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"AS BUILT"

RITTENHOUSE FLOODWATER RETARDING STRUCTURE

A321.602
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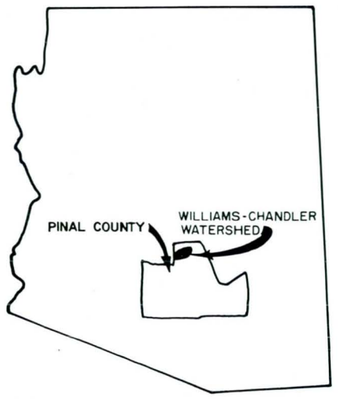

WILLIAMS—CHANDLER WATERSHED
PROTECTION AND FLOOD PREVENTION PROJECT
PINAL COUNTY, ARIZONA

PLANS FOR THE CONSTRUCTION OF

RITTENHOUSE FLOODWATER RETARDING STRUCTURE

BY

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

INDEX OF DRAWINGS

DRWG. NO.	SHT. NO.	TITLE
7-E-20764	1.	INDEX OF DRAWINGS
	2.	LOCATION MAP
	3.	PLAN AND PROFILE
	4.	PLAN AND PROFILE
	5.	PLAN AND PROFILE
	6.	DETAILS OF EMERGENCY SPILLWAY
	7.	DETAILS OF PRINCIPAL SPILLWAY
	8.	DETAILS OF PRINCIPAL SPILLWAY INLET AND TRASH RACK
	9.	DETAILS OF PRINCIPAL SPILLWAY INLET
	10.	DETAILS OF PRINCIPAL SPILLWAY CONDUIT
	11.	DETAILS OF PRINCIPAL SPILLWAY OUTLET STRUCTURE
	12.	DETAILS OF PRINCIPAL SPILLWAY OUTLET STRUCTURE
	13.	DETAILS OF PRINCIPAL SPILLWAY OUTLET STRUCTURE
	14.	DETAILS OF DROP STRUCTURE, STA. 16+00
	15.	DETAILS OF DROP STRUCTURE, STA. 16+00
	16.	DETAILS OF DROP STRUCTURE, STA. 16+00
	17.	DETAILS OF 24" GATED OUTLET
	18.	DETAILS OF 24" GATED OUTLET
	19.	DETAILS OF 24" GATED OUTLET
	20.	P.W.D. BASIN
	21.	FENCING DETAILS, STA. 48+50, STA. 96+60, AND STA. 149+95
	22.	LOCATION OF GEOLOGIC TEST HOLES
	23.	PLAN AND PROFILE FOR GEOLOGIC INVESTIGATIONS
	24.	PLAN AND PROFILE FOR GEOLOGIC INVESTIGATIONS
	25.	PLAN AND PROFILE FOR GEOLOGIC INVESTIGATIONS
	26.	PLAN AND PROFILE FOR GEOLOGIC INVESTIGATIONS

STRUCTURAL NOTES

1. All exposed concrete edges shall be chamfered 1 inch or rounded.
2. Indicated reinforcing bar spacing is center to center of bars, bar cover is clear distance between surface of bar and face of concrete, and shall be 2" for formed and top surfaces and 3" for surfaces poured against earth, unless otherwise shown.
3. In sections having a single mat of reinforcing, the steel shall be positioned in the center of the section unless otherwise shown.
4. All bar splices not shown on the drawings shall be staggered with bars lapped a min. of 30 dia.
5. Quantities are for bid purposes only. Contractor will be responsible for the furnishing and placing of all materials.

GENERAL NOTES

1. Elevations are shown in feet above mean sea level datum.
2. All stationing refers to centerline of construction and is the measured horizontal distance.
3. Subsurface utility lines which lie within excavation limits, unless otherwise noted, will be removed or relocated by the owner thereof or abandoned in place.
4. Locations shown for subsurface utilities are approximate only. Such locations are indicated only to direct the contractor's attention to the probability that those utilities lie within the construction limits.
5. Utility poles which lie within the construction limits or within reservoir or borrow areas will be removed or relocated by the owners thereof unless otherwise noted.

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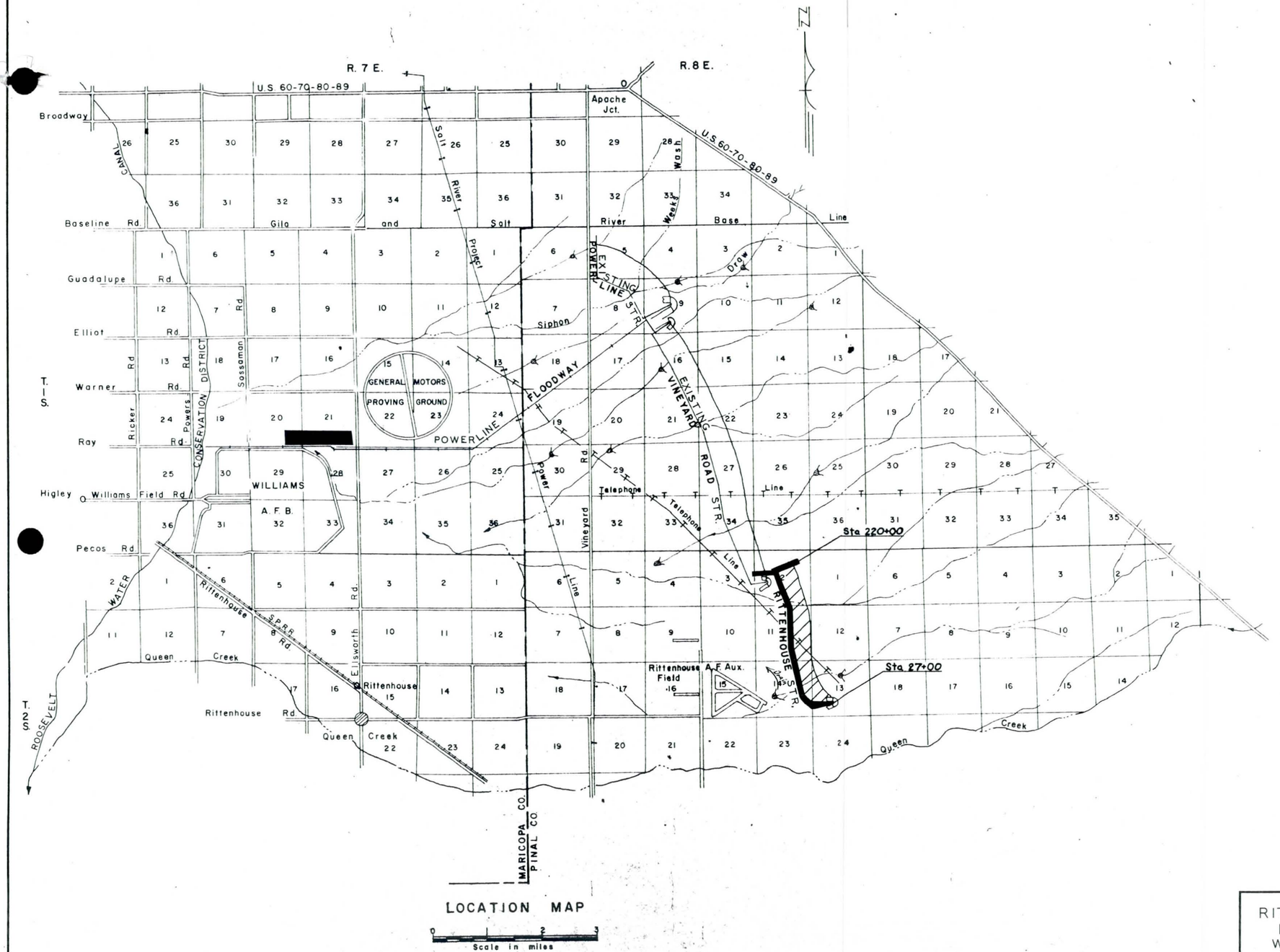
INDEX OF DRAWINGS

WILLIAMS-CHANDLER W.P.P.

PINAL COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

	Date		
Designed Soil Conservation Service	5-68	Approved by	
Drawn Soil Conservation Service	5-68	Title Head E & W.P. Unit	
Traced		Title	
Checked R.O.G. F.I.M.	6-68	Sheet No. 1 of 26	Drawing No. 7-E-20764



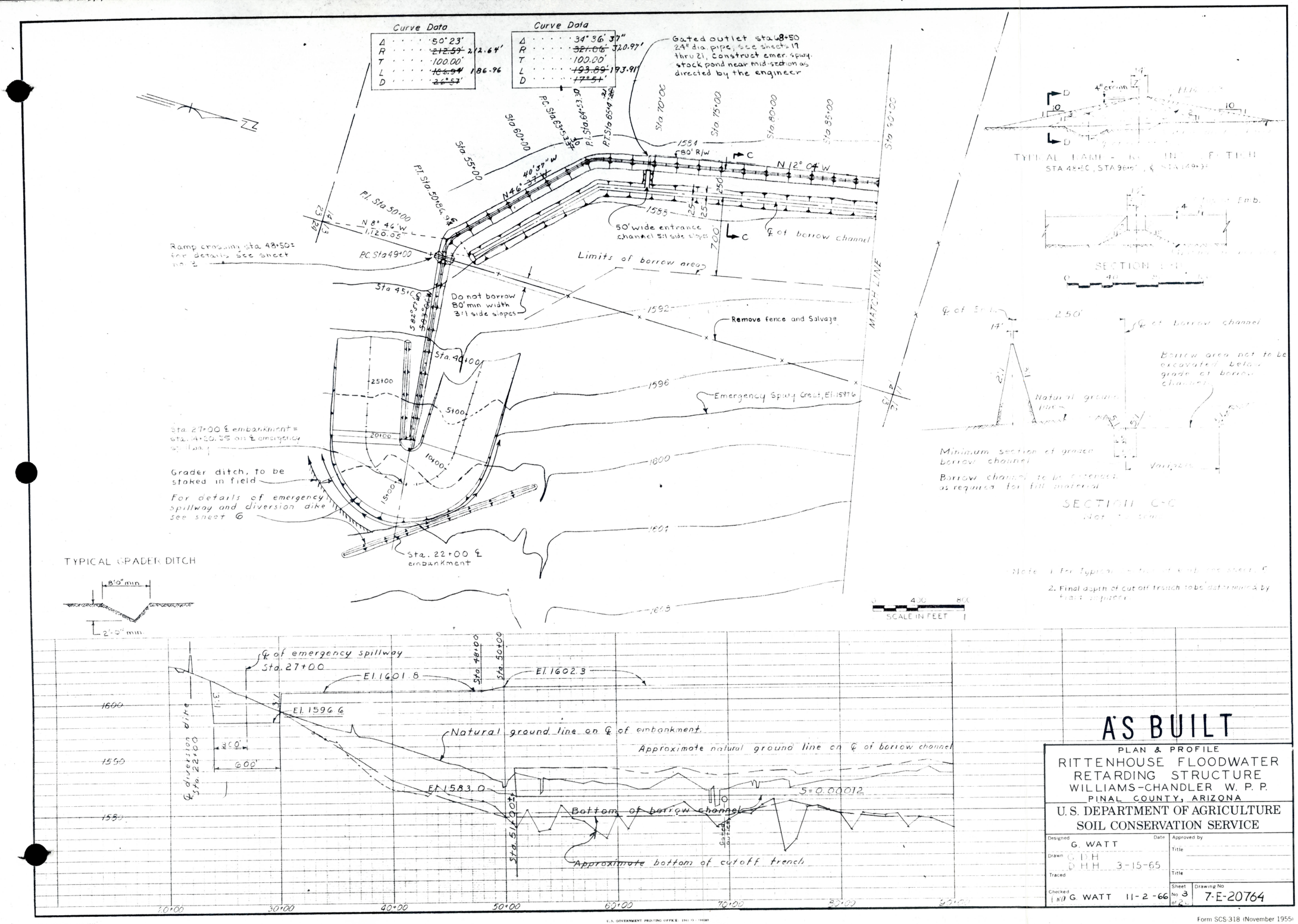
AS BUILT

LOCATION MAP
RITTENHOUSE FLOODWATER RETARDING STRUCTURE
WILLIAMS-CHANDLER W. P. P.
PINAL COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	Date
Drawn G. HANLEY 2-11-66	Approved by
Traced	Title
Checked	Sheet No. 2 of 26
	Drawing No. 7-E-20764

FORM SCS 313 (APRIL 1963)



AS BUILT

PLAN & PROFILE
RITTENHOUSE FLOODWATER RETARDING STRUCTURE
WILLIAMS-CHANDLER W. P. P.
PINAL COUNTY, ARIZONA

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed G. WATT	Date	Approved by	
Drawn G.D.H. D.H.H. 3-15-65		Title	
Traced		Title	
Checked G. WATT 11-2-66		Sheet No. 3 of 2	Drawing No. 7-E-20764

Curve Data

Δ	10°27'15"
R	~~1093.5'~~ 1,093.13'
T	100.00'
L	~~199.45~~ 199.40'
D	~~5°15'~~

Curve Data

Δ	~~19°01'~~ 19°0'30"
R	~~597.34~~ 597.34'
T	100.00
L	~~198.16~~ 198.32'
D	~~9°36'~~

Ramp Crossing Sta ~~96+60~~ 96+78.75
See sheet 3 for detail

Ramp crossing 149+98.51
Sta ~~149+55~~
See sheet 3
For detail

Gated Outlet
Sta ~~54+00~~ 156+00
24"dia Pipe
Sheets 17 thru 19
50' wide entrance
Normal 5:1 side slopes

80' R/W

N 12° 04' W

N 1° 34' W

N 37° 14' W

Sta 90+00

Sta 95+00

Sta 100+00

Sta 105+00

Sta 110+00 .50

P.C. Sta 111+21.50

P.I. Sta 112+21.50

P.T. Sta 113 20.90

Sta 115+00

Sta 120+00

Sta 125+00

Sta 135+00

Sta 140+00

Sta 145+00

1580

1585

1590

1595

1600

1605

25'

25'

700'

92.5'

90.83'

C

C

℄ of borrow channel

Limits of borrow area

R/W Do not borrow
80' min. width
3:1 Side Slopes

R/W Do not borrow
80' Min. width
3:1 Side Slopes

Mountain States Telephone line
crosses ℄ at Sta 141+00±

Remove fence and salvage

MATCH LINE

Emergency Spillway Crest El 1597.6

14 13 12

21 11

0 400 800
SCALE IN FEET

Top of Emb. El. 1602.3

1600

1590

1580

Natural ground line on ℄ of embankment

Approximate natural ground line on ℄ of borrow channel

S=0.00012

El. 1582.0

S=0.000714

Gated outlet pipe 24" dia.

Bottom of borrow channel

Approximate bottom of cutoff trench

Borrow channel slope change Sta. 134+60

1570

90+00 100+00 110+00 120+00 130+00 140+00 150+00 160+00

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PLAN & PROFILE
RITTENHOUSE FLOODWATER
RETARDING STRUCTURE
WILLIAMS-CHANDLER W. P. P.
PINAL COUNTY, ARIZONA

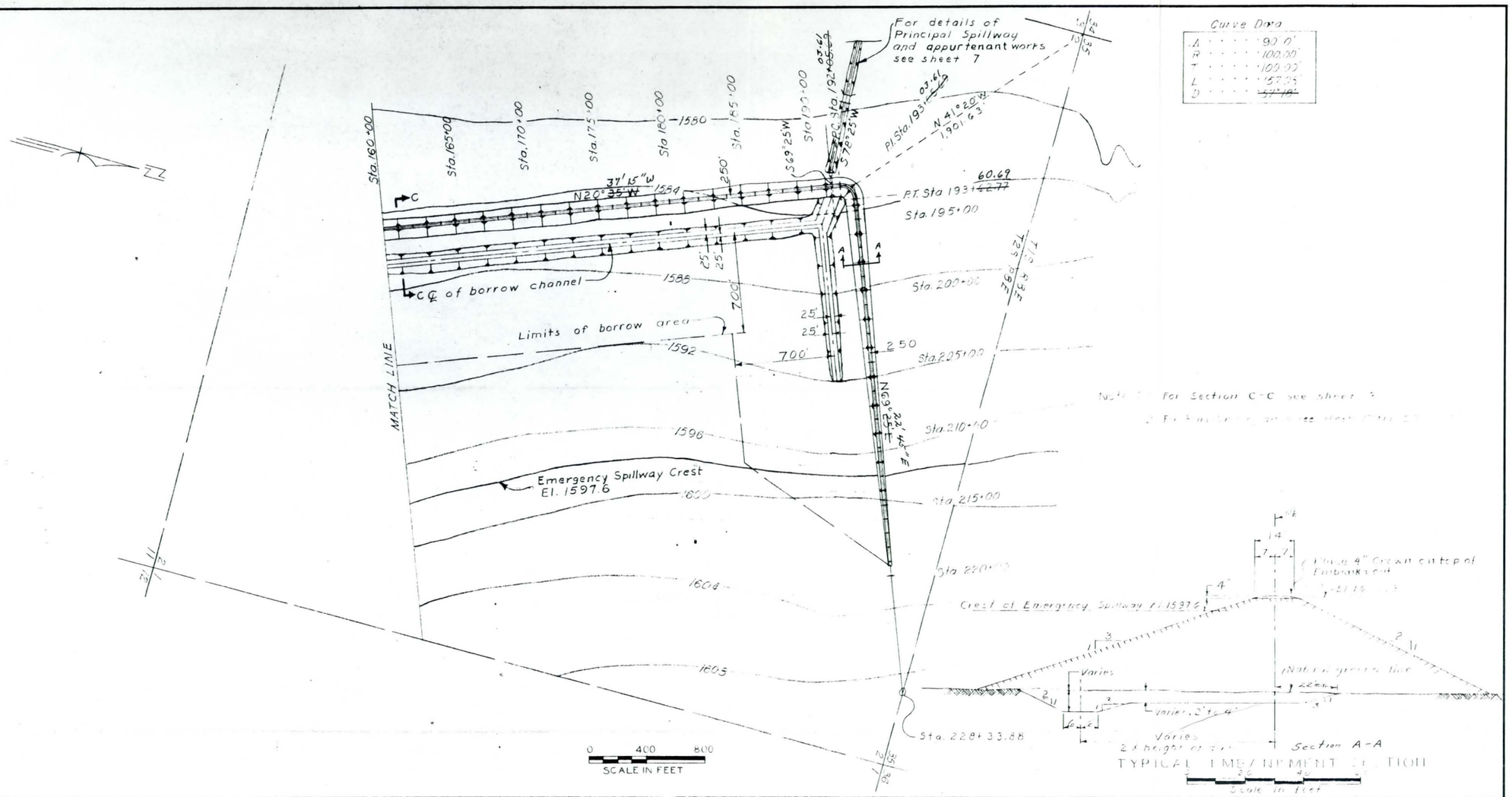
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

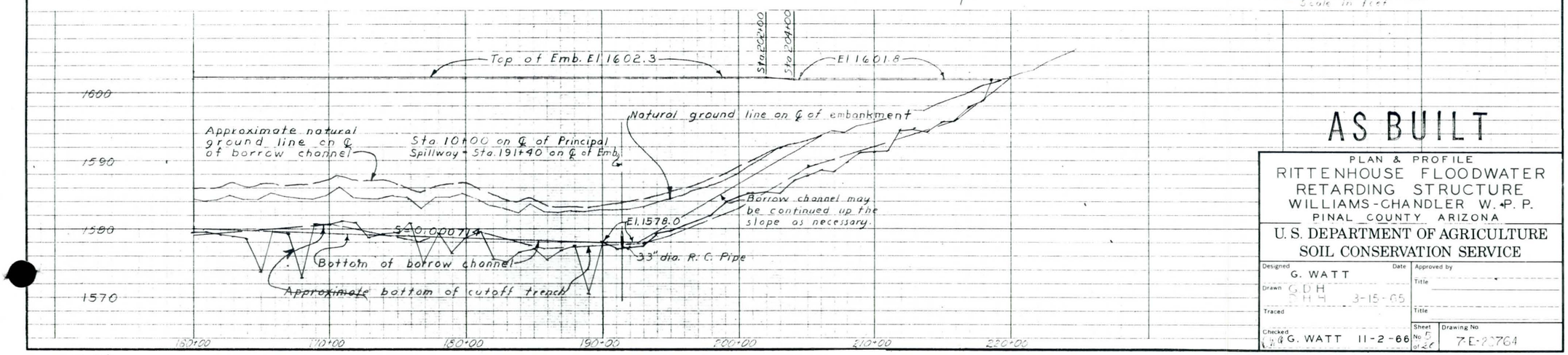
Designed G. WATT	Date	Approved by	
Drawn G. D. H. D. H. H.	3-15-65	Title	
Traced		Title	
Checked G. WATT	11-2-66	Sheet No. 1 of 20	Drawing No. 7-E-2076 4

USDA SCS PORTLAND, OREG. 1968

U.S. GOVERNMENT PRINTING OFFICE: 1961 O - 599188

Form SCS-318 (November 1955)





AS BUILT

PLAN & PROFILE
RITTENHOUSE FLOODWATER RETARDING STRUCTURE
WILLIAMS-CHANDLER W. P. P.
PINAL COUNTY ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed G. WATT	Date	Approved by	
Drawn G D H S H H	3-15-65	Title	
Traced		Title	
Checked G. WATT	11-2-66	Sheet No. 5 of 25	Drawing No. 7E-82764

Form SCS-318 (November 1955)

CURVE DATA

Δ	165°00'
R	400.00'
L	1,151.92'
T	3,038.32
D	~~14°20'26"~~ 14°19'26"

NN

Diversion dike and drain, ~~approx. 1800'~~ 2,350' long, see section A-A

C. Sta 8+48.08

N 1° 0' E

S 89° 00 E

5+00

10+00

S 43° 00' W

45+00

40+00

35+00

15+00

B

P.I. Sta 14+20.55

F.II delta ⌀ El 1461.5

Sta 22+00 ⌀ of emb.

