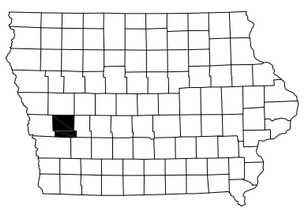
IOWA DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTS
FOR
PRAIRIE ROSE STATE PARK
GRADE STABILIZATION STRUCTURE
SHELBY COUNTY, IOWA

PROJECT # 13-04-83-03



IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com
811 Know what's below. Call before you dig.

DIRECTORY

PROJECT MANAGER		CONSTRUCTION INSPECTOR	
COMPANY	IOWA DEPARTMENT OF NATURAL RESOURCES	COMPANY	IOWA DEPARTMENT OF NATURAL RESOURCES
ADDRESS	502 EAST 9TH STREET	ADDRESS	502 EAST 9TH STREET
CITY,STATE,ZIP	DES MOINES, IA 50319	CITY,STATE,ZIP	DES MOINES, IA 50319
CONTACT	TROY DUFF	CONTACT	MARK JOHNSON
TELEPHONE	515-250-3715	TELEPHONE	515-250-3713
FAX		FAX	
EMAIL	Troy.Duff@dnr.iowa.gov	EMAIL	Mark.Johnson@dnr.iowa.gov

PROJECT DESCRIPTION

THIS PROJECT INVOLVES CONSTRUCTING A SEDIMENT POND AT PRAIRIE ROSE STATE PARK AND OTHER INCIDENTAL WORK AS REQUIRED BY D.N.R CONSTRUCTION INSPECTOR IN SHELBY COUNTY, IOWA.

AUTHORIZATION TO BID

AUTHORIZATION – PARKS | WILDLIFE | FISHERIES | LAW ENFORCEMENT | FORESTRY

ENGINEERING BUREAU CHIEF DATE

SHEET INDEX

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILING
502 E. 9TH ST., DES MOINES, IA 50319-0034

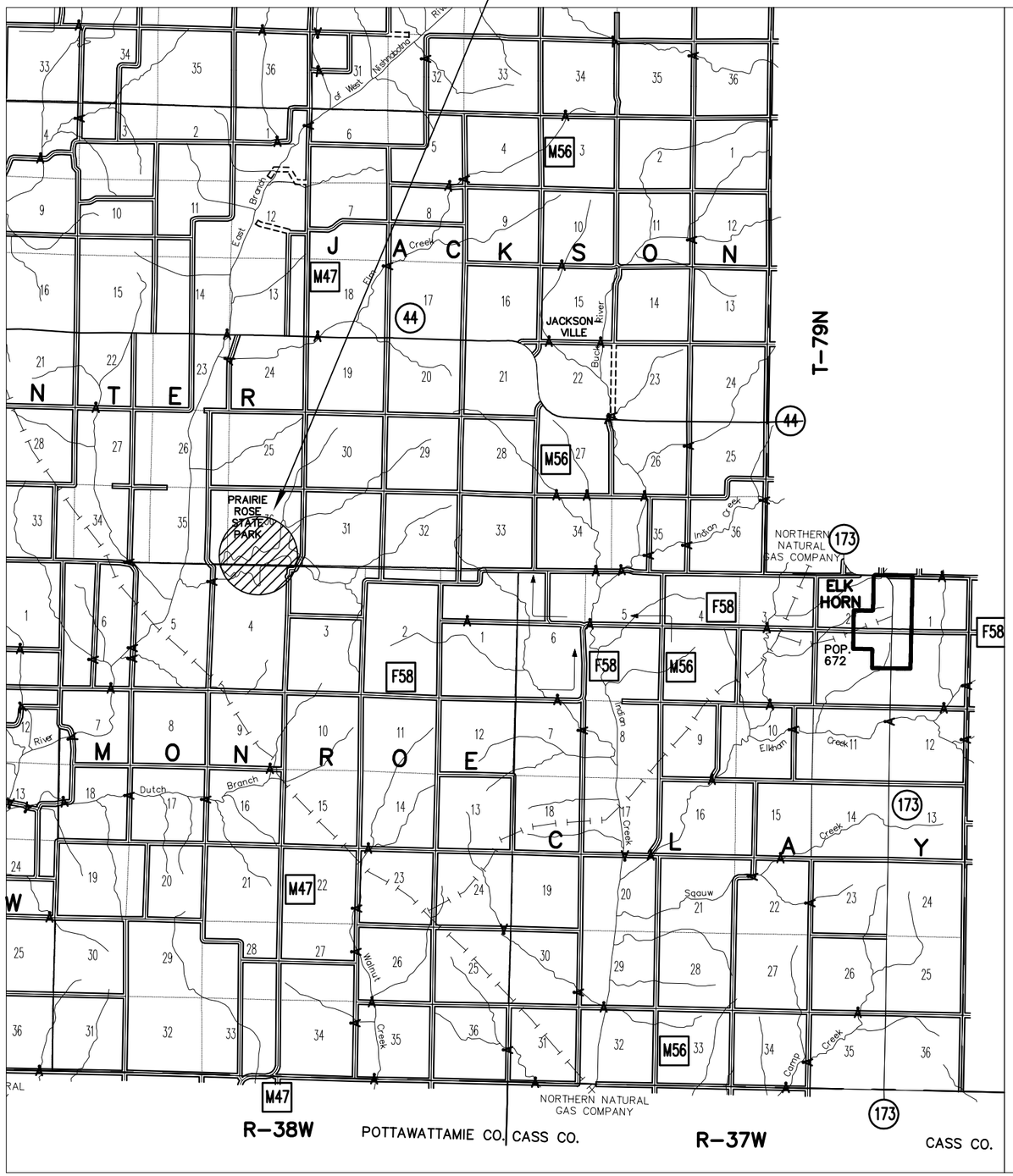
COVER SHEET

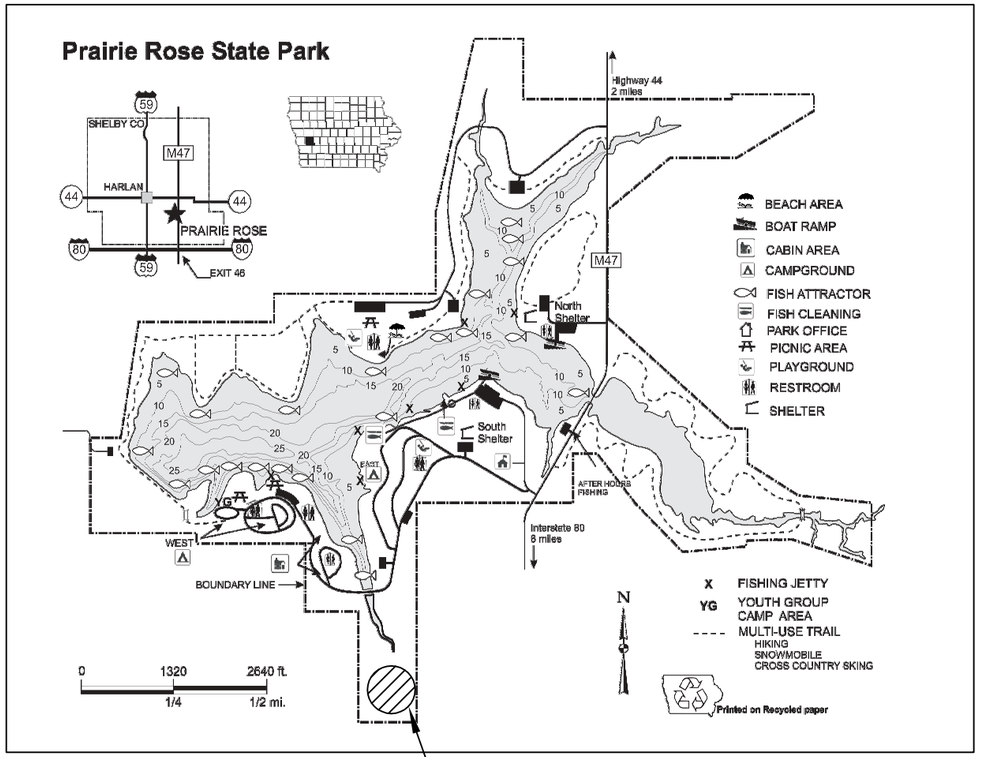
GRADE STABILIZATION STRUCTURE CONSTRUCTION FOR:
PRAIRIE STATE PARK
SHELBY COUNTY, IA

