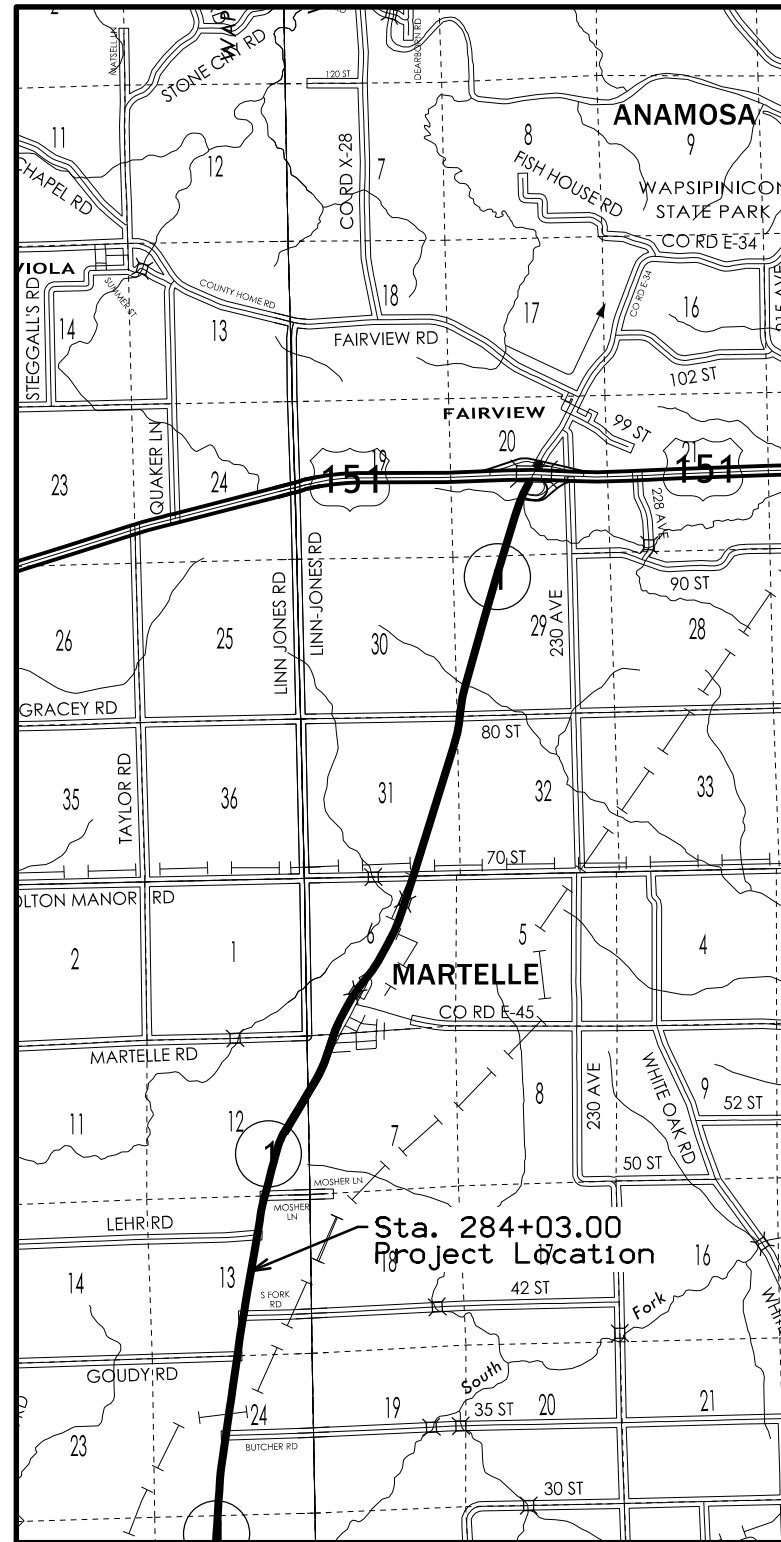
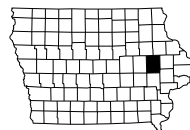


LETTING DATE
2/21/2023
PIPE CULVERTS
NHSN-001-6(42)--2R-57

LINN Co.



PLANS OF PROPOSED IMPROVEMENT ON THE
PRIMARY ROAD SYSTEM
LINN COUNTY
PIPE CULVERTS

1.1 Miles South of Jones County Line

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

Value Engineering Saves. Refer to Article 1105.14 of the Specifications.



INDEX OF SEALS		
SHEET NO.	NAME	TYPE
A.1	Cindy A. Spencer	Primary Signature Block
CS.1	Mark A. Dale	Geotechnical

DESIGN DATA RURAL			
2017	AADT	4,020	V.P.D.
20--	AADT	--	V.P.D.
20--	DHV	--	V.P.H.
	TRUCKS	11	%
	Total		
	Design ESALs	--	

REVISIONS

TOTAL

17

PROJECT IDENTIFICATION NUMBER

22-57-001-010

PROJECT NUMBER

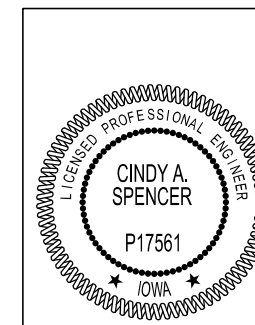
NHSN-001-6(42)--2R-57

R.O.W. PROJECT NUMBER

NHSN-001-6(42)--2R-57

INDEX OF SHEETS

No.	DESCRIPTION
A Sheets	Title Sheets
* A.1	Title Sheet
B Sheets	Typical Cross Sections and Details
B.1 - 2	Typical Cross Sections and Details
C Sheets	Quantities and General Information
C.1 - 4	Tabulations
CS Sheets	Soils Tabulations
CS.1	Soils Tabulations
D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2	Plan & Profile Sheet
J Sheets	Traffic Control and Staging Sheets
J.1	Traffic Control Plan
J.2	Detour Information
RC Sheets	Erosion Control Tabulations
RC.1 - 2	Erosion Control Tabulations
RR Sheets	Erosion Control Sheets
* RR.1 - 2	Erosion Control Sheets
V Sheets	Bridge and Culvert Situation Plans
* V.1	Culvert Situation Plan
	* Color Plan Sheets



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

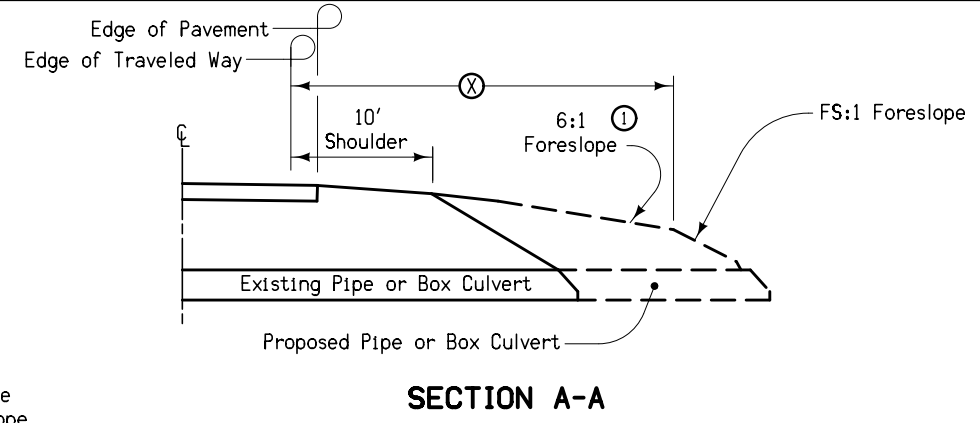
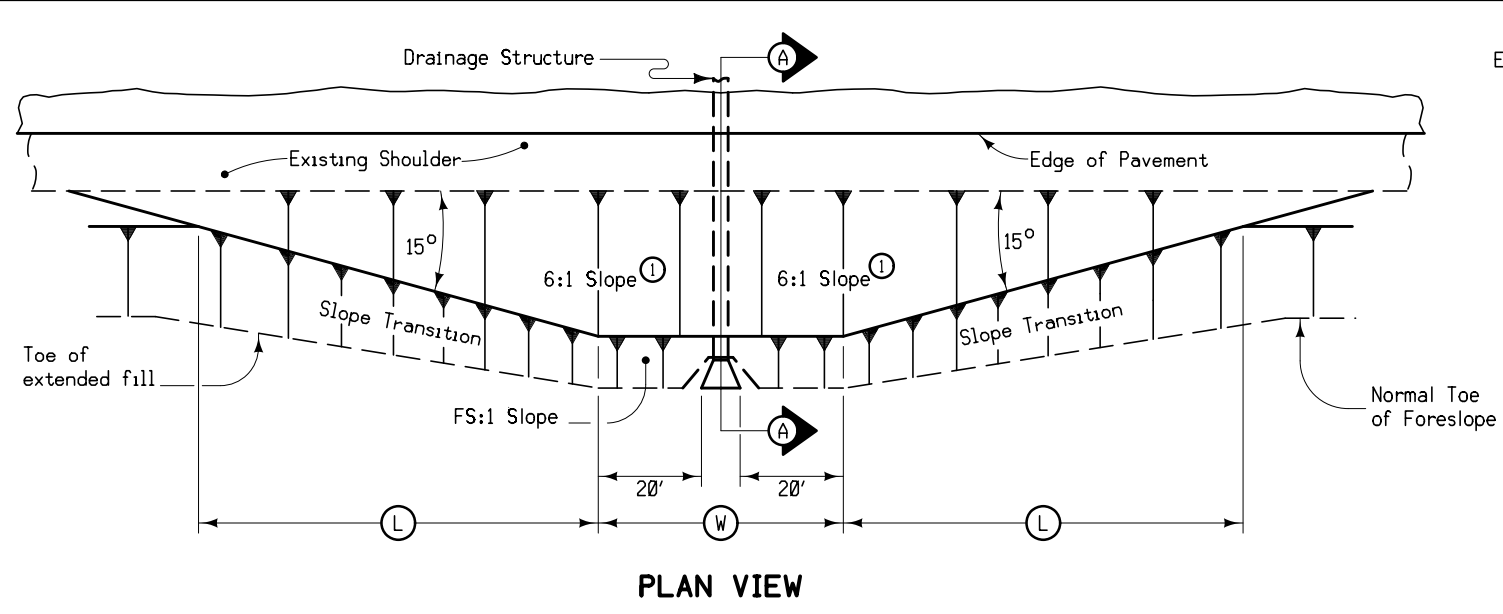
Cindy A. Spencer, P.E. Date