Sta 14+20.55 at emergency spillway = Sta 27+67 on ⌀ of emb.

Construct grassed ditch

48+27.64

Ramp Entrance

Construct dike 4 ft. high, 12' top width, 3:1 slope inside, 2:1 slope outside, and dike at Sta 31+00

S 76° 00' W

25+00

S 20° 50' W

300'

S 14° 00' E

Sta 19+50.0

30+00

34+00

1600

1598

1596

1594

1592

1591

P.T. Sta 20+00

PLAN

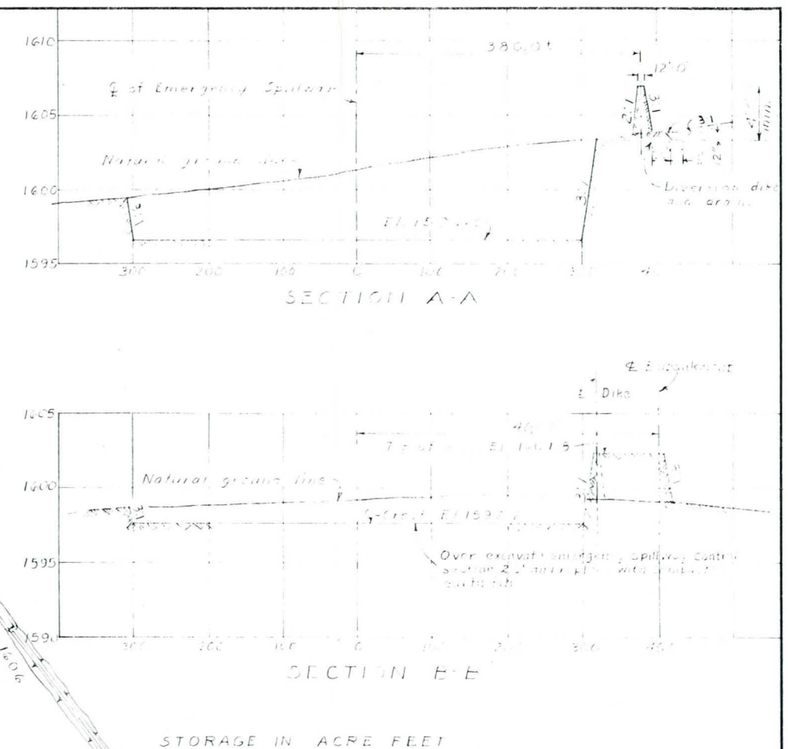
0 200 400 600

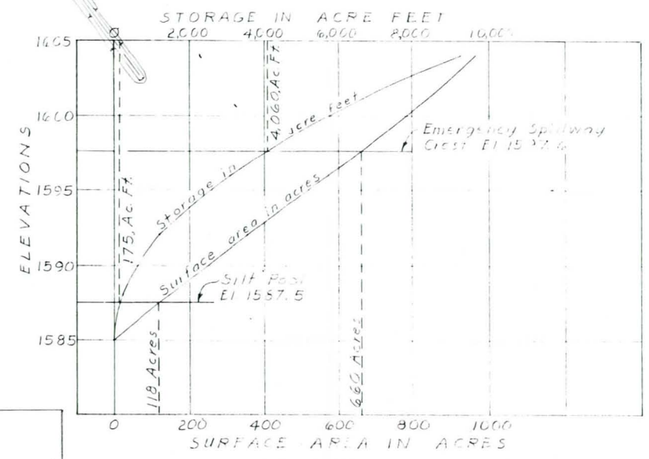
Scale in feet

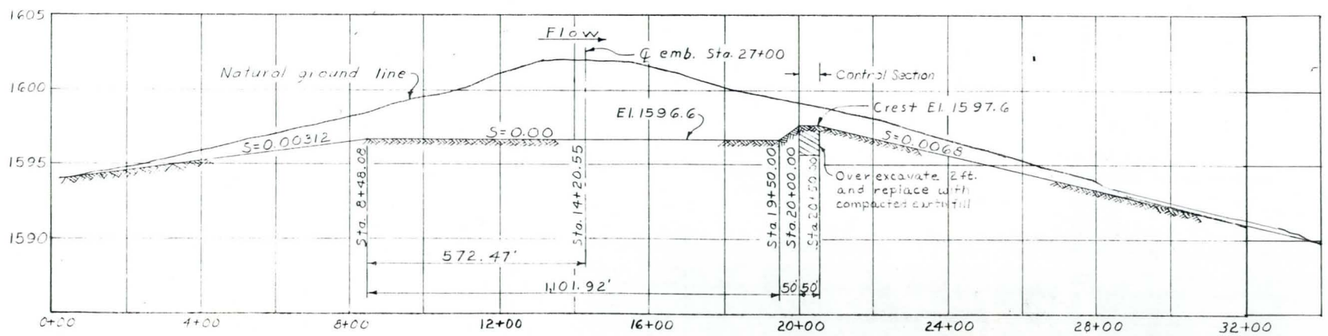
2' min.

8' typical

Typical Grassed Ditch







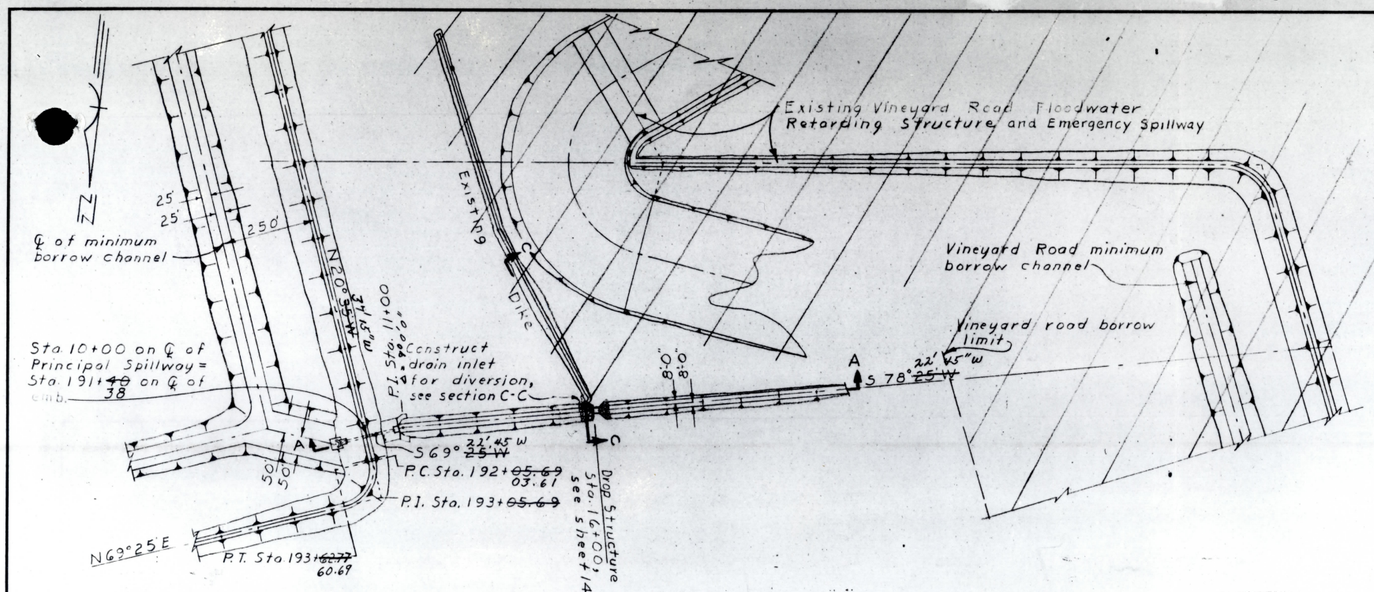
AS BUILT

DETAILS OF EMERGENCY SPILLWAY
RITTENHOUSE FLOODWATER RETARDING STRUCTURE
WILLIAMS-CHANDLER W. P. P.
PINAL COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

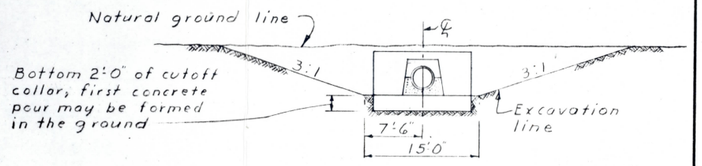
	Date		
Designed	G. W. S. G.D.H.	Approved by	
Drawn	G. D. H. 10-14-65	Title	
Traced		Title	
Checked	G. WATT 11-3-66	Sheet No. 6	Drawing No. 7E-2076

U. S. GOVERNMENT PRINTING OFFICE: 1966 O - 634750

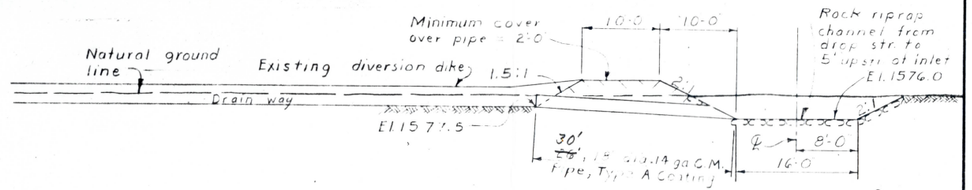


PLAN OF PRINCIPAL SPILLWAY & OUTLET CHANNEL

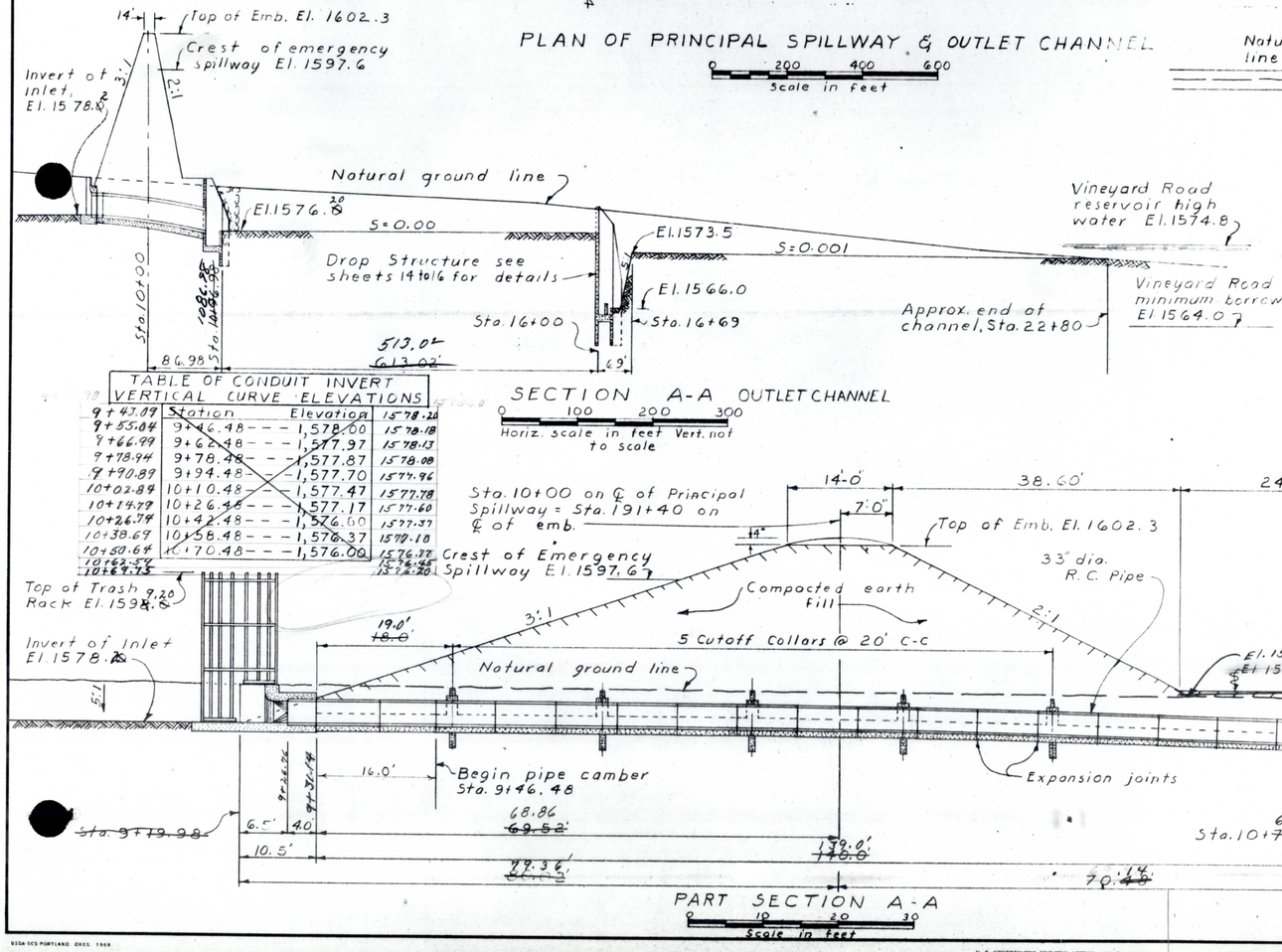
0 200 400 600
Scale in feet



SECTION B-B



SECTION C-C (See attached sheet)
Sta 15+90 of channel



SECTION A-A OUTLET CHANNEL

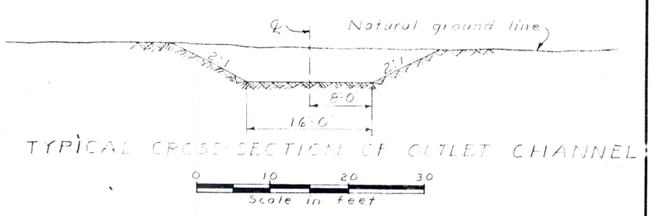
0 100 200 300
Horiz. scale in feet Vert. not to scale

TABLE OF CONDUIT INVERT VERTICAL CURVE ELEVATIONS

Station	Elevation	
9+43.09	9+46.48	1,578.00	1578.20
9+55.04	9+62.48	1,577.97	1578.18
9+66.99	9+78.48	1,577.87	1578.13
9+78.94	9+94.48	1,577.70	1578.08
9+90.89	10+10.48	1,577.47	1574.96
10+02.84	10+26.48	1,577.17	1577.78
10+14.79	10+42.48	1,576.80	1577.60
10+26.74	10+58.48	1,576.37	1577.37
10+38.69	10+74.48	1,576.00	1579.10
10+50.64	10+90.48	1,575.57	1576.77
10+62.59			1576.48
10+67.75			1576.20

PART SECTION A-A

0 10 20 30
Scale in feet



TYPICAL CROSS SECTION OF OUTLET CHANNEL

0 10 20 30
Scale in feet

AS BUILT

DETAILS OF PRINCIPAL SPILLWAY
RITTENHOUSE FLOODWATER RETARDING STRUCTURE
WILLIAMS-CHANDLER W. P. P.
PINAL COUNTY ARIZONA

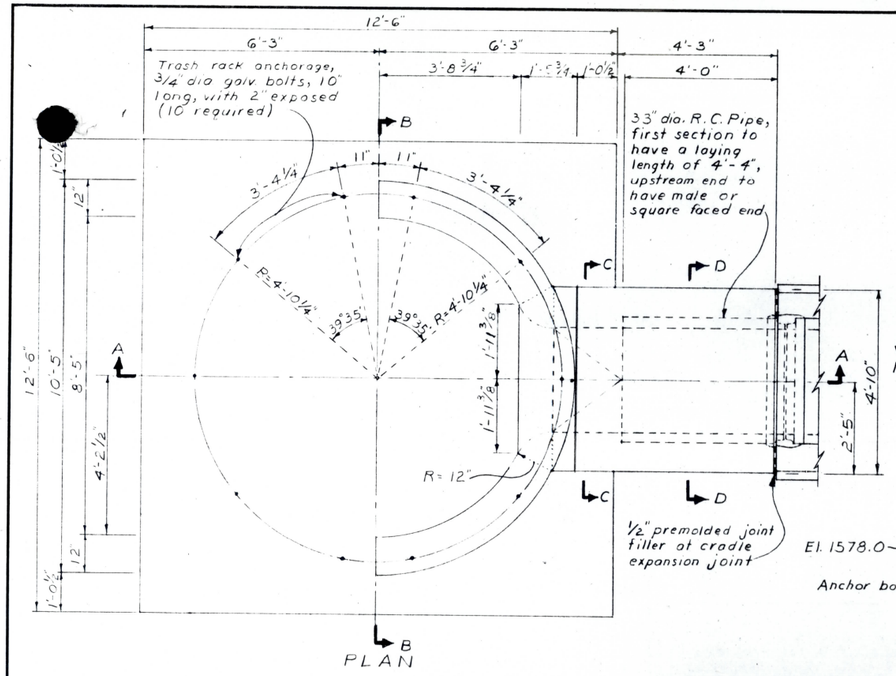
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed G.W. & G.D.H.	Date	Approved by	
Drawn G.D.H.	11-1-1965	Title	
Traced		Title	
Checked G.W. G. WATT	11-3-66	Sheet No. 7 of 26	Drawing No. 7-E-20764

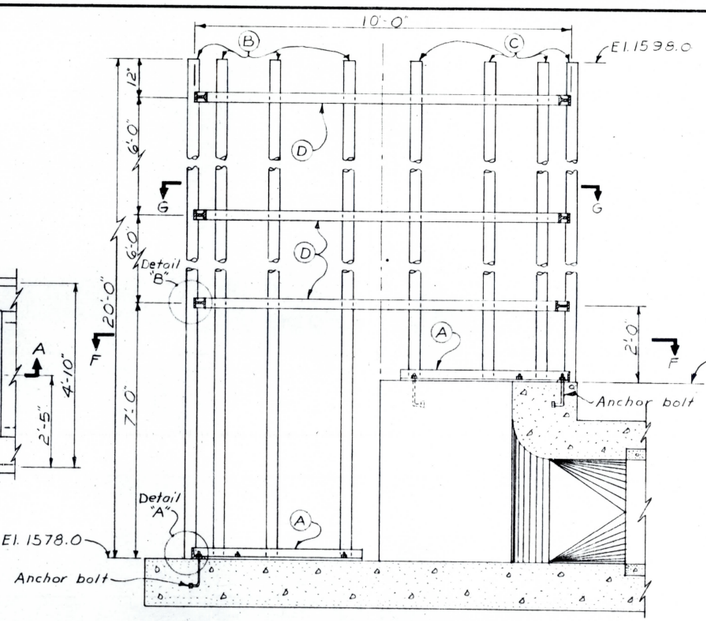
FORM SCS-313 (APRIL 1963)

USDA SCS PORTLAND, OREG. 1968

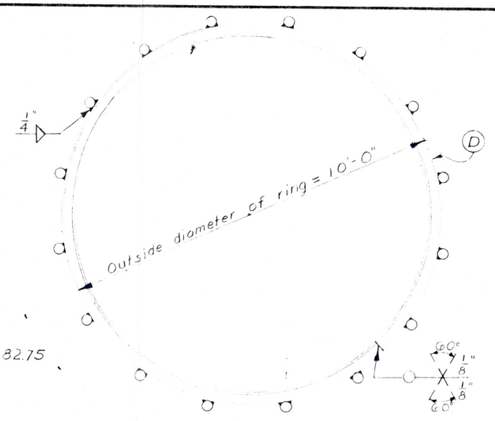
U. S. GOVERNMENT PRINTING OFFICE : 1963 O - 683786



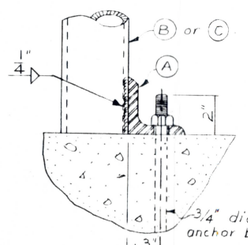
PLAN



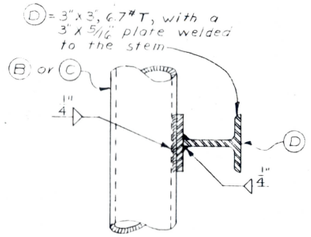
SECTION A-A, SHOWING TRASH RACK



PLAN G-G

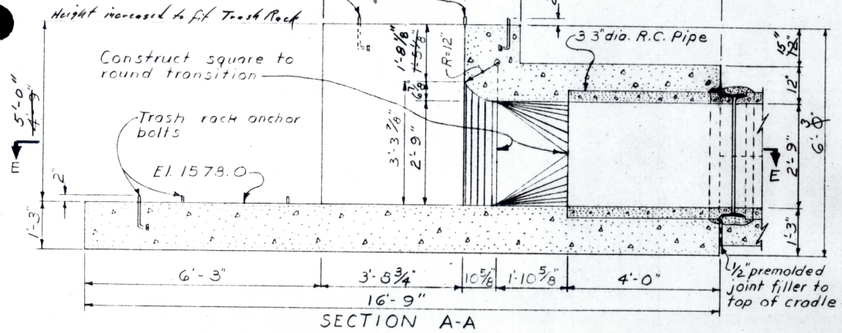


DETAIL "A"



DETAIL "B"

0 3 6 9 12
Scale in inches



SECTION A-A

SECTION F-F

SECTION B-B

SECTION C-C

SECTION D-D

0 2 4 6
Scale in Feet

TRASH RACK MATERIAL LIST

Mark	Description	Quantity
A	L, 3"X3"X5/16", 14'-8" long, bent in circular arc and drilled for anchor bolts as shown.	2
B	Pipe, black, 3" dia. extra strong, 20'-0" long	8
C	Pipe, black, 3" dia. extra strong, 15'-3" long	8
D	3"X3", 6.7 T, 29'-8 3/16" long, with a 3"X5/16" plate, 31'-5" long welded to stem, finished member will be a 10'-0" dia. circular ring, as shown in Plan G-G	3
Bolts	anchor, 3/4" dia. galv., 10" long, with nuts	10

Notes:
1. See reinforcement steel placement drawing for sectional Plan E-E
2. All circular bends of structural steel shall be cold rolled to a smooth radius curve.
3. All exposed concrete edges shall be champhered 3/4"

