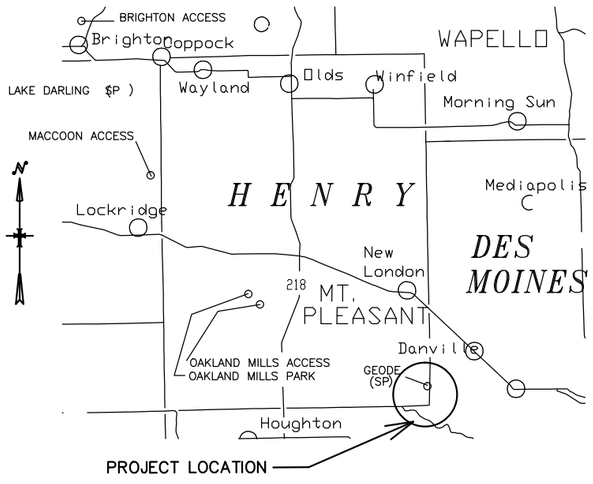


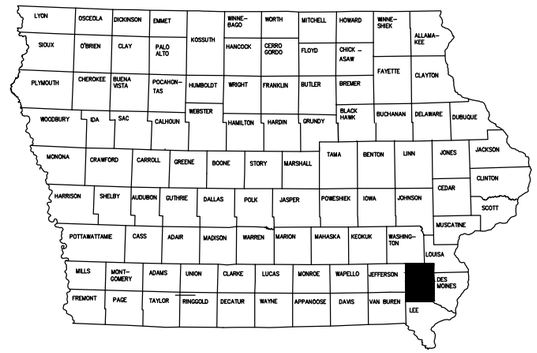
VICINITY MAP

IOWA DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTS FOR LAKE GEODE SEDIMENT PONDS HENRY COUNTY, IOWA

PROJECT #14-06-44-01

LOCATION MAP



SHEET INDEX

SHEET. NO.	SHEET TITLE
1	COVER SHEET
2	LOCATION MAP
3	AREA 8 PLAN VIEW
4	AREA 8 CROSS SECTION
5	AREA 8 CANOPY DETAIL
6	AREA 8 SEEP COLLAR
7	AREA 2A PLAN VIEW
8	AREA 2A CROSS SECTION (6"PIPE)
9	AREA 2A CROSS SECTION (8"PIPE)
10	AREA 2A CANOPY DETAIL (6"PIPE)
11	AREA 2A 12" DIA. RISER DETAIL(8"PIPE)
12	AREA 2A SEEP COLLAR
13	AREA 2B PLAN VIEW
14	AREA 2B CROSS SECTION
15	AREA 2B LATERAL DETAIL
16	AREA 2B CANOPY DETAIL
17	AREA 2B SEEP COLLAR
18	AREA 7 PLAN VIEW
19	AREA 7 CROSS SECTION
20	AREA 7 CANOPY DETAIL
21	AREA 7 SEEP COLLAR
22	AREA 10 PLAN VIEW
23	AREA 10 CROSS SECTION
24	AREA 10 CANOPY DETAIL
25	AREA 10 SEEP COLLAR
26	AREA 12 PLAN VIEW
27	AREA 12 CROSS SECTION
28	AREA 12 CANOPY DETAIL
29	AREA 12 SEEP COLLAR
30	AREA 9 PLAN VIEW
31	AREA 9 CROSS SECTION
32	AREA 9 LATERAL DETAIL
33	AREA 9 CANOPY DETAIL
34	AREA 9 SEEP COLLAR

ESTIMATE OF QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY
1	MOBILIZATION	1 LS
2	6" DIA. SMOOTH STEEL PIPE	517 LF
3	8" DIA. SMOOTH STEEL PIPE	150 LF
4	10" DIA. SMOOTH STEEL PIPE	285 LF
5	12" DIA. SMOOTH STEEL PIPE	134 LF
6	12" DIA. RISER & BALLAST ELBOW (AREA 2A).	1 EA.
7	5' x 5' x 1/4" STEEL SEEP COLLAR	8 EA
8	6' x 6' x 1/4" STEEL SEEP COLLAR	11 EA
9	TRASH RACK / BAR GUARD ASSY. (6")	5 EA
10	TRASH RACK / BAR GUARD ASSY. (10")	1 EA
11	TRASH RACK / BAR GUARD ASSY. (12")	1 EA
12	EARTHWORK/ FILL/ GRADE	59,180 CY
13	SEED & MULCH	14 AC
14	CLEARING & GRUBBING	14 AC
15	CONSTRUCTION SURVEY & STAKING	1 LS
16	FARM – FIELD FENCE (WOVEN & BARB)	9010 LF
17	FARM – FIELD FENCE (NINE STRAND WIRE)	1900 LF
18	STEEL TUBE FARM GATE	4 EA.
19	IDOT CLASS "12" EXCAVATION	500 CY

NOTES:

12. BORROW MATERIAL FOR EMBANKMENT CONSTRUCTION WILL COME FROM WITHIN PERMANENT POOL AREA.
15. STAKING INFORMATION TO BE PROVIDED AT PRE–CONSTRUCTION CONFERENCE. MINOR BRANCH TRIMMING IS ALLOWED AND CONSIDERED INCIDENTAL TO THIS BID ITEM.

16 & 17 FIELD–FARM FENCE SHALL BE INSTALLED AROUND THE SEDIMENT BASINS AND TO REPAIR AREAS WHERE REMOVAL WAS NEEDED FOR ACCESS. SEE SPEC BOOK DETAILS

19. CONFIRM & COORDINATE CLASS 12 EXCAVATION MATERIAL WITH INSPECTOR PRIOR TO REMOVAL.

PROJECT DESCRIPTION

THIS PROJECT IS FOR THE CONSTRUCTION OF SEDIMENT BASINS AT LAKE GEODE, HENRY COUNTY.

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

AUTHORIZATION TO BID

AUTHORIZATION - PARKS | WILDLIFE | FISHERIES | LAW ENFORCEMENT | FORESTRY DATE

ENGINEERING BUREAU CHIEF DATE

DIRECTORY

PROJECT MANAGER		CONSTRUCTION INSPECTOR	
	IOWA DEPARTMENT OF NATURAL RESOURCES		IOWA DEPARTMENT OF NATURAL RESOURCES
	502 EAST 9TH STREET		502 E. 9th STREET
	DES MOINES, IA, 50319		DES MOINES IA, 50319
	MIKE BRODERICK		HEATH DELZELL
	515-281-0873		515-979-0104
	mike.broderick@dnr.iowa.gov		heath.delzell@dnr.iowa.gov

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILING
502 E. 9TH ST., DES MOINES, IA 50319-0034
P: 515.281.5918
F: 515.281.8685

COVER SHEET

GEODE SEDIMENT PONDS

HENRY COUNTY, IOWA

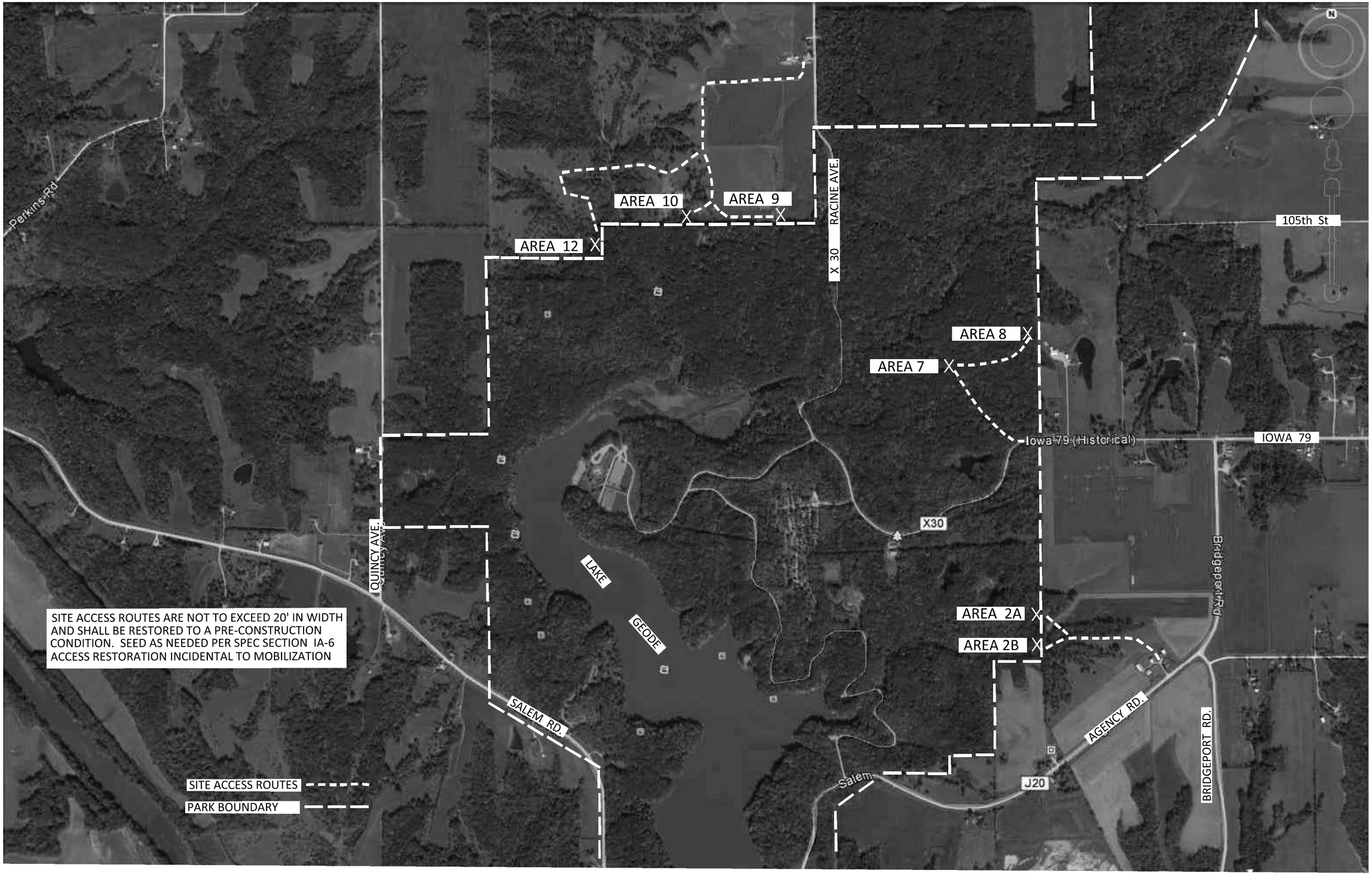
DANVILLE

NO.	BY DATE	REVISION

DRAWN BY: PROJECT NUMBER: 14-06-44-01

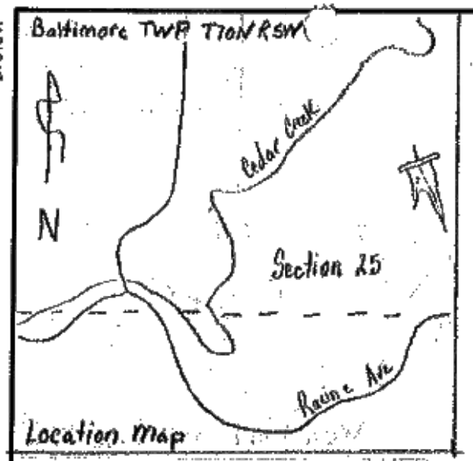
CHK'D BY: DATE: MAY 2014

SHEET No:



PROJECT SEDIMENT PONDS PROJ. NO. 14-06-44-01

AREA LAKE GEODE COUNTY HENRY



0 1320 2640

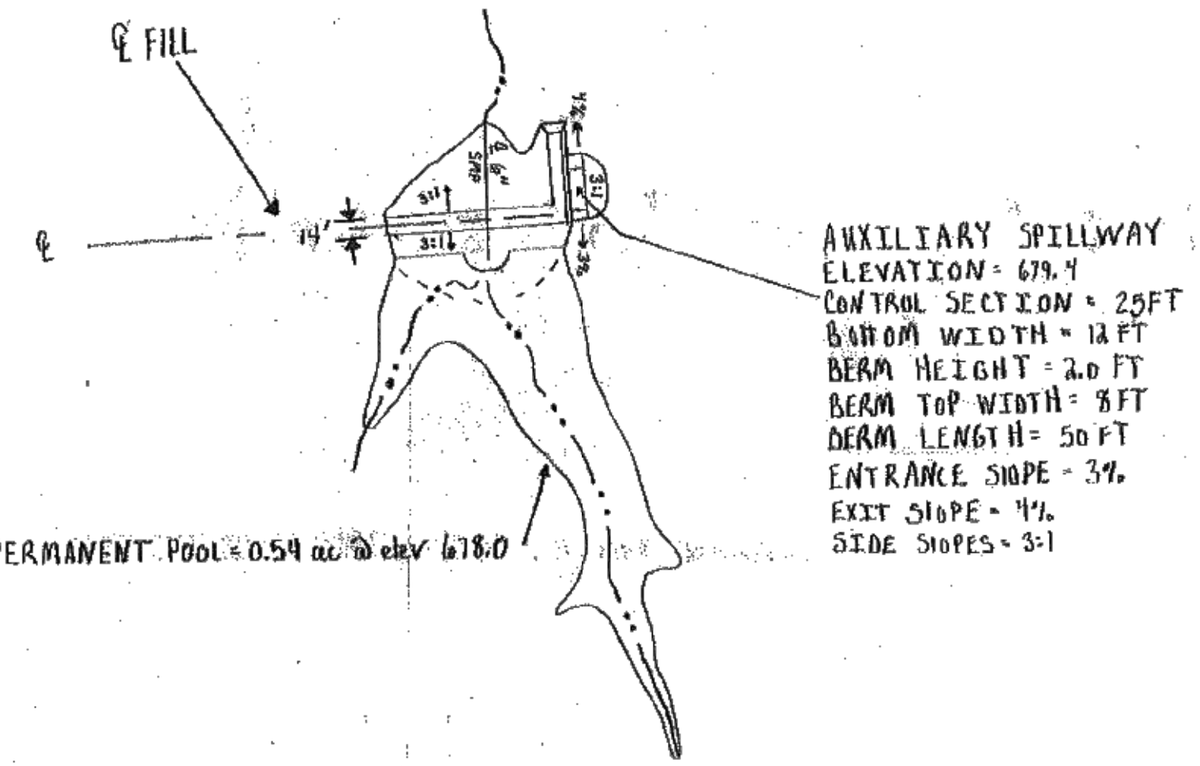
Scale in Feet

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

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

All trees and shrubs shall be cleared and grubbed within a minimum distance of 30' from earthfill and spillway. New plantings shall not be made within these limitations.



ENGINEERING JOB CLASS III

* NOTE
TBM 450 ⊙ S.W.
TBM = 697.90 / TOP OF Steel Rod

PLAN VIEW

75 0 75 150 225 300

SCALE IN FEET

N

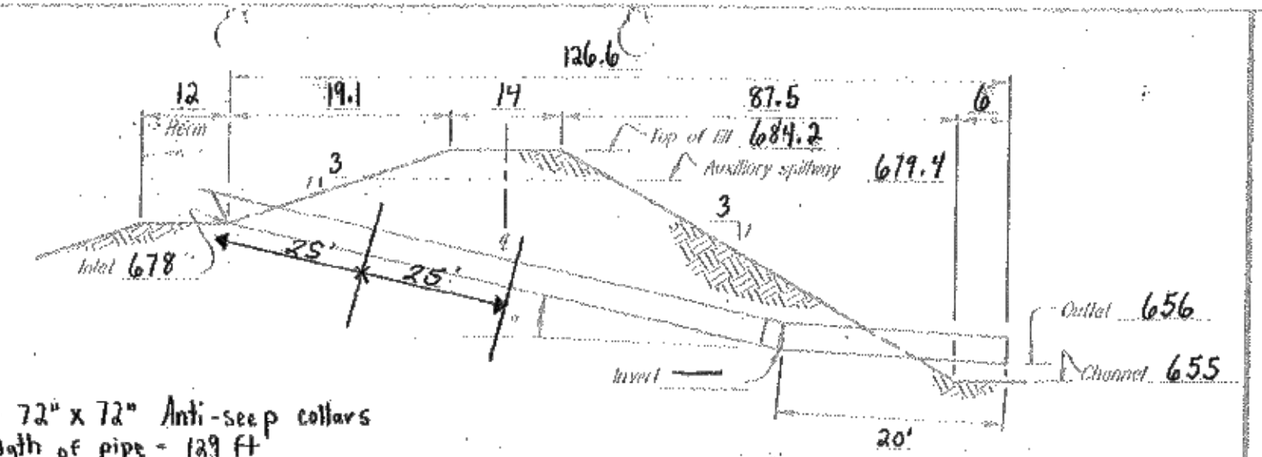
DA # 8 - Geode State Park
Grade Stabilization - 410
Baltimore TWP Section 25
T70N - R5W - Henry Co. Iowa

U.S. DEPARTMENT OF AGRICULTURE - NATURAL RESOURCES CONSERVATION SERVICE

Designed C. Waters 10/1/12
Drawn C. Waters 10/1/12
Traced C. Waters 10/1/12
Checked M. Allen 3/13

Approved D. Ensminger 4/13
Title District Conservationist

CAD FILE NAME



2 - 72" x 72" Anti-seep collars
Length of pipe - 129 ft

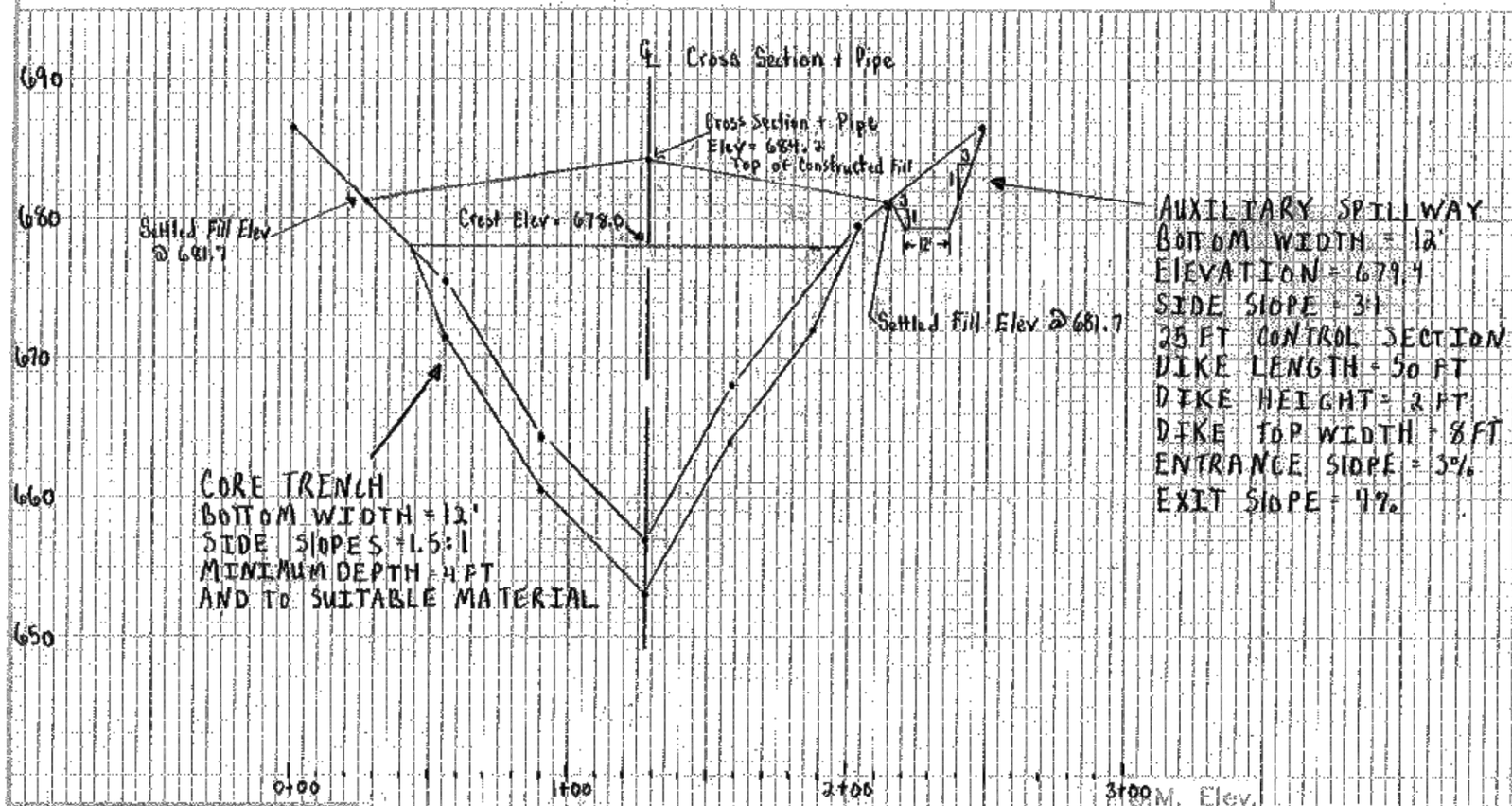
SECTION ON CENTERLINE
Not to Scale

BILL OF MATERIALS

129 ft. of 6 " dia 1/4" ~~gage~~ smooth metal pipe with ~~hood~~ canopy inlet.
Pipe and appurtenances to be welded and water tight at the seams.

2 ea. antiseep collars 72" x 72", 1/4" ga. 2 piece.
Pipe connectors smooth metal

7,184 cu. yd. earth fill
Earthwork includes main fill, dike, core trench, wave berm (eye brow), and stripping.



