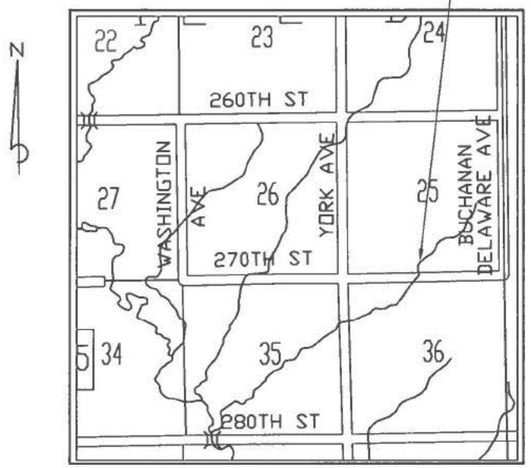
Buchanan COUNTY, IOWA — PROJECT LOCATION

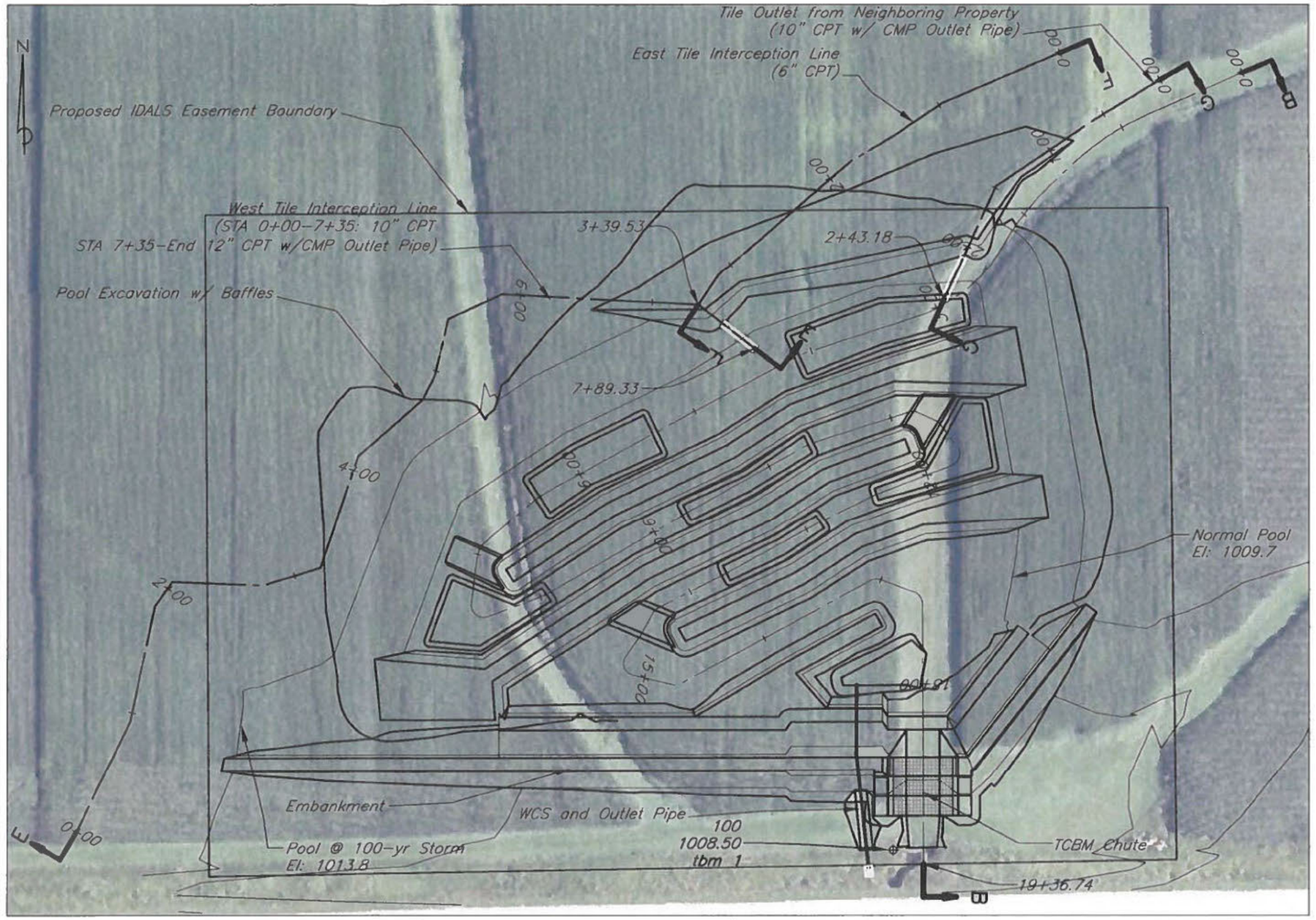


5000 0 5000

Scale in Feet

CONSTRUCTION PRACTICE

SITE MAP



100 0 100 200 300

Scale in Feet

ITEMS OF WORK		
Work or Material	Unit	Quantity
Mobilization	Job	1
Stripping	Cu Yd	821
Excavation (Core Trench)	Cu Yd	2240
Excavation (Pool Area)	Cu Yd	13051
Earthfill	Cu Yd	7611
Iowa DOT Erosion Stone	Ton	30.5
Tile Removal	Ft	2169
6" CPT	Ft	340
10" CPT	Ft	926.6
12" CPT	Ft	5.5
10" CMP	Ft	20
12" CMP	Ft	20
16" PVC DR-25 AWWA C900 Pipe	Ft	139
18" Inline Water Control Structure (10' Height)	No	1
Tied Concrete Block Mat	Sq Ft	2500
Synthetic Underlayment	Sq Ft	800
Rebar Anchors	No	112
Critical Area Seeding	Ac	1.1

BENCH MARK		
NO.	ELEV.	DESCRIPTION
100	1008.50	Wood hub on North side of 270th St. approximately 12 ft West of concrete drop structure in road ditch

TABLE OF CONTENTS	
Sheet 1	COVER SHEET
Sheet 2	POOL AND EMBANKMENT PLAN
Sheet 3	CHUTE AND DRAWDOWN PLAN
Sheet 4	PROFILES (1)
Sheet 5	PROFILES (2)
Sheet 6	PROFILES (3)
Sheet 7	IA-1530
Sheet 8	TCBM CHUTE DETAILS
Sheet 9	TILE PLAN
Sheet 10	IA-1502 (PG. 1)
Sheet11	IA-1502 (PG. 2)
Sheet 12	IA-1314

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

If a cultural resource is identified during construction, stop immediately and notify the local Natural Resources Conservation Service office.

Contractor is required to follow Iowa One Call law. IowaOneCall.com or Call 811
Ticket # _____

I have reviewed and agree with the content of the plans and specifications prepared by the NRCS.

Landowner: _____ *Date:* _____

I certify that this practice has been constructed in accordance with the plans and specifications.

Contractor: _____ *Date:* _____

NRCS Rep.: _____ *Date:* _____

Date 6/25 6/25 8/26
Designed NAK
Drawn NAK
Checked
Approved: Approved 8/26/2026

COVER SHEET CONSTRUCTED WETLAND

[redacted]