License Number P17561

My License Renewal Date is December 31, 2022

Pages or sheets covered by this seal:

A.1, B.1-B.2, C.1-C.4, D.1-D.2, J.1-J.2,
RC.1-RC.2, RR.1-RR.2, V.1



Notes:
At locations where an extended or newly constructed drainage structure extends beyond the normal foreslope cover, flatten the foreslope as indicated so as to cover the structure. Minimum earth cover is 6".

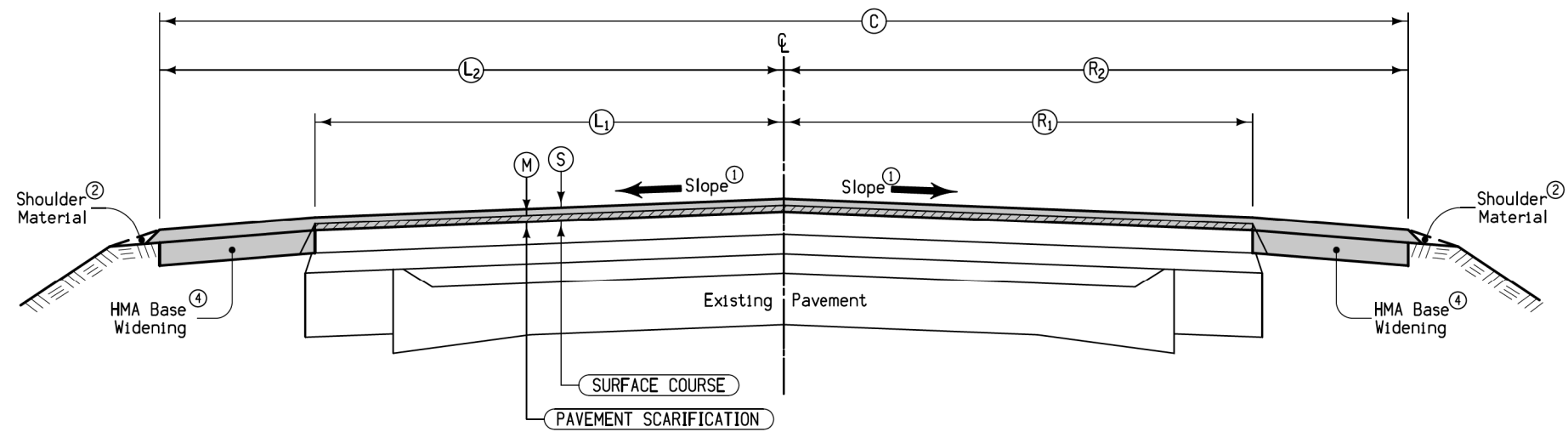
① Slope may be flatter than 6:1.
Ⓜ = Pipe or R.C.B. opening width plus 20 feet each side.

SECTION A-A

STRUCTURE LOCATION		Ⓜ	Ⓛ	ⓧ	ⓕ
STATION	SIDE	Feet	Feet	Feet	Feet
284+03	B	50.1	59.7	26	3.5

BARNROOF FORESLOPE AT DRAINAGE STRUCTURE

■ = HMA Resurfacing and Base Widening
▨ = Pavement Scarification



- ① Finished slope shall match existing pavement except that the maximum allowable slope is 3.0%, minimum allowable slope is 2.0%. Section may be modified as directed by the Engineer through areas of special shaping. Refer to tabulation listing of superelevated curves and Standard Road Plans for additional requirements through superelevated curves.
- ② Refer to Typ. 7135 or Typ. 7145.
- ③ Tack Coat estimated for 1 application.
- ④ Base widening quantities are not included with resurfacing quantities. Refer to Typ. 7151.
- ⑤ Begins 90' (±) north of the centerline of the northerly railroad track.

FOR INFORMATION ONLY

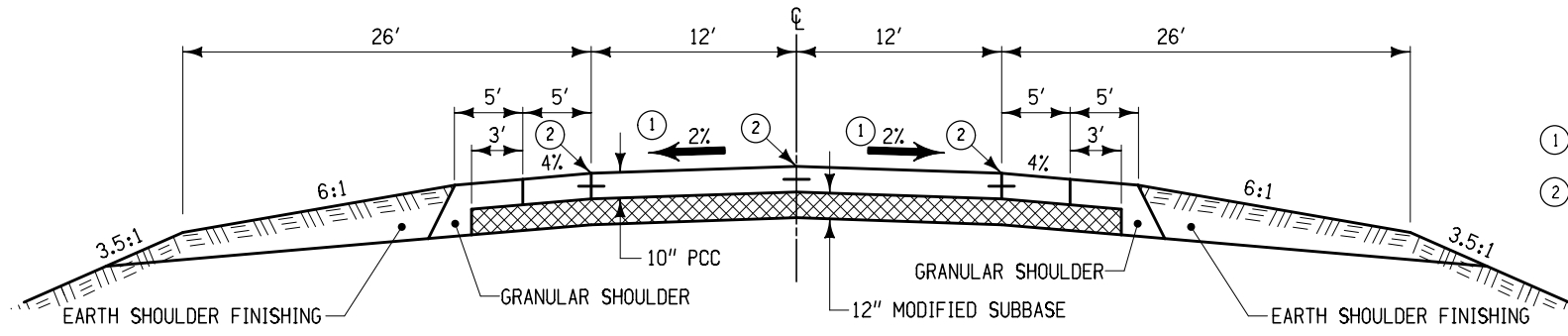
Design Rates

Item	Rate
Surface Course	155 lbs./cu. ft.
Tack Coat	0.05 gal./sq. yd.

Location		Ⓢ	Ⓜ	ⓕ	Ⓛ ₁	Ⓡ ₁	Ⓛ ₂	Ⓡ ₂	Resurfacing Quantities Per Station				Remarks	
Road Id	Station To Station	Inches	Inches	Feet	Feet	Feet	Feet	Feet	Tack Coat ^③	Asphalt Binder	Hot Mix Asphalt (Tons)	Pavement Scarification		
									Gallons	Tons	Surface	SY		
Iowa 1	2+50	339+65	2.0	1.0	34	13	13	17	17	18.9	2.63	43.9	289	⑤ From N. of RR to W. of Co. Line
Iowa 1	339+65	341+07	2.0	1.0	32	12	12	16	16	17.8	2.48	41.3	267	From W. of Co. Line to Co. Line
Iowa 1	-1+83	21+00	2.0	1.0	32	12	12	16	16	17.8	2.48	41.3	267	From Co. Line to PCC
Iowa 1	41+83	206+10	2.0	1.0	32	12	12	16	16	17.8	2.48	41.3	267	From PCC to PCC

TYPICAL CROSS SECTION HMA RESURFACING WITH MILLING

LOCATION		
ROAD IDENTIFICATION	STATION TO STATION	
Iowa 1	283+78.00	284+28.00



- NOTES:
- ① TYPICAL. MATCH SLOPE OF ADJACENT PAVEMENT. CROSS-SLOPE MAY BE MODIFIED IN AREAS OF SUPERELEVATION.
 - ② KT-2 OR L-2 JOINT

**TYPICAL CROSS SECTION
IOWA 1**

100-1D 10-18-05
PROJECT DESCRIPTION
This project is for the replacement of a box culvert on Iowa 1, just south of Jones County, and associated work.