AUXILIARY SPILLWAY
BOTTOM WIDTH = 12'
ELEVATION = 679.4
SIDE SLOPE = 3:1
25 FT CONTROL SECTION
DIKE LENGTH = 50 FT
DIKE HEIGHT = 2 FT
DIKE TOP WIDTH = 8 FT
ENTRANCE SLOPE = 3%
EXIT SLOPE = 4%

CORE TRENCH
BOTTOM WIDTH = 12'
SIDE SLOPES = 1.5:1
MINIMUM DEPTH = 4 FT
AND TO SUITABLE MATERIAL

TBM = On top of Steel Rod @ Elev 697.90
(Note) TBM 450' Southwest of site

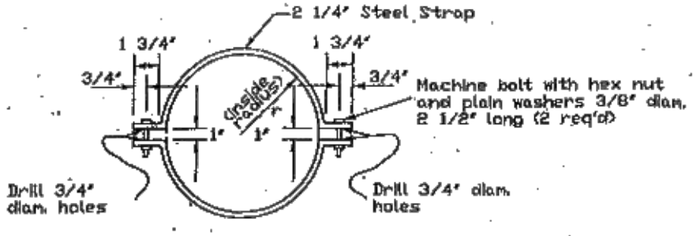
CROSS-SECTION

Canopy ~~HOOD~~ INLET
STANDARD DWG. NO. 713
REVISED: SHEET 1 OF 1

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

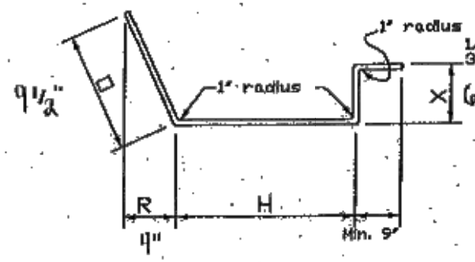
Canopy ~~HOOD~~ INLET
Cooperator DA#8 - Geode State Park
Sec 25 T70N-5W
County Lowe
Henry
U.S. DEPARTMENT OF AGRICULTURE - NATURAL RESOURCES CONSERVATION SERVICE
CAD FILE NAME

Designed C. Waters 9/19/12
Drawn C. Waters 9/19/12
Traced C. Waters 9/19/12
Checked D. Ensminger 4/13
Approved D. Ensminger 4/13
Title District Conservationist
Title

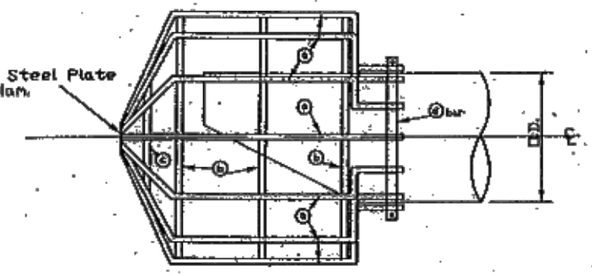


BENDING DIAGRAM FOR
(b) AND (c) RODS

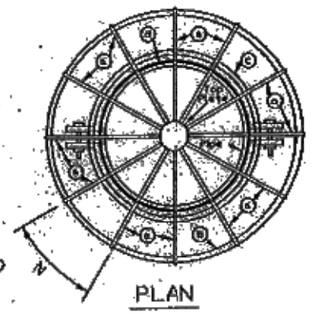
BENDING DIAGRAM FOR
(d) BARS



BENDING DIAGRAM FOR
(a) RODS

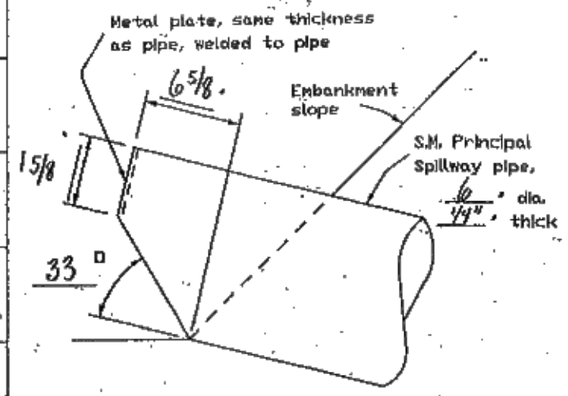


ELEVATION

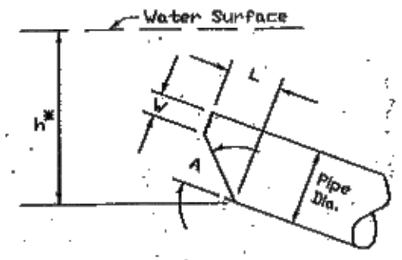


PLAN

Pipe Diam In.	Pipe Grade %	W In.	L In.	A Deg.	h Ft.
6	0-5	1 1/8	3 1/4	56	0.9
	5.1-15	1 1/4	4 3/4	45	0.9
	15.1-25	1 5/8	6 3/8	33	0.9
	25.1-32	2 1/8	7 3/4	27	0.9
8	0-5	1 1/2	4 3/8	56	1.2
	5.1-15	1 5/8	6 3/8	45	1.2
	15.1-25	2 1/8	8 3/4	33	1.2
	25.1-32	2 3/4	10 3/8	27	1.2
10	0-5	1 7/8	5 3/8	56	1.5
	5.1-15	2	8	45	1.5
	15.1-25	2 5/8	11	33	1.5
	25.1-32	3 1/2	13	27	1.5
12	0-5	2 1/4	6 1/2	56	1.8
	5.1-15	2 3/8	9 5/8	45	1.8
	15.1-25	3 1/4	13 1/4	33	1.8
	25.1-32	4 1/4	15 5/8	27	1.8
15	0-5	2 7/8	8 1/8	56	2.3
	5.1-15	3	12	45	2.3
	15.1-25	4	16 1/2	33	2.3
	25.1-32	5 1/4	19 1/2	27	2.3
18	0-5	3 3/8	9 3/4	56	2.7
	5.1-15	3 5/8	14 3/8	45	2.7
	15.1-25	4 7/8	19 3/4	33	2.7
	25.1-32	6 1/4	23 3/8	27	2.7
24	0-5	4 1/2	13	56	3.6
	5.1-15	4 3/4	19 1/4	45	3.6
	15.1-25	6 1/2	26 3/8	33	3.6
	25.1-32	8 3/8	31 1/4	27	3.6

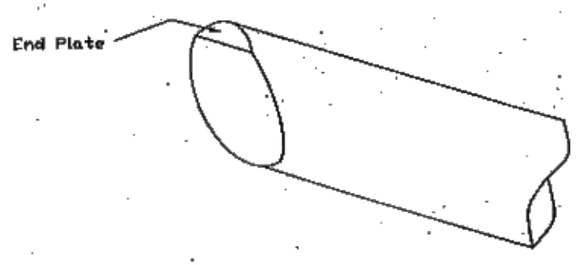


DETAIL OF CANOPY INLET



* Minimum height for full pipe flow.

CANOPY INLET DIMENSIONS



PARTIAL ISOMETRIC VIEW

TABLE OF DIMENSION AND QUANTITIES

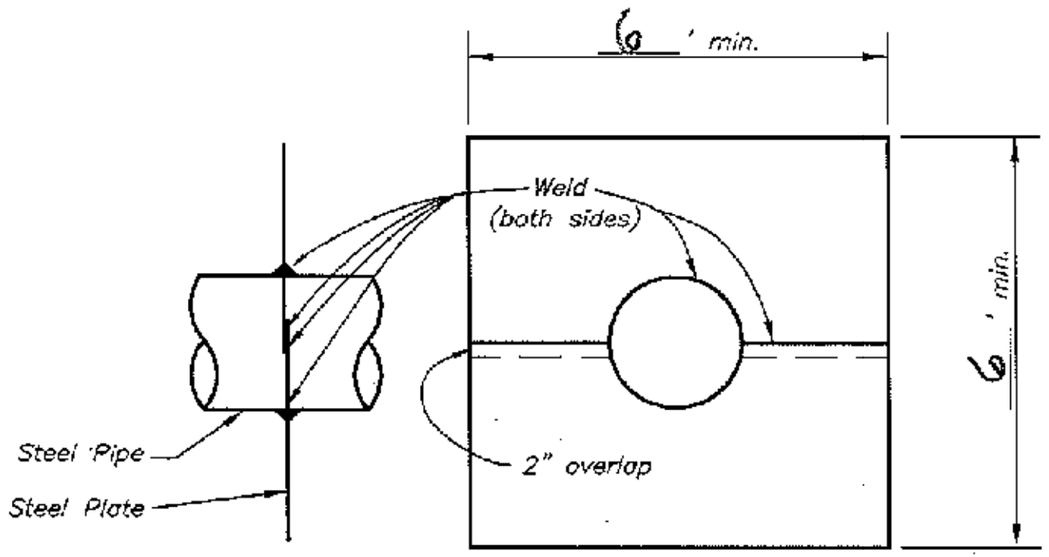
PIPE O.D. IN.	APPROX. WEIGHT LBS	(a) ROD SIZE IN.	H IN.	R IN.	X IN.	B IN.	TOTAL LENGTH IN.	NUMBER REQ'D	N IN.	(b) ROD SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D	(c) ROD SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D	(d) BAR SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D
6	18.9	3/8	9	4	6	9 1/2	33	14	4	3/8	8 1/2	51 7/8	3	---	---	---	0	2 X 1/4	3 3/8	26 1/4	1
8	22.8	3/8	11	4 1/2	6	10 1/2	39	10	6 1/4	3/8	9 1/4	58 1/8	3	---	---	---	0	2 X 1/4	4 3/8	32 1/2	1
10	24.7	3/8	13	5 1/2	6	11 1/2	42	10	7	3/8	10 1/4	64 3/8	3	---	---	---	0	2 X 1/4	5 3/8	38 3/4	1
12	27.1	3/8	15	5 1/2	6	12 1/2	45	10	7 1/8	3/8	11 1/4	70 3/8	3	---	---	---	0	2 X 1/4	6 3/8	45	1
14	48.4	1/2	17	6	6	14	48	10	8 1/8	1/2	12	75 3/8	3	1/2	5	31 3/8	1	2 X 1/4	7 1/2	52 1/8	1
16	52.4	1/2	19	6 1/2	6	15	51	10	8 3/4	1/2	13	81 3/8	3	1/2	6	37 3/8	1	2 X 1/4	8 1/2	58 3/8	1
18	69.5	1/2	22	8 1/2	9	19 1/2	60	12	9 1/2	1/2	17	105 3/4	3	1/2	7	44	1	2 X 1/4	9 1/2	64 3/8	1
20	112.4	5/8	25	9	9	20 1/2	66	12	10	5/8	17 3/4	111 1/2	3	5/8	8	50 1/4	1	2 X 1/4	10 5/8	71 3/4	1
22	118.1	5/8	28	10	9	22	69	12	10 1/2	5/8	18 3/4	117 3/4	3	5/8	8	50 1/4	1	2 X 1/4	11 5/8	78	1
24	124.6	5/8	30	10 1/2	9	23	72	12	11	5/8	19 3/4	124	3	5/8	9 3/8	50 7/8	1	2 X 1/4	12 3/8	84 3/8	1

Design Area #8
Geode state Park
36 Baltimore T.70N R5W

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

Designed C. Waters 9/11/12
Drawn C. Waters 9/14/12
Traced
Checked D.Ensminger 9/13
Approved by D.Ensminger DC

29L226



STEEL PLATE ANTI-SEEP COLLAR

NOTES:
1. All welds shall be watertight.
2. All steel plates shall have a minimum thickness of 1/4 ". Smooth Metal

4/04

NOT TO SCALE

Landowner:

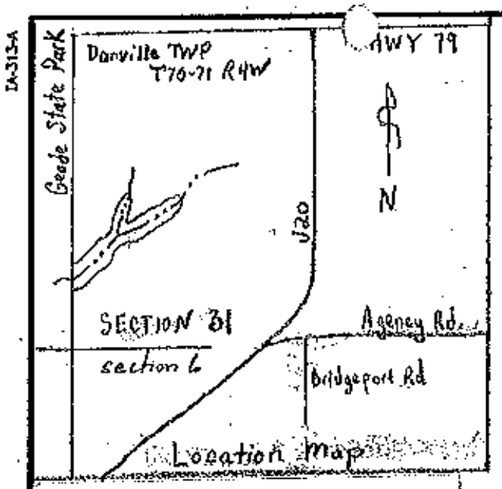
STEEL PLATE
ANTI-SEEP COLLAR DETAILS
DA # 8

Date
Designed C. Waters
Drawn C. Waters
Checked MR Allen 3/3
Approved D. Ensminger 4/3

United States Department of Agriculture
NRCS Natural Resources Conservation Service

File Name
EA316loc12

Drawing Name
29-L-226

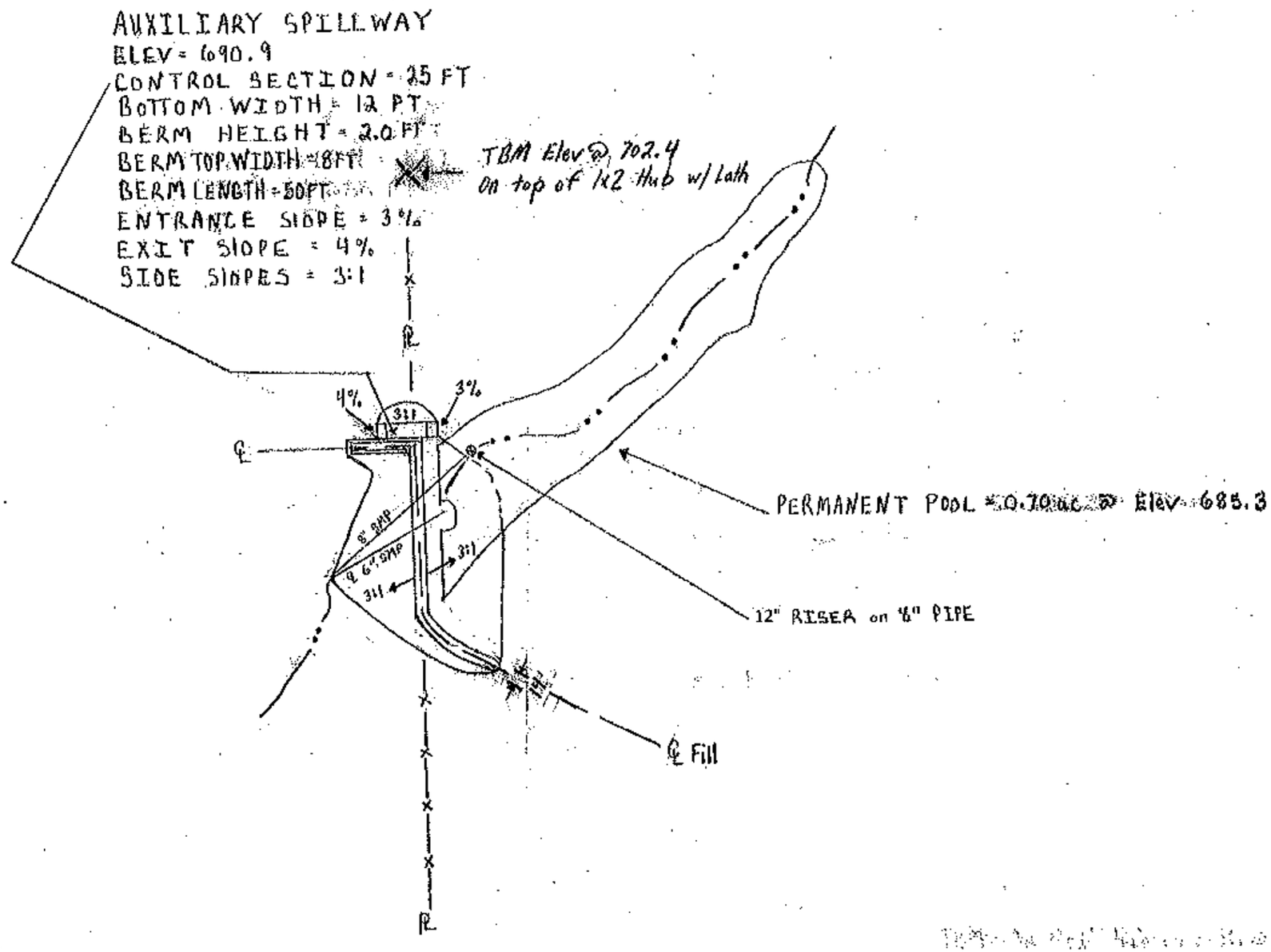


If a cultural resource is identified during construction, stop immediately and notify the Natural Resources Conservation Service Archeologist at 515-284-4370

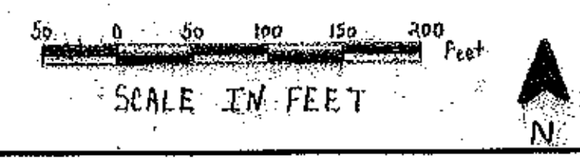
NRCS does not guarantee that this structure will fill and/or remain filled with water to the principal spillway crest elevation

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

All trees and shrubs shall be cleared and grubbed within a minimum distance of 30' from earthfill and spillway. New plantings shall not be made within these limitations.



PLAN VIEW



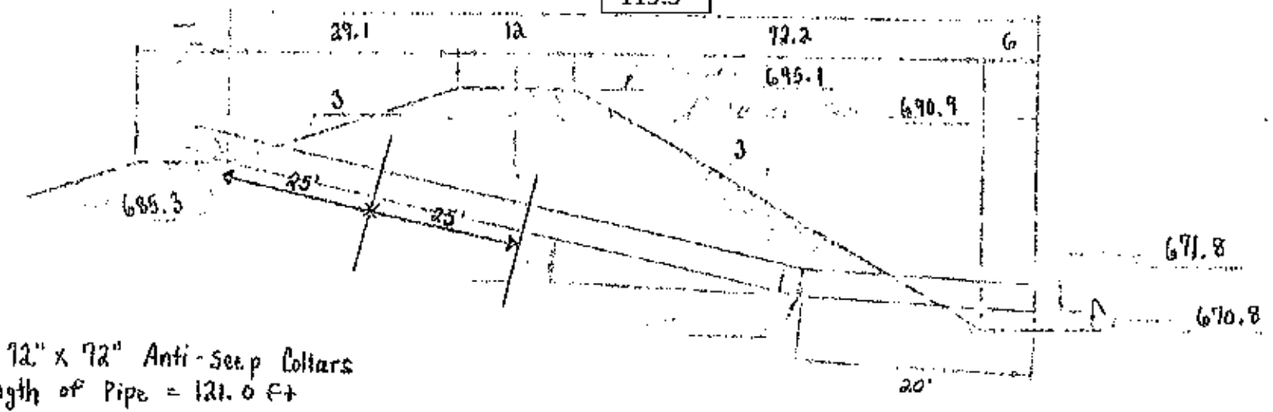
ENGINEERING JOB CLASS III

DA#2A - Johnson
Grade Stabilization - 410
Danville TWP Section 31
T70-71 N Des Moines Co. Iowa

U.S. DEPARTMENT OF AGRICULTURE - NATURAL RESOURCES CONSERVATION SERVICE

Designed C. Waters 10/1/12
Drawn C. Waters 10/1/12
Traced C. Waters 10/1/12
Checked [illegible] 3/13
Approved D. Ensminger 4/13
Title DC
Title

CAD FILE NAME



2 = 72" x 72" Anti-Seep Collars
Length of Pipe = 121.0 Ft

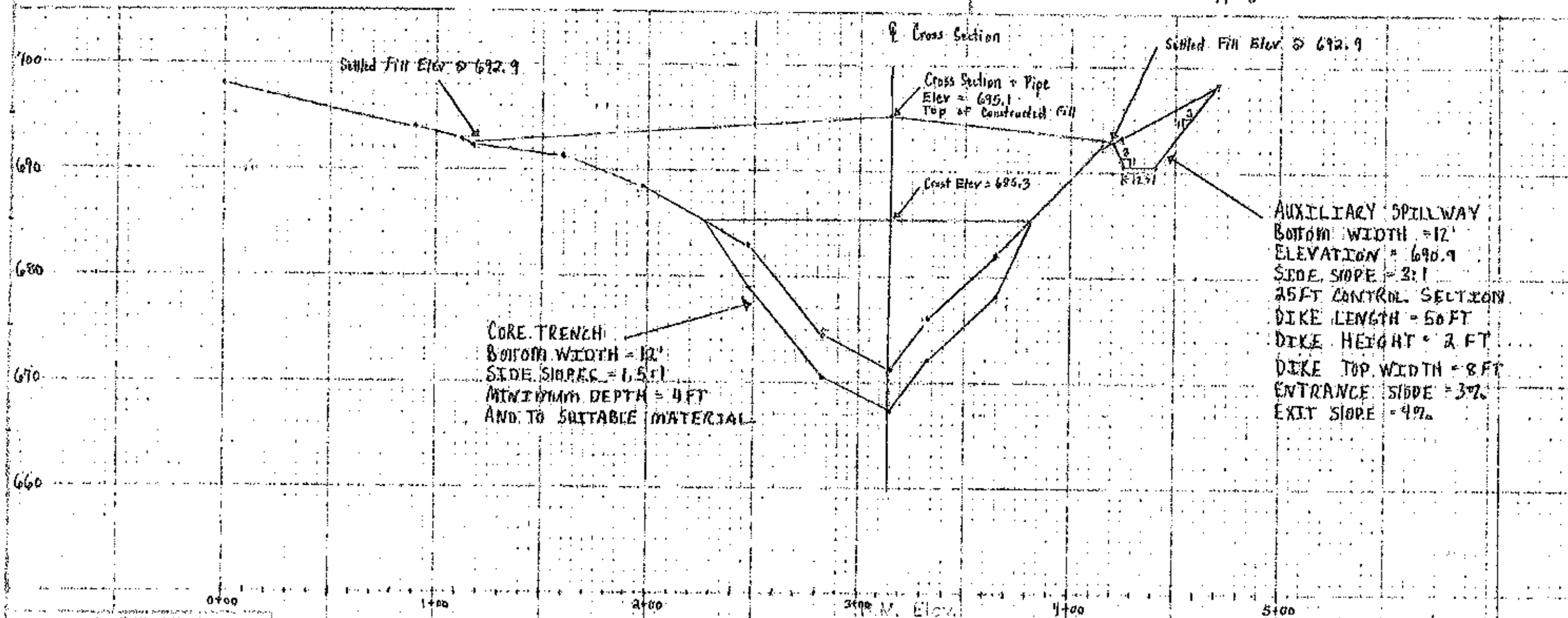
SECTION ON CENTERLINE

BILL OF MATERIALS

121 ft of 6 " 1/4" [illegible] welded and water tight at the seems

2 [illegible] 72" x 72", 1/4" [illegible] 2 [illegible] smooth metal

7,960 [illegible] includes mainfill, dike, core trench, wave berm (eye brow), and stripping.