TABLE OF QUANTITIES

Item	Unit	Quantity
Concrete	Cu.Yd.	~~13.6~~ 13.34
Reinforcing steel	Lbs.	~~1,465~~ 1,491

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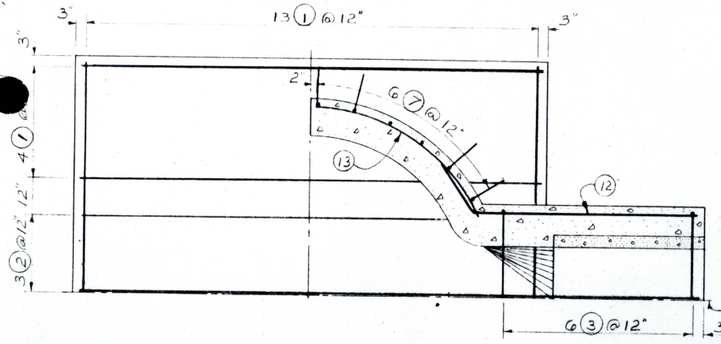
DETAILS OF PRINCIPAL SPWY. INLET & TRASH RACK
RITTENHOUSE FLOODWATER RETARDING STRUCTURE
WILLIAMS-CHANDLER W. P. P.
PINAL COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

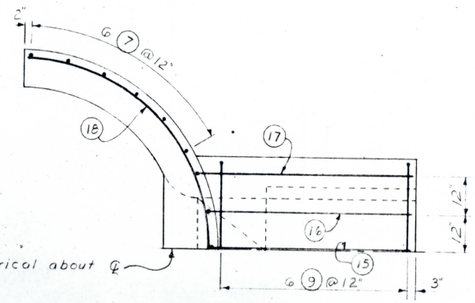
	Date		
Designed G.W. & G.D.H		Approved by:	
Drawn G.D.H	11-14-65	Title	
Traced		Title	
Checked G. WATT	11-7-66	Sheet No. 8 of 28 sheets	Drawing No. 7-E-20764

FORM SCS 313 (APRIL 1963)

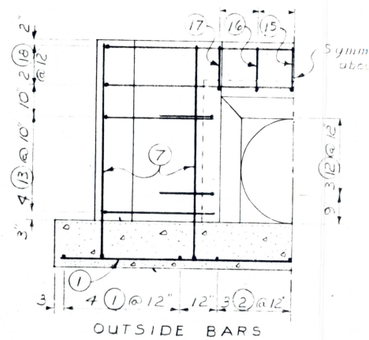
USDA-SCS PORTLAND, OREG. 1968
U. S. GOVERNMENT PRINTING OFFICE: 1963 O - 683705



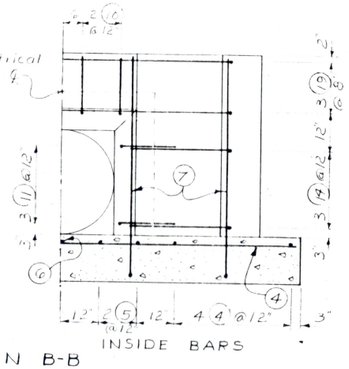
BOTTOM BARS IN APRON & OUTSIDE BARS IN SIDEWALL



TOP BARS IN ENCASEMENT & OUTSIDE BARS IN SIDEWALL

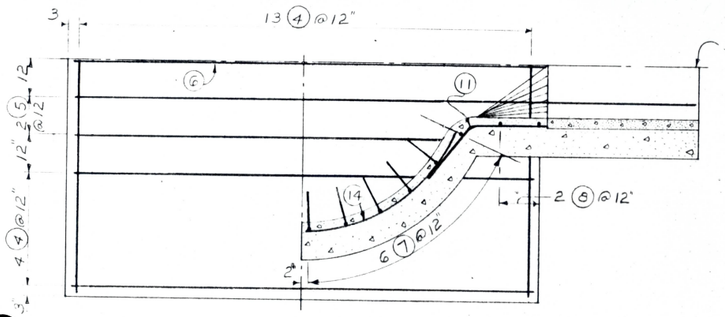


OUTSIDE BARS



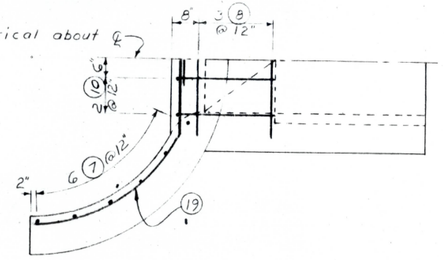
INSIDE BARS

SECTION B-B



TOP BARS IN APRON & INSIDE BARS IN SIDEWALL

SECTIONAL PLAN E-E



BOTTOM BARS IN ENCASEMENT & INSIDE BARS IN SIDEWALL

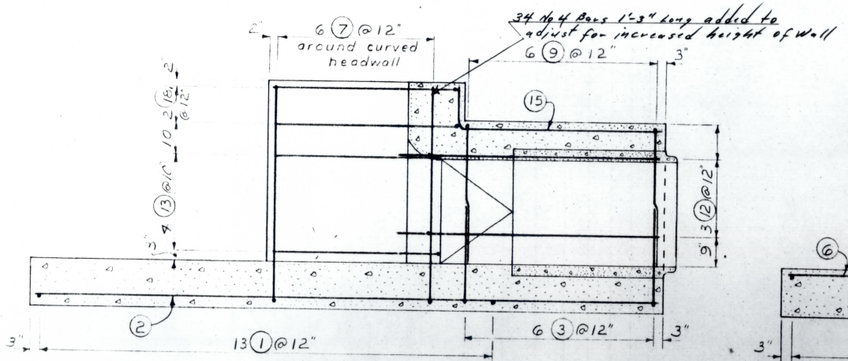
PLAN OF TOP

BAR SCHEDULE

Mark A	No.	Size	Quantity	Length	Total Length	Type	A	B	G	H	K	R	O
A	1	5	21	12-3	257-3	Str.							
A	2	5	5	16-6	82-6	Str.							
A	3	5	6	9-6	57-0	2	2-6	4-6	2-6				
A	4	6	21	12-3	257-3	Str.							
A	5	6	4	16-6	66-0	Str.							
A	6	6	1	12-6	12-6	Str.							
A	7	5	24	6-6	156-0	2	5-6	1-0					
A	8	5	7	4-3	29-9	Str.							
A	9	5	6	11-6	69-0	2	3-6	4-6	3-6				
A	10	5	4	4-0	16-0	14	1-5	0-7	2-6	1-6½	0-6		
A	11	5	6	3-9	22-6	19	1-5	2-0		1-4¼	1-1¼		
A	12	5	6	7-6	45-0	19	1-6	6-0		1-2	0-11½		
A	13	5	8	5-9	46-0	10	5-9					5-0	5-5
A	14	5	6	5-0	30-0	10	5-0					4-5	4-3¾
A	15	5	1	6-3	6-3	2	1-0	5-3					
A	16	5	2	6-6	13-0	2	1-0	5-6					
A	17	5	2	6-9	13-6	2	1-0	5-9					
A	18	5	2	15-6	31-0	10	15-6					5-0	10-0
A	19	5	6	7-6	45-0	9	4-9	2-9				4-5	4-9

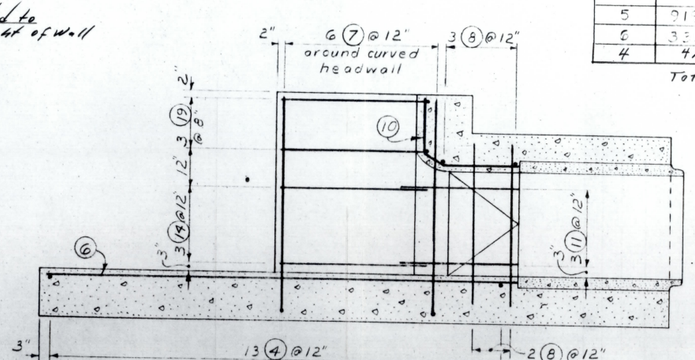
BAR TOTALS

Size	Length in feet	Weight in lbs.
5	917-9	~~960~~ 959
6	335-0	~~532~~ 504
4	42-6	28
	Total	1,491

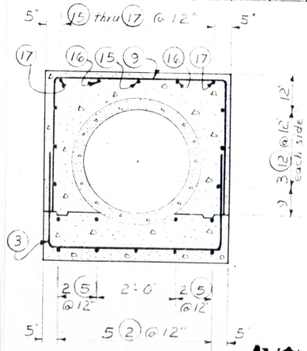


OUTSIDE BARS

SECTION A-A



INSIDE BARS

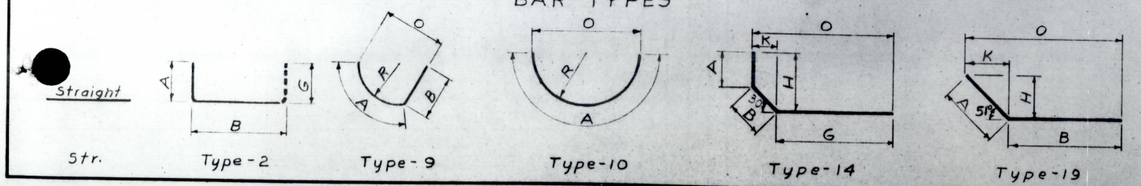


SECTION D-D

AS BUILT

Scale in feet

BAR TYPES



NOTES:

1. All bar dimensions are out to out of bar.
2. Radius of bends are seven times the bar diameter.
3. Place bars 2" from face of concrete, except as shown, and place apron bars 3" clear from ground surface.

DETAILS OF PRINCIPAL SPWY. INLET

RITTENHOUSE FLOODWATER RETARDING STRUCTURE

WILLIAMS-CHANDLER W. P. P.

PINAL COUNTY ARIZONA

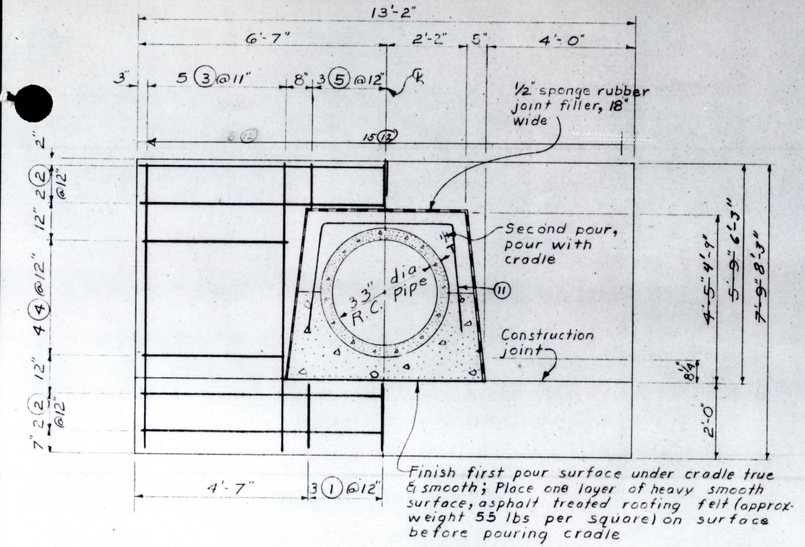
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed G. W. & G. D. H.	Date	Approved by	
Drawn G. D. H.	11-19-65	Title	
Traced		Title	
Checked G. WATT	11-8-66	Sheet No 9 of 26	Drawing No 7-E-20764

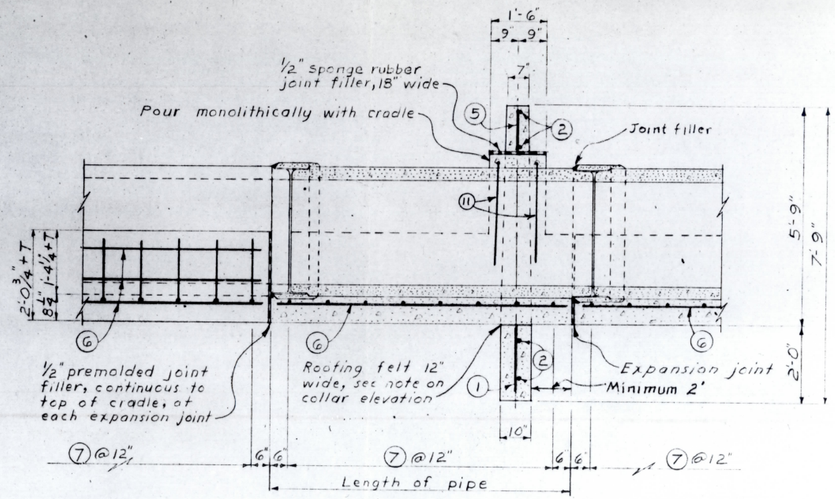
FORM SCS 313 (APRIL 1963)

USDA SCS PORTLAND, OREG. 1968

U. S. GOVERNMENT PRINTING OFFICE: 1963 O - 683766

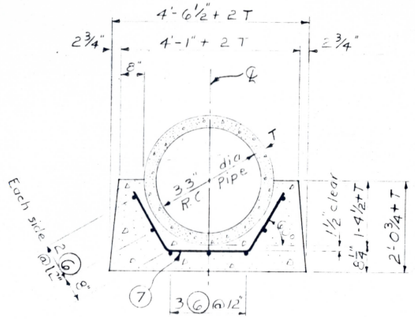


ELEVATION: CUTOFF COLLAR
(5 required)



OUTLET CONDUIT AND CUTOFF COLLAR

0 2 4 6
Scale in feet



CRADLE SECTION

77 bars @ 11'-6" = 885'-6"
7 bars @ 6'-9" = 47'-3"

BAR SCHEDULE												
Mark B	Mark No	Size	Quantity	Length	Total Length	Type	A	B	G	H	K	O
B	1	4	25	1-9	43-9	Str						
B	2	4	20	12-9	255-0	Str						
B	3	4	50	7-3	362-6	Str						
B	4	4	40	3-9	150-0	Str						
B	5	4	25	1-0	25-0	Str						
B	6	6	*	*	932-9	Str						
B	7	4	139	5-9	799-3	7	1-9	2-3	1-9	1-2¼	0-10	4-0
B	11	4	10	10-0	100-0	7	3-0	4-0	3-0	2-11	0-3½	4-7
B	12	4	75	2-0	150-0	Str						

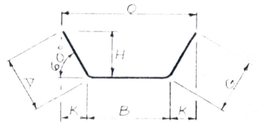
Total lin. feet of no. 4 bars = 1,635'-6 for cradle and collars

* - See note (5)

BAR TYPES

Straight

Str.



Type - 7

TABLE OF QUANTITIES		
Item	Unit	Quantity
Concrete	Cu Yd.	~~[illegible]~~ 52.7
Reinforcing Steel	Lb	~~[illegible]~~ 2661

AS BUI

Notes:
1. All bar dimensions are out to out of bar.
2. Radius of bends equals seven times the bar diameter.
3. Cutoff collars shall be spaced equally a maximum of 20' between collars and placed a minimum of 2'-0 from pipe joints.
4. Cradle expansion joints are to be provided at each pipe joint.
5. Length of reinforcing bar B ⑥ is to be 6" less than corresponding length of pipe section, except end section next to outlet structure, bars are not to be cut until laying length has been determined.

DETAILS OF PRINCIPAL SPILLWAY CONDUIT
RITTENHOUSE FLOODWATER RETARDING STRUCTURE
WILLIAMS-CHANDLER W. P. P.
PINAL COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed G.D.H.	Date	Approved by	
Drawn G.D.H.	11-24-65	Title	
Traced		Title	
Checked G. WATT	11-8-66	Sheet No. 10 of 26	Drawing No. 7-E-20764

FORM SCS 313 (APRIL 1963)

U. S. GOVERNMENT PRINTING OFFICE : 1963 O - 687081

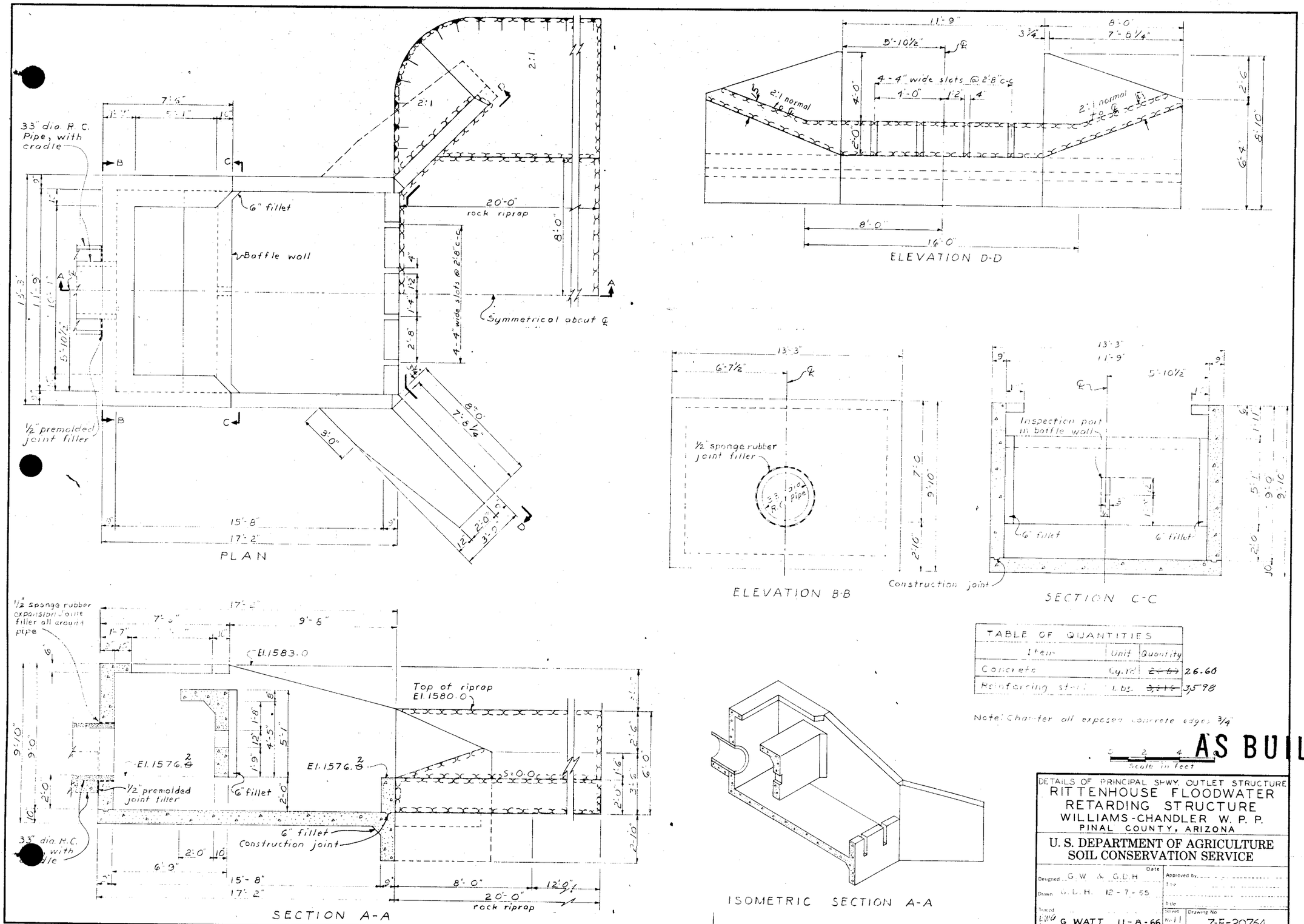


TABLE OF QUANTITIES		
Item	Unit	Quantity
Concrete	Cy. Yd.	~~2.69~~ 26.60
Reinforcing steel	Lbs.	~~3,216~~ 3,598

Note: Chamfer all exposed concrete edges 3/4"