NO.	BY / DATE	REVISION

DRAWN BY: ES
PROJECT NUMBER: 13-04-83-03
CHK'D BY: MD
DATE: JULY/2014
SHEET No: 1

PROJECT LOCATION





PROJECT LOCATION

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

ENGINEERING SERVICES - WALLACE BUILING
502 E. 9TH ST., DES MOINES, IA 50319-0034

PROJECT LOCATION

GRADE STABILIZATION STRUCTURE CONSTRUCTION FOR:
PRAIRIE ROSE STATE PARK

SHELBY COUNTY, IA

NO.	BY DATE	REVISION

DRAWN BY: ES
PROJECT NUMBER: 13-04-83-03
CHKD BY: TD
DATE: JULY/2014
SHEET No: 2

ESTIMATED PROJECT QUANTITIES

ITEM	DESCRIPTION	UNIT	TOTAL
1	MOBILIZATION	L.S	1
2	24" DIA. 16 GA. C.M.P	L.F	114
3	24" DIA. 16 GA. C.M.P SLOTTED FLUME	L.F	30
4	42" DIA. INTAKE ASSEMBLY (EXCLUDE ANTI VORTEX BAFFLE)	L.S	1
5	EARTH FILL (IN PLACE)	C.Y	20,535
6	EXCAVATION	C.Y	3,023
7	ANTI VORTEX BAFFLE	L.S	1
8	TIMBER OUTLET SUPPORT	L.S	1
9	FINE DRAIN FILL	C.Y	30
10	CLASS "E" RIP-RAP (DAM OUTLET)	TONS	16
11	POOL AREA EXCAVATION	C.Y	12,394
12	42" DIA. C.M.P (CULVERT PIPES)	L.F	80
13	PYRAMAT GEOTEXTILE	S.Y	72
14	CLASS "E" RIP-RAP (CROSSING OUTLET)	TONS	20
15	EARTH FILL (CROSSING)	C.Y	328
16	SITE RESTORATION	L.S	1
17	PROPERTY LINE FENCE AND SIGNING	L.S	1
18	CLEARING AND GRUBBING(DIKE)	L.S	1
19	CLEARING AND GRUBBING (FARM CROSSING)	L.S	1

ITEMS NOTES

ITEM	DESCRIPTION
2.	ALUMINIZED CMP, WITH CAULKED SEAM, CLOSE RIVETED, 2 2/3" x 1/2" CORRUGATIONS. COUPLING BANDS SHALL BE WATERTIGHT.
3.	ALUMINIZED CMP SLOTTED FLUME, WITH CAULKED SEAM, CLOSE RIVETED, 2 2/3" x 1/2" CORRUGATIONS.
4.	SEE INTAKE DETAIL SHEET 6
6.	STREAM CHANNEL, CORE TRENCH, & AUXILIARY SPILLWAY
11.	EXCAVATION ON SHEET 4 , NORMAL POOL ELEV: 1267.0, 3:1 SLOPE AND PROPOSED TOE ELEV: 1259.0 EXCAVATION CAN BE AS DEEP AS CONDITIONS BELOW ELEV: 1259.0
17	REMOVE AND REPLACE BOUNDARY FENCE AND SIGNING OR POSTING AT THE PROPERTY LINE EXTENDING TO EACH SIDE OF THE IMPOUNDMENT TO NORMAL POOL.

NOTES:

8" TILE STUB TO BE CAPPED

D.N.R FIELD INSPECTOR SHALL LOCATE WHERE TO SPREAD EXCAVATED MATERIALS THAT IS NOT USABLE FOR FILL

GENERAL NOTES:

ITEM	DESCRIPTION
A.	The contractor shall notify the following two weeks prior to construction: 1. District Inspector: Mark Johnson (515)- 250-3713 2. Project Manager: Troy Duff (515)-250-3715
B.	The contractor shall verify actual locations and elevations with the D.N.R Inspector.
C.	All work shall conform to and be performed in accordance with all applicable codes and ordinances.
D.	The contractor shall visit the site and inspect the project area and thoroughly familiarize themselves with the actual job conditions prior to the start of work. Failure to visit the project site shall not relieve the contractor from performing the work in accordance to the plans, specifications, special provisions and contract.
E.	The contractor shall verify, at the site, all dimensions and conditions shown on the plans and shall notify the D.N.R Inspector of any discrepancies, omissions and/or conflicts prior to proceeding with the work.
F.	The contractor is responsible for providing waste area or disposal for excess material (excavated material or broken concrete) which is not desirable to be incorporated into the work involved on this project. No payment for overhaul will be allowed for material hauled to these sites. No material shall be placed within the right-of-way, unless specifically stated in the plans or approved by the D.N.R Inspector.
G.	The contractor shall not disturb desirable grass areas and desirable trees outside construction limits. The contractor will not be permitted to park or service vehicles and equipment or use these areas for storage of materials. Storage, parking and service areas will be subject to the approval of the D.N.R inspector.
H.	The contractor is expected to have materials, equipment and labor available on a daily basis to install and maintain erosion control features on the project.
I.	The contractor shall be responsible for any damage to existing facilities resulting from their negligence, or that of a subcontractor, and said repairs shall be approved by the owner.

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILING
502 E. 9TH ST., DES MOINES, IA 50319-0034

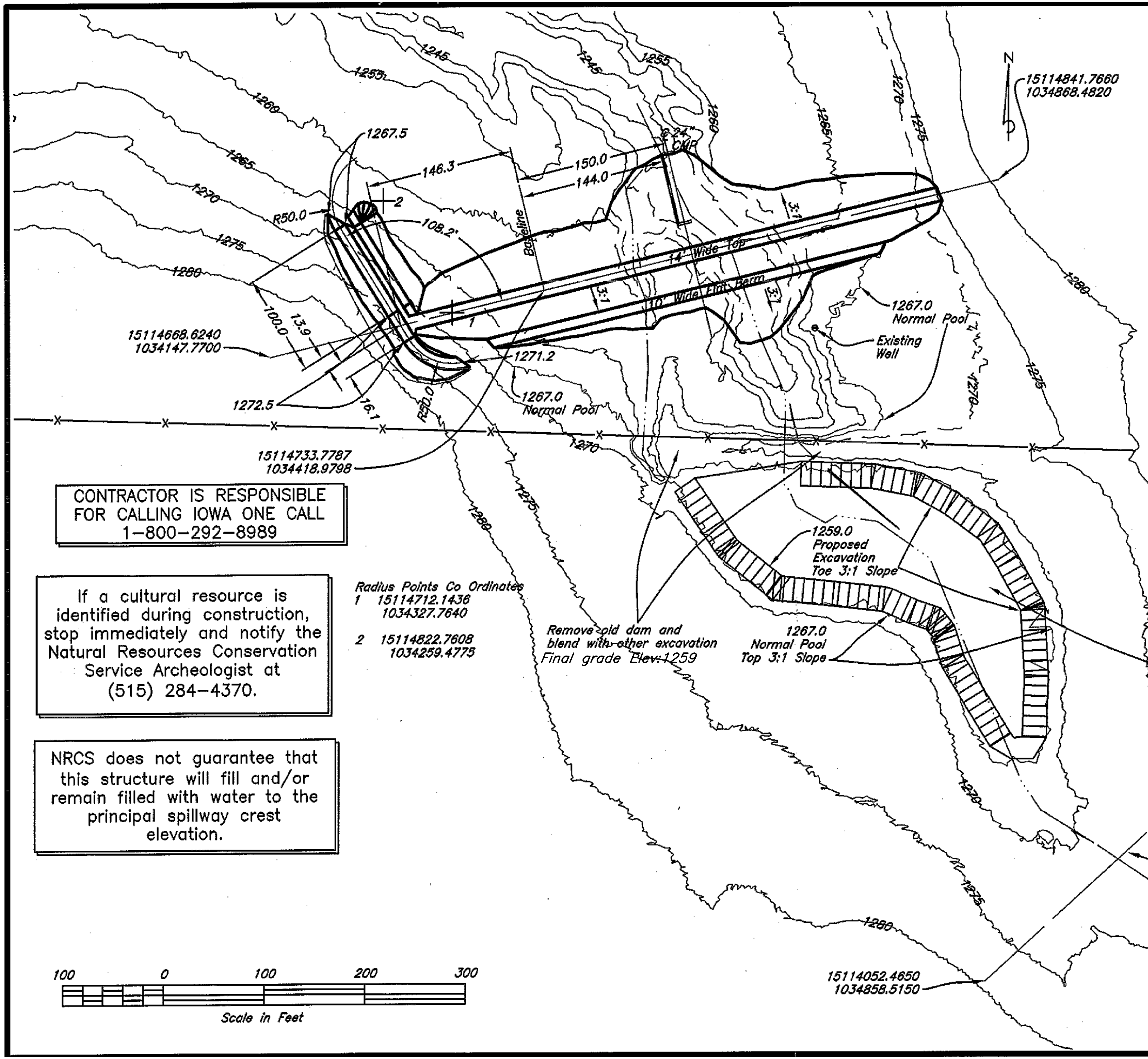
ESTIMATED PROJECT QUANTITIES

GRADE STABILIZATION STRUCTURE CONSTRUCTION FOR:
PRAIRIE ROSE STATE PARK

SHELBY COUNTY,IA

NO.	BY / DATE	REVISION

DRAWN BY: ES
PROJECT NUMBER: 13-04-83-03
CHKD BY: T.D
DATE: JULY /2014
SHEET No: 3



CONTRACTOR IS RESPONSIBLE FOR CALLING IOWA ONE CALL 1-800-292-8989

If a cultural resource is identified during construction, stop immediately and notify the Natural Resources Conservation Service Archeologist at (515) 284-4370.