TBM 1 = Top of 1" X 2" HUB w/ Lath @ ELEV = 702.4
Located on Fenceline North of Dam Site

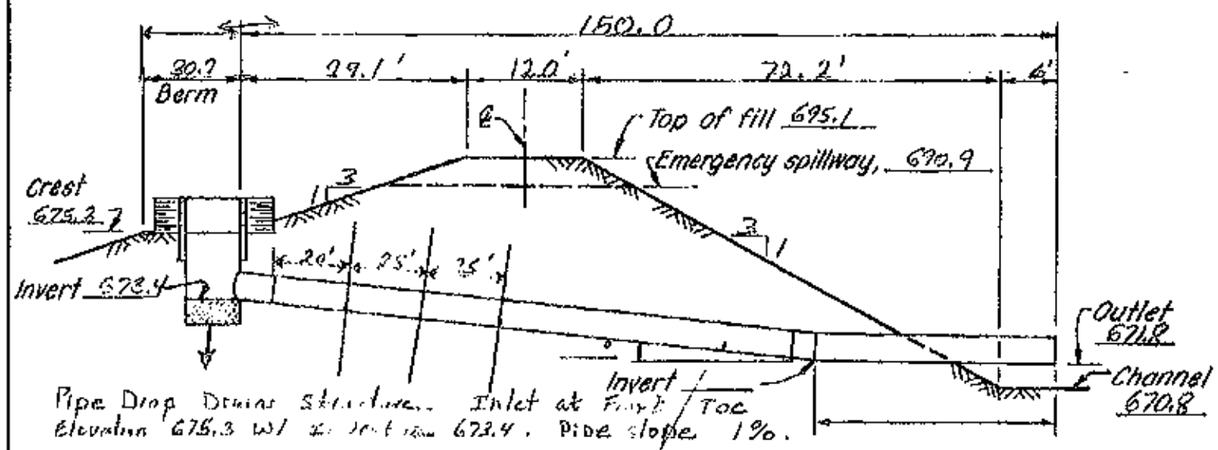
HOOD INLET

DA # 2A - Johnson

Danville
Des Moines

31 70 4

C. Waters 5/5/14
C. Waters 5/5/14
C. Waters 5/5/14
D. Eremeyer 5/5/14



SECTION ON CENTERLINE

BILL OF MATERIALS

10 ft. 12" dia. 1/4 gage metal pipe for riser. Fabricate with a 2' ft. stub of conduit attached at a 91.0° angle, ~~1'-1½" from the bottom. Antivortex device~~ x
"Drill 72-1" Holes 1 Ft. in Top 8.0' of Riser"
150 ft. of 8" dia. 1/4 gage metal pipe for conduit. Pipe and appurtenances to be Welded & water tight at Seams.

3 Antiseep collars 72" x 72", 2 piece.
Pipe connectors Smooth Metal

Earthwork 7960 Includes mainfill, dike, Core trench, eyebrows wave berm & stripping

SEE SHEET 11 FOR INTAKE/RISER INFORMATION

B.M. Elev.

PIPE DROP INLET

Cooperator Johnson 2A
Sec. 3 L T. 70 R. 4
Desmoines County, Iowa

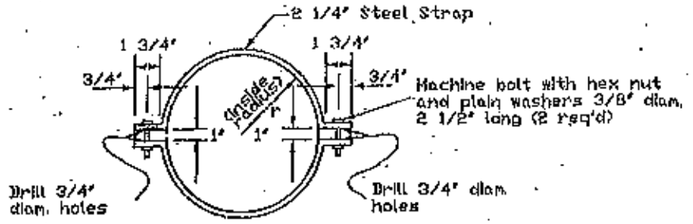
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed C. Waters	5/8/14	Approved by D. Fosmoyer	
Drawn C. Waters	5/8/14	Title DC	
Traced C. Waters	5/8/14	Title	
Checked D. Fosmoyer	5/8/14	Sheet No. 48 of 10	Drawing

9 of 34

USDA-SCS-LINCOLN, NEBR. 1965

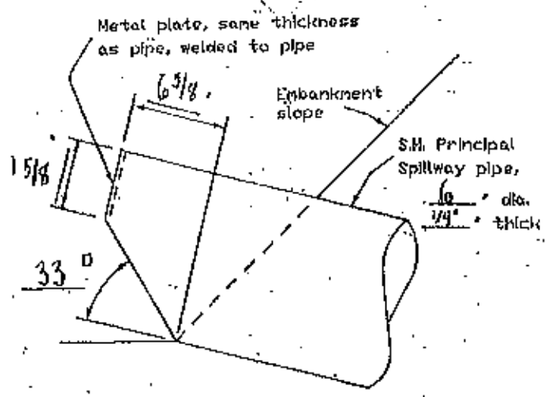
ORDER THIS BLANK DATA SHEET BY DRAWING NUMBER 5.N-21.002



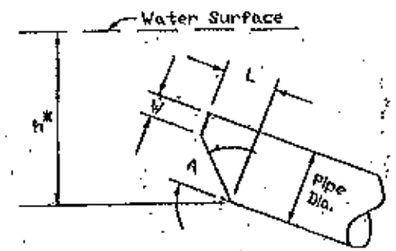
BENDING DIAGRAM FOR
(b) AND (c) RODS

BENDING DIAGRAM FOR
(d) BARS

Pipe Diam. In.	Pipe Grade X	W In.	L In.	∠ Deg.	h Ft.
6	0-5	1 1/8	3 1/4	56	0.9
	5.1-15	1 1/4	4 3/4	45	0.9
	15.1-25	1 5/8	6 5/8	33	0.9
	25.1-32	2 1/8	7 3/4	27	0.9
8	0-5	1 1/2	4 3/8	56	1.2
	5.1-15	1 5/8	6 3/8	45	1.2
	15.1-25	2 1/8	8 3/4	33	1.2
	25.1-32	2 3/4	10 3/8	27	1.2
10	0-5	1 7/8	5 3/8	56	1.5
	5.1-15	2	8	45	1.5
	15.1-25	2 5/8	11	33	1.5
	25.1-32	3 1/2	13	27	1.5
12	0-5	2 1/4	6 1/2	56	1.8
	5.1-15	2 3/8	9 5/8	45	1.8
	15.1-25	3 1/4	13 1/4	33	1.8
	25.1-32	4 1/4	15 5/8	27	1.8
15	0-5	2 7/8	8 1/8	56	2.3
	5.1-15	3	12	45	2.3
	15.1-25	4	16 1/2	33	2.3
	25.1-32	5 1/4	19 1/2	27	2.3
18	0-5	3 3/8	9 3/4	56	2.7
	5.1-15	3 5/8	14 3/8	45	2.7
	15.1-25	4 7/8	19 3/4	33	2.7
	25.1-32	6 1/4	23 3/8	27	2.7
24	0-5	4 1/2	13	56	3.6
	5.1-15	4 3/4	19 1/4	45	3.6
	15.1-25	6 1/2	26 3/8	33	3.6
	25.1-32	8 3/8	31 1/4	27	3.6

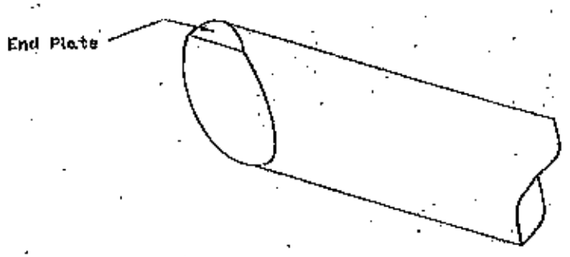


DETAIL OF CANOPY INLET

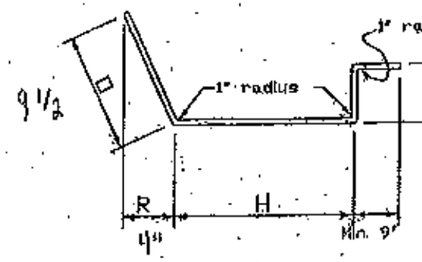


* Minimum height for full pipe flow.

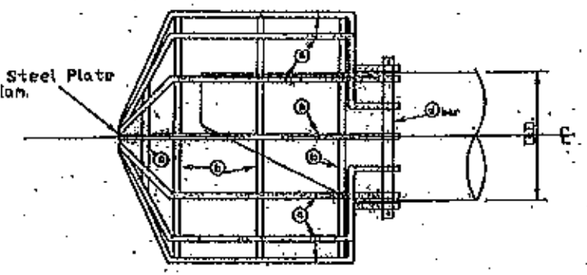
CANOPY INLET DIMENSIONS



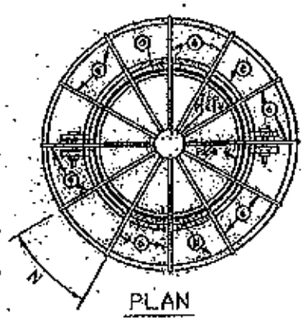
PARTIAL ISOMETRIC VIEW



BENDING DIAGRAM FOR
(a) RODS



ELEVATION



PLAN

TABLE OF DIMENSION AND QUANTITIES

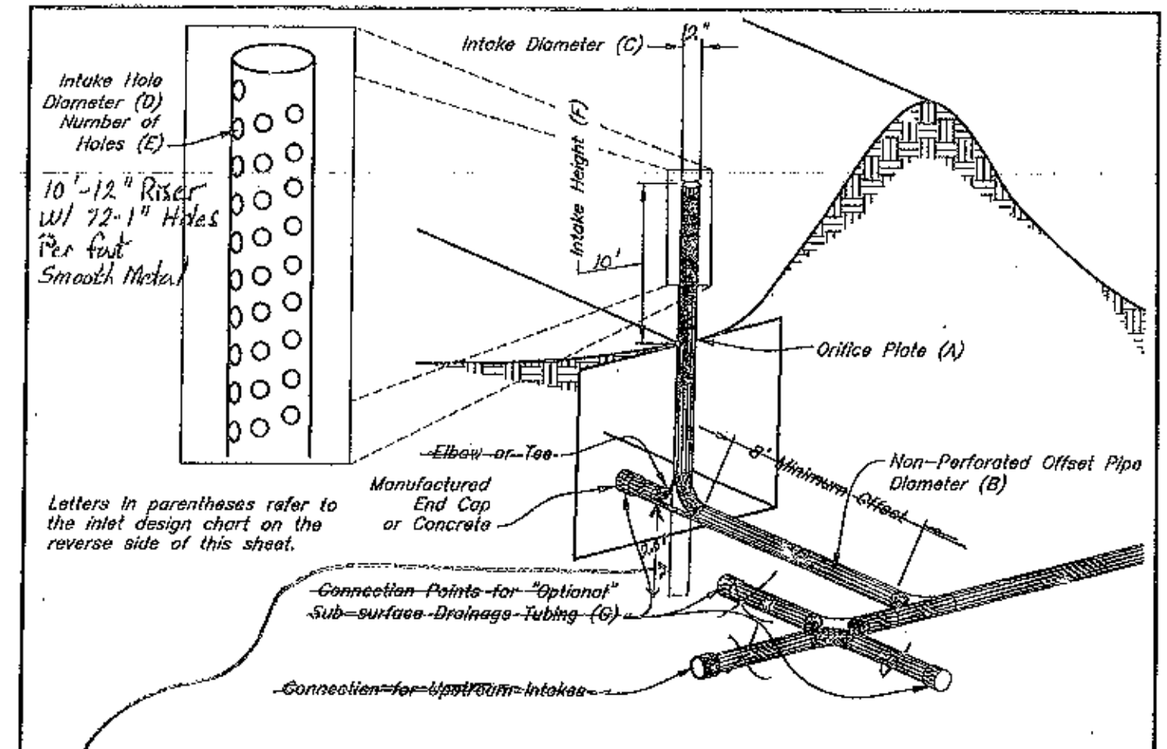
PIPE O.D. IN.	APPROX. WEIGHT LBS	(a) ROD SIZE IN.	H IN.	R IN.	X IN.	θ IN.	TOTAL LENGTH IN.	NUMBER REQ'D	N IN.	(b) ROD SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D	(c) ROD SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D	(d) BAR SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D
6	18.2	3/8	9	4	6	9 1/2	33	14	4	3/8	8 1/4	51 1/8	3	---	---	---	0	2 X 1/4	5 3/8	25 1/8	1
8	22.8	3/8	11	4 1/2	6	10 1/8	39	10	6 1/4	3/8	9 1/4	58 1/8	3	---	---	---	0	2 X 1/4	4 3/8	32 1/8	1
10	24.7	3/8	13	5 1/2	6	11 1/2	42	10	7	3/8	10 1/4	64 3/8	3	---	---	---	0	2 X 1/4	5 3/8	38 3/8	1
12	27.1	3/8	15	3 1/2	6	12 1/2	45	10	7 1/8	3/8	11 1/4	70 3/8	3	---	---	---	0	2 X 1/4	6 3/8	45	1
14	38.4	1/2	17	6	6	14	48	10	8 1/8	1/2	12	75 3/8	3	1/2	5	31 3/8	1	2 X 1/4	7 1/2	52 1/8	1
16	58.4	1/2	19	6 1/2	6	15	51	10	8 3/4	1/2	13	81 3/8	3	1/2	6	37 3/8	1	2 X 1/4	8 1/2	58 3/8	1
18	69.5	1/2	22	8 1/2	9	19 1/2	60	12	9 1/2	1/2	17	106 3/4	3	1/2	7	44	1	2 X 1/4	9 1/2	64 3/8	1
20	118.4	5/8	28	9	9	20 1/2	66	12	10	5/8	17 3/4	111 1/8	3	5/8	8	50 3/4	1	2 X 1/4	10 3/8	71 3/4	1
22	110.1	5/8	28	10	9	22	69	12	10 1/2	5/8	18 3/4	117 3/4	3	5/8	8	50 3/4	1	2 X 1/4	11 3/8	78	1
24	124.6	5/8	30	10 1/2	9	23	72	12	11	5/8	19 3/4	124	3	5/8	9 3/8	58 1/8	1	2 X 1/4	12 3/8	84 1/8	1

DA # 2A ~ Johnson
31 Danville T16-21N R4W

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

designed B Waters 10/12
drawn C Waters 10/12
traced
checked DEnsminger 11/13
approved by DEnsminger
title DE
date

10 of 34



OPERATION AND MAINTENANCE REQUIREMENTS

1. Periodic inspections, especially immediately following significant runoff events, to keep inlets, trash guards, and collection boxes and structures clean and free of materials that can reduce flow.
2. Prompt repair or replacement of damaged components.
3. Repair or replacement of inlets damaged by farm equipment.
4. Repair of leaks and broken or crushed lines to insure proper functioning of the conduit.
5. Periodic checking of the outlet and animal guards to ensure proper functioning.
6. Repair of eroded areas at the pipe outlet.
7. Maintain adequate backfill over the conduit.
8. Control weeds, brush, and trees that could impact the flow or function of the underground outlet by mechanical methods or chemicals

12" Riser on 8" Pipe with 2' Below Elbow For Ballast
All ¼" Smooth metal 72 - 1" Holes / Ft. In Top 8'
Place Bird Cage on Top of Riser
Offset Not Required

STANDARD DWG. IA-1501

DATE Oct. 2008 | PAGE 1 OF 2

NRCS
Natural Resources Conservation Service
United States Department of Agriculture

UNDERGROUND OUTLET

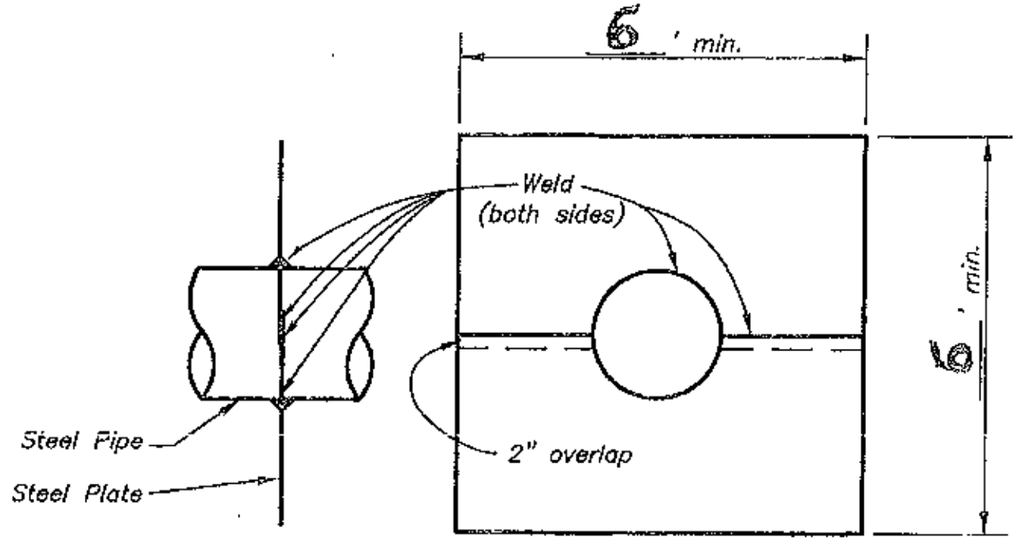
Owner: Johnson
Location: Sec 31, T 76 N, R 4 W
Deaville Township
Des Moines County, Iowa

		Date
Designed	C. Waters	5/5/14
Drawn	C. Waters	5/5/14
Checked	C. Waters	5/5/14
Approved	D Erstmeyer	5/6/14

File Name

Drawing Name

29L226



STEEL PLATE ANTI-SEEP COLLAR

NOTES:
1. All welds shall be watertight.
2. All steel plates shall have a minimum thickness of 1/4 ". Smooth Metal

4/04

NOT TO SCALE

Landowner:

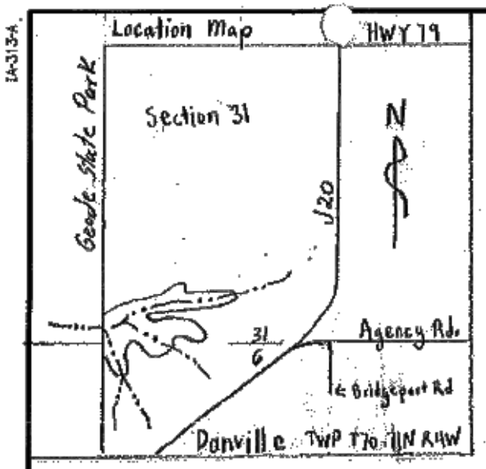
STEEL PLATE
ANTI-SEEP COLLAR DETAILS
DA # 2A (Johnson)

Designed C. Waters
Drawn C. Waters
Checked M. Allen 3/13
Approved D. Ersminger 4/12
Date

United States Department of Agriculture
NRCS
Natural Resources Conservation Service

File Name
IA346100112

Drawing Name
29-L-226



0 1320 2640

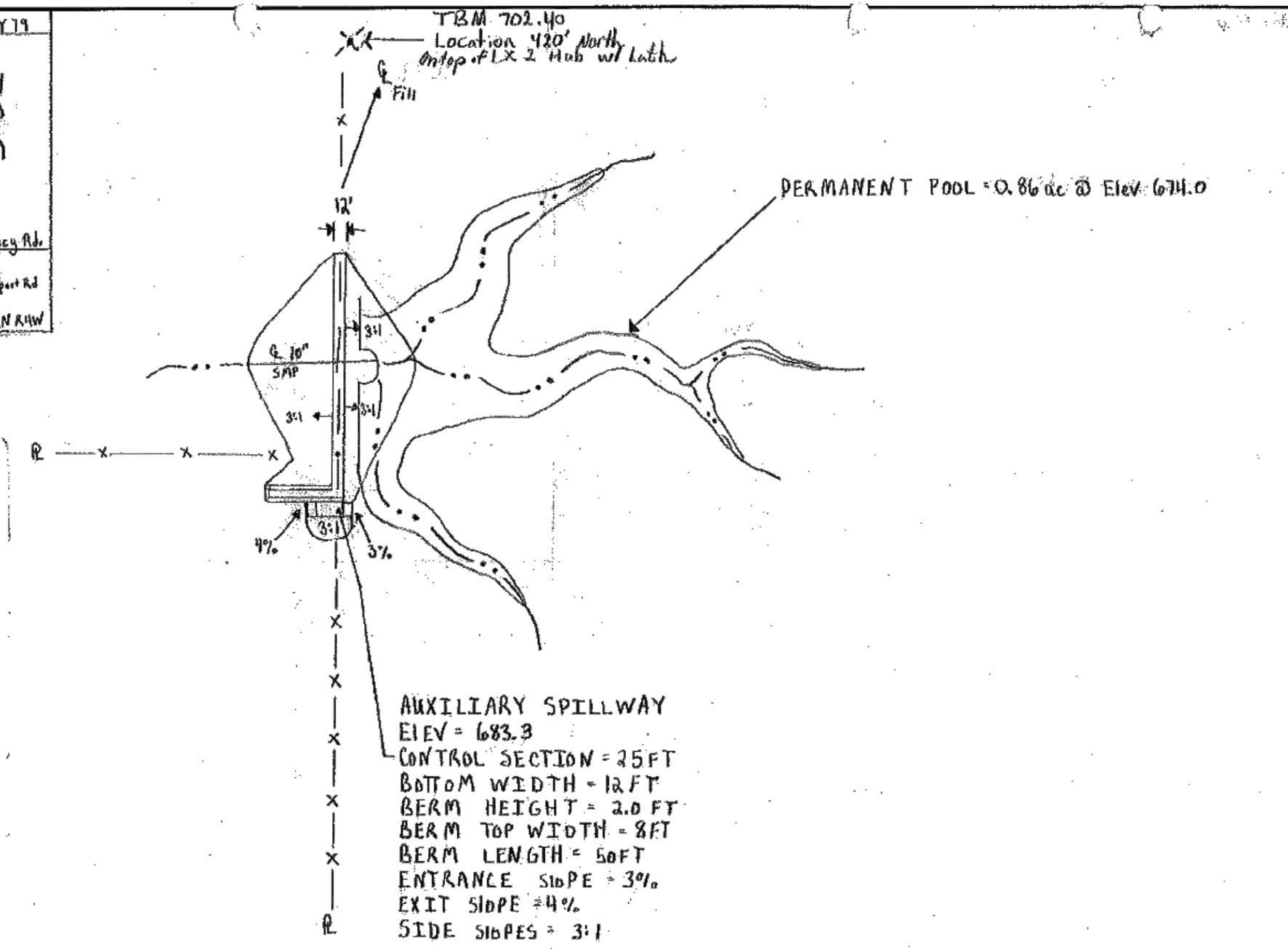
Scale In Feet

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

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

All trees and shrubs shall be cleared and grubbed within a minimum distance of 30' from earthfill and spillway. New plantings shall not be made within these limitations.