Buchanan County, IA

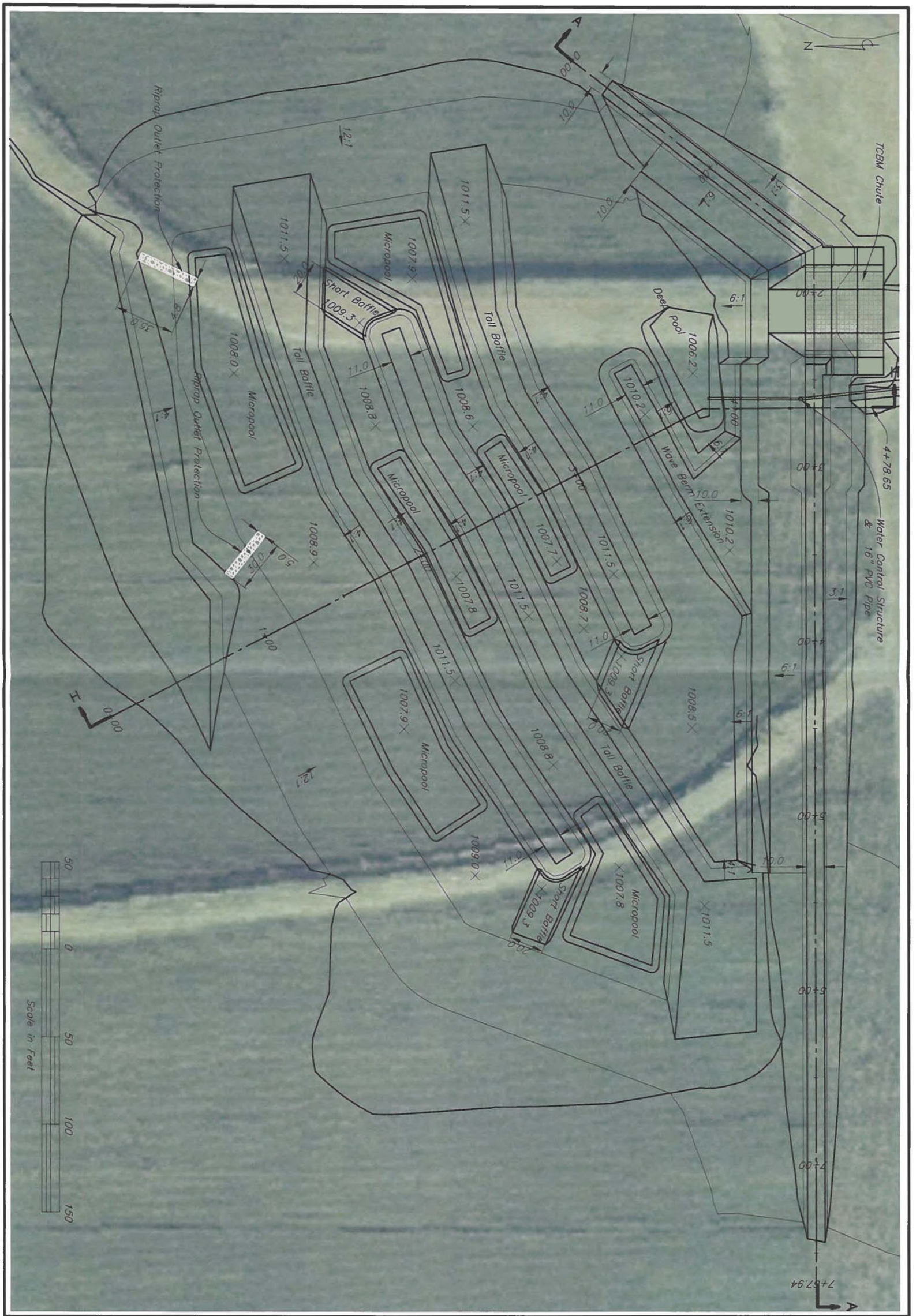
EJC IV, SW ¼, Sec. 25, T88N, R7W

United States Department of Agriculture
USDA Natural Resources Conservation Service

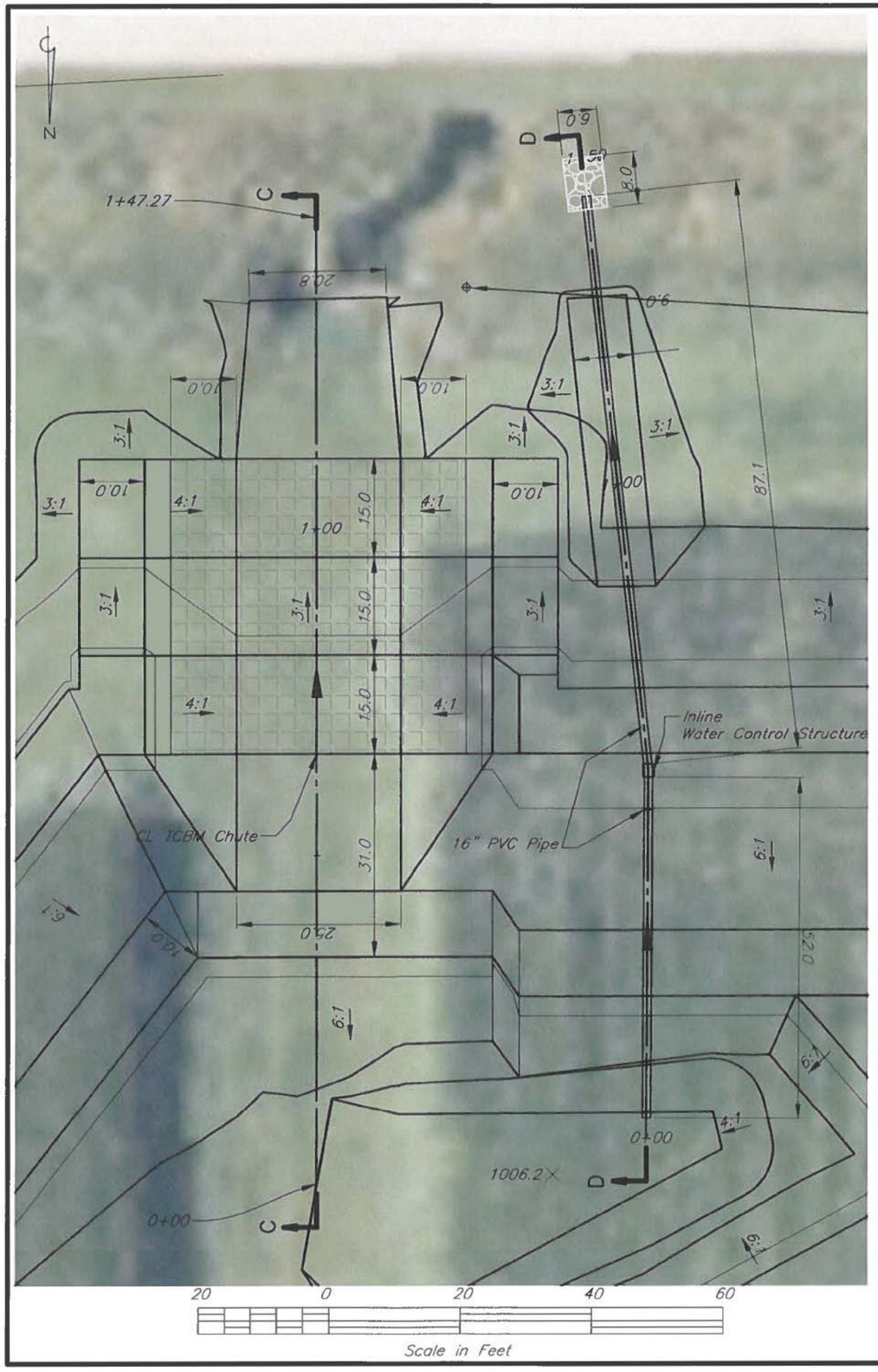
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Drawing No.

8/18/26 3:16 PM
Sheet 1 of 12



Drawing No.	USDA United States Department of Agriculture Natural Resources Conservation Service	SITE PLAN W/ TILE CONSTRUCTED WETLAND	Designed NAK 6/25 Drawn NAK 6/25 Checked [illegible] 8/26 Approved
8/13/26 12:56 PM Sheet 2 of 12	EJC IV	[redacted] Buchanan County, IA	



Construction Notes:

1. *Earthfill volumes were computed to the neat lines and grades shown in the plans. Any difference in as-built yardage will be considered incidental to construction and is the responsibility of the contractor.*
2. *Earthfill material shall be placed and compacted in accordance with the IA-23 Earthfill Construction specification. Method 1 compaction is allowed.*
3. *Material from the pool area is anticipated to be used as the fill material used to construct the embankment. NRCS must inspect and approve borrow material before it is placed. If suitable material connot be found in the pool area then an alternate fill source will need to be found and approved of by NRCS.*
4. *Spoil from excavations shall be placed within the designated spoil area as staked in the field. No compaction is required for any spoil material.*
5. *Tile shall be broken as shown on Sheets 9 and 12.*
6. *Profiles E-E and F-F show planned tile interception lines. Installed locations may need to be altered during to maintain adequate depths and slopes. these changes must be documented and approved by NRCS Staff.*
7. *E-E is anticipated to intercept eleven tile lines before the connection to F-F.*
8. *F-F is anticipated to intercept nine tile lines before the connection to E-E.*
9. *All tile must maintain a minimum depth of cover of at least 2.4 ft.*
10. *Tile lines shall be outletted as shown on Sheet 11.*
11. *Riprap shall conform to Iowa DOT Erosion Stone Specification.*
12. *NRCS Staff MUST be on site for installation of TCBM Chute, and Pipe with WCS.*
13. *NRCS Staff MUST inspect core trench prior to backfilling to ensure and document adequate depth and materials.*
14. *The embankment area (including the chute and pipe cover will be considered "Critical Area Seeding"*