100-1A 07-15-97					
ESTIMATED PROJECT QUANTITIES (1 DIVISION PROJECT)					
Item No.	Item Code	Item	Unit	Total	As Built Qty.
1	2102-2625000	EMBANKMENT-IN-PLACE	CY	404.00	
2	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	168.00	
3	2102-2712015	EXCAVATION, CLASS 12, BOULDERS OR ROCK FRAGMENTS	CY	2.00	
4	2102-4560000	LOCATING TILE LINES	STA	1.00	
5	2105-8425015	TOPSOIL STRIP, SALVAGE, AND SPREAD	CY	297.00	
6	2107-0875100	COMPACTION WITH MOISTURE CONTROL	CY	533.00	
7	2115-0100000	MODIFIED SUBBASE	CY	74.10	
8	2121-7425020	GRANULAR SHOULDERS, TYPE B	TON	43.17	
9	2123-7450020	EARTH SHOULDER FINISHING	STA	1.00	
10	2301-1033100	STANDARD OR SLIP FORM PCC PAVEMENT, CLASS C, CLASS 3, 10 INCH	SY	188.90	
11	2401-6745650	REMOVAL OF EXISTING STRUCTURES	LS	1.00	
12	2402-0425040	FLOODED BACKFILL	CY	228.30	
13	2402-2720100	EXCAVATION, CLASS 20, FOR ROADWAY PIPE CULVERT	CY	350.00	
14	2416-0100078	APRONS, CONCRETE, 78 INCH	EACH	2.00	
15	2416-1180078	CULVERT, CONCRETE ROADWAY PIPE, 78 INCH	LF	76.00	
16	2502-8212034	SUBDRAIN, LONGITUDINAL (SHOULDER), 4 INCH	LF	220.00	
17	2502-8212108	SUBDRAIN, PLASTIC PIPE, 8 INCH	LF	120.00	
18	2502-8221306	SUBDRAIN OUTLET, DR-306	EACH	4.00	
19	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL	LF	507.30	
20	2506-4984000	FLOWABLE MORTAR	CY	21.70	
21	2507-3250005	ENGINEERING FABRIC	SY	31.30	
22	2507-6800061	REVTMENT, CLASS E	TON	17.70	
23	2510-6745850	REMOVAL OF PAVEMENT	SY	190.60	
24	2526-8285000	CONSTRUCTION SURVEY	LS	1.00	
25	2527-9263109	PAINTED PAVEMENT MARKINGS, WATERBORNE OR SOLVENT-BASED	STA	1.63	
26	2528-2518000	SAFETY CLOSURE	EACH	7.00	
27	2528-8445110	TRAFFIC CONTROL	LS	1.00	
28	2533-4980005	MOBILIZATION	LS	1.00	
29	2548-0000200	MILLED SHOULDER RUMBLE STRIPS, PCC SURFACE	STA	1.00	
30	2548-0000320	MILLED CENTERLINE RUMBLE STRIPS, PCC SURFACE	STA	0.50	
31	2601-2634100	MULCHING	ACRE	0.30	
32	2601-2636015	NATIVE GRASS SEEDING	ACRE	0.23	
33	2601-2636043	SEEDING AND FERTILIZING (RURAL)	ACRE	0.07	
34	2602-0000020	SILT FENCE	LF	255.00	
35	2602-0000030	SILT FENCE FOR DITCH CHECKS	LF	138.00	
36	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS	LF	393.00	
37	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS	LF	39.00	
38	2602-0010010	MOBILIZATIONS, EROSION CONTROL	EACH	1.00	
39	2602-0010020	MOBILIZATIONS, EMERGENCY EROSION CONTROL	EACH	1.00	

105-4 10-18-11		
STANDARD ROAD PLANS		
The following Standard Road Plans apply to construction work on this project.		
Number	Date	Title
DR-101	04-18-17	Pipe Culvert (Bedding and Backfill)
DR-102	04-21-15	Pipe Culvert (Cover and Camber)
DR-103	04-21-15	Pipe Culvert (Installation Details)
DR-104	04-19-16	Depth of Cover Tables for Concrete and Corrugated Pipe
DR-121	10-17-17	Connected Pipe Joints
DR-201	04-21-20	Concrete Aprons
DR-301	04-19-22	Subdrains for Fill or Foundation Drainage (Standard)
DR-302	10-20-15	Subdrains Standard (Farm Tile Replacement)
DR-601	04-18-17	Reinforced Concrete Pipe Culvert
EC-201	04-20-21	Silt Fence
EC-301	10-18-16	Rock Erosion Control (REC)
EC-502	04-21-15	Seeding in Rural Areas
EW-101	10-17-17	Embankment and Rebuilding Embankments
EW-102	10-20-15	Allowable Placement of Unsuitable Soil in Embankments
PM-110	04-21-20	Line Types
PV-3	04-16-19	Safety Edge
PV-12	10-20-20	Milled Shoulder Rumble Strips
PV-13	10-17-17	Milled Centerline Rumble Strips
PV-101	04-19-22	Joints
TC-1	10-15-19	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-202	10-19-21	Work Within 15 ft of Traveled Way
TC-252	04-21-20	Routes Closed to Traffic

100-4A 10-29-02		
ESTIMATE REFERENCE INFORMATION		
Item No.	Item Code	Description
1	2102-2625000	EMBANKMENT-IN-PLACE
2	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW
6	2107-0875100	COMPACTION WITH MOISTURE CONTROL Quantity includes 168 CY cut and 693 CY fill+30% shrink (533 CY template fill). 525 CY CY fill not available on-site (404 CY template fill) shall be furnished by the Contractor. Refer to Sheet CS.1 for additional information.
5	2105-8425015	TOPSOIL STRIP, SALVAGE, AND SPREAD Quantity based on 8" stripping over the entire disturbed area.
7	2115-0100000	MODIFIED SUBBASE Refer to Tab. 100-24 for quantity.
8	2121-7425020	GRANULAR SHOULDERS, TYPE B
9	2123-7450020	EARTH SHOULDER FINISHING Refer to Tab. 112-9 for locations and quantities.
10	2301-1033100	STANDARD OR SLIP FORM PCC PAVEMENT, CLASS C, CLASS 3, 10 INCH Refer to Tab. 100-24 for locations and quantities.
11	2401-6745650	REMOVAL OF EXISTING STRUCTURES Refer to Tab. 110-2 for locations and additional information.
12	2402-0425040	FLOODED BACKFILL
13	2402-2720100	EXCAVATION, CLASS 20, FOR ROADWAY PIPE CULVERT
20	2506-4984000	FLOWABLE MORTAR Refer to Tab. 104-3 for locations and quantities.
16	2502-8212034	SUBDRAIN, LONGITUDINAL (SHOULDER), 4 INCH
18	2502-8221306	SUBDRAIN OUTLET, DR-306 Refer to Tab. 104-9, sheet CS.1, for locations and additional information.
17	2502-8212108	SUBDRAIN, PLASTIC PIPE, 8 INCH Refer to Tab. 104-5C for locations and additional information.
19	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL Refer to Tab. 110-7A for locations and quantities.
21	2507-3250005	ENGINEERING FABRIC
22	2507-6800061	REVTMENT, CLASS E Refer to Tab. 100-23 on Sheet RC.1 for locations and quantities.
23	2510-6745850	REMOVAL OF PAVEMENT Refer to Tab. 110-1 for locations and quantities.
25	2527-9263109	PAINTED PAVEMENT MARKINGS, WATERBORNE OR SOLVENT-BASED Refer to Tab. 108-22 for locations and quantities.
26	2528-2518000	SAFETY CLOSURE Refer to Tab. 108-13A for locations.
27	2528-8445110	TRAFFIC CONTROL Refer to the J sheets for traffic control and staging information.
29	2548-0000200	MILLED SHOULDER RUMBLE STRIPS, PCC SURFACE
30	2548-0000320	MILLED CENTERLINE RUMBLE STRIPS, PCC SURFACE Refer to Tab. 112-10 for locations and additional information.
34	2602-0000020	SILT FENCE Refer to Tab. 100-17 in the RC Sheets. The tabulation includes estimated locations for placement of silt fence to address possible erosion during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 25% additional quantity for field adjustments and replacements.
35	2602-0000030	SILT FENCE FOR DITCH CHECKS Refer to Tab. 100-18 in the RC Sheets. The tabulation includes estimated locations for placement of silt fence for ditch checks to address possible erosion during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 50% additional quantity for field adjustments and replacements.
36	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS This item is included for silt fence and silt fence for ditch check removal required for staging reasons, for replacement (replacement to be paid separately), or for areas that have achieved 70% permanent growth.
37	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS This item is included for cleanout and repair of the silt fence and silt fence for ditch checks during the project.

DRAINAGE STRUCTURE BY ROAD CONTRACTOR

Length of unclassified pipe calculated is based on using Reinforced Concrete Pipe.

- * Not a bid item
- ① Diameter or equivalent diameter
- ② UNCL = Unclassified Pipe CMP = Corrugated Metal Pipe RCP = Reinforced Concrete Pipe LCP = Arch or Elliptical Low Clearance Pipe SARC = Steel Arch Pipe
- ③ Backfill according to DR-101

Drainage Area ACRE	Location	Type	Size ① IN	Kind Of Pipe ② RCP	Length New Const. LF	Bedding Class B	Design Cover (H)		Apron No.		Apron Guard* (DR-213) No.	Elbow* (DR-141) No.	Diaphragm* (DR-501) No.	Tee Section* (DR-142) No.	"D" Section* (DR-141) No.	Reducer* No.	Type 'C' Connections* (DR-122) Type No.	Connected Pipe Joint* (DR-121) Type	4" Perforated Subdrain* FT	Flow Line Elevations				Dimensions Lin. Ft.				Skew Ahead Degrees		Dike			Class 20 CY	Flowable Mortar CY	Floodable* Backfill (A) CY	Porous* Backfill (B) CY	Flooded Backfill ③ (A+B) CY	Remarks
							FT	FT	IN	OUT										Lt.	Rt.	Other	Other	Lt.	Rt.	Lt.	Rt.	Lt.	Rt.	Lt.	Rt.	Rt.						
271.9	284+03.00	DR-601	78	RCP	76	B	3.0	0.08	1	1							Type 3			869.85	867.85			46.0	48.5													

LIST OF SUBDRAIN WORK

Possible Standards: DR-121, DR-201, DR-203, DR-301, DR-302, DR-303, DR-305 and DR-306. Possible Detail: 500-10.