50 0 50 100 150 200

SCALE IN FEET

N

PLAN VIEW

ENGINEERING JOB CLASS III

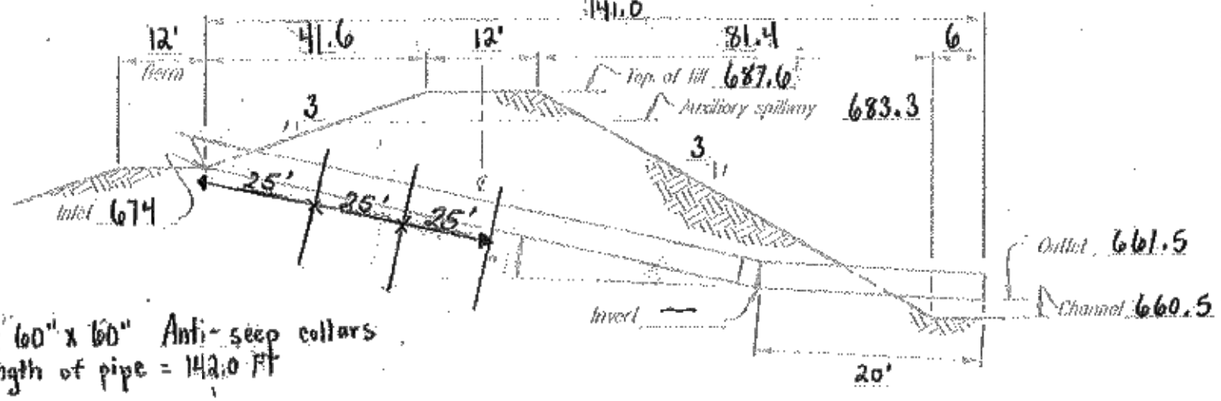
Designed	C. Waters	10/1/12
Drawn	C. Waters	10/1/12
Traced	C. Waters	10/1/12
Checked	M. Allen	3/13

Approved ..... Title ..... Title .....

DA#2B - Johnson
Grade Stabilization - 410
Danville TWP Section 31
T70-71N Des Moines Co. Iowa

U.S. DEPARTMENT OF AGRICULTURE - NATURAL RESOURCES CONSERVATION SERVICE

CAD FILE NAME



SECTION ON CENTERLINE

Not to Scale

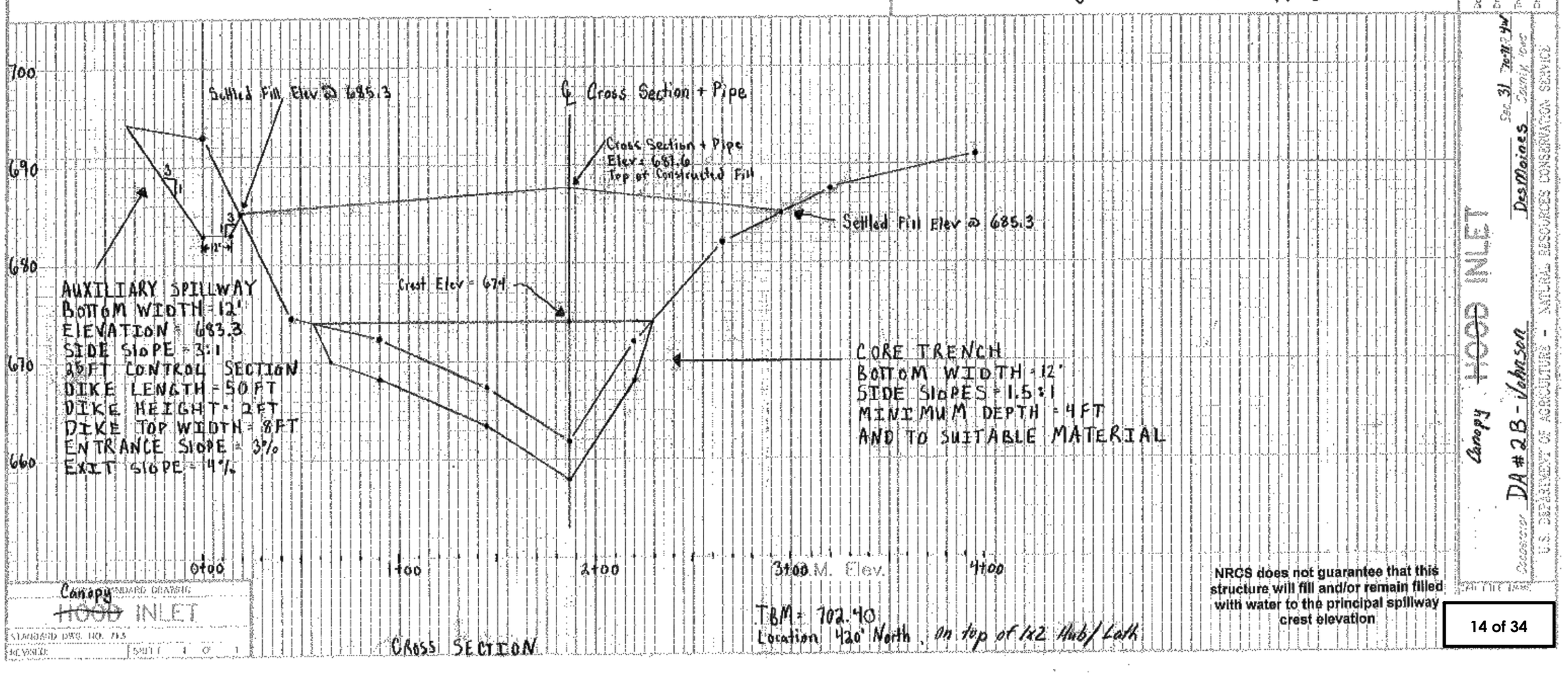
BILL OF MATERIALS

142 ft. of 10 " dia 14 gage metal pipe with ~~hood~~ Canopy inlet.
Pipe and appurtenances to be welded and water tight at the seams.

3 ea. antiseep collars 60" x 60", 14 ga. 2 piece.
Pipe connectors smooth metal

10,208 cu. yd. earth fill
Earthwork includes mainfill, dike, core trench, wave berm (eye brow), and stripping.

Designed	C. Waters	10/13
Drawn	C. Waters	10/13
Traced	C. Waters	10/13
Checked	Mc Allen	9/13



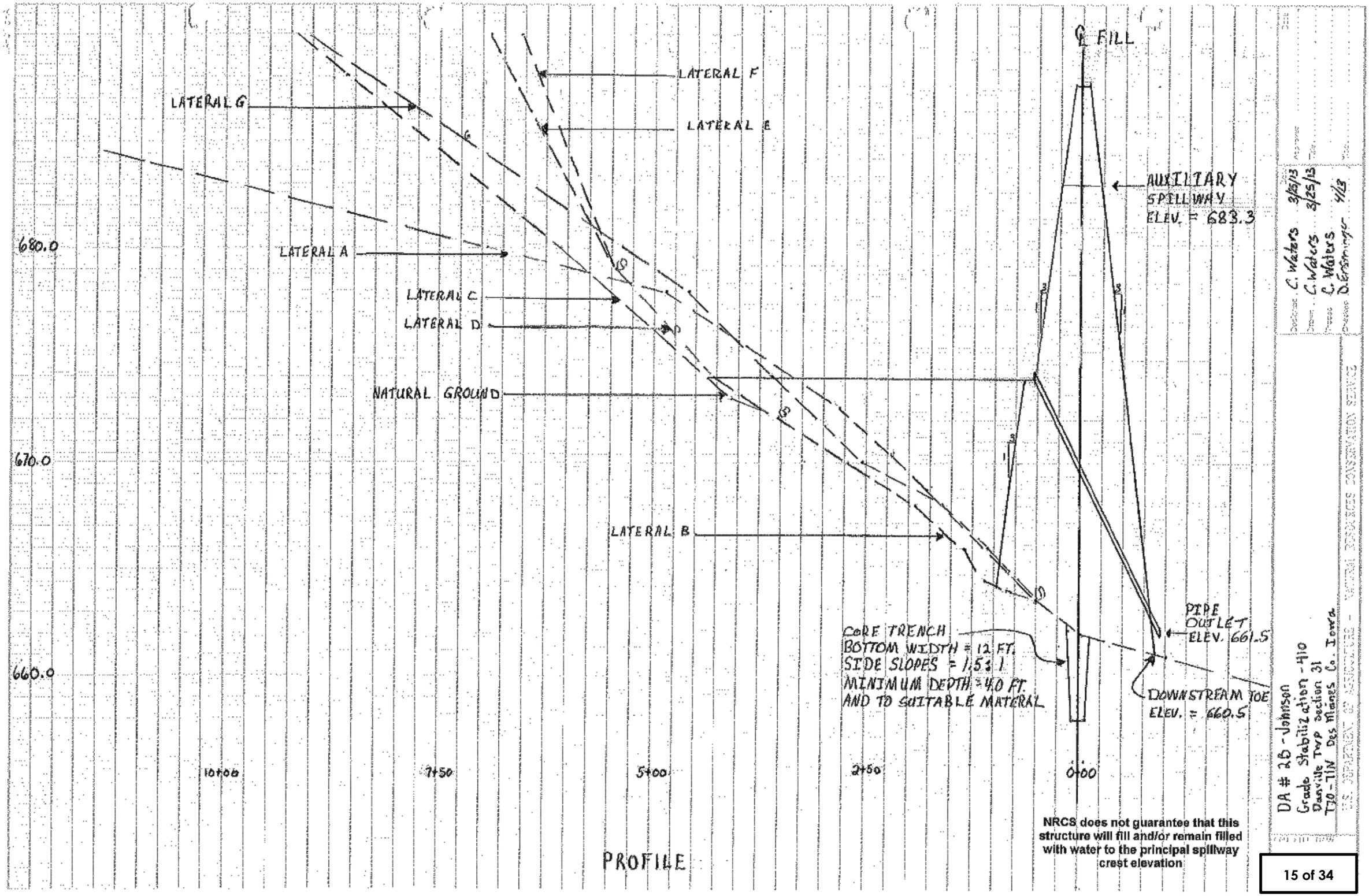
CROSS SECTION

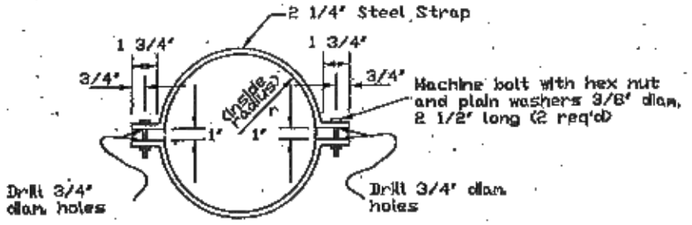
TBM = 702.40
Location 420' North, on top of 1x2 Hub/Lath

Canopy STANDARD DRAWING
~~HOOD~~ INLET
STANDARD DWG. NO. 715
SHEET 4 OF 4

Sec. 31 T6N R4W
Canopy HOOD INLET
Designed Des Moines County, Iowa
DA #28 - Johnson
U.S. DEPARTMENT OF AGRICULTURE - NATURAL RESOURCES CONSERVATION SERVICE

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

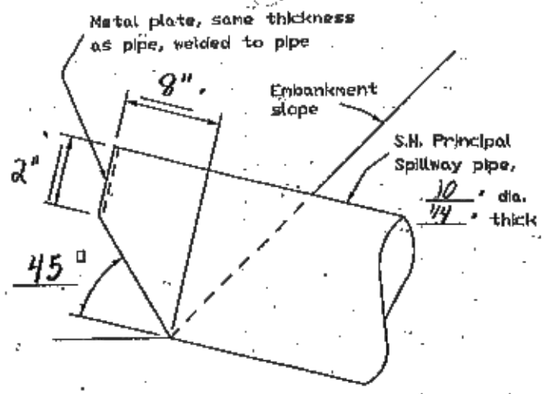

LATERAL F
LATERAL G
LATERAL E
LATERAL A
LATERAL C
LATERAL D
NATURAL GROUND
LATERAL B
℄ FILL
AUXILIARY SPILLWAY ELEV. = 683.3
PIPE OUTLET ELEV. 661.5
CORE TRENCH
BOTTOM WIDTH = 12 FT.
SIDE SLOPES = 1.5:1
MINIMUM DEPTH = 4.0 FT.
AND TO SUITABLE MATERIAL
DOWNSTREAM TOE ELEV. = 660.5
680.0
670.0
660.0
10+00
7+50
5+00
2+50
0+00
PROFILE
NRCS does not guarantee that this structure will fill and/or remain filled with water to the principal spillway crest elevation
Designed C. Waters 3/25/13
Drawn C. Waters 3/25/13
Traced C. Waters
Quantities D. Ernzinger 4/13
DA # 26 - Johnson
Grade Stabilization - 410
Danville Twp Section 31
T70-71N Des Moines Co. Iowa
U.S. DEPARTMENT OF AGRICULTURE - NATURAL RESOURCES CONSERVATION SERVICE



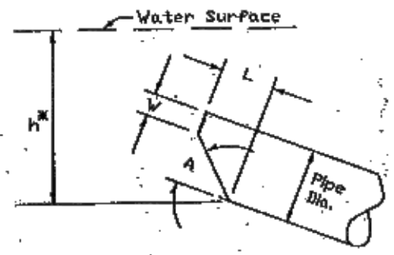
BENDING DIAGRAM FOR
(b) AND (c) RODS

BENDING DIAGRAM FOR
(d) BARS

Pipe Diam. In.	Pipe Grade X	W In.	L In.	A Deg.	h Ft.
6	0-5	1 1/8	3 1/4	56	0.9
	5.1-15	1 1/4	4 3/4	45	0.9
	15.1-25	1 5/8	6 5/8	33	0.9
	25.1-32	2 1/8	7 3/4	27	0.9
8	0-5	1 1/2	4 3/8	56	1.2
	5.1-15	1 5/8	6 3/8	45	1.2
	15.1-25	2 1/8	8 3/4	33	1.2
	25.1-32	2 3/4	10 3/8	27	1.2
10	0-5	1 7/8	5 3/8	56	1.5
	5.1-15	2	8	45	1.5
	15.1-25	2 5/8	11	33	1.5
	25.1-32	3 1/2	13	27	1.5
12	0-5	2 1/4	6 1/2	56	1.8
	5.1-15	2 3/8	9 5/8	45	1.8
	15.1-25	3 1/4	12 1/4	33	1.8
	25.1-32	4 1/4	15 5/8	27	1.8
15	0-5	2 7/8	8 1/8	56	2.3
	5.1-15	3	12	45	2.3
	15.1-25	4	16 1/2	33	2.3
	25.1-32	5 1/4	19 1/2	27	2.3
18	0-5	3 3/8	9 3/4	56	2.7
	5.1-15	3 5/8	14 3/8	45	2.7
	15.1-25	4 7/8	19 3/4	33	2.7
	25.1-32	6 1/4	23 3/8	27	2.7
24	0-5	4 1/2	13	56	3.6
	5.1-15	4 3/4	19 1/4	45	3.6
	15.1-25	6 1/2	26 3/8	33	3.6
	25.1-32	8 3/8	31 1/4	27	3.6

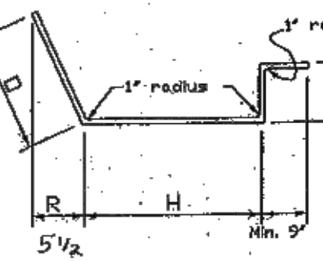


DETAIL OF CANOPY INLET

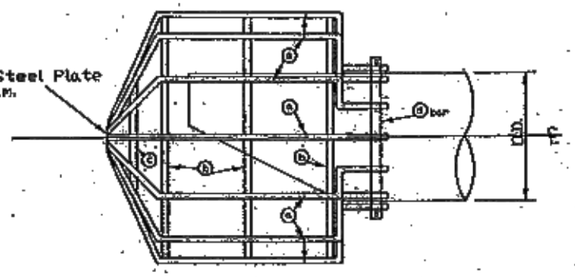


* Minimum height for full pipe flow.

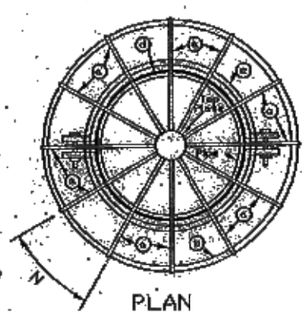
CANOPY INLET DIMENSIONS



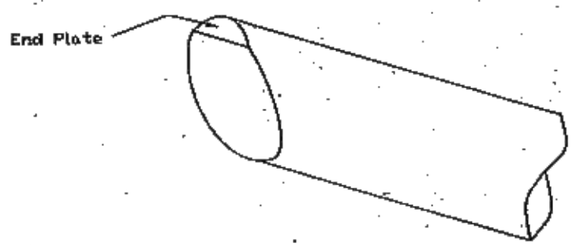
BENDING DIAGRAM FOR
(a) RODS



ELEVATION



PLAN



PARTIAL ISOMETRIC VIEW

TABLE OF DIMENSION AND QUANTITIES

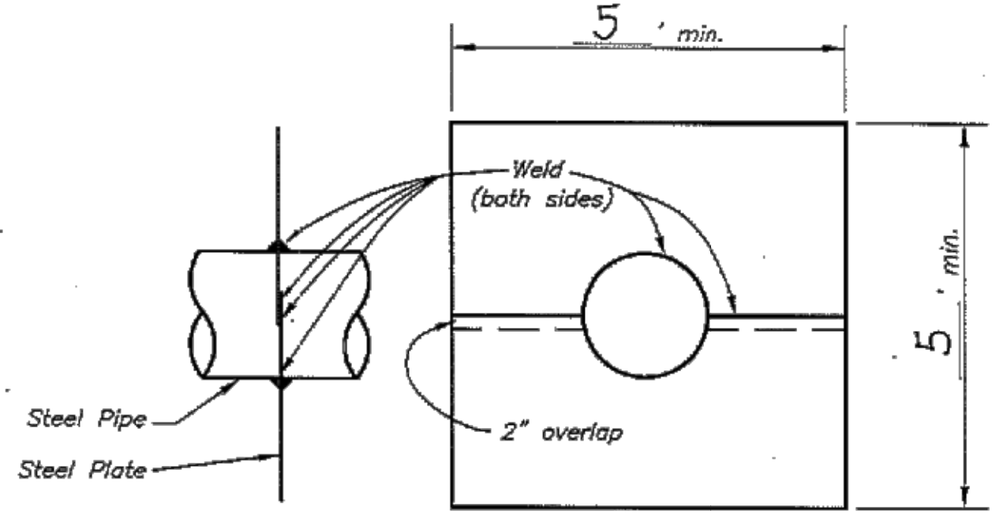
PIPE O.D. IN.	APPROX. WEIGHT LBS	(a) ROD SIZE IN.	H IN.	R IN.	X IN.	D IN.	TOTAL LENGTH IN.	NUMBER REQ'D	N IN.	(b) ROD SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D	(c) ROD SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D	(d) BAR SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D
6	18.9	3/8	9	4	6	9 1/2	33	14	4	3/8	8 1/4	51 7/8	3	---	---	---	0	2 X 1/4	5 3/8	26 1/4	1
8	22.3	3/8	11	4 1/2	6	10 1/2	39	10	6 1/4	3/8	9 1/4	58 1/8	3	---	---	---	0	2 X 1/4	14 3/8	32 1/2	1
10	24.7	3/8	13	5 1/2	6	11 1/2	42	10	7	3/8	10 1/4	64 3/8	3	---	---	---	0	2 X 1/4	5 3/8	38 3/4	1
12	27.1	3/8	15	5 1/2	6	12 1/2	45	10	7 1/8	3/8	11 1/4	70 3/8	3	---	---	---	0	2 X 1/4	6 3/8	45	1
14	48.4	1/2	17	6	6	14	48	10	8 1/8	1/2	12	75 3/8	3	1/2	5	31 3/8	1	2 X 1/4	7 1/2	52 1/8	1
16	52.4	1/2	19	6 1/2	6	15	51	10	8 3/4	1/2	13	81 3/8	3	1/2	6	37 3/8	1	2 X 1/4	8 1/2	58 3/8	1
18	69.5	1/2	22	8 1/2	9	19 1/2	60	12	9 1/8	1/2	17	106 3/4	3	1/2	7	44	1	2 X 1/4	9 1/2	64 3/8	1
20	112.4	5/8	25	9	9	20 1/2	66	12	10	5/8	17 3/4	111 1/2	3	5/8	8	50 1/4	1	2 X 1/4	10 3/8	71 3/4	1
22	118.1	5/8	28	10	9	22	69	12	10 1/2	5/8	18 3/4	117 3/4	3	5/8	8	50 1/4	1	2 X 1/4	11 5/8	78	1
24	124.6	5/8	30	10 1/2	9	23	72	12	11	5/8	19 3/4	124	3	5/8	9 3/8	58 7/8	1	2 X 1/4	12 5/8	84 3/8	1

DA#28- Johnson
31 Danville T70-71N R5W

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

Designed C. Waters 10/31/12
Drawn C. Waters 10/31/12
Traced
Checked D. Erickson 11/2/12
Approved by
Title
Date
Sheet No. 5 of 5

29L226



STEEL PLATE ANTI-SEEP COLLAR

NOTES:
1. All welds shall be watertight.
2. All steel plates shall have a minimum thickness of 1/4 ". Smooth Metal

4/04

NOT TO SCALE

Landowner:

STEEL PLATE
ANTI-SEEP COLLAR DETAILS
DA # 2B (Johnson)

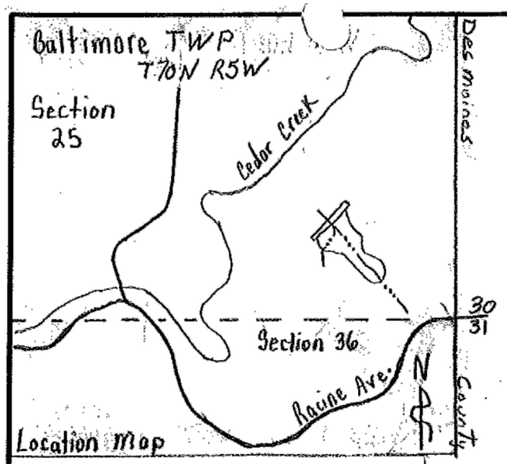
Designed C. Waters Date 3/13
Drawn C. Waters 3/13
Checked M. Allen 3/13
Approved [illegible] 3/13

United States Department of Agriculture
NRCS Natural Resources Conservation Service

File Name
IA346100112

Drawing Name
29-L-226

IA-313-A



0 1320 2640

Scale in Feet

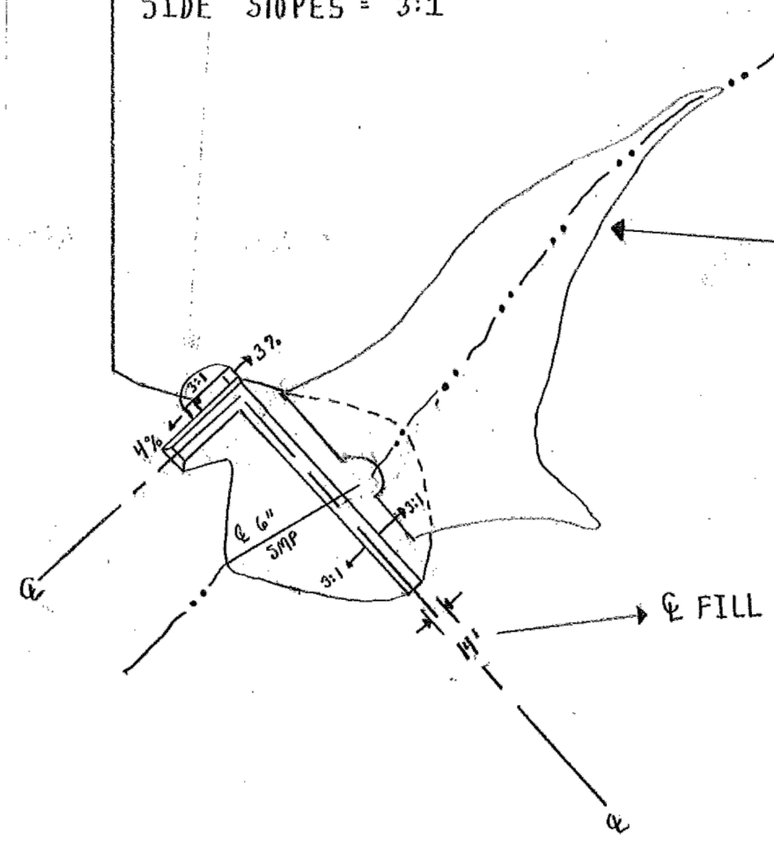
If a cultural resource is identified during construction, stop immediately and notify the Natural Resources Conservation Service Archeologist at 515-284-4370

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

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

All trees and shrubs shall be cleared and grubbed within a minimum distance of 30' from earthfill and spillway. New plantings shall not be made within these limitations.

