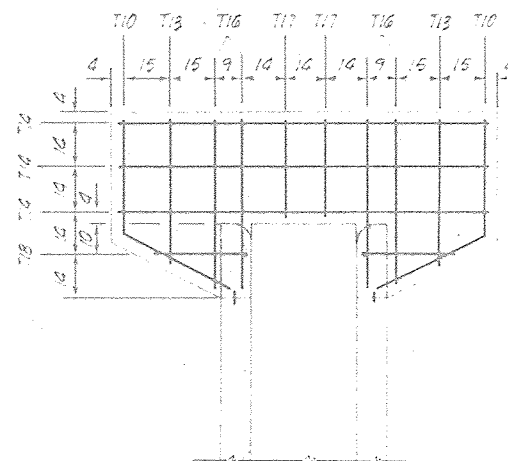
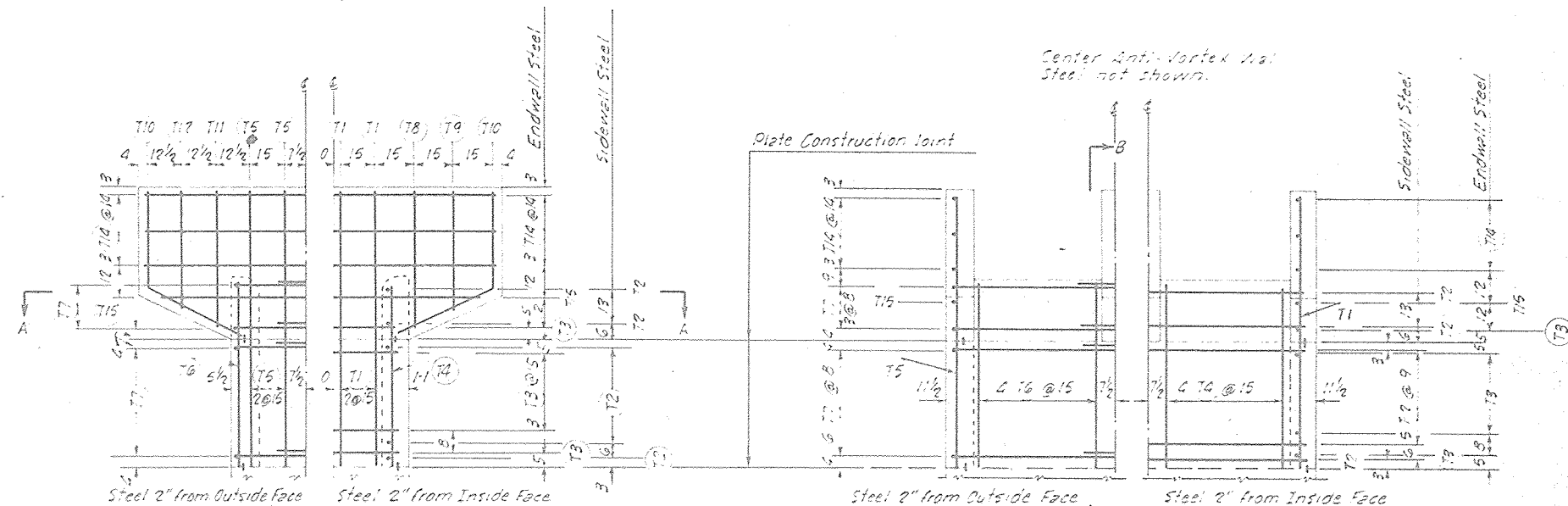


ANTI-VORTEX WALL PLAN



SECTION A-A

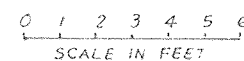
Vertical Steel in Center Anti-Vortex Wall not shown.



CENTER ANTI-VORTEX WALL ELEVATION

(Steel Identical Both Faces)

SECTION B-B



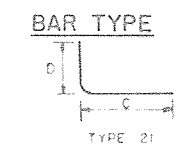
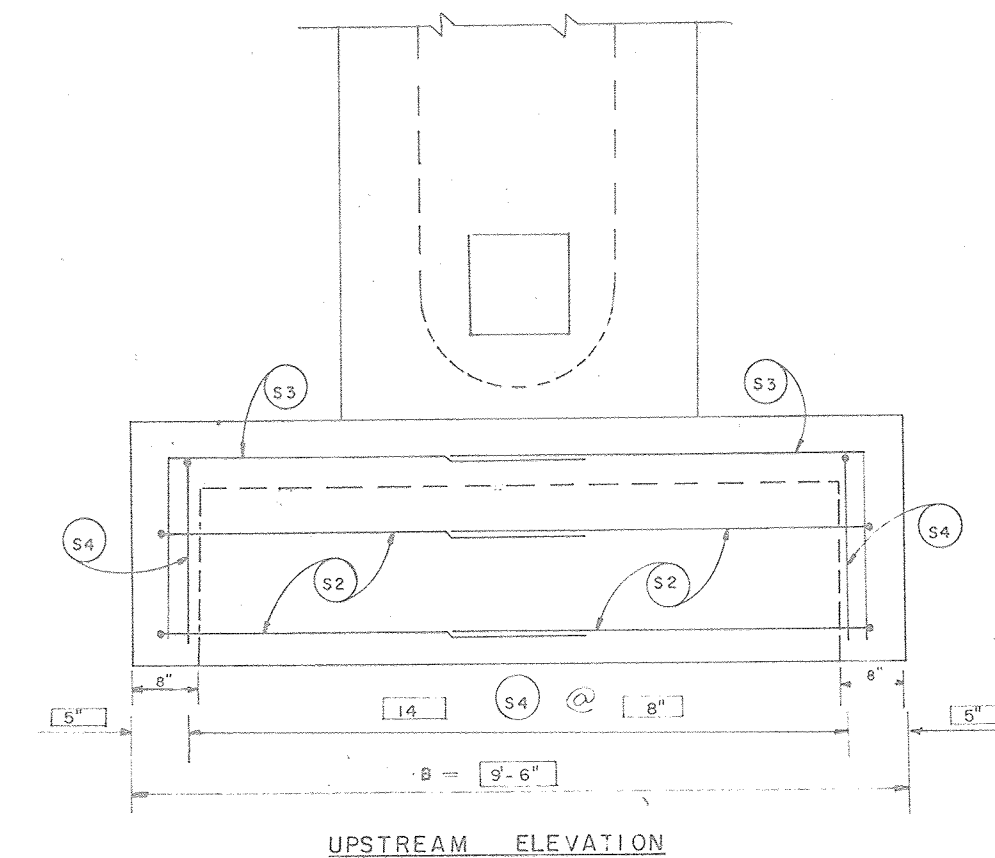
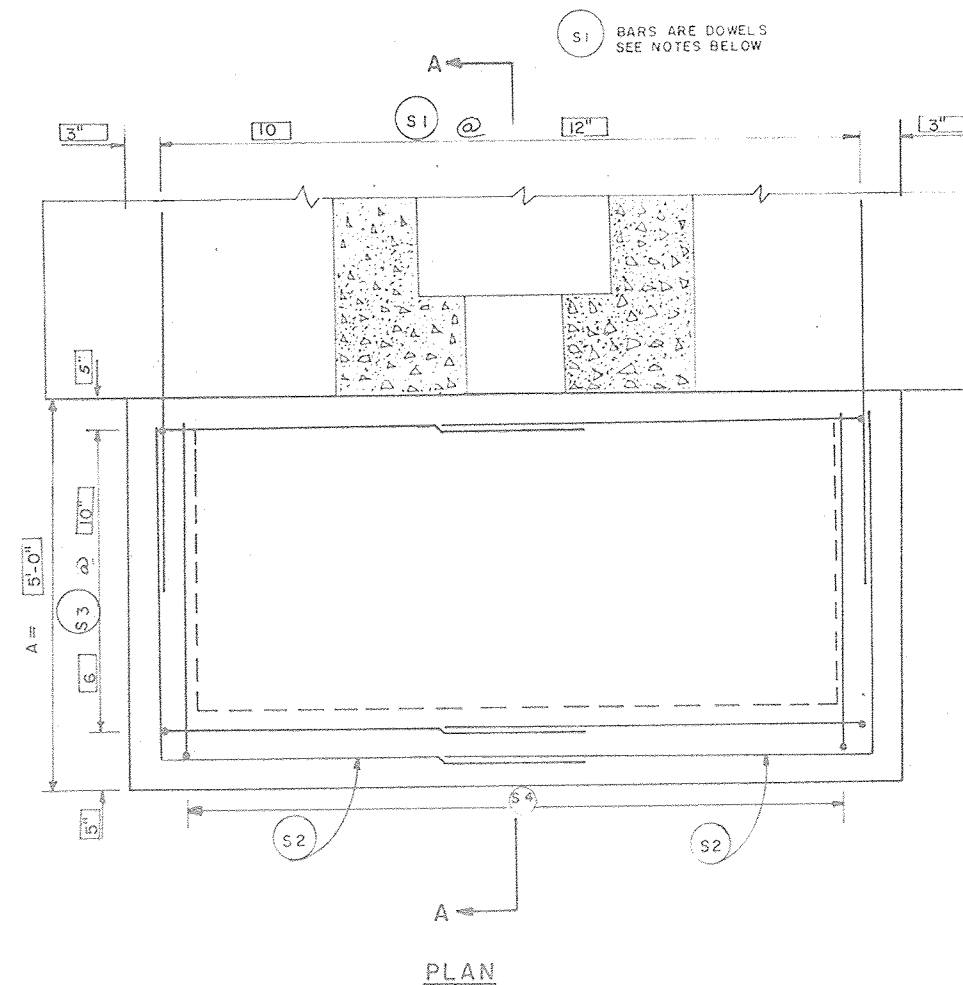
STANDARD OPEN RISER	
DESIGN CONSTANTS	$f'_c = 4000 \text{ psi}$ $f_c = 1600 \text{ psi}$ $n = 8$ $f_s = 20,000 \text{ psi}$
STANDARD DWG NO	ES-3136
DATE	3-67
SHEET	4 OF 4