* Not a bid item

No.	Station to Station	Type of Installation DR-301, DR-302, DR-303	Pipe			Aprons		Outlets			Connected Pipe Joints*		Trench Drain LF	Granular Material Blanket CY	Porous Backfill* CY	Class "A" Crushed Stone* CY	Remarks
			Concrete, C.M.P., or Plastic	Dia. IN	Length LF	DR-201 No.	DR-203 No.	500-10 No.	DR-305 Type No.	DR-306 No.	DR-121 Type No.						
1	284+03	DR-302, Case A	Plastic	8.0	120												

REMOVAL OF PAVEMENT

Refer to Tabulation 102-5

* Not a Bid Item

Begin Station	End Station	Side	Pavement Type	Area		Saw Cut*	Remarks
				SY	LF		
283+78.00	284+28.00	BOTH	HMA	190.6	68.0		

REMOVAL OF EXISTING STRUCTURES

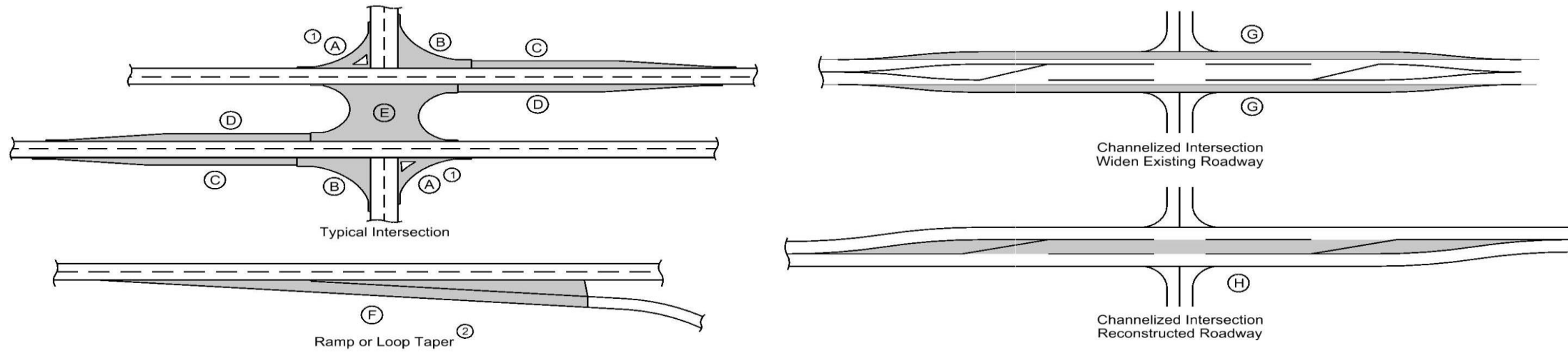
Location	Description	Remarks
284+03	6' x 6' x 51' RCB	Remove

REMOVAL OF STEEL BEAM GUARDRAIL

- ① Lane(s) to which the installation is adjacent.
- ② Includes length of End Terminals and End Anchors.

No.	Direction of Traffic ①	Location		Side	Removal of Guardrail ② LF
		Station to Station			
1	NB	282+57.30	285+04.67	RT	247.4
2	SB	283+01.18	285+61.14	LT	260.0

PCC PAVEMENT



- ① Does not include raised island area or curb. Refer to tabulation 112-4 for quantities.
- ② Refer to PV-410, PV-411, PV-412, and PV-414.
- ③ Quantity includes Pavement Header.

Road Identification	Location		Mainline			Area ③								Total Area By Pavement Thickness		Special Backfill	Modified Subbase	Granular Subbase	Remarks
	Direction of Travel	Station to Station	Width	Length	Area	A ①	B	C	D	E	F ②	G	H	SY					
														10 IN	10% IN				
Iowa 1	BOTH	283+78.00 284+28.00	34.0	50.0	188.9									188.9					

SHOULDERS

- ① Lane(s) to which the shoulder is adjacent.
- ② See Typ. 7156, 7157, or 7158.
- ③ Bid Item.
- ④ Applies only for Paved Shoulders constructed on project with existing granular shoulders.
- ⑤ Bid Item. Typ. 7156, 7157, or 7158.
- ⑥ Does not include shrink.

Calculations assume a HMA unit weight (lbs/cf) of 147, a Special Backfill unit weight (lbs/cf) of 140, and a Granular Shoulder unit weight (lbs/cf) of 140.

Road Identification	Direction of Traffic	Location			Side	P Width	P _{SG} Width	G Width	L Length	Class 13 Excavation	Hot Mix Asphalt		Binder	Paved Shoulder	" Paved Shoulder at Guardrail	Reinforced Paved Shoulder	Special Backfill				Subbase	Granular Shoulder		Earth Shoulder Construction Alternates			Remarks	
		Station to Station	TON	TON/STA							HMA Alternate						PCC Alternate		TON	TON/STA		CY	TON	TON/STA	STA	HMA		PCC
											TON	TON/STA					TON	TON/STA										
Iowa 1	SB	283+78.00	284+28.00	LT			5.0	50.0													8.750	17.500	0.5					
	NB	283+78.00	284+28.00	RT			5.0	50.0													8.750	17.500	0.5					

MILLED RUMBLE STRIPS

See PV-12 and PV-13

* Calculated at 18" width for Shoulder.

Road Identification	Location		Shoulder Pavement Type	Rumble Strip Type (Centerline, Rt or Lt Shoulder)	L IN	Installation Length		Fog Seal* (Milled Rumble Strip) Shoulder	Effective Shoulder Width			Remarks
	Station to Station	Type				PCC	HMA		PCC Paved	HMA Paved	Granular\ Earth	
Iowa 1	283+78.00	284+28.00	PCC	Centerline		0.50		0.0				
	283+78.00	284+28.00	PCC	Left Shoulder	10"	0.50		0.0	5.0		5.0	
	283+78.00	284+28.00	PCC	Right Shoulder	10"	0.50		0.0	5.0		5.0	

PAVEMENT MARKING LINE TYPES

See PM-110

***MNY4 - Factor of 1.00 as value includes number of 4-inch passes to cover median nose area.

*BCY4 - Place on the same side of the roadway to match existing markings near the project.

**NPY4 - For estimating purposes only. No Passing Zone Lines will be located in the field.

BCY4: Broken Centerline (Yellow) @ 0.25

DCY4: Double Centerline (Yellow) @ 2.00

NPY4: No Passing Zone Line (Yellow) @ 1.25

BLW4: Broken Lane Line (White) @ 0.25

ELW4: Edge Line Right (White) @ 1.00

ELY4: Edge Line Left (Yellow) @ 1.00

Road ID	Station to Station	Dir. of Travel	Location	Marking Type	Side			Length by Line Type (Unfactored)												Remarks							
					L	C	R	BCY4*	DCY4	NPY4**	BLW4	ELW4	ELY4														
					STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA		STA	STA	STA				
Iowa 1	283+78.00	284+28.00	BOTH	Waterborne/Solvent Paint	X	X	X			0.50		1.00															
Factored Total: Waterborne/Solvent Paint								-	-	0.63	-	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bid Quantity: Painted Pavement Markings, Waterborne or Solvent-Based											1.63																

SAFETY CLOSURES

Refer to Section 2528 of the Standard Specifications

Station	Closure Type		Remarks
	Road Qty.	Hazard Qty.	
	1		Mt. Vernon - NB
	1		Abbe Hills Rd. - NB
	1		Linn Ridge Rd. - NB
	1		Butcher Rd. - NB
283+50.00		1	
284+50.00		1	
	1		Martelle - SB

103-6
10-17-17

EMBANKMENT WITH MOISTURE CONTROL

Moisture Control is required for all Class 10 fill placed in all locations and depths. Stability berms placed outside the normal foreslope template and topsoil will not require Moisture Control

103-7
08-01-08

SHRINKAGE DATA

Material	%	Remarks
Class 10	30%	
Topsoil	40%	
Boulders	2 CY	

104-9
10-17-17

LONGITUDINAL SUBDRAIN SHOULDER AND BACKSLOPE

Refer to Soils Sheets

* Not a bid item. Bridge berm quantities assume a trench depth of 24 inches.

Line No.	Road or Lane Identification	Location		Side	Longitudinal Subdrain (DR-303)						Subdrain Outlet		Porous* Backfill CY	Class "A"* Crushed Stone CY	Remarks		
		Station to Station			Depth	Shoulder		Backslope		Bridge Berm (EW-203 or EW-204)		DR-303, DR-305 or DR-306					
					D	Size	Length	Size	Length	Standard Road Plan and Type	Size	Length				Station	Standard Road Plan and Type
		IN	FT		IN	FT	IN	FT		IN	FT						
1	IA 1	283+78.00	284+28.00	RT	22.0	4.0	110.0										
2	IA 1	283+78.00	284+28.00	LT	22.0	4.0	110.0										
Total							220.0		0.0			DR-306 = 4	9.0	0.0			

NOTE: ALL LONGITUDINAL SUBDRAINS ARE TYPE 7 WITH PCC OR TYPE 8 WITH HMA (ACC) UNLESS OTHERWISE NOTED IN REMARKS COLUMN.