AUXILIARY SPILLWAY
ELEV: 665.3
CONTROL SECTION = 25 FT
BOTTOM WIDTH = 12 FT
BERM HEIGHT = 2.0 ft
BERM TOP WIDTH = 8 ft
BERM LENGTH = 50 ft
ENTRANCE SLOPE = 3%
EXIT SLOPE = 4%
SIDE SLOPES = 3:1



50 0 50 100 150 200

SCALE IN FEET

N

ENGINEERING JOB CLASS III

PLAN VIEW

Designed C. Waters 9/19/12
Drawn C. Waters 9/19/12
Traced C. Waters 9/19/12
Checked M. Allen 9/13

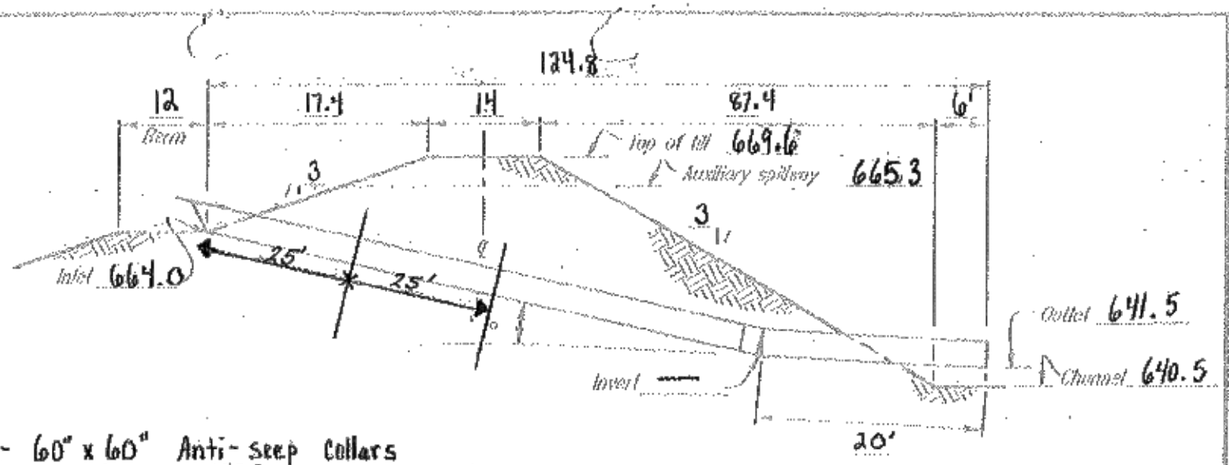
Approved Doug Ensminger 11/3
Title District Conservationist

Title

U.S. DEPARTMENT OF AGRICULTURE - NATURAL RESOURCES CONSERVATION SERVICE

DA # 7 - Goode State Park
Grade Stabilization - 410
Baltimore TWP Section 25
T70N - R5W - Henry Co. Iowa

CAD FILE NAME



2- 60" x 60" Anti-seep Collars
Length of pipe - 127ft

SECTION ON CENTERLINE
Not to Scale

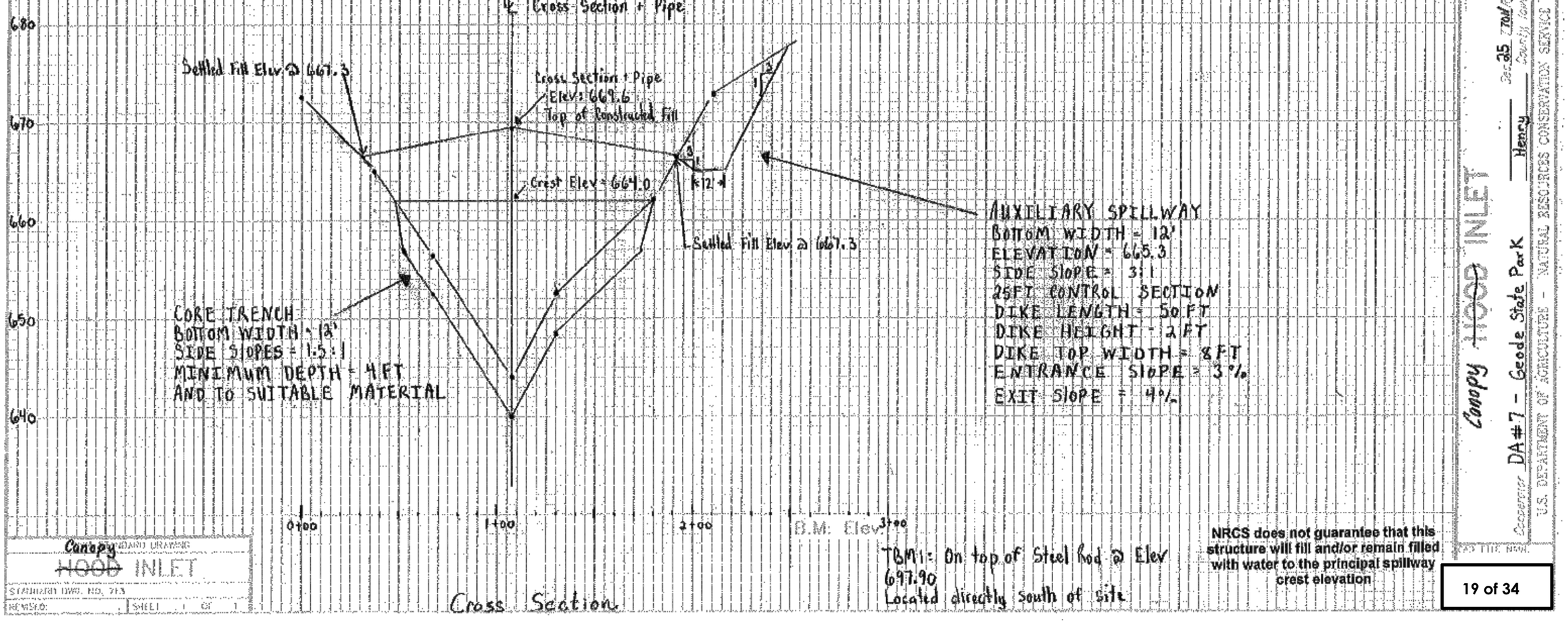
BILL OF MATERIALS

127 ft. of 6 " dia 14" ~~gage~~ Smooth metal pipe with ~~hood~~ canopy inlet.
Pipe and appurtenances to be welded and water tight at the seams.

2 ea. antiseep collars 60" x 60", 14" ga. 2 piece.
Pipe connectors smooth metal

5,945 cu. yd. earth fill
Earthwork includes maintill, dike, core trench, wave berm (eye) brow, and stripping

Designed C. Waters 9/11/12 Approved D. Kramer, NRCS
Drawn C. Waters 9/11/12 Title District Conservationist
Traced C. Waters 9/11/12
Checked [signature] 9/13 Title



Cross Section

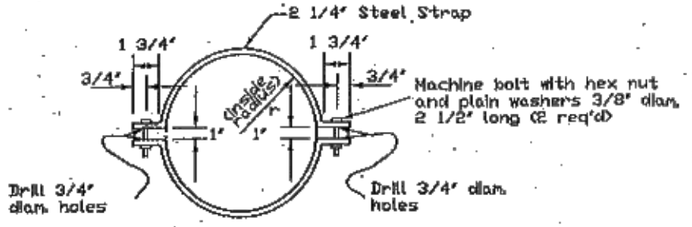
TBM1: On top of Steel Rod @ Elev 697.90
Located directly South of Site

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

Canopy STANDARD DRAWING
~~HOOD~~ INLET
STANDARD DWG. NO. 715
REVISED: | SHEET 1 OF 1

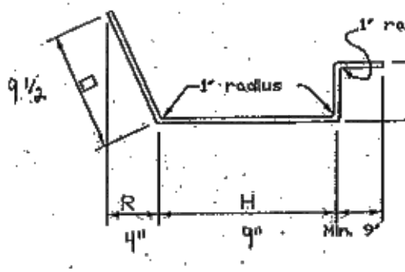
Canopy ~~HOOD~~ INLET

Sec 35 T70N R5W
County Henry
Cooperator DA #7 - Geode State Park
U.S. DEPARTMENT OF AGRICULTURE - NATURAL RESOURCES CONSERVATION SERVICE
NO SCALE

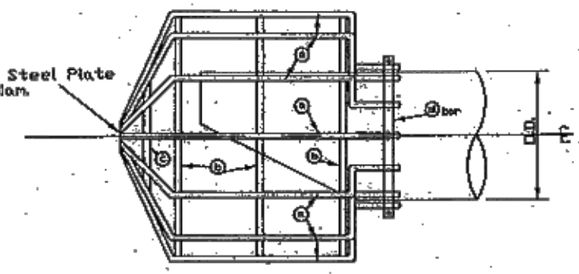


BENDING DIAGRAM FOR (b) AND (c) RODS

BENDING DIAGRAM FOR (d) BARS

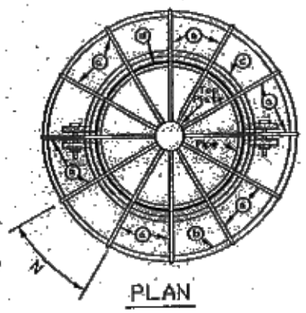


BENDING DIAGRAM FOR (a) RODS

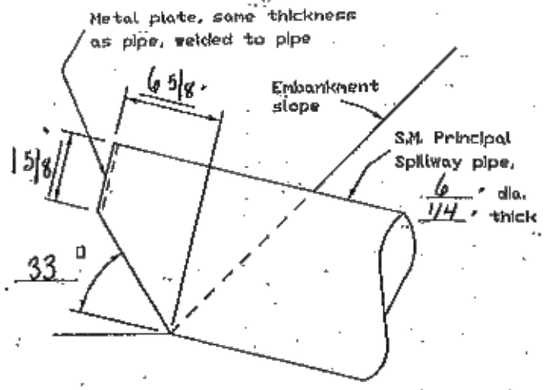


ELEVATION

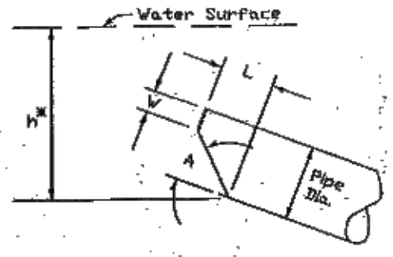
Pipe Diam. In.	Pipe Grade %	W In.	L In.	A Deg.	h Ft.
6	0-5	1 1/8	3 1/4	56	0.9
	5.1-15	1 1/4	4 3/4	45	0.9
	15.1-25	1 5/8	6 5/8	33	0.9
	25.1-32	2 1/8	7 3/4	27	0.9
8	0-5	1 1/2	4 3/8	56	1.2
	5.1-15	1 5/8	6 3/8	45	1.2
	15.1-25	2 1/8	8 3/4	33	1.2
	25.1-32	2 3/4	10 3/8	27	1.2
10	0-5	1 7/8	5 3/8	56	1.5
	5.1-15	2	8	45	1.5
	15.1-25	2 5/8	11	33	1.5
	25.1-32	3 1/2	13	27	1.5
12	0-5	2 1/4	6 1/2	56	1.8
	5.1-15	2 3/8	9 5/8	45	1.8
	15.1-25	3 1/4	13 1/4	33	1.8
	25.1-32	4 1/4	15 5/8	27	1.8
15	0-5	2 7/8	8 1/8	56	2.3
	5.1-15	3	12	45	2.3
	15.1-25	4	16 1/2	33	2.3
	25.1-32	5 1/4	19 1/2	27	2.3
18	0-5	3 3/8	9 3/4	56	2.7
	5.1-15	3 5/8	14 3/8	45	2.7
	15.1-25	4 7/8	19 3/4	33	2.7
	25.1-32	6 1/4	23 3/8	27	2.7
24	0-5	4 1/2	13	56	3.6
	5.1-15	4 3/4	19 1/4	45	3.6
	15.1-25	6 1/2	26 3/8	33	3.6
	25.1-32	8 3/8	31 1/4	27	3.6



PLAN

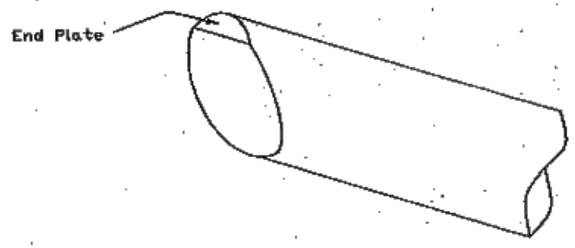


DETAIL OF CANOPY INLET



* Minimum height for full pipe flow.

CANOPY INLET DIMENSIONS



PARTIAL ISOMETRIC VIEW

TABLE OF DIMENSION AND QUANTITIES

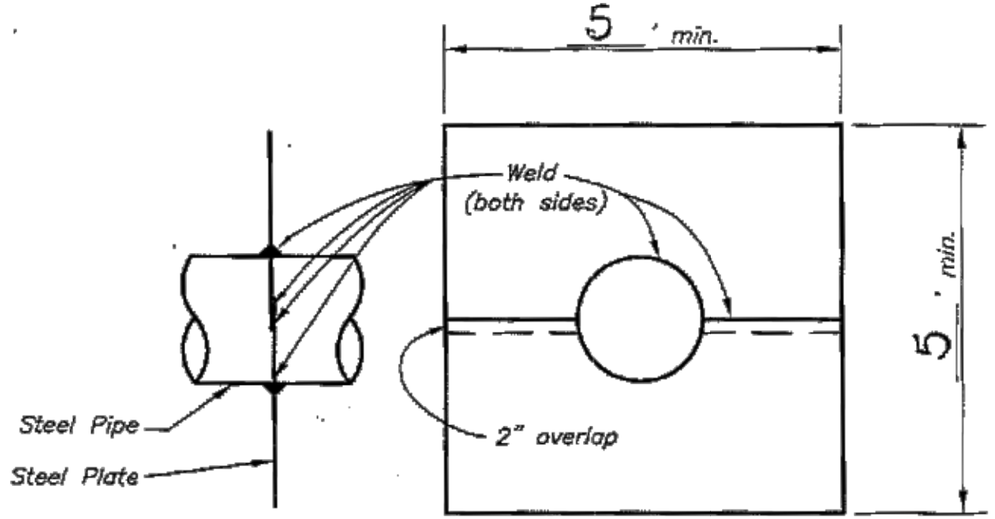
PIPE O.D. IN.	APPROX. WEIGHT LBS	(a) ROD SIZE IN.	H IN.	R IN.	X IN.	D IN.	TOTAL LENGTH IN.	NUMBER REQ'D	N IN.	(b) ROD SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D	(c) ROD SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D	(d) BAR SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D
6	18.9	3/8	9	4	6	9 1/2	33	14	4	3/8	8 1/4	51 7/8	3	---	---	---	0	2 x 1/4	3 3/8	26 1/4	1
8	22.8	3/8	11	4 1/2	6	10 1/2	39	10	6 1/4	3/8	9 1/4	59 3/8	3	---	---	---	0	2 x 1/4	4 3/8	32 1/8	1
10	24.7	3/8	13	5 1/2	6	11 1/2	42	10	7	3/8	10 1/4	64 3/8	3	---	---	---	0	2 x 1/4	5 3/8	38 3/4	1
12	27.1	3/8	15	5 1/2	6	12 1/2	45	10	7 1/2	3/8	11 1/4	70 3/8	3	---	---	---	0	2 x 1/4	6 3/8	45	1
14	48.4	1/2	17	6	6	14	48	10	8 1/8	1/2	12	75 3/8	3	1/2	5	31 3/8	1	2 x 1/4	7 1/2	52 1/8	1
16	52.4	1/2	19	6 1/2	6	15	51	10	8 3/4	1/2	13	81 3/8	3	1/2	6	37 3/8	1	2 x 1/4	8 1/2	58 3/8	1
18	69.5	1/2	22	8 1/2	9	19 1/2	60	12	9 1/2	1/2	17	106 3/4	3	1/2	7	44	1	2 x 1/4	9 1/2	64 5/8	1
20	112.4	5/8	25	9	9	20 1/2	66	12	10	5/8	17 3/4	111 3/8	3	5/8	8	50 1/4	1	2 x 1/4	10 3/8	71 3/4	1
22	118.1	5/8	28	10	9	22	69	12	10 1/2	5/8	18 3/4	117 3/4	3	5/8	8	50 1/4	1	2 x 1/4	11 3/8	78	1
24	124.6	5/8	30	10 1/2	9	23	72	12	11	5/8	19 3/4	124	3	5/8	9 3/8	58 7/8	1	2 x 1/4	12 3/8	84 3/8	1

Design Area #7
Geode state Park
25 Baltimore T70N. R5W

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

Designed C. Waters 9/11 Approved by [illegible]
Drawn C. Waters 9/11 Title
Traced
Checked [illegible] 4/12 Title Sheet No. 3 of 4

29L226



STEEL PLATE ANTI-SEEP COLLAR

NOTES:
1. All welds shall be watertight.
2. All steel plates shall have a minimum thickness of 1/4 ". Smooth Metal

4/04

NOT TO SCALE

Landowner:

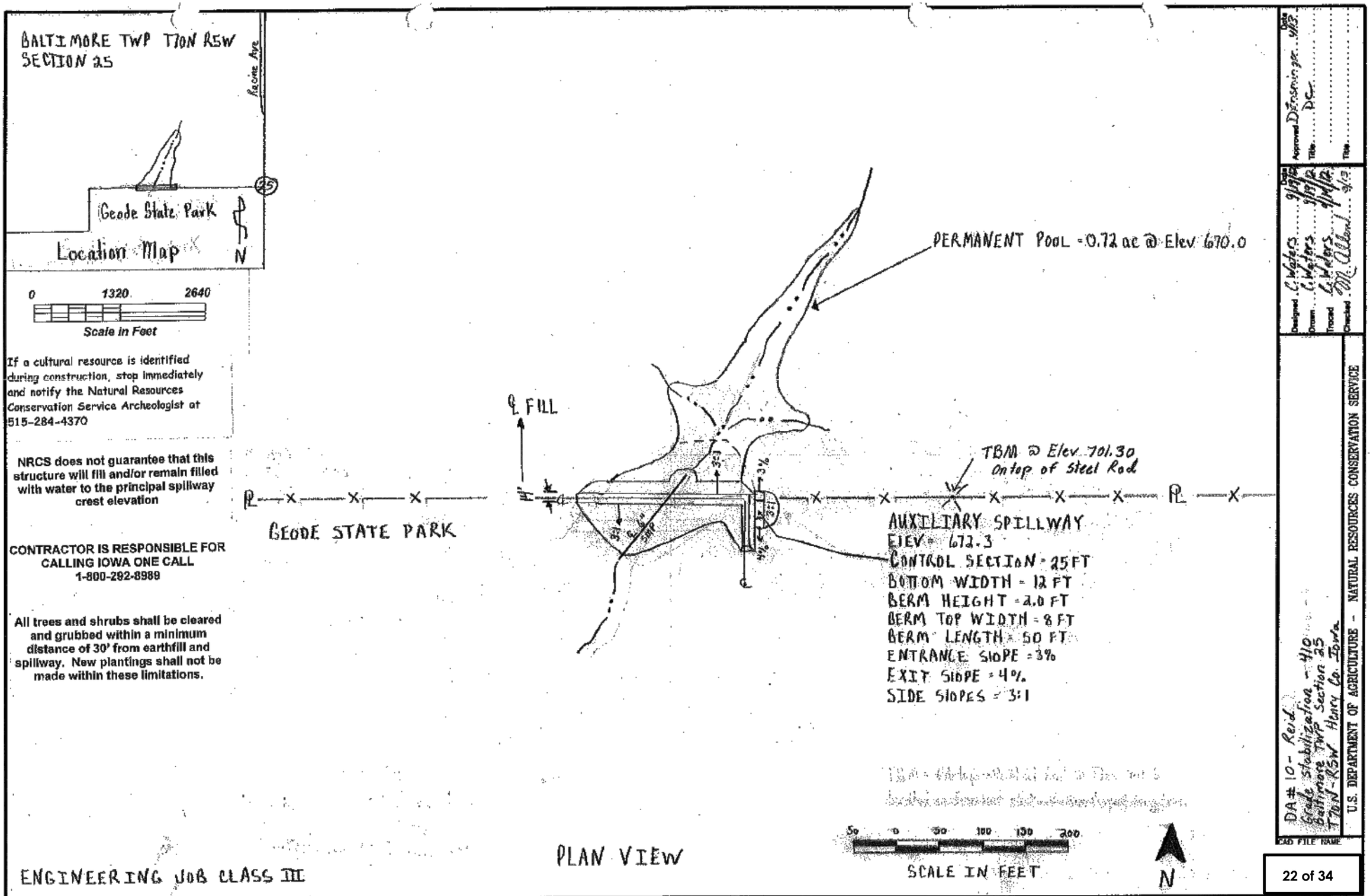
STEEL PLATE
ANTI-SEEP COLLAR DETAILS
DA #7