NO CHANGE IN PLANS

AS-BUILT PLANS
CONSTRUCTION
COMPLETED 3/27/84

STEEL PLACEMENT—PRINCIPAL SPILLWAY INLET
FLOODWATER RETARDING STRUCTURE SITE NO. 5
SANDERSON CANYON WATERSHED
IN
BREWSTER, PECOS, AND TERRELL COUNTIES TEXAS
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	C.H.S.	2-79	Approved by STATE CONSERVATION ENGINEER, SCS TERRELL COUNTY, TEXAS <i>Saul E. [Signature]</i>
Drawn	S.C.S.	2-79	Title HOUSTON, TEXAS
Traced	S.C.S.	2-79	Scale 1" = 16'
Checked	D.E.M.	2-79	Sheet No. 24 Drawing No. 4-E-36,791



MARK	SIZE	QUAN- TITY	LENGTH	TYPE	D	C	TOTAL LENGTH	BAR NO.	C LENGTH EQUALS	D LENGTH EQUALS
S2	4	4	9'-8"	21	4'-6"	5'-2"	38'-8"	S2	B+5' 2	A-6"
S3	4	12	7'-0"	21	1'-11"	5'-1"	84'-0"	S3	E+4' 2	
S4	4	14	6'-5"	21	1'-11"	4'-6"	89'-10"	S4	A-6"	
S1	6	10	4'-0"	-	-	-	40'-0"			

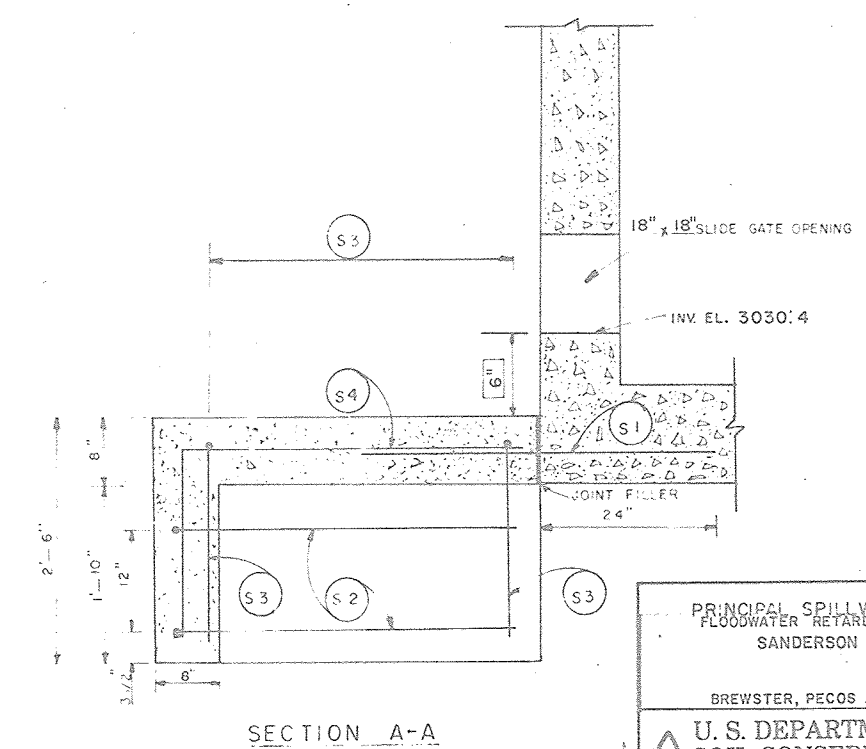
TOTAL STEEL (SIZE 4) 212'-6"= 141.95 LBS

TOTAL STEEL 252'-6"= 202.03 LBS.

TOTAL REINFORCED-CONCRETE 2.0 CU.YDS.

CU YDS. CONCRETE = $8(A)(B) + 176(B) + 352(A) - 2816$
 $A = \text{INCHES}$
 $B = \text{INCHES}$
 46656

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, 10 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.

