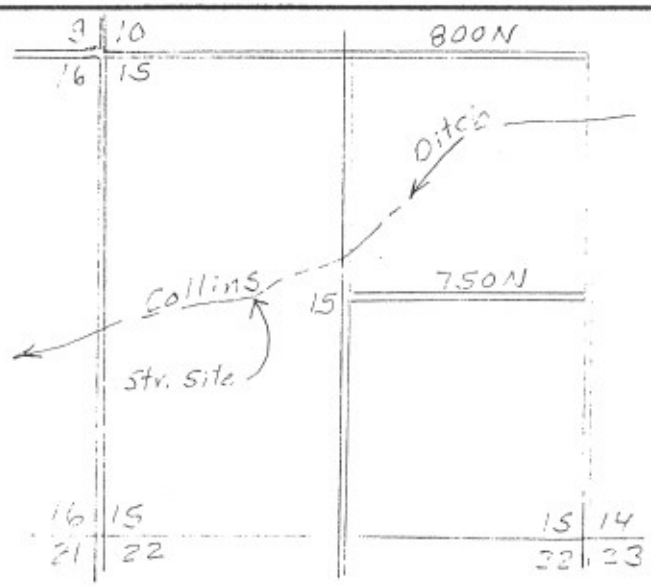
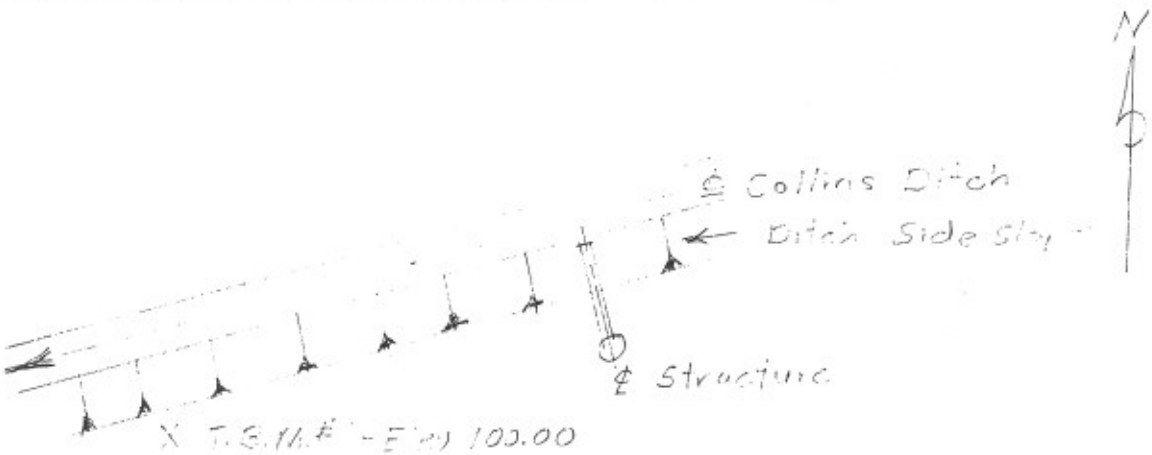


LOCATION MAP

Not to Scale



PLAN VIEW

0 50 100

PLAN FOR	Pipe Drop Structure
COOPERATOR	Al Field
SEC.	15
T.	30N
R.	30W
COOPERATING WITH	Jasper Co. SWCD
COUNTY	Jasper
STATE	Indiana
SURVEYED	D. Designer
DATE	1-81

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	D. Designer	Date 2-81	Approved by Dan Designer
Drawn	D. Designer		Title S.C.T. 2/81
Traced	D. Designer		Title
Checked	A. Checker	2-81	Sheet No 1 of 3 — Drawing No.