NRCS does not guarantee that this structure will fill and/or remain filled with water to the principal spillway crest elevation.

BILL OF MATERIALS
Structure

114 Ft of 24", 16 ga. aluminized CMP, with caulked seam, close riveted, 2 ⅔" x ½" corrugations. Coupling bands shall be watertight.

30 FT of 24", 16 ga. aluminized CMP slotted flume, with caulked seam, close riveted, 2 ⅔" x ½" corrugations. See sheet 7 for details.

8 Ft. of 42", 16 ga. aluminized CMP, caulked seam, close riveted, with 2 ⅔" x ½" corrugations. Fabricate with 2 ft. of conduit attached at a 94.5° angle, 1'-1 ½" from the bottom. A 2 ft length of 8" HCMP shall be added for tile hookup. See sheet 6 for details.

20,535 cy of Earthfill

3,023 cy of Excavation (Stream Channel, core trench, and auxiliary spillway)

1 5' 6" X 2' Anti Vortex baffle. See sheet 6 for details.

1 Timber outlet support. See sheet 7 for details.

30 cubic yard of fine drainfill

1 cubic yard of coarse drainfill

6 cubic yards of riprap, CLASS "E" RIPRAP

12,394 cy Excavation (Old earthfill and sediment from pool area at elevation 1259.0)

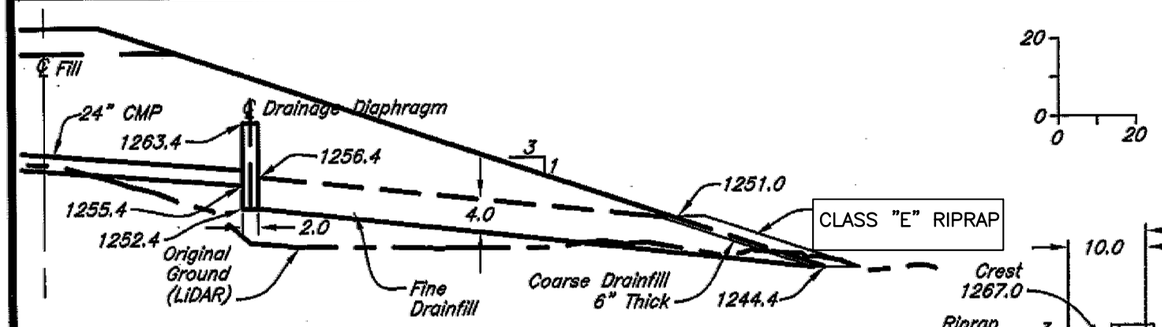
Designed	Holcombe
Drawn	Holcombe
Checked	Godwin (signature)
Approved	(signature)
Date	1/2014, 1/2014

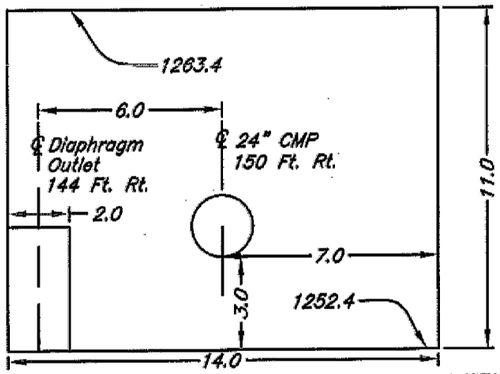
PLAN VIEW

Mills–IDNR, Grade Stabilization Structure
Shelby County, Iowa

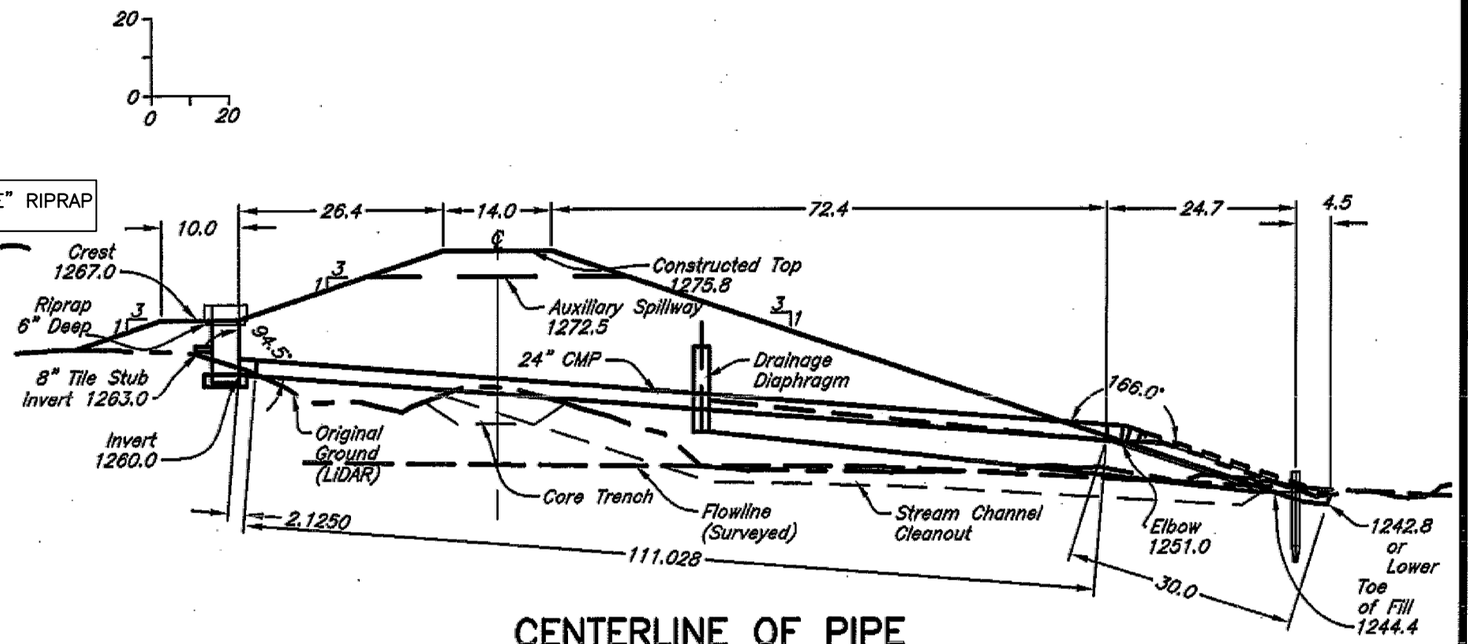
NRCS
Natural Resources Conservation Service
United States Department of Agriculture