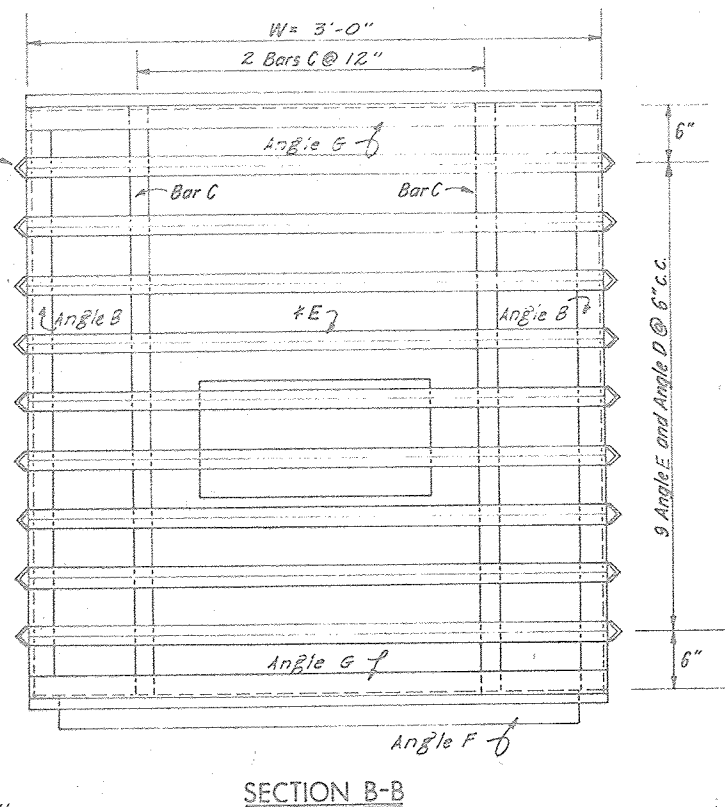
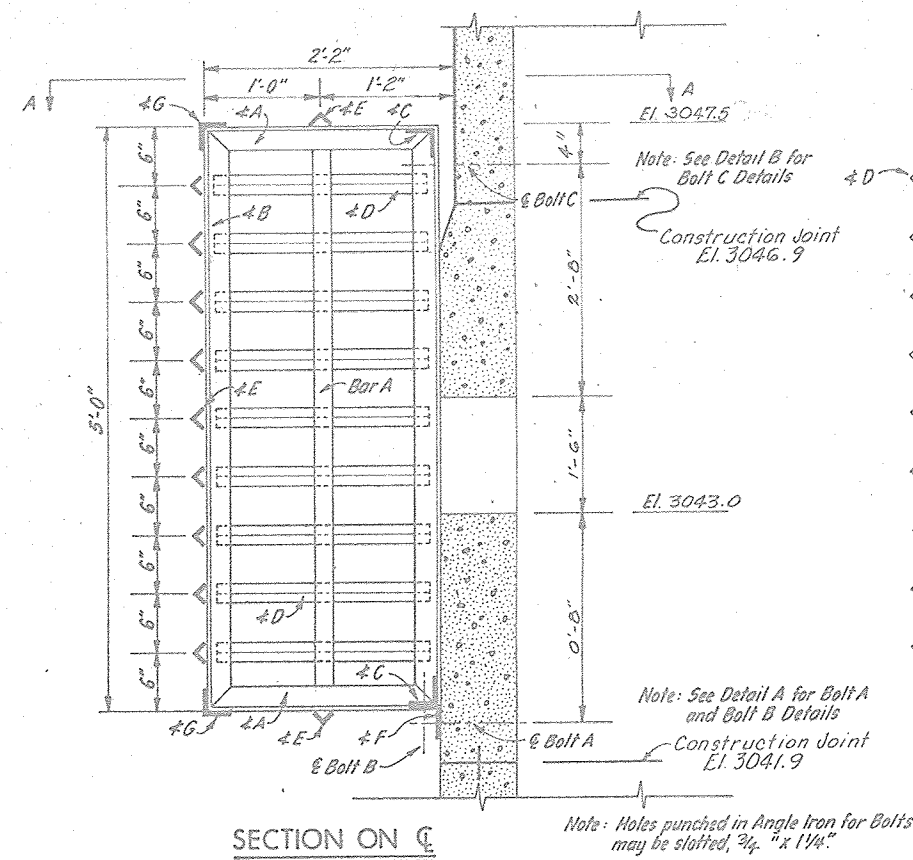
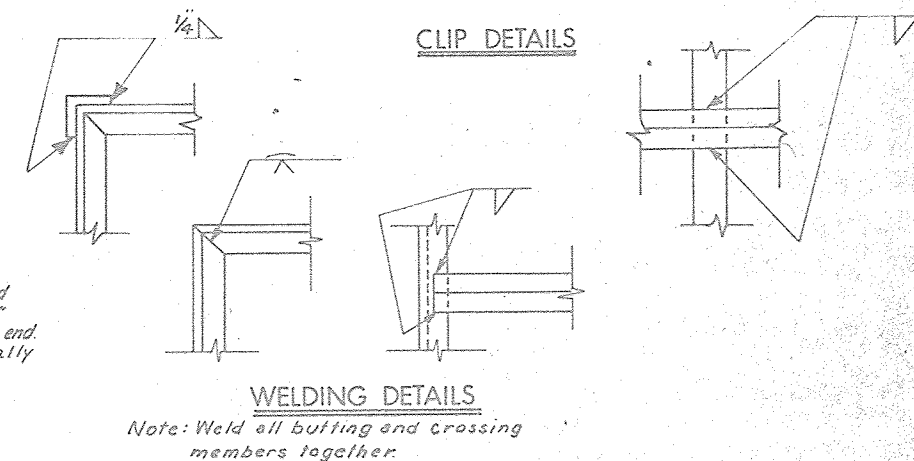
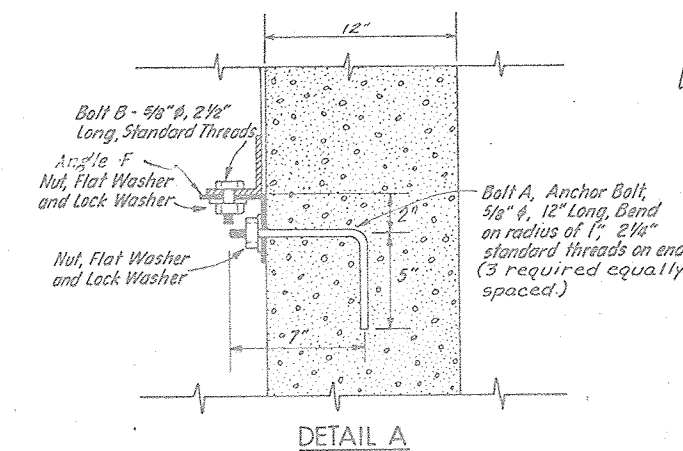
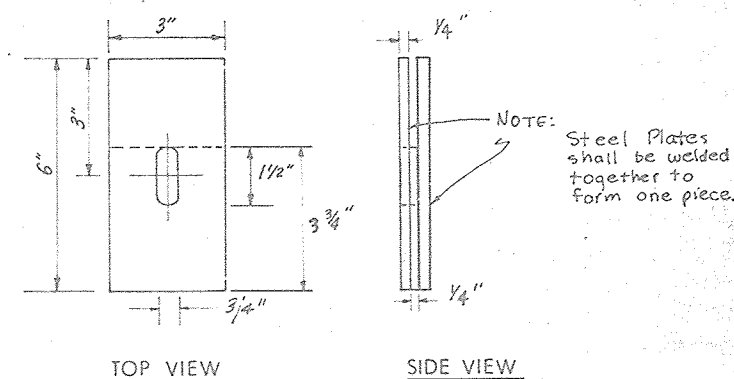
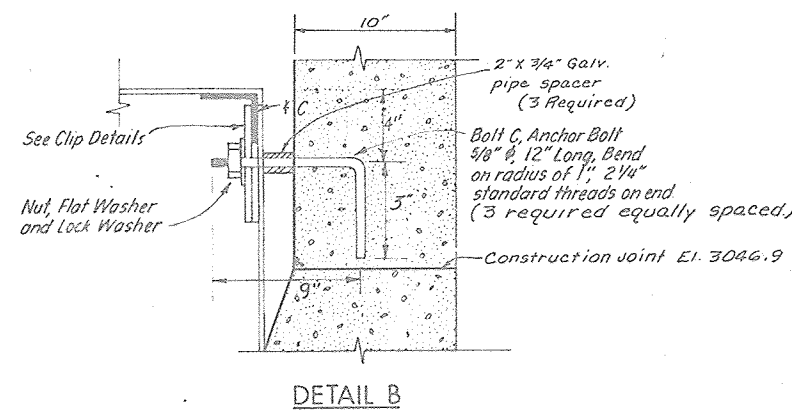
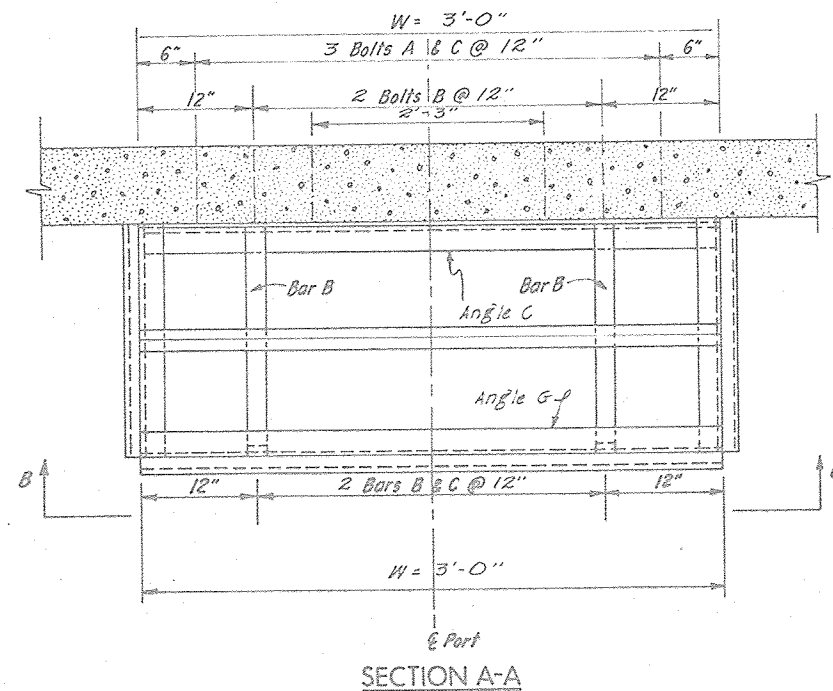


