

Standard Road Plans

Standard Road Plans are listed on sheet number C.6.

Design Data Rural

2024 AADT	3080	V.P.D.
Trucks	16	%
Total 20-yr ESALs	-	

Iowa DOT Bridges and Structures
Consultant Coordinator Contact:
Lili Yang

Index of Seals

Sheet No.	Name	Type
A.1	Samantha L. Wermager	Structural Design
B.1	Cheryl L. Bornheimer Kelley	Roadway Design

Structural 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.

Samantha L. Wermager

Signature Samantha L. Wermager

Printed or Typed Name

My license renewal date is December 31, 2027

Pages or sheets covered by this seal: Sheets A.1-A.2, V.1-V.12



PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM
CASS COUNTY
BRIDGE APPROACH REPAIR

US 71 over Lone Tree Creek
0.1 mi. S. of Co. Rd. G35

Refer to the Plan Sheets for list of applicable specifications.

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



Revisions

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No.	Description
Sheets Bridge Plan	
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A.2	Location Map Sheet
V.1 Estimated Quantities - Design No. 130	
V.1 - V.12	Design No. 130
Road Sheets Road Plan	
B.1 - J.14	Road Plans
C.1 - C.2	Estimated Quantities - Road
C.6	Standard Plans - Road

PROJECT IDENTIFICATION NUMBER

25-15-071-010

PROJECT NUMBER

BRFN-071-3(060)--39-15

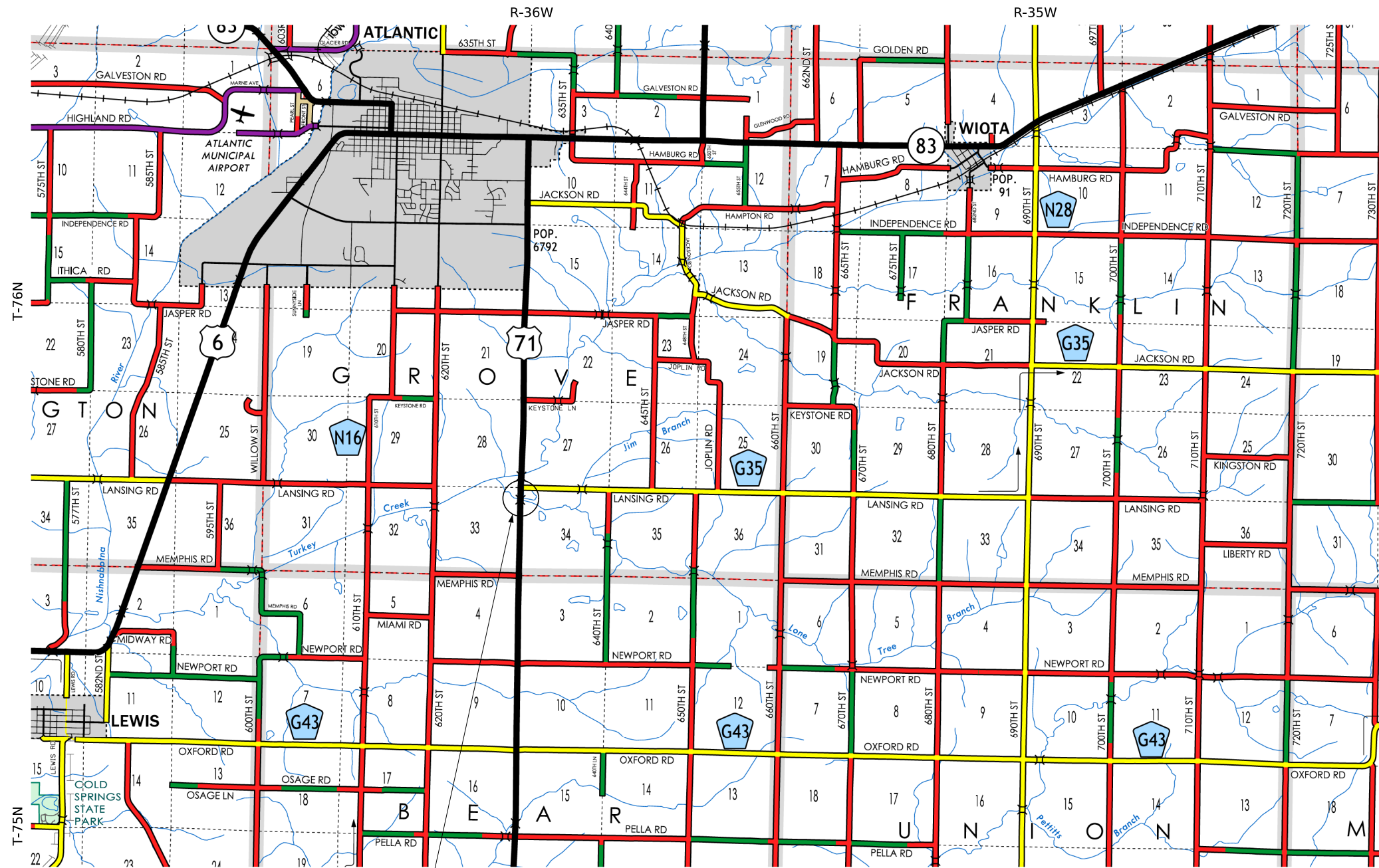
R.O.W. PROJECT NUMBER

PROJECT DIRECTORY NUMBER

1507101025

TOTAL

45



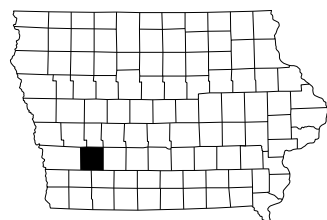
Design No. 130
FHWA No. 17550

Cass County Location Map

Not To Scale

LEGEND

- INTERSTATE HIGHWAY
- PRIMARY HIGHWAY-DIVIDED
- PRIMARY HIGHWAY
- PORTLAND CEMENT CONCRETE ROAD
- ASPHALT ROAD
- BITUMINOUS ROAD
- GRAVEL ROAD
- EARTHEN ROAD
- INTERSTATE HIGHWAY
- UNITED STATES HIGHWAY
- STATE HIGHWAY
- COUNTY HIGHWAY
- RAILROAD
- PIPELINE
- AIRPORT
- HYDROLOGY
- BRIDGE
- STATE BOUNDARY
- COUNTY BOUNDARY
- CORPORATE BOUNDARY
- TOWNSHIP LINE
- SECTION LINE
- ROAD NAMES
- UNINCORPORATED PLACE
- STATE PARKS
- STATE INSTITUTIONS
- FEDERAL LAND



Estimated Bridge Repair Quantities and Reference Notes - Design #130						
Item No.	Item Code	Item	Unit	Quantities Estimated Design No. 130	Quantities As-Built Design No. 130	Estimate Reference Notes
1	2301-0685550	Bridge Approach Pavement, As Per Plan	SY	428.5		Includes 144.5 CY fiber reinforced concrete and 35,864 Lbs. epoxy-coated reinforcing for approach slabs. Concrete and epoxy-coated reinforcing steel for grade beams and HP 10x57 Piles at grade beams are not included. Includes excavation, modified subbase, polymer grid, tie bars at 'RT' joints, drilling of holes in existing PCC pavement at 'RT' joints and joint material required. Includes the cost of any temporary earth retaining systems needed for staged construction.
2	2401-6750001	Removals, As Per Plan	LS	1.00		Includes all work for removal and off-site disposal of the existing south approach slab, and portions of the existing approach pavement which lie within the limits of the proposed approach slab. Removal of scheduled items shall be in accordance with Section 2401, of the Standard Specifications. Any damage to material not to be removed shall be the responsibility of the Contractor and repaired at no extra cost to the state. Contractor to add the following information when submitting the Iowa DNR "Notification of Bridge Demolition and Renovation" form: Name of Asbestos Inspector: Steve McCauley Date Inspected: 5/14/2008 IA License Number: Iowa DOT Inspector Phone: 515-239-1387 Procedure used to detect the presence of asbestos materials: Polarized Light Microscopy (PLM)
3	2403-0100010	Structural Concrete (Bridge)	CY	51.5		Includes costs of excavation, formwork, and all other labor and materials necessary for construction of grade beams per the plans. Class C concrete shall be used. Reinforcing steel and piles not included.
4	2403-1000005	Fiber Reinforcement for Structural Concrete	CY	144.5		Fiber reinforcing shall be used in bridge approach slab concrete. Refer to Developmental Specifications for "Fiber Reinforcement for Structural Concrete" for additional information.
5	2403-1000010	Trial Batch and Test Placement (Fiber Reinforced Concrete)	LS	1		Refer to Developmental Specifications for "Fiber Reinforcement for Structural Concrete" for additional information.
6	2404-7775005	Reinforcing Steel, Epoxy Coated	LB	9,460		Includes all labor and materials for necessary to provide grade beam reinforcing steel per the plans.
7	2412-0000100	Longitudinal Grooving in Concrete, Bridge Approach	SY	374.2		-
8	2501-0201057	Piles, Steel, HP 10 x 57	LF	1,920		-
9	2501-6335010	Prebored Holes	LF	240		-
10	2506-4984000	Flowable Mortar	CY	2.0		-
11	2507-6799000	Bank Shaping	LS	1.00		Includes all necessary shaping, excavation, filling, and compacting to the limits shown in these plans to achieve a smooth, consistent slope.
12	2526-8285040	Construction Survey, Location Survey	LS	1.00		-
13	2533-4980005	Mobilization	LS	1.00		-

General Notes:

This design is for repairs to the existing 310'-8" x 44'-0" Pretensioned Prestressed Concrete Beam Bridge on US-71 over Lone Tree Creek. Electronic copies of original design and repair plans will be made available to the Contractor as part of the e-files supplied with the contract documents. See Design Sheet 2 for list of repair items.

All alignment, stationing, connecting dimensions, and elevations used in the new details in these plans were developed based on the original bridge plans (Design No. 369) and the repair plans (Design No. 218). The Contractor shall field verify these details before starting construction.

Faint lines on plans indicate existing portions of the bridge.

Utility companies whose facilities are shown on the plans or known to be within the construction limits shall be notified by the Contractor of the construction starting date.

Minimum clear distance from face of concrete to near reinforcing bar is to be 2" unless otherwise noted or shown.

These bridge plans label all reinforcing steel with english notation (5a1 is 5⁄8 inch diameter bar). English reinforcing steel received in the field may display the following "Bar Designation". The "Bar Designation" is the stamped impression on the reinforcing bars, and is equivalent to the bar diameter in millimeters.

English Size	3	4	5	6	7	8	9	10	11
Bar Designation	10	13	16	19	22	25	29	32	36

All reinforcing bars and bars noted as dowels supplied for this structure shall be deformed reinforcement unless otherwise noted or shown.

Keyway dimensions shown on these plans are based nominal dimensions unless stated otherwise. In addition, the bevel used on the keyway shall be limited to a maximum of 10 degrees from vertical.

Construction shall be done in stages with at least one lane traffic maintained at all times in accordance with "Traffic Control Plan" note.

Construction stages 1 & 2 as detailed on these plans may be reversed at the contractor's option subject to the Engineer's approval. Estimate of Roadway tabulations based on staging as shown.

The Contractor shall construct new bridge approach pavement as noted and shown. The price bid for "Bridge Approach, As Per Plan" shall be full compensation for furnishing and installing P.C. concrete approach pavement, including excavation, reinforcing steel, and joint material required.

Bank Shaping Notes:

The Contractor shall shape, trim, and dress the berm at the north abutment as directed by the Engineer. Existing high and low areas shall be cut or filled and compacted to create a more even berm surface. Costs for all equipment, material, and labor to perform this work are included in the lump sum unit price for "Bank Shaping" and no additional measurement or payment shall be made.

Pile Notes:

The contract length of 80 feet for the south approach piles is based on a cohesive soil classification, a total factored axial load per pile (Pu) of 155 kips, and a geotechnical resistance factor (phi) of 0.65 for soil and 0.65 for rock end bearing.

The nominal axial bearing resistance for construction control was determined from a cohesive soil classification and a geotechnical resistance factor (phi) of 0.65 for soil and 0.65 for rock end bearing. Piles are assumed to be driven from a start elevation at the bottom of prebore.

The required nominal axial bearing resistance for south approach piles is 119 tons at end of drive. The pile contract length shall be driven as per plan unless piles reach refusal. Construction control requires a WEAP analysis with bearing graph.

Specifications:

Design:
AASHTO series of 2002.

Construction:
Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, Series 2023, plus applicable General Supplemental Specifications, Developmental Specifications, Supplemental Specifications and Special Provisions shall apply to construction work on this project.
- Developmental Specification for "Fiber Reinforcement for Structural Concrete"

Design Stresses:

Design stresses for the following materials are in accordance with the AASHTO Standard Specifications for Highway Bridges, Series of 2002.

Reinforcing steel in accordance with Section 8, Grade 60.

Concrete in accordance with Section 8, f'c = 4.0 ksi.

Structural steel in accordance with AASHTO Section 10. ASTM A709 Grade 50. (AASHTO M270 Grade 50).

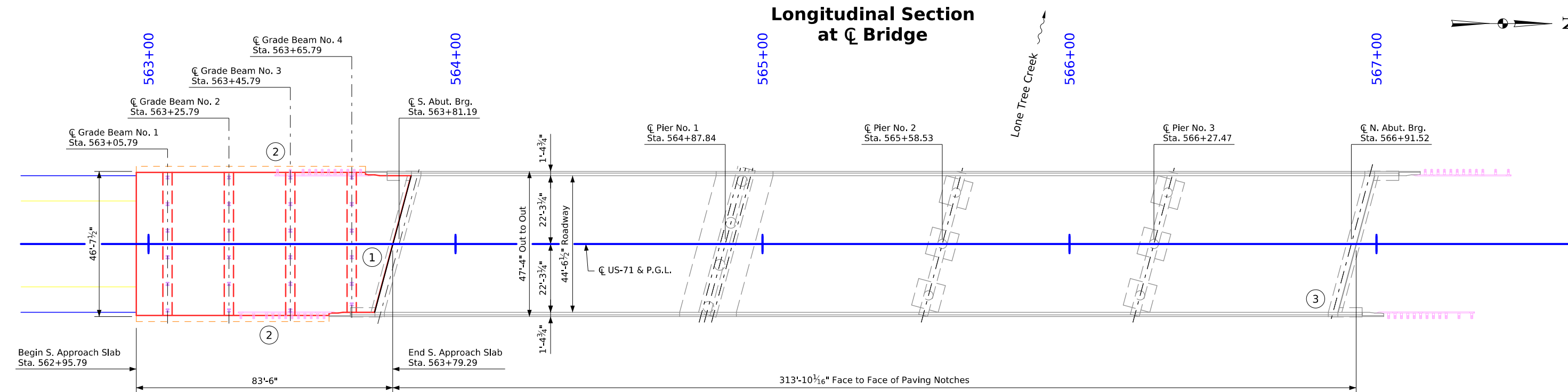
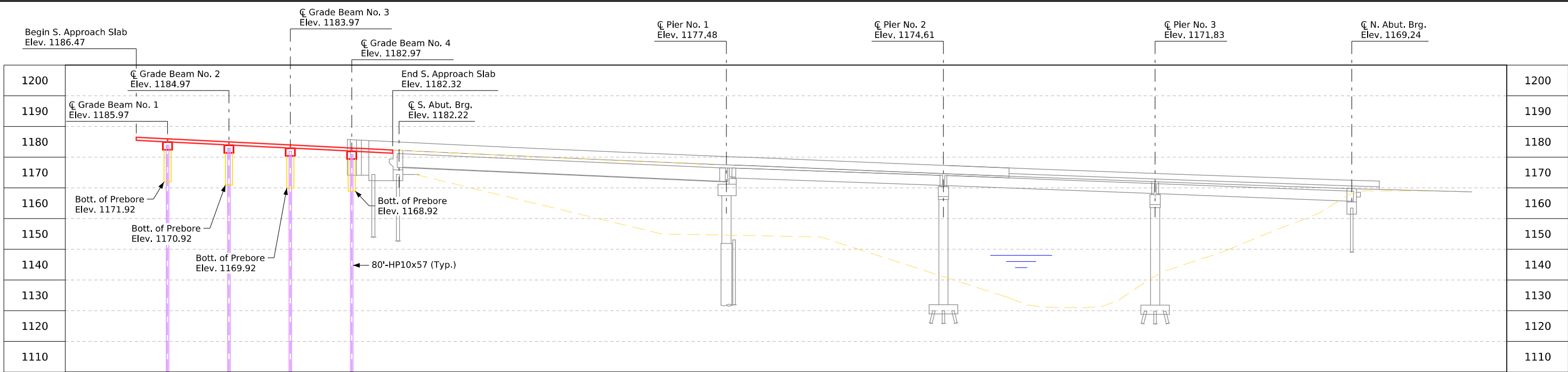
Contractor shall perform a construction survey to confirm that site conditions match the as-built profile grade information shown on Design Sheet 2. The designer relied on this profile information which was provided by Iowa DOT. The Contractor has the duty to verify this information, and inform the Engineer of any deviation(s) in profile elevations as compared to these plans.

Design History at this Site (Includes this Design)	
Des. No.	Type of Work
369	Original Constructed in 1969
1189	Retrofit Barrier Rail in 1989
207	Paving Notch Replacement in 2007
312	Bridge Deck Repair and Overlay in 2012
218	Lengthen PPCB Bridge
130	Approach Slab Repair

Roadway quantities shown elsewhere in these plans.

Traffic Control Plan
The roadway will be open to thru traffic. Refer to the Traffic Control Plan shown elsewhere in these plans.