File No. Mills.DWG
Drawing No. ----
Sheet 4

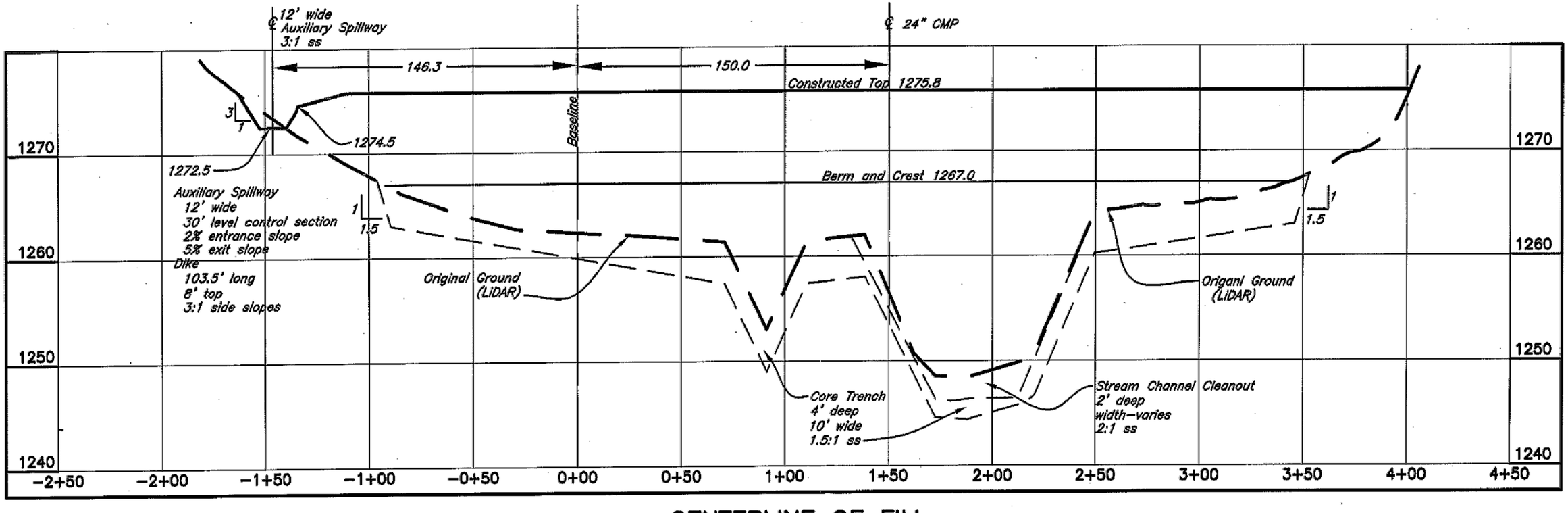




DRAINAGE DIAPHRAGM and OUTLET
(Not to Scale)



CENTERLINE OF PIPE



CENTERLINE OF FILL

Date
Designed Holcombe 1/2014
Drawn Holcombe 1/2014
Checked Godwin 4/14
Approved

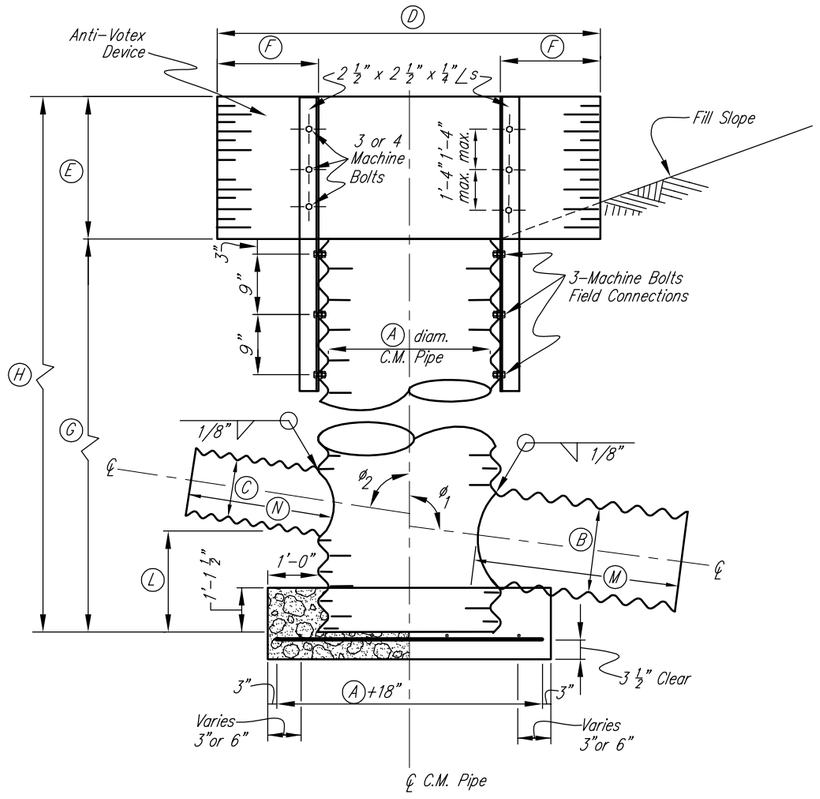
CROSS SECTIONS

Shelby County, Iowa
Mills-IDNR, Grade Stabilization Structure

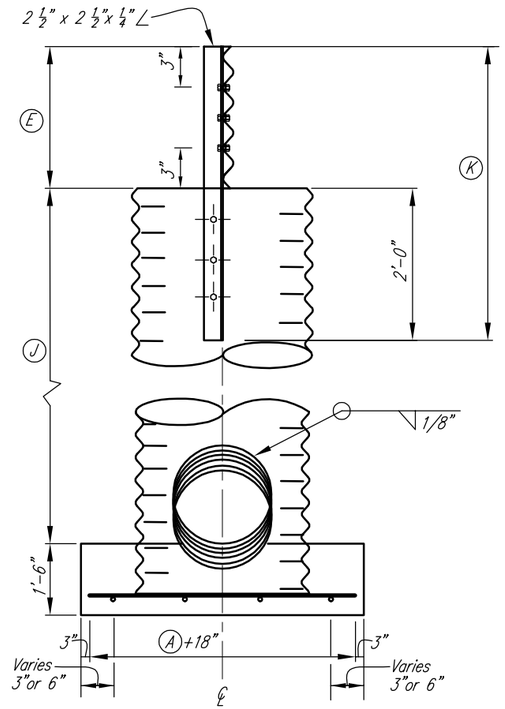
NRCS
Natural Resources Conservation Service
United States Department of Agriculture

File No. Mills.DWG
Drawing No.

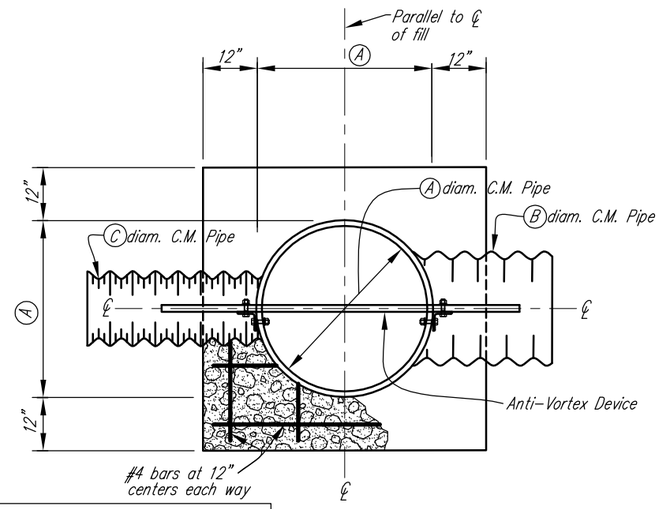
Sheet 5



SECTION ON CENTERLINE



REAR ELEVATION



PLAN

Notes:

All holes for bolts shall be 9/16" diam.

Vertical Inlet to be shop fabricated. After welding, damaged coatings shall be repaired as specified in Construction Specification 51.

Minimum (M) Dimension
B≤ 36" M=2'–1 ½"
B> 36" M=4'–1 ½"

Minimum (N) Dimension
N=2'–1 ½"

OPTIONAL (C) FABRICATION		
	C1	C2
Diameter, Inches	8"	
Sheet Thickness	16 ga	
Corrugations		
Position O'clock (B=12:00)	6:00	
(L)	2'	
Ø2 Degrees–Angles	90.0	
Slope in ft./ft.	00	

DETAILS OF INLET

Not to Scale

TABLE–DIMENSIONS AND MATERIAL		
		Dimensions
(A)		42"
(B)		24"
(C)		8"
(D)		5'–6"
(E)		2'
(F)		1'
(G)		8'–1 1/2"
(H)		10'–1 1/2"
(J)		7'
(K)		4'
(L)		4'
(M)		2'–11/2"
(N)		4'
Sheet Thickness for (A) diam.		16 ga
Corrugations for (A) diam.		2 2/3" x 1/2"
Sheet Thickness for (B) diam.		16 ga
Corrugations for (B) diam.		2 2/3" x 1/2"
Sheet Thickness for (C) diam.		16 ga
Corrugations for (C) diam.		2 2/3" x 1/2"
Sheet Thickness for Anti–Vortex Device		14 ga
Corrugations for Anti–Vortex		2 2/3" x 1/2"
MATERIAL ITEMS		QUANTITY REQUIRED
2 ½" x 2 ½" x ¼" Ls x (K) Galv.		2
(D) x (E) Corr. Metal Sheets Galv.		1
½" x 1 ¼" Steel Cadmium Plated Mach. Bolts		12
½" Steel Split Lockwashers		12
½" Steel Cadmium Plated Nuts		12
Ø Degrees–Angles	Ø1	94.5
	Ø2	90.0
Slope of (B) diam. pipe in ft./ft.		0.0783
Slope of (C) diam. pipe in ft./ft.		0.00