NO CHANGE IN PLANS
 AS-BUILT PLANS
 CONSTRUCTION
 COMPLETED 3/27/04

PRINCIPAL SPILLWAY INLET SCOUR APRON
 FLOODWATER RETARDING STRUCTURE SITE NO. 6
 SANDERSON CANYON WATERSHED
 IN
 BREWSTER, PECOS AND TERRELL COUNTIES, TEXAS
 U. S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE

DESIGNED BY	C.H.S.	DATE	2-79
DRAWN BY	S.C.S.	DATE	2-79
TRACED BY	S.C.S.	DATE	2-79
CHECKED BY	D.E.M.	DATE	2-79

APPROVED BY
 SOIL CONSERVATION ENGINEER, S.C.S.
 TEMPLE, TEXAS
 DAVID E. YOCUM
 SOIL CONSERVATION ENGINEER
 HOUSTON, TEXAS
 SHEET NO. 7
 OF 24
 DRAWING NO.
 4-E-36.791



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 2'-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 3'-0" Weld
1	Angle F*	3 1/2" x 3 1/2" x 1/4" x 2'-6" Weld
2	Angle G	2 1/2" x 2 1/2" x 1/4" x 3'-0" Weld
2	Bar A	1/4" x 2" x 4'-7" Weld
4	Bar B	1/4" x 2" x 2'-0" Weld
2	Bar C	1/4" x 2" x 4'-11 1/4" Weld
3	Bolt A	5/8" dia Anchor Bolt, See Detail A
2	Bolt B	5/8" dia, See Detail A
3	Bolt C	5/8" dia, Anchor Bolt, See Detail B
3	Clip	See Clip Details
8	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

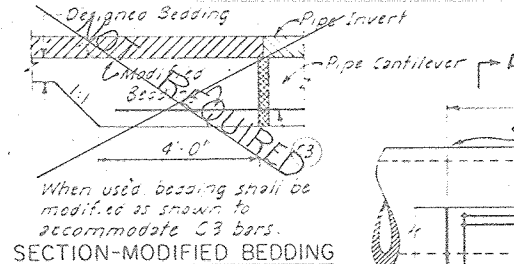
All bolts, nuts, washers and other parts of trash rack shall be galvanized.

NO CHANGE IN PLANS

AS-BUILT PLANS
CONSTRUCTION
COMPLETED 3/27/84

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

PORT TRASH RACK FLOODWATER RETARDING STRUCTURE SITE NO. 6 SANDERSON CANYON WATERSHED IN BREWSTER, PECOS AND TERRELL COUNTIES, TEXAS			
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
DESIGNED	C.H.S.	DATE	2-79
DRAWN	S.C.S.	DATE	2-79
TRACED	S.C.S.	DATE	2-79
CHECKED	D.E.M.	DATE	2-79
APPROVED BY		STATE CONSERVATION ENGINEER, S. C. S.	
DRAWN BY		D. W. B. R. R. R.	
TRACED BY		D. W. B. R. R. R.	
CHECKED BY		D. W. B. R. R. R.	
SHEET		DRAWING NO.	
18		4-E-36,791	
of 24			



Note: At the Contractor's option two 10-foot length joints of pipe may be used in lieu of the 20-foot length joint shown on the drawings.

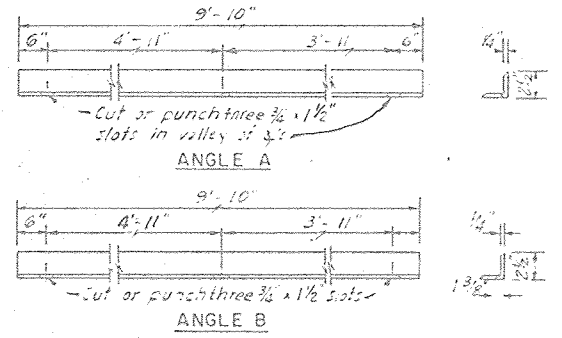
30 Linear Ft of 36" I.D. Pipe

Note: Sides of Pipe Cantilever to be formed with lumber or metal.

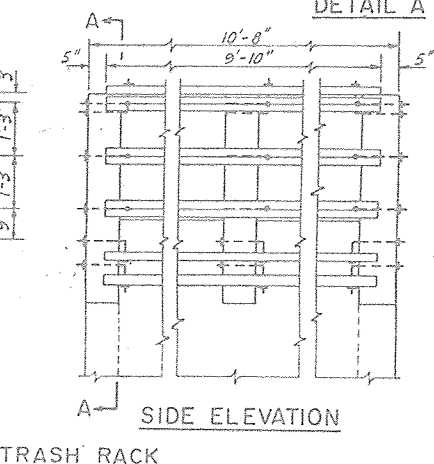
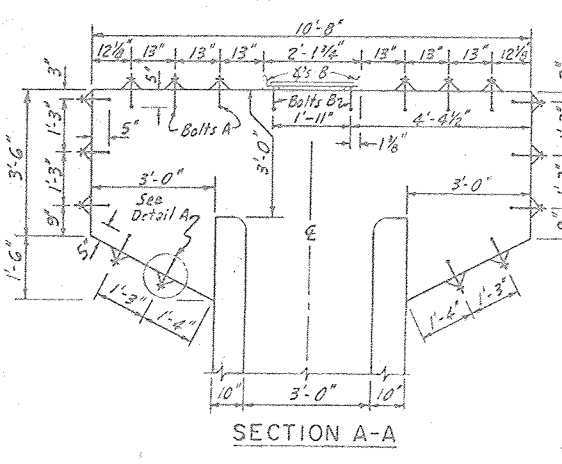
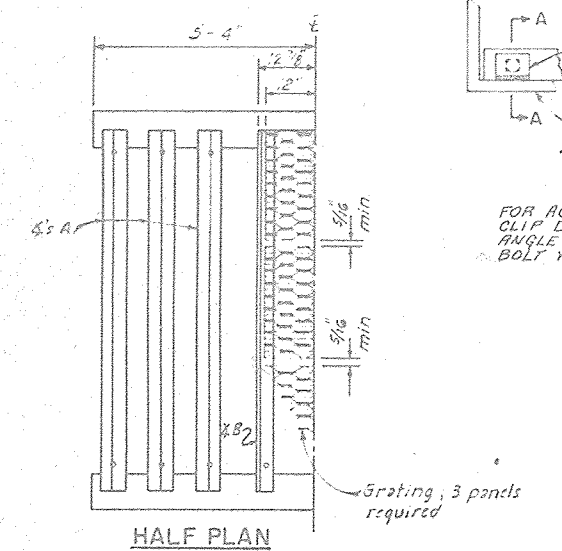
SCHEDULE OF MATERIALS FOR TRASH RACK