	Date
Designed NAK	6/25
Drawn NAK	6/25
Checked [illegible]	8/26
Approved	

SITE PLAN W/ TILE CONSTRUCTED WETLAND

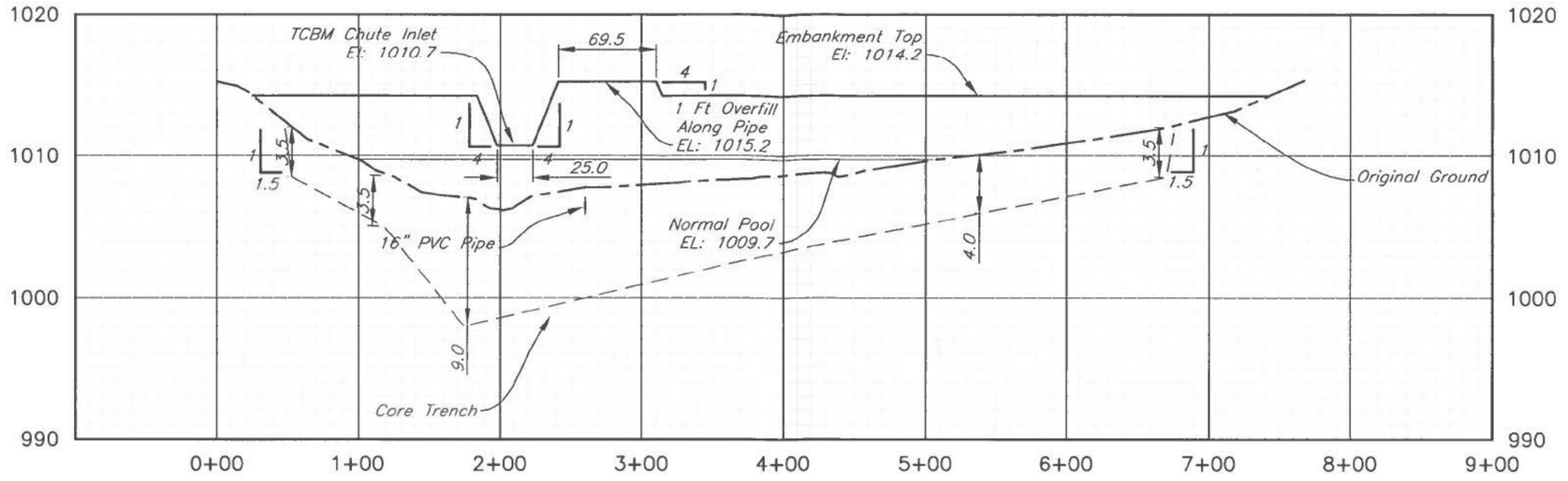
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United States Department of Agriculture
Natural Resources Conservation Service

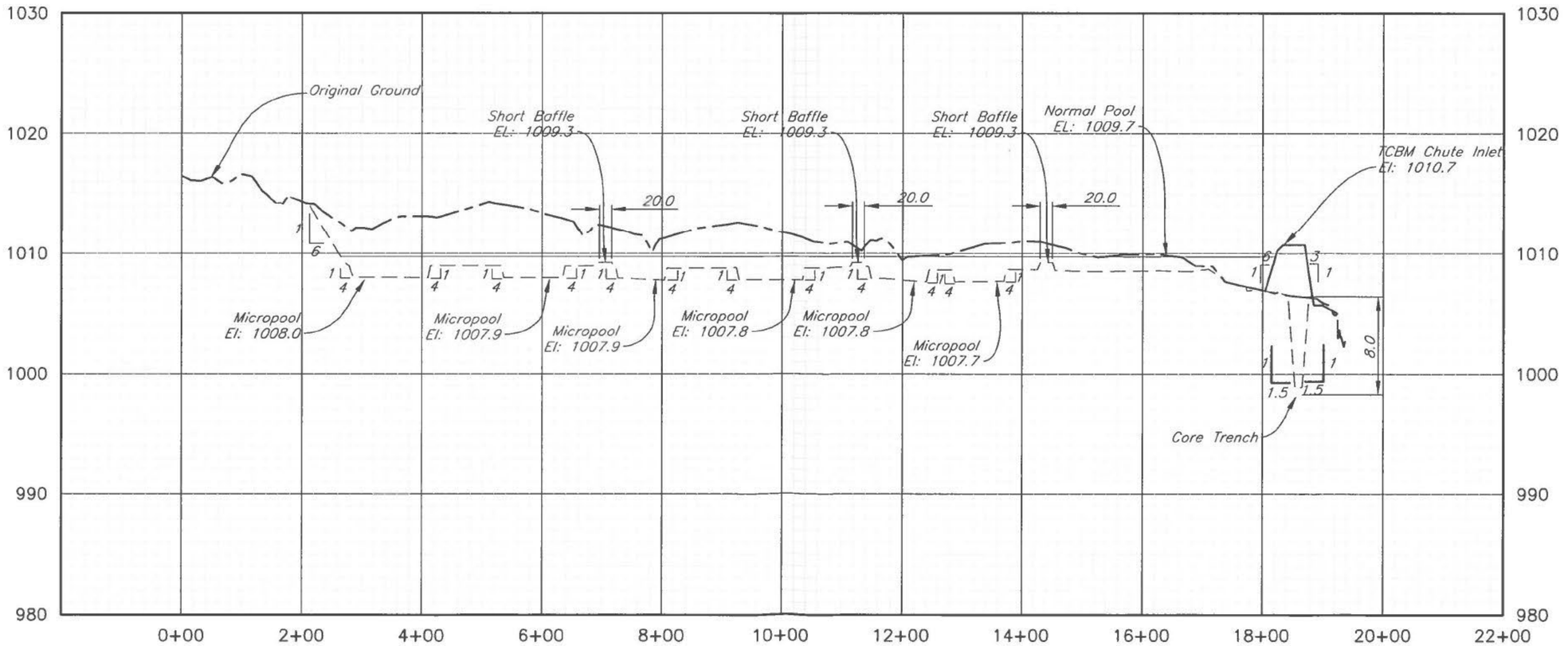
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Drawing No.

8/13/26 12:56 PM
Sheet 3 of 12



A–A PROFILE



B–B PROFILE

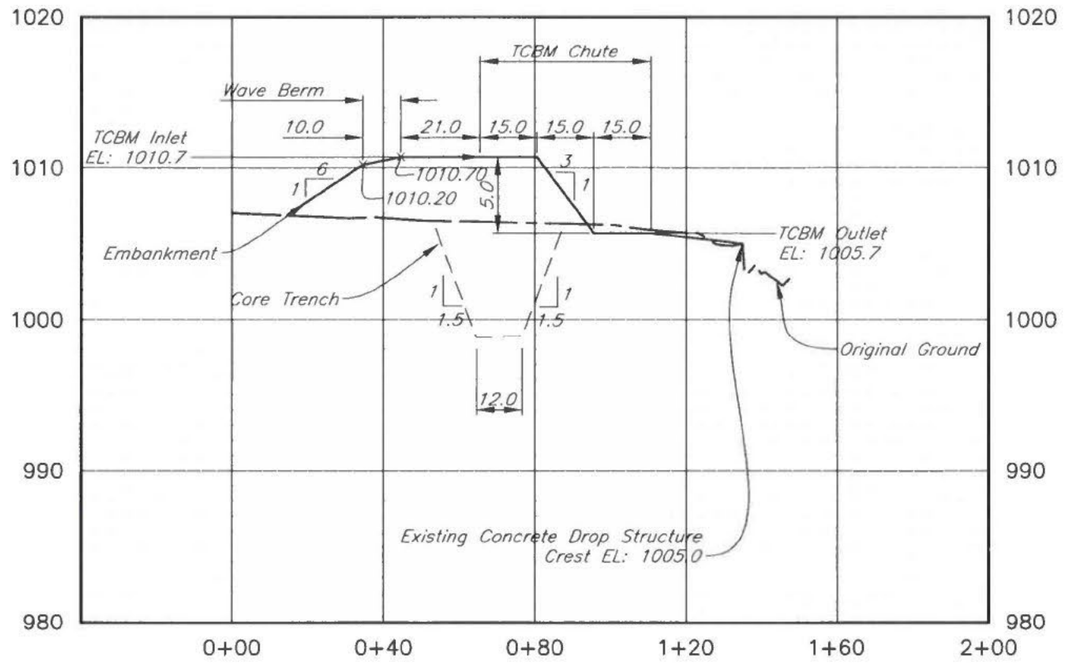
Date 6/25
Designed NAK 6/25
Drawn NAK
Checked
Approved