VERTICAL INLET BASE QUANTITIES				
Dimension (in.) (A)	Concrete Cu. Yd.	Steel Reinforcement #4 Bar		
		Length Each Bar	Number of Bars	Total Weight Pounds
18"	0.68	3'–0"	8	16.0
24"	0.88	3'–6"	8	18.7
30"	1.13	4'–0"	10	26.7
36"	1.39	4'–6"	10	30.1
42"	1.68	5'–0"	12	40.1
48"	2.00	5'–6"	12	44.1
54"	2.35	6'–0"	14	56.1
60"	2.72	6'–6"	14	60.8

STANDARD DWG. IA–1131

DATE Oct. 2012 | PAGE 1 OF 1

Date 1/2014
Designed Holcombe
Drawn Holcombe 1/2014
Checked
Approved

DETAILS OF CORRUGATED METAL PIPE VERTICAL INLET WITH ANTI–VORTEX DEVICE

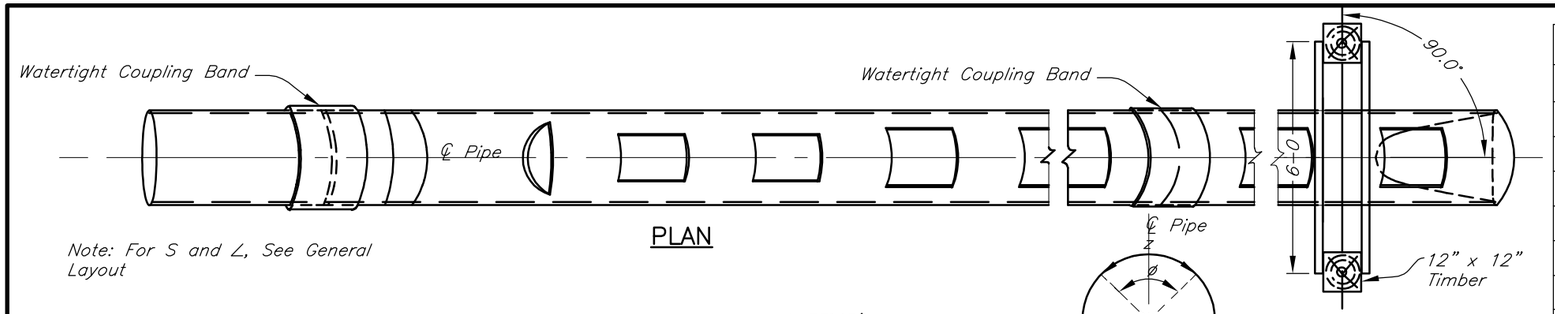
Shelby County, Iowa
Mills–IDNR, Grade Stabilization Structure

NRCS Natural Resources Conservation Service
United States Department of Agriculture

File No. Mills.DWG

Drawing No.

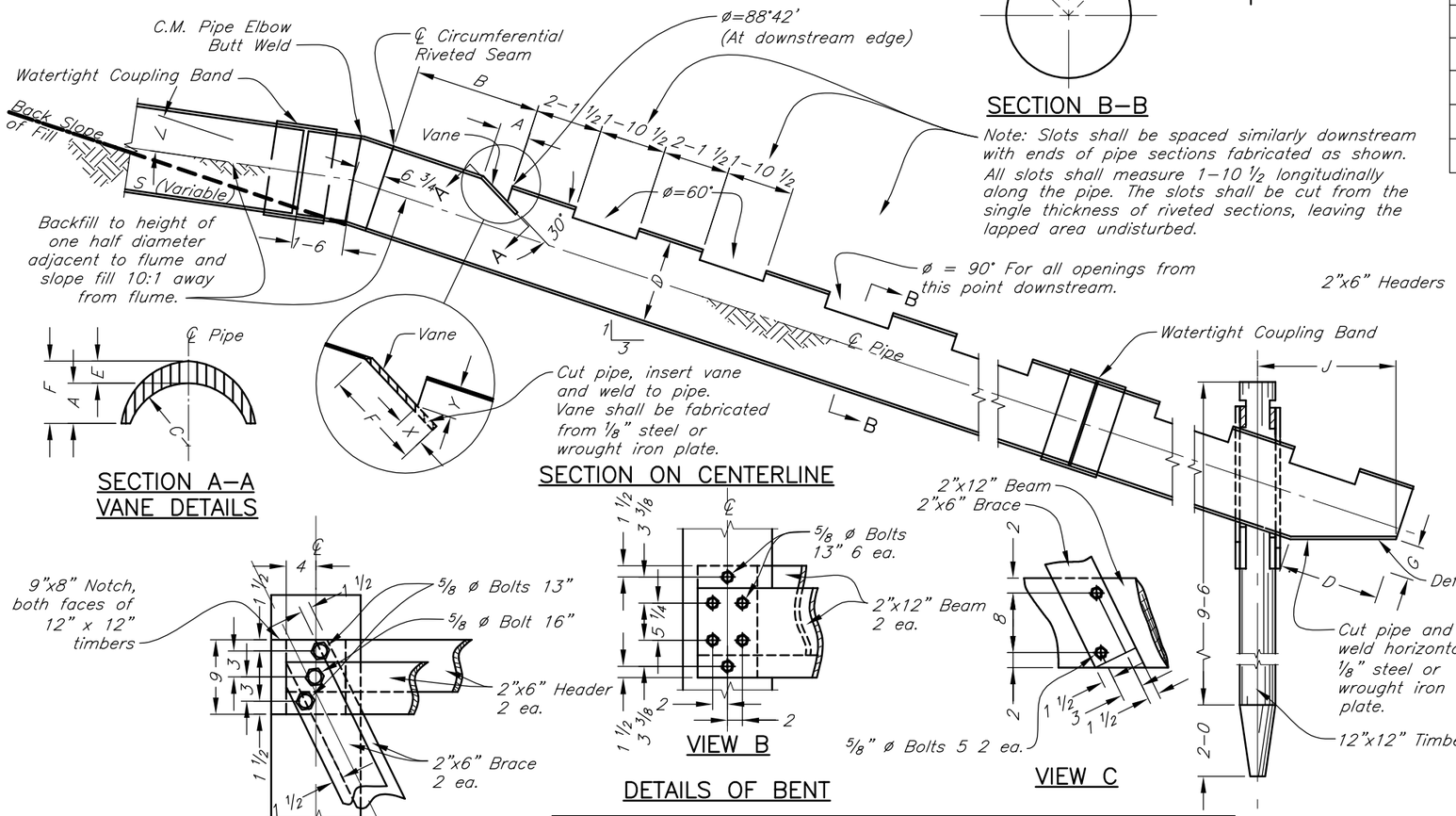
Sheet 6



PLAN

Note: For S and ∠, See General Layout

SECTION B–B



Note: Slots shall be spaced similarly downstream with ends of pipe sections fabricated as shown. All slots shall measure 1–10 ½ longitudinally along the pipe. The slots shall be cut from the single thickness of riveted sections, leaving the lapped area undisturbed.

Backfill to height of one half diameter adjacent to flume and slope fill 10:1 away from flume.

Cut pipe, insert vane and weld to pipe. Vane shall be fabricated from 1/8" steel or wrought iron plate.

SECTION ON CENTERLINE

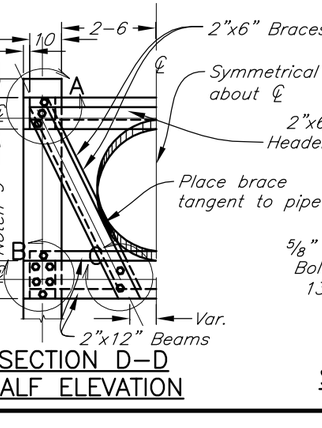
SECTION A–A
VANE DETAILS

VIEW A

VIEW B

VIEW C

DETAILS OF BENT



BENT ELEVATION
(Not to Scale)

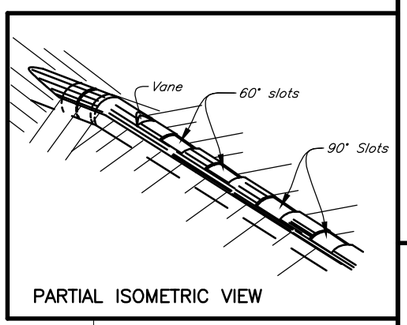
Notes:

Round timbers may be substituted for 12" x 12" timbers.