GEOTECHNICAL DESIGN

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature: _____ Date: _____

Mark A. Dell
Printed or Typed Name

My license renewal date is December 31, 2023

Pages or sheets covered by this seal: CS.1



PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)	Existing Utilities
SHADING		
SHADING	Design Color No.	
Yellow	(4)	Highlight for Critical Notes or Features
Red	(3)	Delineates Restricted Areas
Lavender	(9)	Temporary Pavement Shading
Gray, Light	(48)	Proposed Pavement Shading
Gray, Med	(80)	Proposed Granular Shading
Gray, Dark	(112)	Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)	Grading Shading
Tan	(8)	Proposed Sidewalk Shading
Blue, Light	(230)	Proposed Sidewalk Landing Shading
Pink	(11)	Proposed Sidewalk Ramp Shading

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

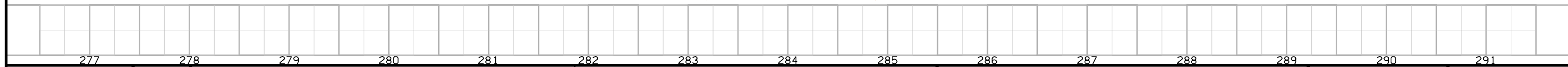
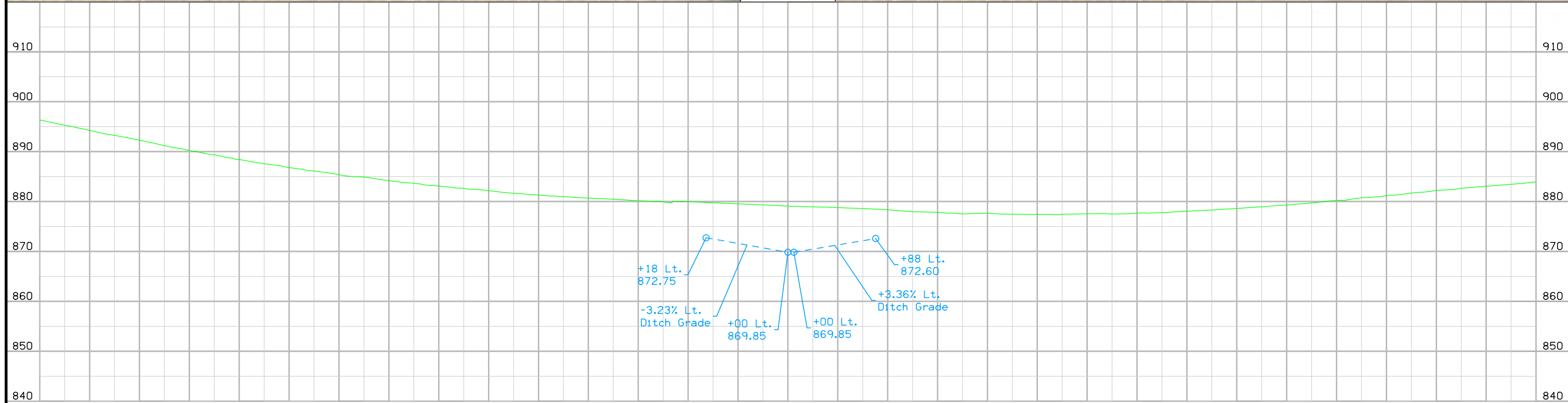
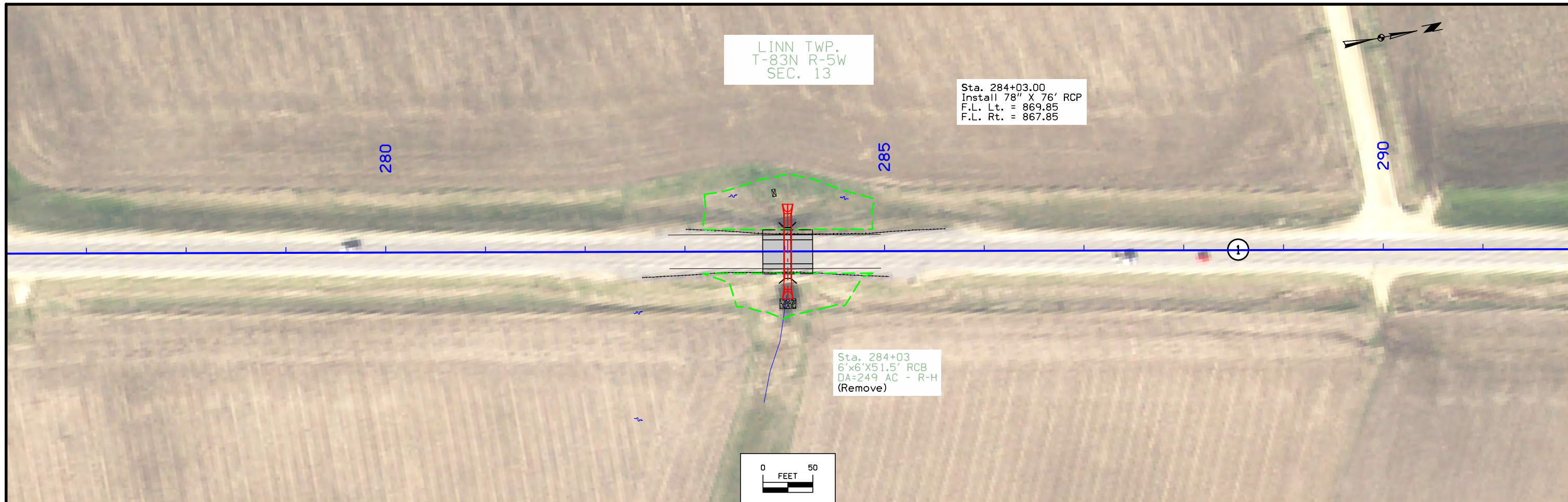
LINEWORK	Design Color No.	
Green	(2)	Existing Ground Line Profile
Blue	(1)	Proposed Profile and Annotation
Magenta	(5)	Existing Utilities
Blue, Light	(230)	Proposed Ditch Grades, Left
Black	(0)	Proposed Ditch Grades, Median
Rust	(14)	Proposed Ditch Grades, Right

	Reference Point
	Station
	Survey Line
	Section Corner
	Ground Line Intercept
	Saw Cut
	Guardrail
	Trench Drain
	HighTension Cable Guardrail
	Sheet Pile
	Pavement Removal
	Clearing & Grubbing Area

RIGHT-OF-WAY LEGEND	
	Proposed Right-of-Way
	Existing Right of Way
	Existing and Proposed Right-of-Way
	Easement and Existing Right-of-Way
	Easement (Temporary)
	Easement
	Access Control
	Property Line

**PLAN AND PROFILE
LEGEND AND SYMBOL
INFORMATION SHEET**

(COVERS SHEET SERIES D, E, F, & K)



108-23A
08-01-08

TRAFFIC CONTROL PLAN

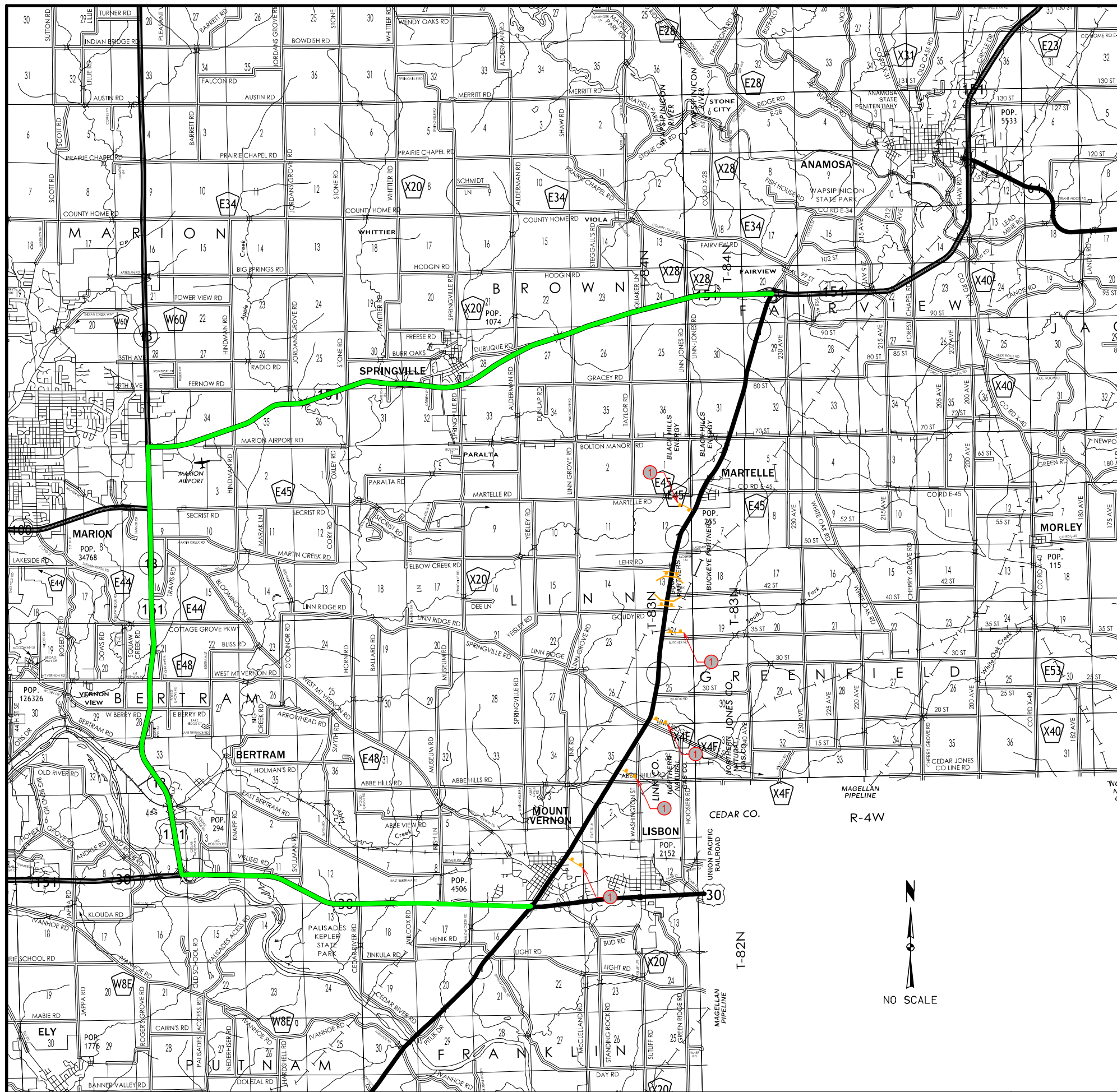
1. Iowa 1 will be closed during construction of improvements. Through traffic will be detoured on U.S. 30 and U.S. 151. Through traffic detour signage will be provided by the Iowa DOT.
2. Coordinate roadway closure with adjacent project. Stage construction of culverts so that properties between installation locations maintain access from Iowa 1 at all times.
3. Traffic control will be per the Standard Road Plans listed elsewhere in these plans.