PROFILES (1)
CONSTRUCTED WETLAND

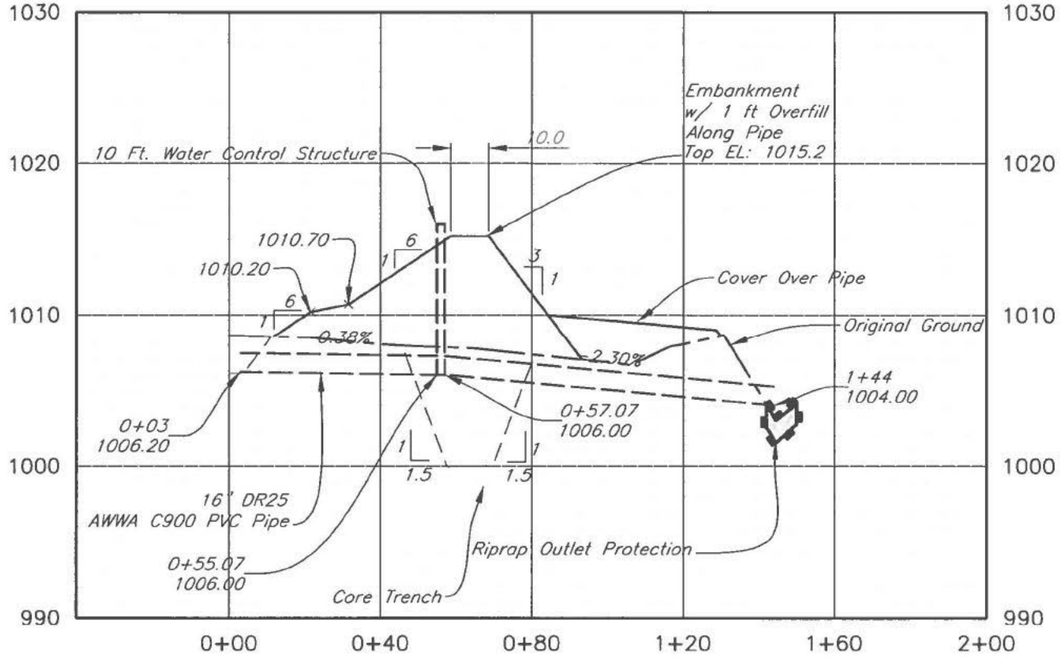
United States Department of Agriculture
Natural Resources Conservation Service

Drawing No.

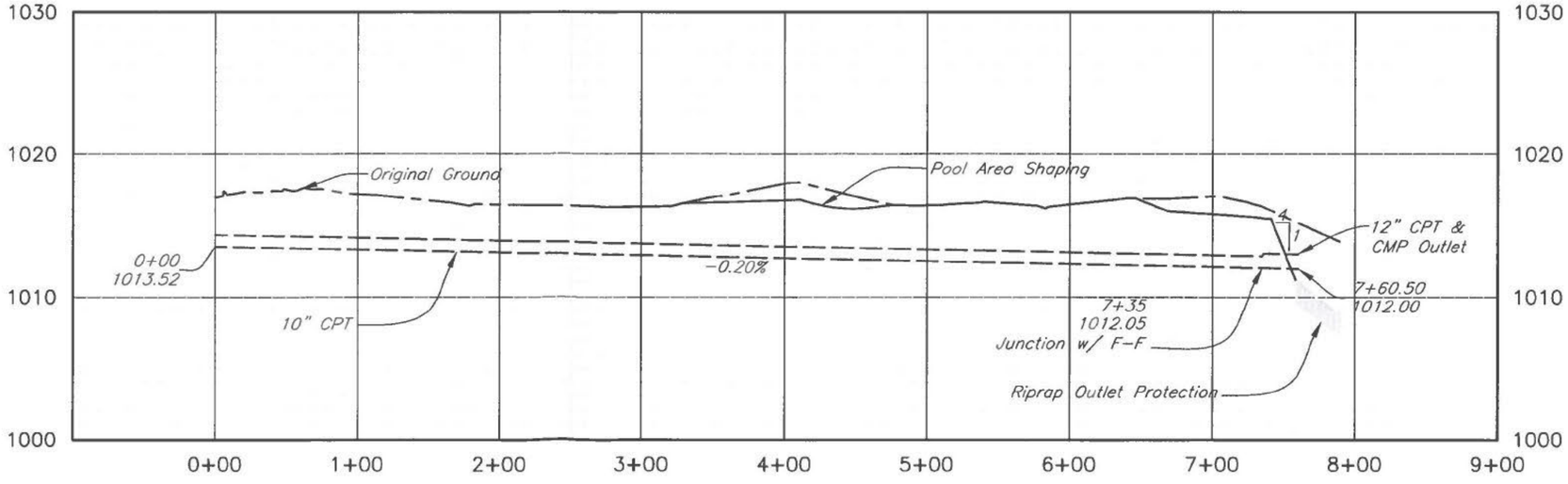
8/13/26 12:56 PM
Sheet 4 of 12



C–C PROFILE



D–D PROFILE



E–E PROFILE

Date 6/25 6/25 8/26
Designed NAK
Drawn NAK
Checked
Approved

PROFILES (2)
CONSTRUCTED WETLAND

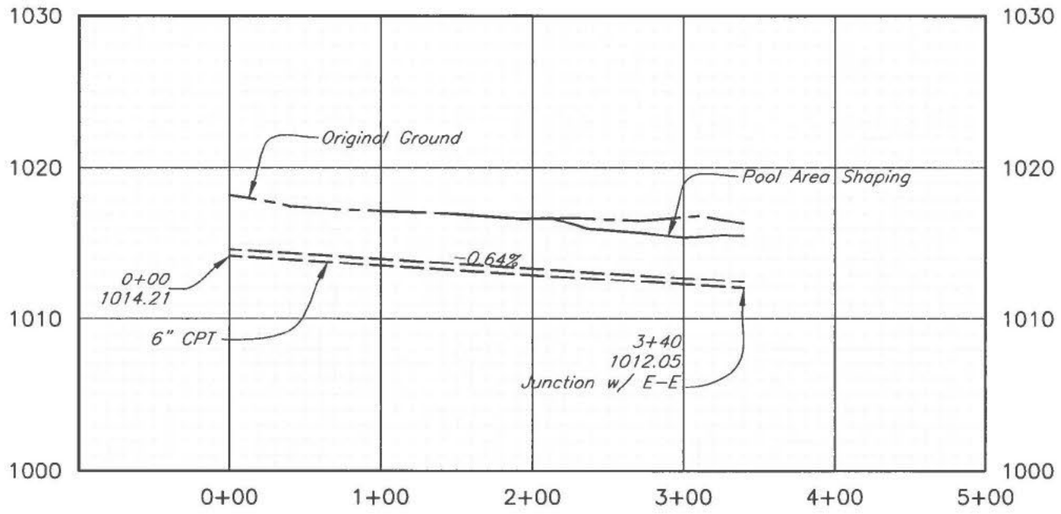
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United States Department of Agriculture
Natural Resources Conservation Service

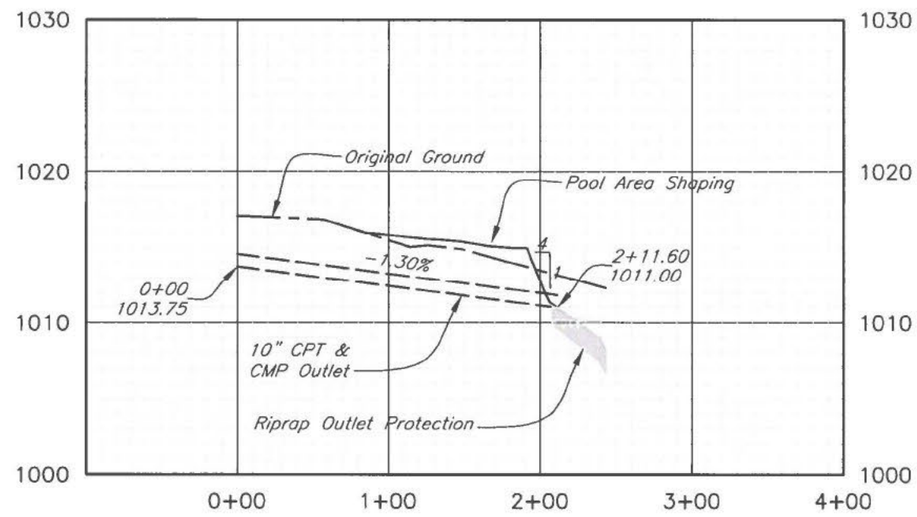
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Drawing No.