AS BUIL

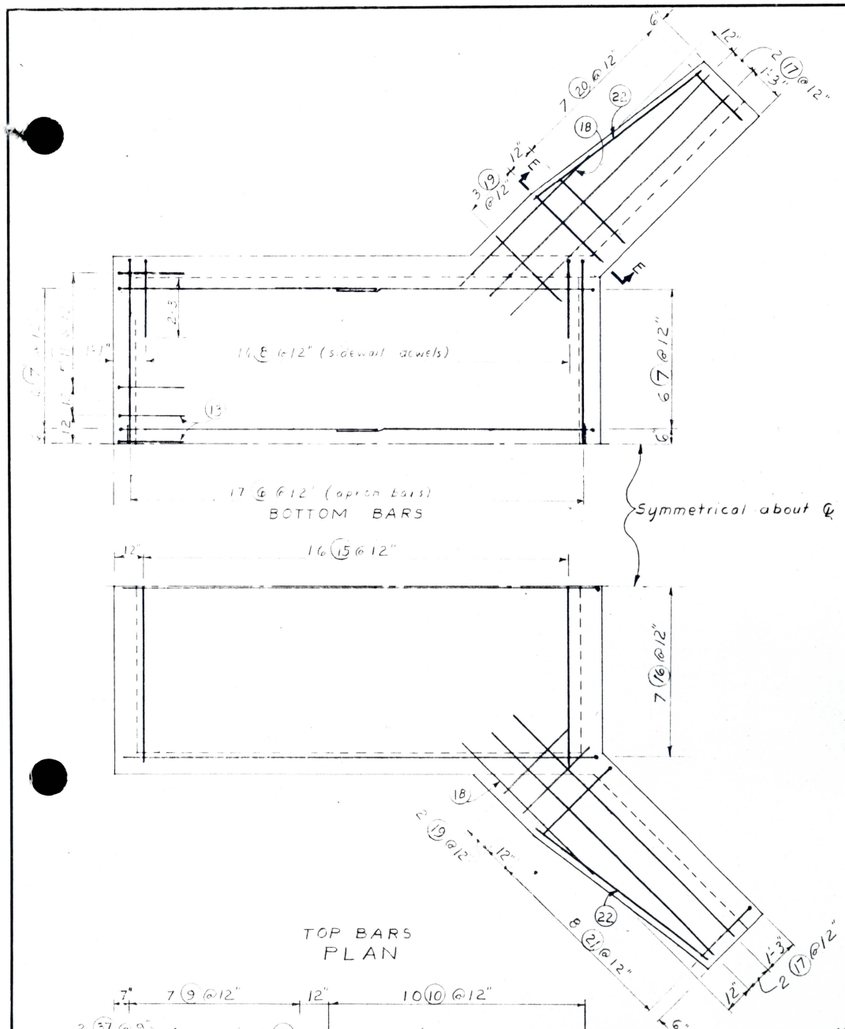
Scale in feet

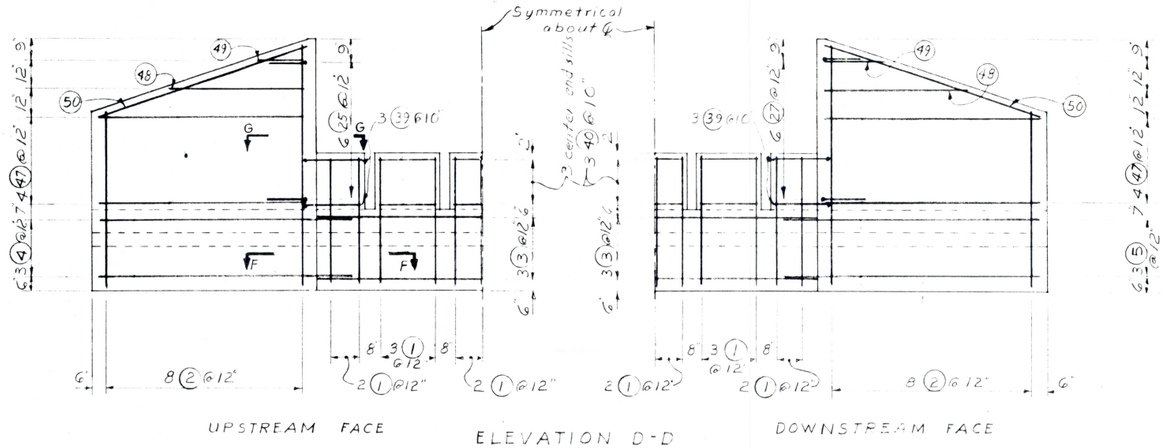
DETAILS OF PRINCIPAL SPWY. OUTLET STRUCTURE
RITTENHOUSE FLOODWATER RETARDING STRUCTURE
WILLIAMS-CHANDLER W. P. P.
PINAL COUNTY, ARIZONA

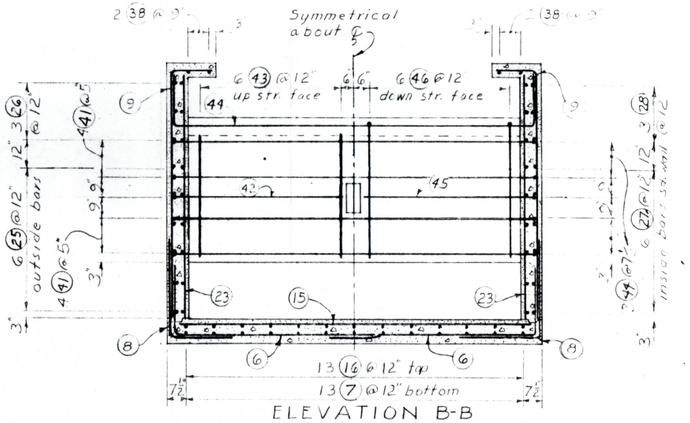
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

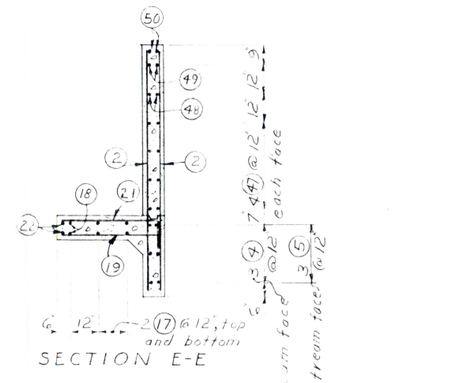
Designed G. W. & G. D. H. Date
Drawn G. D. H. 12-7-65
Traced EWG Checked G. WATT 11-8-66
Approved by
Title
Title
Sheet No. 11 of 26
Drawing No. 7-E-20764

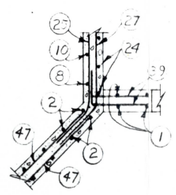
FORM SCS 313 (APRIL 1963)

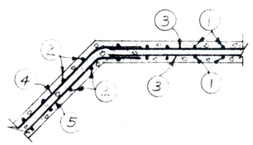


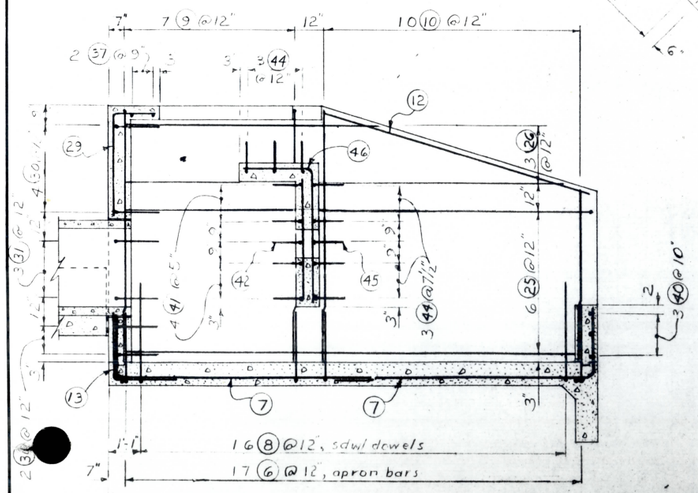


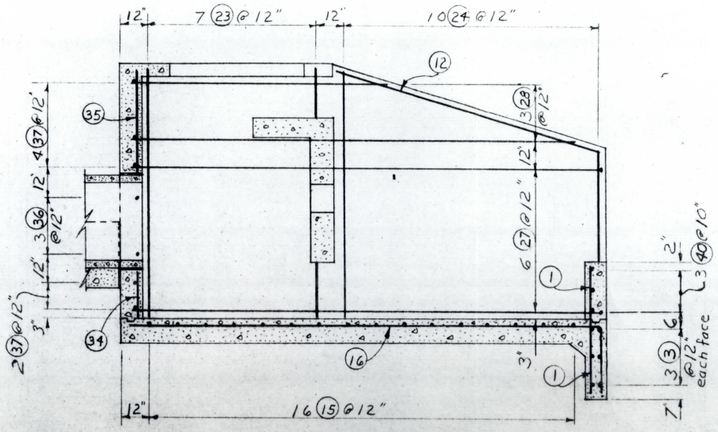












Note: For bar's (29) thru (37) see sheet 13

Scale in feet

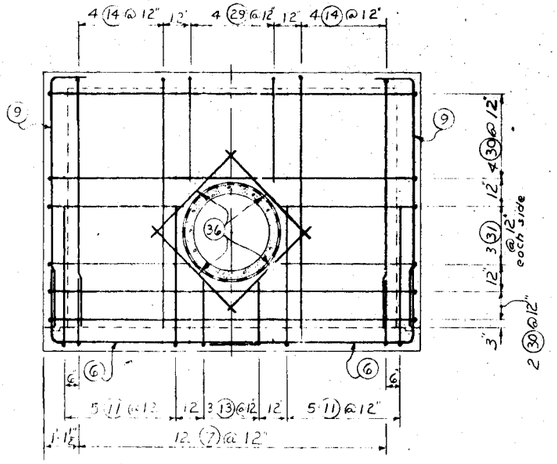
AS BUIL

DETAILS OF PRINCIPAL SPWY. OUTLET STRUCTURE
RITTENHOUSE FLOODWATER RETARDING STRUCTURE
WILLIAMS-CHANDLER W. P. P.
PINAL COUNTY, ARIZONA

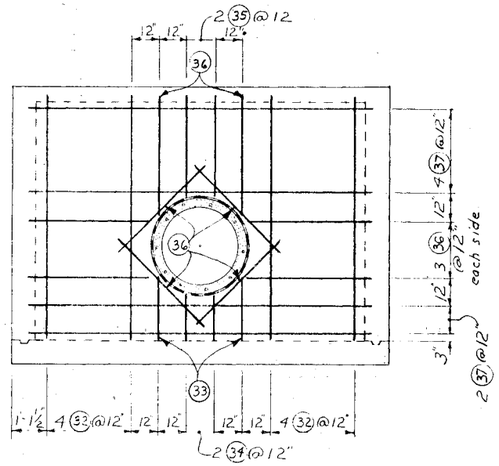
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

	Date		
Designed G.W. & G.D.H		Approved by	
Drawn G.D.H. 12-16-65		Title	
Traced EWO		Title	
Checked G. WATT	11-9-66	Sheet No 12 of 26	Drawing No. 7-E-20764

USDA-SCS PORTLAND, OREG. 1968
U. S. GOVERNMENT PRINTING OFFICE : 1965 O - 803766
FORM SCS 313 (APRIL 1963)



OUTSIDE BARS



INSIDE BARS

ELEVATION B-B

0 2 4 6
Scale in feet

BAR TOTALS

Size	Length in feet	Weight in Lbs.
4	~~2,794.42~~ ~~2,619.42~~	~~1,867~~ ~~1,804~~
5	1,659.75	1,732
Total weight		~~3598~~ ~~3,536~~

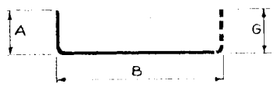
BAR SCHEDULE

Location	Mark C	Mark No.	Size	Quantity	Length	Total Length	Type	A	B	G	H
End sill, vertical	C	1	4	15	4-6	65-6	Str.				
Wingwall, vertical	C	2	4	4 sets of 8 bars	6-2 to 8-6 at 4" increments	234-8	Str.				
Cutoffwall, horizontal	C	3	4	6	11-6	69-0	Str.				
Wingwall footing, horiz.	C	4	4	6	9-9	58-6	19	1-9	8-0		1-2¾
" " "	C	5	4	6	9-3	55-6	19	1-6	7-9		1-0¾
Apron	C	6	5	34	9-9	331-6	2	2-6	7-3		
"	C	7	4	24	11-3	270-0		2-3	9-0		
"	C	8	5	32	6-3	200-0	2	2-3	2-9		
Sidewall & apron	C	9	5	14	9-9	136-6	2	1-3	9-6	-	
Sidewall	C	10	5	2 sets of 10 bars	5-9 to 11-9 at 4" increments	145-[illegible]	2	Str.			
Headwall & apron	C	11	4	10	7-3	73-[illegible]	2	[illegible]	[illegible]		
Wingwalls " "	C	12	4	4	10-9	43-[illegible]	2	[illegible]			
Headwall & "Apron	C	13	4	5	4-6	1[illegible]-6	2	2-3	2-3		
" " "	C	14	4	8	9-9	78-6	2	1-3	[illegible]-6		
Apron	C	15	4	16	12-9	204-0	Str.				
"	C	16	5	13	12-3	2[illegible]-3	2	2-6	16-9		
Wingwall footing	C	17	4	8	11-0	88-0	Str.				
" "	C	18	4	4	6-6	26-0	Str.				
" "	C	19	4	10	3-3	32-6	Str.				
" "	C	20	4	2 sets of 7 bars	2-6 to 3-3 at 1½" increments	40-3	Str.				
" "	C	21	4	2 sets of 8 bars	3-6 to 4-4½ at 1½" increments	63-0	2	1-0	2-6 to 3-4½ at 1½" increments		
" "	C	22	4	4	11-6	46-0	Str.				
Sidewall, vertical	C	23	4	14	8-9	122-6	Str.				
" "	C	24	4	2 sets of 10 bars	5-9 to 8-4½ at 3½" increments	141-3	Str.				
Sidewall, horizontal	C	25	5	12	18-0	216-0	19	1-9	16-3		1-2¾
" "	C	26	5	2 sets of 3 bars	8-9 to 15-2 at 3-2½" increments.	71-9	Str.				
" "	C	27	4	12	18-6	222-0	19	2-0	16-6		1-5
" "	C	28	4	2 sets of 3 bars	9-0 to 15-5 at 3-2½" increments	73-3	Str.				
Headwall, vertical	C	29	4	4	4-9	19-0	2	1-3	3-6		
Headwall, horizontal	C	30	4	6	15-9	94-6	2	1-5½	12-10	1-5½	
" "	C	31	4	6	6-3	37-6	2	1-6	4-9		
Headwall, vertical	C	32	4	8	8-6	68-0	Str.				
" "	C	33	4	2	2-3	4-6	Str.				
" "	C	34	4	2	1-6	3-0	Str.				
" "	C	35	4	2	3-6	7-0	Str.				
Headwall	C	36	4	16	4-3	68-0	Str.				
Headwall, horizontal	C	37	4	8	12-3	98-0	Str.				
Splash guard	C	38	4	4	6-3	25-0	Str.				
End sills, horizontal	C	39	4	12	3-3	39-0	2	1-1	2-2		
" " "	C	40	4	18	2-0	36-0	Str.				
Bafflewall, horizontal	C	41	4	8	14-9	118-[illegible]	2	1-0	12-9	1-0	
" "	C	42	4	2	7-0	14-0	2	1-0	6-0		
Bafflewall, vertical	C	43	5	12	4-9	57-0	Str.				
Bafflewall, horizontal	C	44	5	2	14-9	1[illegible]-[illegible]	2	1-0	12-9	1-0	
" "	C	45	5	2	7-0	14-0	2	1-0	6-0		
Bafflewall, vertical	C	46	5	12	7-3	87-0	2	2-6	4-9		
Wingwall, horizontal	C	47	4	16	7-6	1[illegible]-0	Str.				
" "	C	48	4	4	4-9	19-0	Str.				
" "	C	49	4	4	1-6	6-0	Str.				
Wingwall, top	C	50	4	4	7-9	31-0	Str.				

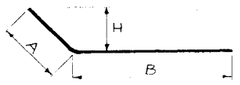
BAR TYPES

Straight

Str.



Type - 2



Type -19

Notes:
1. All bar dimensions are out to out of bar.
2. Radius of bends equals seven times the bar diameter
3. Place bars 2" clear from face of concrete, except as shown, and place apron bars 3" clear from ground surface.

AS BUILT

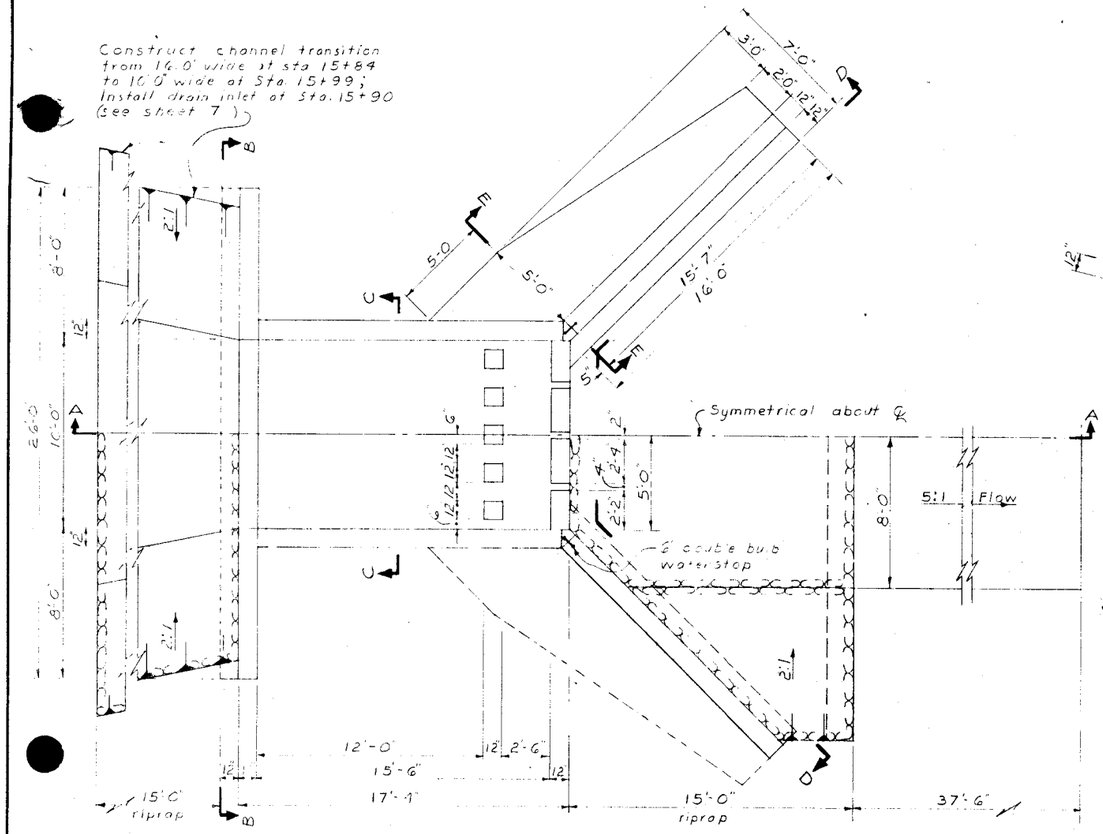
DETAILS OF PRINCIPAL SPLY. OUTLET STRUCTURE
RITTENHOUSE FLOODWATER RETARDING STRUCTURE
WILLIAMS-CHANDLER W.P.P.
PINAL COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

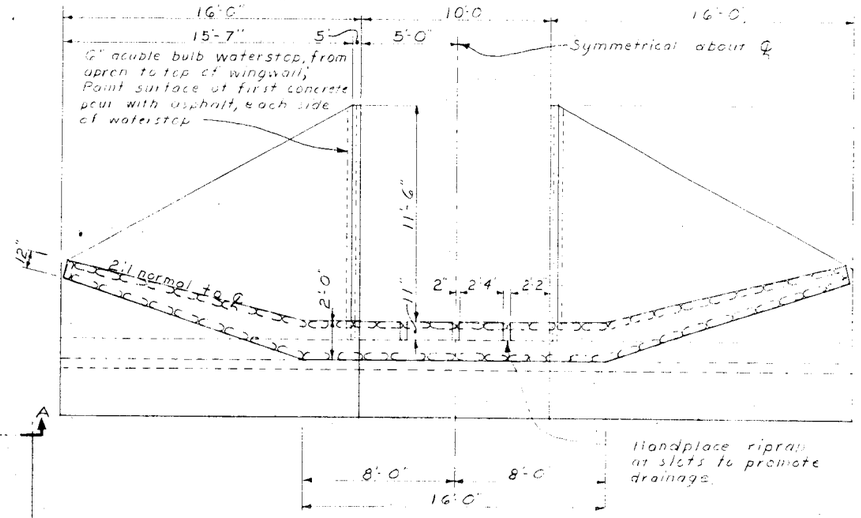
Designed G.W. & G.D.H.	Date 12-65	Approved by	
Drawn G.D.H.	12-65	Title	
Traced		Title	
Check		Sheet No. 13 of 26	Drawing No. 7-E-20764

USDA SCS PORTLAND OREG. 1964

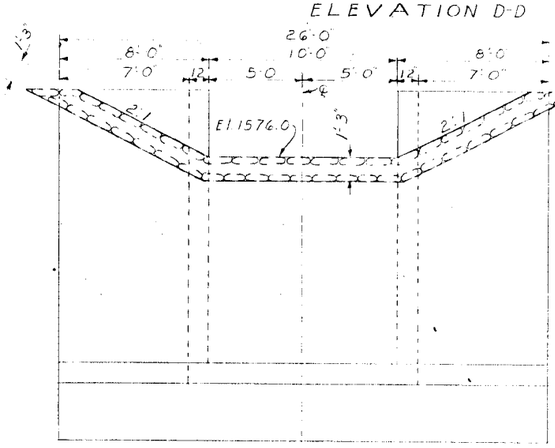
Construct channel transition from 16.0' wide at sta 15+84 to 10.0' wide at Sta. 15+99; Install drain inlet at Sta. 15+90 (see sheet 7)