111-01
04-17-12




COORDINATED OPERATIONS

Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.


Project	Type of Work
NHSN-001-7(8)--2R-53	Pipe Culverts



LEGEND

-  SIGN
-  TYPE 3
-  DETOUR ROUTE

ROAD CLOSED TO THRU TRAFFIC



100-17
04-20-10

TABULATION OF SILT FENCES

Refer to EC-201

Location			Length LF	Remarks
Begin Station	End Station	Side		
283+18.00	284+00.00	RT	102.0	
284+06.00	284+88.00	RT	102.0	

100-23
04-17-18

ROCK EROSION CONTROL

Refer to EC-301 and Detail 570-8

Location				Rock Erosion Control (REC)					Material Bid Quantities			Remarks		
Road Identification	Begin Station	End Station	Side	L FT	W FT	Type 1	Type 2	Type 3	Type 4	Type 5	Eng. Fabric		Class E Revetment	Erosion Stone
						Rock Ditch Check	Rock Ditch	Rock Flume	Rock Splash Basin	Rock Slope Protection	SY		TON	TON
Iowa 1	284+03.00		RT	16.1	10				X		31.3	17.7		

100-18
10-16-18

SILT FENCES FOR DITCH CHECKS

Possible Standard: EC-201

Cross Section View

Longitudinal Profile View

* The functional height used in the volume equation is 85% of effective height. Effective height is 1.58 feet as shown on EC-201.
 * Volume equation: $[0.5 * Spacing * (0.5 * H^2 * FS + DW * H + 0.5 * H^2 * BS)]$

Basin No.	Type	Location		Bid Items			Stormwater Storage Volume Summary					Remarks
		Station	Side	Installation LF	Maintenance LF	Removal LF	Foreslope FS:1	Backslope BS:1	Ditch Width FT	Avg. % Slope Ditch Grade	Volume* CF	
	1	283+50.00	LT	23.0			3.5	3.0	10.0	3.2%		
	1	283+95.00	LT	23.0			3.5	3.0	10.0	3.2%		
	1	284+10.00	LT	23.0			3.5	3.0	10.0	3.4%		
	1	284+55.00	LT	23.0			3.5	3.0	10.0	3.4%		

110-12
10-20-20

POLLUTION PREVENTION PLAN

This project is regulated by the requirements of the Iowa Department of Natural Resources (DNR) National Pollutant Discharge Elimination System (NPDES) General Permit No. 2 OR an Iowa Department of Natural Resources (DNR) National Pollutant Discharge Elimination System (NPDES) individual storm water permit. The Contractor shall carry out the terms and conditions of this permit and the Pollution Prevention Plan (PPP).

This Base PPP includes information on Roles and Responsibilities, Project Site Description, Controls, Maintenance Procedures, Inspection Requirements, Non-Storm Water Controls, Potential Sources of Off Right-of-Way Pollution, and Definitions. This plan references other documents rather than repeating the information contained in the documents. A copy of this Base Pollution Prevention Plan, amended as needed during construction, will be readily available for review.

All contractors shall conduct their operations in a manner that controls pollutants, minimizes erosion, and prevents sediments from entering waters of the state and leaving the highway right-of-way. The Contractor shall be responsible for compliance and implementation of the PPP for their entire contract. This responsibility shall be further shared with subcontractors whose work is a source of potential pollution as defined in this PPP.

I. ROLES AND RESPONSIBILITIES

A. Designer:

1. Prepares Base PPP included in the project plan.
2. Prepares Notice of Intent (NOI) submitted to Iowa DNR.
3. Is signature authority on the Base PPP. If consultant designed, signature from Contracting Authority is also required.

B. Contractor:

1. Signs a co-permittee certification statement adhering to the requirements of the NPDES permit and this PPP. All co-permittees are legally required under the Clean Water Act and the Iowa Administrative Code to ensure compliance with the terms and conditions of this PPP.
2. Designates a Water Pollution Control Manager (WPCM), who has the duties and responsibilities as defined in Section 2602 of the Standard Specifications.
3. Submits an Erosion Control Implementation Plan (ECIP) and ECIP updates according to Section 2602 of the Standard Specifications.
4. Installs and maintains appropriate controls. This work may be subcontracted as documented through Subcontractor Request Forms (Form 830231).
5. Supervises and implements good housekeeping practices according to Paragraph III, C, 2.
6. Conducts joint required inspections of the site with inspection staff. When Contractor is not mobilized on site, Contractor may delegate this responsibility to a trained or certified subcontractor. Contracting Authority also may waive joint inspection requirement during winter shutdown. In both circumstances, WPCM (or trained or certified delegate from the Contractor) is still responsible to review and sign inspection reports.
7. Complies with training and certification requirements of Section 2602 of the Standard Specifications.
8. Submits amended PPP site map according to Section 2602 of the Standard Specifications.

C. Subcontractors:

1. Sign a co-permittee certification statement adhering to the requirements of the NPDES permit and this PPP if: responsible for sediment or erosion controls; involved in land disturbing activities; or performing work that is a source of potential pollution as defined in this PPP. Subcontracted work items are identified in Subcontractor Request Forms (Form 830231). All co-permittees are legally required under the Clean Water Act and the Iowa Administrative Code to ensure compliance with the terms and conditions of this PPP.

110-12
10-20-20

POLLUTION PREVENTION PLAN

2. Implement good housekeeping practices according to Paragraph III, C, 2.

D. RCE/Project Engineer:

1. Is Project Storm Water Manager.
2. On projects where DOT is the Contracting Authority, is current with erosion control training or certification.
3. Takes actions necessary to ensure compliance with storm water requirements including, where appropriate, issuing stop work orders, and directing additional inspections at construction project sites that are experiencing problems with achieving permit compliance.
4. Orders the taking of measures to cease, correct, prevent, or minimize the consequences of non-compliance with the storm water requirements of the Applicable Permit.
5. Supervises all work necessary to meet storm water requirements at the Project, including work performed by contractors and subcontractors.
6. Requires employees, contractors, and subcontractors to take appropriate responsive action to comply with storm water requirements, including requiring any such person to cease or correct a violation of storm water requirements, and to order or recommend such other actions as necessary to meet storm water requirements.
7. Is familiar with the Project PPP and storm water site map.
8. On projects where DOT is Contracting Authority, is responsible for periodically monitoring inspection reports to determine whether deficiencies identified in inspection reports were adequately and timely addressed, and if not, has the authority and responsibility to direct immediate actions to correct the deficiencies.
9. Is the point of contact for the Project for regulatory officials, Inspector, contractors, and subcontractors regarding storm water requirements.
10. Is signature authority on Notice of Discontinuation.
11. Maintains an up-to-date record of contractors, subcontractors, and subcontracted work items through Subcontractor Request Forms (Form 830231).
12. Makes information to determine permit compliance available to the DNR upon their request.

E. Inspector:

1. Updates PPP through fieldbook entries and storm water site inspection reports if there is a change in design, construction, operation, or maintenance which has a significant effect on the discharge of pollutants from the project.
2. Makes information to determine permit compliance available to the DNR upon their request.
3. Conducts joint required inspections of the site with the contractor/subcontractor.
4. Completes an inspection report after each inspection.
5. Is signature authority on storm water inspection reports.