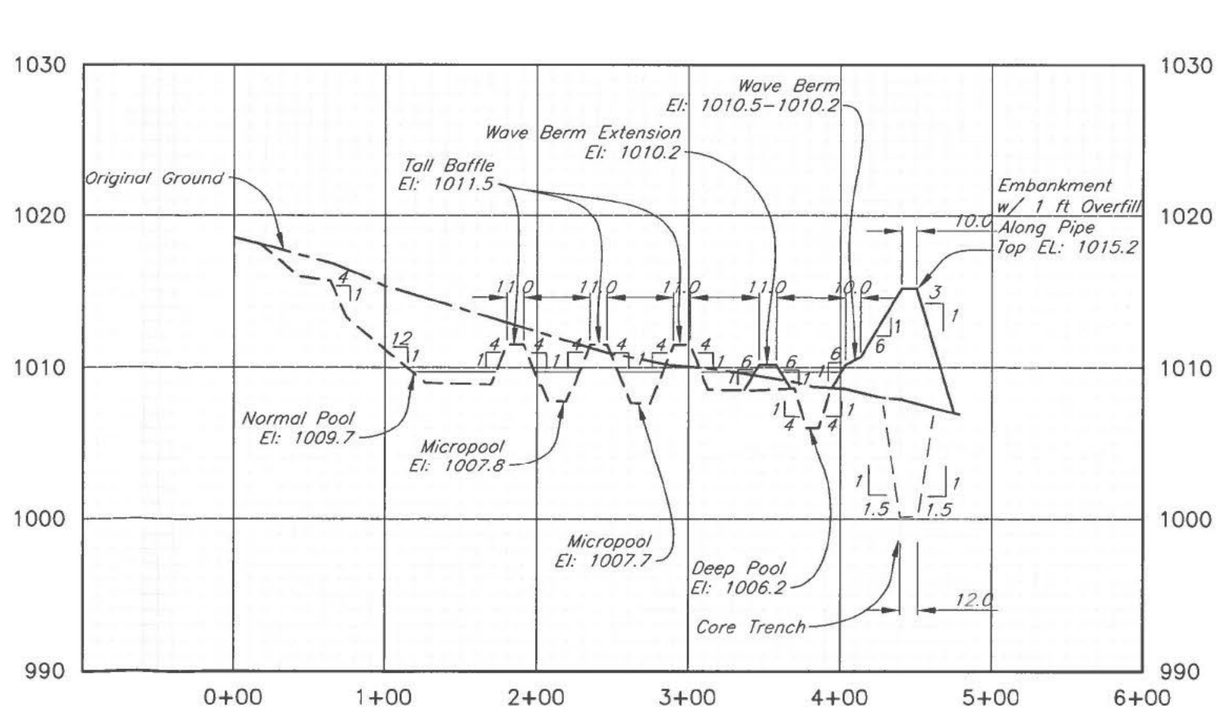
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Sheet 5 of 12



F–F PROFILE



G–G PROFILE



H–H PROFILE

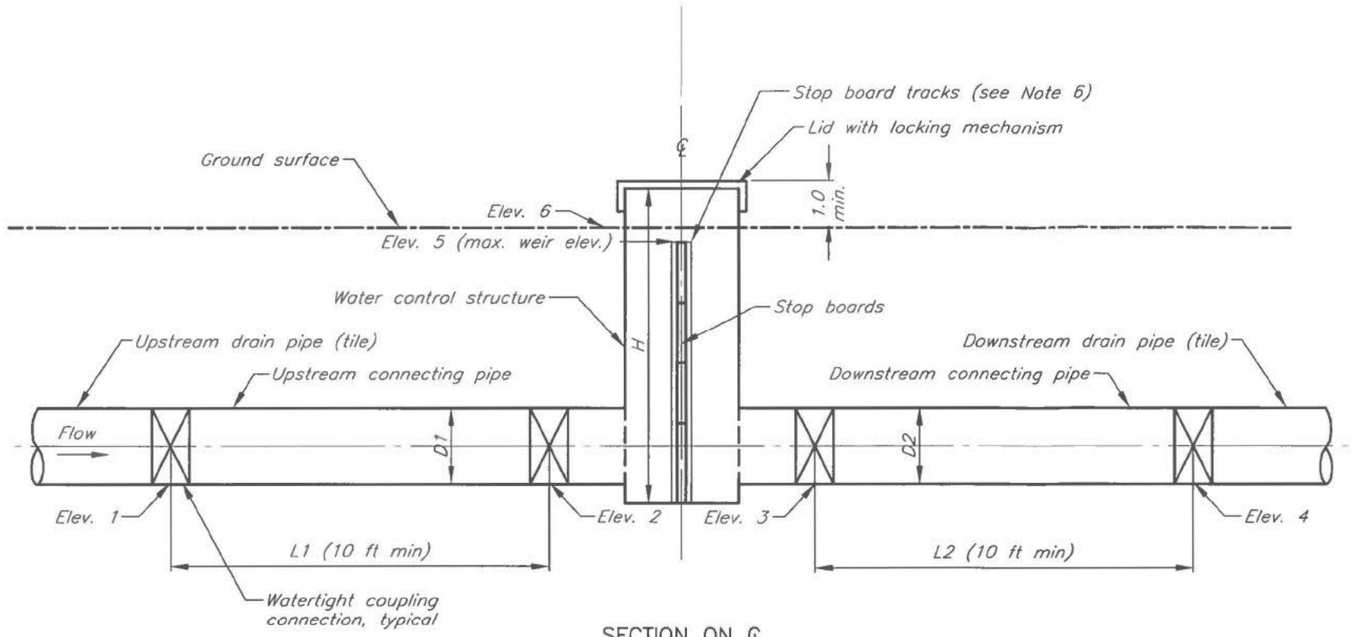
Date 6/25
Designed NAK 6/25
Drawn NAK
Checked
Approved

PROFILES (3)
CONSTRUCTED WETLAND

United States Department of Agriculture
Natural Resources Conservation Service

Drawing No.

8/13/26 12:56 PM
Sheet 6 of 12



SECTION ON ℄

NOTES:

1. Water Control Structure (WCS) materials and installation shall be in conformance with Iowa NRCS Construction Specification (CS) IA–45. Plastic (PVC, PE) Pipe.
2. Connecting pipe materials and installation shall be in conformance with CS IA–45; IA–46, Tile Drains For Land Drainage; IA–51, Corrugated Metal Pipe Conduits; or IA–52, Steel Pipe Conduits.
3. WCS shall be fabricated of PVC with integral upstream and downstream water–tight coupling connections, corrosion–resistant stop boards, aluminum extrusions and stainless steel fasteners and appurtenances. Acceptable models include Agri Drain, Nyloplast, or approved equal.
4. WCS shall provide flow capacity equal to or greater than that of adjacent pipe under expected flow conditions.
5. Stop boards shall provide a water–tight seal under 4 ft of pressure head (min.).
6. In situations where water levels higher than maximum design elevation would impact neighboring properties or other aspects of the site design, consider a custom–order box which limits extent of stop board tracks to the maximum design weir elevation.
7. Stop board removal tool shall be provided.
8. As an alternative to a stop board straight weir structure, a circular inner standpipe may be provided which meets the design flow requirements, with approval of the engineer (Nyloplast Standpipe WCS or equal). Maximum weir elevation shall be set at Elev. 5.
9. All connections shall be water–tight.
10. Structure lid shall be provided with locking mechanism.
11. Backfill around the WCS shall meet the requirements of CS IA–45. Normal stop board operation shall be verified following backfill.
12. Mark location of each structure using post or manufactured marker flag for safety in the field.