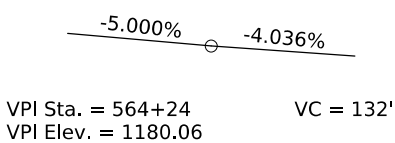
Design For Repair to 15° Skew (L.A.)
310'-8" x 44'-0" Pretensioned Prestressed Concrete Beam Bridge
106'-8" & 64'-1" End Spans70'-8" & 68'-11" Interior Spans
Estimated Quantities and General Notes
STA. 565+36.18 (US 71)Turn-In Date: August 2026
Cass County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 130Design Sheet No. 1 of 12FHWA No. 17550



Situation Plan

Repairs shall consist of:

- 1 Remove and replace south approach slab with non-standard approach slab. Reuse existing paving notch.
- 2 Remove and reinstall existing guardrail at south approach as necessary for approach slab replacement. See Roadway plans.
- 3 Repair undermining at the east side of the north abutment.

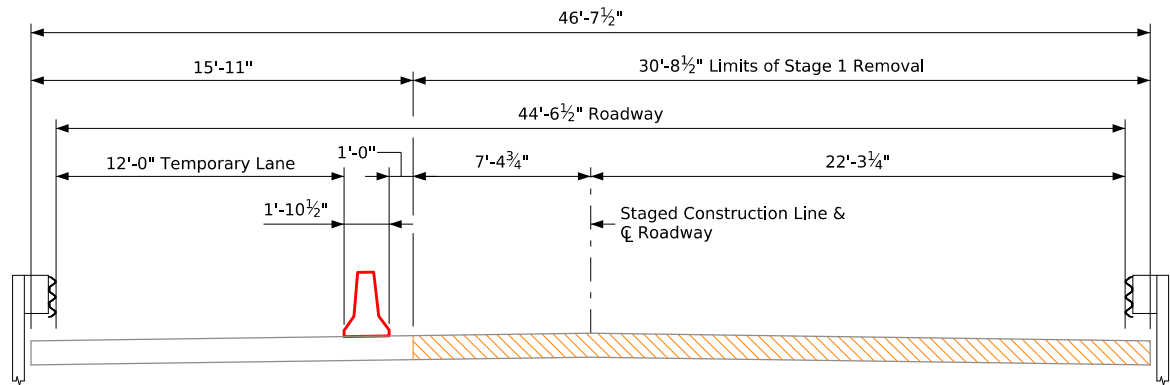


As-Built Profile
Grade

Location

US 71 over Lone Tree Creek
T-76N R-36W
Section 33/34
Grove Township
Cass County
FHWA No. 17550
Bridge Maint. No. 1554.95071
Latitude 41.343719°
Longitude -94.984549°

Design For Repair to 15° Skew (L.A.)
310'-8" x 44'-0" Prestressed Concrete Beam Bridge
106'-8" & 64'-1" End Spans 70'-8" & 68'-11" Interior Spans
Situation Plan
STA. 565+36.18 (US 71) Turn-in Date: August 2026
Cass County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 130 Design Sheet No. 2 of 12 FHWA No. 17550

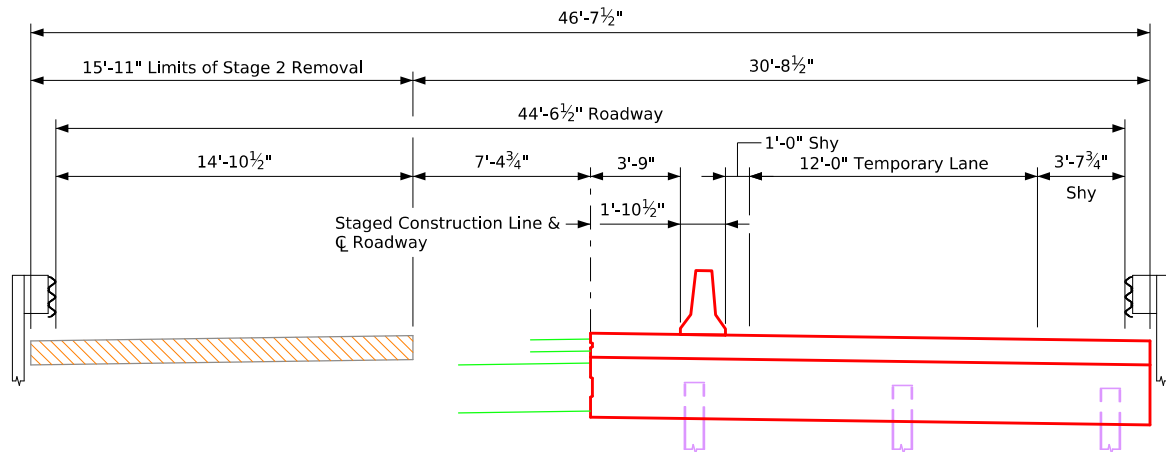


Stage 1 Removal

(Looking North, near Grade Beam 3)

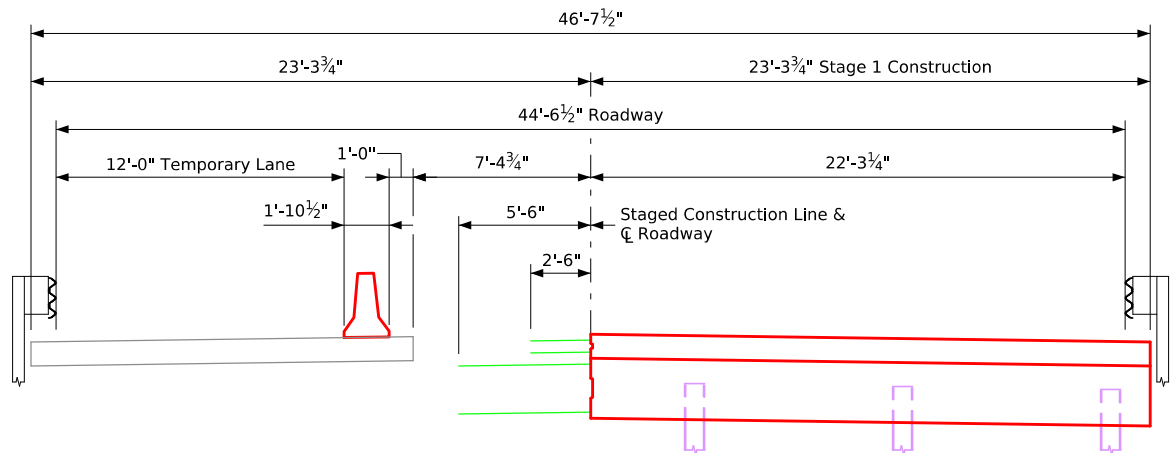
Legend

 Removal



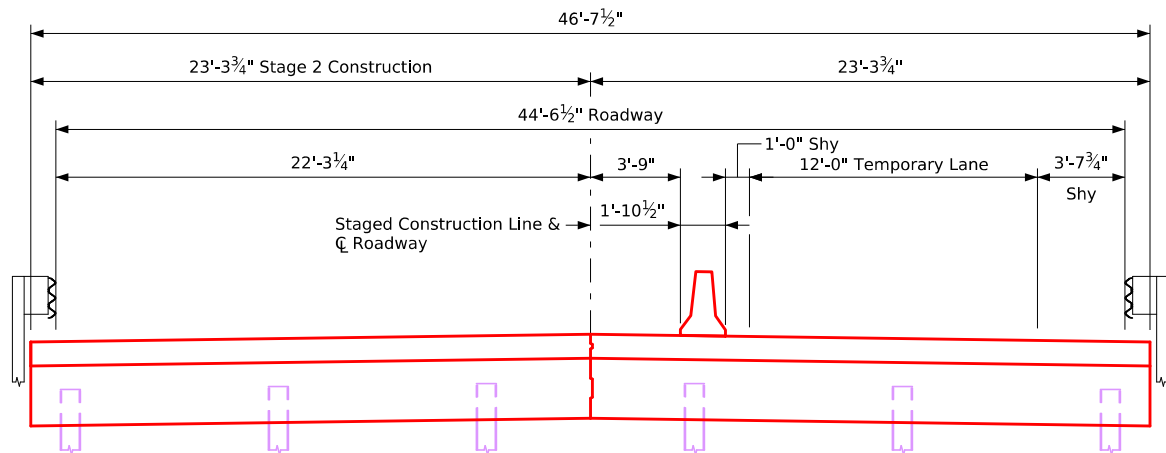
Stage 2 Removal

(Looking North, near Grade Beam 3)



Stage 1 Construction

(Looking North, near Grade Beam 3)



Stage 2 Construction

(Looking North, near Grade Beam 3)

Note:

Temporary barrier rail shall be pinned to existing approach slab in Stage 1 only.

Design For Repair to 15° Skew (L.A.)

**310'-8" x 44'-0" Prestensioned
Prestressed Concrete Beam Bridge**

106'-8" & 64'-1" End Spans 70'-8" & 68'-11" Interior Spans

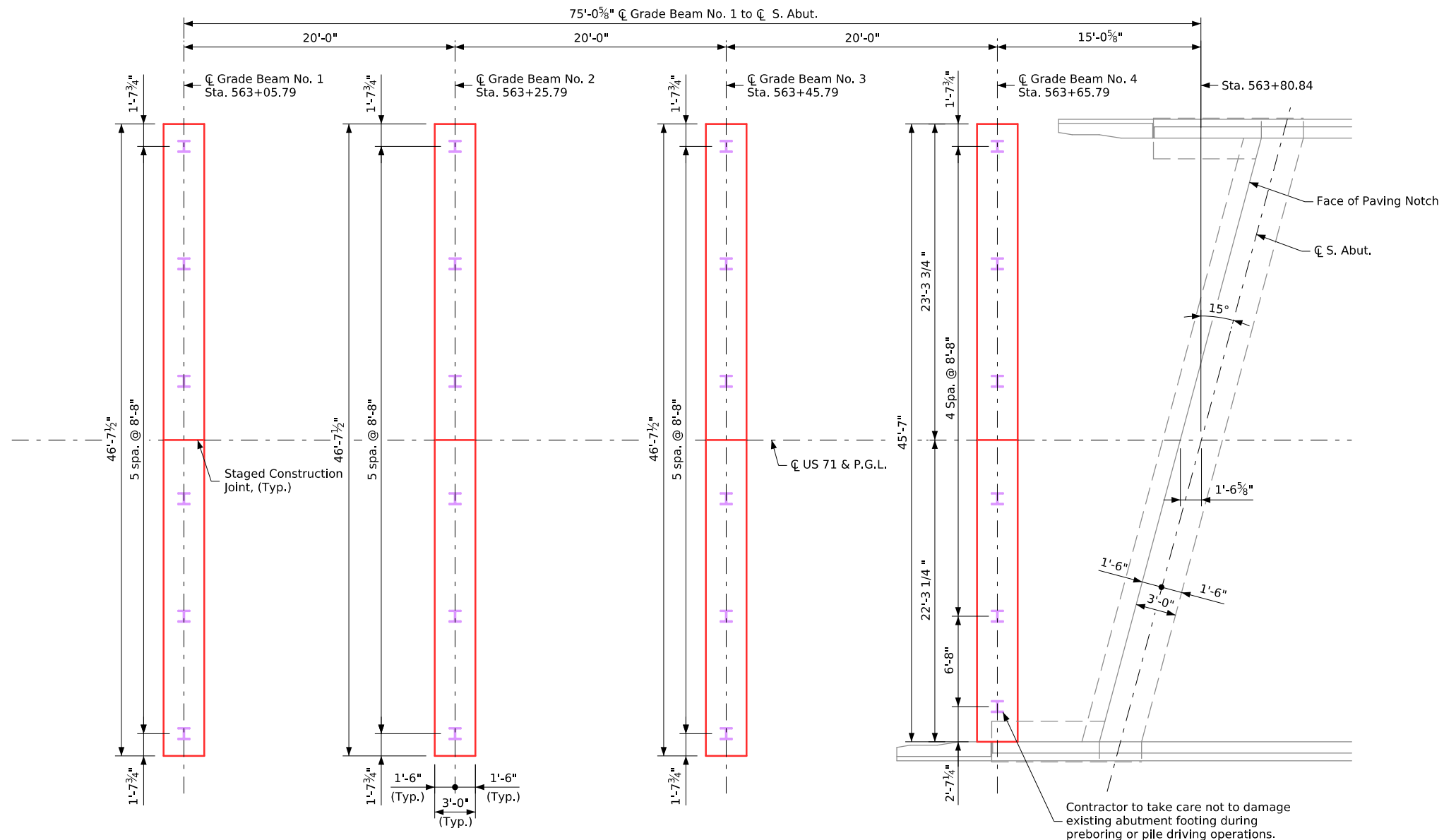
Stage & Construction Details

STA. 565+36.18 (US 71) Turn-in Date: August 2026

Cass County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 130 Design Sheet No. 3 of 12 FHWA No. 17550



Staking Diagram

Design For Repair to 15° Skew (L.A.)

**310'-8" x 44'-0" Pretensioned
Prestressed Concrete Beam Bridge**

106'-8" & 64'-1" End Spans 70'-8" & 68'-11" Interior Spans

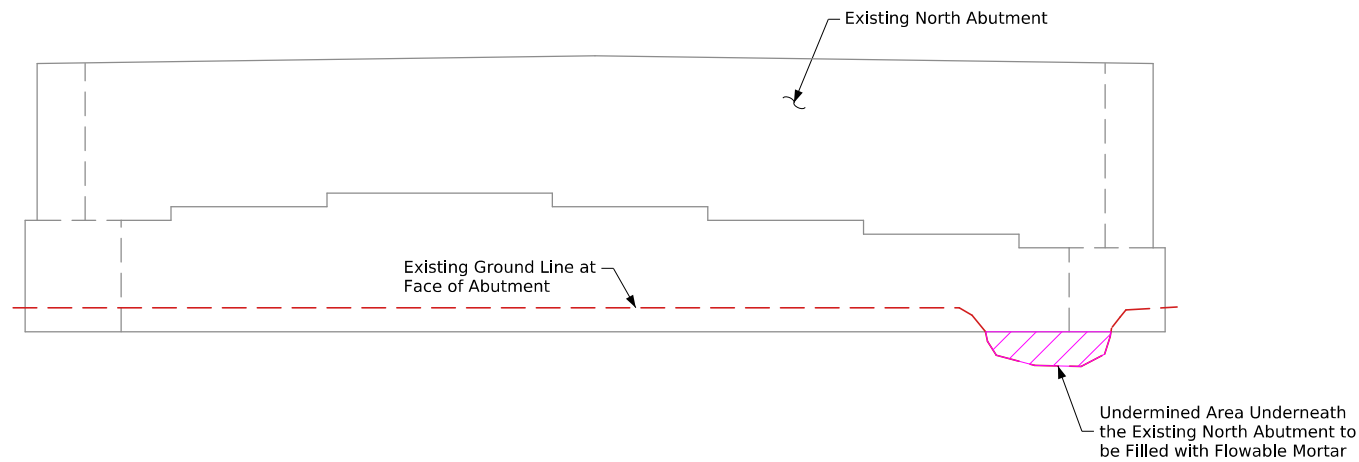
Staking Diagram

STA. 565+36.18 (US 71) Turn-In Date: August 2026

Cass County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 130 Design Sheet No. 4 of 12 FHWA No. 17550



North Abutment Undermining Repair Detail



North Abutment Undermining

North Abutment Undermining Repair Notes:

Flowable mortar shall be in accordance with Section 2506 of the Standard Specifications. Approximate quantity of flowable mortar is 2.0 CY.

The flowable mortar shall fill all open gaps under and behind the footing and around pile.

Prior to placing flowable mortar the Engineer shall inspect and approve all areas to be filled with flowable mortar.

Design For Repair to 15° Skew (L.A.)

310'-8" x 44'-0" Prestensioned
Prestressed Concrete Beam Bridge

106'-8" & 64'-1" End Spans70'-8" & 68'-11" Interior Spans

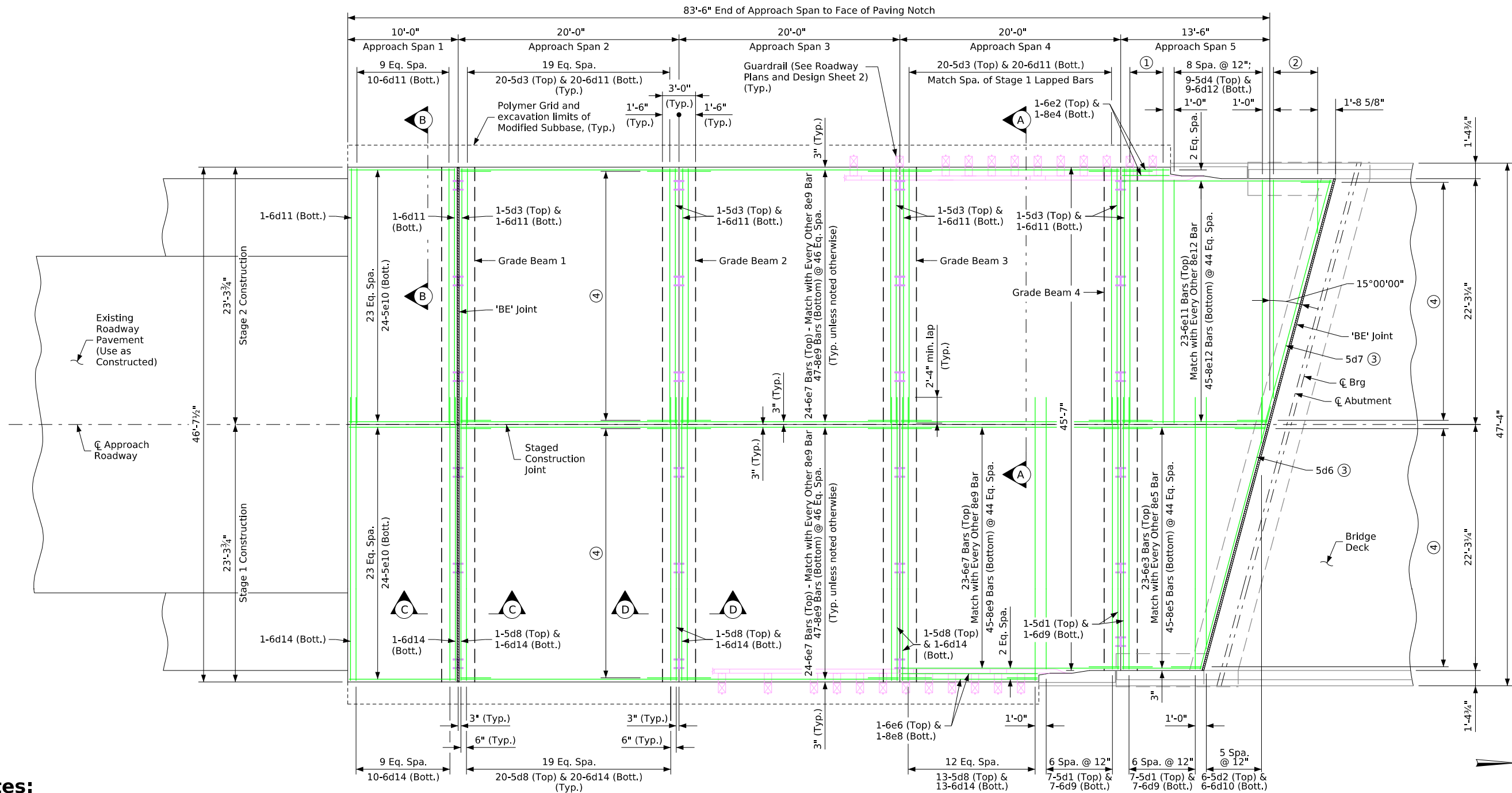
Undermining Repair Details

STA. 565+36.18 (US 71)Turn-In Date: August 2026

Cass County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 130Design Sheet No. 5 of 12FHWA No. 17550



Notes:

See Design Sheet 11 for grade beam reinforcing, including bars which extend into approach slab.