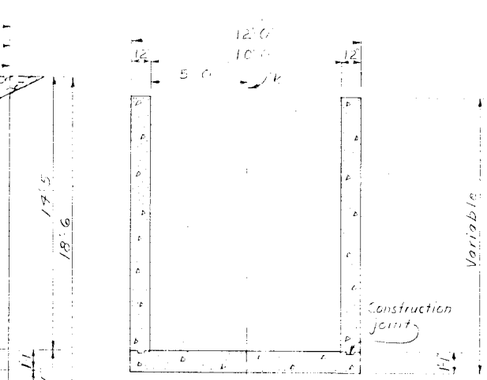
PLAN



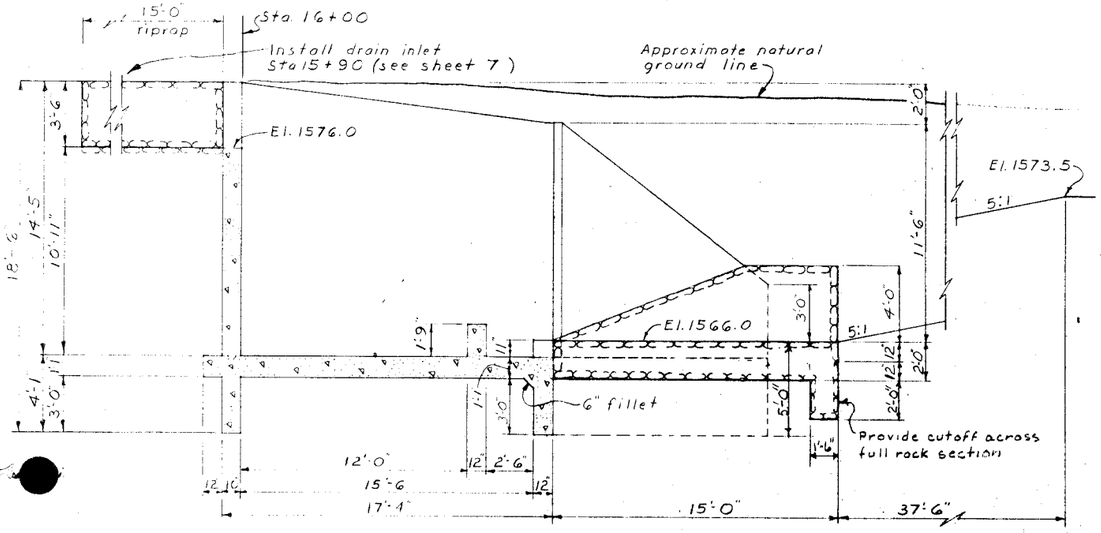
ELEVATION D-D



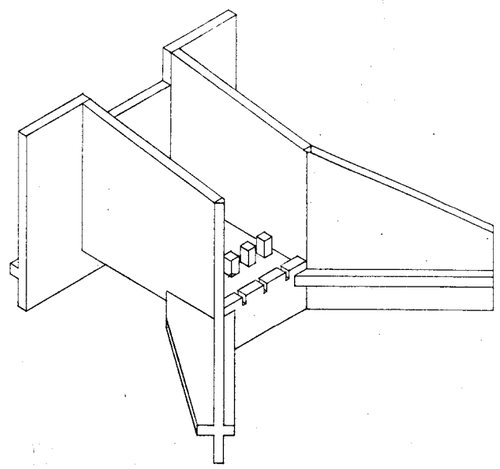
ELEVATION B-B



ELEVATION C-C



SECTION A-A



ISOMETRIC VIEW OF DROP

TABLE OF QUANTITIES		
Item	Unit	Quantity
Concrete	Cu. Yd.	62.10
Reinforcing steel	Lbs.	9,417

Note: 1. Chamfer all exposed concrete edges 3/4
2. See Reinforcing steel drawings for section E-E

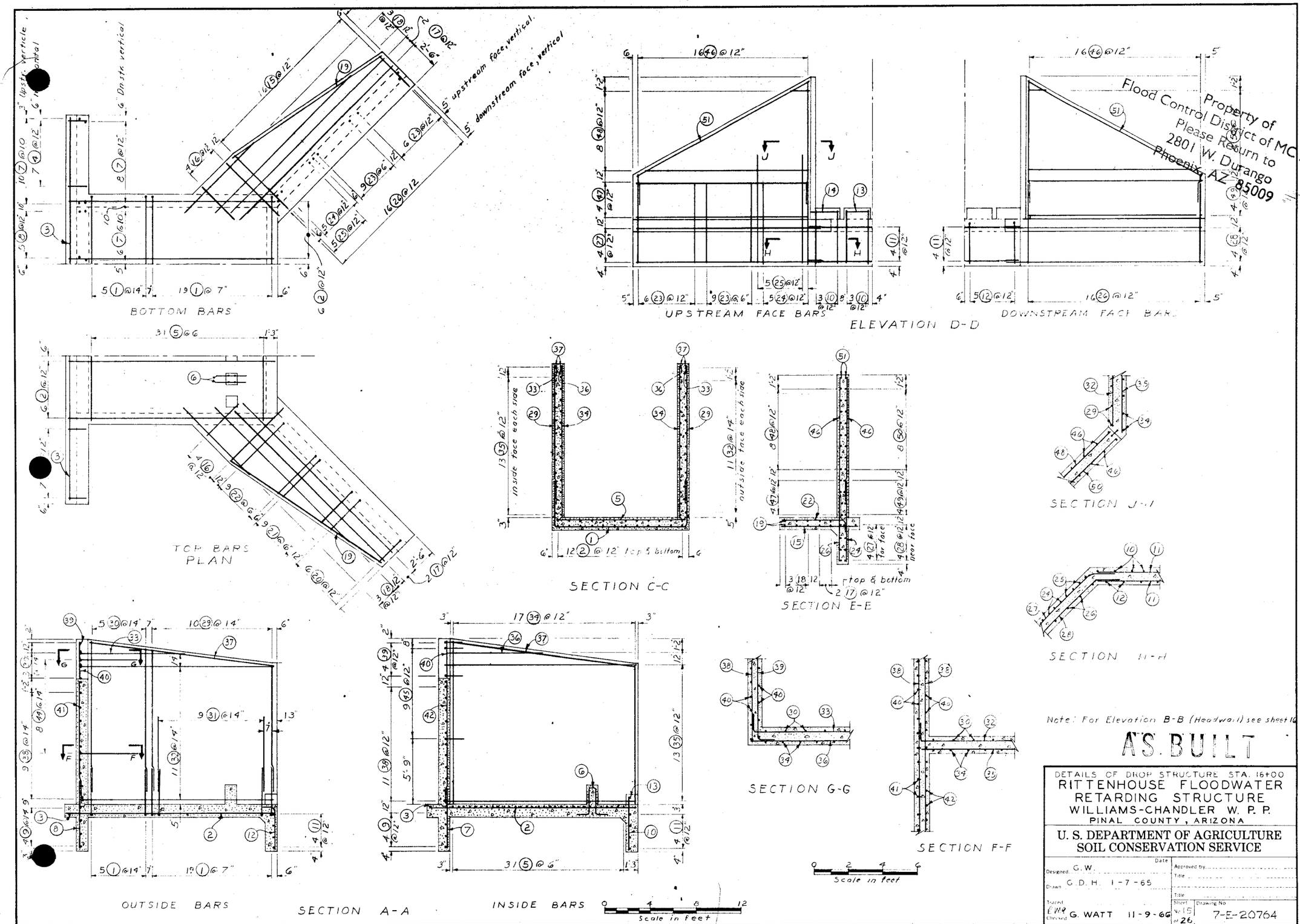
A'S BUILT

DETAILS OF DROP STRUCTURE STA. 16+00
RITTENHOUSE FLOODWATER RETARDING STRUCTURE
WILLIAMS-CHANDLER W. P. P.
PINAL COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed G.W.	Date	Approved by	
Drawn G.D.H. 12-22-65		Title	
Traced		Title	
Checking G. WATT 11-9-66		Sheet No. 14 of 26	Drawing No. 7-E-20764

FORM SCS 313 (APRIL 1963)



Property of
Flood Control District of MC Lib
Please Return to
2801 W. Durango
Phoenix, AZ 85009

Note: For Elevation B-B (Headwall) see sheet 16

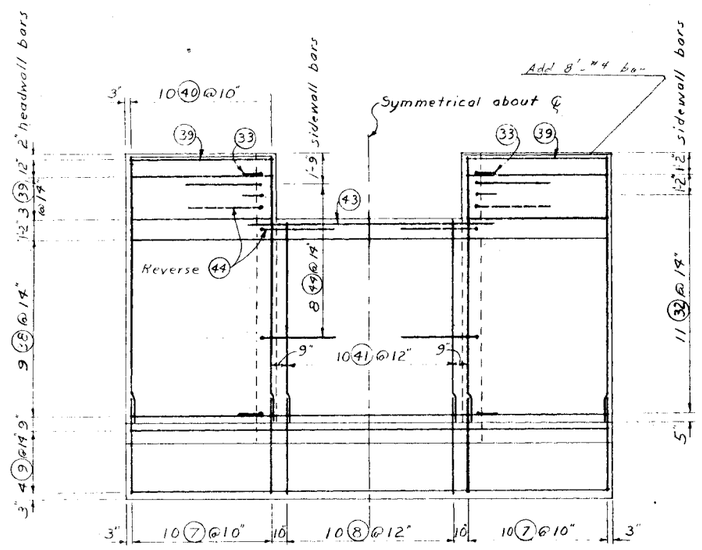
AS BUILT

DETAILS OF DROP STRUCTURE STA. 16+00
RITTENHOUSE FLOODWATER
RETARDING STRUCTURE
WILLIAMS-CHANDLER W. P. P.
PINAL COUNTY, ARIZONA

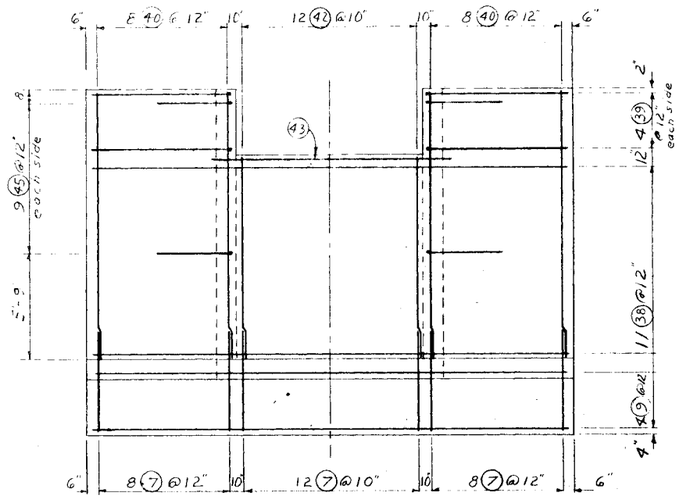
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed G. W.	Date	Approved by	
Drawn G. D. H. 1-7-65		Title	
Traced		Title	
Checked G. WATT 11-9-66		Sheet No. 15 of 26	Drawing No. 7-E-20764

FORM SCS 313 (APRIL 1963)



UPSTREAM BARS



DOWNSTREAM BARS
ELEVATION B-B

0 4 8 12
Scale in feet

BAR SCHEDULE

Location	Mark U	Mark No	Size	Quantity	Length		Type	A	B	C	D	G	H
Apron	D	1	8	24	19-6	468-0	2	3-11	11-3			3-11	
"	D	2	5	24	18-0	432-0	Str.						
"	D	3	4	2	25-6	51-0	Str.						
Headwall footing	D	4	4	28	1-3	35-0	Str.						
Apron	D	5	5	31	11-3	348-9	Str.						
Floor blocks	D	6	4	10	7-6	75-0	22	1-0	2-5	0-8	2-5	1-0	
Headwall footing	D	7	4	48	5-3	252-0	Str.						
"	D	8	5	10	5-9	57-6	Str.						
" "	D	9	5	8	25-6	204-0	Str.						
Toewall	D	10	4	12	4-6	54-0	Str.						
"	D	11	4	8	10-0	80-0	Str.						
"	D	12	4	10	4-6	45-0	2	1-0	3-6				
Endsills	D	13	4	2	2-0	4-0	Str.						
"	D	14	4	2	2-6	5-0	Str.						
Wingwall footings	D	15	4	2 sets of 16 bars	3-8 to 6-0½ at 2½" increments	16-4	Str.						
" "	D	16	4	4 sets of 4 bars	4-0 to 6-3 at 9" increments	62-0	Str.						
" "	D	17	4	8	19-0	152-0	Str.						
" "	D	18	4	4 sets of 3 bars	9-0 to 17-0 at 4-0 increments	156-0	Str.						
" "	D	19	4	4	15-6	62-0	Str.						
" "	D	20	5	2 sets of 6 bars	3-8 to 4-8½ at 2¼ 2¼" increments	50-3	2	1-0	2-4 to 3-1½ at 2½" increment				
" "	D	21	5	2 sets of 9 bars	4-9 to 5-9 at 1½" increment	94-6	2	1-0	3-9 to 4-9 at 1½" increment				
" "	D	22	7	2 sets of 9 bars	5-5 to 6-5 at 1½" increments	10 -	2	1-0	4-5 to 5-5 at 1½" increment				
"	D	23	5	30	7-0	210-0	Str.						
"	D	24	7	10	7-0	70-0	Str.						
" "	D	25	7	10	9-3	92-6	Str.						
" "	D	26	5	32	7-1	224-0	Str.						
" "	D	27	4	8	18-3	146-0	19	2-0	16-3				1-5
" "	D	28	5	8	17-9	142-0	19	2-0	15-9				1-5
Sidewalls	D	29	6	2 sets of 10 bars	11-0 to 12-1½ at 1½" increments	231-3	Str.						
"	D	30	6	2 sets of 5 bars	12-6 to 13-0 at 1½" increments	127-6	Str.						
"	D	31	6	18	6-6	117-0	Str.						
"	D	32	6	22	18-0	396-0	2	1-3	16-9				
"	D	33	6	2	10-0	20-0	2	1-3	8-9				
"	D	34	5	2 sets of 17 bars	12-3 to 14-3 at 1½" increments	450-6	Str.						
"	D	35	5	26	16-9	435-6	Str.						
"	D	36	5	2	8-6	17-0	Str.						
"	D	37	4	4	16-0	64-0	Str.						
Headwall	D	38	5	20	25-6	510-0	Str.						
"	D	39	6	16	8-6	136-0	2	1-0	7-6				
"	D	40	4	36	14-0	504-0	Str.						
"	D	41	5	10	10-9	107-6	Str.						
"	D	42	4	12	10-9	129-0	Str.						
"	D	43	4	2	13-0	26-0	Str.						
Headwall, sidewall	D	44	6	16	9-0	144-0	2	4-0	5-0				
" "	D	45	5	18	5-6	99-0	2	1-6	4-0				
Wingwall	D	46	5	4 sets of 16 bars	2-9 to 10-10½ at 6½" increments	436-0	Str.						
"	D	47	4	8	15-3	122-0	Str.						
"	D	48	4	2 sets of 8 bars	1-6 to 14-4 at 1'-10" increments	126-8	Str.						
"	D	49	5	8	15-3	122-0	Str.						
"	D	50	5	2 sets of 8 bars	1-6 to 14-4 at 1'-10" increments	126-8	Str.						
"	D	51	4	4	16-0	64-0	Str.						
"	D	52	4	2	8-0	16-0	Str.						

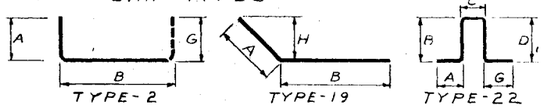
AS BUILT

BAR TOTALS

Size	Length in feet	Weight in pounds
4	2,418-0	1,611
5	1,[illegible]-2	4,[illegible]
6	1,177-9	1,760
7	2,[illegible]	5[illegible]
8	46-0	1,259
Total Weight		3,[illegible]

BAR TYPES

Straight Str.



NOTES:
1. All bar dimensions are out to out of bar.
2. Radius of bends equals seven times the bar diameter.
3. Place bars 2" clear from face of concrete, except as shown, and place apron and footing bars 3" clear from ground surface.

DETAILS OF DROP STRUCTURE STA. 16+00
RITTENHOUSE FLOODWATER RETARDING STRUCTURE
WILLIAMS-CHANDLER W. P. P.
PINAL COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

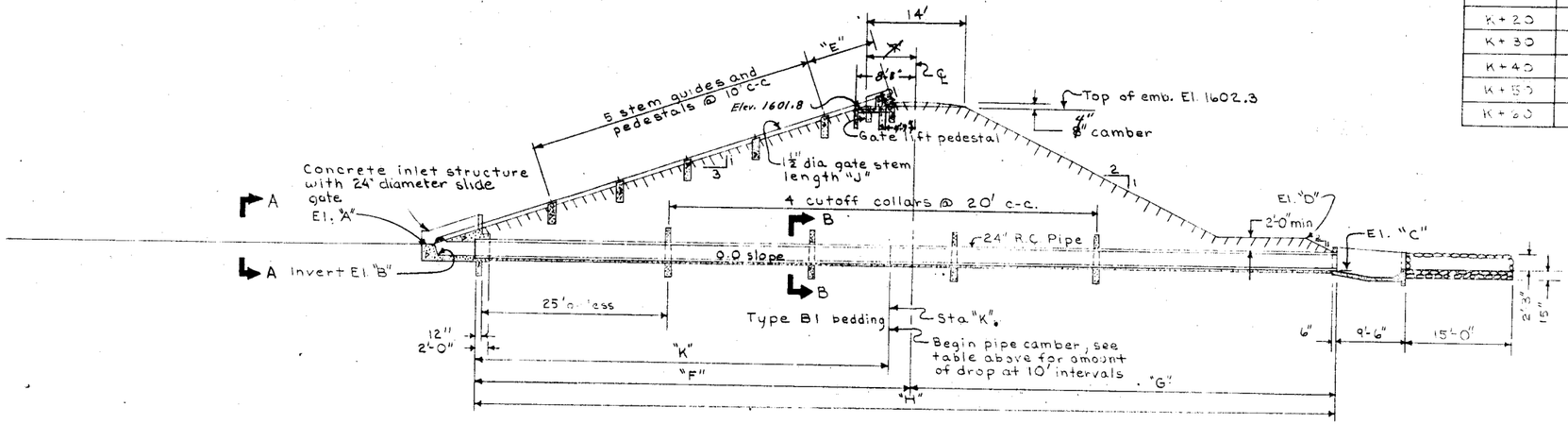
Designed G. W.	Date	Approved by	
Drawn G. D. H. 1-7-65		Title	
Traced [illegible]		Title	
Checked G. WATT 11-9-66		Sheet No. 16 of 26	Drawing No. 7-E-20764

FORM SCS-313 (APRIL 1963)

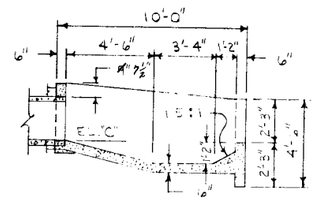
U.S.D.A. S.C.S. PORTLAND, OREG. 1966
U. S. GOVERNMENT PRINTING OFFICE : 1967 O - 883786

TABLE FOR PIPE CAMBER

Station	Drop in. ft.	Elevation
K+00	0	"B"
K+10	0.01	"B"-0.01
K+20	0.06	"B"-0.06
K+30	0.13	"B"-0.13
K+40	0.22	"B"-[illegible]
K+50	0.35	"B"-[illegible]
K+60	0.50	"C"-"B"-0.50



SECTION ON ℄ OF GATED OUTLET



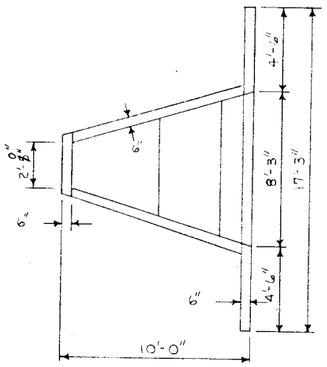
SECTIONAL ELEVATION

TABLE OF DIMENSION

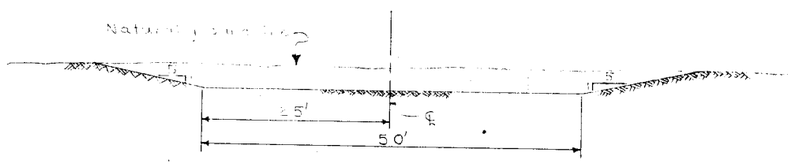
Structure Station	Elevation "A"	Elevation "B"	Elevation "C"	Elevation "D"	Dimension "E"	Dimension "F"	Dimension "G"	Dimension "H"	Length of gate stems "J"	Distance of 0% grade "K"
68+50	1582.7	1580.7	1580.2	1584.45	9'-5"	61.7	68.3	130.0'	65.7	50.0'
156+00	1580.5	1578.5	1578.0	1582.25	16'-6"	68.3	71.7	140.0'	72.9	58.0

P.W.D. DETAILS

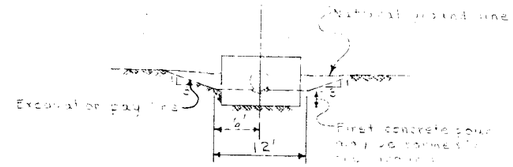
0 1 2 4 6 8 10
SCALE IN FEET



PLAN



SECTION A-A



SECTION B-B

0 10 20 30
SCALE IN FEET

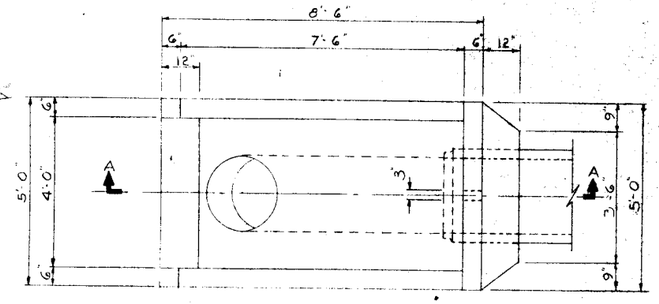
AS BUILT

DETAILS OF STRUCTURES STA 68+50 & 154+60
RITTENHOUSE FLOODWATER RETARDING STRUCTURE
WILLIAMS-CHANDLER W. P. P.
PINAL COUNTY ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

		Date	
Designed	R. ARRINGTON	4/63	Approved by
Drawn	D. MARLOW	4/63	Title
Traced	D. MARLOW	4/63	Title
Checked	[illegible]		Sheet No. 17 of 26 — Drawing No. 7-E-20764

FORM SCS 313 (APRIL 1963)



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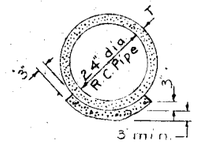
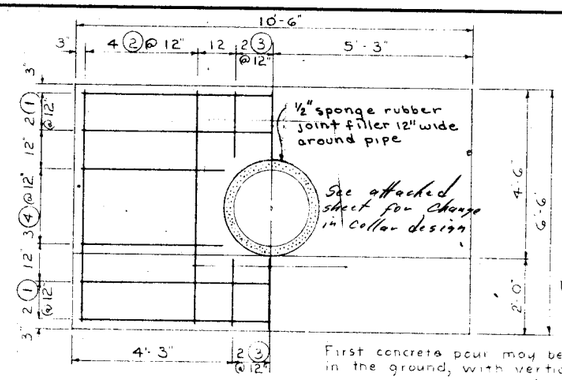
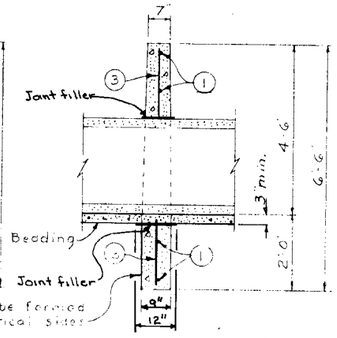