Round timbers shall conform to the requirements of ASTM D 25. The minimum circumference 3 feet from the butt shall be 38 inches.

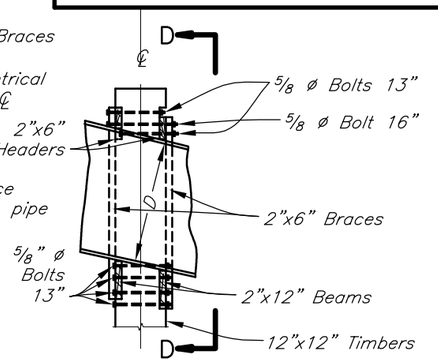
Round timbers shall be treated in accordance with the requirements of ASTM D 1760.

Steel Strap shall be painted in accordance with Construction Specification 82 or IA–81.



PARTIAL ISOMETRIC VIEW

SECTION D–D
HALF ELEVATION



SECTION ON ℄

TIMBER SUPPORT DIMENSIONS (APPROX.)

D	18	21	24	30	36
H	2–6 1/2	2–9 1/2	3–0 1/2	3–7	4–1
I	4–7 1/2	4–10 1/2	5–1	5–5 1/2	5–8
J	4–5 7/8	4–5 7/8	4–4 1/2	4–3 1/4	4–2

BILL OF MATERIALS FOR TIMBER OUTLET SUPPORT

ITEM	GRADE	REQD.	SIZE	LENGTH	TOT LIN. FT.
Timber	1400#f	2	12" x 12"	14–0	28–0
Headers	1400#f	2	2" x 6"	6–8	13–4
Beams	1400#f	2	2" x 12"	6–8	13–4
Braces	1200#f	4	2" x 6"	(See dimension in table)	
Bolts (Galv)		8	5/8" ø	5"	
Bolts (Galv)		16	5/8" ø	13"	
Bolts (Galv)		2	5/8" ø	16"	
Nuts (Galv)		26	5/8" ø		
Washers		52	5/8" ø		

STANDARD DWG. IA–1149

DATE *July 2008* | SHEET *1* OF *1*

FLUME DIMENSIONS					
D	18	21	24	30	36
A	4 1/2	5 1/2	6	7 1/2	9
B	1–11 1/4	1–11 1/4	1–11 1/4	3–11 1/4	3–11 1/4
C	7 1/4	8 3/4	9 5/8	1–0	1–2 3/8
E	2 1/4	2 5/8	3	3 3/4	4 1/2
F	6 3/4	7 7/8	9	11 1/4	1–1 1/2
G	6	7	8	10	1–0
X	0–1 1/2	0–1 3/4	0–2 1/8	0–2 5/8	0–3 3/8
Y	0–2 5/8	0–3	0–3 1/2	0–4 5/8	0–5 1/4
Z(ø=88°42')	1–1 7/8	1–4 1/4	1–6 5/8	1–11 1/4	2–3 7/8
Z(ø=60°)	0–9 3/8	0–11	1–0 5/8	1–3 3/4	1–6 7/8
Z(ø=90°)	1–2 1/8	1–4 1/2	1–6 7/8	1–11 5/8	2–4 1/4

Date 1/2014
Designed Holcombe
Drawn Holcombe 1/2014
Checked
Approved

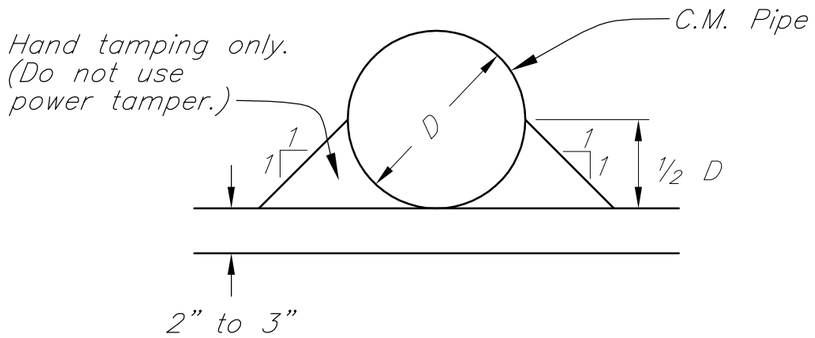
DETAILS OF SLOTTED FLUME OUTLET WITH TIMBER SUPPORT 18" TO 36" DIAM. C.M. PIPE

Mills–IDNR Grade Stabilization Structure
Shelby County, Iowa

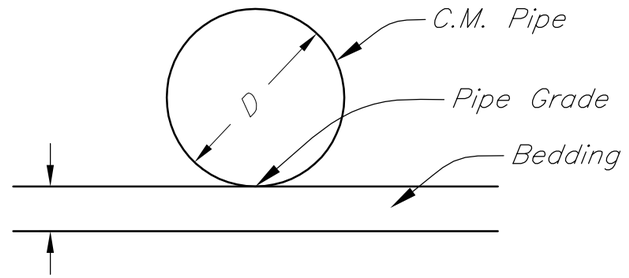
NRCS
Natural Resources Conservation Service
United States Department of Agriculture

File No. Mills.DWG
Drawing No.
Sheet 7

Note
Begin backfill immediately
after pipe has been placed.

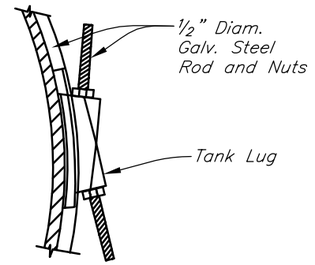


CORRUGATED OR SMOOTH METAL PIPE PRINCIPAL SPILLWAY BACKFILL DETAIL

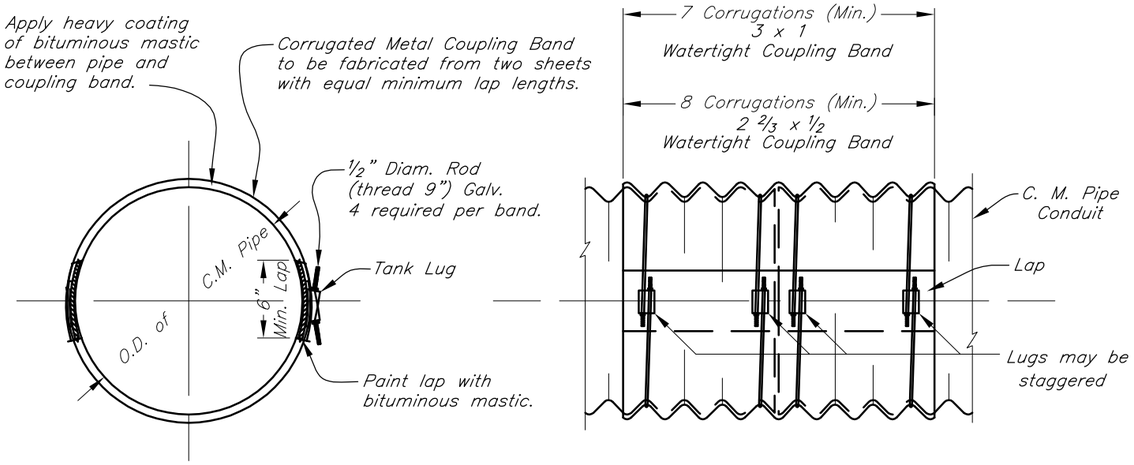


Excavate 2 to 3 inches below pipe grade. Then backfill with damp friable soil free from lumps and raked or graded to a true plane before placing C.M. Pipe. No compaction of bedding is required.

CORRUGATED OR SMOOTH METAL PIPE PRINCIPAL SPILLWAY BEDDING DETAIL



DETAIL OF TANK LUG



NOTES:

1. See spillway general layout drawing for location of watertight bands.
2. Metal treatment, thickness, and coating of watertight coupling bands shall be as specified for the pipe.
3. Rivets in longitudinal seams of C.M. Pipe under watertight coupling band shall be flat head or omitted and seams welded inside and outside with a continuous ⅛" fillet weld.
4. All welded areas shall be treated as specified for "Repair of Damaged Coatings." Refer to Construction Specification 51A or IA–51.
5. Rods and lugs on coupling bands shall be installed according to the drawing; the nuts on the rods shall be tightened equally on either side of the lug and shall be retightened at least twice after initial installation. Striking each rod sharply with a hammer at several locations around the circumference of the rod will help to draw the band tighter.