See Design Sheet 9 for Sections A-A and B-B.

See Design Sheet 12 for Sections C-C and D-D.

- ① 3 Spa. @ 12"; 4-5d3 (Top) & 4-6d11 (Bott.)
- ② 4 Spa. @ 12"; 5-5d5 (Top) & 5-6d13 (Bott.)
- ③ To be placed mid-height of approach slab along skew. See Design Sheet 8.
- ④ 4e1 Bar at Each 6e Bar, Typ. at the Beginning and End of Approach Spans 2, 3, 4 & 5.

South Approach Slab Reinforcing

(Grade beam reinforcing not shown for clarity)

Design For Repair to 15° Skew (L.A.)

310'-8" x 44'-0" Prestressed Concrete Beam Bridge

106'-8" & 64'-1" End Spans 70'-8" & 68'-11" Interior Spans

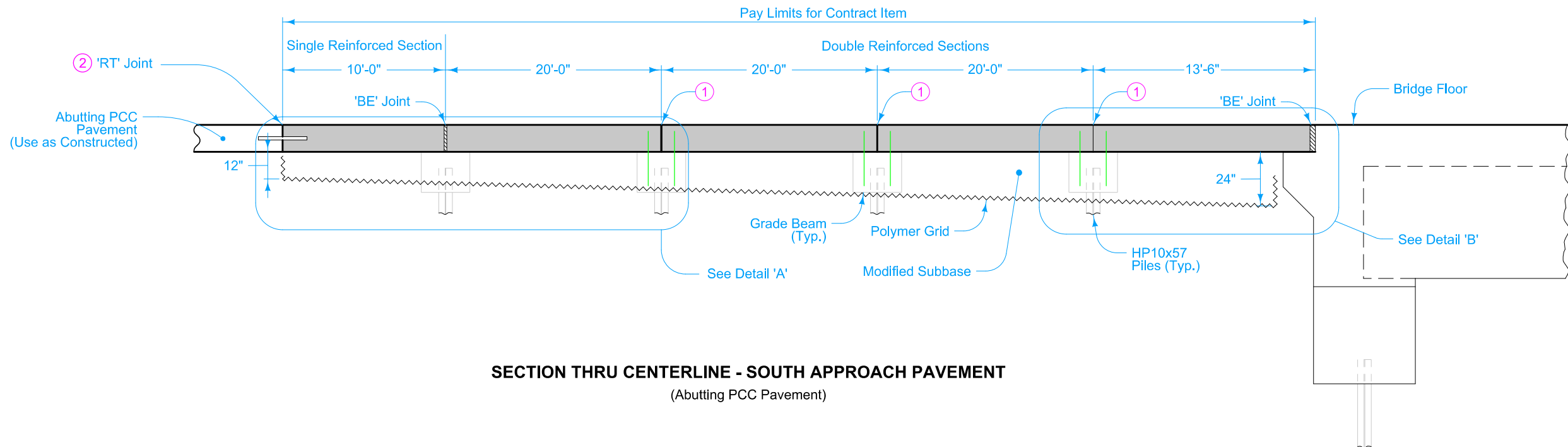
S. Approach Slab - Plan

STA. 565+36.18 (US 71) Turn-In Date: August 2026

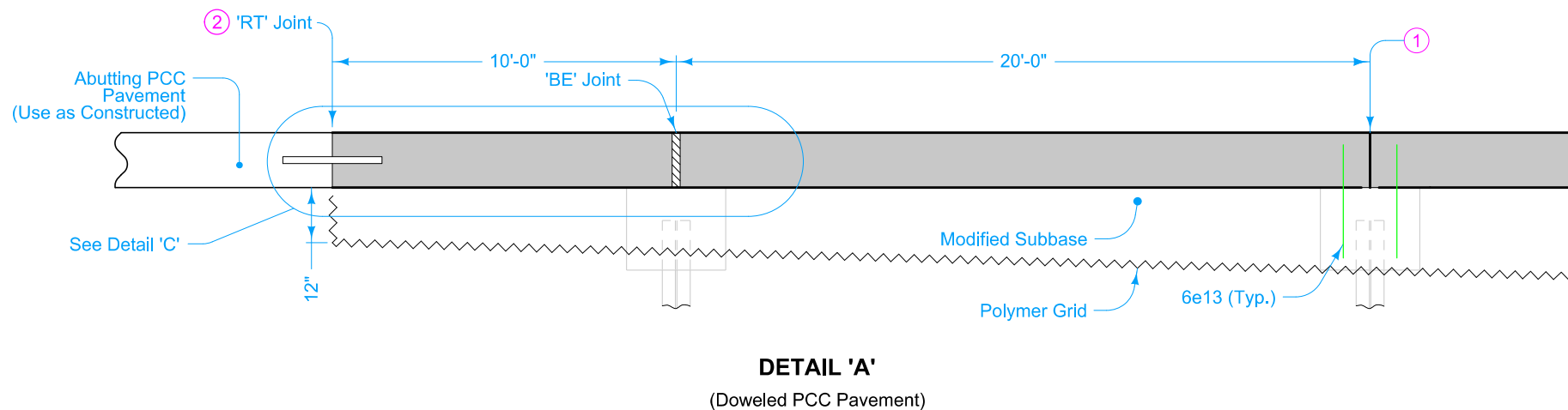
Cass County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 130 Design Sheet No. 6 of 12 FHWA No. 17550



SECTION THRU CENTERLINE - SOUTH APPROACH PAVEMENT
(Abutting PCC Pavement)



DETAIL 'A'
(Doweled PCC Pavement)

Notes:

For Details 'B' and 'C', see Design Sheet 8.

For 'BE' Joint Detail, see Design Sheet 8.

- ① 1/4" Resilient Joint Filler and Seal Top
- ② Refer to PV-101 for 'RT' Joint details and notes.
Tie Bars at 'RT' Joint shall be considered subsidiary to 'Bridge Approach Pavement, As Per Plan'.

Design For Repair to 15° Skew (L.A.)

**310'-8" x 44'-0" Pretensioned
Prestressed Concrete Beam Bridge**

106'-8" & 64'-1" End Spans 70'-8" & 68'-11" Interior Spans

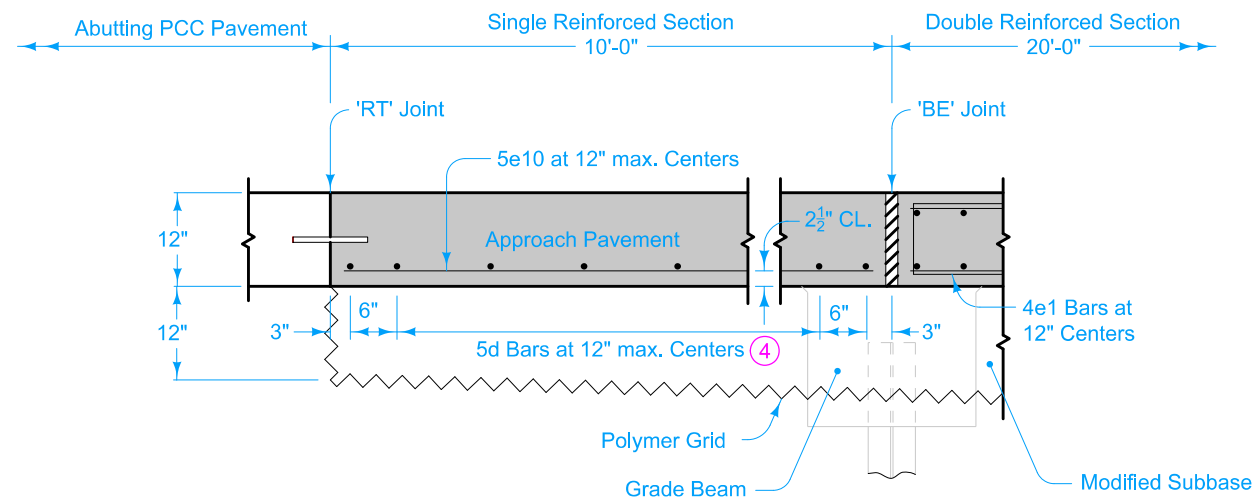
Modified BR-203 (1 of 3)

STA. 565+36.18 (US 71) Turn-In Date: August 2026

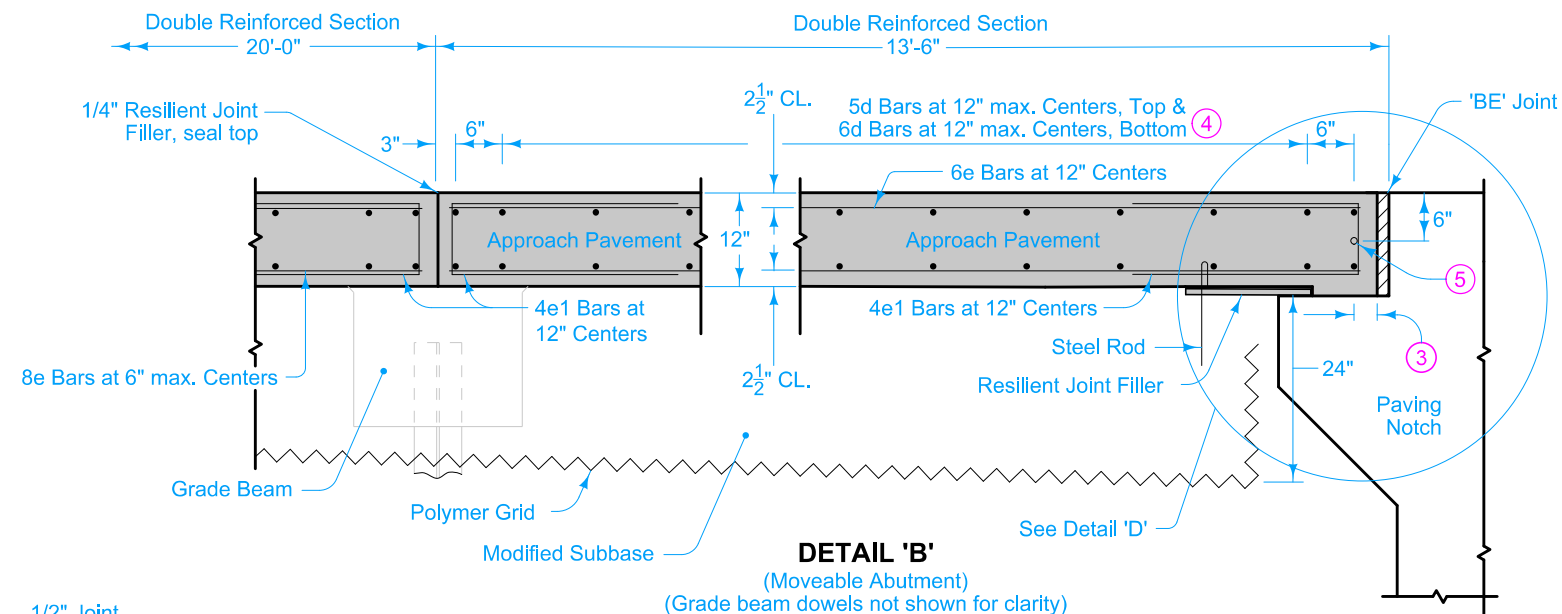
Cass County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 130 Design Sheet No. 7 of 12 FHWA No. 17550

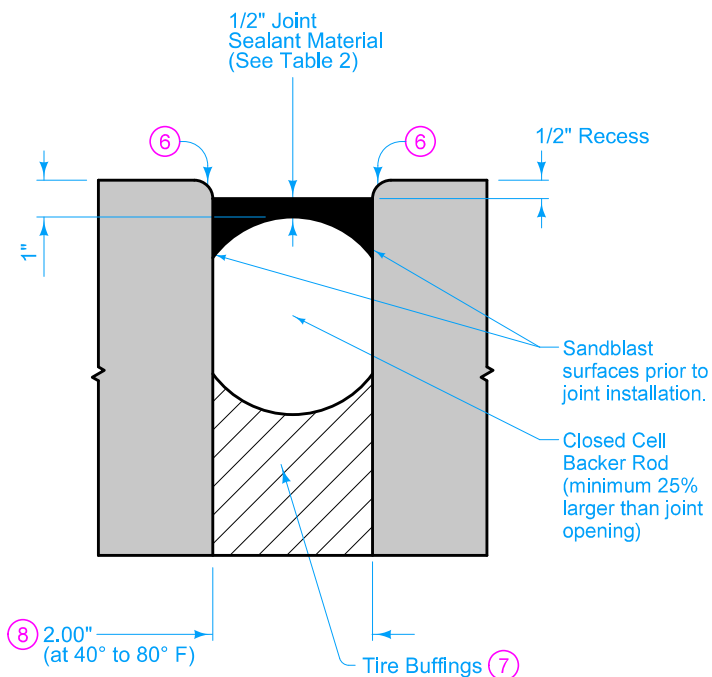


DETAIL 'C'



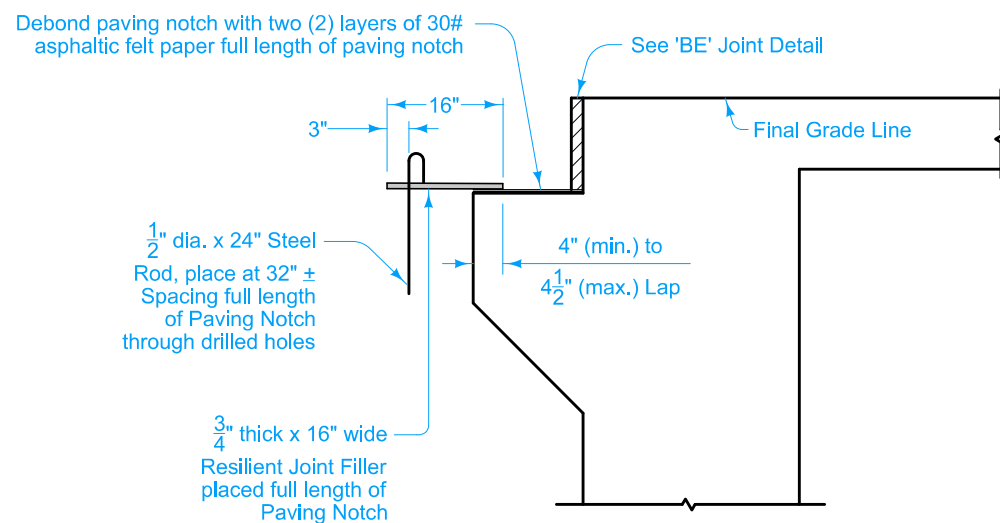
DETAIL 'B'

(Moveable Abutment)
(Grade beam dowels not shown for clarity)



'BE' JOINT DETAIL

Table 2
Approved List of Sealant
Dow - Dowsil 902 RCS
Sika - Sikasil 728 RCS
Watson Bowman Acme - Wabo SiliconeSeal
Pecora - 322FC



DETAIL 'D'
(Moveable Abutment)

Notes:

For locations of Detail 'B' and Detail 'C', see Design Sheet 7.

For grade beam details, see Design Sheets 11 and 12.

- ③ 2" to 2 1/2" clear to bent bar.
- ④ Minimum lap length of 5d and 6d transverse bars between Stage 1 and Stage 2 - 28 inches
- ⑤ Place additional #5 bar parallel to skewed face, 5d6 lapped with 5d7.
- ⑥ Edge with 1/4 inch tool for length of joint indicated if formed; edging not required when cut with diamond blade saw.
- ⑦ Compact tire buffings by spading with a square-nose shovel. Tire buffings shall not be larger than 1/2 inch.
- ⑧ Setting Width Notes:
 - Width is perpendicular to joint centerline.
 - Temperature of concrete deck on the underside or shaded portion of the deck shall be between 40 to 80 degrees Fahrenheit when placing approach slab concrete.

Design For Repair to 15° Skew (L.A.)