SECTION OF PIPE & BEDDING

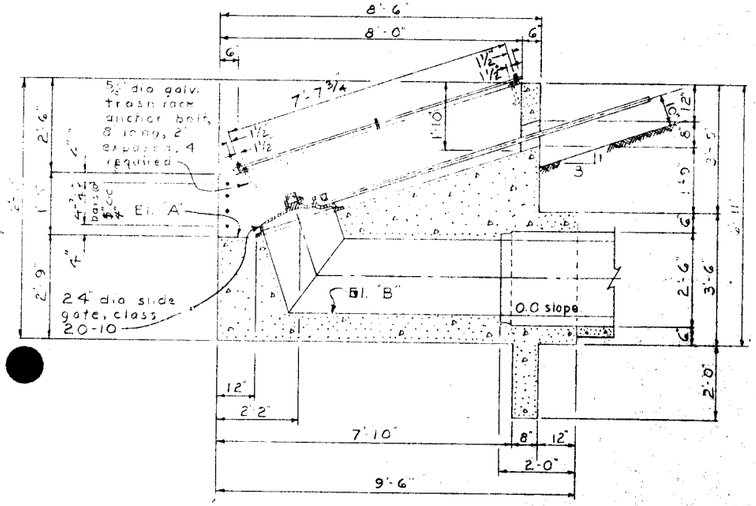


ELEVATION

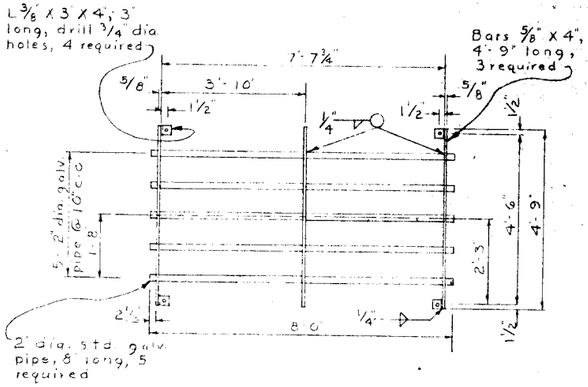


SECTION

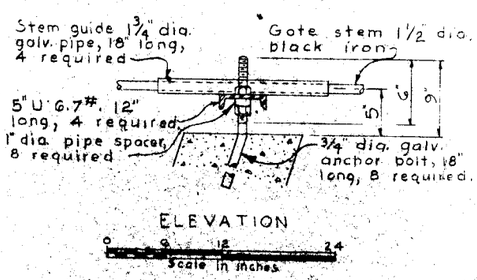
DETAILS OF CUTOFF COLLAR



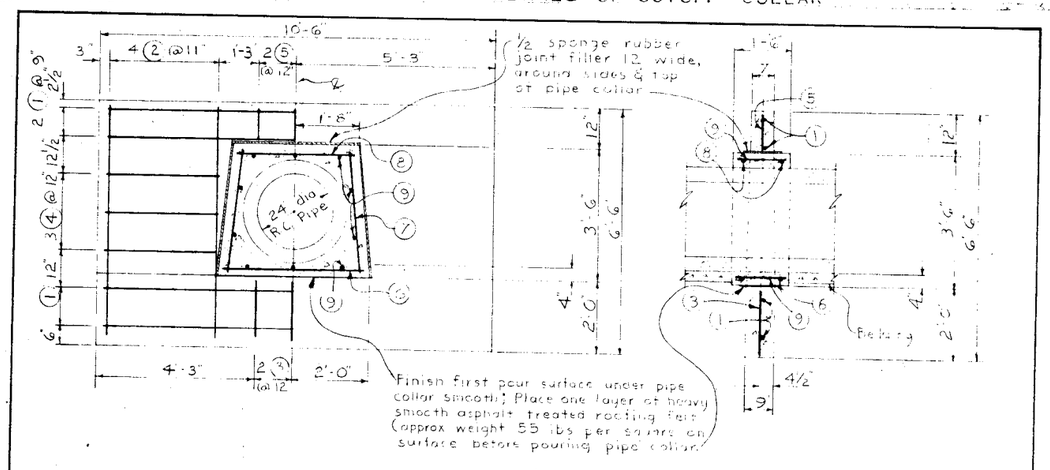
SECTION A-A



PLAN OF TRASH RACK



ELEVATION



BAR SCHEDULE

Mark	Size	No.	Length	Total Length
1	4	32	10'0	320'0
2		64	6-0	384-0
3		24	1'9	42-0
4		48	3-0	144-0
5		24	0'9	18-0
6		16	3-9	60-0
7		32	3-3	104-0
8		16	3-0	48-0
9	4	80	1-0	80-0

Total length = 1200'
= 802 lbs

CONCRETE QUANTITIES

Cutoff Collars, 1.47 yd³ each X 8 = 11.28 yd³

Pipe Collars, 0.42 yd³ each X 8 = 3.36 yd³

AS BUILT

RITTENHOUSE DAM

GATED OUTLET CUTOFF COLLAR MODIFICATION

U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	
DESIGNED BY G. WATT	APPROVED BY
CHECKED BY	DRAWING NO. 7E20764
DATE 11-5-68	SHEET 1 OF 1

Form SCS 313A (March 1957)

U. S. GOVERNMENT PRINTING OFFICE : 1961 O - 617672

INDEX

AS BUILT

DETAILS OF GATED OUTLETS -- STA 69+50 & 154+60

RITTENHOUSE FLOODWATER RETARDING STRUCTURE

WILLIAMS-CHANDLER W.R.P.

PINAL COUNTY, ARIZONA

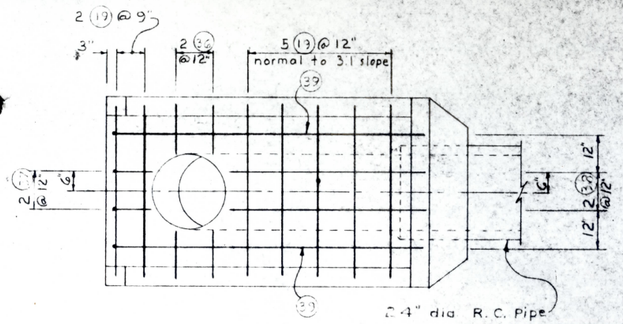
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed R. ASPINOTEN	Date 5/68	Approved by	
Drawn G. HANLEY	5/68	Title	
Traced		Title	
Checked RMR	5-67	Sheet No. 18 of 26	Drawing No. 7-E-20764

FORM SCS 313 (APRIL 1963)

USDA FCS PORTLAND, OREG. 1968

U. S. GOVERNMENT PRINTING OFFICE : 1963 O - 617672



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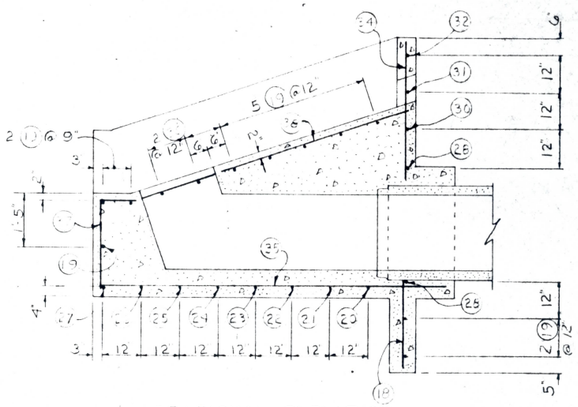
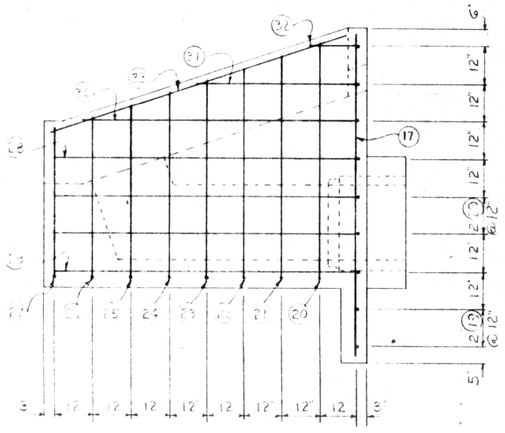


SECTIONAL ELEVATION



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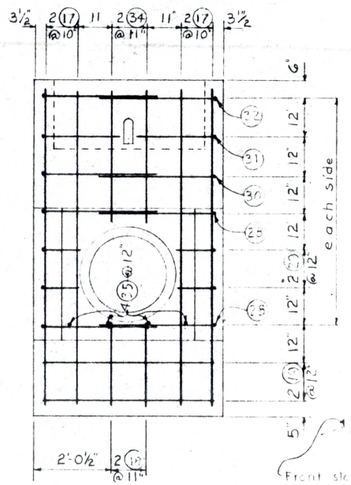


ELEVATION

DETAILS OF INLET

BAR SCHEDULE

Structure & Location	Mark	No.	Size	Quantity	Length	Total Length	Type	A	B	C	D	E	G	H	K
Cutoff Collar	D	1	4	16	10-0	160-0	Str								
" "	D	2	4	32	6-0	192-0	Str								
" "	U	3	4	24	1-9	42-0	Str								
" "	U	4	4	24	3-9	90-0	Str								
Gate Stem Pedestal	D	5	4	4	3-0	44-0	Str								
" "	D	6	5	4	3-6	14-8	2	1	0	2-6					
" "	U	7	5	4	6-0	24-0	2	1	4	4-6					
" "	U	8	4	4	8-3	33-0	T1	0	2	0	8	0	8	0	5-0
" "	U	9	4	4	8-3	33-0	2	1	4	4-6					
" "	U	10	4	5	9-3	77-6	Str								
" "	D	11	4	9	10-3	11-3	Str								
" "	D	12	6	4	19-6	75-0	Str								
" "	U	13	7	4	19-6	78-0	Str								
" "	U	14	4	4	28-6	114-0	2	1	4	4-6					
" "	U	15	4	2	9-6	19-0	2	1	4	4-6					
" "	U	16	4	2	9-6	19-0	2	1	4	4-6					
Inlet "	U	17	4	4	8-6	34-0	Str								
" "	D	18	4	2	2-3	4-6	Str								
" "	U	19	4	10	4-6	45-0	Str								
" "	U	20	4	1	17-0	17-0	2	1	3	4-6				3	3
" "	U	21	4	1	16-0	16-0	2	5	4	4-6				7	1
" "	U	22	4	1	15-6	15-6	2	0	3	4-6				5	6
" "	U	23	4	1	15-0	15-0	2	5	3	4-6				5	3
" "	U	24	4	1	14-6	14-6	2	5	0	4-6				5	0
" "	U	25	4	1	13-6	13-6	2	4	4	4-6				4	6
" "	U	26	4	1	13-0	13-0	2	4	3	4-6				4	3
" "	U	27	4	1	12-6	12-6	2	4	0	4-6				4	0
" "	U	28	4	4	11-0	44-0	2	1	0	5-0					
" "	D	29	4	4	9-6	38-0	2	1	0	5-0					
" "	D	30	4	2	10-3	20-6	2	2	0	7-3					
" "	U	31	4	2	6-3	12-6	2	2	0	4-3					
" "	U	32	4	2	4-3	8-6	2	2	0	1-3					
" "	U	33	4	2	2-3	4-6	Str								
" "	D	34	4	2	3-6	7-0	Str								
" "	D	35	4	4	10-3	41-0	Str								
" "	U	36	4	4	5-0	20-0	Str								
" "	U	37	4	2	6-6	13-0	2	1	0	2-3					
" "	D	38	4	2	10'-9	21'-6	Str								
" "	D	39	4	2			14	2	3	1-0			7	6	10-3
Stem Pedestal	D	40	4	5/10	2-0	25-0	Str								
Lift Anchor	D	41	4	5/10	2-3	22-6	Str								
" "	D	42	4	2	6-3	12-6	2	1	6	3-3				1	6
" "	U	43	4	2	5-3	11-6	Str								
" "	U	44	4	1	5-3	5-3	2	1	6	3-3				1	6
" "	U	45	4	1	5-9	5-9	2	1	9	3-3				1	9
" "	D	46	4	4	4-6	18-0	2	0	4	2-0				1	4
" "	D	47	4	2	4-9	9-6	2	0	5	2-0				1	5
" "	U	48	4	2	3-0	6-0	Str								
" "	U	49	4	2	2-9	5-6	Str								

Notes: 1 All exposed concrete edges shall be chamfered 3/4

2 All bar dimensions are out to out of bar.

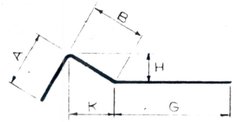
3 Radius of bends are seven times the bar diameter.

BAR TYPES

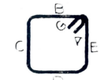
Straight

Type T2

← 08 for remaining Str.



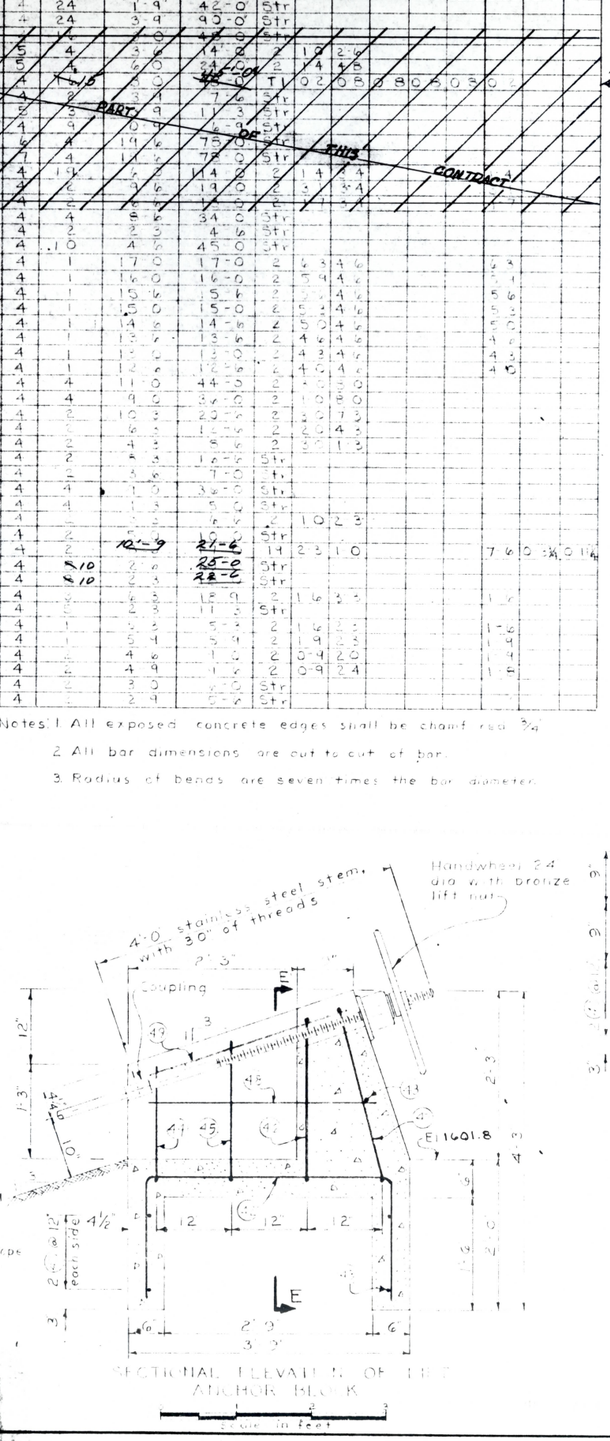
Type T9

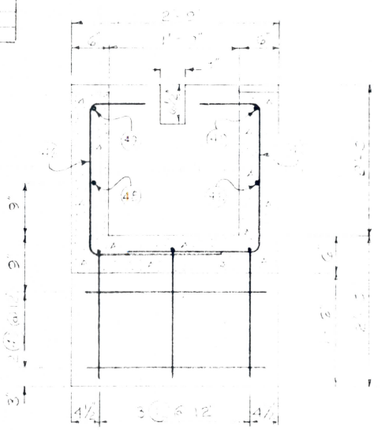


Type T1

QUANTITIES TABLE

Structure	Concrete	Reinforcing Steel
Inlet	6.6	283.6
Pedestal	2.6	None
Cutoff Collar	6.5	3
PWD Basin	3.5	274.2
Gate Stem Pedestal	0.6	31.7 26
Cutoff Collar	0.6	4
Total	20.4	950 951





SECTION E-E

AS BUILT

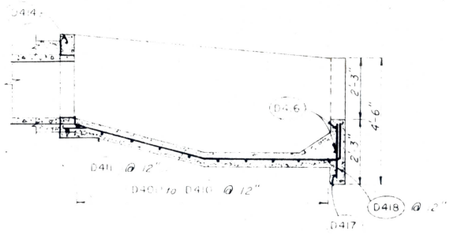
DETAILS OF GATED OUTLETS STA 69+50 & 154+60
RITTENHOUSE

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

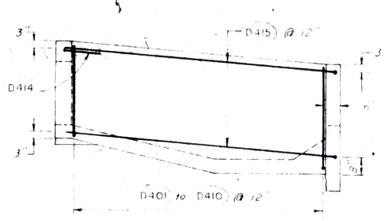
Designed	Date 5/68	Approved	Date
Drawn	5/68		
Traced			
Checked		Sheet No. 19 of 26 sheets	Drawing No. 7-E-20764

USCA SCS PORTLAND, OREG. 1968

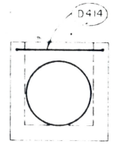
FORM SCS-ET-ENG 1005



SECTIONAL ELEVATION



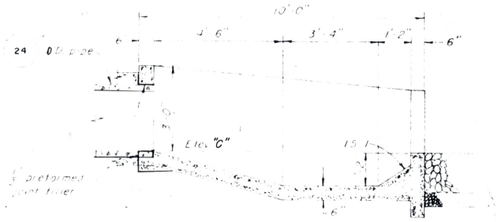
SIDEWALL ELEVATION



HEADWALL ELEVATION

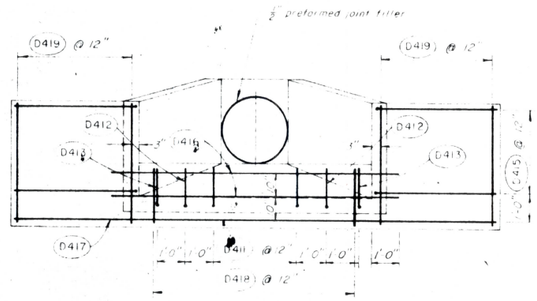
STEEL SCHEDULE

Location	Size	Mark	Type	Length	Quan	A	B	C	Total Length
P.W.D BASIN									
Apr	4	D401	2	5'-6"	4	2'-3"	3'-0"		11'-6"
	4	D402	2	6'-6"	2	2'-3"	3'-3"		13'-0"
	4	D403	2	7'-6"	2	2'-6"	3'-6"		14'-0"
	4	D404	2	8'-6"	2	3'-0"	3'-6"		16'-0"
	4	D405	2	7'-0"	2	3'-6"	3'-6"		14'-0"
	4	D406	2	7'-3"	2	3'-6"	3'-9"		14'-6"
	4	D407	2	7'-6"	2	3'-6"	3'-9"		15'-0"
	4	D408	2	7'-9"	2	3'-6"	3'-9"		15'-6"
	4	D409	2	7'-3"	2	3'-6"	3'-6"		14'-6"
	4	D410	2	8'-3"	2	4'-0"	3'-6"		16'-6"
	4	D411	STA	11'-6"	4	2'-6"	4'-9"	1'-3"	42'-0"
	4	D412	STA	7'-3"	2	1'-3"	4'-9"	1'-3"	13'-6"
	4	D413	2	4'-0"	2	1'-6"	1'-6"		8'-0"
Sidewall	4	D414	SPA	5'-3"	1	1'-5"	2'-9"	1'-3"	5'-5"
	4	D415	SPA	4'-3"	4	1'-3"	10'-0"		42'-0"
Cutoff wall	4	D416	Str	10'-1"	4				40'-4"
	4	D417	Str	4'-3"	1				4'-3"
	4	D418	Str	1'-4"	8				14'-0"
	4	D419	Str	4'-0"	10				40'-0"

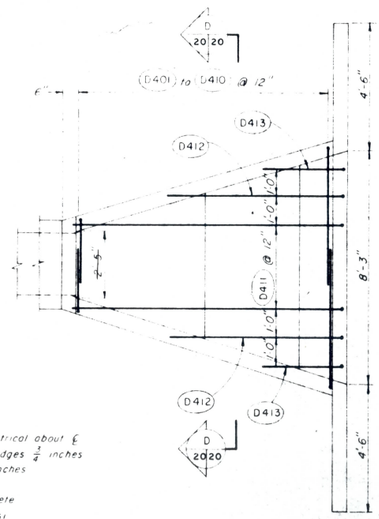


SECTIONAL ELEVATION

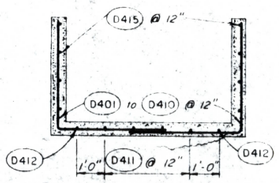
Note: For elevations see sheet no. 17



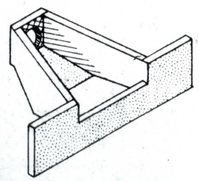
WINGWALL ELEVATION



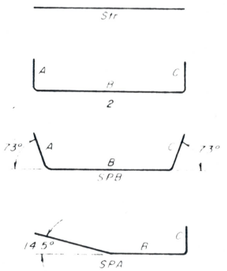
PLAN



SECTION (D 20 20)



ISOMETRIC VIEW



BAR TYPES

Notes:

Structure is symmetrical about ℄
Chamfer exposed edges $\frac{3}{4}$ inches
Splice length 15 inches

Class 3000 Concrete
f_s = 20,000 psi
f_c = 3000 psi
f_c = 1350 psi

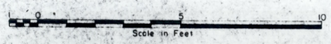


TABLE OF QUANTITIES	
Concrete	3.53 cu yd
Reinforcing steel	274 lbs

AS BUILT

P.W.D. BASIN SIZE D

PORTLAND, OREGON, E & WP UNIT

P.W.D. BASIN

RITTENHOUSE FLOODWATER RETARDING STRUCTURE

WILLIAMS-CHANDLER W.P.P.