Item	Qty	Length	Total Feet
2 1/2" x 2 1/2" x 1/4" Angles A	16	9'-10"	157'-4"
5/8" Angle Bolts A, Washers & nuts	48	21"	
3/4" Pipe Sleeve	54	0'-10"	45'-0"
2 1/2" x 2 1/2" x 1/4" Angles B	2	9'-10"	19'-8"
5/8" Angle Bolts B, Washers & nuts	6	20"	
Grating Panels	3		

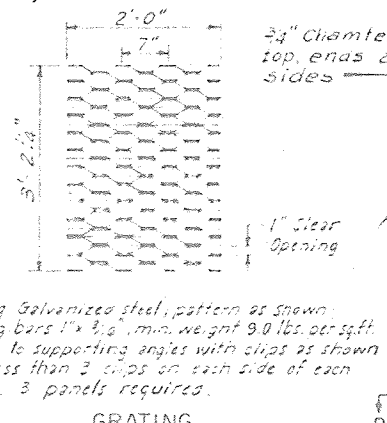
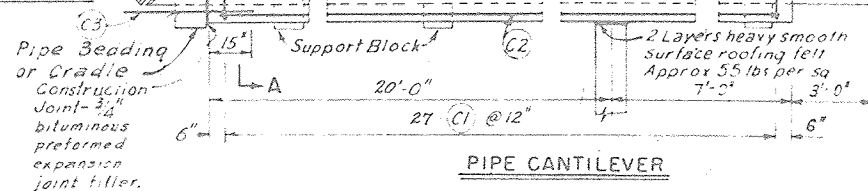
All parts of the trash rack shall be galvanized See Construction Specification 91 and Material Specification 582.



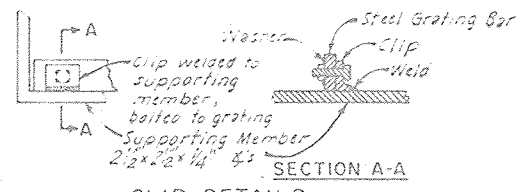
DETAIL OF ANGLES FOR TRASH RACK



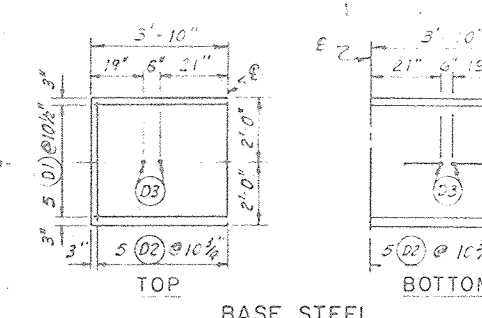
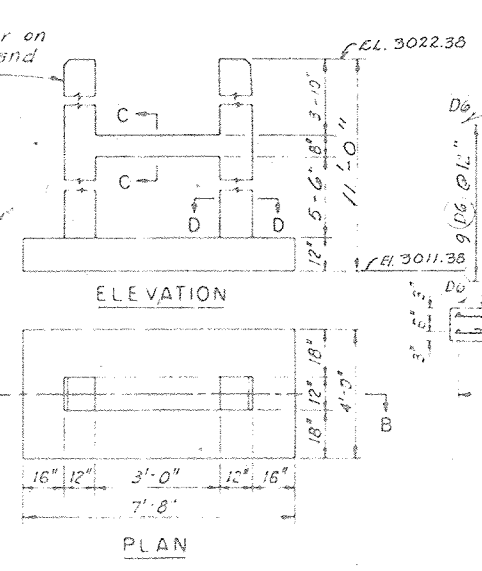
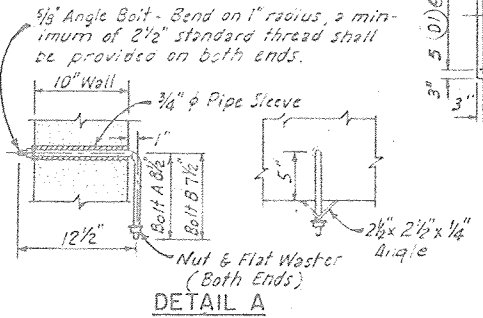
TRASH RACK



Grating Galvanized steel, pattern as shown bearing bars 1" x 3/4" min. weight 9.0 lbs. per sq. ft. Fasten to supporting angles with clips as shown. Not less than 3 clips on each side of each panel. 3 panels required.



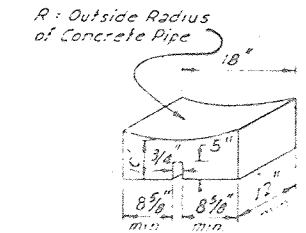
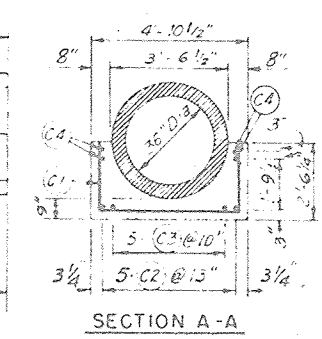
FOR ACCEPTABLE ALTERNATE TO ABOVE CLIP DETAIL ANCHOR GRATING TO ANGLE WITH 1/2" x 3/4" LONG GALVANIZED BOLT W/ 1/2" WASHER



BASE STEEL
PIPE CANTILEVER SUPPORT

FOR TYPICAL BAR TYPES REFER TO A C I STANDARD 315

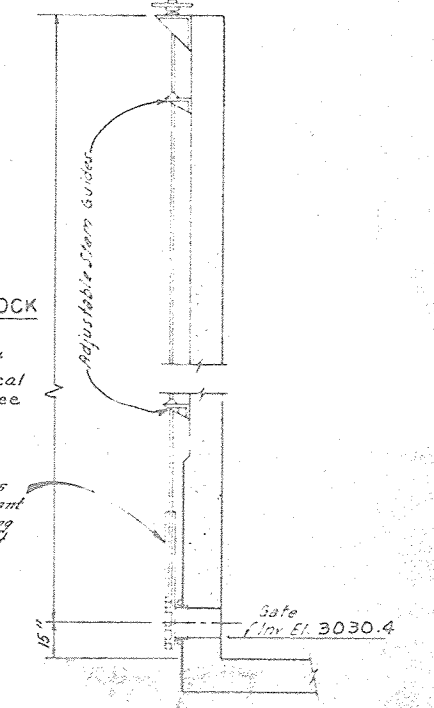
No.	LOCATION	QTY	LENGTH	TOTAL LENGTH	SIZE	TYPE	A	B	C	D	E	F	G	H	J	O
D1	Cantilever Supp	10	7'-3"	72'-6"	4	Str										
D2	"	18	3'-7"	64'-6"	4	"										
D3	"	4	3'-9"	15'-0"	6	2	1-3	2-6								
D4	"	8	9'-10"	78'-8"	7	Str										
D5	"	4	3'-11"	15'-0"	4	2	1-0	2-11								
D6	"	26	3'-2"	82'-4"	3	T-1	0-4	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) = 82'-4" = 30.96 lbs.																
Total Steel in Pipe Cantilever Support (Size 4) = 152'-8" = 101.93 lbs.																
Total Steel in Pipe Cantilever Support (Size 6) = 15'-3" = 22.53 lbs.																
Total Steel in Pipe Cantilever Support (Size 7) = 78'-0" = 160.80 lbs.																
Total Steel = 316.27 lbs																
Total Reinforced Concrete in Cantilever Support = 1.965 cu yds																
C1	Pipe Cantilever	27	8'-10"	238'-6"	4	S-10		2-	4-6	2-2						
C2	"	5	26'-6"	132'-6"	4	Str										
C3	"	5	5'-0"	25'-0"	4	"										
C4	"	4	26'-6"	106'-0"	8	"										
Total Steel in Pipe Cantilever (Size 4) = 396'-0" = 264.53 lbs																
Total Steel in Pipe Cantilever (Size 8) = 106'-0" = 283.02 lbs																
Total Steel = 547.55 lbs																
Total Reinforced Concrete in Pipe Cantilever = 7.36 cu yds																



CANTILEVER SUPPORT BLOCK

Note: Wall bracket & stem guides shall have sufficient adjustment to insure a vertical mounting for the gate stem. See sh. 10 for location of wall thickness changes.