II. PROJECT SITE DESCRIPTION

- A. This Pollution Prevention Plan (PPP) is for the construction of a culvert replacement on Iowa 1 just south of Jones County.
- B. This PPP covers approximately 1 acre with an estimated 0.6 acres being disturbed. The portion of the PPP covered by this contract has 0.6 acres disturbed.
- C. The PPP is located in an area of Dinsdale-Klinger soil association. The estimated weighted average runoff coefficient number for this PPP after completion will be 0.47.
- D. Storm Water Site Map is located in the R sheets. Proposed slopes are shown in cross sections, details, or standard road plans. Supplemental information is located in the Tabulations in the C or CE sheets.
- E. The base storm water site map is amended by contract modifications and progress payments (fieldbook entries) of completed erosion control work. Also, due to project phasing, erosion and sediment controls shown on project plans may not be installed until

POLLUTION PREVENTION PLAN

needed, based on site conditions. For example, silt fence ditch checks will typically not be installed until the ditch has been installed. Installed locations may also be modified from tabulation locations by field staff. Installed locations will be documented by fieldbook entries and amended PPP site map.

F. Runoff from this work will flow into South Fork Walnut Creek.

III. CONTROLS

A. The Contractor's ECIP specified in Article 2602.03 of the Standard Specifications for accomplishment of storm water controls should clearly describe the intended sequence of major activities, and for each activity define the control measure and the timing during the construction process that the measure will be implemented.

B. Preserve vegetation in areas not needed for construction.

C. Sections 2601 and 2602 of the Standard Specifications define requirements to implement erosion and sediment control measures. Actual quantities used and installed locations may vary from the Base PPP and amendment of the plan will be documented via fieldbook entries, amended PPP site map, or by contract modification. Additional erosion and sediment control items may be required as determined by the inspector and/or contractor during storm water site inspections. If the work involved is not applicable to any contract items, the work will be paid for according to Article 1109.03 paragraph B of the Standard Specifications.

1. EROSION AND SEDIMENT CONTROLS

a. Stabilization Practices

- 1) Site plans will ensure that existing vegetation or natural buffers are preserved where attainable and disturbed portions of the site will be stabilized.
- 2) Initialize stabilization of disturbed areas immediately after clearing, grading, excavating, or other earth disturbing activities have:
 - a) Permanently ceased on any portion of the site, or
 - b) Temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days.
- 3) Staged permanent and/or temporary stabilizing seeding and mulching shall be completed as the disturbed areas are completed. Incomplete areas shall be stabilized according to paragraph III, C, 1, a, 2, b above.
- 4) Permanent and Temporary Stabilization practices to be used for this project are located in the storm water site map, Estimated Project Quantities (100-0A, 100-1A, or 100-1C), and Estimate Reference Information (100-4A) located in the C or R sheets. Typical drawings detailing construction of the practices to be used on this project are referenced in the Standard Road Plans Tabulation (105-4) in the C or R sheets.
- 5) Preservation of existing vegetation within right-of-way or easements will act as vegetative buffer strips.
- 6) Preservation of topsoil: Bid items to be used for this project are located in the Estimated Project Quantities (100-0A, 100-1A, or 100-1C) and Estimate Reference Information (100-4A) located in the C or R sheets. Additional information may be found in the Tabulations in the C or T Tabulation sheets, or is referenced in Section 2105 of the Standard Specifications.

b. Structural Practices

- 1) Structural practices will be implemented to divert flows from exposed soils and detain or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Additionally, structural practices may include: silt basins that provide 3600 cubic feet of storage per acre drained or equivalent sediment controls, outlet structures that withdraw water from surface when discharging basins, and controls to direct storm water to vegetated areas.
- 2) Structural practices to be used for this project are located in the storm water site map, Estimated Project Quantities (100-0A, 100-1A, or 100-1C), and Estimate Reference Information (100-4A) located in the C or R sheets, as well as all other item specific Tabulations. Typical drawings detailing construction of the devices to be used on this project can be found on the B or R sheets or are referenced in the Standard Road Plans Tabulation (105-4) located in the C or R sheets.

c. Storm Water Management

Measures shall be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed. This may include velocity dissipation devices at discharge locations and along length of outfall channel as necessary to provide a non-erosion velocity flow from structure to water course. If included with this project, these items are located in the storm water site map and Estimated Project Quantities (100-0A, 100-1A, or 100-1C) and Estimate Reference Information (100-4A) located in the C or R sheets, as well as all other item specific Tabulations. Typical drawings detailing construction of the practices to be used on this project are referenced in the Standard Road Plans Tabulation. The installation of these devices may be subject to Section 404 of the Clean Water Act.

2. OTHER CONTROLS

Contractor disposal of unused construction materials and construction material wastes shall comply with applicable state and local waste disposal, sanitary sewer, or septic system regulations. In the event of a conflict with other governmental laws, rules and regulations, the more restrictive laws, rules or regulations shall apply.

- a. Vehicle Entrances and Exits - Construct and maintain entrances and exits to prevent tracking of sediments onto roadways.
- b. Material Delivery, Storage and Use - Implement practices to prevent discharge of construction materials during delivery, storage, and use.
- c. Stockpile Management - Install controls to reduce or eliminate pollution of storm water from stockpiles of soil and paving.
- d. Waste Disposal - Do not discharge any materials, including building materials, into waters of the state, except as authorized by a Section 404 permit.
- e. Spill Prevention and Control - Implement chemical spill and leak prevention and response procedures to contain and clean up spills and prevent material discharges to the storm drain system and waters of the state.
- f. Concrete Residuals and Washout Wastes - Waste shall not be discharged to a surface water and is not allowed to adversely affect a water of the state. Designate temporary concrete washout facilities for rinsing out concrete trucks. Provide directions to truck drivers where designated washout facilities are located. Designated washout areas should be located at least 50 feet away from storm drains, streams or other water bodies. Care should be taken to ensure these facilities do not overflow during storm events.
- g. Concrete Grooving/Grinding Slurry - Do not discharge slurry to a waterbody or storm drain. Slurry may be applied on foreslopes or removed from the project.
- h. Vehicle and Equipment Storage and Maintenance Areas - Perform on site fueling and maintenance in accordance with all environment laws such as proper storage of onsite fuels and proper disposal of used engine oil or other fluids on site. Employ washing practices that prevent contamination of surface and ground water from wash water. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge.
- i. Litter Management - Ensure employees properly dispose of litter. Minimize exposure of trash if exposure to precipitation or storm water would result in a discharge of pollutants.
- j. Dewatering - Properly treat water to remove suspended sediment before it re-enters a waterbody or discharges off-site. Measures are also to be taken to prevent scour erosion at dewatering discharge point.

3. APPROVED STATE OR LOCAL PLANS

During the course of this construction, it is possible that situations will arise where unknown materials will be encountered. When such situations are encountered, they will be handled according to all federal, state, and local regulations in effect at the time.

POLLUTION PREVENTION PLAN

IV. MAINTENANCE PROCEDURES

The Contractor is required to maintain all temporary erosion and sediment control measures in proper working order, including cleaning, repairing, or replacing them throughout the contract period. This shall begin when the features have lost 50% of their capacity.

V. INSPECTION REQUIREMENTS

- A. Inspections shall be made jointly by the Contractor and the Contracting Authority's inspector at least once every seven calendar days. Storm water site inspections will include:
1. Date of the inspection.
 2. Summary of the scope of the inspection.
 3. Name and qualifications of the personnel making the inspection.
 5. Review of erosion and sediment control measures within disturbed areas for the effectiveness in preventing impacts to receiving waters.
 6. Major observations related to the implementation of the PPP.
 7. Identification of corrective actions required to maintain or modify erosion and sediment control measures.
- B. Include storm water site inspection reports in the Amended PPP. Incorporate any additional erosion and sediment control measures determined as a result of the inspection. Immediately begin corrective actions on all deficiencies found within 3 calendar days of the inspection and complete within 7 calendar days following the inspection. If it is determined that making the corrections less than 72 hours after the inspection is impracticable, it should be documented why it is impracticable and indicate an estimated date by which the corrections will be made.

VI. NON-STORM WATER DISCHARGES

This includes subsurface drains (i.e. longitudinal and standard subdrains) and slope drains. The velocity of the discharge from these features may be controlled by the use of headwalls or blocks, Class A stone, erosion stone or other appropriate materials. This also includes uncontaminated groundwater from dewatering operations, which will be controlled as discussed in Section III of the PPP.

VII. POTENTIAL SOURCES OF OFF RIGHT-OF-WAY (ROW) POLLUTION

Silts, sediment, and other forms of pollution may be transported onto highway right-of-way (ROW) as a result of a storm event. Potential sources of pollution located outside highway ROW are beyond the control of this PPP. Pollution within highway ROW will be conveyed and controlled per this PPP.

VIII. DEFINITIONS

- A. Base PPP - Initial Pollution Prevention Plan.
- B. Amended PPP - Base PPP amended during construction. May include Plan Revisions or Contract Modifications for new items, storm water site inspection reports, fieldbook entries made by the inspector, amended PPP site map by the Contractor, ECIP, NOI, co-permittee certifications, and Subcontractor Request Forms. Items amending the PPP are stored electronically and are readily available upon request.
- C. Fieldbook Entries - This contains the inspector's daily diary and bid item postings.
- D. Controls - Methods, practices, or measures to minimize or prevent erosion, control sedimentation, control storm water, or minimize contaminants from other types of waste or materials. Also called Best Management Practices (BMPs).
- E. Signature Authority - Representative authorized to sign various storm water documents.