Designed C. Wakers 10/18/12
Drawn C. Wakers 10/18/12
Checked DeShawn 10/19/12
Approved DeShawn 10/19/12

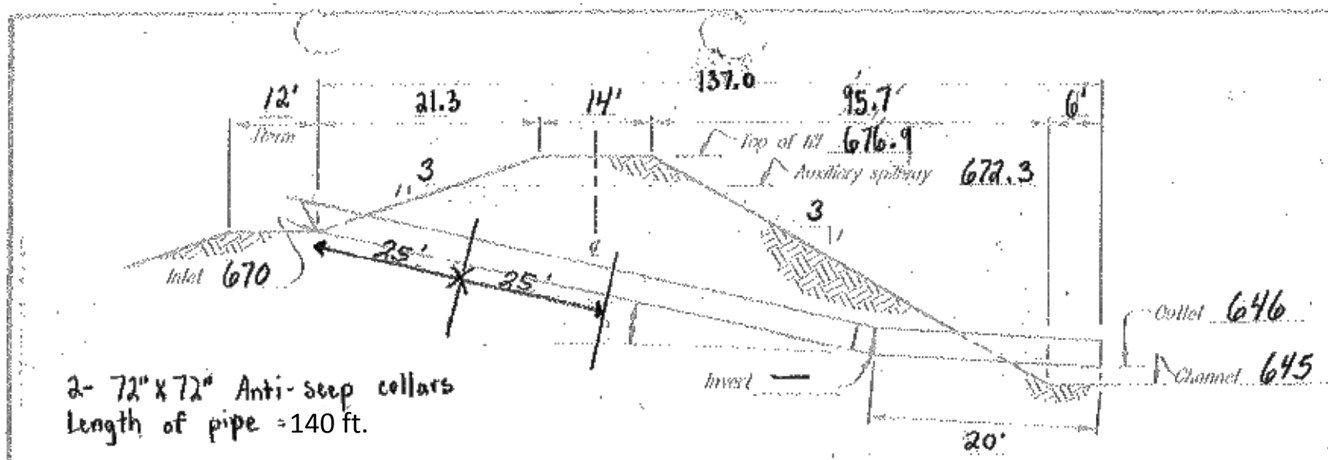
United States Department of Agriculture
Natural Resources Conservation Service
NRCS

File Name
IA346091912

Drawing Name
29-L-226



BALTIMORE TWP T70N R5W
SECTION 25
Racine Ave
25
Geode State Park
Location Map
N
0 1320 2640
Scale in Feet
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
CONTRACTOR IS RESPONSIBLE FOR CALLING IOWA ONE CALL 1-800-292-8989
All trees and shrubs shall be cleared and grubbed within a minimum distance of 30' from earthfill and spillway. New plantings shall not be made within these limitations.
PERMANENT POOL = 0.72 ac @ Elev 670.0
℄ FILL
TBM @ Elev 701.30 On top of Steel Rod
GEODE STATE PARK
AUXILIARY SPILLWAY
ELEV = 672.3
CONTROL SECTION = 25 FT
BOTTOM WIDTH = 12 FT
BERM HEIGHT = 2.0 FT
BERM TOP WIDTH = 8 FT
BERM LENGTH = 50 FT
ENTRANCE SLOPE = 3%
EXIT SLOPE = 4%
SIDE SLOPES = 3:1
50 0 50 100 150 200
SCALE IN FEET
N
PLAN VIEW
ENGINEERING JOB CLASS III
Designed C. Waters 9/19/12
Drawn C. Waters 9/19/12
Traced C. Waters 9/19/12
Checked M. Allen 9/13
Approved D. Ensminger 9/13
Title DC
Title
DA # 10 - Reid
Grade Stabilization - 410
Baltimore TWP Section 25
T70N-R5W Henry Co. Iowa
U.S. DEPARTMENT OF AGRICULTURE - NATURAL RESOURCES CONSERVATION SERVICE
CAD FILE NAME



2- 72" x 72" Anti-seep collars
Length of pipe = 140 ft.

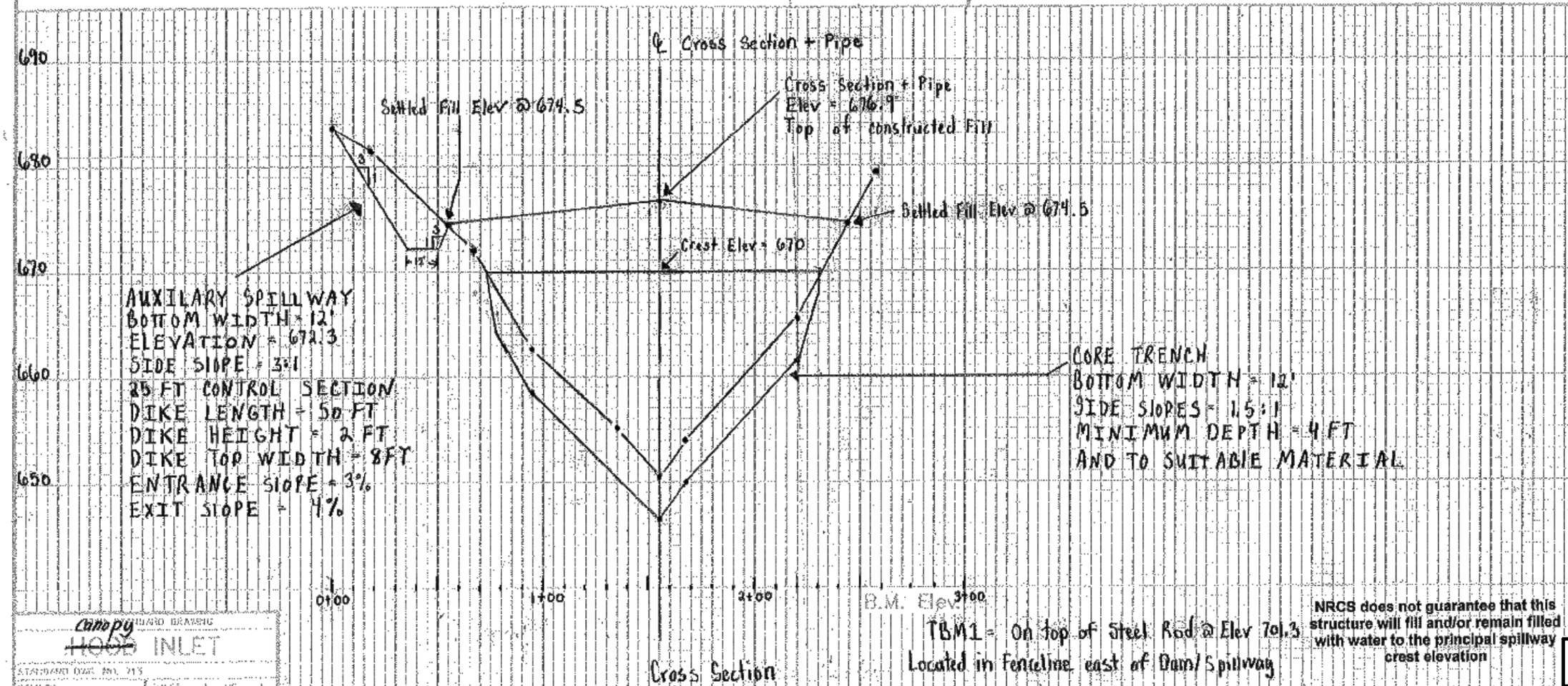
SECTION ON CENTERLINE
Not to Scale

BILL OF MATERIALS

140 ft. of 6 " dia 1/4" ~~gage~~ smooth metal pipe with ~~hood~~ canopy inlet.
Pipe and appurtenances to be welded and water tight at the seams.

2 ea. antiseep collars 72" x 72" 1/4" ga. 2 piece.
Pipe connectors smooth metal

7,836 cu. yd. earth fill
Earthwork includes main fill, dike, core trench, wave berm (eye brow), and stripping.



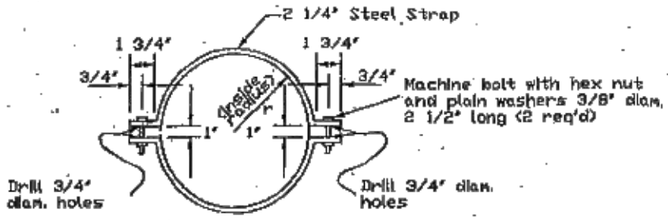
TBM1 = On top of Steel Rod @ Elev 701.3
Located in Fenceline east of Dam/Spillway

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

Canopy ~~HOOD~~ INLET
STANDARD DWG. NO. 713
REVISED: SHEET 1 OF 1

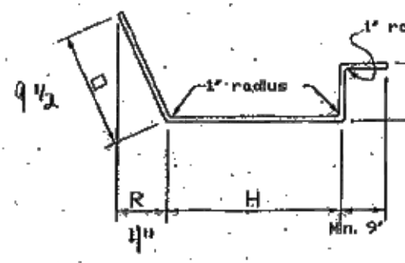
Canopy ~~HOOD~~ INLET
Sec. 25 70N-5W
Henry County, Iowa
Cooperator DA# 10 (Reid)
U.S. DEPARTMENT OF AGRICULTURE - NATURAL RESOURCES CONSERVATION SERVICE

Designed C. Waters 9/19/12
Drawn C. Waters 9/19/12
Traced C. Waters 9/19/12
Checked D. Ensminger 4/13
Approved D. Ensminger 4/13
Title DC
Date

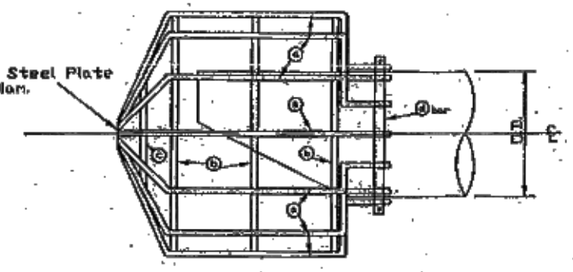


BENDING DIAGRAM FOR (b) AND (c) RODS

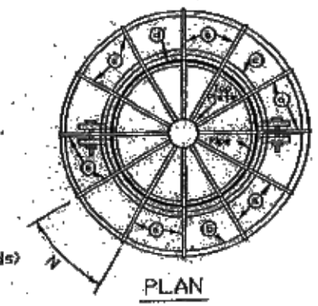
BENDING DIAGRAM FOR (d) BARS



BENDING DIAGRAM FOR (a) RODS

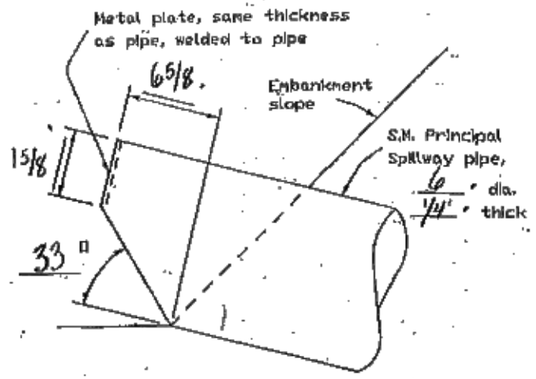


ELEVATION

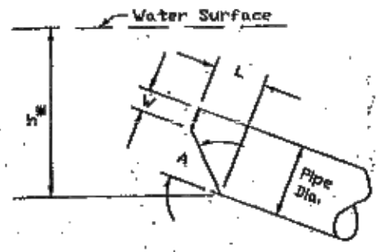


PLAN

Pipe Diam. In.	Pipe Grade %	W In.	L In.	A Deg.	h Ft.
6	0-5	1 1/8	3 1/4	56	0.9
	5.1-15	1 1/4	4 3/4	45	0.9
	15.1-25	1 5/8	6 5/8	33	0.9
	25.1-32	2 1/8	7 3/4	27	0.9
8	0-5	1 1/2	4 3/8	56	1.2
	5.1-15	1 5/8	6 3/8	45	1.2
	15.1-25	2 1/8	8 3/4	33	1.2
	25.1-32	2 3/4	10 3/8	27	1.2
10	0-5	1 7/8	5 3/8	56	1.5
	5.1-15	2	8	45	1.5
	15.1-25	2 5/8	11	33	1.5
	25.1-32	3 1/2	13	27	1.5
12	0-5	2 1/4	6 1/2	56	1.8
	5.1-15	2 3/8	9 5/8	45	1.8
	15.1-25	3 1/4	13 1/4	33	1.8
	25.1-32	4 1/4	15 5/8	27	1.8
15	0-5	2 7/8	8 1/8	56	2.3
	5.1-15	3	12	45	2.3
	15.1-25	4	16 1/2	33	2.3
	25.1-32	5 1/4	19 1/2	27	2.3
18	0-5	3 3/8	9 3/4	56	2.7
	5.1-15	3 5/8	14 3/8	45	2.7
	15.1-25	4 7/8	19 3/4	33	2.7
	25.1-32	6 1/4	23 3/8	27	2.7
24	0-5	4 1/2	13	56	3.6
	5.1-15	4 3/4	19 1/4	45	3.6
	15.1-25	6 1/2	26 3/8	33	3.6
	25.1-32	8 3/8	31 1/4	27	3.6

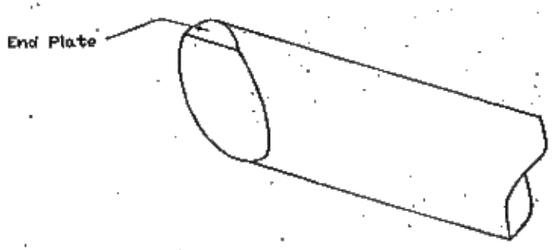


DETAIL OF CANOPY INLET



* Minimum height for full pipe flow

CANOPY INLET DIMENSIONS



PARTIAL ISOMETRIC VIEW

TABLE OF DIMENSION AND QUANTITIES

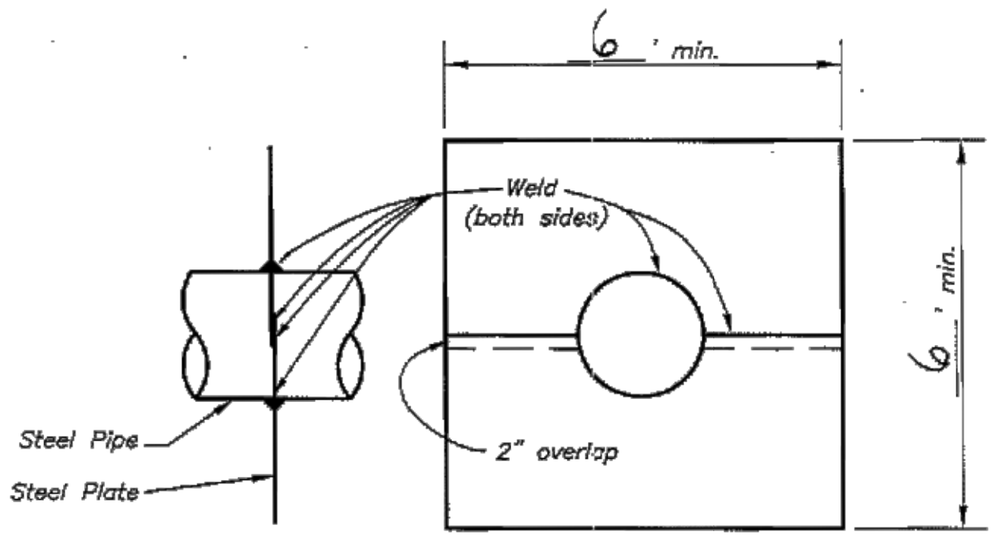
PIPE O.D. IN.	APPROX. WEIGHT LBS	(a) ROD SIZE IN.	H IN.	R IN.	X IN.	D IN.	TOTAL LENGTH IN.	NUMBER REQ'D	N IN.	(b) ROD SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D	(c) ROD SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D	(d) BAR SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D
6	18.9	3/8	9	4	6	9 1/2	33	14	4	3/8	8 1/2	51 7/8	3	---	---	---	0	2 X 1/4	3 3/8	26 1/4	1
8	22.8	3/8	11	4 1/2	6	10 1/2	39	10	6 1/4	3/8	9 1/4	58 1/8	3	---	---	---	0	2 X 1/4	4 3/8	32 1/2	1
10	24.7	3/8	13	5 1/2	6	11 1/2	42	10	7	3/8	10 1/4	64 3/4	3	---	---	---	0	2 X 1/4	5 3/8	38 3/4	1
12	27.1	3/8	15	5 1/2	6	12 1/2	45	10	7 1/8	3/8	11 1/4	70 5/8	3	---	---	---	0	2 X 1/4	6 3/8	45	1
14	48.4	1/2	17	6	6	14	48	10	8 1/8	1/2	12	75 3/8	3	1/2	5	31 3/8	1	2 X 1/4	7 1/2	52 1/8	1
16	52.4	1/2	19	6 1/2	6	15	51	10	8 3/4	1/2	13	81 3/8	3	1/2	6	37 5/8	1	2 X 1/4	8 1/2	58 3/8	1
18	69.5	1/2	22	8 1/8	9	19 1/2	60	12	9 1/2	1/2	17	106 3/4	3	1/2	7	44	1	2 X 1/4	9 1/2	64 5/8	1
20	112.4	5/8	25	9	9	20 1/2	66	12	10	5/8	17 3/4	111 1/2	3	5/8	8	50 1/4	1	2 X 1/4	10 3/8	71 3/4	1
22	118.1	5/8	28	10	9	22	69	12	10 1/2	5/8	18 3/4	117 3/4	3	5/8	8	50 1/4	1	2 X 1/4	11 3/8	78	1
24	124.6	5/8	30	10 1/2	9	23	72	12	11	5/8	19 3/4	124	3	5/8	9 3/8	58 7/8	1	2 X 1/4	12 3/8	84 1/8	1

Reid Site #10
Grade Stabilization - 410
25 - Baltimore T.70N R5W

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

Designed C. Waters 9/19/12 — Approved by D. Erasmayer
Drawn C. Waters 9/19/12 — Title PE
Traced C. Waters 9/19/12 — Title
Checked D. Erasmayer 9/19/12 — Sheet No. 3 of 4

291 226



STEEL PLATE ANTI-SEEP COLLAR

NOTES:
1. All welds shall be watertight.
2. All steel plates shall have a minimum thickness of 1/4 ". Smooth Metal

4/04

NOT TO SCALE

Landowner:

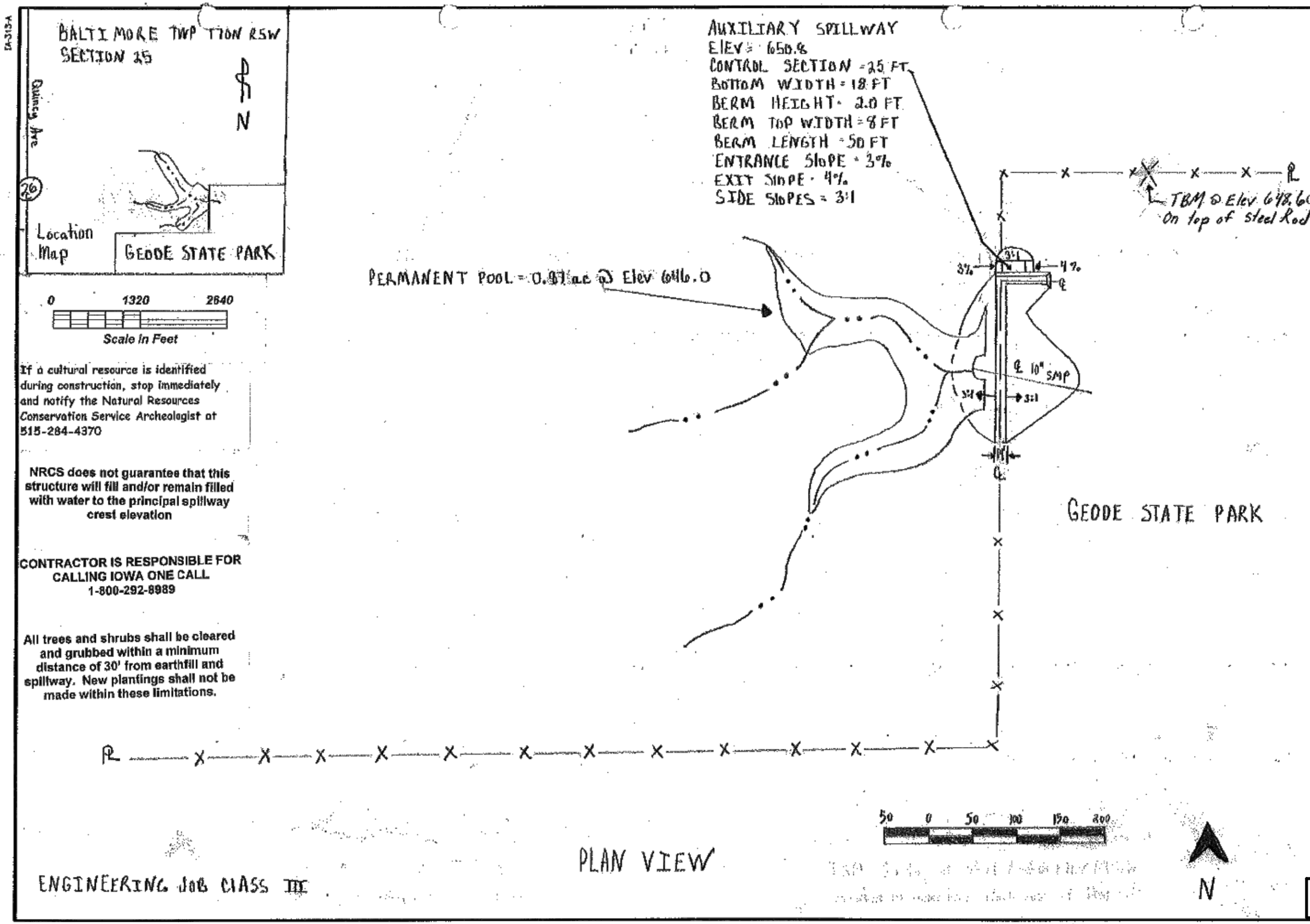
STEEL PLATE
ANTI-SEEP COLLAR DETAILS
DA #10 (Reid)

Designed C. Waters 9/19/12
Drawn C. Waters 9/19/12
Checked M. Allen 9/19/12
Approved D. Brinkmeyer 9/13

United States Department of Agriculture
Natural Resources Conservation Service
NRCS

File Name
IA346091912

Drawing Name
29-L-226



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

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

All trees and shrubs shall be cleared and grubbed within a minimum distance of 30' from earthfill and spillway. New plantings shall not be made within these limitations.