310'-8" x 44'-0" Prestressed Concrete Beam Bridge

106'-8" & 64'-1" End Spans 70'-8" & 68'-11" Interior Spans

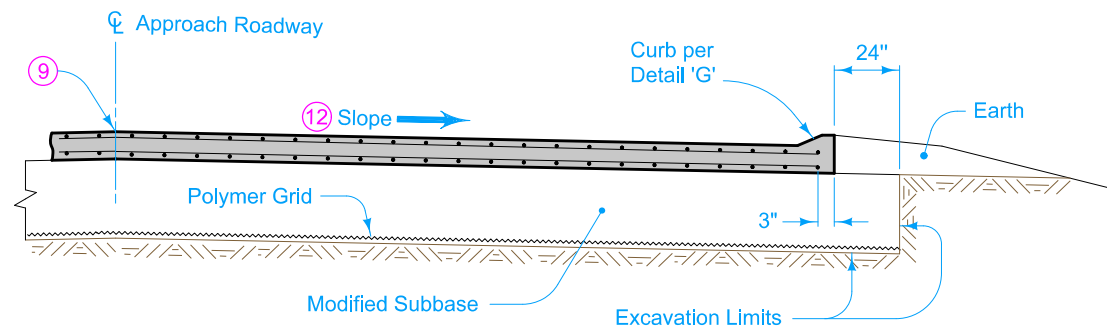
Modified BR-203 (2 of 3)

STA. 565+36.18 (US 71) Turn-In Date: August 2026

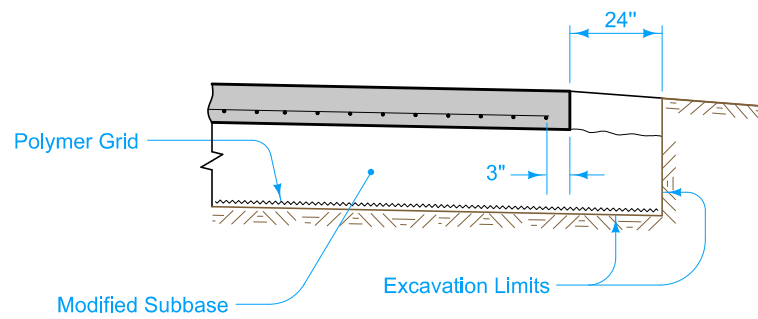
Cass County

IOWA DEPARTMENT OF TRANSPORTATION

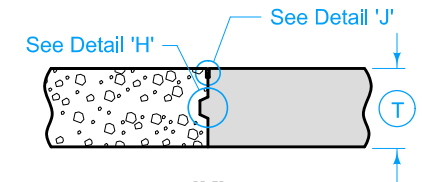
Design No. 130 Design Sheet No. 8 of 12 FHWA No. 17550



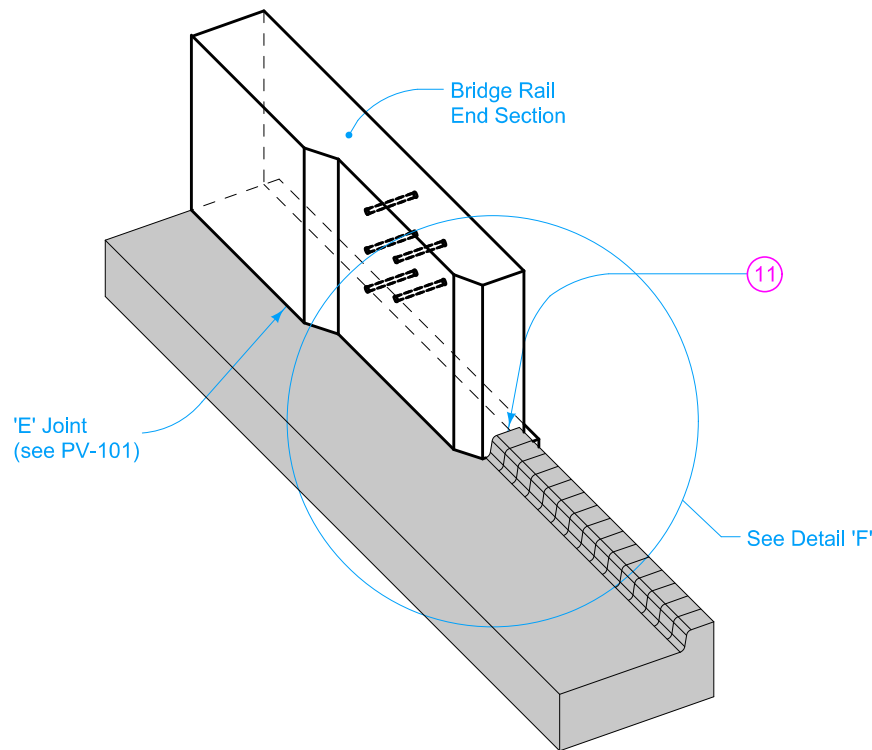
SECTION A-A



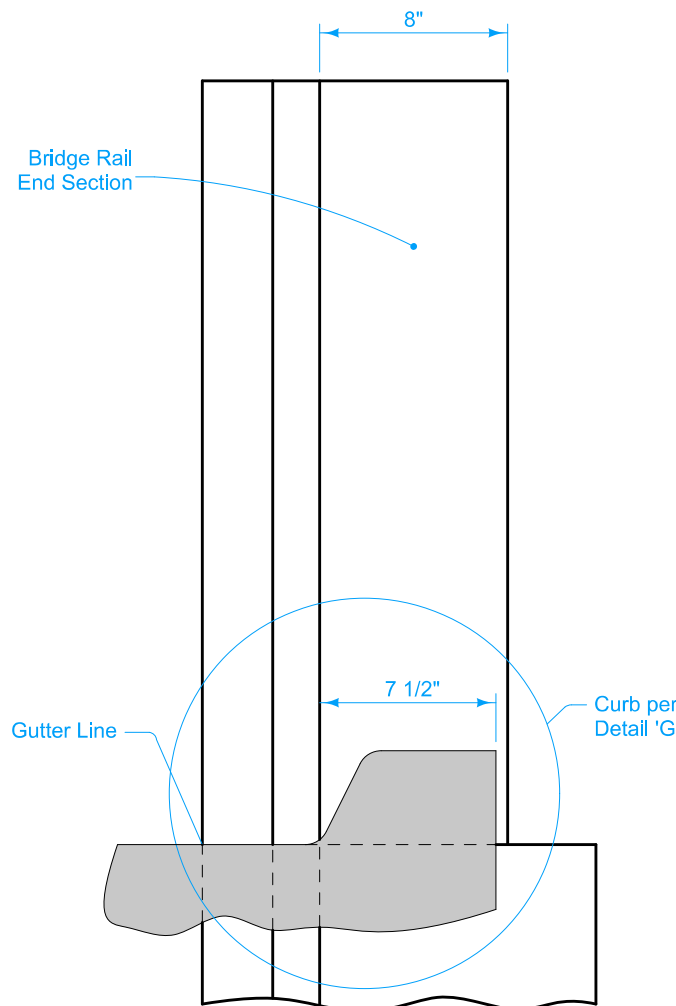
SECTION B-B



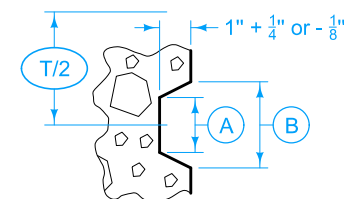
'K'
KEYED JOINT FOR ADJACENT SLABS
(Where T is 8" or more)
(Reinforcing not shown for clarity)



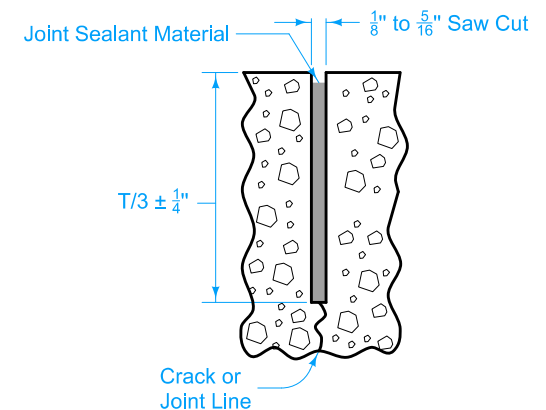
APPROACH SLAB DETAIL AT BRIDGE RAIL
(Joint Placement)



DETAIL 'F'
(Back of Curb Placement)

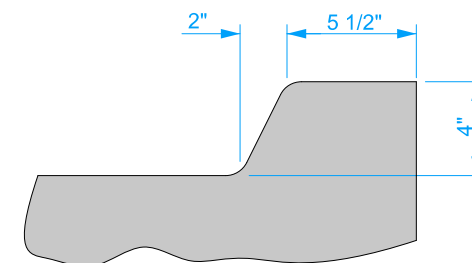


DETAIL 'H'



DETAIL 'J'

KEYWAY DIMENSIONS				
Keyway Type	Pavement Thickness	T	A	B
Standard	8" or greater		1 3/4"	2 3/4"



DETAIL 'G'

Notes:

- ⑨ Longitudinal joint between stages:
Use keyed joint as shown on details, this sheet. Extend stage 1 transverse reinforcing bars, top and bottom mats, as shown on Design Sheets 6 & 11.
- ⑩ For the locations of Section A-A and Section B-B, see Design Sheet 6.
- ⑪ Joint at end of Bridge Rail End Section:
Place joint filler the full depth of the bridge approach pavement. In areas with curb, place full depth of pavement plus curb and shape material to fit the shape of the curb per Section B-B of PV-101. Seal joint per Detail F of PV-101.

- Moveable Abutment Bridges: Flexible Foam Expansion Joint Filler complying with Section 4136 of the Standard Specifications.
Set width of gap to 2 inches. Joint length as required to completely fill from back side of curb to front face of bridge wing.
- ⑫ Slope 2%, typical, on lane and shoulder of proposed approach slab, but varies at the end; refer to Design Sheet 10.

Design For Repair to 15° Skew (L.A.)

**310'-8" x 44'-0" Pretensioned
Prestressed Concrete Beam Bridge**

106'-8" & 64'-1" End Spans 70'-8" & 68'-11" Interior Spans

Modified BR-203 (3 of 3)

STA. 565+36.18 (US 71) Turn-In Date: August 2026

Cass County

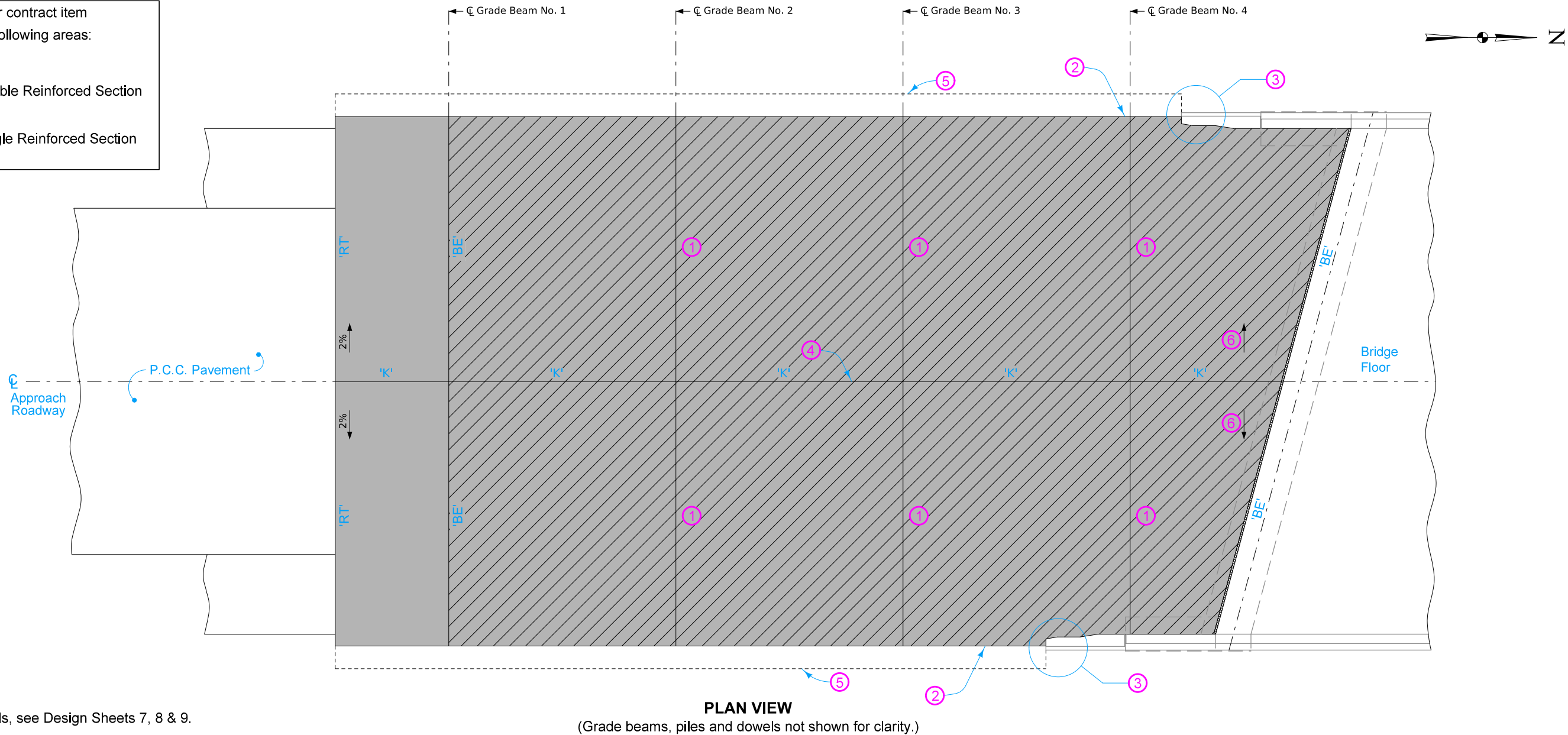
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 130 Design Sheet No. 9 of 12 FHWA No. 17550

Pay limits for contract item
include the following areas:

Double Reinforced Section

Single Reinforced Section



Notes:

For joint details, see Design Sheets 7, 8 & 9.

- 1 1/4" Resilient Joint Filler and seal top
- 2 Continue 4" Curb to the centerline of Grade Beam 3. Include a 'C' joint in west curb at centerline of Grade Beam 4, see PV-101.
- 3 See Approach Slab Detail at Bridge Rail on Design Sheet 9 for additional joint details and notes.
- 4 'K' Joint. See Design Sheet 9 for additional details and notes regarding the longitudinal joint between stages.
- 5 Polymer Grid and excavation limits of Modified Subbase are 2 feet outside of pavement edge, see Design Sheets 7, 8 & 9.
- 6 Over the last 10 feet of the approach slab, adjacent to the south abutment, gradually transition the elevation of the top surface of the approach slab to match the cross slope and crown of the existing bridge deck.

PLAN VIEW
(Grade beams, piles and dowels not shown for clarity.)

Design For Repair to 15° Skew (L.A.)

310'-8" x 44'-0" Prestressed

Prestressed Concrete Beam Bridge

106'-8" & 64'-1" End Spans70'-8" & 68'-11" Interior Spans

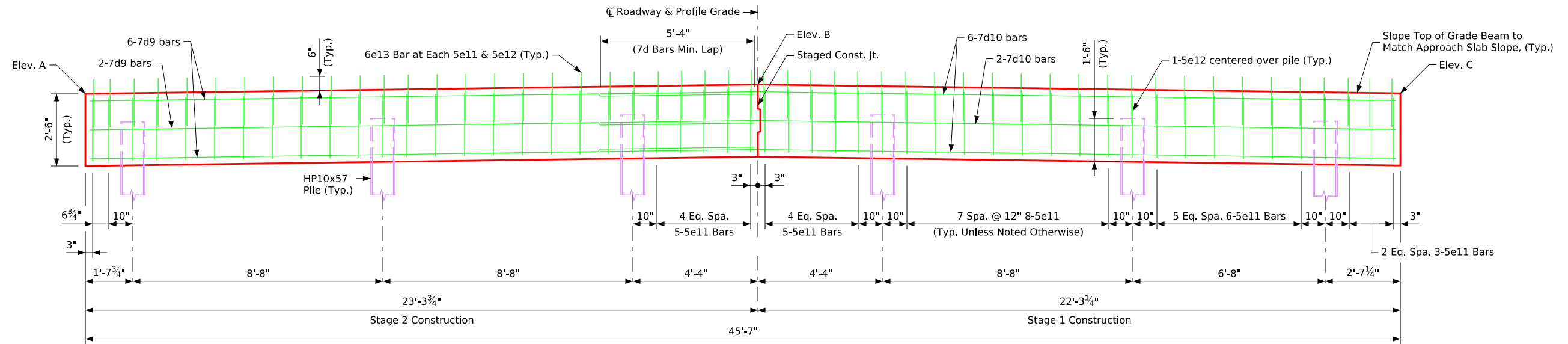
Modified BR-211

STA. 565+36.18 (US 71)Turn-In Date: August 2026

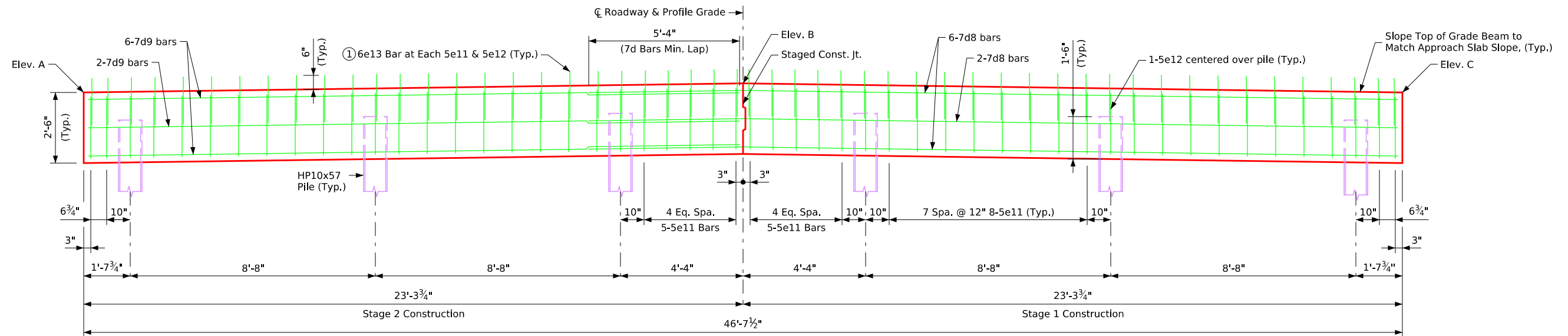
Cass County

IOWA DEPARTMENT OF TRANSPORTATION

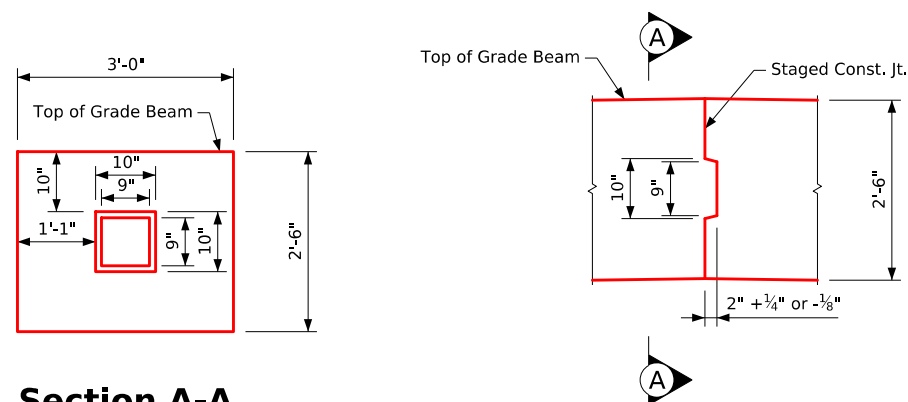
Design No. 130Design Sheet No. 10 of 12FHWA No. 17550



Grade Beam 4 Elevation
(At centerline of grade beam, looking North)



Grade Beams 1, 2 & 3 Elevation
(At centerline of grade beam, looking North)



Section A-A

(Reinforcing and pile not shown for clarity)

Grade Beam Key Detail

(Reinforcing not shown for clarity)

Note:

- ① No 6e13 Bars at Grade Beam 1.