Note: Wall bracket and stem guides shall have sufficient adjustment to ensure a vertical mounting for the gate stem. Detail at right is not to scale.



The slide gate shall be centered in the upstream wall of the riser. See manufacturer's data of gate frame, stem splices and anchor bolt layout.

Note: Shear Plate shall be free from dirt, oil, grease, paint, mill scale, loose or thick rust, or other coating which might destroy or reduce its bond with concrete.

1/4" min x 6" Steel Plate to be continuous throughout construction joint. Where a splice is necessary, the ends shall be butt welded, lapped 3 inches and fillet welded, or lapped 3 inches and bolted.

DETAIL OF SHEAR PLATE CONSTRUCTION JOINT

AS-BUILT PLANS
CONSTRUCTION
COMPLETED 3/27/84

Note: All concrete shall equal or exceed Class 4000

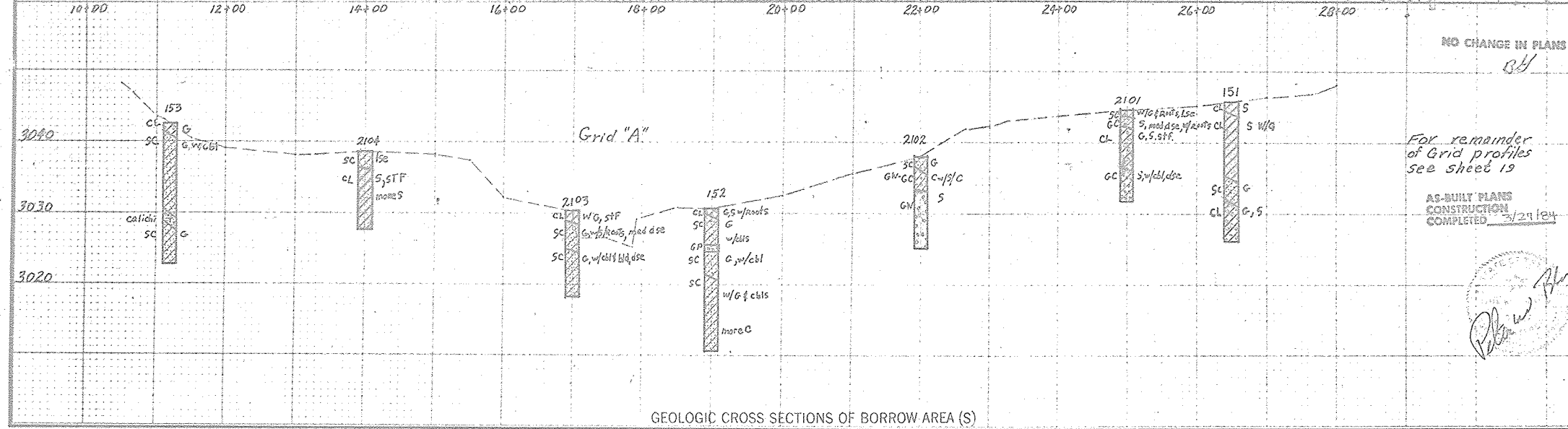
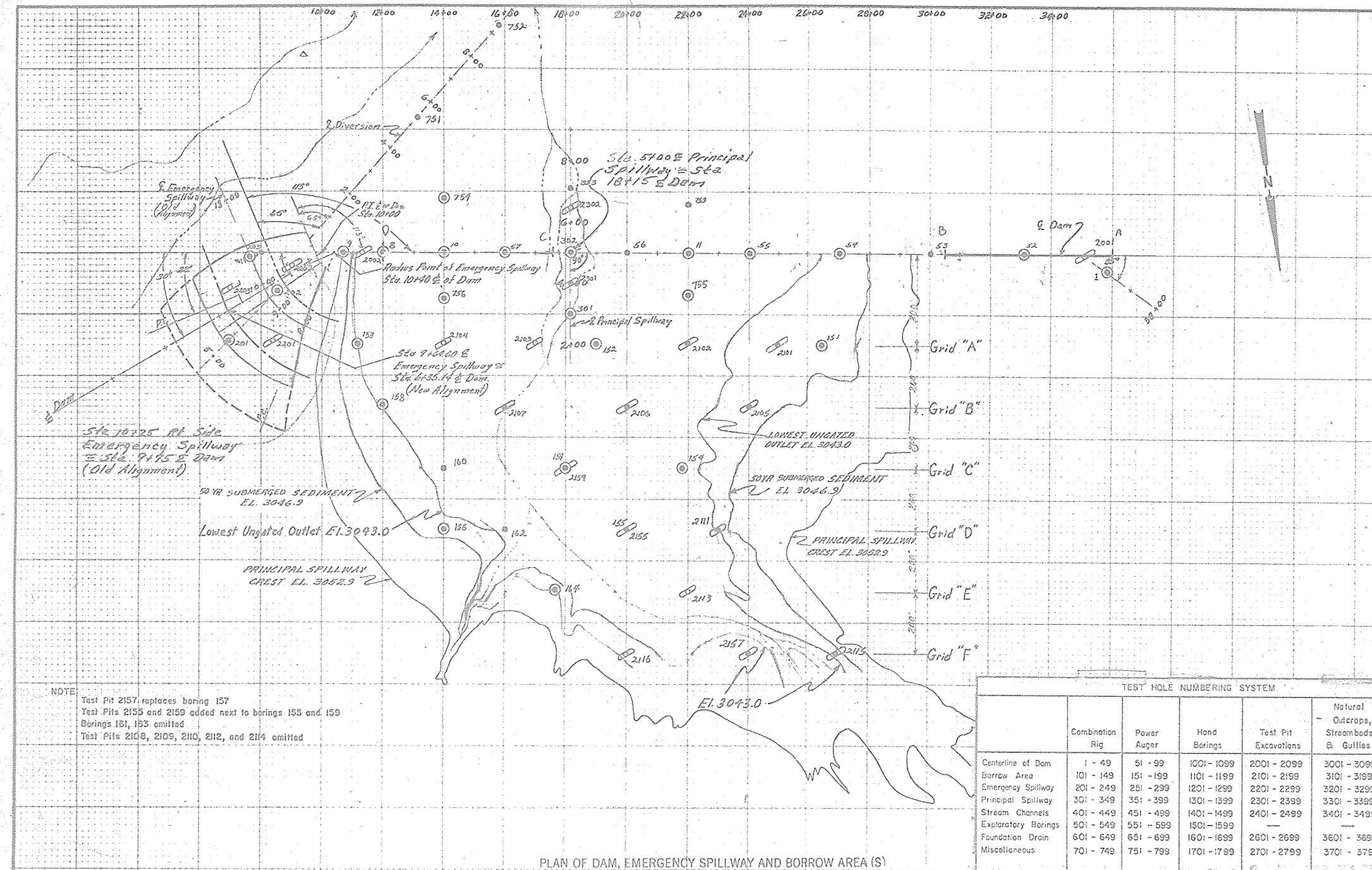
TRASH RACK, SLIDE GATE, AND PIPE CANTILEVER SUPPORT DETAILS
FLOODWATER RETARDING STRUCTURE SITE NO. 6
SANDERSON CANYON WATERSHED
IN
BREWSTER, PECOS AND TERRELL COUNTIES, TEXAS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	C.H.S.	Date	2-79
Drawn	S.C.S. <td>2-79</td> <td></td>	2-79	
Traced	S.C.S. <td>2-79</td> <td></td>	2-79	
Checked	D.E.M. <td>2-79</td> <td></td>	2-79	