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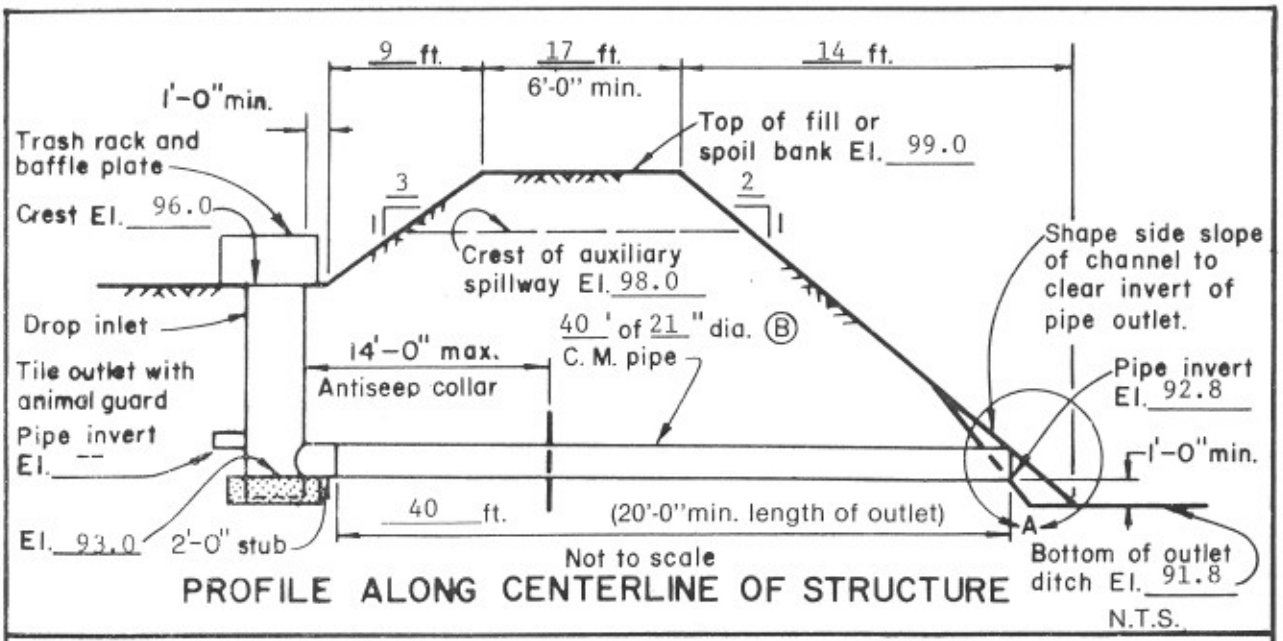
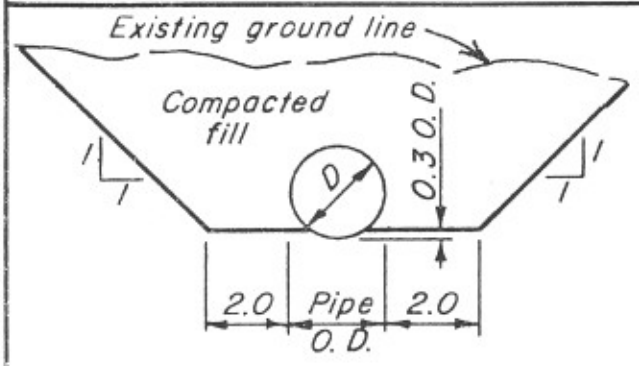
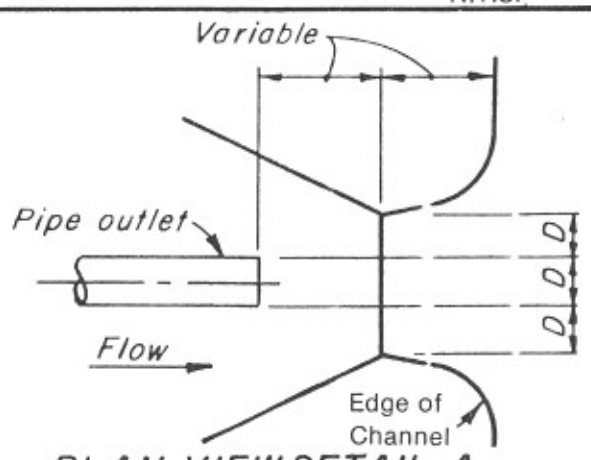




TYPICAL EXCAVATION AND BACKFILL FOR PIPE INSTALLATION



PLAN VIEW DETAIL A

ESTIMATE OF MATERIALS

ITEM	QUANTITY	
Clearing	--	Acres
Excavation	--	Cu.yd.
Earth fill	150	Cu.yd.
Pipe 21 inch diameter (B), C.M. metal thickness ~~0.06~~" (16 ga.)	40	Lin.ft.
Riser 30 inch diameter (A), C.M. metal thickness ~~0.06~~" (16 ga.) (B)	4	Lin.ft.
Tile stub -- inch diameter	~~2-0~~	Lin.ft.
Animal guard	--	Each
Baffle plate	1	Each
Trash rack	--	Each
Antiseep collar	1	Each
Concrete	1.2	Cu.yd.
Seeding and mulching	0.2	Acres
Fencing	--	Lin.ft.