	Grade Beam Elevs.			
	1	2	3	4
Elev. A	1184.42	1183.42	1182.42	1181.42
Elev. B	1184.89	1183.89	1182.89	1181.89
Elev. C	1184.42	1183.42	1182.42	1181.44

Design For Repair to 15° Skew (L.A.)

**310'-8" x 44'-0" Prestensioned
Prestressed Concrete Beam Bridge**

106'-8" & 64'-1" End Spans 70'-8" & 68'-11" Interior Spans

Grade Beam Details

STA. 565+36.18 (US 71) Turn-in Date: August 2026

Cass County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 130 Design Sheet No. 11 of 12 FHWA No. 17550

Reinforcing Bar List						
South Approach Slab	Bar	Location	Shape	No.	Length	Weight
	5d1	Transv., Top, Stage 1		16	24'-8"	412
	5d2	Transv., Top, Stage 1, Flared		6	Varies	83
	5d3	Transv., Top, Stage 2		71	23'-0"	1,703
	5d4	Transv., Top, Stage 2		9	21'-11"	206
	5d5	Transv., Top, Stage 2 Flared		5	Varies	65
	5d6	Skewed Transv., Stage 1		1	25'-5"	27
	5d7	Skewed Transv., Stage 2		1	22'-9"	24
	5d8	Transv., Top, Stage 1		58	25'-8"	1,553
	6d9	Transv., Bott., Stage 1		16	24'-8"	593
	6d10	Transv., Bott., Stage 1, Flared		6	Varies	120
	6d11	Transv., Bott., Stage 2		83	23'-0"	2,867
	6d12	Transv., Bott., Stage 2		9	21'-11"	296
	6d13	Transv., Bott., Stage 2, Flared		5	Varies	93
	6d14	Transv., Bott., Stage 1		70	25'-8"	2,699
Grade Beams	4e1	End Ties		384	6'-1"	1,560
	6e2	Longit. Top at Wing		2	4'-2"	13
	6e3	Longit. Top, Flared, Stage 1		23	Varies	345
	8e4	Longit. Bott. at Wing		2	4'-2"	22
	8e5	Longit. Bott., Flared, Stage 1		45	Varies	1,202
	6e6	Longit. Top at Wing		2	12'-3"	37
	6e7	Longit. Top		143	19'-8"	4,224
	8e8	Longit. Bott. at Wing		2	12'-3"	65
	8e9	Longit. Bott.		280	19'-8"	14,703
	5e10	Longit. Bott.		48	9'-8"	484
	6e11	Longit. Top, Flared, Stage 2		23	Varies	551
	8e12	Longit. Bott., Flared, Stage 2		45	Varies	1,917
	Reinforcing Steel - Epoxy Coated - Total (Lbs.)					35,864
	Bar	Location	Shape	No.	Length	Weight
	7d8	Grade Beams 1, 2, 3 Longit., Stage 1		42	28'-8"	2,461
	7d9	Grade Beam 1, 2, 3, 4 Longit., Stage 2		56	23'-0"	2,633
	7d10	Grade Beam 4 Longit., Stage 1		14	27'-7"	789
	5e11	Grade Beam Stirrups between Piles		183	10'-4"	1,972
	5e12	Grade Beam Stirrups over Piles		24	6'-9"	169
	6e13	Grade Beam Dowels		310	3'-1"	1,436
	Reinforcing Steel - Epoxy Coated - Total (Lbs.)					9,460

Concrete Placement Quantities	
Location	Quantity
South Bridge Approach Slab	144.5
Grade Beams	51.5
Total (Cu. Yds.)	196.0

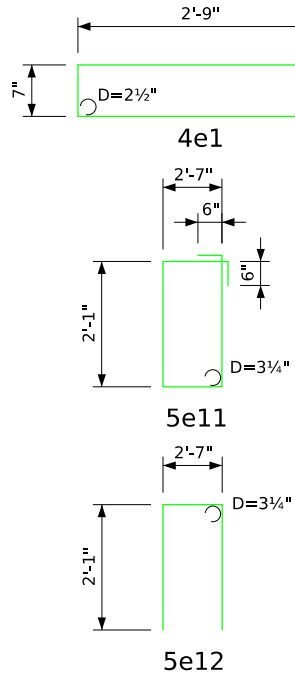
Variable Bar Length

South Approach:

5d2 22'-8" to 4'-0"
5d5 19'-10" to 4'-11"
6d10 22'-8" to 4'-0"
6d13 19'-10" to 4'-11"

6e3 12'-11" to 7'-1"
8e5 12'-11" to 7'-1"
6e11 18'-11" to 13'-0"
8e12 18'-11" to 13'-0"

Bent Bar Details

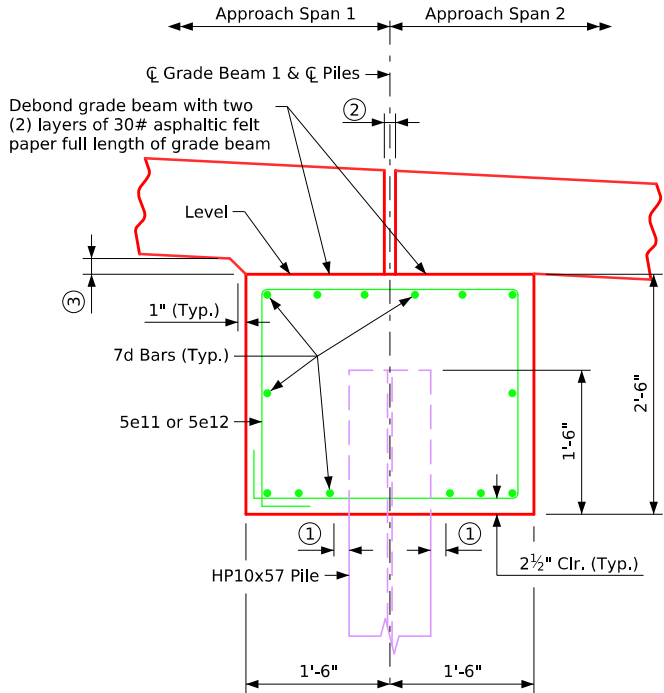


Note:
All dimensions are out to out.
D = Pin Diameter.

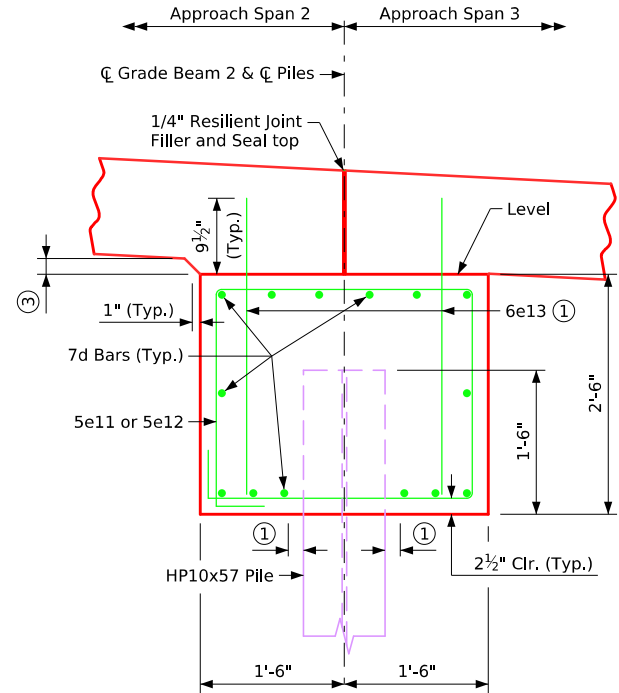
Bridge Approach Section

*Not a Bid Item

Location	Thickness	Single Reinf. Pavement Area	Double Reinf. Pavement Area	Modified Subbase	Polymer Grid	Remarks
	Inches	SY	SY	Ton	SY	
South Approach	12	51.8	376.7	428.5	469.3	
Totals:	-	51.8	376.7	428.5	469.3	
Bid Item:	Bridge Approach Pavement, As Per Plan					



Section C-C



Section D-D

(Grade Beam 2 shown; Grade Beams 3 & 4 similar)

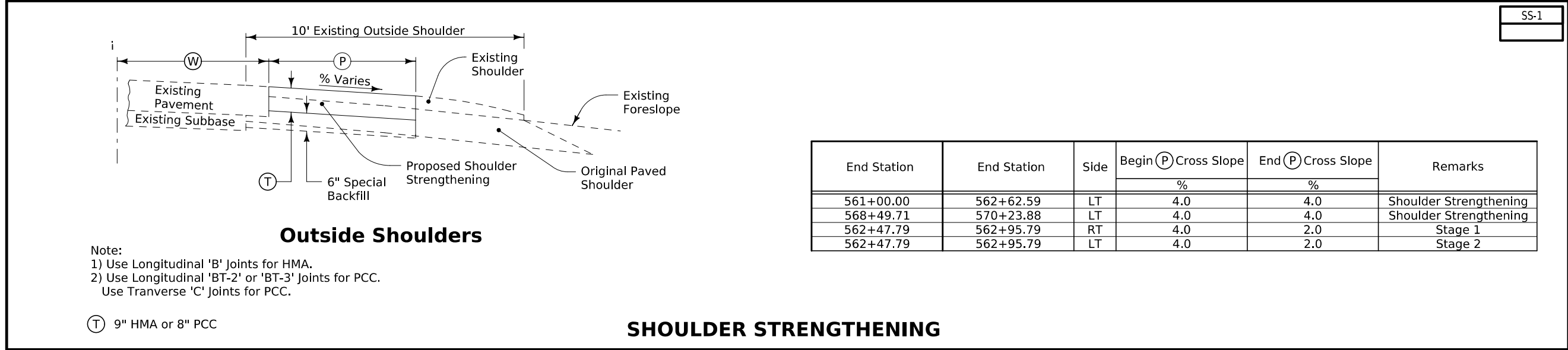
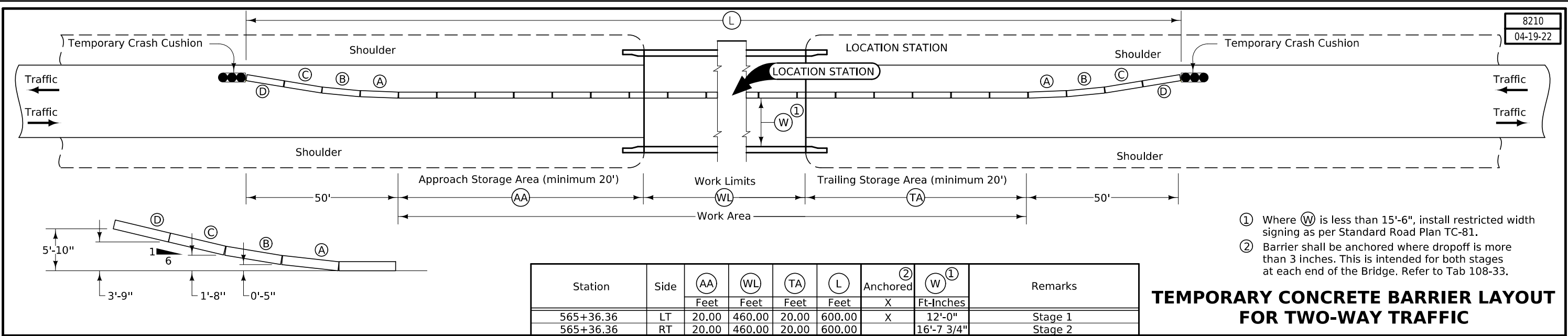
Notes:

See Design Sheet 6 for locations of Section C-C and Section D-D.

See Design Sheet 1 for Pile Notes.

- ① Maintain a minimum of 1 1/2" clear of longitudinal reinforcing to face of pile.
- ② See Design Sheet 8 for 'BE' Joint details.
- ③ Varies, 1" Typ. at Grade Beam.

Design For Repair to 15° Skew (L.A.)
310'-8" x 44'-0" Prestressed Concrete Beam Bridge
106'-8" & 64'-1" End Spans 70'-8" & 68'-11" Interior Spans
S. Approach Slab & Grade Beam - BOR
STA. 565+36.18 (US 71) Turn-In Date: August 2026
Cass County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 130 Design Sheet No. 12 of 12 FHWA No. 17550



PROFESSIONAL ENGINEER

Cheryl Lynn Bornheimer Kelley

24976

IOWA

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.

Cheryl Lynn Bornheimer Kelley

Signature

08-27-2026

Date

Cheryl Lynn Bornheimer Kelley

Printed or Typed Name

My license renewal date is December 31, 2027

Pages or sheets covered by this seal: B.1, C.1-C.15, D.1, J.1-J.14

ESTIMATED PROJECT QUANTITIES AND REFERENCE NOTES

Roadway Items : Roadway Items

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Roadway Items	
1	2102-0425070	SPECIAL BACKFILL	TON	121.2	Refer to SS-1 on sheet B.1 and Tab. 112-09 on sheet C.14 for details and locations. Existing HMA and PCC from Pavement removal may be used on the project as special backfill.
2	2102-2713090	EXCAVATION, CLASS 13, WASTE	CY	28.1	Item is for the excavation required to construct shoulder widening. Refer to Tab. 112-9 "Shoulders" on sheet C.14. Item includes removal of waste material from the project site. Dispose of excess material according to Article 1106.07 of the current specifications.
3	2122-7450080	SHOULDER STRENGTHENING, OPTIONAL HOT MIX ASPHALT MIXTURE OR PORTLAND CEMENT CONCRETE, 8 IN.	SY	384.7	Refer to SS-1 on sheet B.1 for locations and details.
4	2123-7450000	SHOULDER CONSTRUCTION, EARTH	STA	5.71	Refer to Tab. 112-9 "Shoulders" on sheet C.14 and sheet V.9 for details. An estimated 18.7 CY of material is needed for earth shoulder construction. Excavated Class 13 material that meets the requirements for Earth Shoulder Construction per Standard Specification 2123 may be used.
5	2505-6765006	REMOVE AND REINSTALL FORMED STEEL BEAM GUARDRAIL	LF	203	Refer to Tab 110-07A on sheet C.12 for locations and details. The intent of this work is to remove and reinstall only the steel beam guardrail for placement of pavement. Carefully remove and stockpile steel beam guardrail for reinstallation. The Contractor has the option to leave the posts in place, or to remove and reinstall the posts at no additional cost to the Contracting Authority. Replace steel beam rail and posts damaged by the Contractor's operations at no additional cost to the Contracting Authority. Posts, delineators, and object markers are to remain in place. Replace posts, delineators, and object markers damaged by the Contractors operations at no additional cost to the Contracting Authority. Ensure that all posts are firm and plum prior to reinstalling the guardrail. Restore the area disturbed by removal and reinstallation operations to an acceptable condition. Method of Measurement: Measurement will be in linear feet, measured along the front of the rail, of steel beam guardrail (includes W-beam and Thrie-beam guardrail) removed and reinstalled. Basis of Payment: Payment will be at the contract unit price per linear foot of steel beam guardrail removed and reinstalled. Payment includes all labor, equipment, and materials required to remove and reinstall the steel beam guardrail.
6	2510-6745850	REMOVAL OF PAVEMENT	SY	384.7	Refer to sheet B.1 and Tab. 110-1 on sheet C.11 for locations and details.
7	2527-9263181	PAVEMENT MARKINGS REMOVED	STA	22.17	Refer to tab 108-22 on sheet C.7 for locations and details.
8	2527-9263209	PAINTED PAVEMENT MARKINGS, WATERBORNE OR SOLVENT-BASED	STA	16.89	
9	2527-9263231	REMOVABLE TAPE MARKINGS, WET RETROREFLECTIVE	STA	5.28	

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Roadway Items	
10	2528-8400048	TEMPORARY BARRIER RAIL, CONCRETE	LF	1,200	Refer to Tab 108-33 on sheet C.10 for locations and detail 8212 on sheet B.1 for additional information. All temporary barrier rail shall be nominal 12'-6 long concrete units.
11	2528-8400256	TEMPORARY TRAFFIC SIGNALS	EACH	1	Refer to Tab 108-28 on sheet C.8 for locations and details.
12	2528-8445110	TRAFFIC CONTROL	LS	1	Refer to J-sheets for additional information.
13	2528-9290050	PORTABLE DYNAMIC MESSAGE SIGN (PDMS)	CDAY	0	See Proposal.
14	2551-0000110	TEMP CRASH CUSHION	EACH	4	Refer to Tab 108-30 on sheet C.9 for locations and details.
15	2602-0000020	SILT FENCE	LF	788	Refer to Tab 100-17 on sheet C.4 for locations and details. The tabulation includes estimated locations for placement with the Engineer prior to beginning placement. Bid item includes 25% additional quantity of Silt Fence to address possible erosion during construction. Verify the specific locations for field adjustments and replacements.
16	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS	LF	788	Refer to Tab 100-17 on sheet C.4 for locations and details. This item is included for silt fence and silt fence for ditch check removal. Remove silt fence and posts after mulching or vegetation is established and approved by the engineer.
17	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK	LF	788	Refer to Tab 100-17 on sheet C.4 for locations and details. This item is included for clean-out and repair of the silt fence and silt fence for ditch checks during the project.