Approved by: *[Signature]*
STATE CONSERVATION ENGINEER, S.C.S.,
HOUSTON, TEXAS

Project: *[Signature]*
DRAWING NO.
4-E-36,791



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	caliche
marble	soapstone	undifferentiated	

Other Symbols

hole logged only	strike and dip	pit, logged only
hole sampled	pit or trench, sampled	

ABBREVIATIONS

ang. angular boulders (> 12")	lam. laminated	G gravel, gravelly
calc. calcareous	lse. loose	S sand, sandy
cali. caliche	mas. massive	M silt, silty
cav. cavities	med. medium	C clay, clayey
cmt. cemented	mic. micaceous	O organic
cse. coarse cobbles (3"-12")	mod. moderately	W well graded
cbl. compact	n. r. no recovery	P poorly graded
con. concretions	po. permeable	
xln. crystalline	rd. rounded	
ds. dense	sft. soft	
dip. dipping	sl. slightly	
d.s. downstream	st. stiff	
fin. fine	stb. thin-bedded	
frm. firm	tuff. tuffaceous	
frac. fractured	u.s. upstream	
frag. fragments	var. variable	
fri. friable	v. very	
grn. grain	w. with	
gyp. gypseous	wea. weathered	
hd. hard	w.l. (date) static water level	
h. highly		