DETAILS OF WATERTIGHT COUPLING BAND

STANDARD DWG. IA–1227

DATE July 2008 | SHEET 1 OF 1

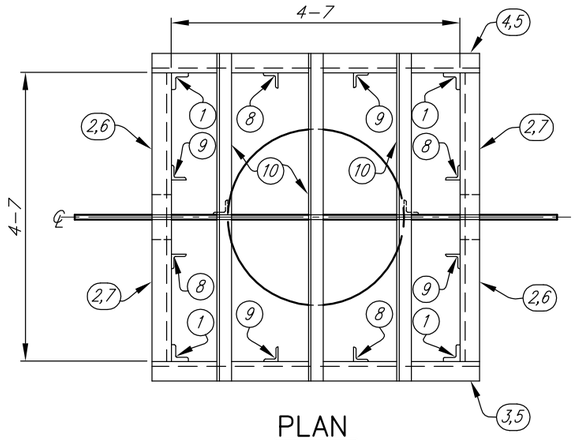
Date 1/2014
Designed Holcombe
Drawn Holcombe 1/2014
Checked
Approved

DETAILS OF WATERTIGHT COUPLING BAND, TANK LUG, BEDDING AND BACKFILL

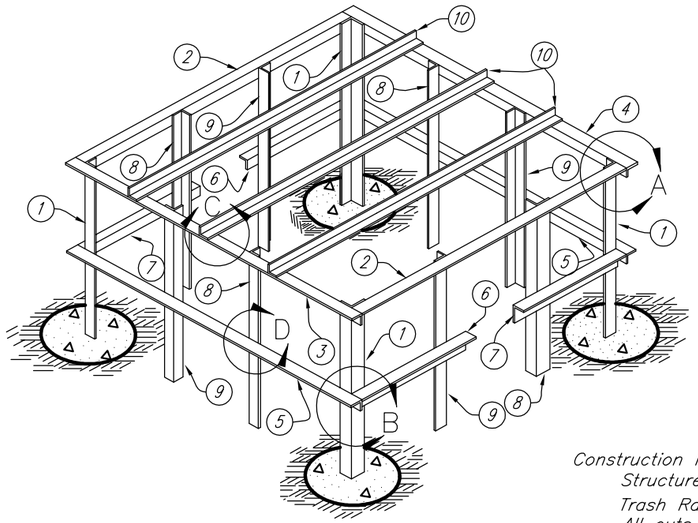
Shelby County, Iowa
Mills–IDNR, Grade Stabilization Structure

NRCS Natural Resources Conservation Service
United States Department of Agriculture

File No. Mills.DWG
Drawing No.
Sheet 8



PLAN



ISOMETRIC VIEW

Not to Scale

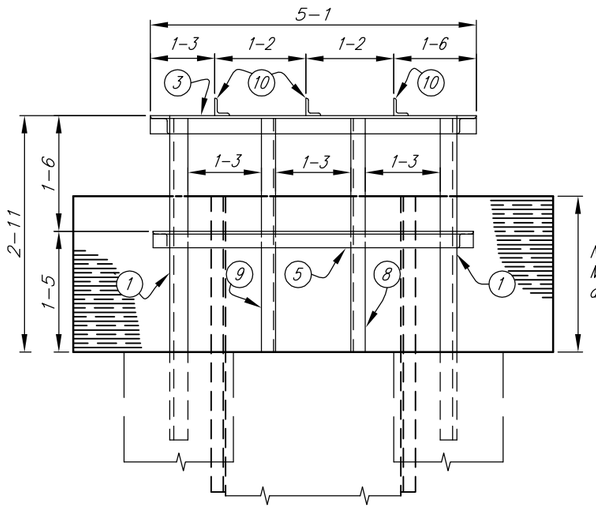
BILL OF MATERIALS			LENGTHS
Mark	Quantity	Item	42" Diam.
1	4	∠'s 3"x3"x$\frac{5}{16}$"	3–11
2	2	"	4–7
3	1	"	5–1
4	1	"	5–1
5	2	∠'s 2"x2"x$\frac{3}{16}$"	4–11
6	2	"	2–0
7	2	"	2–0
8	4	"	2–11
9	4	"	2–11
10	3	"	5–1
	46	$\frac{1}{2}$" ø Machine Bolts w/Lock Washers and Hex. Nuts	0–1$\frac{1}{2}$
		Concrete_ _ _ _ _ _0.6 Cu.Yd.	

Construction Notes:

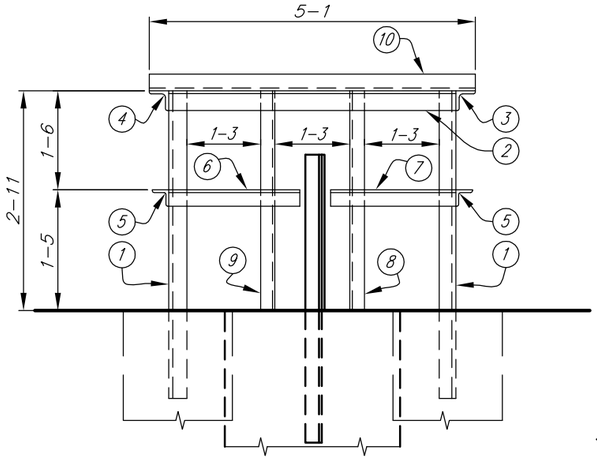
Structure is symmetrical about ℄.

Trash Rack to be fabricated of steel angles, bolted together with $\frac{1}{2}$" diam. machine bolts. All cuts shall be saw cuts.

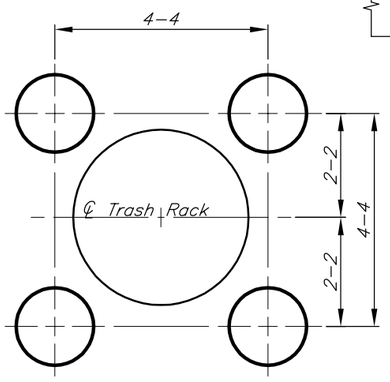
All holes for bolts shall be $\frac{1}{16}$ inch larger than bolt diam.



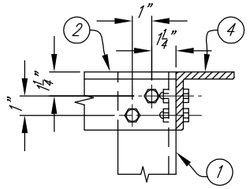
RIGHT SIDE ELEVATION



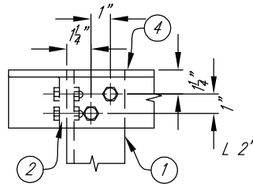
UPSTREAM ELEVATION



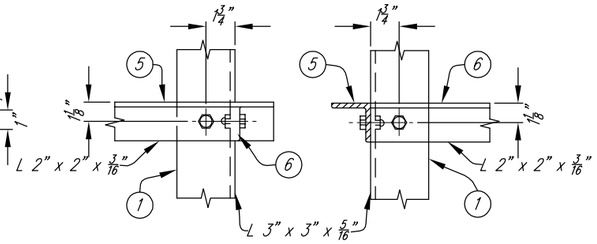
CONCRETE FOOTING LAYOUT



FRONT ELEV.

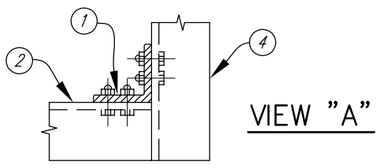


SIDE ELEV.



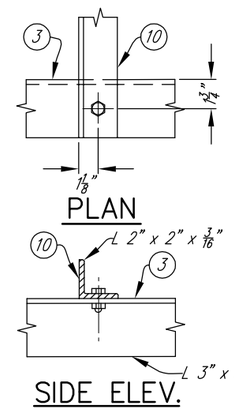
SIDE ELEV. FRONT ELEV.

VIEW "B"



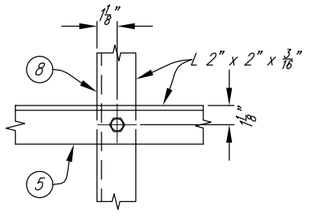
VIEW "A"

PLAN



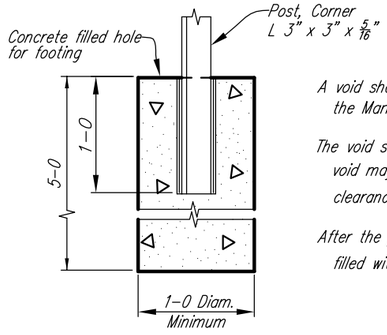
SIDE ELEV.