SOIL INVESTIGATION REPORT

LOCATION OF BORINGS	DEPTH FEET	UNIFIED SOIL CLASSIFICATION
℄ Pipe in		
Gully	0-5	CL

CORRUGATED METAL PIPE CONDUIT WITH DROP INLET

NAME Al Field

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Date
Designed
Drawn
Checked
Reviewed
Approved by
Title
Title
Sheet No. 2 Of 3

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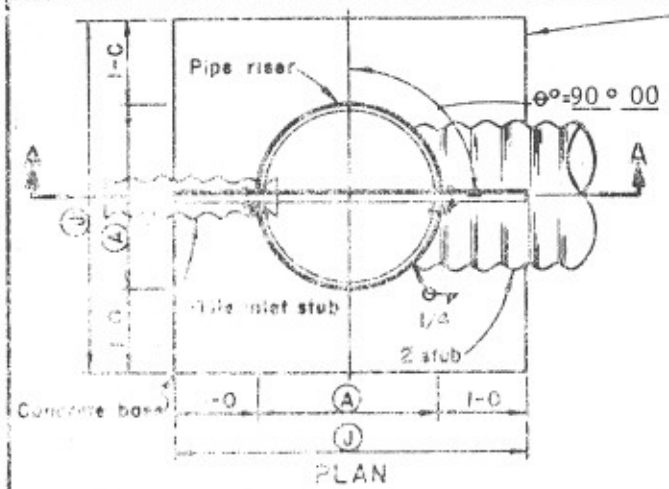
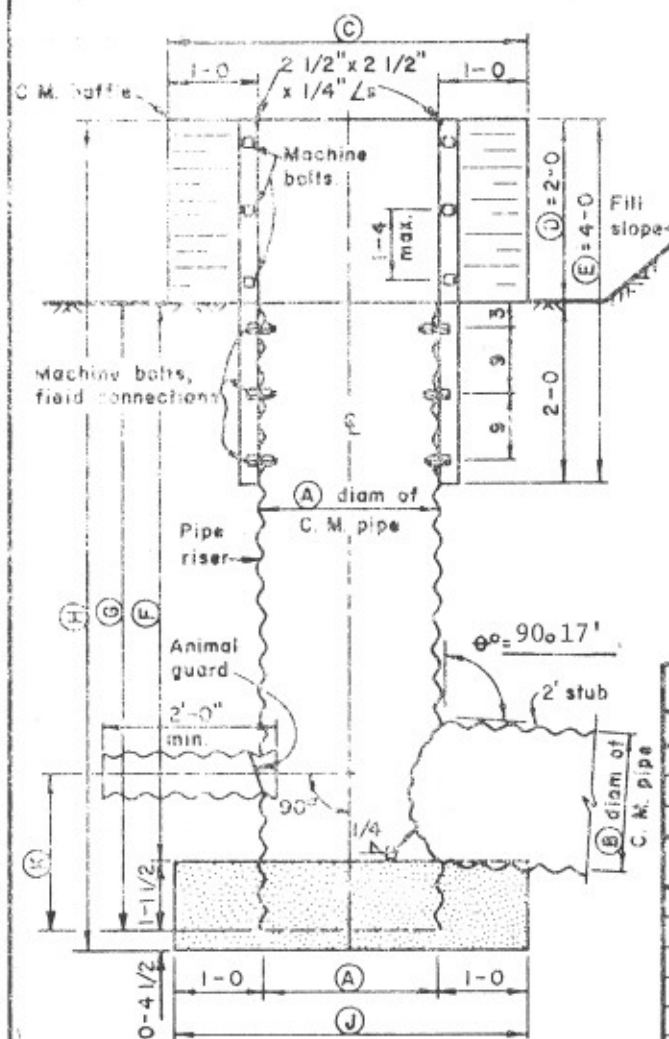


Concrete shall have a minimum compressive strength at 28 days equal to a minimum of 2500 lb./sq.in. (5 bag mix).

TABLE OF QUANTITIES FOR CONCRETE RISER BASE

DIA. OF RISER IN INCHES	18"	21"	24"	30"
CONCRETE, CU.YD.	0.58	0.78	0.89	1.12

INLET PROPORTIONS (MIN.)		ANTIVORTEX BAFFLE
PIPE DIA. CONDUIT (B)	RISER DIA. (A)	LENGTH FEET (C)
8 TO 12	18	3-6
15	21	3-9
18	24	4-0
21 AND 24	30	4-6



SECTION ON CENTERLINE
SECTION A-A

DETAILS OF INLET

NOTES:

1. CORRUGATED METAL PIPE MAY BE MADE OF ALUMINUM OR ZINC-COATED IRON OR STEEL AND MEET FEDERAL SPECIFICATIONS, WW-P-402C OR WW-P-405A AND SHALL BE CLASS I OR II, SHAPE 1. USE 16 GAGE (THICKNESS = 0.06")
2. ALL ACCESSORIES AND FASTENERS SHALL BE OF COMPATIBLE METALS THROUGHOUT STRUCTURE. GALVANIZED OR CADMIUM PLATED BOLTS, NUTS AND WASHERS MAY BE USED.
3. ALL HOLES FOR BOLTS SHALL BE 1/16" LARGER THAN DIAMETER OF BOLTS.
4. DROP INLET SHALL BE SHOP FABRICATED.
5. ZINC-COATED METALS, AFTER WELDING OR CUTTING, SHALL BE REPAIRED AS FOLLOWS:
   (A) THOROUGHLY CLEAN THE DAMAGED AREAS ON BOTH SIDES OF THE PIPE WITH WIRE BRUSH.
   (B) PAINT THE CLEANED AREAS WITH TWO COATS OF ZINC OXIDE - ZINC DUST PAINT.
   (C) APPLY A HEAVY COAT OF ASPHALT OVER THE PAINTED AREAS.

TABLE SHOWING DIMENSIONS AND MATERIALS

DIMENSIONS							
(A)	30"	(D)	24"	(G)	48"	(K)	
(B)	21"	(E)	48"	(H)	78"		
(C)	4'6"	(F)	36"	(I)	54"		

MATERIAL ITEMS	QUANTITY REQUIRED
2 1/2" X 2 1/2" X 1/4" ANGLES X (E) 4-0	2
(C) X (D) C.M. SHEET	1
1/2" X 1 1/4" MACHINE BOLTS	12
1/2" STEEL SPLIT LOCKWASHERS	12
1/2" NUTS	12
Connecting Bend	2

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GENERAL DATA

Drainage Acres 42 Acres; Runoff Curve No. 80

Ave. W.S. Slope = $\frac{\text{Vertical Drop}}{\text{Length}}$ = 1.2 % (Flat) Moderate, Steep (Circle One)

PRINCIPAL SPILLWAY

Elevations: Outlet Channel Bottom 91.8; Invert Inlet 93.0; Invert Outlet 92.8
Top Fill 99.0; Emerg. Spillway 98.0; Tailwater --;
Weir (Pipe Drop) 96.0

Controlled Drop 4.2 feet; Design Frequency 5 years(24 hr.); Rainfall 3.6 inches;
Runoff 1.72 inches; Q from ES-1027 38 cfs; Slope correction factor 1.03;
Ponding or Swampy Area adjusting factor 0.94; Design Q 36.8 cfs;
Pipe Diam. 21 inches; Pipe Length 40 Feet; Riser Diam. 30 inches; n = 0.020

Outlet Control:
Hydraulic head 3.1 ft; Assumed Capacity 19.1 cfs.
One of the following criteria must apply (check one)

Drop Inlet:
- ☐ outlet slope is completely submersed and Z = 2D
- ☒ pipe slope is less than critical slope and Z = 2D - Used next size riser.
- ☐ Z = 5D

Hooded Inlet:
- ☐ outlet is pipe completely submerged
- ☐ stage at inlet is 1.8D
- ☐ pipe slope is less than critical slope

Flared Inlet:
- ☐ outlet of pipe completely submerged
- ☐ stage at inlet is 2.0D
- ☐ pipe slope is less than critical slope

Inlet Control: Hydraulic head 3.25 ft.; Assumed Capacity 21.5 cfs.
Prinicipal Spillway Capacity 19.1 cfs (smaller of inlet or (outlet) control)

DETENTION STORAGE

Volume of Runoff (Vr) 6.1 Ac.Ft.; Required Volume of Storage (Vs) 1.75 Ac. Ft.
Available Volume of Storage (Vsa) 2.1 Ac.Ft.

24 Hr. REMOVAL VOLUME

Principal Capacity 19.1 x 1.983 x outflow factor 0.4 = 15.1 Ac.Ft.
(outflow factor = 0.4 for pipe drop inlets; 0.3 for flared and hooded inlets)

ENERGENCY SPILLWAY

Design frequency 10 yrs(24hr.); Rainfall 2.12 inches; Q from ES-1027 48 cfs;
Slope correction factor 1.03; Ponding or Swampy Area adjusting factor 0.94;
Corrected Total Q = 46.4 cfs;

Design Q = Total Q 46.4 — Principal Spillway Q 36.8 = 9.6 cfs;
Max. Velocity = ____ ft/s.; Retardance ____;
Discharge q ____ cfs/ft.; L ____ ft;

Note: Channel bank is fairly level and will be used as an emergency spillway Hold 1.0' of fill over 99.0 for 25' either side of structure

Bottom Width (b) (Stability) = $\frac{\text{Design Q}}{\text{Discharge q}}$ = ____ ft.