100_01D
8/15/22

PROJECT DESCRIPTION

This project is for bridge and approach work along US-71 over Lone Tree Creek, 0.1 miles south of County Road G-35. It will involve temporary traffic control items and shoulder strengthening for the project's staged traffic control.

TABULATION OF SILT FENCES

Refer to EC-201

Line No.	Station From	Station To	Side	Length (FT)	Remarks
1.0	561+00.00	564+00.00	Left	300.00	South End
2.0	562+50.00	564+00.00	Right	150.00	South End
3.0	568+45.00	570+25.00	Left	180.00	North End
Total				630.00	

Additional 25%: 158 ft.
Total with additional: 788 ft.

EXISTING PAVEMENT

Line No.	County	Route	Direction of Travel	Begin Ref. Location Sign	End Ref. Location Sign	Year	Type	Project Number	Surface Type	Surface Depth (IN)	Base Type	Base Depth (IN)	Subbase Type	Subbase Depth (IN)	Removal Type	Removal Depth (IN)	Coarse Aggregate Source	Coarse Aggregate Type	Course Aggregate Durability Class	Reinforcement Type	Remarks
1.0	Cass	US 71	NB	54.85	55.25	1972		F-71-3(8)--20-15* <1>	BAC	2.5	ATB	7.0	SLS	6.0			LYMAN	C.LST.	I		
2.0	Cass	US 71	NB	54.85	55.25	2007	W	NHSN-071-3(42)--2R-15	PCC	8.0	HMA	9.0									
3.0	Cass	US 71	NB	54.85	55.25	1981		FR-71-3(26)--2G-15	RAC	2.0							ATLANTIC	C.LST.			
4.0	Cass	US 71	NB	54.85	55.25	2007		NHSN-071-3(42)--2R-15	PCC	8.0					MIL	3.0					

STANDARDS

The following Standards apply to construction work on this project.

Number	Date	Title
BA-401	4/20/2021	Temporary Barrier Rail (Precast Concrete)
BA-500	4/20/2021	Temporary Crash Cushions Sand Barrel
EC-201	4/20/2021	Silt Fence
PM-110	10-15-24	Line Types
SI-881	10-20-26	Special Signs for Workzones
TC-1	10/15/2019	Work Not Affecting Traffic
TC-81	04-18-23	Restricted Width Signing (Less Than 15.5 Feet)
TC-217	10-20-26	Lane Closure with Signals and TBR
TC-282	10-15-19	Uneven Lanes
TC-202	4/18/2023	Work within 15 ft of Traveled Way

PAVEMENT MARKING LINE TYPES

Line factors based on 6-inch wide continuous line.
*BCY4 - Place on the same side of the roadway to match existing markings near the project.
**NPY4 - Estimating purposes only. No Passing Zone Lines will be located in the field.
***MNY6 - Factor of 1.00 includes number of 6-inch passes to cover median nose area.
BCY4: Broken Centerline (Yellow) @ 0.17 BCY6: Broken Centerline (Yellow) @ 0.25 BLC6: Broken Line Contrast (White/Black) @ 0.50 BLW4: Broken Lane Line (White) @ 0.17 BLW6: Broken Lane Line (White) @ 0.25
CBW6: Crosswalk Bar (White) @ 10.00 CHW8: Channelizing Line (White) @ 1.33 CHW10: Channelizing Line (White) @ 1.67 CHY8: Channelizing Line (Yellow) @ 1.33 CHY10: Channelizing Line (Yellow) @ 1.67
CLW6: Crosswalk Line (White) @ 2.00 DCY4: Double Centerline (Yellow) @ 1.34 DCY6: Double Centerline (Yellow) @ 2.00 DDY4: Double Dotted Line (Yellow) @ 0.44 DDY6: Double Dotted Line (Yellow) @ 0.67
DLW4: Dotted Line (White) @ 0.22 DLW6: Dotted Line (White) @ 0.33 DLY4: Dotted Line (Yellow) @ 0.22 DLY6: Dotted Line (Yellow) @ 0.33 ELW4: Edge Line Right (White) @ 0.67
ELW6: Edge Line Right (White) @ 1.00 ELY4: Edge Line Left (Yellow) @ 0.67 ELY6: Edge Line Left (Yellow) @ 1.00 LDW8: Lane Drop (White) @ 0.33 LDW10: Lane Drop (White) @ 0.42
MNY6: Median Nose (Yellow) @ 1.00 NPY4: No Passing Zone Line (Yellow) @ 0.84 NPY6: No Passing Zone Line (Yellow) @ 1.25 RLW4: Ramp Edge Line Right (White) @ 0.67 RLW6: Ramp Edge Line Right (White) @ 1.00
RLY4: Ramp Edge Line Left (Yellow) @ 0.67 RLY6: Ramp Edge Line Left (Yellow) @ 1.00 SLW2: Stop Line (White) @ 4.00 SLW4: Solid Lane Line (White) @ 0.67 SLW6: Solid Lane Line (White) @ 1.00
SPW4: Sloped Curb 4" (White) @ 2.16 SPW6: Sloped Curb 6" (White) @ 2.28 SPY4: Sloped Curb 4" (Yellow) @ 2.16 SPY6: Sloped Curb 6" (Yellow) @ 2.28 STW6: Standard Curb 6" (Yellow) @ 2.03
STY6: Standard Curb 6" (Yellow) @ 2.03 YLW2: Yield Line (White) @ 1.15

Line No.	Road ID	Station From	Station To	Line Length (STA)	Lane	Marking Type	Left	Center	Right	Groove Marking Needed?	Groove Qty. (STA)	BCY4* Factored (STA)	ELW4 Factored (STA)	NPY4** Factored (STA)	SLW2 Factored (STA)	Remarks
1.0	US 71	560+26.18	570+23.88	9.98	SB	Removal of Paint	X						6.69			Stage 1
2.0	US 71	560+26.18	562+96.18	2.70		Removal of Paint		X						2.27		Stage 1
3.0	US 71	562+96.18	570+23.88	7.28		Removal of Paint		X				1.24				Stage 1
4.0	US 71	560+26.18	570+23.88	9.98	NB	Removal of Paint			X				6.69			Stage 1
10.0	US 71	560+26.18	560+26.18		NB	Removal of Paint			X						0.48	Stage 2
11.0	US 71	560+26.18	561+91.18	1.65	NB	Removal of Paint			X				1.11			Stage 2
12.0	US 71	561+91.18	562+76.18	0.85		Removal of Paint		X					0.57			Stage 2
13.0	US 71	570+23.88	570+23.88		SB	Removal of Paint	X								0.48	Stage 2
19.0	US 71	560+26.18	560+26.18		NB	Removal of Paint	X								0.48	Final
20.0	US 71	567+73.88	568+58.88	0.85		Removal of Paint		X					0.57			Final
21.0	US 71	568+58.88	570+23.88	1.65	SB	Removal of Paint	X						1.11			Final
22.0	US 71	570+23.88	570+23.88		SB	Removal of Paint			X						0.48	Final
Total												1.24	16.74	2.27	1.92	
Marking Type : Removal of Paint																
23.0	US 71	560+26.18	570+23.88	9.98	SB	Waterborne/Solvent Paint	X						6.69			Final
24.0	US 71	560+26.18	562+96.18	2.70		Waterborne/Solvent Paint		X						2.27		Final
25.0	US 71	562+96.18	570+23.88	7.28		Waterborne/Solvent Paint		X				1.24				Final
26.0	US 71	560+26.18	570+23.88	9.98	NB	Waterborne/Solvent Paint			X				6.69			Final
Total												1.24	13.38	2.27	0	
Marking Type : Waterborne/Solvent Paint																
5.0	US 71	560+26.18	560+26.18		NB	Wet Retroreflective Removable Tape			X						0.48	Stage 1
6.0	US 71	560+26.18	561+91.18	1.65	NB	Wet Retroreflective Removable Tape			X				1.11			Stage 1
7.0	US 71	561+91.18	562+76.18	0.85		Wet Retroreflective Removable Tape		X					0.57			Stage 1
8.0	US 71	570+23.88	570+23.88		SB	Wet Retroreflective Removable Tape	X								0.48	Stage 1
14.0	US 71	560+26.18	560+26.18		NB	Wet Retroreflective Removable Tape	X								0.48	Stage 2
15.0	US 71	567+73.88	568+58.88	0.85		Wet Retroreflective Removable Tape		X					0.57			Stage 2
16.0	US 71	568+58.88	570+23.88	1.65	SB	Wet Retroreflective Removable Tape	X						1.11			Stage 2
17.0	US 71	570+23.88	570+23.88		SB	Wet Retroreflective Removable Tape			X						0.48	Stage 2
Total												0	3.36	0	1.92	
Marking Type : Wet Retrroreflective Removable Tape																
Grand Totals																
												2.48	33.48	4.54	3.84	

108_28 8/15/22				
TEMPORARY TRAFFIC SIGNALS				
Line No.	Item No.	Station	Signal Type	Remarks
1.0	1	561+06.00	One Lane Traffic	South End
2.0	2	569+44.00	One Lane Traffic	North End

CRASH CUSHIONS

* Bid Item
1. Lane(s) to which the installation is adjacent.
2. Complete this section when using the Temporary Crash Cushion bid item and Earthwork is needed for Sand Barrel placement. Refer to BA-500.

Line No.	Lane	Station	Side	Obstacle Width (FT)	Crash Cushion Type	Crash Cushion Quantity	V (FT) (2)	W (FT) (2)	X (FT) (2)	Y (FT) (2)	Z (FT) (2)	Excavation Class 10* (CY)	Embankment in Place* (CY)	Obstacle Description	Remarks
1.0	NB	561+91.00	Right	1.9	Temporary	1								Temporary Barrier Control	Stage 1
2.0	NB	561+91.00	Right	1.9	Temporary	1								Temporary Barrier Control	Stage 1
3.0	SB	568+59.00	Left	1.9	Temporary	1								Temporary Barrier Control	Stage 2
4.0	SB	568+59.00	Left	1.9	Temporary	1								Temporary Barrier Control	Stage 2
Total						4									

TEMPORARY BARRIER RAIL

Possible Standard: BA-401 Possible Detail: 560-7

* Not a bid item. Anchorage requirements are based on TBR locations shown in the plans. TBR alignments that vary from what is shown in the plans may result in additional TBR sections requiring anchorage.

Line No.	No.	Station From	Station To	Length (FT)	Barrier Rail Type	Anchored*	Modular Glare Screen System	Remarks
1.0	1	562+26.00	568+24.00	600.0	Concrete BA-401	Yes	No	Stage 1
2.0	2	562+26.00	568+24.00	600.0	Concrete BA-401	No	No	Stage 2
Total				1200.0				

REMOVAL OF PAVEMENT

Refer to Tabulation 102-5.

* Not a bid item.

Line No.	Station From	Station To	Side	Pavement Type	Area (SY)	Saw Cut* (LF)	Remarks
1.0	561+00.00	561+50.50	Left	4FT HMA & 4FT Gravel	44.9	50.1	Removal of Shoulder, Shoulder Strengthening
2.0	561+50.50	562+62.59	Left	4FT PCC & 4FT Gravel	99.6	112.1	Removal of Shoulder, Shoulder Strengthening
3.0	568+49.71	570+23.88	Left	4FT PCC & 4FT HMA	154.8	174.2	Removal of Shoulder, Shoulder Strengthening
4.0	562+47.79	562+95.79	Right	8FT PCC	42.7	48.0	Removal of Shoulder, Stage 1
5.0	562+47.79	562+95.79	Left	8FT PCC	42.7	48.0	Removal of Shoulder, Stage 2
Total					384.7		

REMOVAL AND REINSTALL OF GUARDRAIL

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

Line No.	No.	Direction of Traffic (1)	Station From	Station To	Side	Removal and Reinstall of Guardrail (LF) (2)
1.0	1	NB	562+45.00	563+59.00	Right	114.0
2.0	2	SB	562+82.00	563+71.00	Left	89.0
Total						203

111_25 10/20/26			
INDEX OF TABULATIONS			
Line No.	Tabulation	Tabulation Title	Sheet No.
1.0	100_01D	PROJECT DESCRIPTION	C.3
2.0	100_04A	ESTIMATE REFERENCE INFORMATION	C.1 & C.2
3.0	100_17	TABULATION OF SILT FENCES	C.4
4.0	102_05	EXISTING PAVEMENT	C.5
5.0	105_04	STANDARD ROAD PLANS	C.6
6.0	108_22	PAVEMENT MARKING LINE TYPES	C.7
7.0	108_23A	TRAFFIC CONTROL PLAN	J.1
8.0	108_25	511 TRAVEL RESTRICTIONS	J.2
9.0	108_26A	STAGING NOTES	J.3
10.0	108_28	TEMPORARY TRAFFIC SIGNALS	C.8
11.0	108_30	CRASH CUSHIONS	C.9
12.0	108_33	TEMPORARY BARRIER RAIL	C.10
13.0	110_01	REMOVAL OF PAVEMENT	C.11
14.0	110_07A	REMOVAL AND REINSTALL OF GUARDRAIL	C.12
15.0	111_01	COORDINATED OPERATIONS	J.4
16.0	112_09	SHOULDERS	C.14
17.0	232_03A	EROSION CONTROL (RURAL SEEDING)	C.15
18.0	232_03C	EROSION CONTROL (NATIVE GRASS SEEDING)	C.15
19.0	262_06	UTILITIES (NOT A POINT 25 PROJECT)	C.15

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.
(7) Paved shoulder thickness specified in Remarks.
(8) Subbase type specified in Remarks.

Roadway Identification	Direction of Travel (1)	Station From	Station To	Side	P Width (FT)	P SG Width (2) (FT)	G Width (FT)	L Length (FT)	Class 13 Excavation (CY)(3)(4)	HMA (TON)	HMA (TON/ STA)	Binder (TONS)	Paved Shoulder (3) (SY)	Paved Shoulder at Grd rail (5)(7) (SY)	Reinforced Paved Shoulder(3) (SY)	Special Backfill HMA Alt. (3) (TON)	Special Backfill HMA Alt. (TON/STA)	Special Backfill PCC Alt. (3) (TON)	Special Backfill PCC Alt. (TON/STA)	Pavement Scarification (SY)	Polymer Grid (SY)	Subbase (3) (8) (CY)	Earth Shoulder Const. Alt (3) (STA)	Remarks
US 71	SB	561+00.00	562+62.59	Left	8			162.59	28.1	70.727	43.500	4.244	144.5			45.525	28.000	45.525	28.000				1.63	9" HMA or 8" PCC, Shoulder Strengthening
US 71	SB	568+49.71	570+23.88	Left	8			174.17		75.764	43.500	4.546	154.8			48.768	28.000	48.768	28.000				1.74	9" HMA or 8" PCC, Shoulder Strengthening
US 71	NB	562+47.79	562+95.79	Right	8			48.00		20.880	43.500	1.253	42.7			13.440	28.000	13.440	28.000				0.48	9" HMA or 8" PCC, Stage 1
US 71	NB	562+95.79	563+58.38	Right				62.59															0.63	Outside bridge approach, Stage 1
US 71	SB	562+47.79	562+95.79	Left	8			48.00		20.880	43.500	1.253	42.7			13.440	28.000	13.440	28.000				0.48	9" HMA or 8" PCC, Stage 2
US 71	SB	562+95.79	563+70.31	Left				74.52															0.75	Outside bridge approach, Stage 2
Total		28.1384.7121.1735.71																						

232_03A 9/28/22 EROSION CONTROL (RURAL SEEDING) Area to be seeded is estimated to be less than 1 acre. If the contractor determines the area exceeds 2 acres, notify the Engineer. Approved quantity in excess of 2 acres will be paid for as extra work according to Article 1109.03,B of the Standard Specifications. Following the completion of work in a disturbed area and according to the seeding dates in Section 2601 of the Standard Specifications, place seed, fertilizer, and mulch on the disturbed area lying 8 feet adjacent to shoulder and median as follows: Place seed and fertilize according to the requirements of Article 2601.03,C,3 and Section 4169 of the Standard Specifications. Place mulch according to the requirements of Articles 2601.03,E,2,a and 4169.07,A of the Standard Specifications. Preparing the seedbed, furnishing and applying seed, fertilizer, and mulch are all incidental to mobilization and will not be paid for separately.			262_06 9/28/22 UTILITIES (NOT A POINT 25 PROJECT) This is NOT a POINT 25 project and is not subject to the provisions of IAC 761-115.25.		
232_03C 8/28/24 EROSION CONTROL (NATIVE GRASS SEEDING) Area to be seeded is estimated to be less than 1 acre. If the Contractor determines the area exceeds 2 acres, notify the Engineer. Approved quantity in excess of 2 acres will be paid for as extra work according to Article 1109.03,B of the Standard Specifications. Following the completion of work in a disturbed area and according to the seeding dates in Section 2601 of the Standard Specifications, place seed and mulch on the disturbed area lying 8 feet or more beyond the shoulder as follows: SEED MIX: Big bluestem (Andropogon geradii) 6 lbs. PLS/Acre (7.0 kg/ha) Indiangrass (Sorghastrum nutans) 6 lbs. PLS/Acre (7.0 kg/ha) Little bluestem (Schizachyrium scoparium) 6 lbs. PLS/Acre (7.0 kg/ha) Partridge Pea (Chamaecrista fasciculata) 4 lbs. PLS/Acre (4.5 kg/ha) Sideoats grama (Bouteloua curtipendula) 4 lbs. PLS/Acre (4.5 kg/ha) Canada wildrye (Elymus canadensis) 2 lbs. PLS/Acre (2.2 kg/ha) Switchgrass (Panicum virgatum) 1 lbs. PLS/Acre (1.1 kg/ha) Oats (Avena sativa) 32 lbs./Acre (36.0 kg/ha) Furnish Big bluestem, Indiangrass, Canada wildrye and Little bluestem that is debarbed or equal to facilitate the application of seed. Furnish seed certified as Source Identified Class (Yellow Tag) Source G0-Iowa. Oats are excluded from this requirement. Place seed according to the requirements of Article 4169.02 of the Standard Specifications. Place mulch according to the requirements of Articles 2601.03,E,2,a and 4169.07,A of the Standard Specifications. Preparing the seedbed, furnishing and applying seed and mulch are incidental to mobilization and will not be paid for separately.			281_01 9/28/22 SECTION 404 PERMIT AND CONDITIONS Construct this project according to the requirements of U.S. Army Corps of Engineers Nationwide, Permit No. 3. A copy of this permit is available from the Iowa DOT website (http://www.envpermits.iowadot.gov/). The U.S. Army Corps of Engineers reserves the right to visit the site without prior notice.		