CERTIFICATION STATEMENT






I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



Signature

Printed or Typed Name

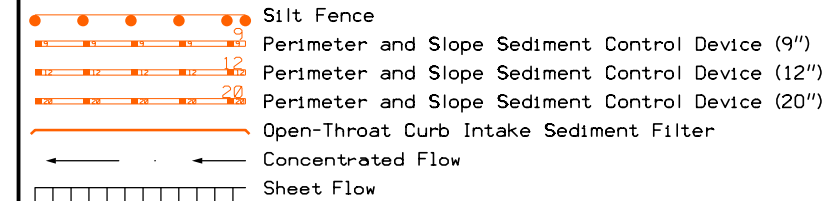
Signature

PLAN VIEW COLOR LEGEND OF EROSION CONTROL SHEETS

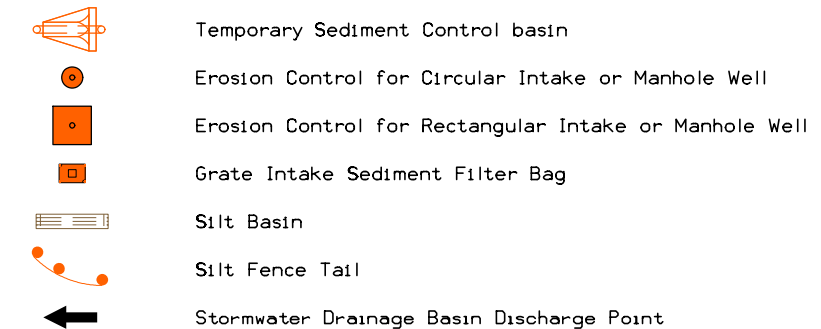
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Green	(2)		Existing Topographic Features and Labels
Blue	(1)		Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)		Existing Utilities
Black	(0)		Permanent Erosion Control Features
Blaze Orange	(222)		Temporary Erosion Control Features

SHADING		Design Color No.		Transparency
Citron	(234)		Mulching, All Types	50%
Light Brown	(238)		Special Ditch Control, Wood Excelsior Mat	0%

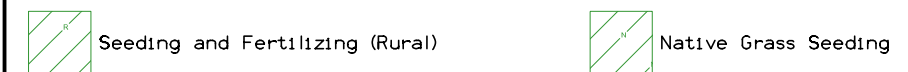
LINE STYLE LEGEND OF EROSION CONTROL SHEETS



CELL LEGEND OF EROSION CONTROL SHEETS



PATTERN LEGEND OF EROSION CONTROL SHEETS



EROSION CONTROL LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES R)

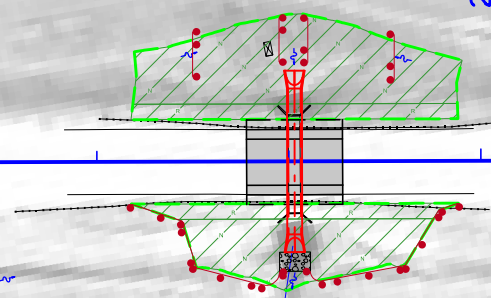
LINN TWP.
T-83N R-5W
SEC. 13

Sta. 284+03.00
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F.L. Lt. = 869.85
F.L. Rt. = 867.85

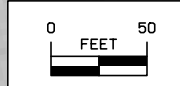
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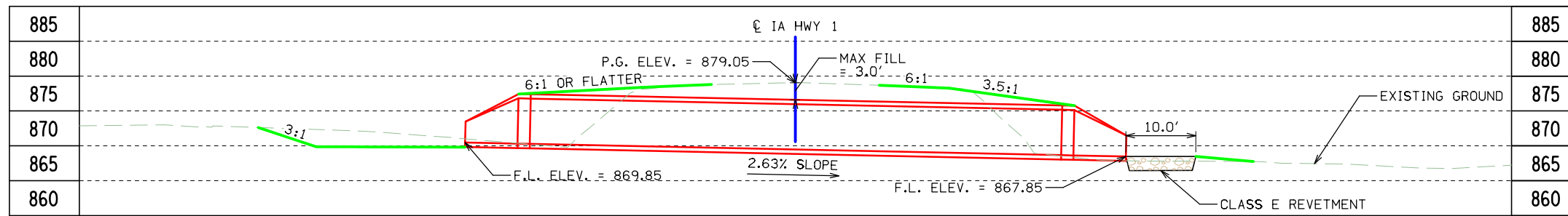
285

290



Sta. 284+03
6'x6'x51.5' RCB
DA=249 AC - R-H
(Remove)





LONGITUDINAL SECTION ALONG CULVERT

BENCH MARK NO. C910
 ELEV. = 889.337
 STA. 53+67.35, 20.73' RT
 IRS RED CAP



HYDRAULIC DATA
 DRAINAGE AREA = 271.9 ACRES HILLY
 Q₅₀ = 360.9 CFS

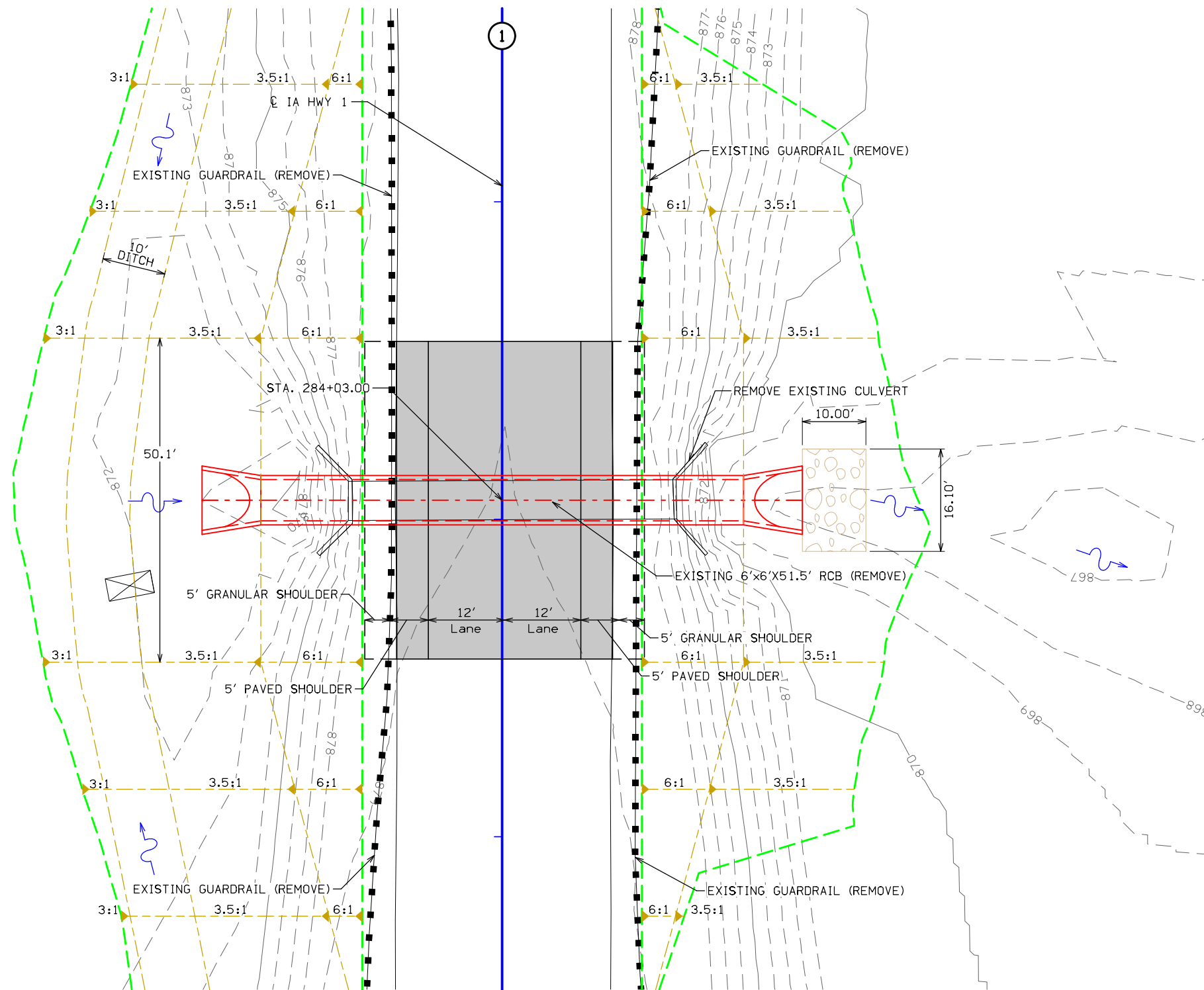
LOCATION

T-83N R-5W
 SECTION 13
 LINN TWP.
 LINN COUNTY

284+50

284+00

283+50



PLAT PLAN

DESIGN FOR 0° SKEW
78" X 76'
REINFORCED
CONCRETE PIPE CULVERT
PLAT PLAN
 STA. 284+03.00 C Iowa Hwy 1
 LINN COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. ___ OF ___ FILE NO. ___ DESIGN NO. ___
 Apr. 19, 2022