Hp ____ ft; Bottom Width b (used) 25 ft;

Discharge q (used) = $\frac{\text{Design Q}}{\text{B}}$ = ____ cfs/ft;

Hp (used) ____ ft; Min. Slope ____ %
Max. Slope ____ %;
Exit Slope (Actual) ____ %
Freeboard ____ ft.

PIPE STRUCTURE DATA

NAME Al Field

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

	Date		
Designed		Approved by	
Drawn		Title	
Checked		Title	
Reviewed		Sheet No. 3 Of. 3	Drawing No.

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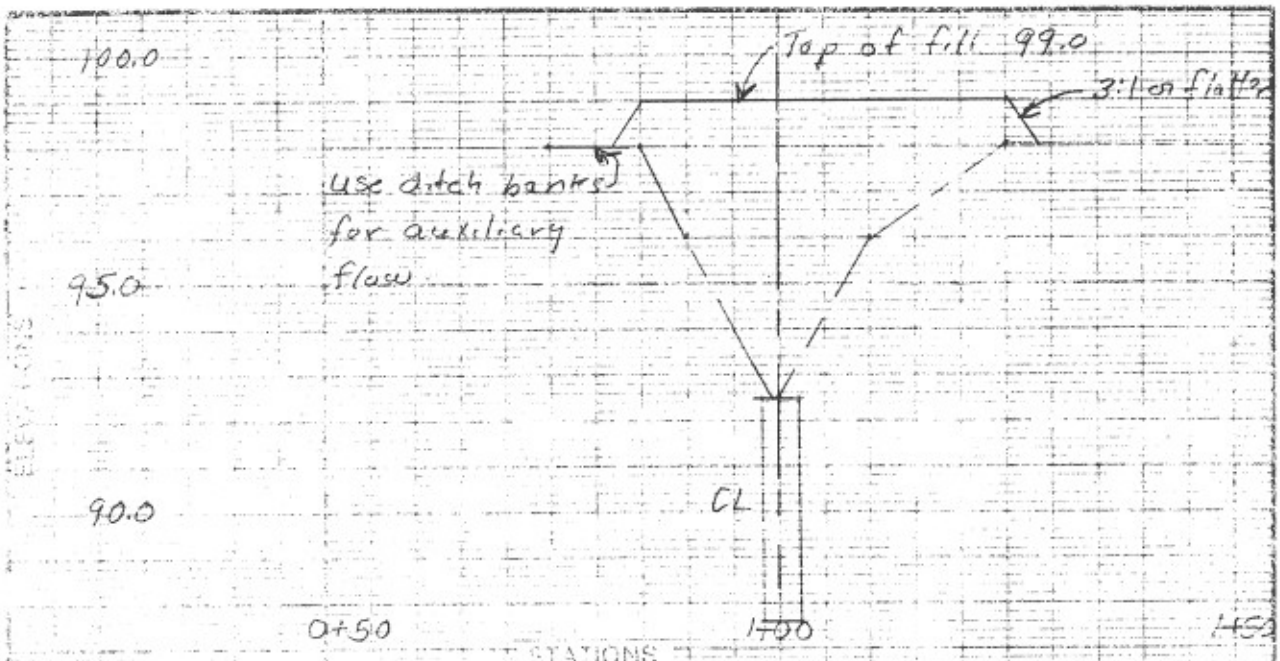

PROFILE ALONG CENTERLINE OF FILL
(Show soil borings)

EARTHWORK COMPUTATIONS

Station	Elevation	Fill height ft.	Cu.yd. per ft.	Average fill cu.yd.	Distance ft.	Fill cu.yd.
0+75	98.0	1.0	0.74			
				0.74	10	7.4
0+85	98.0	1.0	0.74			
				1.72	5	8.6
0+90	96.0	3.0	2.70			
				5.34	10	53.4
1+00	92.5	6.5	7.98			
				5.34	10	53.4
1+10	96.0	3.0	2.70			
				1.72	15	25.8
1+25	98.0	1.0	0.74			
					Total	148.6

CONSTRUCTION CHECK

Top of fill el. 99.2

Auxiliary spillway el. 98.0

Crest of drop inlet el. 95.9

Invert inlet el. 92.9

Invert outlet el. 92.7

I certify that this job meets all the requirements of Indiana Standards and Specifications for Structures (Code 410 or 587) and the plans as designed.

Checked by Dan Designer

Date 4-6-81

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