VIEW "C"



SIDE ELEV.

VIEW "D"



FOOTING DETAIL

A void shall be formed in the concrete footings to receive the Mark (1) posts.

The void shall be one foot deep. The cross section of the void may be triangular, rectangular or circular with $\frac{1}{4}$" clearance between the concrete and the Mark (1) posts.

After the posts are installed, the remaining voids shall be filled with bituminous mastic.

Not to Scale

DETAILS OF TRASH RACK FOR 42" C.M. PIPE VERTICAL INLET

Mills–IDNR Grade Stabilization Structure

Shelby County, Iowa

Designed Holcombe Date 1/2014

Drawn Holcombe 1/2014

Checked

Approved

NRCS Natural Resources Conservation Service United States Department of Agriculture

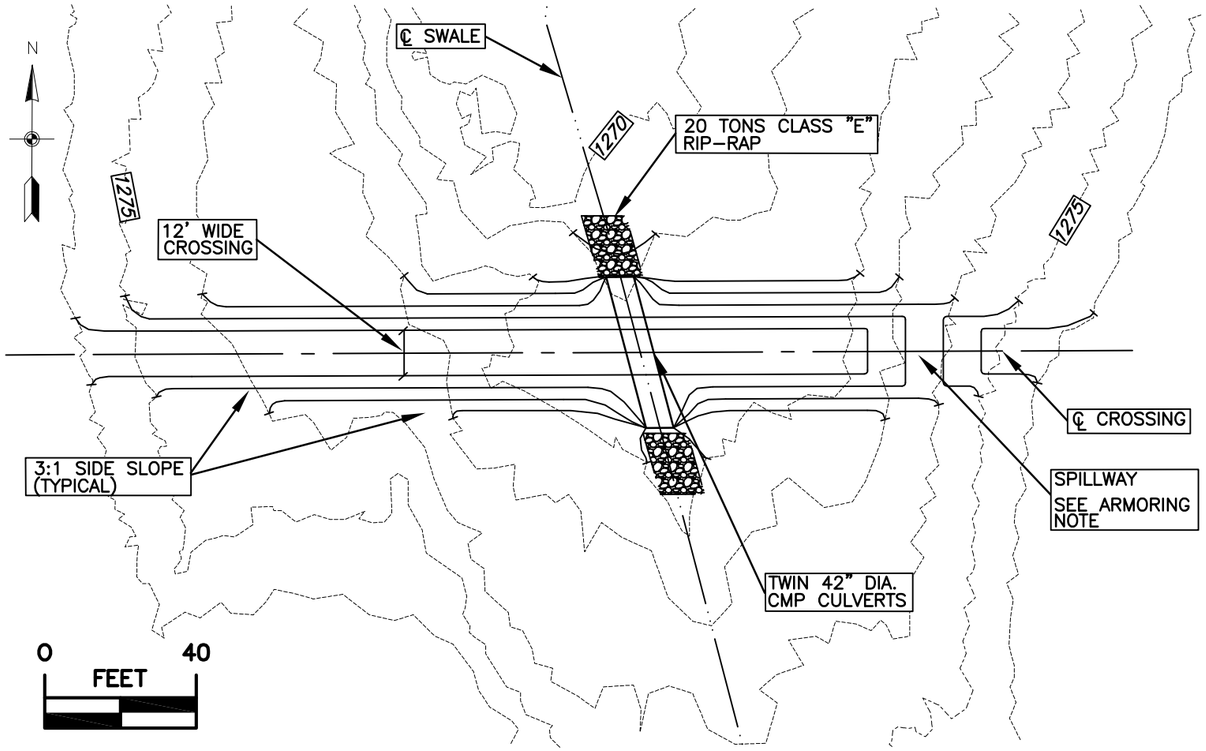
File No. Mills.DWG

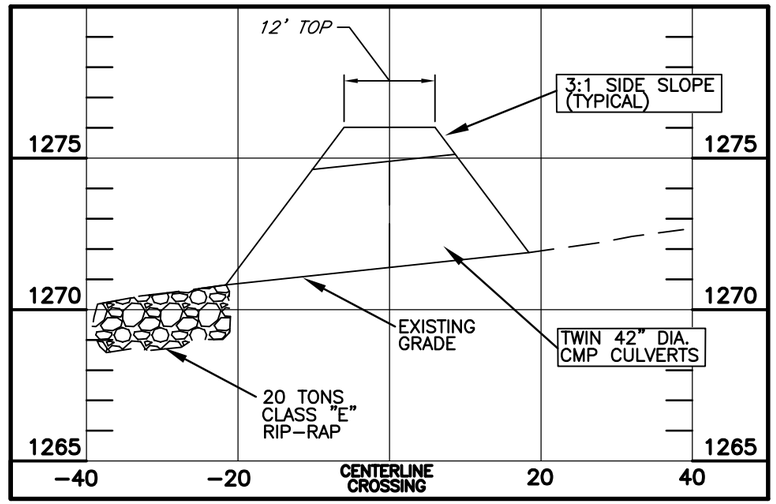
Drawing No.

STANDARD DWG. IA–1108

DATE Oct. 2012 | PAGE 1 OF 1

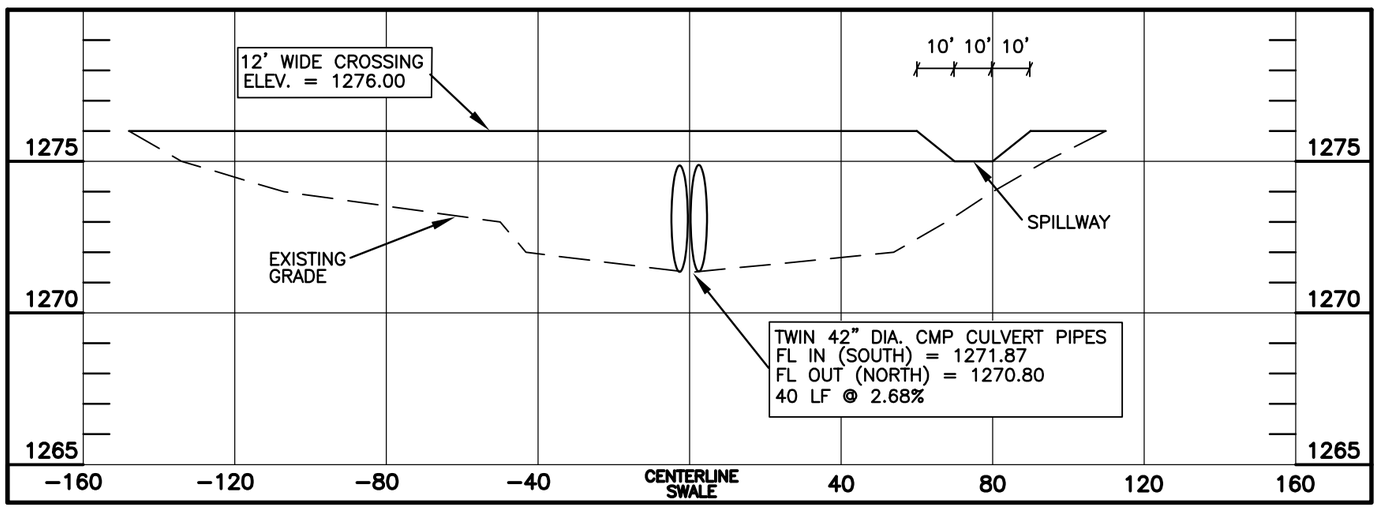
Sheet 9





CULVERT SECTION VIEW

NOTE: THE SPILLWAY CHANNEL IS TO BE LINED WITH "PYRAMAT" TYPE GEOTEXTILE AND SHALL OVERLAP THE CHANNEL EDGES ON ALL SIDES A MINIMUM OF 3'.



CROSSING SECTION VIEW

Designed ROLFE - BRODERICK Date 1/2014
Drawn BRODERICK 1/2014
Checked
Approved

FARM CROSSING

Mills-IDNR, Grade Stabilization Structure

Shelby County, Iowa

NRCS
Natural Resources Conservation Service
United States Department of Agriculture

File No. Mills.DWG

Drawing No. ----

Sheet 10