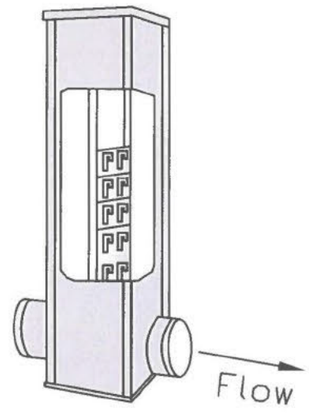
Structure Materials and Dimensions

Water Control Structure				Connecting Pipe (Non–perforated)						U/S Drain Pipe		D/S Drain Pipe	
ID	H (ft)	Width/Dia (in)	Design Flow (cfs)	L1 (ft)	U/S Connecting Pipe Material	D1 (in)	L2 (ft)	D/S Connecting Pipe Material	D2 (in)	Dia. (in)	Material	Dia. (in)	Material
1	10	24	3.4	52	DR–25 AWWA C900	16	87	DR–25 AWWA C900	16	N/A	N/A	N/A	N/A

Elevation Table

WCS ID	Elev. 1	Elev. 2	Elev. 3	Elev. 4	Elev. 5	*	Elev. 6
1	1006.2	1006.0	1006.0	1004.0	1009.7		1015.0

* Check box if stop board tracks must be limited to Elev. 5



WATER CONTROL STRUCTURE
ISOMETRIC VIEW

NOT TO SCALE

STANDARD DWG. IA–1530

DATE Jan. 2017 | PAGE 1 OF 1

Date 4/26
Designed NAK 4/26
Drawn NAK
Checked 6/26
Approved

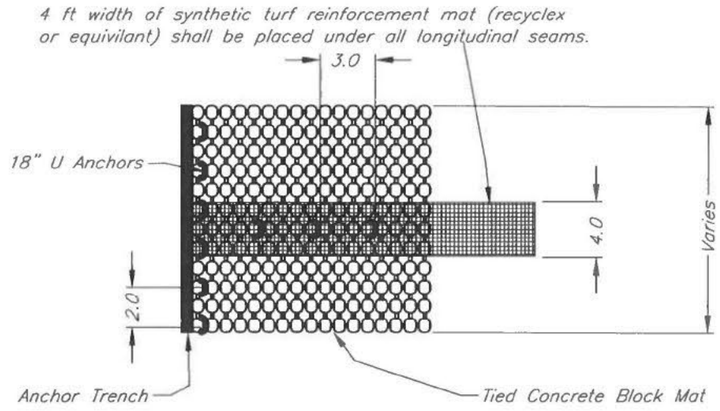
INLINE WATER CONTROL STRUCTURE

United States Department of Agriculture
Natural Resources Conservation Service

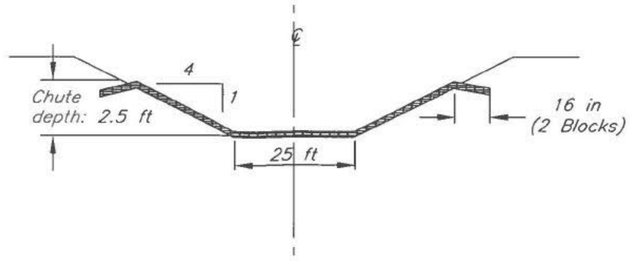
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Drawing No.

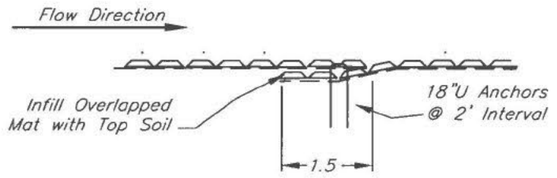
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Sheet 7 of 12



PLAN VIEW (LONGITUDINAL SEAM)



TYPICAL CROSS SECTION



PROFILE VIEW (PERPENDICULAR OVERLAP)

NOTES:

1. The maximum chute slope in the direction of flow shall be 3:1. The maximum side slopes of the chute shall be 2:1.
2. The outlet section shall be flat (0% grade).
3. Apply seed and fertilizer prior to placing Tied Concrete Block Mat (TCBM), and after TCBM is placed.
4. Longitudinal seams shall be anchored every 3 ft.
5. 4 ft width of synthetic turf reinforcement mat (recyclex or equivilant) shall be placed under all longitudinal seams.
6. Anchor leading and downstream edge of TCBM in a minimum 24" deep (sized for tthree rows of blocks) trench. Trench should be backfilled with suitable material and compacted.

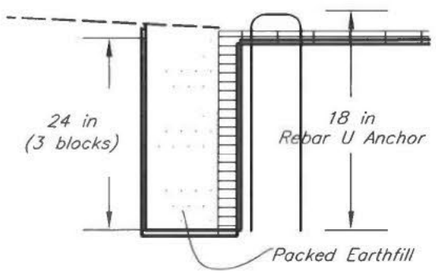
TABLE OF QUANTITIES*		
Item	Quantity	Unit
Tied Concrete Block Mat	2500	sq.ft.
Underlayment	800	sq.ft.
Seeding	0.1	acres
Rebar Anchors	112	No.

*ABOVE QUANTITIES ASSUME 5x 10'x50' TCBM ROLLS ARE USED

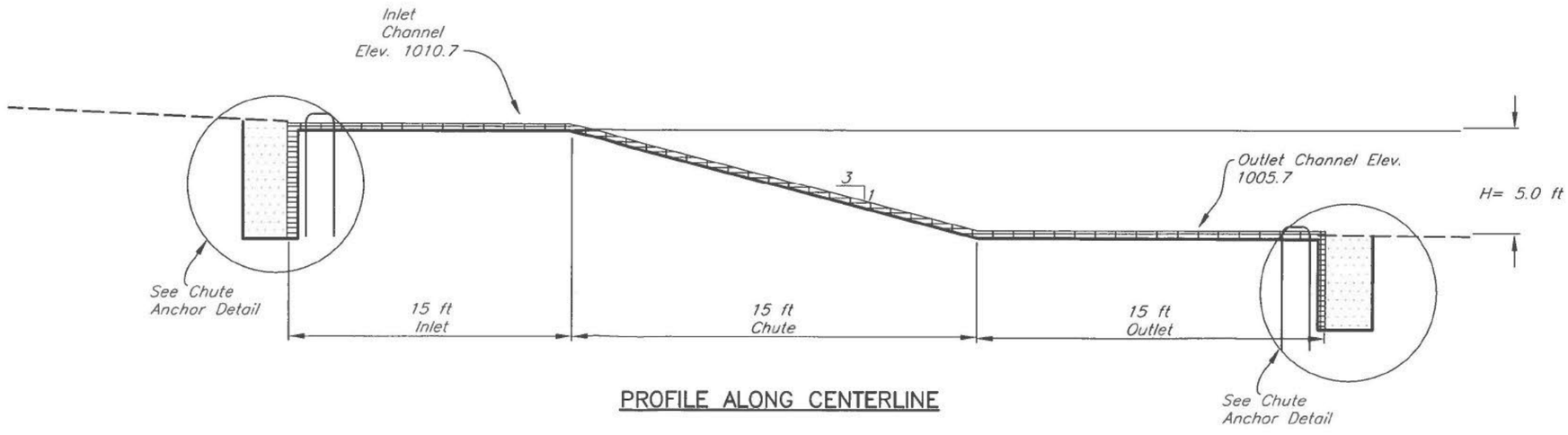
NOTES Cont.:

7. Recess two outside blocks 16" into subgrade along each edge of structure.
8. On perpendicular lap, and at anchor trenches, 18" U anchors are installed in 2' increments across overlap seam. Install anchor behind first row of blocks so that anchor is tight with subgrade.
9. Downstream rolls of TCBM and underlayment are shingled under upstream roll.
10. Rebar U anchors shall be 18" long and fabricated from #3 rebar

NOT TO SCALE



CHUTE ANCHOR DETAIL



PROFILE ALONG CENTERLINE

Date
Designed N. Klingenberg 1/2020
Drawn N. Klingenberg 1/2020
Checked [redacted] 8/26
Approved