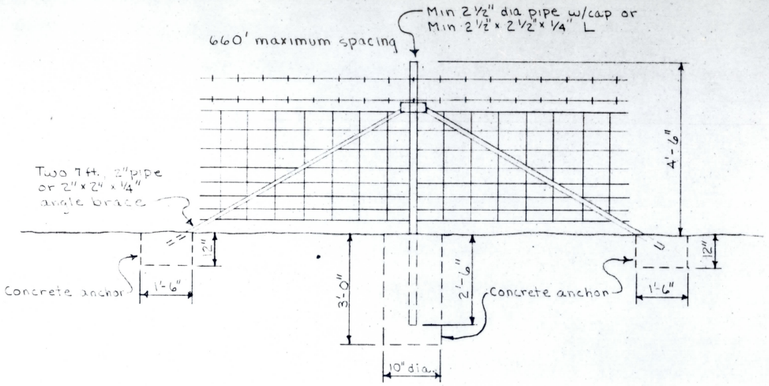
PINAL COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

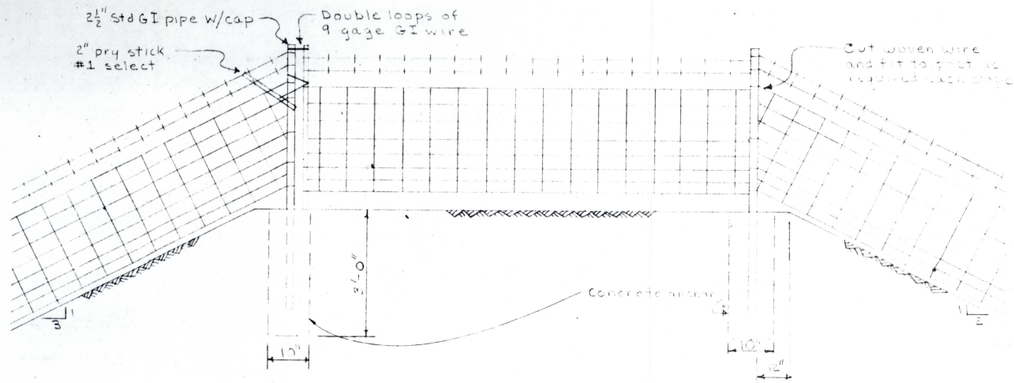
Designed	Date	Approved by	Title
Drawn			
Traced			
Checked		Sheet No. 20 of 26	Drawing No. 7-E-20764

7-E-20463-D

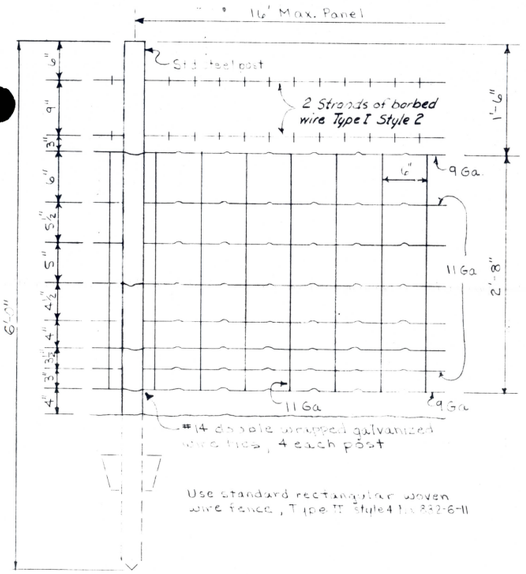
USDA SCS PORTLAND OREG 1968



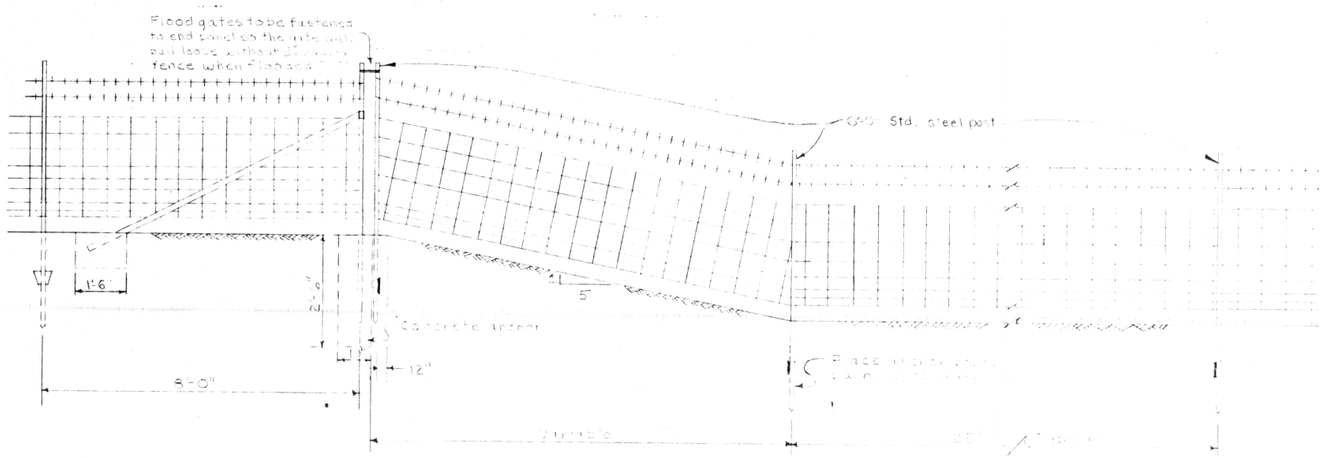
PULL POST ASSEMBLY



WIRE GATE DETAILS



STOCK FENCE DETAILS



FLOOD GATE DETAILS

AS BUILT

NOT DRAWN TO SCALE

FENCING DETAILS STA 48+50, STA 96+60, & STA 149+05
RITTENHOUSE FLOODWATER RETARDING STRUCTURE
WILLIAMS-CHANDLER W.P.P.
PINAL COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	R. ARRINGTON	Date 5/63	Approved by
Drawn	D. MARLOW	5/63	Title
Traced			Title
Checked	C.W.J.	5/68	Sheet No. 21 of 26 sheets; Drawing No. 7-E-20704

FORM SCS-ENG (APRIL 1963)

P.I. Sta 50+00

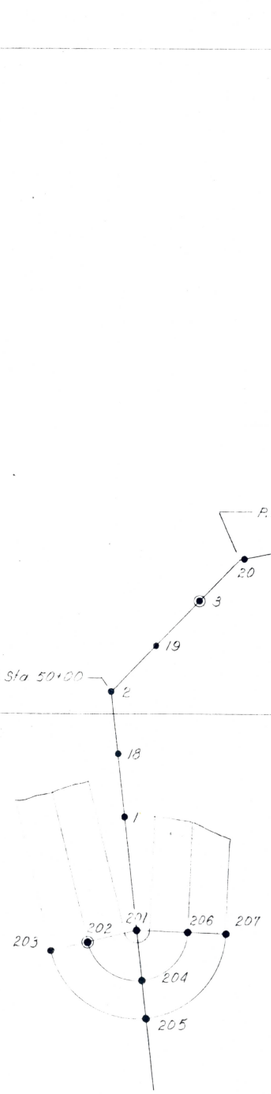
P.I. Sta 64+66.43

P.I. Sta 112+41.05

℄ Rittenhouse Dam

P.I. Sta 150+14.45

P.I. Sta 193+27.25



Z Z

PLAN OF EMB. & EMERGENCY SPILLWAY

0 600 1200
Scale in feet

T2S R8E
T2S R9E

AS BUILT

LOCATION OF GEOLOGIC TEST HOLES
RITTENHOUSE FLOODWATER
RETARDING STRUCTURE
WILLIAMS CHANDLER W. P. P.
PINAL COUNTY, ARIZONA

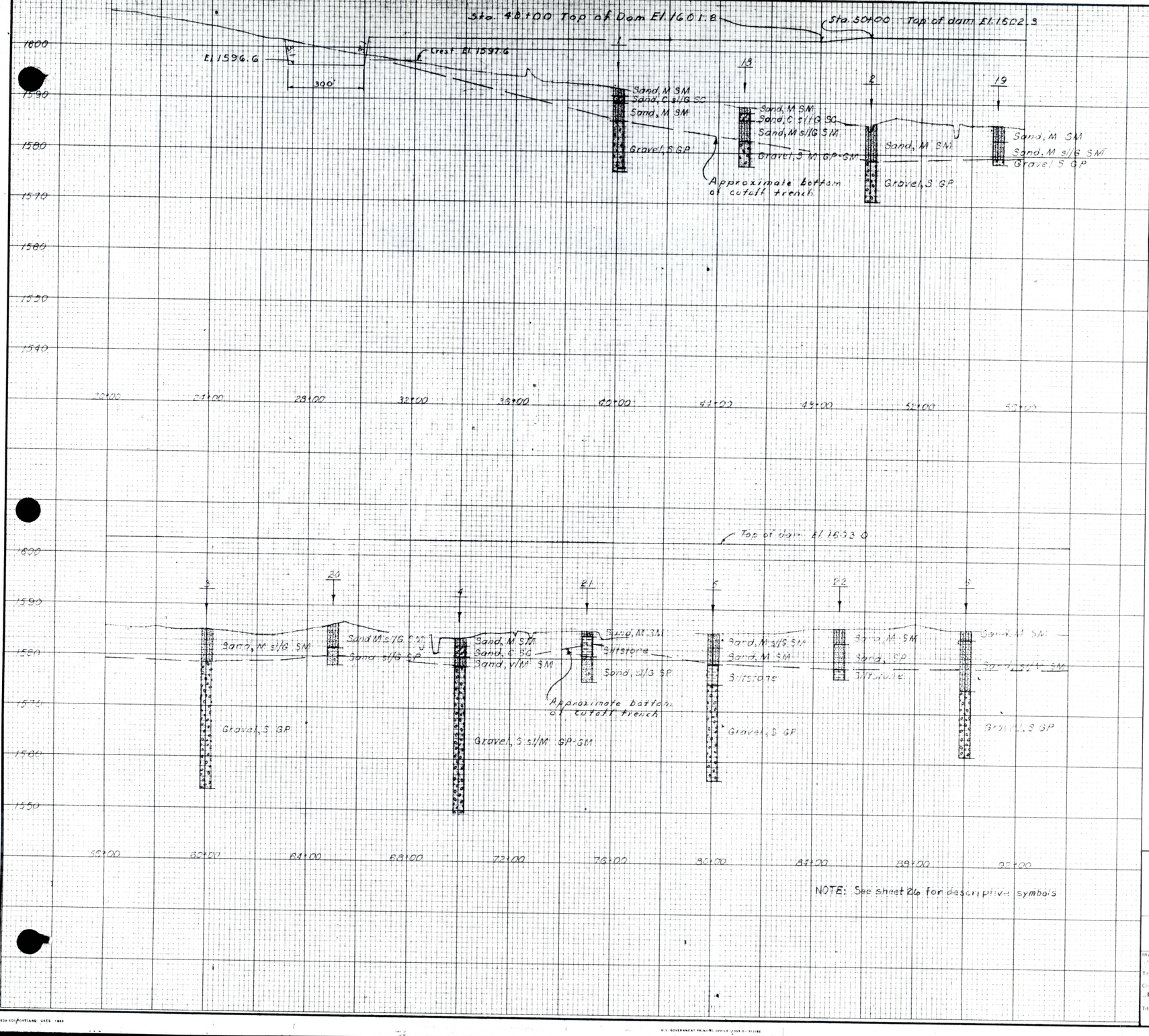
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

	Date		
Designed W.F. MILDNER	7-7-65	Approved by	
Drawn D.H.H.	7-7-65	Title	
Traced		Title	
Checked E.W.A.		Sheet No. 22 of 26	Drawing No. 7E-20764

SCS-313B (APRIL 1963)

USDA-SCS PORTLAND, OREG. 1965

U.S. GOVERNMENT PRINTING OFFICE : 1966 O—241-126



NOTE: See sheet 26 for descriptive symbols

LEGEND

SYMBOLS

UNCONSOLIDATED MATERIAL

gravel, sand, silt, clay, cobbles, boulders, gravel, sandy, sand, gravelly, silt, gravelly, clay, gravelly, peat, gravel, silty, sand, silty, silt, sandy, clay, sandy, gypsiferous *, gravel, clayey, sand, clayey, silt, clayey, clay, silty, calcareous *, gravel, sand, silt, sand, silt, clay, organic silt, organic clay

* to be added to Standard Symbol when significant amounts of dispersed gypsum or calcified zones are present in the section.

CONSOLIDATED MATERIAL

Sedimentary Rocks

shale, sandstone, limestone, chalk, coal, calcareous shale, calcareous sandstone, cherty limestone, marl, gypsum, sandy shale, shaley sandstone, sandy limestone, chert, conglomerate, siltstone, breccia, dolomite

Metamorphic Rocks

quartzite, slate, gneiss, schist, marble, soapstone talc serpentine

Igneous Rocks

intrusive, extrusive, pyroclastic

Undifferentiated

Other Symbols

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

ABBREVIATIONS

aq	aquifer	fri	friable
cav.	cavities	lam	laminated
℄	centerline	mas	massive
con	concretions	TD	total depth
US	undisturbed samples	v.	very
DS	disturbed samples	w/	with
dip	dipping	wea	weathered
frac	fractured	WL	(date) groundwater level on a specified date

TEST HOLE NUMBERING SYSTEM

Centerline of dam	1 - 99
Borrow area	101 - 199
Emergency spillway	201 - 299
Centerline of outlet structure	301 - 399
Stream channel	401 - 499
Relief wells	501 - 599
	601 - 699
	701 - 799

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
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SM	Silty sand
SC	Clayey sands; sand-clay mixtures
ML	Silts; silty, v. fine sands; sandy or clayey silts
CL	Clays of low to medium plasticity; silty, sandy or gravelly clays
CH	Inorganic clays of high plasticity; fat clays
MH	Elastic silts; micaceous or diatomaceous silts
OL	Organic silts and organic silty clays of low plasticity
OH	Organic clays of medium to high plasticity

AS BUILT

PLAN AND PROFILES FOR GEOLOGIC INVESTIGATIONS

RITTENHOUSE FLOODWATER RETARDING STRUCTURE

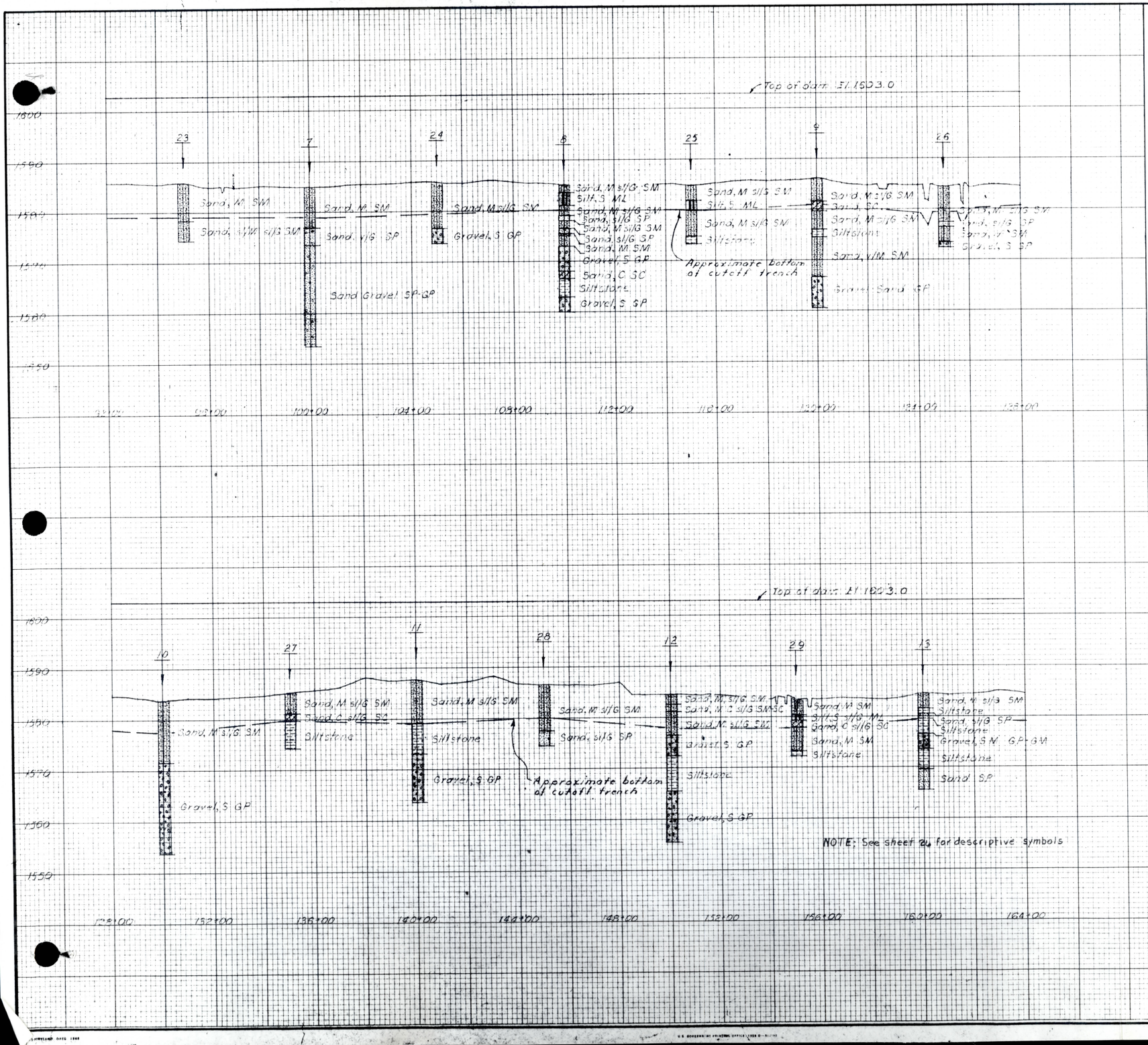
WILLIAMS-CHANDLER W. P. P.

PINAL COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Investigated by [illegible] Date [illegible]	Approved by
Title [illegible]	Title
Checked by [illegible]	Title
Title	Sheet No. 25 of 26 — Drawing No. 7-E-20764

ES 900 Sheet 4 of 4 SCS-35D (6-59)



LEGEND

SYMBOLS

UNCONSOLIDATED MATERIAL

gravel, sand, silt, clay, cobbles, boulders, gravel, sandy, sand, gravelly, silt, gravelly, clay, gravelly, peat, gravel, silty, sand, silty, silt, sandy, clay, sandy, gypsiferous *, gravel, clayey, sand, clayey, silt, clayey, clay, silty, calcareous *, gravel, sand, silt, sand, silt, clay, organic silt, organic clay

* to be added to Standard Symbol when significant amounts of dispersed gypsum or calcified zones are present in the section.

CONSOLIDATED MATERIAL

Sedimentary Rocks

shale, sandstone, limestone, chalk, coal, calcareous shale, calcareous sandstone, cherty limestone, marl, gypsum, sandy shale, shaley sandstone, sandy limestone, chert, conglomerate, siltstone, breccia, dolomite

Metamorphic Rocks: quartzite, slate, gneiss, schist, marble, soapstone talc serpentine

Igneous Rocks: intrusive, extrusive, pyroclastic

Undifferentiated

Other Symbols

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

ABBREVIATIONS

aq	aquifer	fri	friable
cav.	cavities	lam	laminated
℄	centerline	mas	massive
con	concretions	TD	total depth
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OH	Organic clays of medium to high plasticity

AS BUILT

PLAN AND PROFILES FOR GEOLOGIC INVESTIGATIONS

RITTENHOUSE FLOODWATER RETARDING STRUCTURE

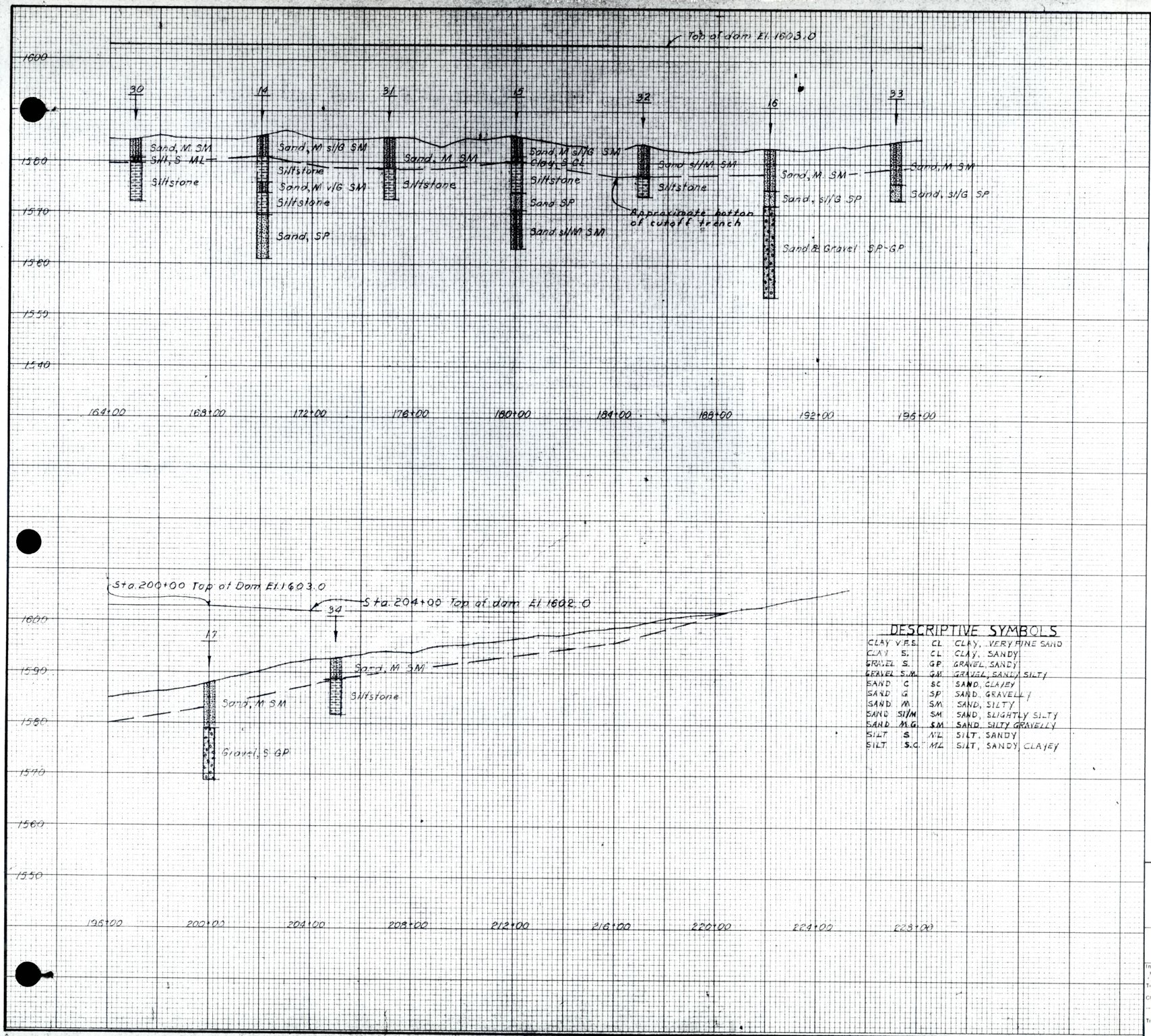
WILLIAMS-CHANDLER W. P. P.