UAD unable to auger deeper
UED unable to excavate deeper

Seismic Refraction line & Shot Point Location

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

Revised February 1963

PLAN AND PROFILES FOR GEOLOGIC INVESTIGATIONS

FLOODWATER RETARDING STRUCTURE SITE NO. 6

SANDERSON CANYON WATERSHED

IN

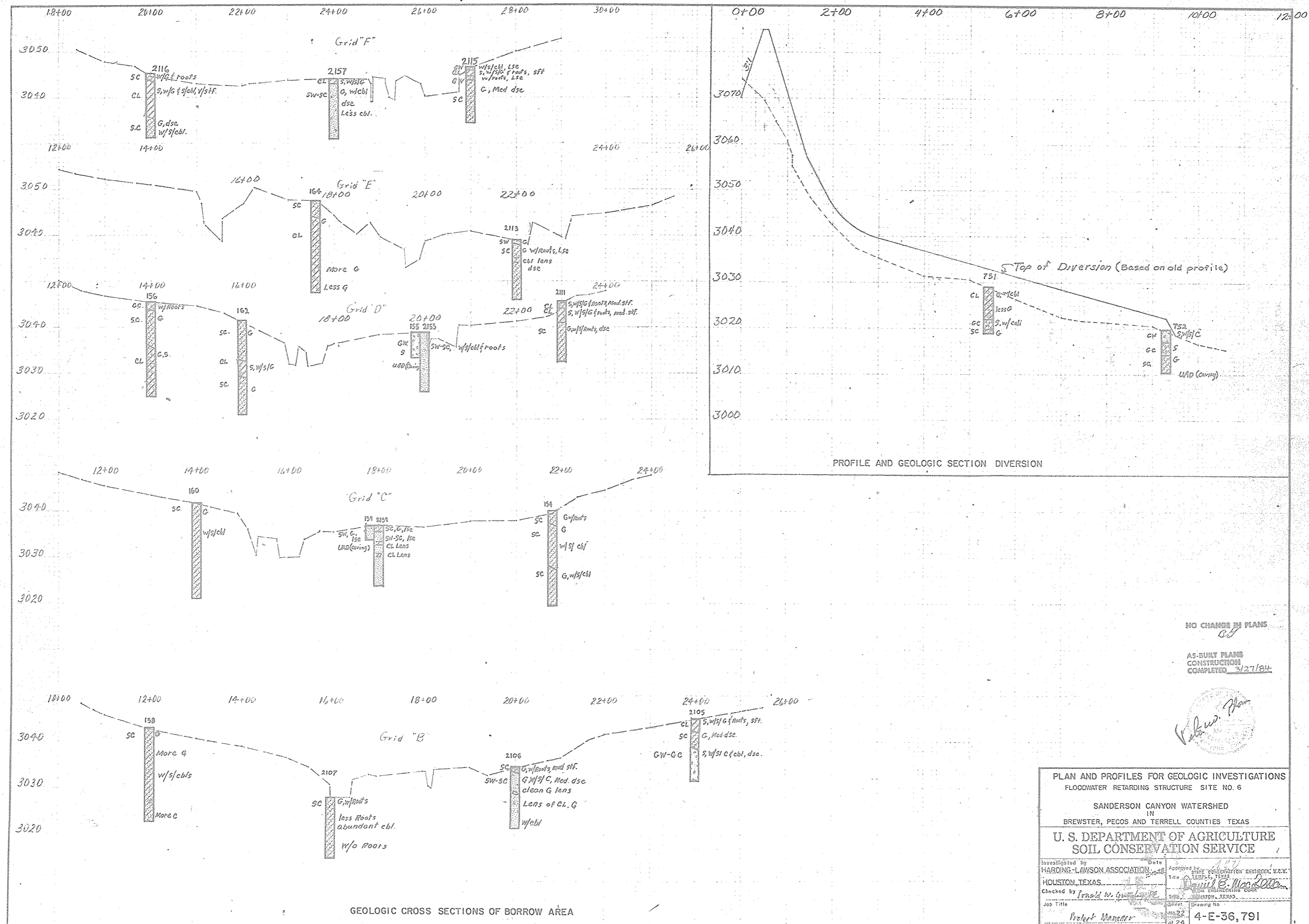
BREWSTER, PECOS, AND TERRELL COUNTIES TEXAS

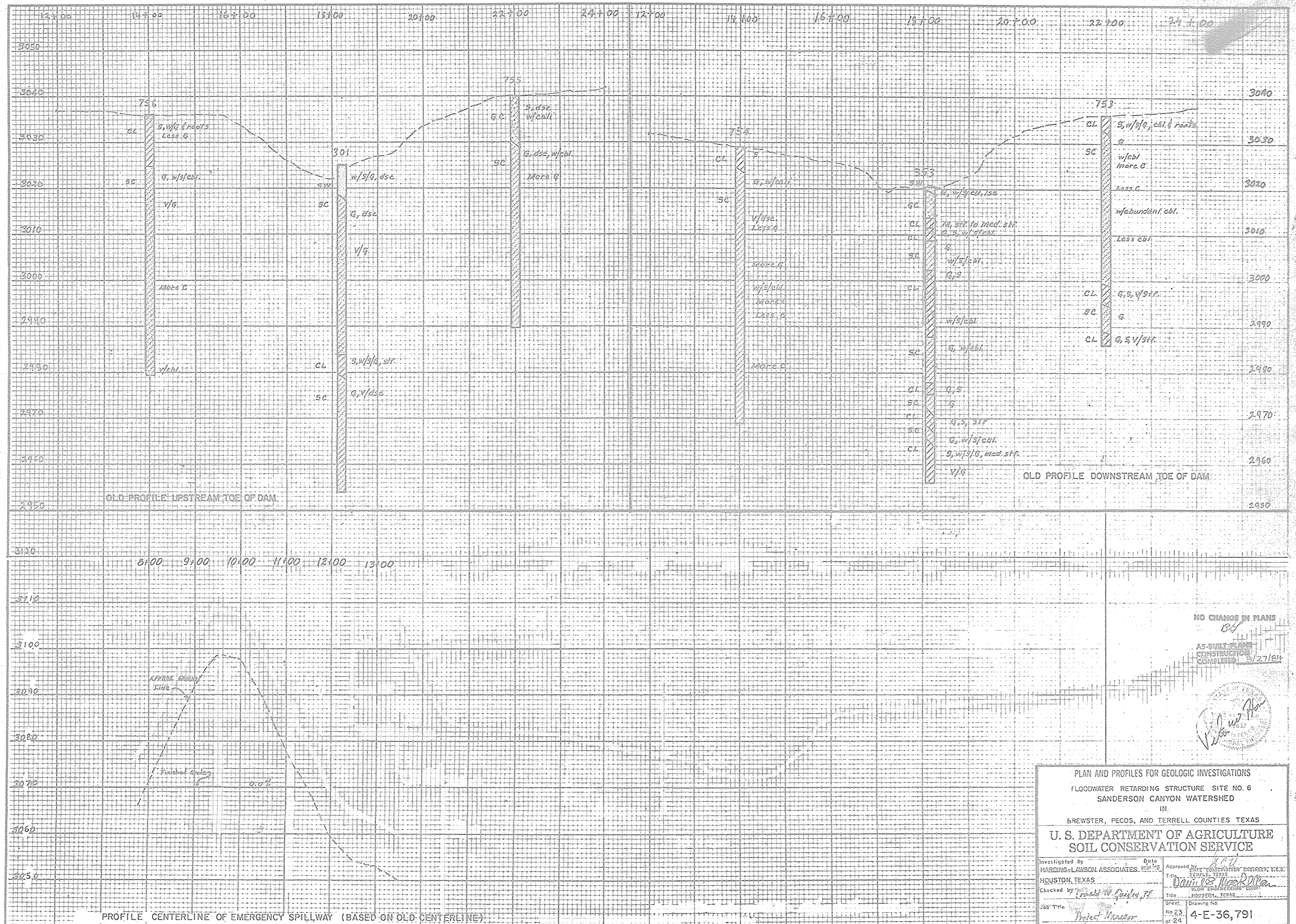
U. S. DEPARTMENT OF AGRICULTURE

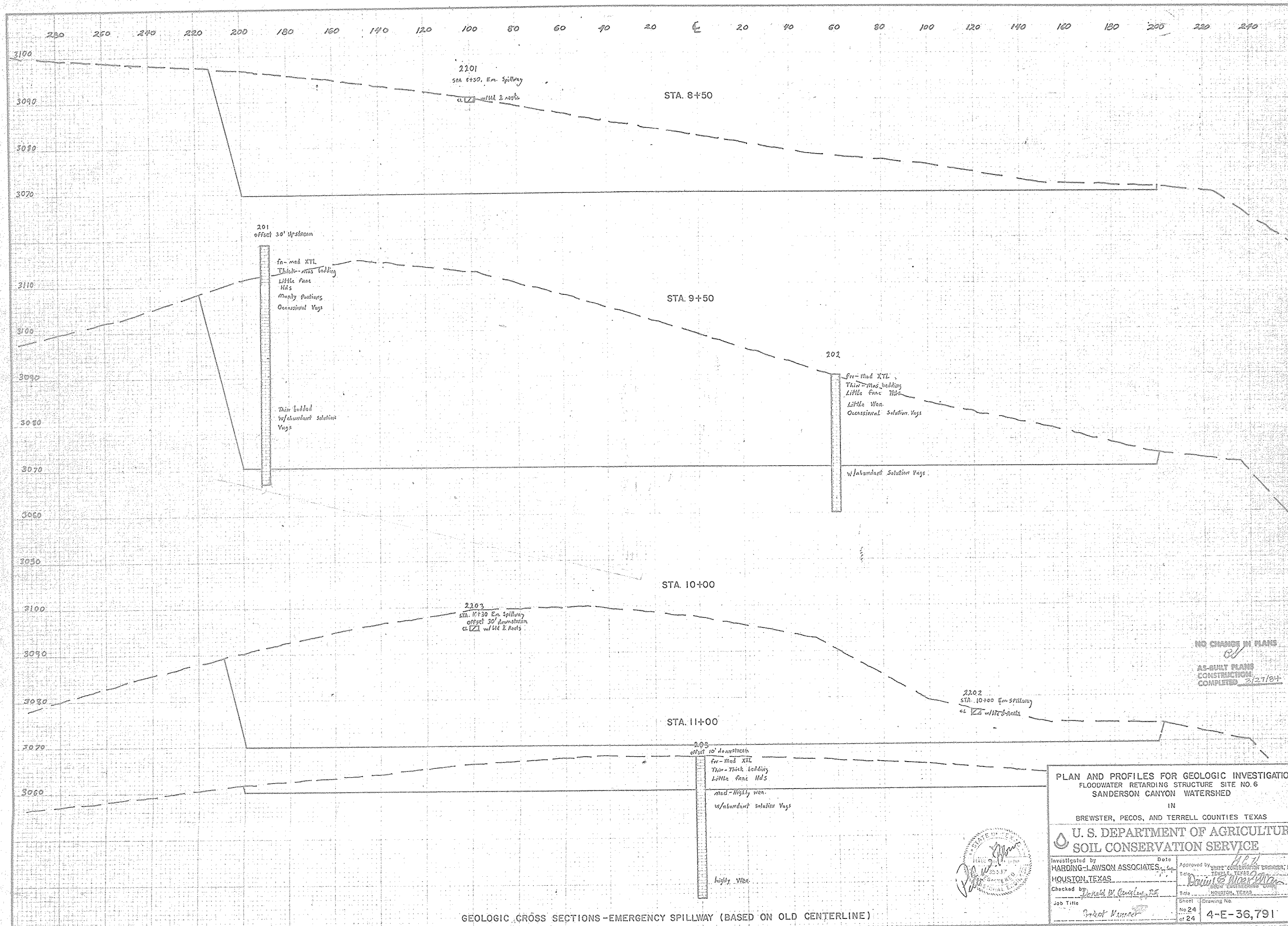
SOIL CONSERVATION SERVICE

Investigated by HARDING-LAWSON ASSOCIATES HOUSTON, TEXAS	Date 3/29/84	Approved DAVID E. MOORE HOUSTON, TEXAS
Checked by Donald W. Menden	Title Project Manager	Sheet No. 20 of 24
Job Title Project Manager	Drawing No. 4-E-36,791	

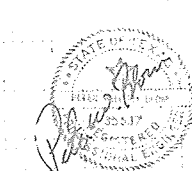
ES 900 RSC-35A (April 1958)







GEOLOGIC CROSS SECTIONS-EMERGENCY SPILLWAY (BASED ON OLD CENTERLINE)



PLAN AND PROFILES FOR GEOLOGIC INVESTIGATIONS FLOODWATER RETARDING STRUCTURE SITE NO. 6 SANDERSON CANYON WATERSHED IN BREWSTER, PECOS, AND TERRELL COUNTIES TEXAS			
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
Investigated by HARDING-LAWSON ASSOCIATES HOUSTON, TEXAS	Date 11/23/83	Approved by State Conservation Engineer, TX DAVID E. McNEELY HOUSTON, TEXAS	Title SOIL CONSERVATION SERVICE
Checked by Donald W. Conley, Jr. Project Manager	Sheet No 24 of 24	Drawing No.	4-E-36,791