PLAN VIEW

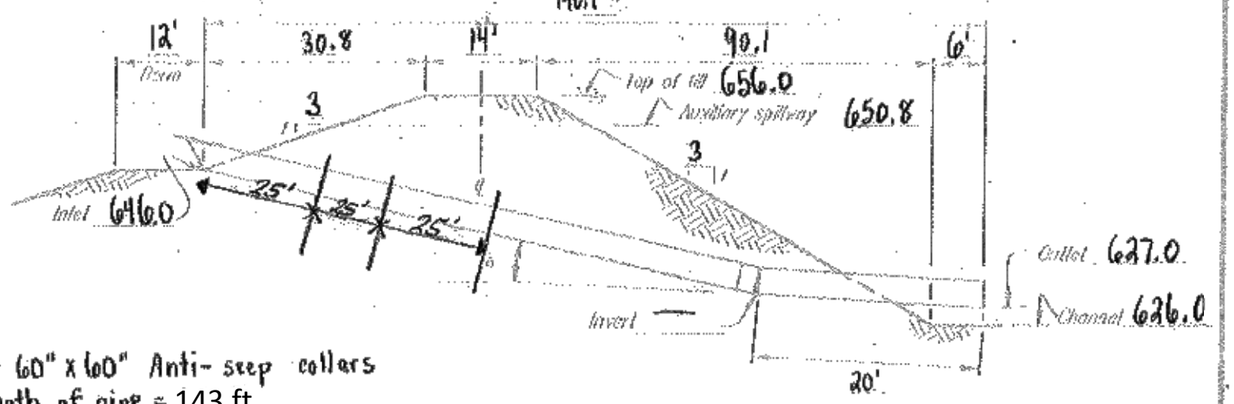
ENGINEERING JOB CLASS III

Designed C. Waters 10/8/12
Drawn C. Waters 10/8/12
Traced C. Waters 10/8/12
Checked M. Allen 3/13
Approved D. Ersmoyer 4/13
Title DC
Title

DA #12 (Reid)
Grade Stabilization - 410
Baltimore TWP Section 25
T70N - R5W Henry Co. Iowa

U.S. DEPARTMENT OF AGRICULTURE - NATURAL RESOURCES CONSERVATION SERVICE

CAD FILE NAME



3- 60" x 60" Anti- seep collars
Length of pipe = 143 ft

SECTION ON CENTERLINE
Not to Scale

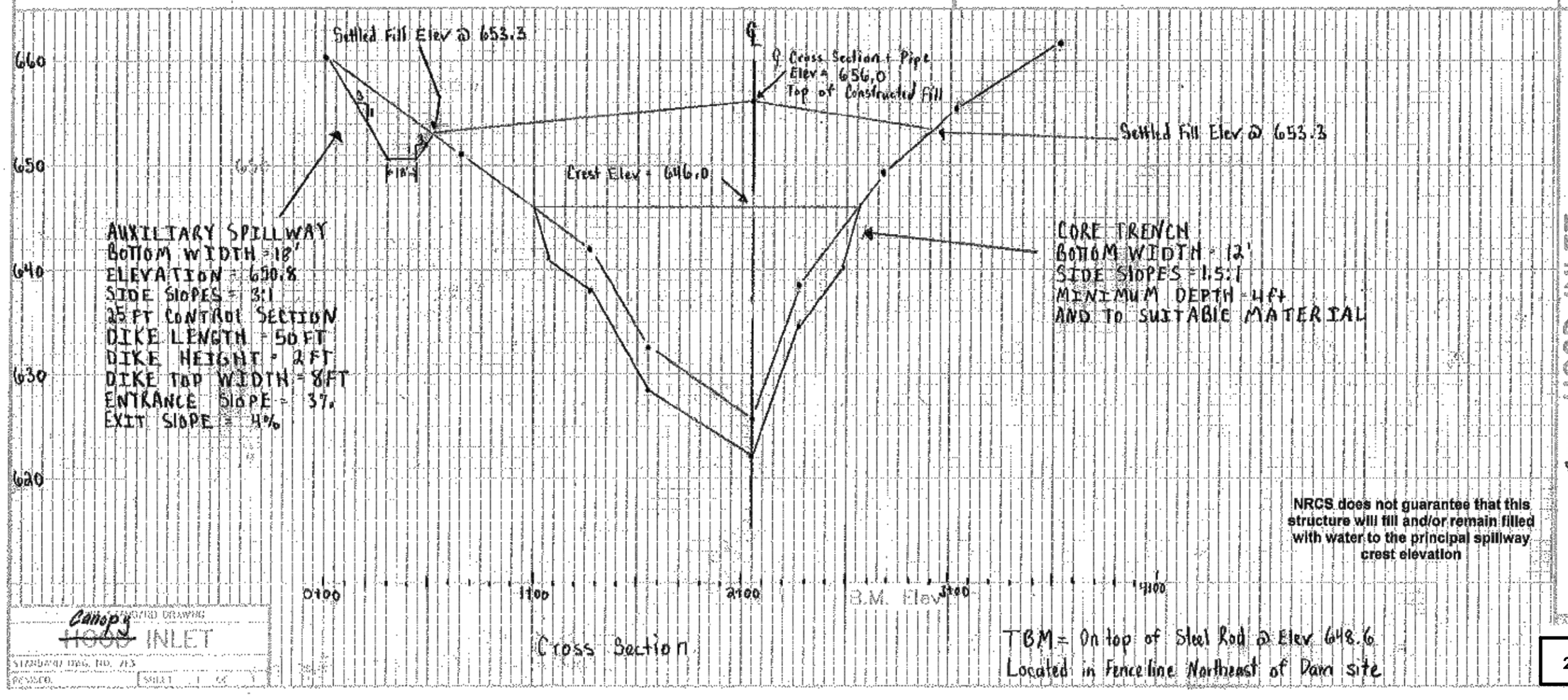
BILL OF MATERIALS

143 ft. of 10" dia 14" gage metal pipe with ~~hood~~ canopy inlet. Pipe and appurtenances to be welded and water tight at the seams.

3 ea. antiseep collars 60" x 60", 14" ga. 2 piece. Pipe connectors smooth metal

10,296 cu. yd. earth fill
Earthwork includes mainfill, dike, core trench, wave berm (eye brow), and stripping.

Approved D. Grossinger 9/13 Title PC
Designed C Waters 10/8/12 Drawn C Waters 10/8/12 Traced G. Wilcox 10/8/12 Checked M. Allen 9/13



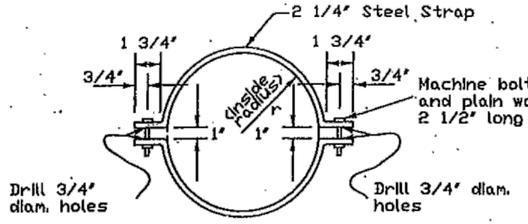
NRCS does not guarantee that this structure will fill and/or remain filled with water to the principal spillway crest elevation

Cross Section

TBM = On top of Steel Rod @ Elev 648.6
Located in Fenceline Northeast of Dam site

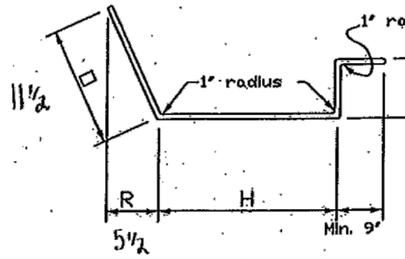
Scale: 25' Date: 9/13 Designed: Canopy HOOD INLET Drawn: DA #12 - Reid Traced: Henry Checked:
U.S. DEPARTMENT OF AGRICULTURE - NATURAL RESOURCES CONSERVATION SERVICE

STANDARD DRAWING
Canopy ~~HOOD~~ INLET
STANDARD DWG. NO. 713
REVISED SHEET 1 OF 1

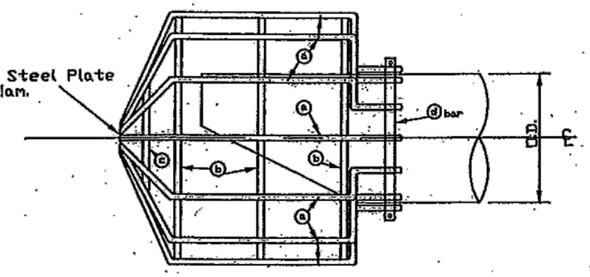


BENDING DIAGRAM FOR
(b) AND (c) RODS

BENDING DIAGRAM FOR
(d) BARS

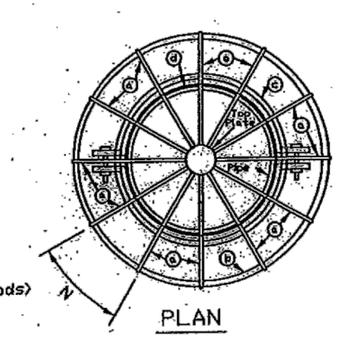


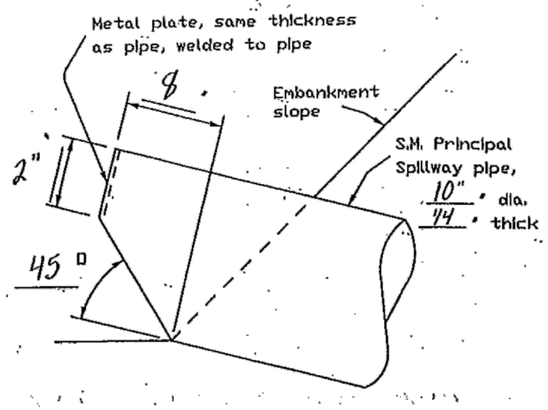
BENDING DIAGRAM FOR
(a) RODS



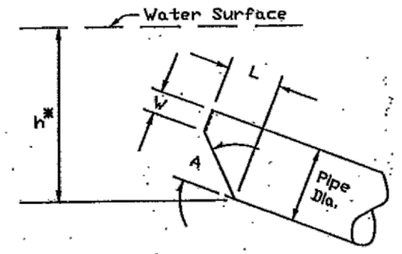
ELEVATION

Pipe Diam. In.	Pipe Grade %	W In.	L In.	h Deg.	h Ft.
6	0-5	1 1/8	3 1/4	56	0.9
	5.1-15	1 1/4	4 3/4	45	0.9
	15.1-25	1 5/8	6 5/8	33	0.9
	25.1-32	2 1/8	7 3/4	27	0.9
8	0-5	1 1/2	4 3/8	56	1.2
	5.1-15	1 5/8	6 3/8	45	1.2
	15.1-25	2 1/8	8 3/4	33	1.2
	25.1-32	2 3/4	10 3/8	27	1.2
10	0-5	1 7/8	5 3/8	56	1.5
	5.1-15	2	8	45	1.5
	15.1-25	2 5/8	11	33	1.5
	25.1-32	3 1/2	13	27	1.5
12	0-5	2 1/4	6 1/2	56	1.8
	5.1-15	2 3/8	9 5/8	45	1.8
	15.1-25	3 1/4	13 1/4	33	1.8
	25.1-32	4 1/4	15 5/8	27	1.8
15	0-5	2 7/8	8 1/8	56	2.3
	5.1-15	3	12	45	2.3
	15.1-25	4	16 1/2	33	2.3
	25.1-32	5 1/4	19 1/2	27	2.3
18	0-5	3 3/8	9 3/4	56	2.7
	5.1-15	3 5/8	14 3/8	45	2.7
	15.1-25	4 7/8	19 3/4	33	2.7
	25.1-32	6 1/4	23 3/8	27	2.7
24	0-5	4 1/2	13	56	3.6
	5.1-15	4 3/4	19 1/4	45	3.6
	15.1-25	6 1/2	26 3/8	33	3.6
	25.1-32	8 3/8	31 1/4	27	3.6



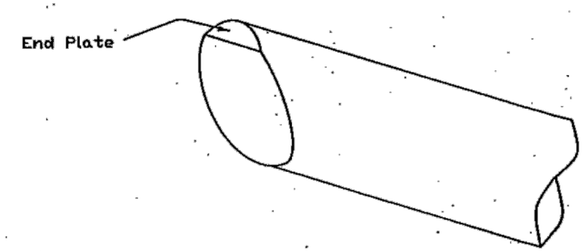


DETAIL OF CANOPY INLET



* Minimum height for full pipe flow.

CANOPY INLET DIMENSIONS



PARTIAL ISOMETRIC VIEW

TABLE OF DIMENSION AND QUANTITIES

PIPE O.D. IN.	APPROX. WEIGHT LBS	(a) ROD SIZE IN.	H IN.	R IN.	X IN.	D IN.	TOTAL LENGTH IN.	NUMBER REQ'D	N IN.	(b) ROD SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D	(c) ROD SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D	(d) BAR SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D
6	18.9	3/8	9	4	6	9 1/2	33	14	4	3/8	8 1/4	51 7/8	3	---	---	---	0	2 X 1/4	3 3/8	26 1/4	1
8	22.9	3/8	11	4 1/2	6	10 1/2	39	10	6 1/4	3/8	9 1/4	58 1/8	3	---	---	---	0	2 X 1/4	4 3/8	32 1/2	1
10	24.7	3/8	13	5 1/2	6	11 1/2	42	10	7	3/8	10 1/4	64 3/8	3	---	---	---	0	2 X 1/4	5 3/8	38 3/4	1
12	27.1	3/8	15	5 1/2	6	12 1/2	45	10	7 1/2	3/8	11 1/4	70 5/8	3	---	---	---	0	2 X 1/4	6 3/8	45	1
14	48.4	1/2	17	6	6	14	48	10	8 1/8	1/2	12	75 3/8	3	1/2	5	31 3/8	1	2 X 1/4	7 1/2	52 1/8	1
16	52.4	1/2	19	6 1/2	6	15	51	10	8 3/4	1/2	13	81 5/8	3	1/2	6	37 5/8	1	2 X 1/4	8 1/2	58 3/8	1
18	69.5	1/2	22	8 1/2	9	19 1/2	60	12	9 1/2	1/2	17	106 3/4	3	1/2	7	44	1	2 X 1/4	9 1/2	64 5/8	1
20	112.4	5/8	25	9	9	20 1/2	66	12	10	5/8	17 3/4	111 1/2	3	5/8	8	50 1/4	1	2 X 1/4	10 5/8	71 3/4	1
22	118.1	5/8	28	10	9	22	69	12	10 1/2	5/8	18 3/4	117 3/4	3	5/8	8	50 1/4	1	2 X 1/4	11 5/8	78	1
24	124.6	5/8	30	10 1/2	9	23	72	12	11	5/8	19 3/4	124	3	5/8	9 3/8	58 7/8	1	2 X 1/4	12 5/8	84 3/8	1

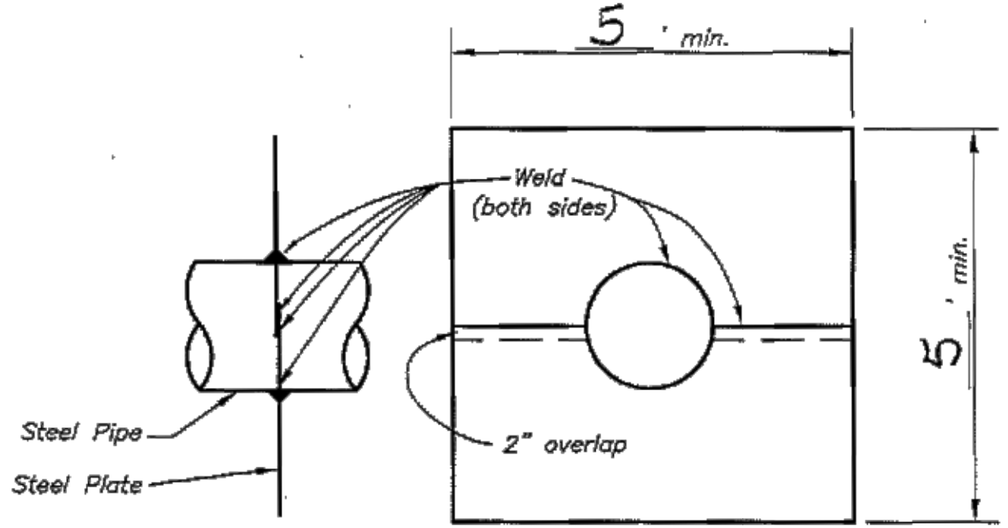
DA #12 - Reid
Grade stabilization - 410
25. Danville T70N-R5W

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

Designed C. Waters 10/8/12
Drawn C. Waters 10/8/12
Traced C. Waters 10/8/12
Checked D Ensminger 4/13

Approved by D Ensminger
Title DE

Sheet No. 7 of 9



STEEL PLATE ANTI-SEEP COLLAR

NOTES:
1. All welds shall be watertight.
2. All steel plates shall have a minimum thickness of 1/4". Smooth Metal

4/04

NOT TO SCALE

Landowner:

STEEL PLATE
ANTI-SEEP COLLAR DETAILS
DA # 12 (Reid)

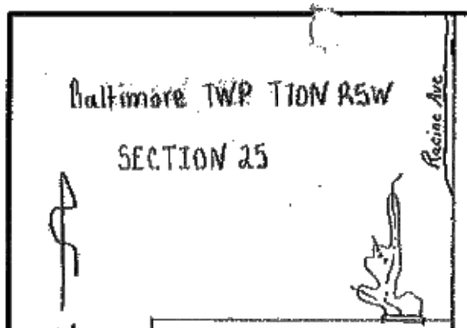
Designed C. Waters 10/8/12
Drawn C. Waters 10/8/12
Checked M. Allen 1/3/13
Approved D. Erdmeyer 4/13

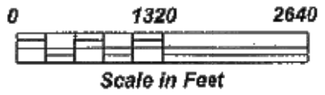
United States Department of Agriculture
NRCS Natural Resources Conservation Service

File Name

Drawing Name
29-L-226

IA-313-A



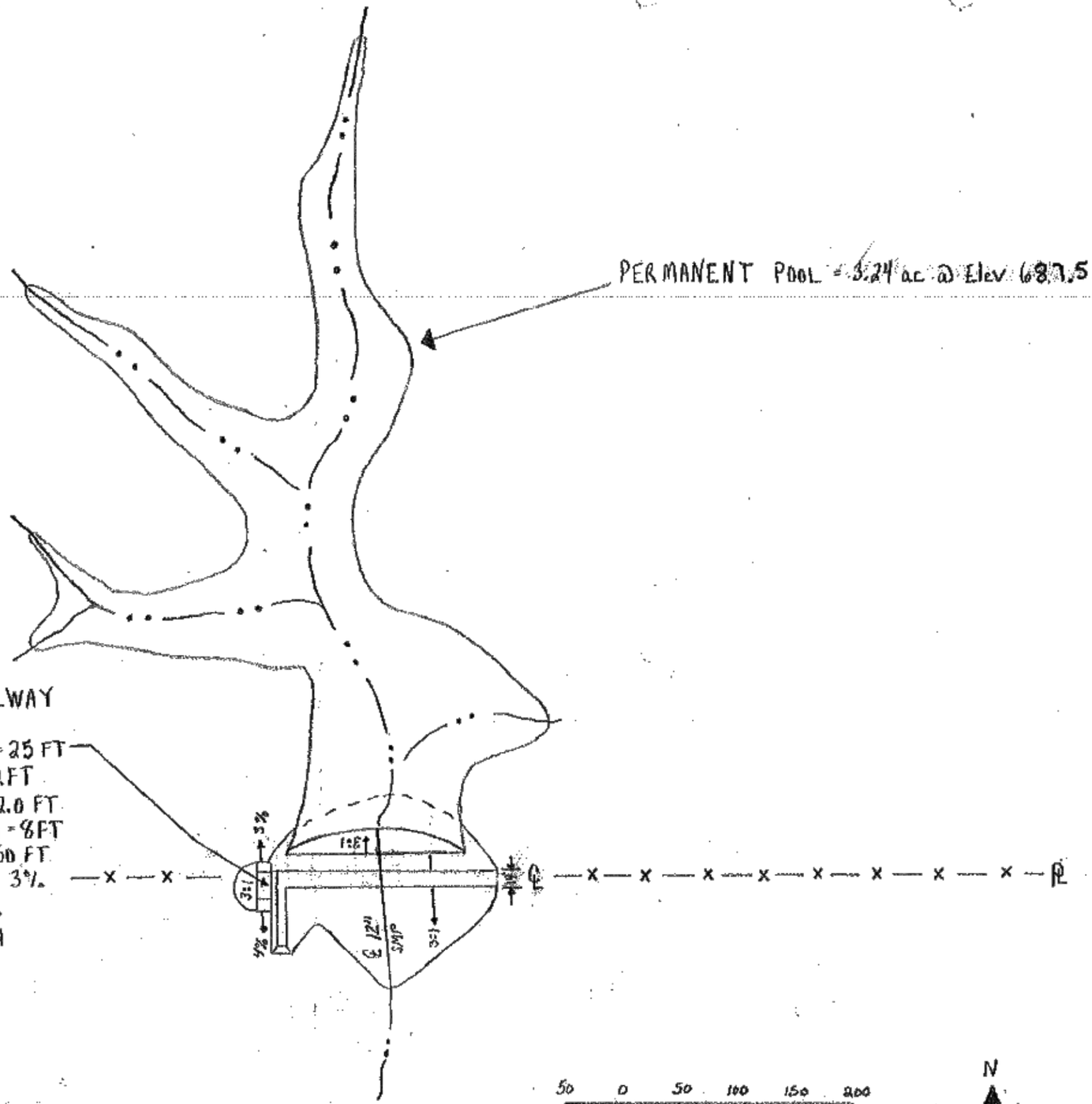


If a cultural resource is identified during construction, stop immediately and notify the Natural Resources Conservation Service Archeologist at 515-284-4370

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

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

All trees and shrubs shall be cleared and grubbed within a minimum distance of 30' from earthfill and spillway. New plantings shall not be made within these limitations.