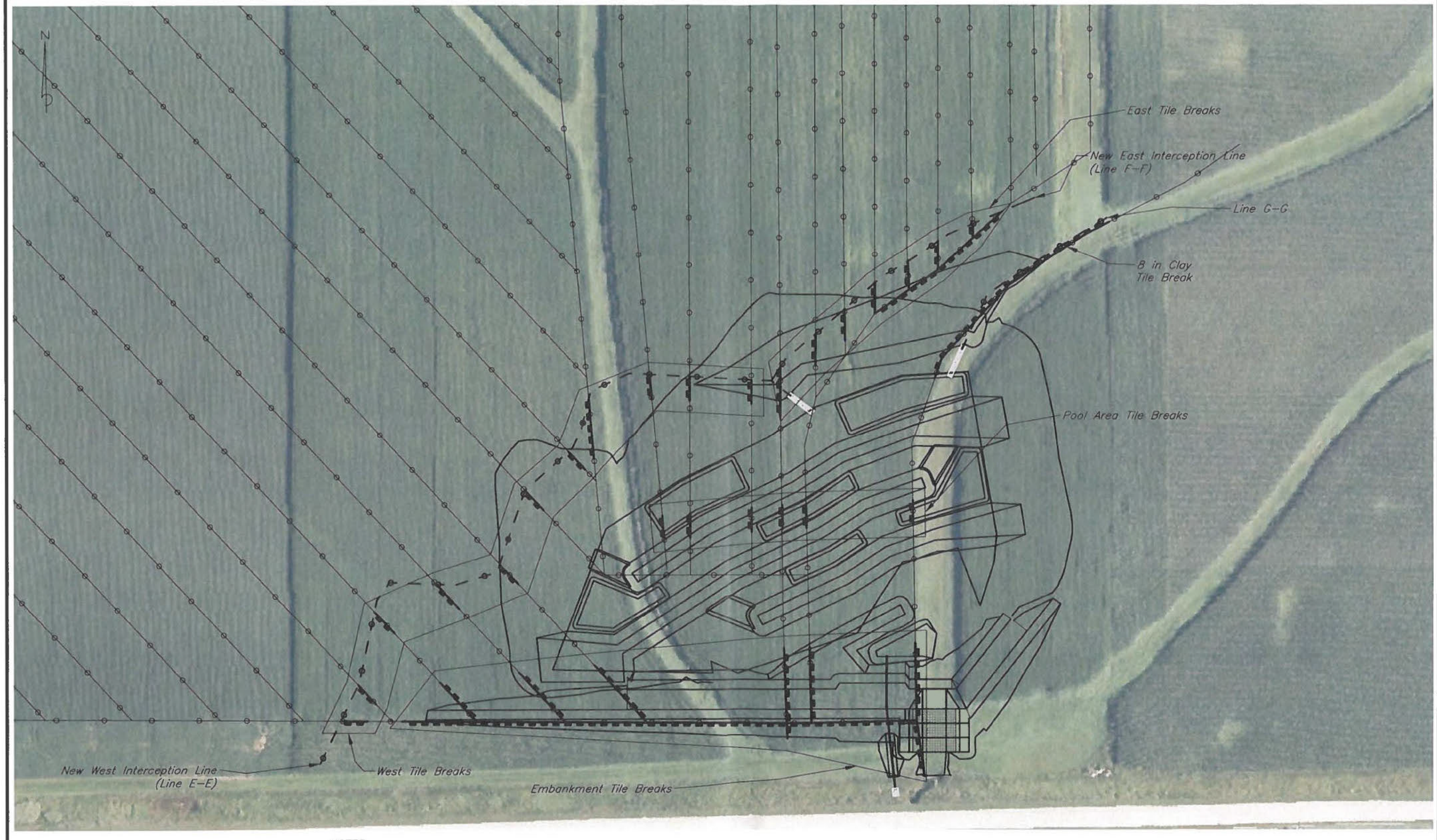
TIED CONCRETE BLOCK MAT CHUTE DETAILS Constructed Wetland [redacted]

United States Department of Agriculture
Natural Resources Conservation Service

File No.

Drawing No.

Sheet 8 of 12



—o———: Existing Tile (From Maps)

—o— — —: New Tile

▬▬▬▬: Planned Tile Breaks

NOTES:
- See Sheets 10 & 11 for New Tile details.
- See Sheet 12 for Tile Break details.
- If additional tile is discovered during construction notify NRCS Staff who will evaluate the discovered tile and decide how to treat it.

100 0 100 200 300

Scale in Feet

TILE PLAN
CONSTRUCTED WETLAND

	Date
Designed NAK	6/25
Drawn NAK	6/25
Checked	8/26
Approved	

United States Department of Agriculture
Natural Resources Conservation Service

File No. [redacted]

Drawing No.

8/13/26 12:56 PM
Sheet 9 of 12

DESIGN DATA

Line ID	Drain Profile Data		Conduit Capacity				Nominal Conduit Diameter	Conduit Material	Perf.	Reach Length	Grade
	Station	Design Elev.	Area Drained	Drain. Coeff.	Req'd Cap.	Drain Cap.					
			(acres)	(in/d)	(cfs)	(cfs)	(inches)	(Note 1)	(Y/N)	(feet)	(%)
E–E	0+00	1013.52	39.30	3/8	0.62	0.85	10	CPT	Y	735.00	0.2
	7+35	1012.05	57.50	3/8	0.91	1.38	12	CPT	Y	25.50	0.2
	7+60.5	1012.0									
F–F	0+00	1014.21	18.20	3/8	0.29	0.38	6	CPT	Y	340.00	0.6
	3+40	1012.05									
G–G	0+00	1013.75	128.00	3/8	2.03	2.67	10	CPT	Y	211.60	1.3
	2+11.6	1011.0									

Note 1. CPT = Corrugated Polyethylene (PE) Pipe (Tubing), ASTM F405, Heavy Duty, or ASTM F667
DWP = Annular Corrugated Profile Wall (Dual Wall) Polyethylene (PE) Pipe, ASTM F2648 or ASTM F2306
PVC = Poly Vinyl Chloride (PVC) Plastic Pipe, ASTM D2241 or D3034, SDR 26 or heavier, or ASTM D1785, Schedule 40 or greater
CMP = Corrugated Metal Pipe, ASTM A760, A762, or A929 (Galvanized Steel), or ASTM B745 (Aluminum), 16 ga. or heavier
SMP = Smooth Metal (Steel) Pipe, 3/16" minimum wall thickness

ESTIMATED QUANTITIES
(Connections and fittings not included)

Dia. (in.)	Material	Const. Spec.	Units	Quantity
6	CPT	IA–45	Ft	340
10	CPT	IA–45	Ft	926.6
12	CPT	IA–45	Ft	5.5
10	CMP	IA–51	Ft	20
12	CMP	IA–51	Ft	20

OUTLET PIPE with Animal Guard

Line ID	Material	Dia. (in.)	Length
E–E	CMP	12	20
G–G	CMP	10	20

RELIEF WELL with Screen

Line ID	Station	Material	Dia. (in.)

Engineering Job Class: IV

BENCH MARK

ID	Elev.	Description

STANDARD DWG. IA–1502

DATE: March 2015 PAGE: 1 OF 2

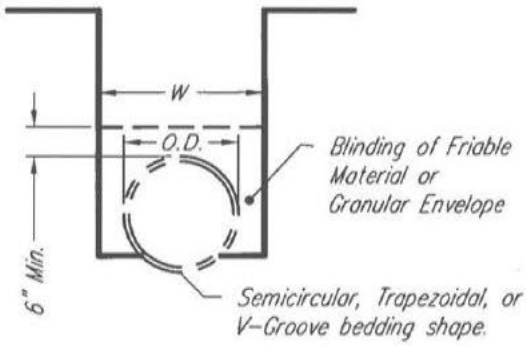
USDA United States Department of Agriculture
Natural Resources Conservation Service

SUBSURFACE DRAIN INSTALLATION

[redacted]

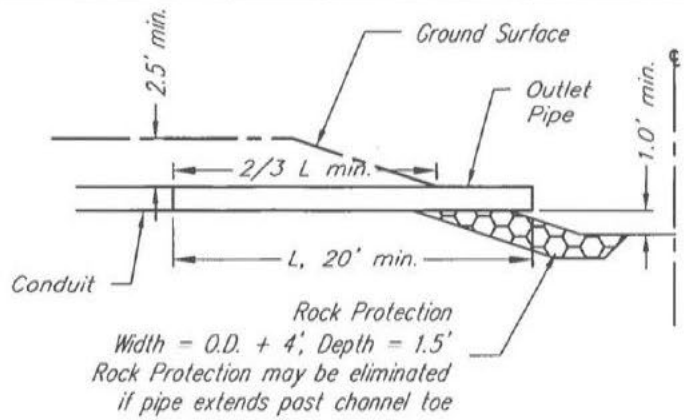
Designed NAK Date 4/2026
Drawn NAK 4/2026
Checked GJ 8/26
Approved