FILE NO. 32828	ENGLISH	DESIGN TEAM Burns & McDonnell	Cass COUNTY	PROJECT NUMBER BRFN-071-3(060)--39-15	SHEET NUMBER C.15	
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108_23A
8/15/22

TRAFFIC CONTROL PLAN

1 lane of traffic along NB and SB US-71 will be maintained at all times, see Tab 108-26A for traffic control specifics. Maintain traffic on US-71 at all times in accordance with Standard Road Plans listed on Tab. 105-4 on Sheet C.5.

For additional information, refer to Part 6 of the Manual on Uniform Traffic Control Devices and the current Standard Specifications.

Refer to J.3 for Staging Notes.

511 TRAVEL RESTRICTIONS

Line No.	Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No. or Structure ID or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
1.0	US 71	2-Lane	Cass	0.1 miles south of County Road G-35	Lone Tree Creek	Barrier	1554.9S071	Horizontal	N/A	12'-0"	11'-0"	N/A	Stage 1
2.0	US 71	2-Lane	Cass	0.1 miles south of County Road G-35	Lone Tree Creek	Barrier	1554.9S071	Horizontal	N/A	16'-7 3/4"	N/A	N/A	Stage 2
3.0	US 71	2-Lane	Cass	0.1 miles south of County Road G-35	Lone Tree Creek	Temporary Signal	1554.9S071	Vertical	N/A	15'-0"	14'-0"	N/A	Stage 1 & 2

STAGING NOTES

It is not the intent to confine the Contractor's activities to the areas of suggested stages alone. It is understood that some of the various steps may occur simultaneously. The contractor may conduct several operations concurrently, provided that the traffic is maintained and that these operations do not conflict with the staging indicated herein.

It is recognized that as the various activities related to construction progress, certain situations may arise which will preclude adhering to the original construction sequence or which would readily lend themselves to more efficient staging operations. Should the contractor desire to deviate from the original plan, a written alternative plan shall be submitted to the Project Engineer for approval a minimum of one (1) week prior to the proposed changes.

Prior to Stage 1 construction, strengthen shoulder on southbound lane.

2 WEEKS Before Stage 1:
Place portable dynamic message signs (PDMS) at last paved intersections, one each for northbound and southbound on US-71. PDMS to remain in place throughout the duration of Stage 1.

Stage 1:
Traffic Control:
Stage 1 will utilize a traffic signal to act as a flagger. Traffic will run in the southbound lanes.
Construction:
Remove and replace the approach in the northbound lanes. Strengthen shoulder on northbound lane at approach transition. Refer to Sheet D.1 and V sheets for more details.

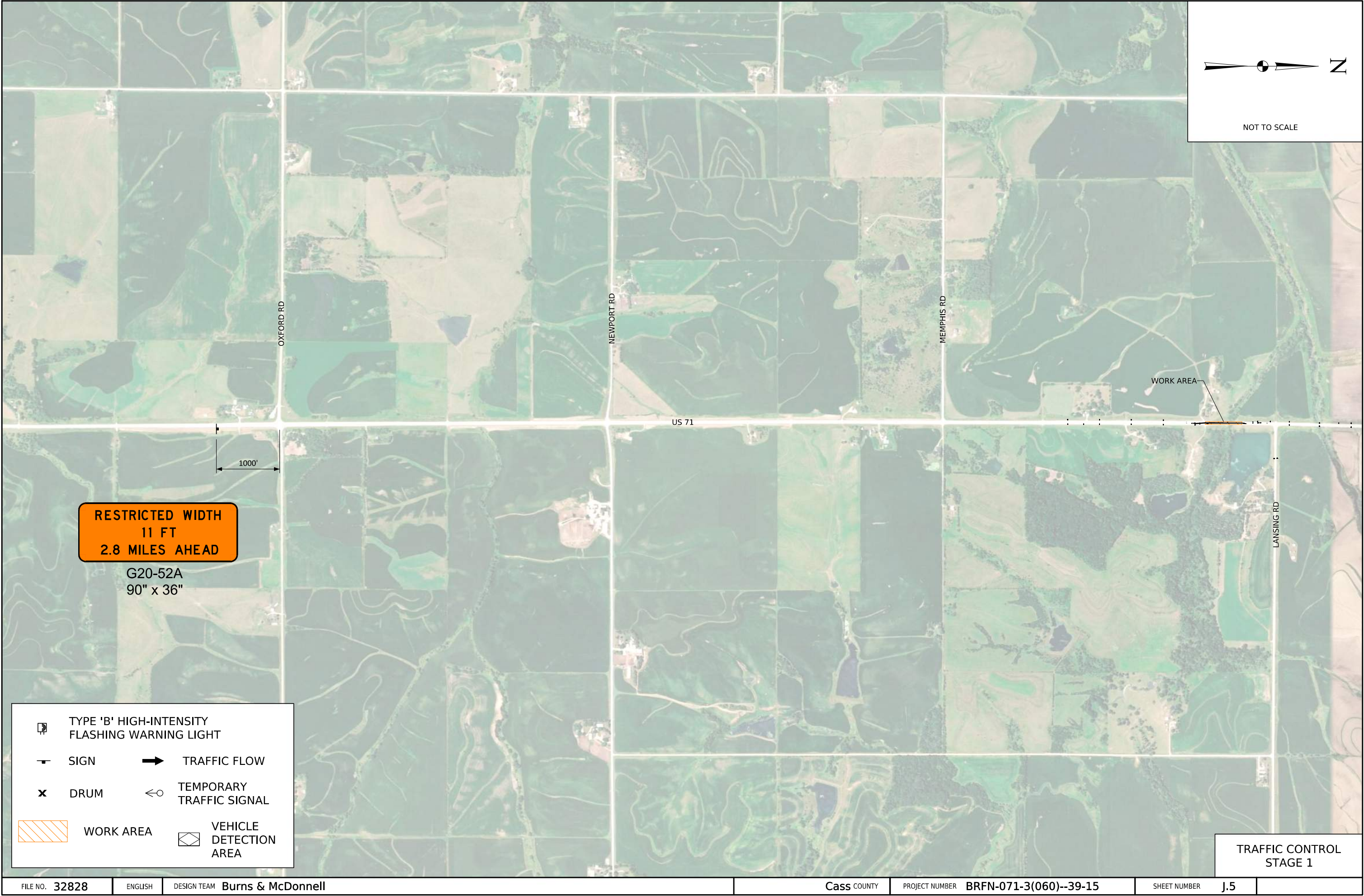
Stage 2:
Traffic Control:
Stage 2 will utilize a traffic signal to act as a flagger. Traffic will run in the northbound lanes.
Construction:
Remove and replace the approach in the southbound lanes. Strengthen shoulder on southbound lane at approach transition. Refer to Sheet D.1 and V sheets for more details.

111_01
10/14/22

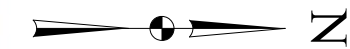
COORDINATED OPERATIONS

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
None provided.	







NOT TO SCALE

END
ROAD WORK

G20-2A
48" x 24"

NO
PASSING
ZONE

W14-3
48" X 64" X 64"

ONE LANE
ROAD
AHEAD

W20-4
48" x 48"

US 71

250'

500'

500'

500'

ROAD
WORK
AHEAD

W20-1
48" x 48"

35
M.P.H.

W13-1
24" x 24"

RESTRICTED
WIDTH AHEAD
11 FT

G20-55A
66" x 36"

DO
NOT
PASS

R4-1
36" x 48"

ONE LANE
ROAD
AHEAD

W20-4
48" x 48"



TYPE 'B' HIGH-INTENSITY
FLASHING WARNING LIGHT



SIGN



TRAFFIC FLOW



DRUM



TEMPORARY
TRAFFIC SIGNAL



WORK AREA



VEHICLE
DETECTION
AREA

TRAFFIC CONTROL
STAGE 1

FILE NO. 32828

ENGLISH

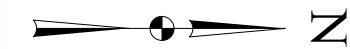
DESIGN TEAM Burns & McDonnell

Cass COUNTY

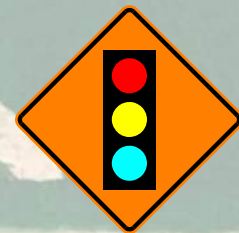
PROJECT NUMBER BRFN-071-3(060)--39-15

SHEET NUMBER J.7

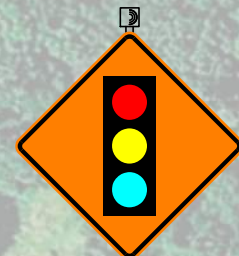
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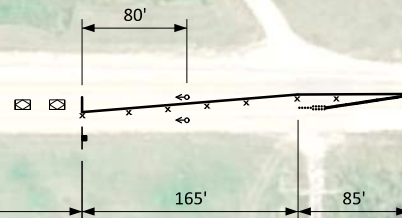
NOT TO SCALE



W3-3
48" x 48"



W3-3
48" x 48"



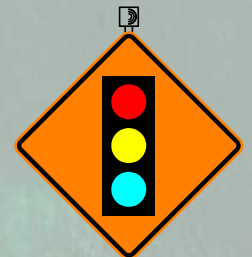
R10-6
24" x 36"



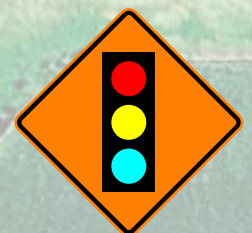
R10-6
24" x 36"

RESTRICTED
WIDTH AHEAD
11 FT

G20-55A
66" x 36"



W3-3
48" x 48"



W3-3
48" x 48"



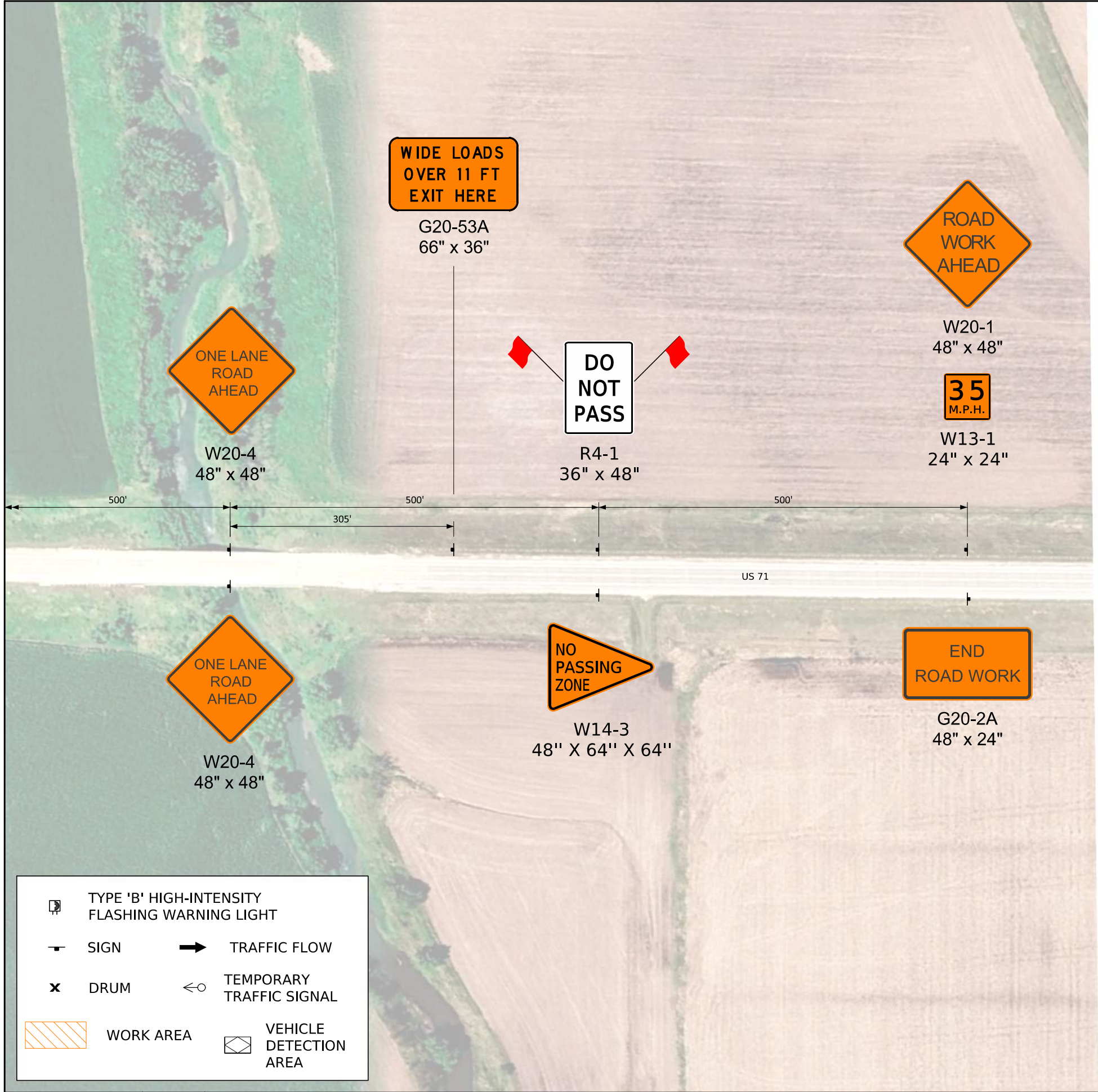
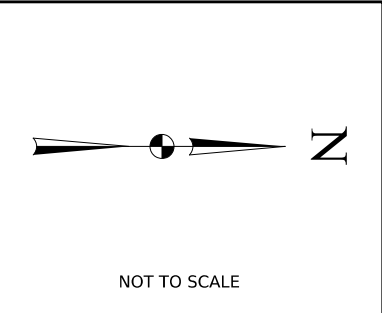
W20-1
48" x 48"

END
ROAD WORK

G20-2A
48" x 24"