ENGINEERING JOB CLASS IV

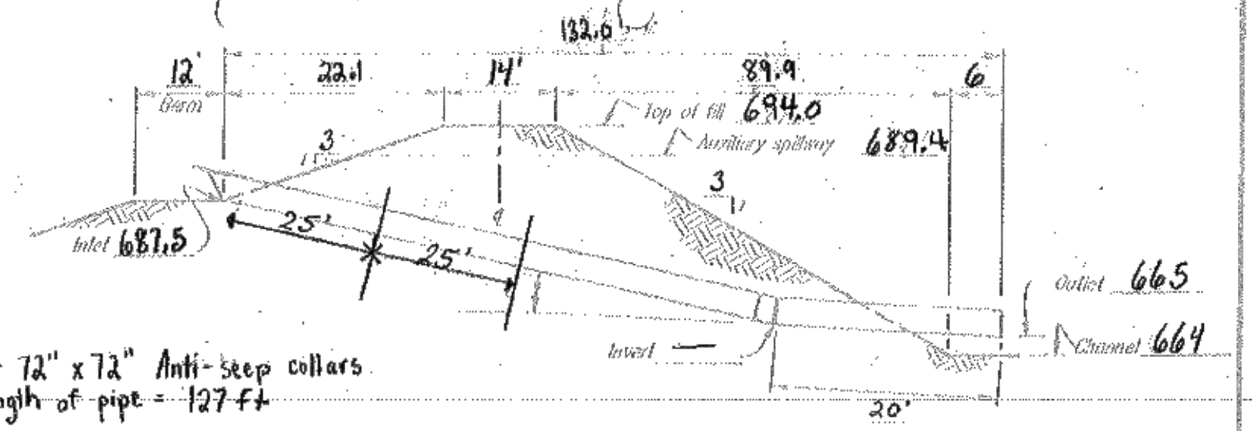
PLAN VIEW

	Date
Approved	
Title	
Designed	C. Waters 9/19/12
Drawn	C. Waters 9/19/12
Traced	C. Waters 9/19/12
Checked	[illegible] 9/19/12

U.S. DEPARTMENT OF AGRICULTURE – NATURAL RESOURCES CONSERVATION SERVICE

DA # 9 - Reid
Grade Stabilization - 410
Baltimore TWP Section 25
T70N - R5W Henry Co. Iowa

CAD FILE NAME



SECTION ON CENTERLINE

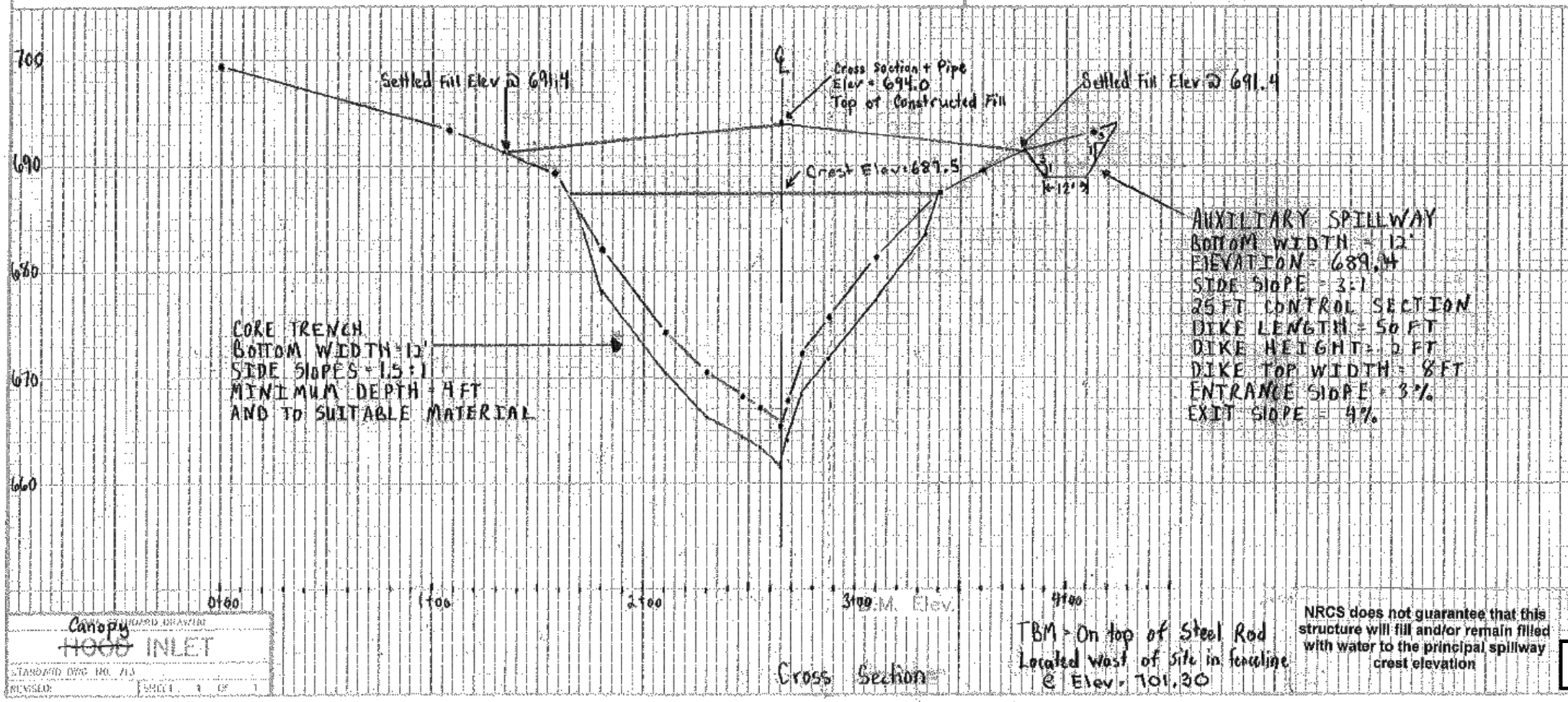
Not to Scale

BILL OF MATERIALS

134 ft. of 12" " dia 1/4" smooth ~~gage~~ metal pipe with ~~hood~~ canopy inlet.
Pipe and appurtenances to be welded and water tight at seams.

2 ea. antiseep collars 72" x 72", 1/4" ga. 2 piece.
Pipe connectors smooth metal

9,751 cu. yd. earth fill
Earthwork includes mainfill, dike, core trench, wave berm (eye brow), and stripping



Canopy ~~HOOD~~ INLET

STANDARD DWG. NO. 713

REVISED: SHEET 1 OF 1

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

Designed C. Waters 9/19/12
Drawn C. Waters 9/19/12
Traced C. Waters 9/19/12
Checked M. Allen 3/13

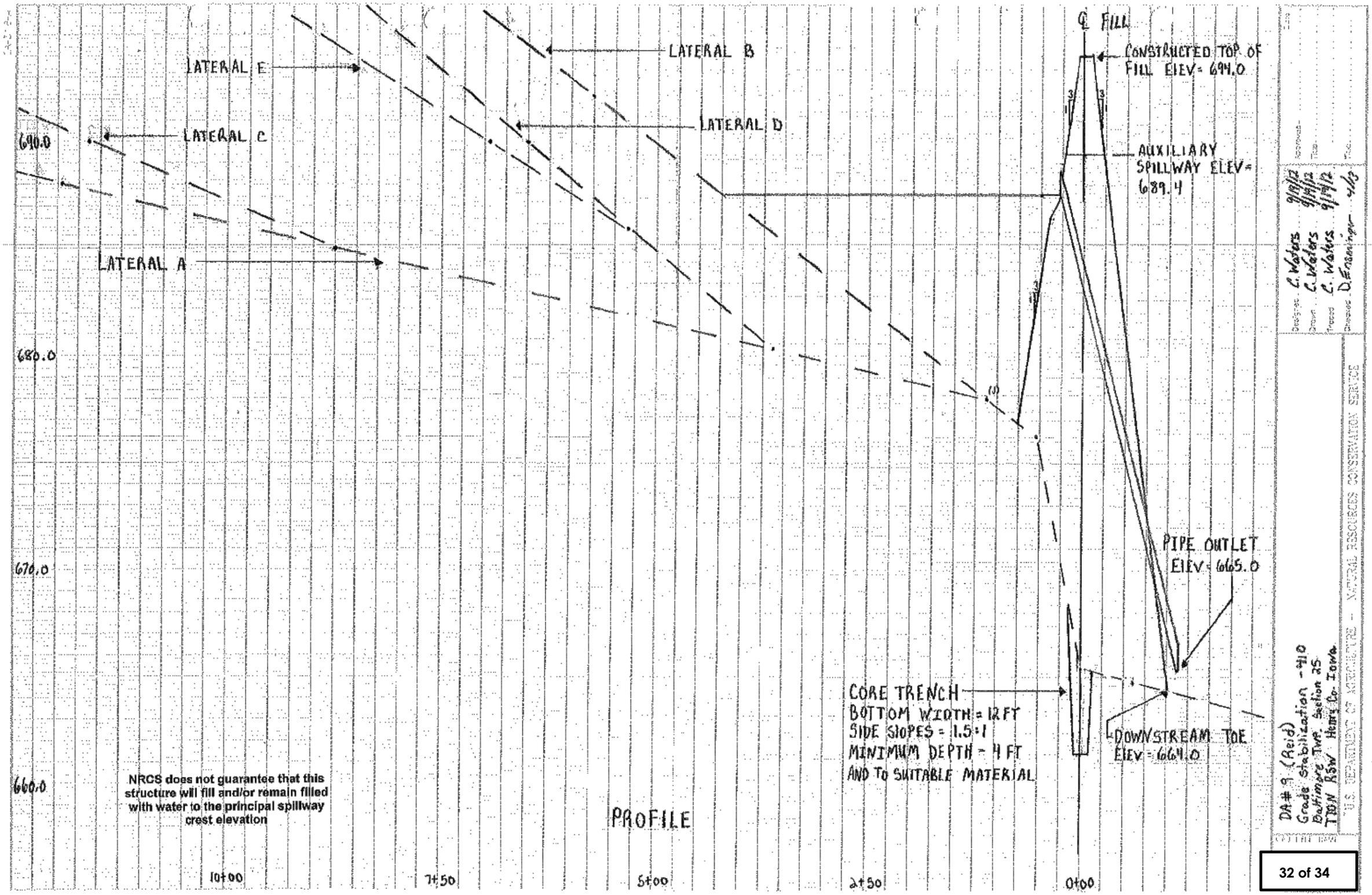
Approved
Title
Title

Sec. 25 T 70N R 5W
County Iowa
Henry

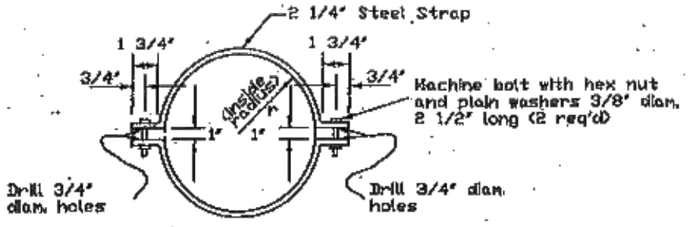
Canopy ~~HOOD~~ INLET

Cooperator DA#9 - Reid

U.S. DEPARTMENT OF AGRICULTURE - NATURAL RESOURCES CONSERVATION SERVICE



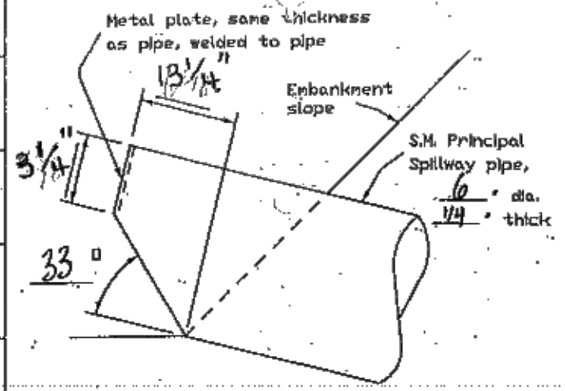
LATERAL A
LATERAL B
LATERAL C
LATERAL D
LATERAL E
℄ FILL
CONSTRUCTED TOP OF FILL ELEV= 694.0
AUXILIARY SPILLWAY ELEV= 689.4
PIPE OUTLET ELEV= 665.0
CORE TRENCH
BOTTOM WIDTH = 12 FT
SIDE SLOPES = 1.5:1
MINIMUM DEPTH - 4 FT
AND TO SUITABLE MATERIAL
DOWNSTREAM TOE ELEV = 664.0
690.0
680.0
670.0
660.0
10+00
7+50
5+00
2+50
0+00
PROFILE
NRCS does not guarantee that this structure will fill and/or remain filled with water to the principal spillway crest elevation
DA # 9 (Reid)
Grade Stabilization - 410
Baltimore Twp. Section 25
T10N R5W Henry Co. Iowa
U.S. DEPARTMENT OF AGRICULTURE - NATURAL RESOURCES CONSERVATION SERVICE
Designed C. Waters 9/19/12
Drawn C. Waters 9/19/12
Traced C. Waters 9/19/12
Checked D. Ensminger 4/13



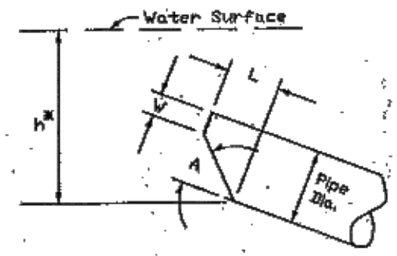
BENDING DIAGRAM FOR ⓑ AND ⓒ RODS

BENDING DIAGRAM FOR ⓓ BARS

Pipe Diam. In.	Pipe Grade %	W In.	L In.	θ Deg.	h Ft.
6	0-5	1 1/8	3 1/4	56	0.9
	5.1-15	1 1/4	4 3/4	45	0.9
	15.1-25	1 5/8	6 5/8	33	0.9
	25.1-32	2 1/8	7 3/4	27	0.9
8	0-5	1 1/2	4 3/8	56	1.2
	5.1-15	1 5/8	6 3/8	45	1.2
	15.1-25	2 1/8	8 3/4	33	1.2
	25.1-32	2 3/4	10 3/8	27	1.2
10	0-5	1 7/8	5 3/8	56	1.5
	5.1-15	2	8	45	1.5
	15.1-25	2 5/8	11	33	1.5
	25.1-32	3 1/2	13	27	1.5
12	0-5	2 1/4	6 1/2	56	1.8
	5.1-15	2 3/8	9 5/8	45	1.8
	15.1-25	3 1/4	13 1/4	33	1.8
	25.1-32	4 1/4	15 5/8	27	1.8
15	0-5	2 7/8	8 1/8	56	2.3
	5.1-15	3	12	45	2.3
	15.1-25	4	16 1/2	33	2.3
	25.1-32	5 1/4	19 1/2	27	2.3
18	0-5	3 3/8	9 3/4	56	2.7
	5.1-15	3 5/8	14 3/8	45	2.7
	15.1-25	4 7/8	19 3/4	33	2.7
	25.1-32	6 1/4	23 3/8	27	2.7
24	0-5	4 1/2	13	56	3.6
	5.1-15	4 3/4	19 1/4	45	3.6
	15.1-25	6 1/8	26 3/8	33	3.6
	25.1-32	8 3/8	31 1/4	27	3.6

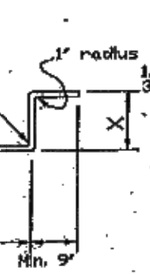


DETAIL OF CANOPY INLET

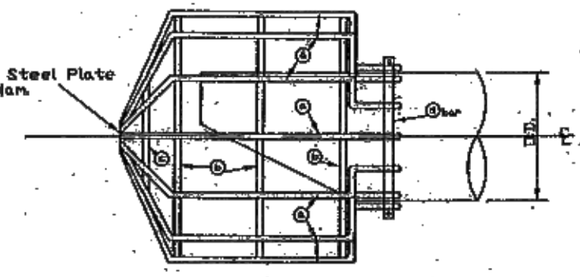


* Minimum height for full pipe flow.

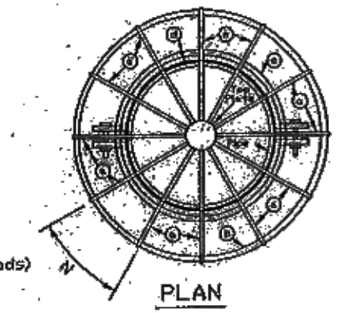
CANOPY INLET DIMENSIONS



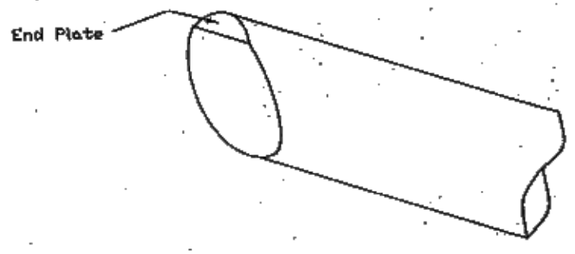
BENDING DIAGRAM FOR ⓐ RODS



ELEVATION



PLAN



PARTIAL ISOMETRIC VIEW

TABLE OF DIMENSION AND QUANTITIES

PIPE O.D. IN.	APPROX. WEIGHT LBS	ⓐ ROD SIZE IN.	H IN.	R IN.	X IN.	D IN.	TOTAL LENGTH IN.	NUMBER REQ'D	N IN.	ⓑ ROD SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D	ⓒ ROD SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D	ⓓ BAR SIZE IN.	r IN.	LENGTH IN.	NUMBER REQ'D
6	18.9	3/8	9	4	6	9 1/2	33	14	4	3/8	8 1/2	51 1/4	3	---	---	---	0	2 X 1/4	3 3/4	26 1/2	1
8	22.8	3/8	11	4 1/2	6	10 1/2	39	10	6 1/4	3/8	9 1/4	66 1/4	3	---	---	---	0	2 X 1/4	4 3/4	32 1/2	1
10	24.7	3/8	13	5 1/2	6	11 1/2	42	10	7	3/8	10 1/4	64 3/4	3	---	---	---	0	2 X 1/4	5 3/4	38 3/4	1
12	27.1	3/8	15	5 1/2	6	12 1/2	45	10	7 1/2	3/8	11 1/4	70 3/4	3	---	---	---	0	2 X 1/4	6 3/4	45	1
14	48.3	1/2	17	6	6	14	48	10	8 1/2	1/2	12	75 3/4	3	1/2	5	31 3/4	1	2 X 1/4	7 1/2	52 1/2	1
16	52.4	1/2	19	6 1/2	6	15	51	10	8 3/4	1/2	13	81 3/4	3	1/2	6	37 3/4	1	2 X 1/4	8 1/2	58 3/4	1
18	69.5	1/2	22	8 1/2	9	19 1/2	60	12	9 1/2	1/2	17	106 3/4	3	1/2	7	44	1	2 X 1/4	9 1/2	64 3/4	1
20	112.4	5/8	25	9	9	20 1/2	66	12	10	5/8	17 3/4	111 1/2	3	5/8	8	50 1/4	1	2 X 1/4	10 3/4	71 3/4	1
22	118.1	5/8	28	10	9	22	69	12	10 1/2	5/8	18 3/4	117 3/4	3	5/8	8	50 1/4	1	2 X 1/4	11 3/4	78	1
24	124.6	5/8	30	10 1/2	9	23	72	12	11	5/8	19 3/4	124	3	5/8	9 3/4	58 7/8	1	2 X 1/4	12 3/4	84 3/4	1

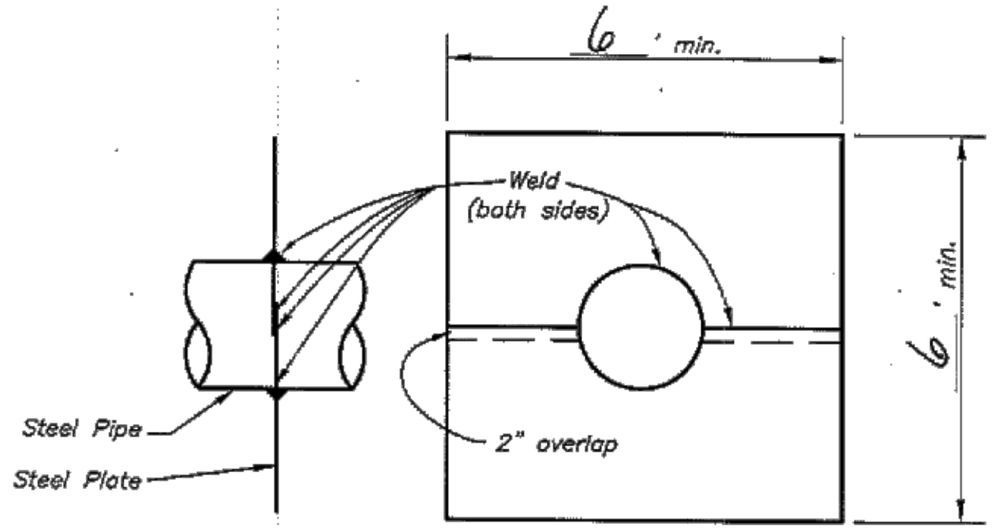
DA#9 - Reid
35 Danville T7ON R5W

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

Designed C.Waters 9/9/12
Drawn C.Waters 9/9/12
Traced C.Waters 9/9/12
Checked DBensinger 9/13

Approved by
Title
Date
Sheet No. 5 of 5

29L226



STEEL PLATE ANTI-SEEP COLLAR

NOTES:
1. All welds shall be watertight.
2. All steel plates shall have a minimum thickness of 1/4 ". Smooth Metal

4/04

NOT TO SCALE

Landowner:

STEEL PLATE
ANTI-SEEP COLLAR DETAILS
DA #9 (Reid)

		Date
Designed	L. Waters	3/13
Drawn	L. Waters	3/13
Checked	M. Allen	3/13
Approved	Engineer	4/13

United States Department of Agriculture
Natural Resources Conservation Service
NRCS

File Name
DA34609I912

Drawing Name
29-L-226