PINAL COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Investigated by: AF MILLNER 4-20-65 (Date)	Approved by
Title: GEOLOGIST	Title
Checked by: Ewa	Title
Title	Sheet No. 24 of 26 — Drawing No. 7-E-20764

ES 900 Sheet 4 of 4 SCS-35D (6-59)



DESCRIPTIVE SYMBOLS

CLAY	V.F.S.	CL	CLAY, VERY FINE SAND
CLAY	S.	CL	CLAY, SANDY
GRAVEL	S.	GP	GRAVEL, SANDY
GRAVEL	S.M.	GM	GRAVEL, SANDY SILTY
SAND	C	SC	SAND, CLAYEY
SAND	G	SP	SAND, GRAVELLY
SAND	M	SM	SAND, SILTY
SAND	Sl/M	SM	SAND, SLIGHTLY SILTY
SAND	M.G.	SM	SAND, SILTY GRAVELLY
SILT	S	ML	SILT, SANDY
SILT	S.C.	ML	SILT, SANDY, CLAYEY

LEGEND

SYMBOLS

UNCONSOLIDATED MATERIAL

gravel; sand; silt; clay; cobbles, boulders
gravel, sandy; sand, gravelly; silt, gravelly; clay, gravelly; peat
gravel, silty; sand, silty; silt, sandy; clay, sandy; gypsiferous *
gravel, clayey; sand, clayey; silt, clayey; clay, silty; calcareous *
gravel, sand, silt; sand, silt, clay; organic silt; organic clay

* to be added to Standard Symbol when significant amounts of dispersed gypsum or calcified zones are present in the section.

CONSOLIDATED MATERIAL

Sedimentary Rocks

shale; sandstone; limestone; chalk; coal
calcareous shale; calcareous sandstone; cherty limestone; marl; gypsum
sandy shale; shaley sandstone; sandy limestone; chert; conglomerate
siltstone; breccia; dolomite

Metamorphic Rocks

quartzite; slate
gneiss; schist
marble; soapstone talc serpentine

Igneous Rocks

intrusive; extrusive
pyroclastic

Undifferentiated

Other Symbols

● hole logged only
◉ hole sampled
dip and strike
pit or trench

ABBREVIATIONS

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OH	Organic clays of medium to high plasticity

AS BUILT

PLAN AND PROFILES FOR GEOLOGIC INVESTIGATIONS

RITTENHOUSE FLOODWATER RETARDING STRUCTURE

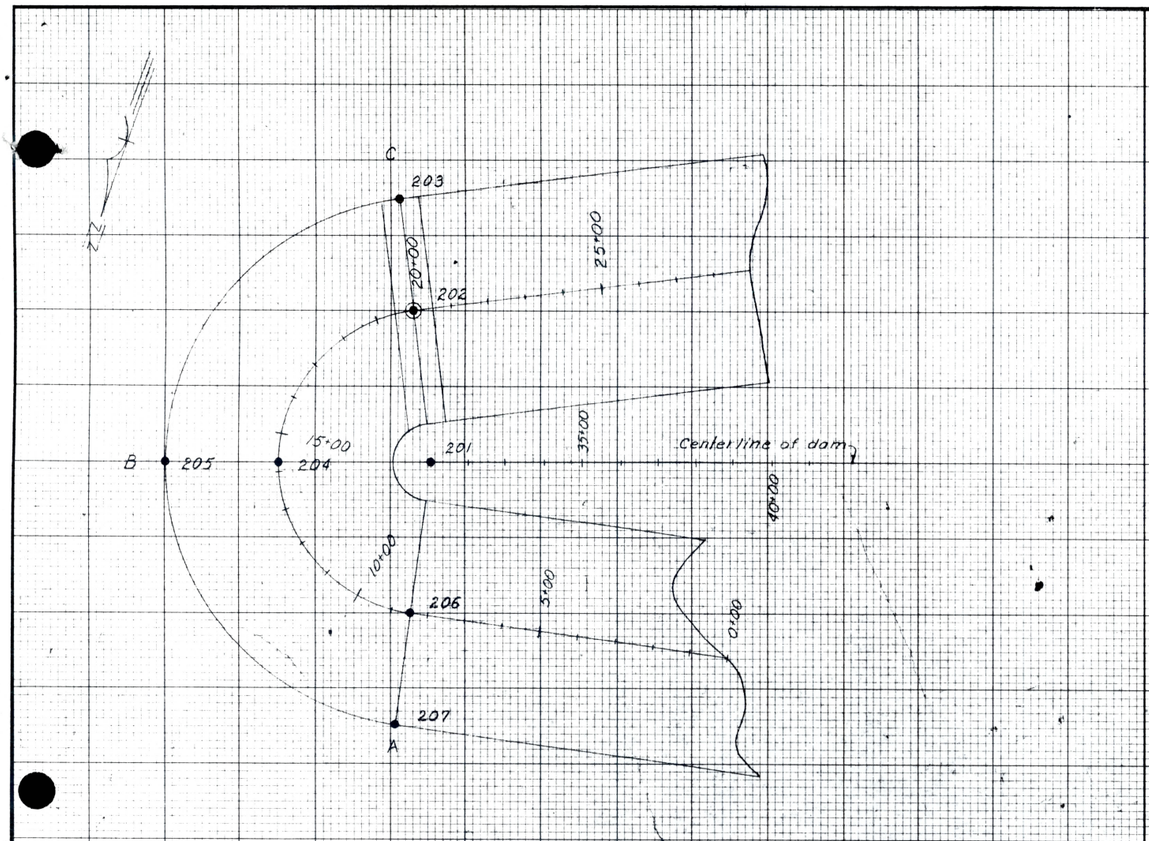
WILLIAM CHANDLER W. P. P.

PINAL COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

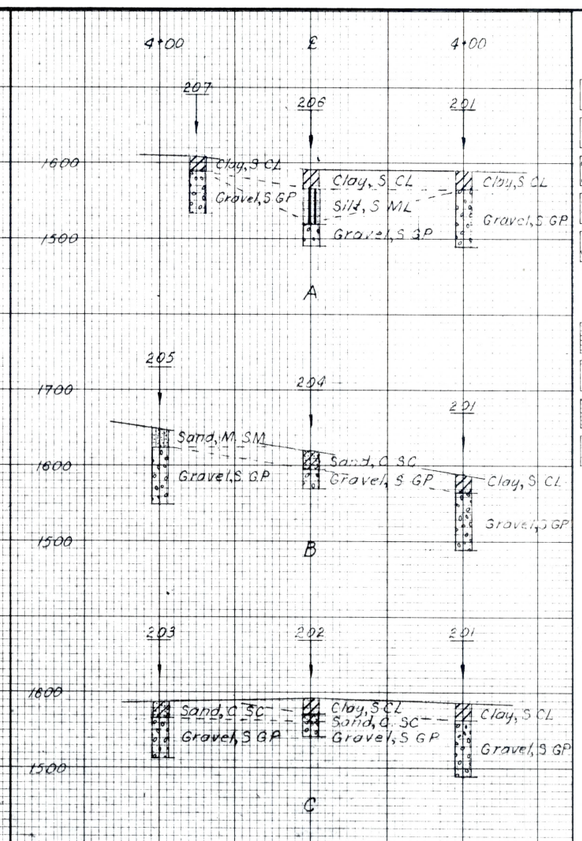
Investigated by: W.F. MILDNER 4-20-65	Approved by:
Title: GEOLOGIST	Title:
Checked by: RWA	Title:
Title: 1	Sheet No. 25 of 26 — Drawing No. 7-E-20764

ES 900 Sheet 4 of 4 SCS-35D (6-59)

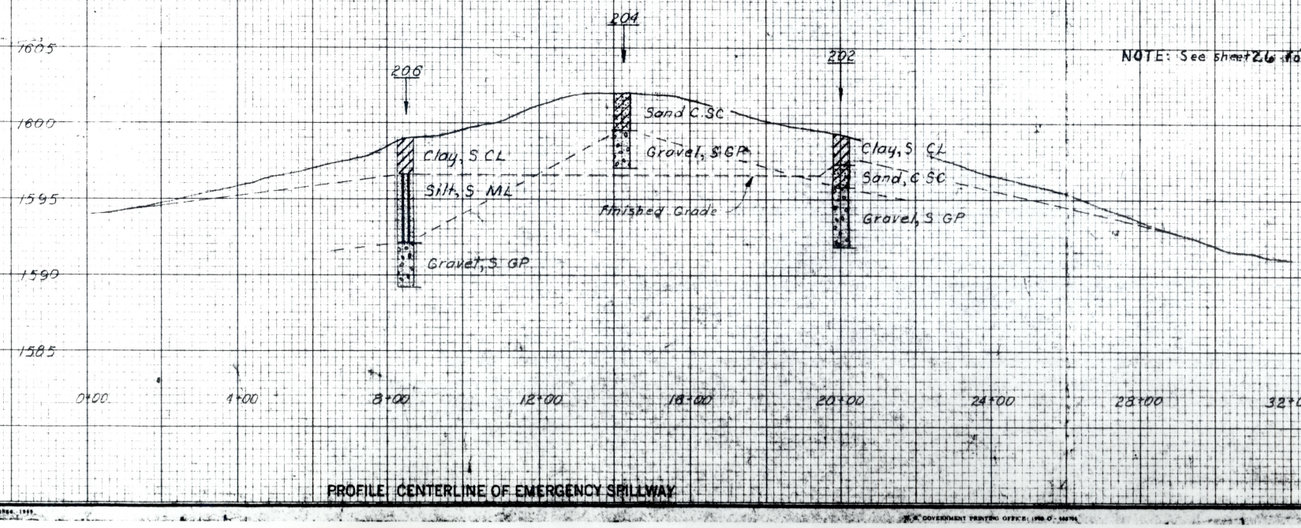


PLAN OF EMERGENCY SPILLWAY

0 200 400
Scale in feet



GEOLOGIC CROSS SECTIONS OF EMERGENCY SPILLWAY



PROFILE CENTERLINE OF EMERGENCY SPILLWAY

NOTE: See sheet 26 for descriptive symbols

LEGEND

SYMBOLS

UNCONSOLIDATED MATERIAL

gravel	sand	silt	clay	cobbles, boulders
gravel, sandy	sand, gravelly	silt, gravelly	clay, gravelly	peat
gravel, silty	sand, silty	silt, sandy	clay, sandy	gypsiferous *
gravel, clayey	sand, clayey	silt, clayey	clay, silty	calcareous *
gravel, sand, silt	sand, silt, clay	organic silt	organic clay	

* to be added to Standard Symbol when significant amounts of dispersed gypsum or calcified zones are present in the section.

CONSOLIDATED MATERIAL

Sedimentary Rocks

shale	sandstone	limestone	chalk	coal
calcareous shale	calcareous sandstone	cherty limestone	marl	gypsum
sandy shale	shaley sandstone	sandy limestone	chert	conglomerate
siltstone	breccia	dolomite		

Metamorphic Rocks

quartzite	slate	
gneiss	schist	
marble	soapstone talc serpentine	

Igneous Rocks

intrusive	extrusive
pyroclastic	

Undifferentiated

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AS BUILT

PLAN AND PROFILES FOR GEOLOGIC INVESTIGATIONS
RITTENHOUSE FLOODWATER RETARDING STRUCTURE
WILLIAMS-CHANDLER W. P. P.
PINAL COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Investigated by W. F. MILLNER Date 4-2-65
Title GEOLOGIST
Checked by [illegible]
Title

Approved by
Title
Title

Sheet No 26 of 26
Drawing No. 7-E-20764

USCOMM-WASH-DC 1966—1959

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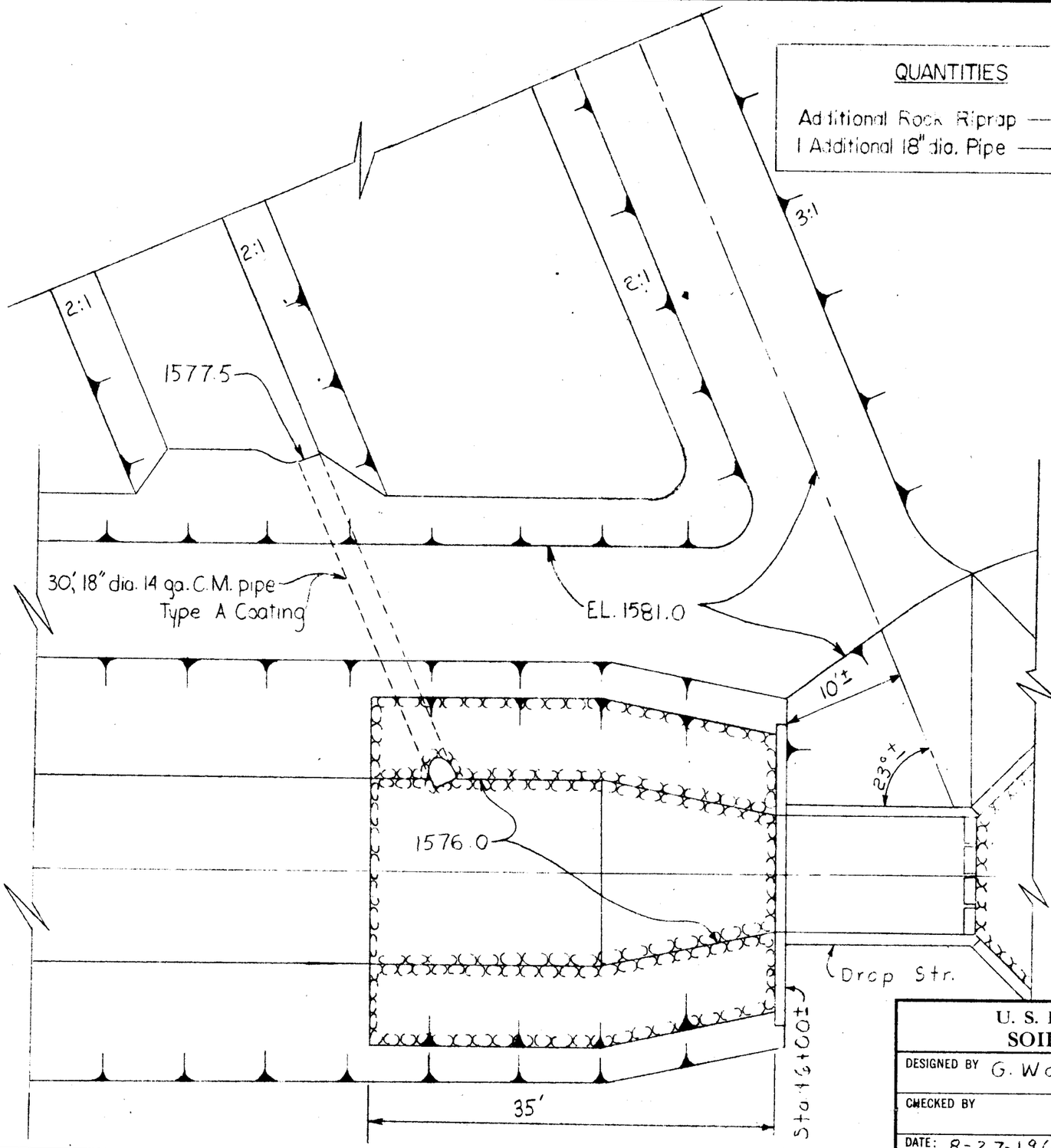

QUANTITIES

Additional Rock Riprap	32 cu. yd.
1 Additional 18" dia. Pipe	4 lin. ft.

PLAN OF DRAIN INLET

RITTENHOUSE FLOODWATER

RETARDING STRUCTURE

PINAL COUNTY, ARIZONA

AS BUILT

SCALE: 1 inch = 10 feet

U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	
DESIGNED BY G. Watt.	APPROVED BY
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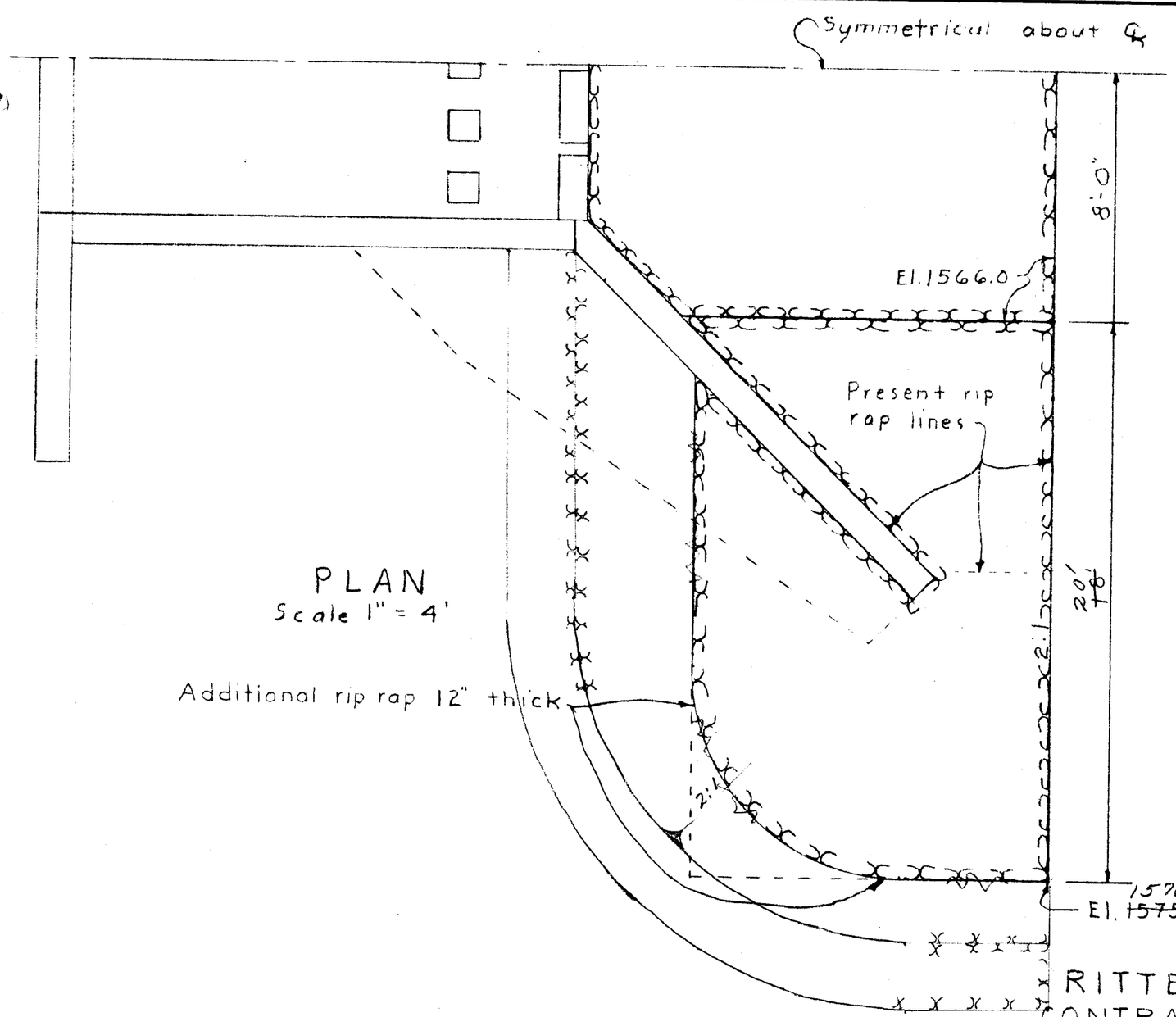

PLAN
Scale 1" = 4'

Additional rip rap 12" thick

Additional rip rap = ~~10.5~~ 21.0 Yd³

AS BUILT

RITTENHOUSE F. R. STRUCTURE
CONTRACT MODIFICATION No.
RIP RAP FOR DROP STRUCTURE

U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	
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