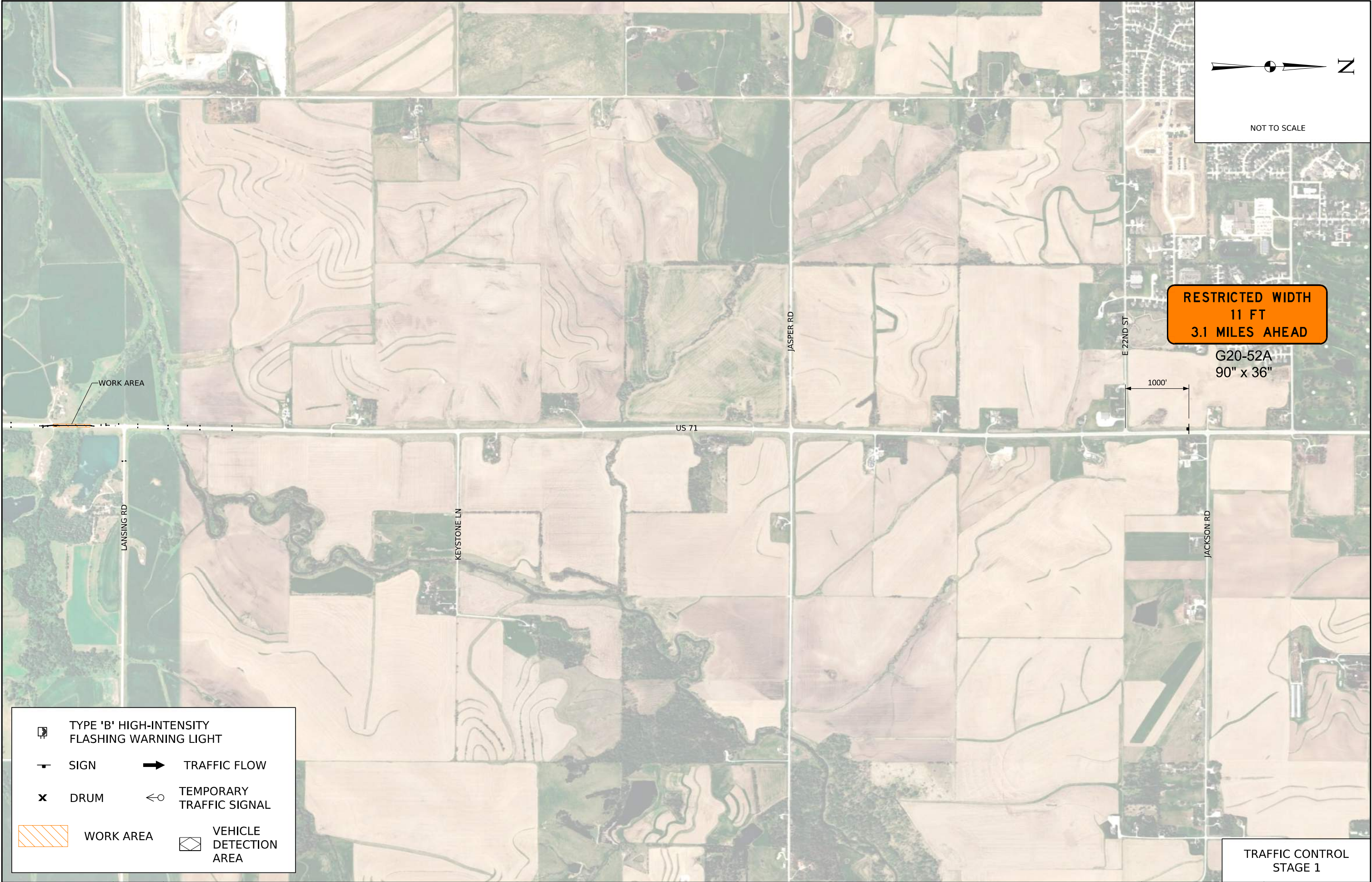
TRAFFIC CONTROL
STAGE 1

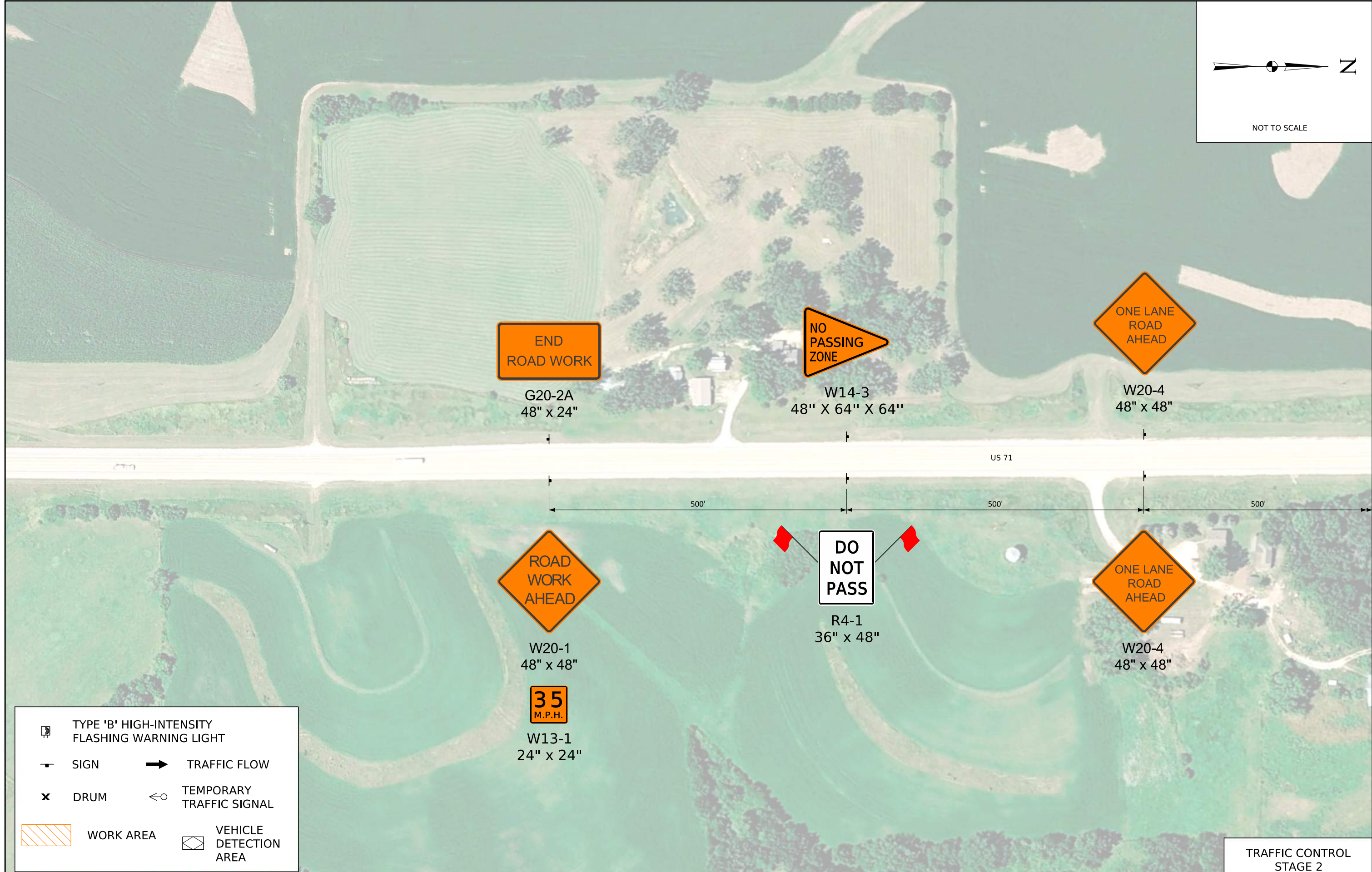
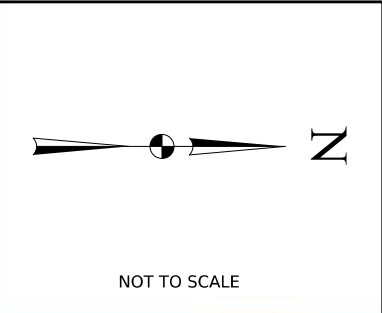
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	SIGN
	TRAFFIC FLOW
	DRUM
	TEMPORARY TRAFFIC SIGNAL
	WORK AREA
	VEHICLE DETECTION AREA



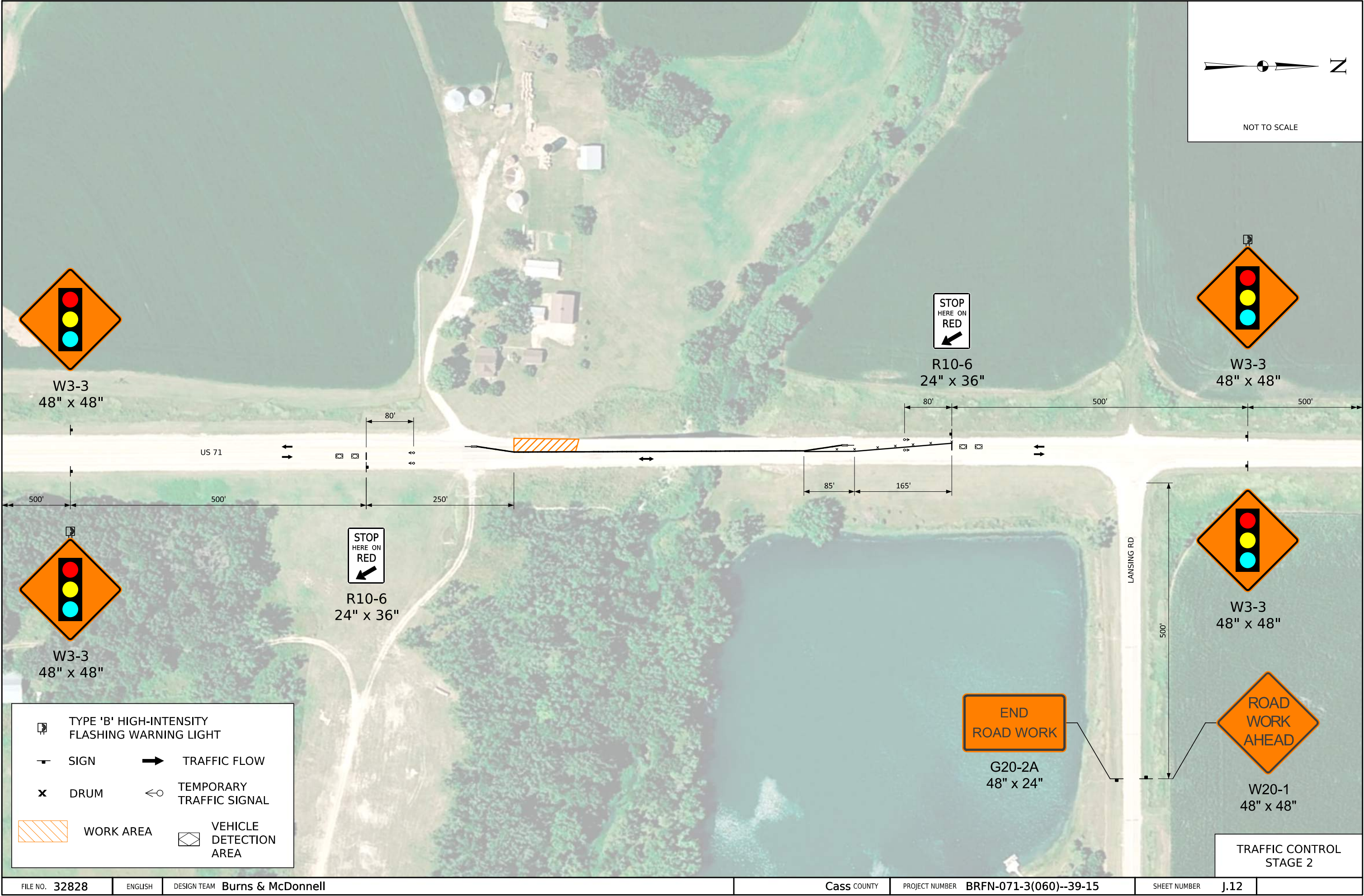
	TYPE 'B' HIGH-INTENSITY FLASHING WARNING LIGHT
	SIGN
	TRAFFIC FLOW
	DRUM
	TEMPORARY TRAFFIC SIGNAL
	WORK AREA
	VEHICLE DETECTION AREA

TRAFFIC CONTROL
STAGE 1



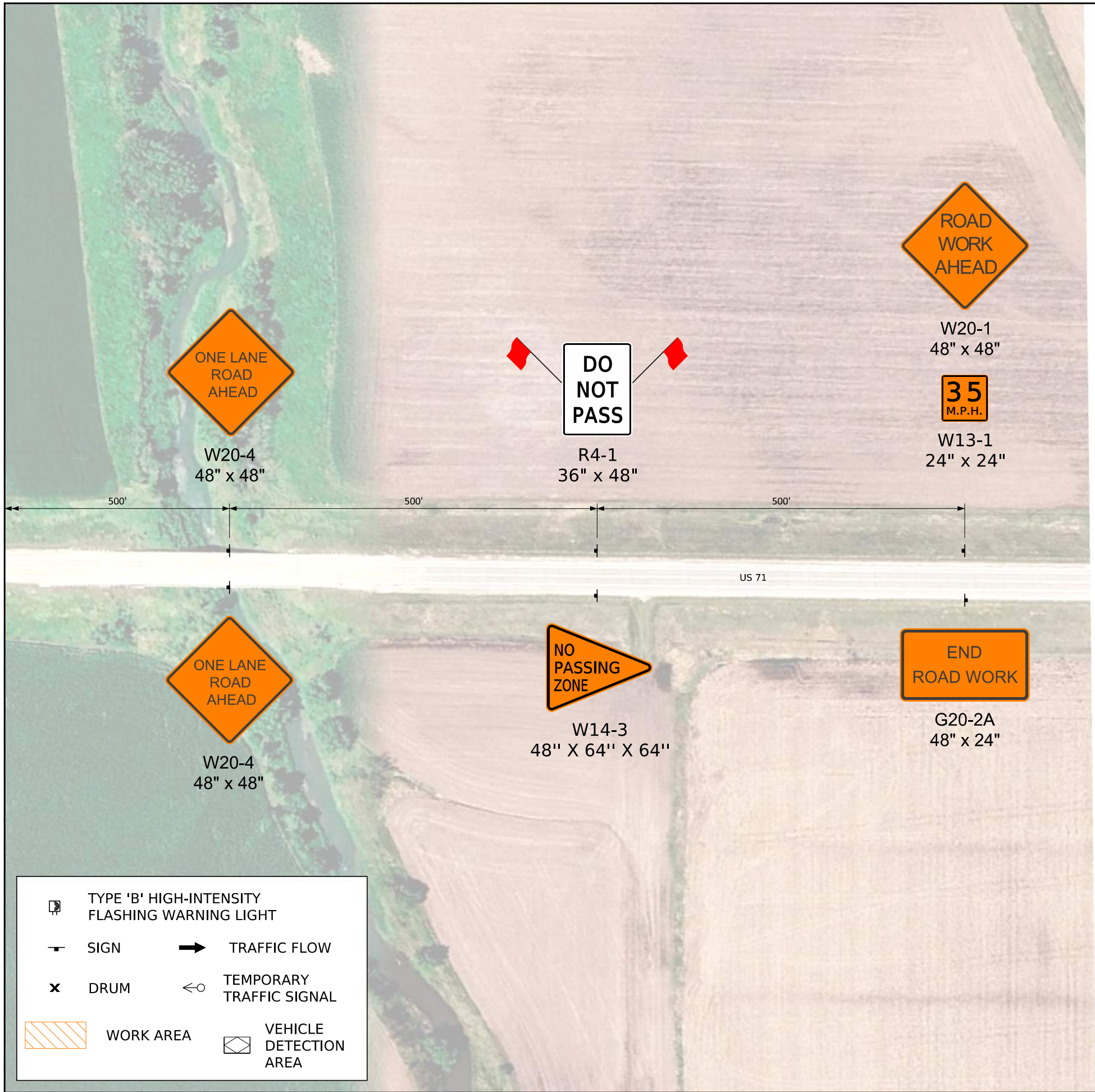


TRAFFIC CONTROL
STAGE 2





NOT TO SCALE



Legend



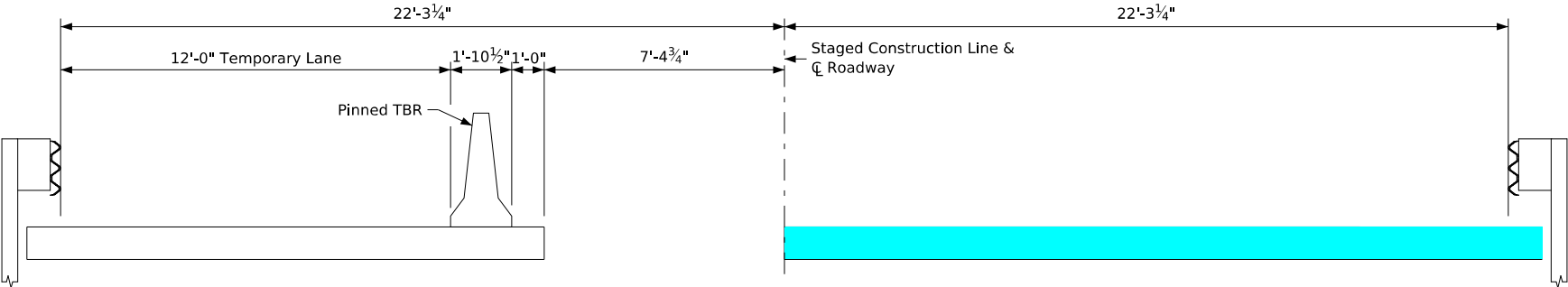
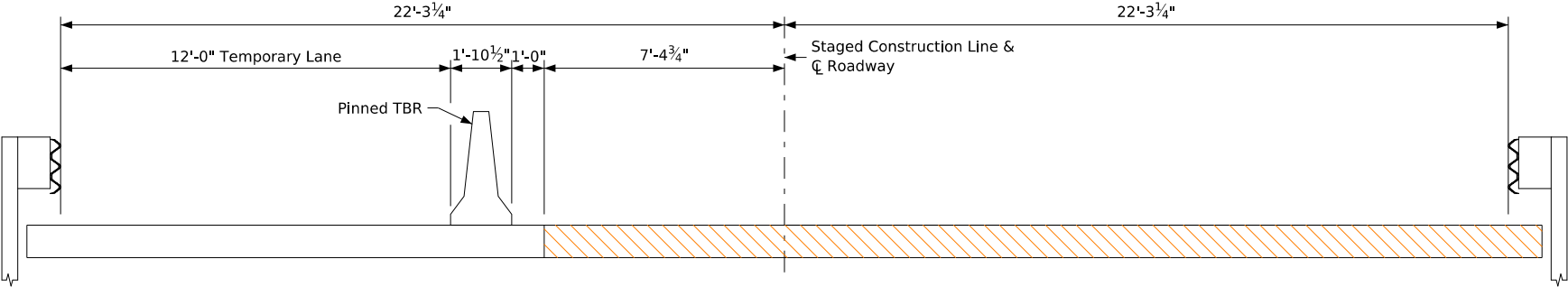
Removal



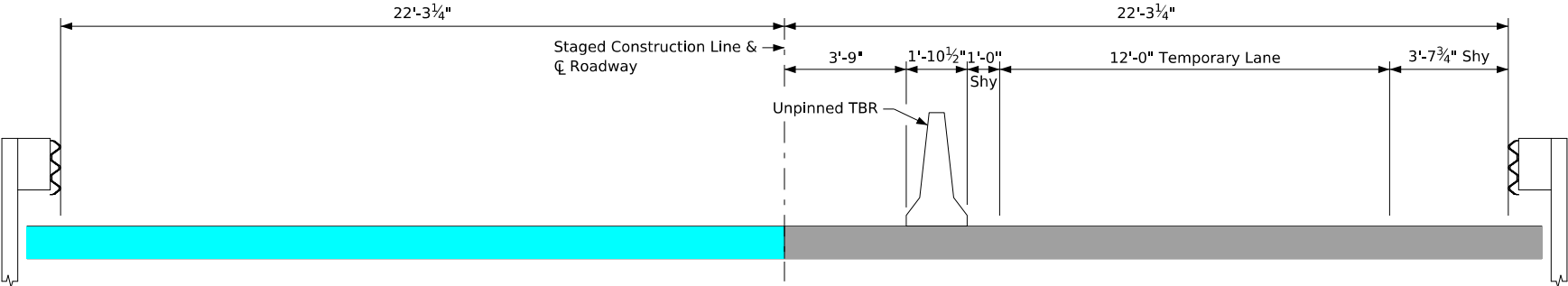
New Construction,
This Stage



New Construction,
Previous Stage



Stage 1



Stage 2

US-71
(Looking North)

STAGING
TYPICALS