File Name
Drawing Name
Sheet 10 of 12

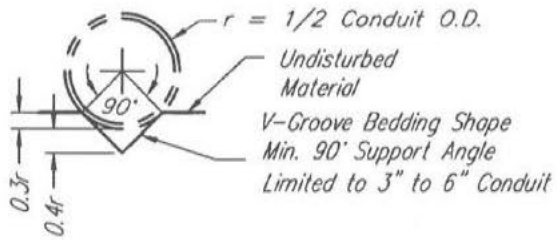


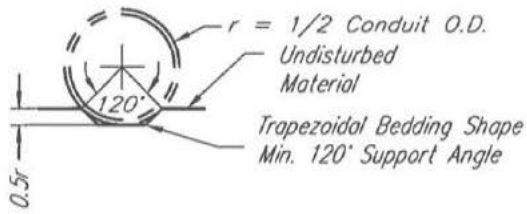
1. W = trench width at top of conduit
2. W = O.D.+6" min. for trench installation;
   W = O.D.+4" min. for plow installation.
3. Where W > O.D.+12", hand compact the blinding or use a granular envelope.

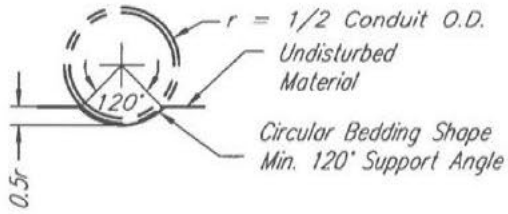
TRENCH DETAIL



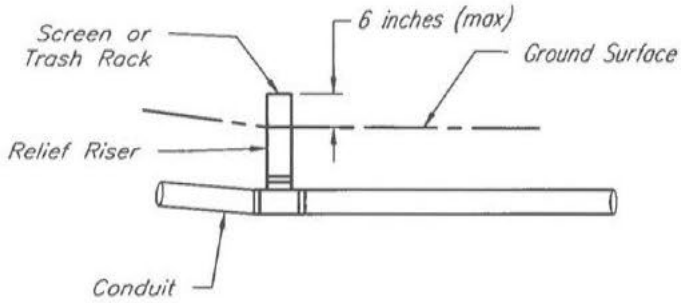
OUTLET PIPE DETAIL







BEDDING DETAIL



RELIEF WELL DETAIL

Notes:

1. All work shall comply with Construction Specification IA-46.
2. See Sheet 1 of 10 for the Plan View.
3. Maximum fill over conduit installed in a trench condition (W < O.D.+24") shall be 11 feet or as specified by the manufacturer.
4. All changes must be approved by the person approving the original plans.

DRAFT STANDARD DWG. IA-1502

DATE March 2015 | PAGE 2 OF 2

USDA United States Department of Agriculture
Natural Resources Conservation Service

SUBSURFACE DRAIN INSTALLATION

[redacted]

	Date
Designed NAK	4/2026
Drawn NAK	4/2026
Checked GS	8/26
Approved	

File Name

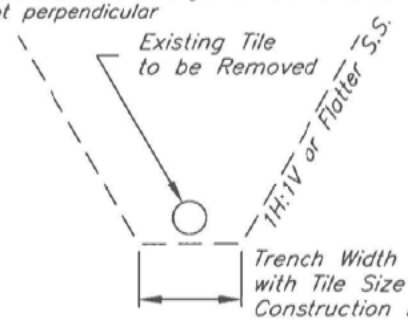
Drawing Name

Sheet 11 o 12

SUBSURFACE DRAIN BLOCK DETAILS

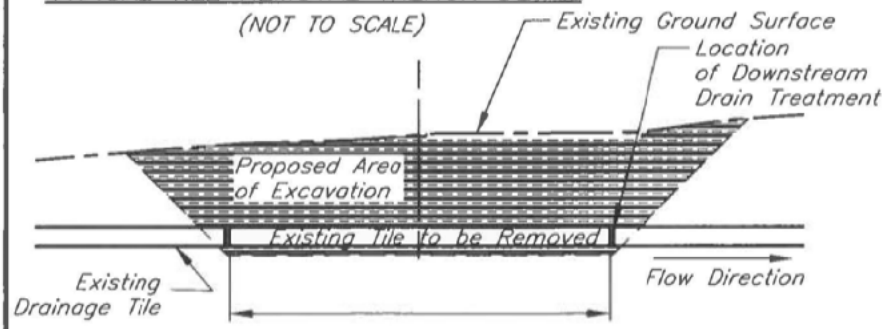
Subsurface Drain Removal ID	Removal Type (A or B)	Length to be Removed per Break (ft.)			Total Length Removed (ft.)	Downstream Drain Treatment Type		
		A	B	C		Cap/Plug	Surface Inlet*	Water Control Structure**
Embankment	B		25	25	1067	X		
Pool Area	A	25			150	X		
East	A	25*			340	X		
West	A	25*			362	X		
8 in Clay	A	250			250	X		

* *Dimension "A" for tile breaks along East and West is intended to indicate that all tile within 25 ft of the downstream side of the collection lines is to be removed. The 25 ft measurement is to be perpendicular to the new tile installed, so the length of tile removed may exceed 25 ft if existing tile is not perpendicular*



TYPICAL TILE REMOVAL TRENCH DETAIL

(NOT TO SCALE)



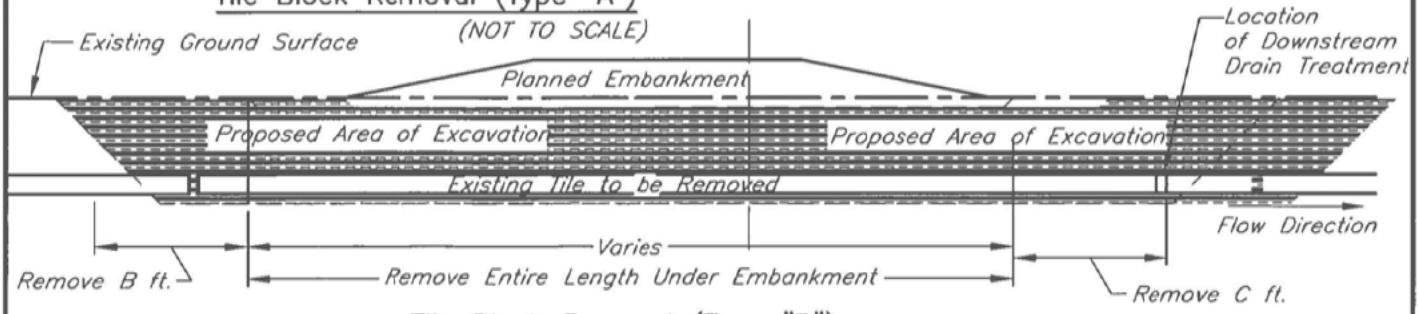
Remove A FT. Drainage Tile

NOTES:

1. *The work which includes labor, materials, and equipment required to complete the excavation and removal of all tile drainage systems shall be shown on the drawings or staked in the field.*
2. *If any existing drainage tile not shown on the drawings or staked in the field is encountered during excavation, the Engineer shall be notified. No additional work in the area of the encountered drainage tile shall be performed prior to the Engineer's approval. Any work done to remove, replace, or repair the encountered drainage tile shall be as directed by the Engineer.*
3. *Disconnected subsurface drains leaving the site shall be treated as shown on the plans. All others shall be capped or plugged.*
4. *For a minimum distance of two feet around each sealed tile end, backfill in layers not over 4 inches thick and tamp by hand or manually directed power tamper. Do not backfill with any soil containing broken tile fragments. The remainder of each trench shall be backfilled with the most suitable soil material available and compacted to a density equal to or greater than that of the surrounding undisturbed soil.*

Tile Block Removal (Type "A")

(NOT TO SCALE)



Tile Block Removal (Type "B")

(NOT TO SCALE)

ADAPTED FROM IA-1314

USDA United States Department of Agriculture Natural Resources Conservation Service	SUBSURFACE DRAIN BLOCK	Designed NAK Date 4/2026 Drawn NAK 4/2026 Checked GS 8/26 Approved	File Name Drawing Name Sheet 12 of 12